

F i n a l C o n c e p t P a p e r

Mid-Valley Pipeline

Coachella Valley, California

**Submitted to:
Coachella Valley Water District**

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Executive Summary

This concept paper provides District staff and the District Board with the information needed to evaluate the feasibility of proceeding with design of the Mid-Valley Pipeline. In addition, it will to serve as background information for a request for proposal for engineering services on the Mid-Valley Pipeline. **Sketch 2-1** (all sketches are in **Appendix B**) shows the Mid-Valley area. The area includes a large concentration of golf courses that currently obtain most of their water from groundwater.

The Mid-Valley Pipeline was initially proposed in the Conjunctive Use/Surplus Water Storage Study prepared in 2000. That study proposed a system to deliver water from the Coachella Canal (Canal) to golf courses in the Mid-Valley area (generally Palm Desert, Indian Wells and Rancho Mirage). The system would operate as a conjunctive use project, allowing the District to better manage use of Canal water and groundwater. From a legal perspective, the Canal water would be water from the State Water Project (SWP). The District would exchange the SWP water with Metropolitan Water District of Southern California (Metropolitan) for some of Metropolitan's Colorado River water.

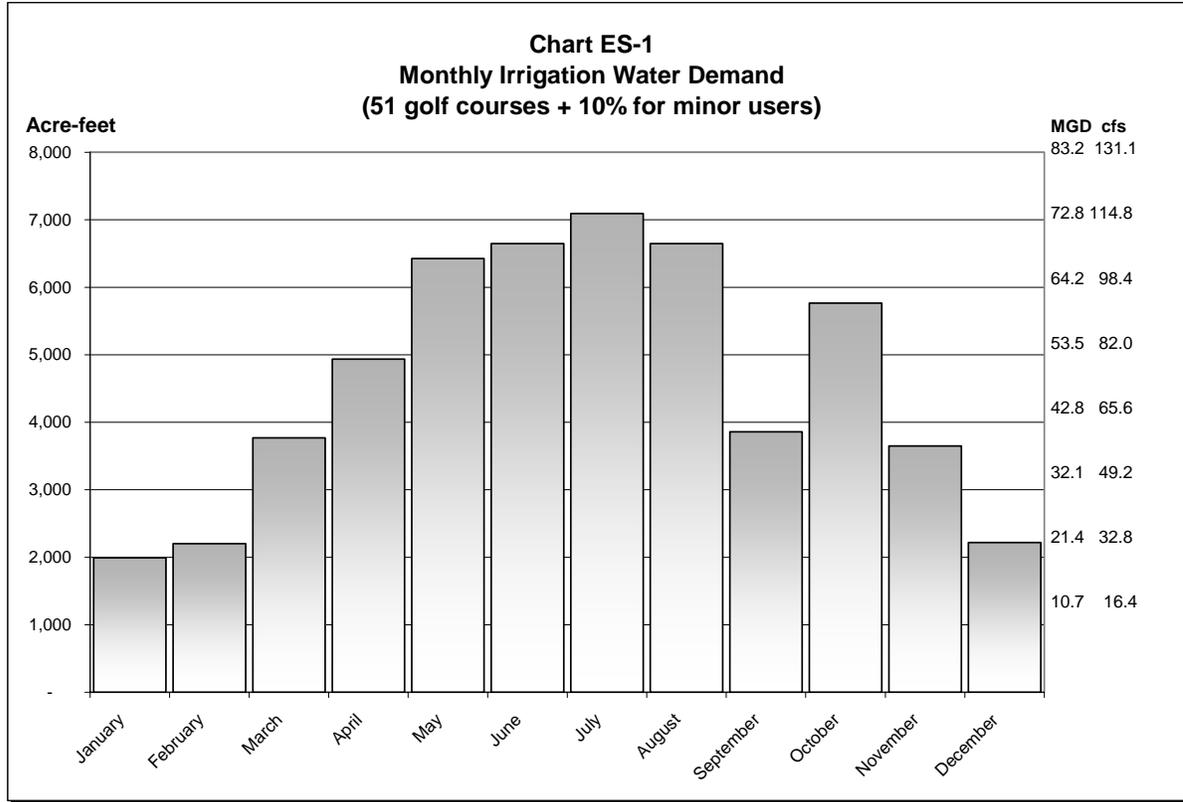
The Mid-Valley Pipeline has been incorporated into the Preferred Alternative of the District's September 2002 Final Water Management Plan. The Preferred Alternative of the Water Management Plan sets a goal of eliminating approximately 37,000 acre-feet/yr of groundwater pumping with this conversion. The Preferred Alternative also includes a conversion of 8,000 acre-feet of groundwater use by golf courses to recycled water. The Program Environmental Impact Report of the Water Management Plan provides program-level CEQA analysis for these two projects. Project-level (site-specific) CEQA analysis for facilities construction will be required for facilities construction.

This concept paper reviews the previous work and provides a more detailed evaluation. It proposes integrating the use of Canal water with the use of WRP 10 recycled water program.

Irrigation Use in the Mid-Valley Area

There are 51 golf courses within Mid-Valley area, including proposed courses. Annual water use of these courses in 2015 will be approximately 50,200 acre-feet per year or 975 acre-feet per year per golf course. Minor irrigation water users in the area including homeowners associations, parks and the Palm Desert High School, may use an additional 10 percent or 5,000 acre-feet.

Chart ES-1 shows the monthly use of irrigation water in the Mid-Valley area.



Impacts on Golf Course Operations

While the golf courses recognize the necessity of reducing groundwater pumping they operate in a highly competitive market and are concerned with equity among all golf courses. If the project is implemented in a manner that puts one golf course at a disadvantage to another, there may be severe financial impacts. Golf courses have a number of concerns with the projects impact on their operations and costs. These concerns include water quality, capital costs of converting their irrigation systems and increased maintenance and operations costs.

The District has set in place a collaborative effort with the golf courses in the Mid-Valley area to address issues related to use of Canal water, recycled water and groundwater on the courses.

WRP 10 Recycled Water Facilities

WRP 10 is located within the Mid-Valley area on the south side of Hovley Lane east of Cook Street. An existing recycled water system serves golf courses and other users with tertiary treated water from WRP 10. Since 1987, WRP 10 has been providing recycled water to golf courses, homeowners associations, and the Palm Desert High School.

In 2003, WRP 10 treated 3,752 million gallons of influent (11,515 acre-feet). While influent is higher in winter, flows are relatively constant from season to season. Historically, inflow has increased by approximately 5 percent per year.

Only about one-third of influent was recycled in 2003. In August 2004, the District and Toscana Country Club signed an agreement to serve that golf course with recycled water. Still, only about one-half of the influent will be recycled. Further expansion of recycled water use is limited by the inability to meet demand during the high demand months. If Canal water were brought to WRP 10 and delivered to the recycled water pump station, then additional customers could be added and the use of recycled water maximized by supplementing the supply during the summer when irrigation demand is high.

Proposed Mid-Valley Pipeline Facilities

The Mid-Valley Pipeline facilities would consist of a Canal Water Transmission System from the Coachella Canal to WRP 10 and distribution facilities from WRP 10 to the golf courses and other users. There would be two types of distribution facilities. First Canal water would be used to augment the existing recycled water supply allowing expansion of the recycled system. Second, a separate Canal Water Distribution System would be constructed to serve the remaining demand.

Canal Water Transmission System

The Canal Water Transmission System would consist of Pump Station 1 located adjacent to the Canal, a Transmission Line to WRP 10, a Receiving Impoundment at WRP 10 and service connections to adjacent golf courses.

Pump Station 1 would be sized to deliver the projected remaining demand for irrigation water after maximum use is made of recycled water produced by WRP 10. A preliminary estimate of the required area for the pump station is 0.7 acres, not including any additional land for mitigating noise and aesthetic impacts.

Two alignments for the Transmission Line to WRP 10 have been evaluated. **Sketch 4-1** shows the locations of these two alignments. The Coachella Stormwater Channel Alignment (Stormwater Channel Alignment) generally follows the Coachella Stormwater Channel. The 42nd Avenue/Hovley Lane Alignment (42nd Avenue Alignment) follows public streets for the majority of its route.

District staff and Bookman-Edmonston met with staff from the cities of Indio, Indian Wells, La Quinta and Palm Desert, and the County of Riverside in February and May 2005. The cities and county all indicated a preference for the Stormwater Channel Alignment in order to reduce construction impacts. While the 42nd Avenue Alignment is shorter, constructing along a major street presents significant challenges including traffic control, maintaining access for adjacent property owners, utility conflicts and restricted construction zones.

A Receiving Impoundment at WRP 10 will be required to allow matching flows entering WRP 10 from the Canal with flows being delivered from the plant to the golf courses. District plans for WRP 10 include construction of a 5 million gallon (15-acre-foot) impoundment adjacent to an existing recycled water reservoir. Construction of this impoundment as part of the transmission system will allow operation of the Mid-Valley Pipeline at partial capacity. Additional storage will be required as additional golf courses are connected to the system.

It is feasible to connect some golf courses located adjacent to the Canal Water Transmission System directly to the system.

Recycled Water System Extension

The existing Recycled Water System will need to be extended to make the additional deliveries made possible by the addition of Canal water to the recycled system. The extension is not addressed in this report.

Canal Water Distribution System

The District and the golf course operators are collaborating to fully understand the opportunities and constraints in delivering Canal water to the golf courses. A possible system configuration has been prepared in order to develop an understanding of the feasibility and cost of a distribution system.

From the proposed Pump Station 2 at WRP 10, the Canal Water Distribution System would extend to the northwest with approximately 120,000 lineal feet of pipeline. Additional storage will be constructed as the system is built. Fifteen million gallons of storage (in addition to the five million gallons built with the transmission system) would allow operation of the Canal Water Transmission System for 24 hours and delivery of canal water to the golf courses over 18-hours.

Two options were evaluated for the sizing and operation of the distribution system. The first option is to enlarge the system to allow all deliveries to the distribution system to occur at mid-peak or off-peak energy rates. The second option is the inclusion of an additional pump station to reduce energy consumption by allowing some deliveries to be made with less pumping.

Project Cost

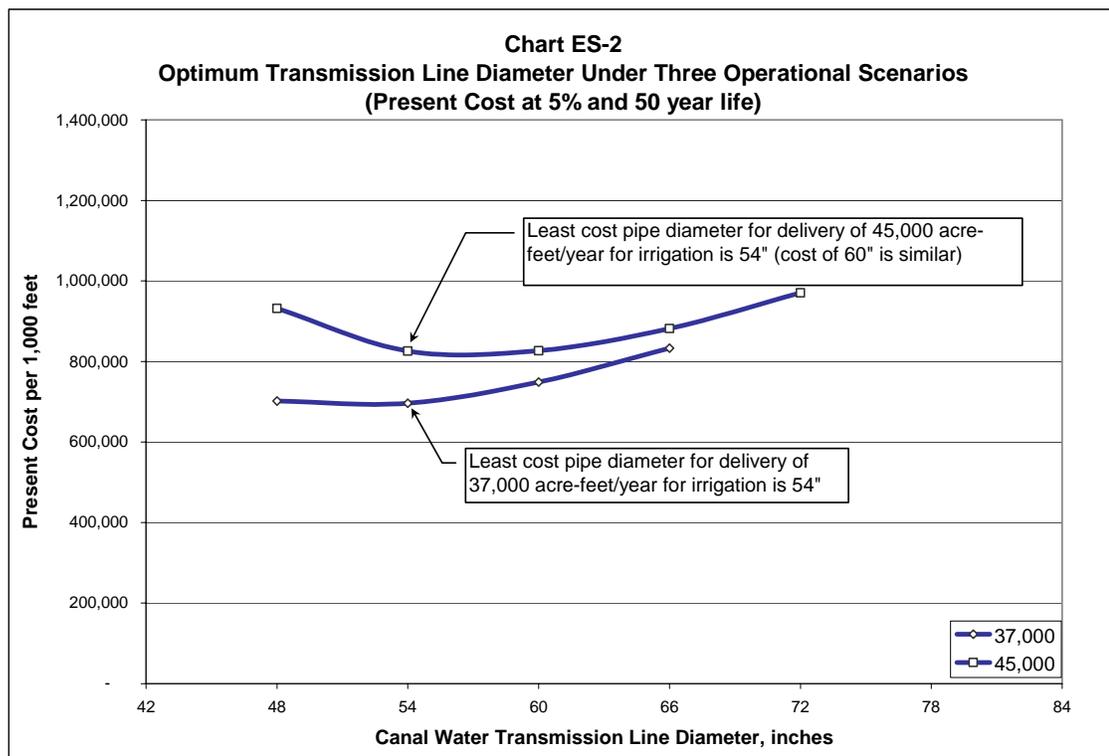
Project costs have been developed using current (2005) price levels. These costs include the costs of construction and a partial evaluation of operation costs where those costs affect sizing and design of the proposed facilities. **Table ES-2** summarizes the projected capital cost of each alignment and various sizes of the Canal Water Transmission System.

Table ES-2
Canal Water Transmission System Capital Cost
Includes Pump Station 1 and 5 MG storage at WRP 10
(2005 Price Level)

Pipe Diameter (inches)	42nd Avenue/Hovley Lane Alignment	Coachella Stormwater Channel Alignment	
		Levee	Invert
54	\$ 27,509,799	\$ 29,266,322	\$ 29,914,107
60	\$ 30,328,335	\$ 32,716,761	\$ 32,889,852
66	\$ 33,652,274	\$ 36,728,243	\$ 36,389,973

The estimated capital cost varies by approximately ten-percent between the alignments. Given uncertainty of predicting the construction climate more than a year from now and the preliminary nature of these estimates, the capital cost of each alignment is essentially the same.

Determination of the most cost effective pipe diameter depends not only on the capital cost, but also on operation and maintenance costs. Energy to pump the water, the largest element in the operation and maintenance cost, depends on the diameter of the pipeline. In **Chart ES-2** the total cost (capital and operation and maintenance) for a length of pipe has been evaluated under two operational scenarios. If the transmission line is to be sized to meet the goal delivering 37,000 acre-feet per year of Canal water as stated in the District’s Water Management Plan, a 54-inch diameter pipeline would be the most cost effective. Initial sizing of the project has focused on a potential of delivering 45,000 acre-feet per year. A 54-inch or a 60-inch diameter pipeline would be the most cost effective size for the delivery of 45,000 acre-feet.



Canal Water Distribution System Cost

Table ES-3 shows the capital cost of each option considered for this system.

Table ES-3
Canal Water Distribution System Capital Cost
(2005 Price Level. Includes design and construction management. Does not include supervision and administration by District staff)

	Single Pressure Zone	Dual Pressure Zone
Canal Water Distribution System, Pump Station 2 at 72 cfs for 24-hour Delivery	\$ 37,090,824	\$ 40,603,627
Canal Water Distribution System, Pump Station 2 at 96 cfs for 18-hour Delivery	\$ 40,132,982	\$ 44,654,383
Notes: Does not include supervision and administration by District staff		

An evaluation of the operation and maintenance costs of each of these four options has been made. The savings from 18-hour deliveries would be on the order of \$60,000 per year. This annual savings would justify approximately \$1.5 million dollars of construction (50 year life, 3 percent interest rate). The cost estimate in Table ES-3 shows an increased capital cost of three to four million to enlarge the system to facilitate 18-hour delivery. While there are still issues with the location of storage and system operations to be resolved, it appears that 18-hour delivery cannot be justified based on savings in energy costs.

Including a dual lift for the distribution system would reduce the lift of 23,000 acre-feet of Canal water by 180 feet. This reduction in lift would result in an annual savings in energy of \$550,000. This reduction easily justifies the additional cost of approximately \$ 4 million. Including the second lift station may have additional advantages of facilitating construction of the distribution system in phases.

Mid-Valley Pipeline Cost

Table ES-4 presents an evaluation of the capital cost and cost per acre-foot of the Mid-Valley Pipeline. The table focuses on the anticipated deliveries of the project and on the construction of the Canal Water Transmission System. Thus, the cost of the Canal Water Distribution System is kept constant for each alternative. Four different diameters for the Canal Water Transmission System and two different annual delivery goals are shown. The anticipated capital cost is between \$74 million and \$85 million. The annual operation and maintenance cost is predominately energy for pumping. The cost per acre-foot of water delivered varies between \$170 and \$208.

Table ES-4
Cost of Mid-Valley Pipeline
(2005 price level. 5% and 50 year life)

	Diameter of the Canal Water Transmission System			
	54-inch	60-inch	66-inch	72-inch
Capital Costs (2005 price level)				
Canal Water Transmission System (Stormwater Channel Alignment, Invert)	\$ 29,300,000	\$ 32,900,000	\$ 36,400,000	\$ 40,300,000
Canal Water Distribution System (18-hour deliveries, dual lift)	44,700,000	44,700,000	44,700,000	44,700,000
On site improvements to golf courses	Not included	Not included	Not included	Not included
Expansion of recycled water system	Not included	Not included	Not included	Not included
Capital Cost	\$ 73,900,000	\$ 77,500,000	\$ 81,000,000	\$ 84,900,000
37,000 acre-feet per year of canal water delivered (Goal of Water Management Plan)				
Equivalent annual capital cost	\$ 4,050,000	\$ 4,250,000	\$ 4,440,000	\$ 4,650,000
Annual Operation and Maintenance cost	3,030,000	3,010,000	3,020,000	3,040,000
Equivalent annual cost	\$ 7,080,000	\$ 7,260,000	\$ 7,460,000	\$ 7,690,000
Equivalent annual cost per acre-foot	\$ 191	\$ 196	\$ 202	\$ 208
45,000 acre-feet per year of canal water delivered (all pumping of groundwater in Mid-Valley eliminated)				
Equivalent annual capital cost	\$ 4,050,000	\$ 4,250,000	\$ 4,440,000	\$ 4,650,000
Annual Operation and Maintenance cost	3,610,000	3,540,000	3,510,000	3,520,000
Equivalent annual cost	\$ 7,660,000	\$ 7,790,000	\$ 7,950,000	\$ 8,170,000
Equivalent annual cost per acre-foot	\$ 170	\$ 173	\$ 177	\$ 182

Recommendations

The evaluation in this concept paper is adequate to recommend that the District fund implementation of the Mid-Valley Pipeline. The first phase of construction should be the Canal Water Transmission System to deliver Canal water to WRP 10. Planning for the expansion of the existing recycled system and construction of the proposed Canal Water Distribution System should be initiated in order that deliveries of Canal water to golf courses can start soon after construction of the Transmission Facilities is complete.

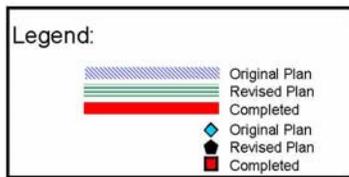
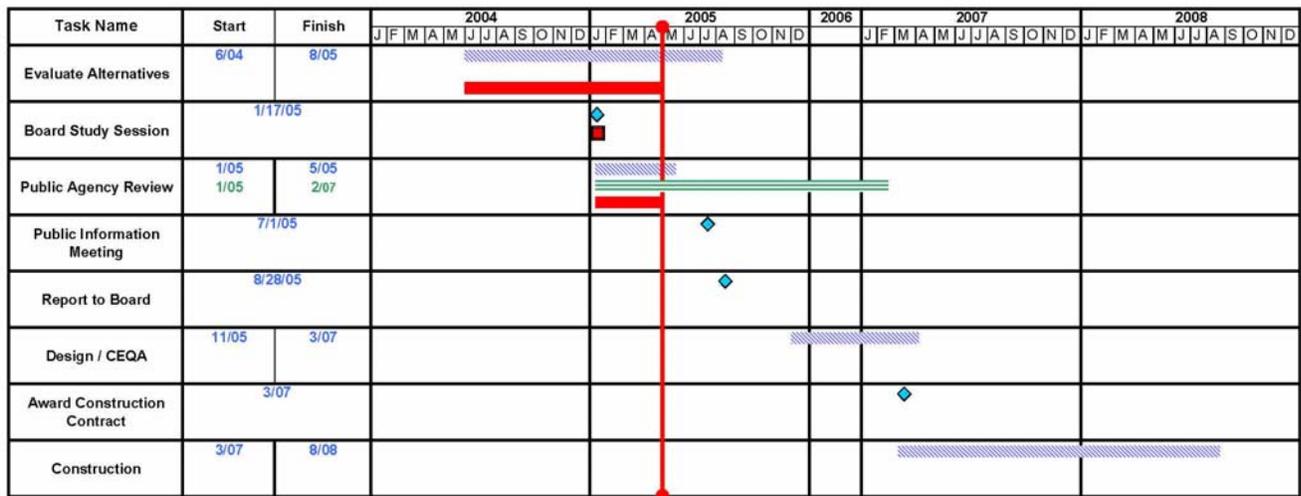
The proposed Canal Water Transmission System should be sized to allow delivery of up to 37,000 acre-feet of Canal water for irrigation purposes and should be integrated with the existing Recycled Water System. The cost difference between a 54-inch and 60-inch diameter Transmission Line is small. Further evaluation during pre-design is warranted to select the pipeline diameter. The Stormwater Channel Alignment is recommended over the Hovely Lane/42nd Avenue Alignment due to reduced construction impacts. District staff has initiated selection of property for the pump station to be located at the canal under the presumption that the Stormwater Channel Alternative will be selected. Once a selection is made, the District should assure that the selected site remains available.

Implementation requires significant coordination with the golf courses. During design of the Canal Water Transmission System discussions should occur with golf courses that possibly

can be connected to the Canal Water Transmission System. During design and construction, discussions should occur with the golf courses that can be connected to an expanded recycled water system. During construction, discussions should occur with the golf courses that can be connected to the Canal Water Distribution System. Table 4-1 in Section 4 divides the Mid-Valley area golf courses into Phases 1, 2 and 3 respectively.

A preliminary design and construction schedule through design and construction of the Transmission system is shown in **Chart ES-3**. Planning and design efforts for construction of the Canal Water Distribution System would continue during this period. Implementation of the distribution system and enlargement of the Recycled Water Distribution System would be initiated with the completion of the Transmission System.

**Chart ES-3
Preliminary Schedule through construction of
Canal Water Transmission System**



1 Introduction

The Mid-Valley Pipeline was initially proposed in the Conjunctive Use/Surplus Water Storage Study prepared for the Coachella Valley Water District (District) and Metropolitan Water District of Southern California (Metropolitan) (Bookman-Edmonston, 2000). The project was then incorporated into the District's September 2002 Final Water Management Plan.

The Conjunctive Use/Surplus Water Storage Study proposed a system to deliver water from the Coachella Canal (Canal) to golf courses in the Mid-Valley area (generally Palm Desert, Indian Wells and Rancho Mirage). The system would operate as a conjunctive use project, allowing the District to better manage its use of Canal water and groundwater. The study determined that there was a market for up to 35,900 acre-feet of Canal water if 49 golf courses converted from groundwater to Canal water. From a legal perspective, the water from the Canal would be water from the State Water Project (SWP). The District would exchange the SWP water with Metropolitan for some of Metropolitan's Colorado River water. The study proposed that the golf courses would maintain their groundwater wells and the ability to shift back to groundwater when imported supplies were unavailable. The potential would also exist for the golf courses to produce groundwater for use by the District. The District could then deliver groundwater to the Canal by operating the proposed facilities in reverse.

The concept was incorporated into the Preferred Alternative of the District's September 2002 Final Water Management Plan and is covered by the CEQA documentation of that plan as "Conversion of Upper Valley Golf Courses to SWP Exchange Water" (Montgomery Watson Harza, 2002a). The Preferred Alternative sets a goal of eliminating 37,000 acre-feet/yr of groundwater pumping with this conversion. The Preferred Alternative also includes "Upper Valley Golf Courses Conversion to Recycled Water." This conversion anticipated an increase of about 8,000 acre-feet/year in recycled water use. The Program Environmental Impact Report of the Water Management Plan provides program-level CEQA analysis for these two projects. The District's Board of Directors certified the Final Program Environmental Impact Report prepared for the Water Management Plan in Resolution No. 2002-213. Project-level (site-specific) CEQA analysis for facilities construction will be required for facilities construction (Montgomery Watson Harza, 2002b and 2002c).

The District retained Bookman-Edmonston, a division of GEI Consultants, to prepare a concept paper on the Mid-Valley Pipeline. This concept paper reviews the previous work and provides a more detailed evaluation. In addition, it proposes integrating the use of Canal water in the Mid-Valley area with the use of recycled water. This integration would facilitate water management by allowing better matching of supply and demand – monthly supply of

recycled water is relatively constant while demand for irrigation water is seasonal. This concept paper provides District staff and the District Board with the information needed to evaluate the feasibility of proceeding with design. In addition, it is intended to serve as background information for a Request for Proposal for additional engineering services.

Section 2 reviews the demand for irrigation water in the Mid-Valley Pipeline area. In Section 3 the existing recycled water supply is discussed. Section 4 addresses the design criteria and evaluates several options for the required project facilities. The project costs are discussed in Section 5. Section 6 addresses eliminated alternatives and study limitations. Finally, Section 7 contains recommendations for proceeding with the Mid-Valley Pipeline.

2 Irrigation Water Use in Mid-Valley Area

The Mid-Valley Pipeline area (Mid-Valley area) is generally bounded by Interstate 10 on the northeast, Washington Street on the east, Highway 111 on the south, and Date Palm Drive on the west. In addition, several golf courses along Deep Canyon Channel, south of Highway 111, are included. The area includes a large concentration of golf courses that currently obtain most of their water from groundwater and the remainder from the District's recycled water program. **Sketch 2-1** (all sketches are in **Appendix B**) shows the Mid-Valley area. The limits of the area were established based on the engineering and economic feasibility of delivering water from the Coachella Canal (Canal).

This section updates the water demand projections of the Conjunctive Use/Surplus Water Storage Study (Bookman-Edmonston, 2002). The primary changes have been to reflect the construction of additional golf courses and to include golf courses that use recycled water. While the prior study treated recycled water as a separate system, this concept paper proposes close integration of the recycled water and Canal water systems.

2.1 Irrigation Water Demand

There are 51 golf courses within Mid-Valley area (A 27-hole golf course is counted as 1.5 golf courses), including several proposed courses. **Table 2-1** lists these golf courses and their projected water use in 2015. Water use by minor users in the area (including homeowners associations, parks and the Palm Desert High School) is assumed to use ten percent of golf course use.

Chart 2-1 shows the monthly pattern of irrigation in the area. **Chart 2-2** combines the data in Table 2-1 and Chart 2-1 to show the anticipated monthly Mid-Valley area demand. Combining the information from Table 2-1 and Chart 2-1, the average 18-hole golf course uses approximately 975 acre-feet per year (0.87 million gallons per day (MGD)). The highest demand occurs in July, when each golf course uses an average of 3.88 acre-feet per day (1.26 MGD).

**Table 2-1
Projected Mid-Valley Use of Irrigation Water (2015)**

Golf Course	Holes/18-Hole Equivalents	2015 Projected Water Use¹ (acre-feet per year)
Desert Willow ²	36	1800
Portola Country Club ²	18	900
The Golf Center, Palm Desert ²	9	450
Woodhaven Country Club	18	994
Palm Desert Country Club	27	1,999
Palm Desert Resort Country Club	18	1,157
Indian Ridge Country Club ²	36	923
Palm Valley Country Club	36	1,664
Avondale	18	793
Emerald Desert Country Club	9	333
Desert Falls Country Club	18	1,522
The Lakes Country Club	27	2,308
The Oasis	18	931
The Golf Resort at Indian Wells	36	1,845
Indian Wells Country Club	27	885
El Dorado Country Club	18	307
Desert Horizons Country Club	18	867
Marriott's Shadow Ridge ³ (built since 2000)	18	923
Santa Rosa Country Club ²	18	746
Suncrest Country Club	9	714
Chaparral Country Club	18	951
Monterey Country Club	27	1,628
Date Palm Country Club	18	619
Marriott's Desert Springs Resort	36	1587
Palm Desert Greens Country Club ²	18	884
Toscana Country Club ⁴	36	1800
Rancho Portola, future course at T4S/R6E Sec 33	18	923
The Eagle, future course at T4S/R6E Sec 31	36	1,845
Rancho Las Palmas Resort Country Club, Marriott's	27	1,236
Date Palm Country Club	18	619
Sunrise Country Club	18	961
Thunderbird Country Club	18	574
The Springs Club	18	1,289
Desert Island Golf and Country Club	18	852
Rancho Mirage Country Club	18	1,236
Tamarisk Country Club	18	692
The Club at Morningside Heights	18	1,205
Westin Mission Hills Resort	36	1,854
Mission Hills Country Club	54	5,747
Private at NW corner Hope and Sinatra ⁵	9	450
Private at top of Magnesia Canyon ⁵	18	900
Total golf course irrigation	51	50,194
Average demand per golf course (18 hole equivalent)		975
Minor irrigation (assumed to equal 10% of golf course use)		5,019
Total irrigation demand in Mid-Valley area		55,213

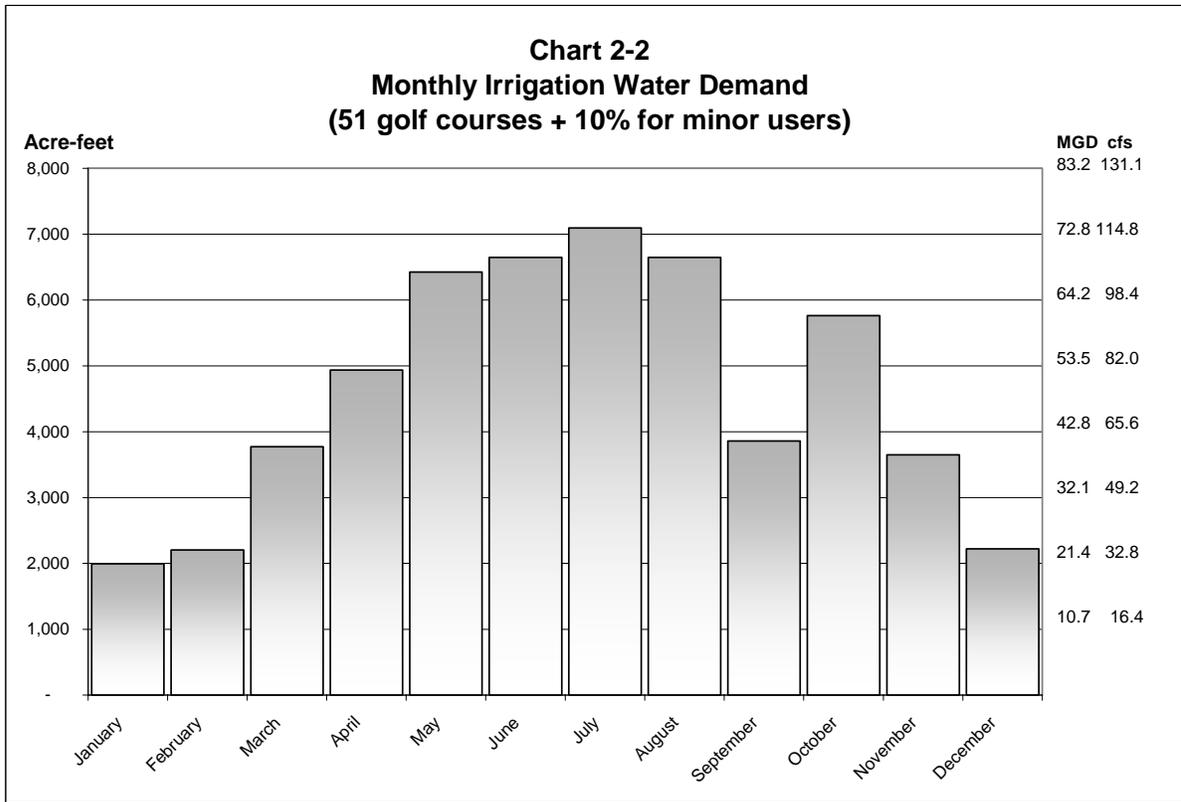
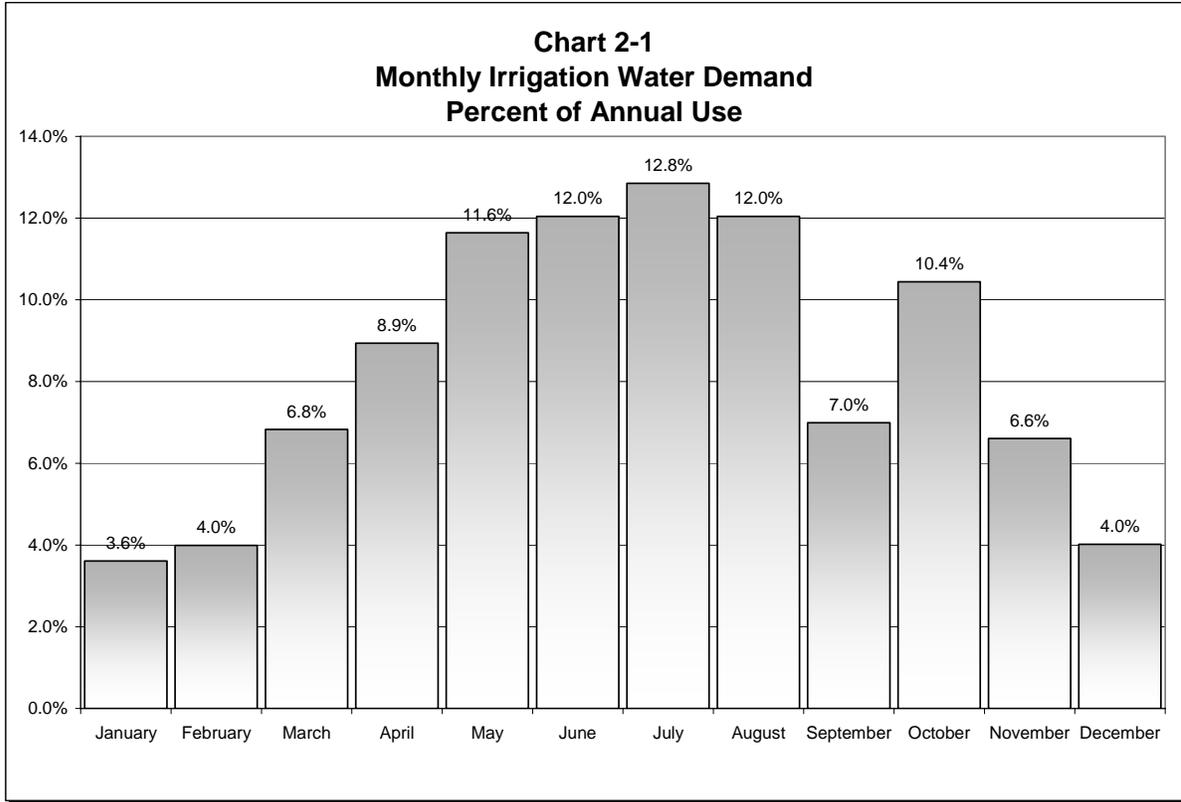
¹ Unless otherwise noted, projected 2015 usage is from the District's Water Management Plan. Projections for 2105 assume implementation of water conservation measures.

² Golf courses currently receiving recycled water. Use assumed to be 900 acre-feet per year.

³ Marriott's Shadow Ridge was constructed to facilitate later conversion to recycled water (low pressure system). It is currently using groundwater.

⁴ Toscana Country Club signed agreements with the District in August 2004 to use recycled water. Construction is underway.

⁵ These are closely-held private courses. The Magnesia Canyon course obtains water from a private well located below the cove. Use assumed to be 900 acre-feet per year.



2.2 Impacts on Golf Course Operations

While the golf courses recognize the necessity of the project they operate in a highly competitive market and are concerned with equity among all golf courses. If the project is implemented in a manner that puts one golf course at a disadvantage to another, there may be severe financial impacts. The golf courses have a number of concerns with the projects impact on their operations and costs.

The golf courses are concerned with water quality. Canal water has higher suspended solids than groundwater or recycled water. Canal water and recycled water both have higher total dissolved solids (salt or TDS) and a different mix of salts than groundwater. The golf courses must manage their operations to avoid or minimize damage from the suspended solids and salts.

Converting to Canal water or recycled water from groundwater will require an investment in their irrigation system by the golf courses. The golf courses have an investment in their existing groundwater production system that they do not want to abandon. Use of recycled water requires compliance with State regulations.

As will be discussed later, use of Canal water (pumped from the Canal 24 hours a day and applied to the golf courses at night) will require storage. To the extent this storage is on the golf course there is a cost to the golf courses.

The District has set in place a collaborative effort with the golf courses in the Mid-Valley area to address issues related to use of Canal water, recycled water and groundwater on the courses.

3 Mid-Valley Recycled Water Facilities

Water Reclamation Plant 10 (WRP 10) is located within the Mid-Valley area south of Hovley Lane and east of Cook Street. Since 1987, WRP 10 has been providing recycled water (tertiary treated) to golf courses, homeowners associations, and the Palm Desert High School. The WRP 10 permitted influent capacity is 18.0 MGD (55 acre-feet per day). The permitted recycling capacity is 15.0 MGD (46 acre-feet per day). In 2003, the plant treated 3,752 million gallons of influent (11,515 acre-feet). Historically, inflow has increased by approximately five percent per year. This section describes the current system and proposes an approach to maximizing the use of recycled water.

3.1 Recycled Water Program at WRP 10

Recycled water facilities at WRP 10 include a 5-million-gallon earth-embankment reservoir with a floating roof and a pump station with both “high-pressure” and “low pressure” pumps. The high-pressure system delivers water at sprinkler pressure. The low-pressure system delivers to impoundments on the golf courses. Total pumping capacity is approximately 20,000 gallons per minute (gpm) or 45 cubic feet per second (cfs). The high-pressure pumps have a peak flow of approximately 12,000 gpm or 27 cfs. **Table 3-1** lists the customers served by the recycled system; **Sketch 3-1** shows the layout of the distribution lines. With modest additions, the current recycled water distribution system can serve much of the Mid-Valley area south of Gerald Ford Drive and east of Monterey Avenue.

Table 3-1
Current WRP 10 Recycled Water Customers

Indian Ridge Country Club	Silver Sands HOA
Santa Rosa Country Club	Casa Blanca HOA
Palm Desert Greens Country Club	Palm Desert High School
Portola Country Club	Desert Willow Golf Resort
The Golf Center, Palm Desert	Mountain View Falls HOA4
Marriott's Desert Springs Resort	Toscana Country Club
Vista Del Montanas HOA	

Table 3-2 shows the treatment and use of WRP 10 influent during 2003. Only about one-third of influent was recycled. In August 2004, the District and Toscana Country Club signed an agreement to serve that golf course with recycled water. During hot weather, Toscana Country Club will need 2 to 2.5 MGD (6 to 8 acre-feet per day) to serve two 18-hole golf courses. With this addition to the recycled system, summer use of recycled water from WRP 10 will come closer to the potential supply. Still, only about one-half of the influent will be recycled. Further expansion of recycled water use is limited by the inability to meet demand during the high-demand months. Providing Canal water to the recycled system

during high-demand months would allow additional golf courses to be connected to the system.

**Table 3-2
Treatment and Use of WRP 10 Influent**

Month (1993 actual)	Inflow		Percolated (Secondary Treated)		Recycled (Tertiary Treated)		On-Site Use	
	(acre-feet)	(million gallons)	(acre-feet)	(million gallons)	(acre-feet)	(million gallons)	(acre-feet)	(million gallons)
January	1,029	335	754	246	151	49	124	40
February	920	300	789	257	92	30	40	13
March	1,075	350	745	243	235	77	96	31
April	1,038	338	724	236	301	98	14	4
May	991	323	472	154	495	161	23	8
June	924	301	196	64	547	178	182	59
July	894	291	294	96	467	152	132	43
August	937	305	280	91	507	165	150	49
September	902	294	390	127	339	110	173	56
October	950	309	464	151	323	105	162	52
November	997	325	676	220	169	55	152	50
December	986	321	698	227	176	57	112	36
Total	11,642	3,792	6,482	2,111	3,802	1,238	1,358	442

Source: CVWD. Alan Harrell, e-mail. July 27, 2004

3.2 Expansion of the Recycled Water Program at WRP 10

Sketch 3-1 also shows golf courses that could be added to the recycled system, if the supply of recycled water were adequate. These include Marriott’s Shadow Ridge, Palm Desert Resort, Woodhaven, The Oasis, Palm Desert Country Club, Lakes Country Club, Desert Falls Country Club, Avondale Golf Club, Palm Valley Country Club, Emerald Desert Country Club and RV Resort and the NorthStar development east of Interstate 10. The existing irrigation system at Marriott’s Shadow Ridge (north of Frank Sinatra Drive, between Monterey Avenue and Portola Avenue) was designed to accommodate conversion to recycled water from the low-pressure recycled system. The recycled water pump station and recycled water distribution systems at WRP 10 are sized for these expanded deliveries.

4 Proposed Facilities and Phasing

This section develops an initial layout for the Mid-Valley Pipeline facilities. The facilities are sized presuming the project was sized to deliver enough Canal water to eliminate groundwater pumping. First, the integrated use of Canal water and recycled water is discussed and flow rates are established for Canal water. Then, pipeline alignments and pump station locations for a proposed transmission system are reviewed. The distribution systems necessary to serve the golf courses are discussed next. Finally three phases are proposed for connecting golf courses to the project.

Additional information will be collected from discussions with golf courses during predesign studies. It is anticipated that this information will result in changes to the alignments and to the sizes of some facilities. Because each golf course is unique and the layout of its irrigation system is not known, the optimal location and size of each service connection cannot be determined at this stage. Due to uncertainty in this analysis, an allowance of ten-percent is included in the sizing of facilities.

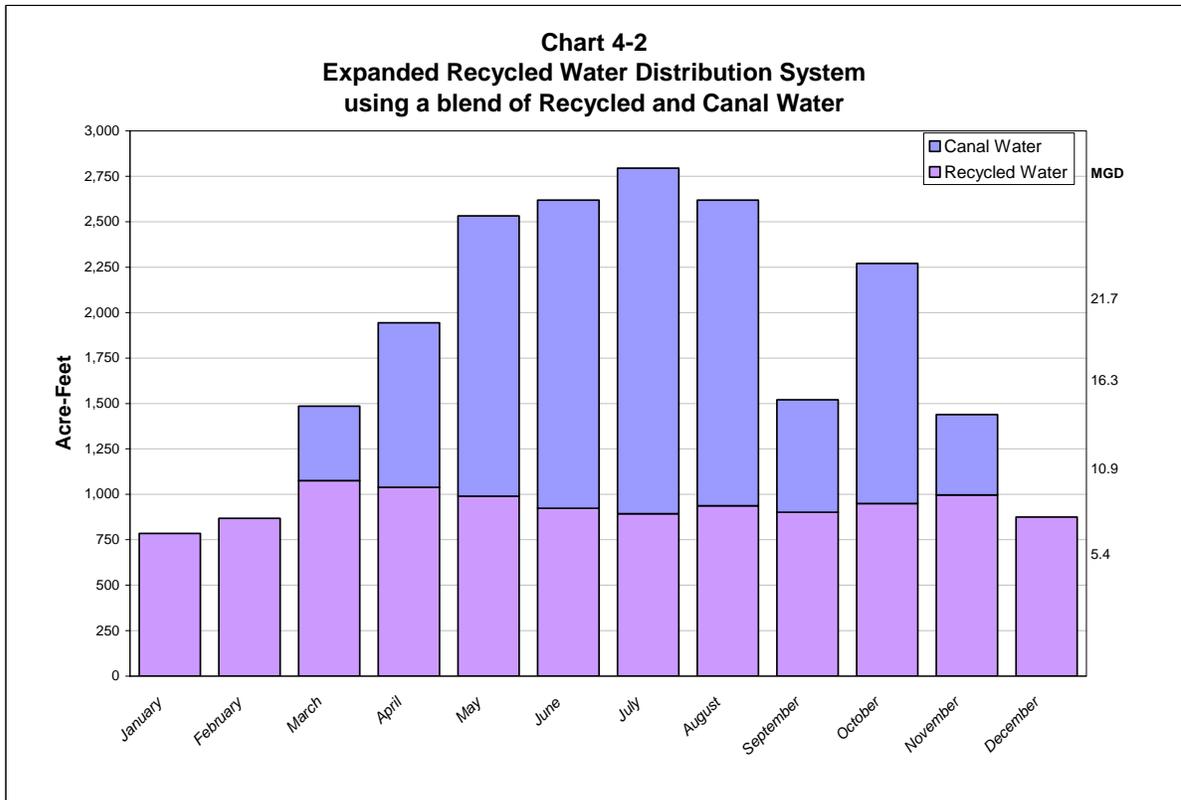
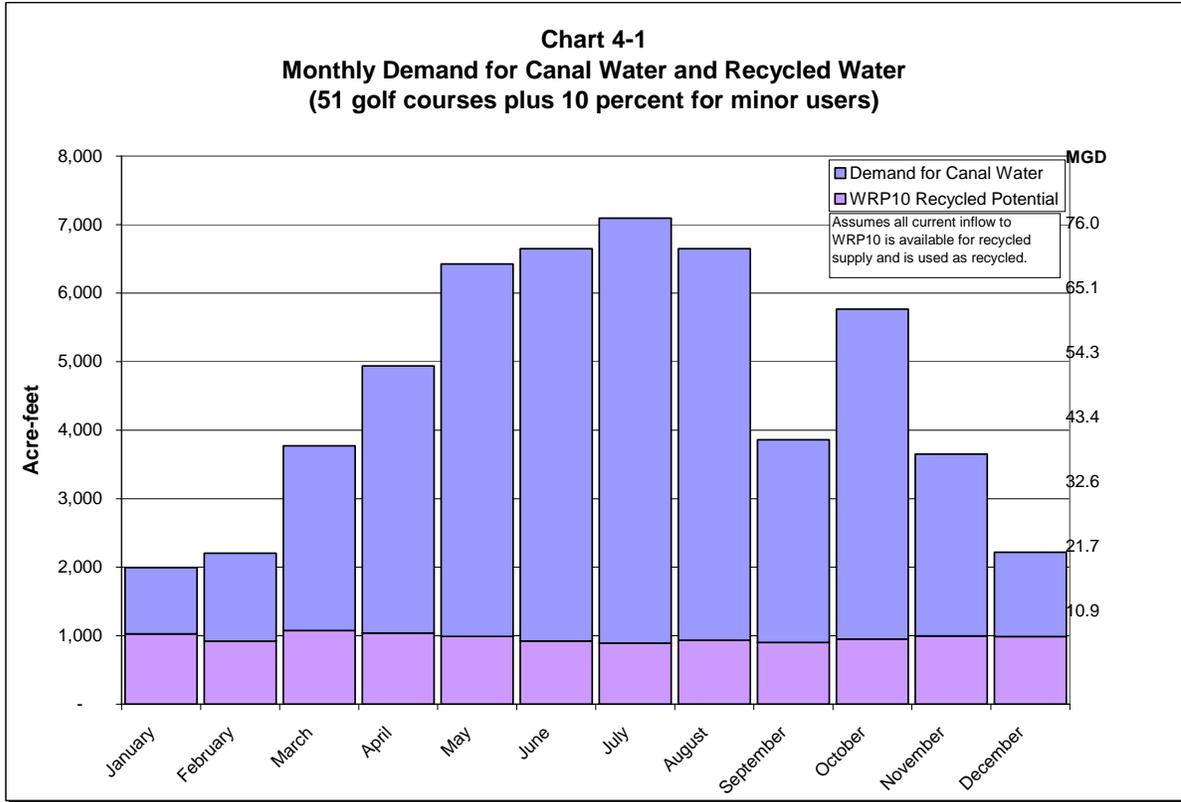
4.1 Required Canal Water Flow

Section 2 established the monthly demand for irrigation water. Section 3 reviewed the availability of recycled water and showed that expansion of the existing recycled water is limited by the inability to meet summer irrigation demand with the relatively constant supply of recycled water. The most efficient use of water is to maximize use of recycled water and then import Canal water to supply the remaining demand.

Chart 4-1 shows the monthly demand for irrigation water in the Mid-Valley area (year 2015) and the proportion of that demand that could be served by recycled water. Peak monthly demand in July is 7,095 acre-feet when only 894 acre-feet of recycled water are available. The remaining 6,201 acre-feet must be met with Canal water. A delivery rate of 104 cfs is required to deliver this amount from the Canal. Including a ten-percent increase for uncertainty and to allow for daily peaking, the recommended Canal water delivery rate to WRP 10 would be 114 cfs. A Canal Water Transmission System would deliver this water from the Canal to WRP 10 for distribution.

Two distribution systems are proposed. One an expansion of the existing Recycled Water System would distribute a blend of recycled and Canal water, the proposed Canal Water Distribution System would distribute Canal water only. Both of these systems would start with pump stations at WRP 10.

Chart 4-2 shows, on a monthly basis, the amount of Canal water that would have to be added to the recycled system to allow the envisioned expansion of that system.



4.2 Canal Water Transmission System

The Canal Water Transmission System from the Canal to WRP 10 would consist of Pump Station 1 located adjacent to the Canal, a Transmission Line, a Receiving Impoundment at WRP 10 and service connections to adjacent golf courses. These facilities are discussed below.

4.2.1 Pump Station 1

Pump Station 1 would be sized to deliver the projected remaining demand for irrigation water after maximum use is made of recycled water produced by WRP 10. The pump station would operate 24-hours a day to minimize impacts on Canal operations. Imperial Irrigation District, which provides electrical power in this area, does not have time-of-use rates eliminating a reason to avoid pumping during peak hours by constructing a larger pump station. It is anticipated that control of transients (water hammer) will require construction of pressure vessels at the pump station. Screening for removal of debris will be included at Pump Station 1. Sediment removal may not be practical at this location.

Depending on the location selected for the pump station, noise impacts and aesthetics could potentially impact adjacent land uses. Noise mitigation measures could include enclosures, walls and earth berms. Aesthetic considerations could affect the design perimeter walls and require landscaping. A larger site than is needed for the facilities could also mitigate noise and aesthetic impacts.

A preliminary estimate of the required area for the pump station is 0.7 acres, not including any additional land for mitigating noise and aesthetic impacts.

4.2.2 Transmission Line

Two alignments for the Transmission Line from the Canal to WRP 10 have been evaluated. The Coachella Stormwater Channel Alignment (Stormwater Channel Alignment) generally follows the Coachella Stormwater Channel. The 42nd Avenue/Hovley Lane Alignment (42nd Avenue Alignment) follows public streets for the majority of its route. **Sketch 4-1** shows these two alignments. **Sketches 4-2 to 4-16** show more detail for the Stormwater Channel Alignment. **Sketches 4-17 to 4-22** show more detail for the 42nd Avenue Alignment.

The Stormwater Channel Alignment presents two options. The pipeline could be constructed in the levee or in the invert. Construction in the levee presents challenges with restricted space and utility conflicts (Sketch 4-5 and 4-6). Construction in the invert presents challenges with scour and existing drop structures. The best option may vary in different portions of the alignment.

The pump station for the Stormwater Channel Alignment would be located at the intersection of the canal and the Stormwater Channel (Sketch 4-2). The District is currently evaluating

the availability of land at this location for the Pump Station. Each of the four corners is a possibility although it appears that the west corner (currently owned by Heritage Palms Golf Club) will be acquired by Imperial Irrigation District for an electrical substation. Discussions with Imperial (Randy Gray, April 12, 2005) indicate that Imperial will need the entire site for the substation.

The pump station for the 42nd Avenue Alignment would be located along the canal and south of Indio Highway. Land on the west side of the Canal from Indio Highway to the extension of Avenue 43, a distance of 1600 feet is currently vacant. But, significant development is occurring in the vicinity (Sketch 4-17).

District staff and Bookman-Edmonston met with staff from the cities of Indio, Indian Wells, La Quinta and Palm Desert, and the County of Riverside in February and May 2005. The cities and county all indicated a preference for the Stormwater Channel Alignment in order to reduce construction impacts. The City of Indian Wells noted that construction of a pipeline through the Golf Resort at Indian Wells (which straddles the channel) is consistent with their intent to remodel the course. While the 42nd Avenue Alignment is shorter, constructing along a major street presents significant challenges including traffic control, maintaining access for adjacent property owners, utility conflicts and restricted construction zones.

4.2.3 Receiving Impoundment

As Pump Station 1 will operate 24-hours a day and golf course irrigation occurs at night there is a need for significant storage. The storage will occur either at District facilities or on the golf courses. Generally golf courses irrigate for 12 hours or less while Pump Station 1 will operate 24 hours. At peak operation of 114 cfs, approximately 114 acre-feet of storage would be required. While each golf course is unique, they typically have been designed with adequate storage to allow their wells to operate up to 18-hours a day. If, on the average, the golf courses have storage to take deliveries over 18 hours, then an additional 60 acre-feet of storage is needed. This additional storage could be constructed at WRP 10, on golf courses or at District owned sites on distribution pipelines.

A Receiving Impoundment at WRP 10 will be required to allow matching flows entering WRP 10 from the Canal with flows being delivered from the plant to the golf courses.

District plans for WRP 10 include construction of a 5 million-gallon (MG) or 15 acre-foot impoundment adjacent to the existing recycled water reservoir. Assuming that distribution from WRP 10 to golf courses occurs over 18-hours, this would allow operation of the transmission system at 30 cfs or approximately one-quarter of ultimate capacity.

While additional storage will be needed for the complete project, a 5 MG receiving impoundment is included with the transmission system. The impoundment will include sediment removal facilities, a connection to the existing recycled water reservoir and allowances for future connection to the proposed Canal Water Distribution System.

4.2.4 Adjacent Golf Courses

Whichever route is selected for the transmission line, it will be possible to connect some golf courses directly to the transmission line. The Golf Resort at Indian Wells has expressed interest in connecting to the transmission system if the line is routed along the Stormwater Channel.

4.3 Recycled Water System Extension

The existing Recycled Water System will need to be extended to make the additional deliveries made possible by the addition of Canal water to the recycled system. The extension is not addressed in this report.

4.4 Canal Water Distribution System

As discussed in Section 2, the District and the golf course operators are collaborating to fully understand the opportunities and constraints in delivering Canal water to the golf courses. This section lays out a possible configuration in order to develop an understanding of the feasibility and cost of a distribution system. Two variations in the configuration are examined. The first variation is enlarging the system to allow all deliveries to the distribution system to occur at mid-peak or off-peak energy rates (Southern California Edison provides service to WRP 10 and time-of-use rates are available). The second variation is dividing the system into two pressure zones by including an additional pump station with the goal of reducing energy consumption.

Sketch 4-23 shows a possible layout for the Canal Water Distribution System. With this layout, 21 golf courses would connect to this system. The remaining 29 Mid-Valley area golf courses either are served by the recycled system or by branches off the main Transmission Line between Pump Station 1 and WRP 10.

The golf courses to be served by the Canal Water Distribution System have a peak demand of 72 cfs using the criteria established above and 24-hour a day delivery. An 18-hour delivery period would increase the maximum daily flow rate to approximately 96 cfs. The pump station supplying the Canal Water Recycled System has been designated as Pump Station 2.

From Pump Station 2, the distribution system extends to the northwest with approximately 78,000 lineal feet of pipeline ranging from 48- to 24-inches in diameter. An additional 39,000 lineal feet of smaller-diameter pipelines will be required to branch out to the golf courses throughout the region.

After Pump Station 2, the flow is split at the intersection of Portola Avenue and Country Club Drive to create a looped system. This not only gives the District the ability to back feed its customers if a pipeline were damaged, but also allows smaller diameter pipe to be used. The looped system utilizes several branch systems to serve the outlying customers. The branch systems are labeled Branch 3 through Branch 6 on Sketch 4-23.

Sizing of the system is discussed below. Making deliveries over 24-hours and over 18-hours are both evaluated. Also, adding a lift station along the system is evaluated.

4.4.1 24-Hour Delivery

A 24-hour a day delivery schedule minimizes the size requirements for the distribution system. However, with continuous delivery the pump systems are operating during on-peak peak energy charge periods and delivering water to golf courses at times of low use (typically watering occurs at night and early morning, off-peak hours). The sections below evaluate the system requirements for both pump station alternatives under the continuous delivery scenario.

4.4.1.1 Single Pump Station at WRP 10 (Single pressure zone)

Under this alternative, the entire Canal Water Distribution System would be served by a proposed Pump Station 2 at WRP 10. The maximum flow would be 72 cfs, with a required pumping head of approximately 390 feet. **Chart 4-4** illustrates the hydraulic grade through the system. While developing the system pressure needs, a requirement of 20 psi delivery pressure at each golf course was assumed and an additional 10 ft of head was added at those delivery points to account for elevation uncertainties and depth of pipe. The triangles indicate pressure requirements for the branches off the main distribution facilities.

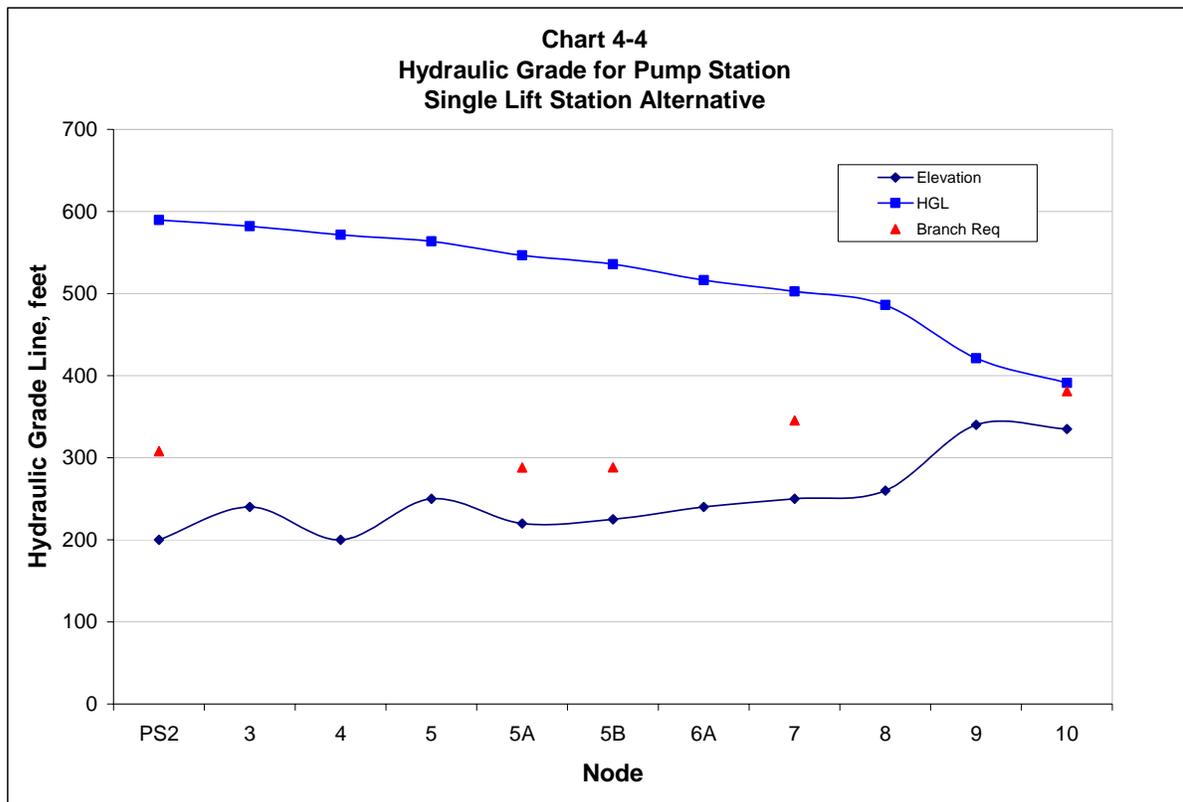
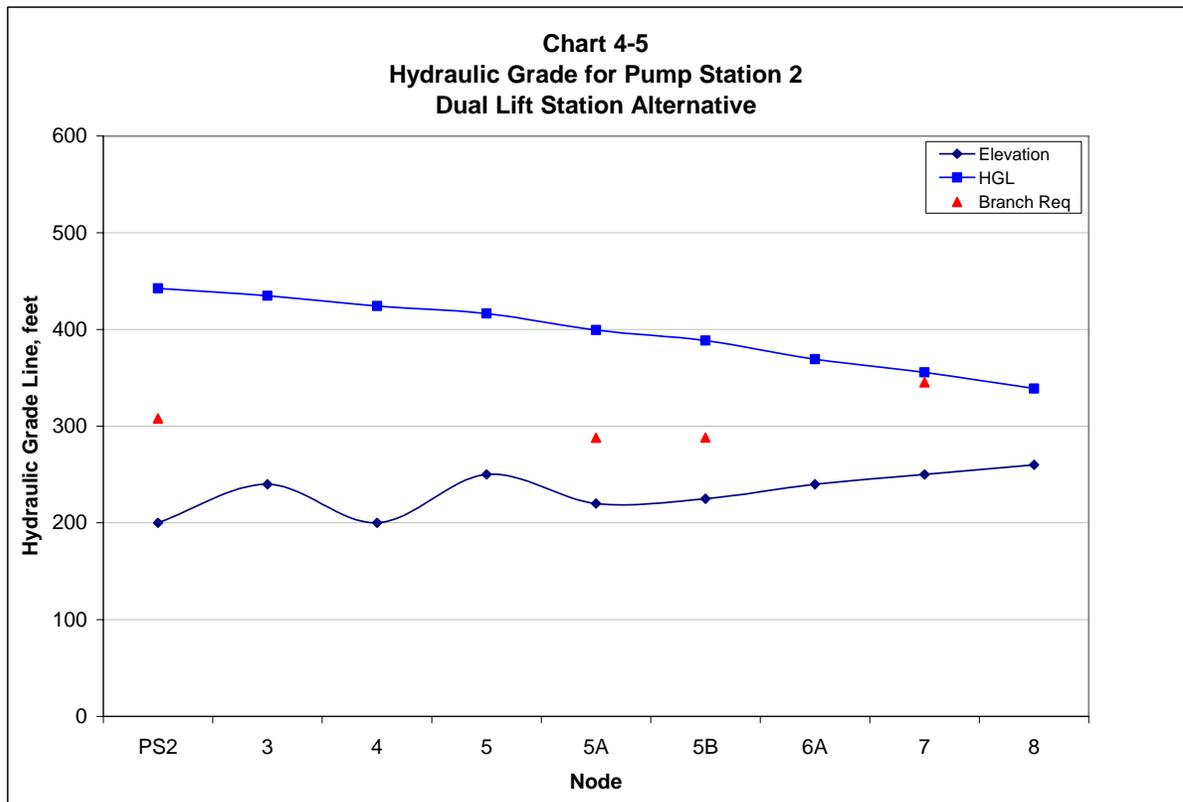


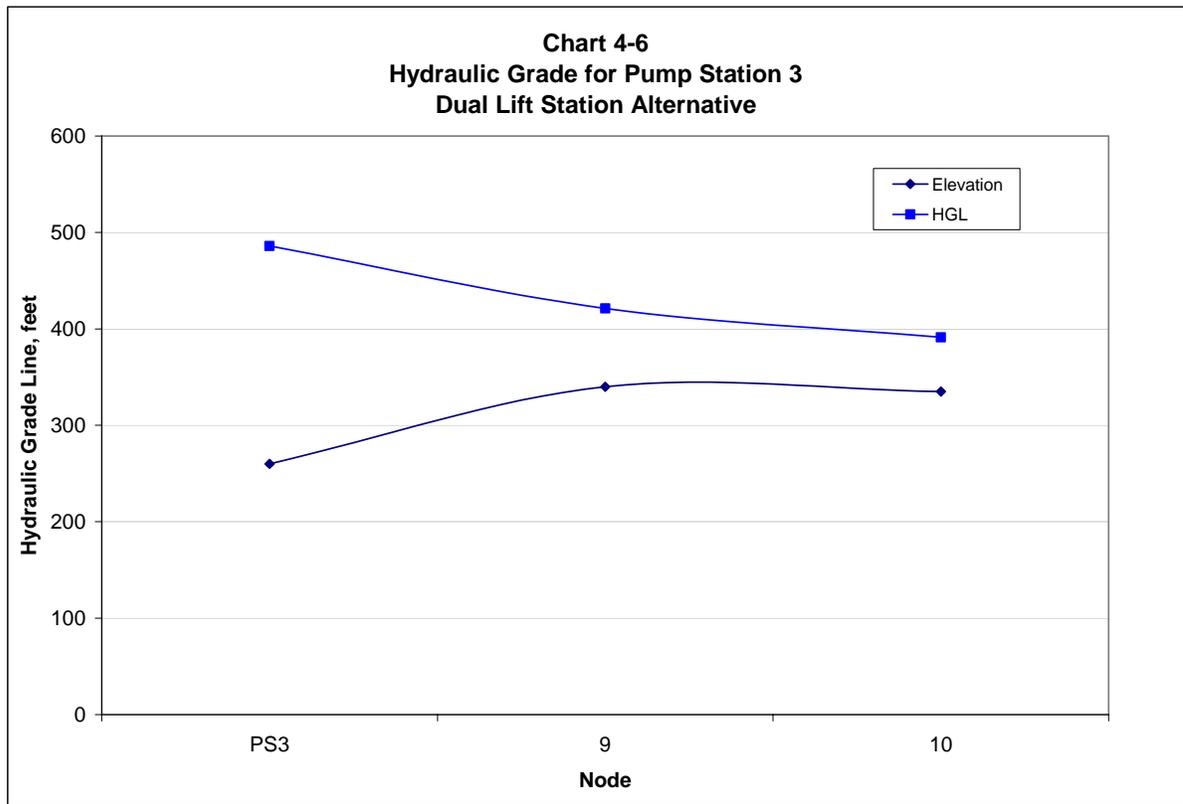
Chart 4-4 illustrates that pumping head is wasted in the initial legs of this system in order to provide the necessary pressure at the northern most golf course. The opportunity to save energy by dividing the distribution system into two pressure zones is examined next.

4.4.1.2 Additional Pump Station (Two pressure zones)

The elevations of the golf courses to be served by this system vary for a few feet to 180 feet above WRP 10. Delivering water to the lower golf courses directly from Pump Station 2 and including another pump station to lift Canal Water to the higher golf courses would reduce the lift requirement and energy demand of the Pump Station 2. Were the added pump station, Pump Station 3, added near the intersection of Bob Hope Drive and Frank Sinatra Drive, the lift of Pump Station 2 would be reduced from 390 feet to 242 feet with the same flow characteristics. There is a vacant section of land on the northeast side of this intersection. **Chart 4-5** shows the hydraulic grade for Pump Station 2 at WRP 10 under this alternative.



Pump Station 3, serving the northern most golf courses would be sized to deliver a flow of 20 cfs with a total dynamic head of 226 feet. **Chart 4-6** below shows the hydraulic grade through the system downstream of Pump Station 3, located at the intersection of Frank Sinatra Drive and Bob Hope Drive.



4.4.2 18-Hour Delivery Scenario

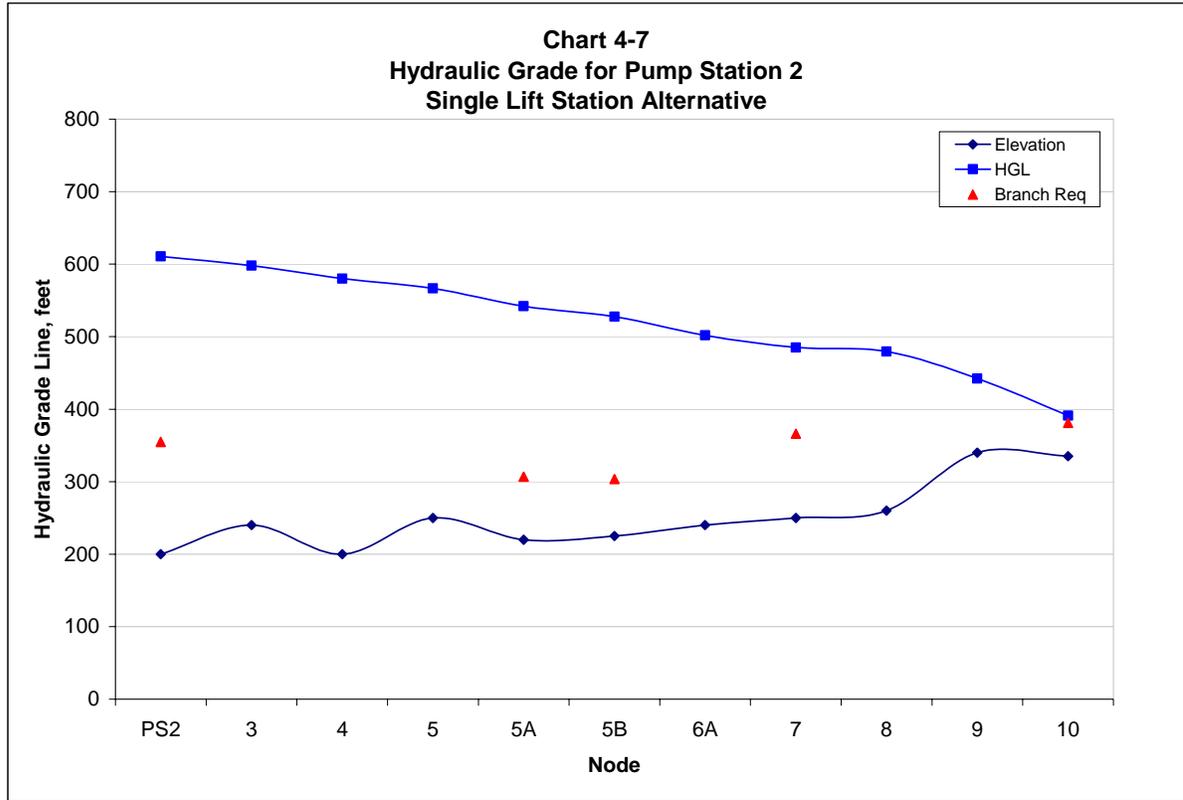
An 18-hour a day delivery schedule better matches delivery with demand. This option also allows the District to avoid pumping during on-peak hours (Noon to 6:00 PM). However, decreasing the daily operation period from 24-hour to 18-hour the flow requirements for sizing the distributions and pumping systems are increased by 33 percent. Additional storage would also be required at WRP 10 as deliveries from the Canal will be on a 24-hour basis. The sections below evaluate the system requirements for both pump station alternatives under the 18-hour delivery scenario.

4.4.2.1 Additional storage at WRP 10

The required storage at WRP 10 would be approximately six hours of Pump Station 1’s peak flow rate of 114 cfs or 56 acre-feet (18 MG), although deliveries made directly from the Transmission System prior to WRP 10 would reduce the requirement by a small amount. The Transmission System portion of the project includes a 15-acre-foot (5 MG) receiving impoundment. The additional storage requirement would be approximately 41 acre-feet.

4.4.2.2 Single Pump Station at WRP 10 (Single pressure zone)

Under this alternative the new pump station at WRP 10 would require a maximum flow of 96 cfs, with a required pumping head of approximately 529 feet. **Chart 4-7** illustrates the hydraulic grade through the system with one pump station operating at WRP 10. The same delivery pressure requirements and assumptions were made with this alternative.



4.4.2.3 Additional Pump Station (Two pressure zones)

The evaluation of two pressure zones for the 18-hour delivery scenario is similar to the evaluation made for the 24-hour scenario in Section 4.4.1 and is not repeated here.

4.5 Golf Course Connections and On Site Conversions

In addition to the service laterals and meters required for each golf course, various on-site conversions will be necessary. These conversions are site specific and will differ for each golf course. On going discussions with the golf course operators will allow further definition of these requirements. The golf courses would be connected to the project in phases. Phase 1 would include those golf courses that could be connected to the Canal Water Transmission System without additional pumping. Phase 2 would be golf courses that could be connected to the expanded recycled water system. Phase 3 would be the remaining courses that would be connected to the proposed Canal Water Distribution System. **Table 4-1** shows which golf courses would be in each phase. The goals for Phase 1 are ambitious. It is likely that

physical or institutional limitations will prevent some of these courses from being included in Phase 1.

Table 4-1
Proposed Phasing Goals for Golf Course participation in Mid-Valley In-Lieu Program

Golf Course	Holes/18-Hole Equivalents	2015 Water Use (af/y)	Proposed Phase		
			Phase 1	Phase 2	Phase 3
Desert Willow	36	1,800	1,800		
Portola Country Club	18	900	900		
The Golf Center, Palm Desert	9	450	450		
Woodhaven Country Club	18	994		994	
Palm Desert Country Club	27	1,999		1,999	
Palm Desert Resort Country Club	18	1,157		1,157	
Indian Ridge Country Club	36	923	923		
Palm Valley Country Club	36	1,664		1,664	
Avondale	18	793		793	
Emerald Desert Country Club	9	333		333	
Desert Falls Country Club	18	1,522		1,522	
The Lakes Country Club	27	2,308		2,308	
The Oasis	18	931		931	
The Golf Resort at Indian Wells	36	1,845	1,845		
Indian Wells Country Club	27	885		885	
El Dorado Country Club	18	307		307	
Desert Horizons Country Club	18	867	867		
Marriott's Shadow Ridge	18	923		923	
Santa Rosa Country Club	18	746	746		
Suncrest Country Club	9	714			714
Chaparral Country Club	18	951			951
Monterey Country Club	27	1,628			1,628
Date Palm Country Club	18	619			619
Marriott's Desert Springs Resort	36	1,587	1,587		
Palm Desert Greens Country Club	18	884	884		
Toscana Country Club	36	1,800	1,800		
Future course at T4S/R6E Sec 33	18	923			923
Future course at T4S/R6E Sec 31	36	1,845			1,845
Rancho Las Palmas Resort Country Club, Marriott's	27	1,236			1,236
Date Palm Country Club	18	619			619
Sunrise Country Club	18	961			961
Thunderbird Country Club	18	574			574
The Springs Club	18	1,289			1,289
Desert Island Golf and Country Club	18	852			852
Rancho Mirage Country Club	18	1,236			1,236
Tamarisk Country Club	18	692			692
The Club at Morningside Heights	18	1,205			1,205
Westin Mission Hills Resort	36	1,854			1,854
Mission Hills Country Club	54	5,747			5,747
Private at NW corner Hope & Sinatra	9	450			450
Private at top of Magnesia Canyon	18	900			900
Indian Springs County Club ⁶			900		
Projected water use			12,702	13,816	24,295
Current recycled water use			4,000		
Potential Conversions			8,702	13,816	24,295

Note: See notes on Table 2-1 for additional information on golf courses.

5 Project Cost

This section covers the capital cost of facilities discussed in Section 4 and addresses operating costs to the extent necessary to allow selection between different alternatives. The Transmission System for the Canal to WRP 10 is discussed first, then the Canal Water Distribution System. All costs are in year 2005 dollars. Detailed cost estimates are included in **Appendix C**. Section 7 makes recommendations for which alternatives should be carried forward to design or further evaluation.

5.1 Canal Water Transmission System

Section 4 discussed the requirements for the Transmission System including Pump Station 1 (114 cfs), a Transmission Line and a Receiving Impoundment at WRP 10. It described two alternative alignments for the Transmission Line: the 42nd Avenue/Hovley Lane Alignment and the Stormwater Channel Alignment. It also discussed whether the Stormwater Channel Alignment would be in the channel levee or the invert. **Table 5-1** summarizes the projected capital cost of each alignment and various sizes of the Canal Water Transmission System.

Table 5-1
Canal Water Transmission System Capital Cost
Includes Pump Station 1 and 5 MG storage at WRP 10
(2005 Price Level. Includes design and construction management)

Pipe Diameter (inches)	42nd Avenue/ Hovley Lane Alignment	Coachella Stormwater Channel Alignment	
		Levee	Invert
54	\$ 27,509,799	\$ 29,266,322	\$ 29,914,107
60	\$ 30,328,335	\$ 32,716,761	\$ 32,889,852
66	\$ 33,652,274	\$ 36,728,243	\$ 36,389,973
72	\$ 37,392,524	\$ 41,145,454	\$ 40,261,509

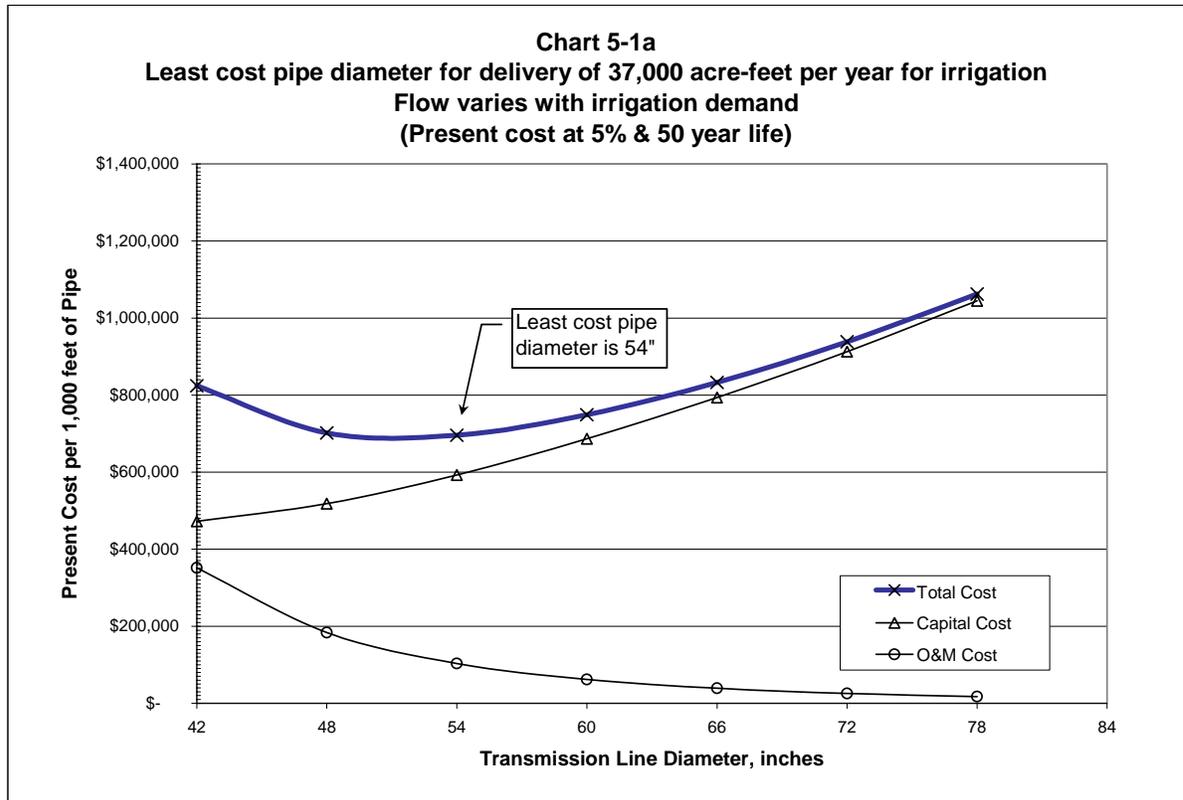
The capital cost of each pipe diameter varies by approximately ten percent between the alignments. Given uncertainty of predicting the construction climate more than a year from now and the preliminary nature of these estimates, the capital cost for each alignment is essentially the same.

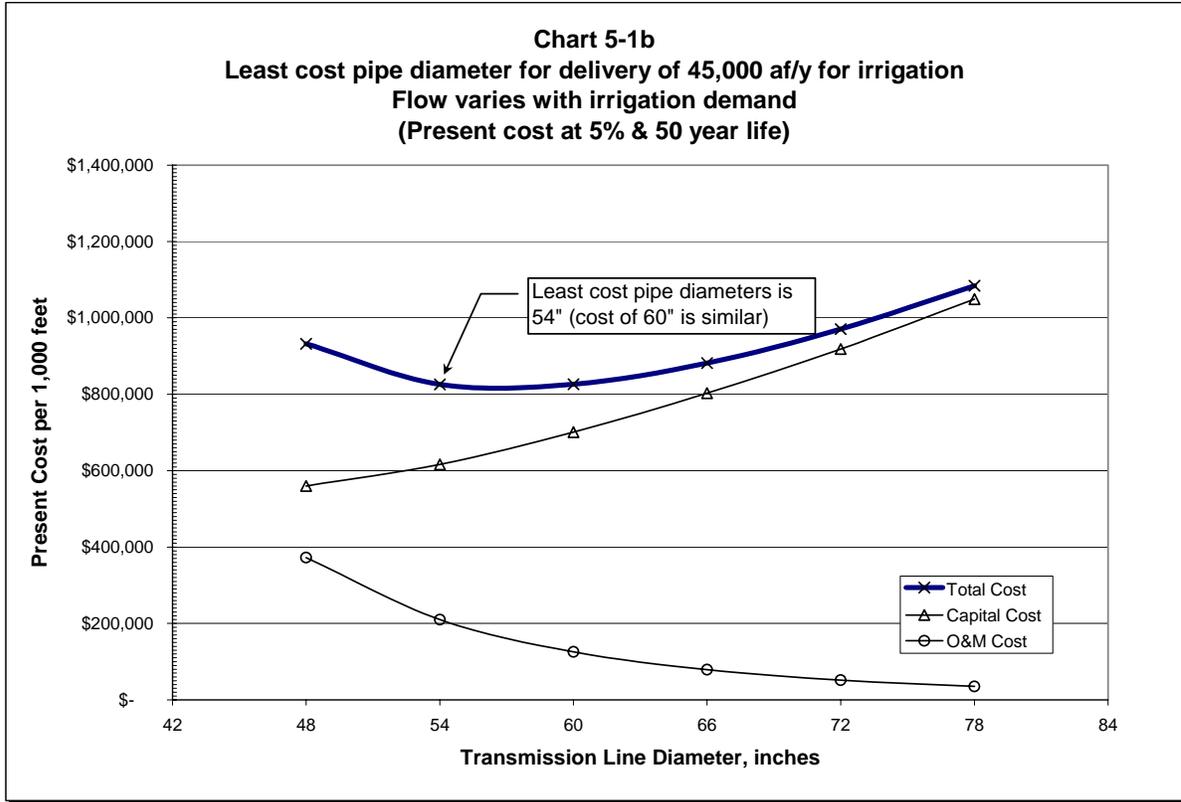
The next step of evaluating the cost of the Transmission System is evaluation of the operation and maintenance costs of different pipe diameters. Two different operational goals were considered in evaluating the most cost efficient diameter for the Transmission Line:

- (1) The District's Water Management Plan goal of delivering 37,000 acre-feet per year of Canal water to the Mid-Valley area for irrigation use. Deliveries peak during the summer.

(2) Replacing all groundwater pumping for irrigation in the Mid-Valley area by delivering 45,000 acre-feet per year. Deliveries peak during the summer.

This evaluation includes the capital cost to construct the pipe and pumping capacity to overcome friction losses operation and maintenance costs including energy to overcome friction losses, electrical connection costs for the pumping plant, maintenance of the pipeline and maintenance of the pump capacity. A set of three charts demonstrates the varying capital cost and operation and maintenance cost for different pipe diameters under each of these operational goals using a fixed length of 1,000 feet of pipe. The larger the pipe diameter, the higher the capital cost and the lower the operation and maintenance costs. If these two costs are summed for each pipe diameter, the lowest cost pipe diameter can be determined. **Chart 5-1a** shows the cost to deliver 37,000 acre-feet per year for irrigation using different diameters. **Chart 5-1b** shows the cost to deliver 45,000 acre-feet per year for irrigation.





While these graphs provide guidance on selection of pipe diameter, they do not by themselves determine the correct size. The goals for the Mid-Valley Pipeline, the need for flexibility in its operations and uncertainty all need to be considered. Chart 5-1a suggests that a 54-inch pipeline would most efficiently meet the goal of the Water Management Plan, but may not be the most efficient size were the project able to entirely replace use of groundwater. Chart 5-1b shows that a 60- or 66-inch line would be preferred for delivering 45,000 acre-feet per year of irrigation water. The District may also choose a pipe diameter larger than the apparent optimal size due to uncertainty and to allow flexibility in operations.

5.2 Canal Water Distribution System

One alignment was developed for the Canal Water Distribution System. This alignment was then expanded into four variations by evaluating two delivery scenarios and by evaluating splitting the system into two pressure zones.

The two delivery scenarios examined were 24-hour delivery and 18-hour delivery. The 24-hour delivery option would require storage at the golf courses. The 18-hour delivery option would require storage at WRP 10 and either at the golf courses or along the distribution system, but would avoid pumping at on-peak rates.

The second variation splits the system into two pressure zones by including a pump station located in the vicinity of Frank Sinatra and Bob Hope Drives. This third pump station reduces the average lift and energy costs.

Table 5-2 shows the capital cost of each option.

Table 5-2
Canal Water Distribution System Capital Cost
(2005 Price Level. Includes design and construction management. Does not include supervision and administration by District staff)

	Single Pressure Zone	Dual Pressure Zone
Canal Water Distribution System, Pump Station 2 at 72 cfs for 24-hour Delivery	\$ 37,090,824	\$ 40,603,627
Canal Water Distribution System, Pump Station 2 at 96 cfs for 18-hour Delivery	\$ 40,132,982	\$ 44,654,383
Notes: Does not include supervision and administration by District staff		

With the caution that the on going collaborative effort between the District and the golf courses is expected to provide insights that will impact the design of the Canal Water Distribution System, partial evaluation of the operation and maintenance costs of each of these four variations has been made.

A key advantage of 18-hour operation compared to 24-hour operation would be the ability to avoid pumping from Noon to 6:00 PM during summer week days when on-peak rates are in effect. The pump stations would be located within Southern California Edison’s service area and would operate under time of use rates. Evaluation of the probable pumping schedule for 24-hour operation shows that only about 7 percent of pumping would occur during the on-peak time period, approximately 72 percent would occur during off-peak time periods with the remaining at mid-peak. The energy savings from 18-hour deliveries would be on the order of \$60,000 per year. This annual savings would justify approximately \$1.5 million dollars of construction (50 year life, 3 percent interest rate). The cost estimate in Table 5-2 shows an increased capital cost of three to four million to enlarge the system to facilitate 18-hour delivery. While there are still issues with the location of storage and system operations to be resolved, it appears that 18-hour delivery cannot be justified based on savings in energy costs.

Splitting the Canal Water Distribution System into two pressure zones reduces the lift of the 23,000 acre-feet of water delivered to the lower zone by 180 feet. This reduction would result in an annual savings in energy of \$550,000 assuming a cost of \$ 0.10/kWh and a pump efficiency of 0.8. This reduction easily justifies the additional cost of approximately \$ 4 million. Including the second pressure zone may have additional advantages of facilitating construction of the distribution system in phases.

Additional storage (beyond that built when the Canal Water Transmission System is constructed) will be required as the distribution system is expanded. Some of this storage will occur on golf courses and some will be District owned. For purposes of cost estimating,

an additional 15 MG (45 acre-feet) has been assumed. While some of this storage may be located along the distribution system, space should be reserved at WRP 10 for future storage.

5.3 Mid-Valley Pipeline Cost

Table 5-3 presents an evaluation of the capital cost and cost per acre-foot of the Mid-Valley Pipeline. The table focuses on the anticipated deliveries of the project and on the construction of the Canal Water Transmission System. Thus, the cost of the Canal Water Distribution System is kept constant for each alternative. Four different diameters for the Canal Water Transmission System and two different annual delivery goals are shown. The annual operation and maintenance cost is predominately energy for pumping. This analysis shows that the cost per acre-foot of water delivered varies between \$170 and \$208.

Table 5-3
Cost of Mid-Valley Pipeline
(2005 price level, 5% and 50 year life)

	Diameter of the Canal Water Transmission System			
	54-inch	60-inch	66-inch	72-inch
Capital Costs (2005 price level)				
Canal Water Transmission System (Stormwater Channel Alignment, Invert)	\$ 29,300,000	\$ 32,900,000	\$ 36,400,000	\$ 40,300,000
Canal Water Distribution System (18-hour deliveries, dual lift)	44,700,000	44,700,000	44,700,000	44,700,000
On site improvements to golf courses	Not included	Not included	Not included	Not included
Expansion of recycled water system	Not included	Not included	Not included	Not included
Capital Cost	\$ 73,900,000	\$ 77,500,000	\$ 81,000,000	\$ 84,900,000
37,000 acre-feet per year of canal water delivered (Goal of Water Management Plan)				
Equivalent annual capital cost	\$ 4,050,000	\$ 4,250,000	\$ 4,440,000	\$ 4,650,000
Annual Operation and Maintenance cost	3,030,000	3,010,000	3,020,000	3,040,000
Equivalent annual cost	\$ 7,080,000	\$ 7,260,000	\$ 7,460,000	\$ 7,690,000
Equivalent annual cost per acre-foot	\$ 191	\$ 196	\$ 202	\$ 208
45,000 acre-feet per year of canal water delivered (all pumping of groundwater in Mid-Valley eliminated)				
Equivalent annual capital cost	\$ 4,050,000	\$ 4,250,000	\$ 4,440,000	\$ 4,650,000
Annual Operation and Maintenance cost	3,610,000	3,540,000	3,510,000	3,520,000
Equivalent annual cost	\$ 7,660,000	\$ 7,790,000	\$ 7,950,000	\$ 8,170,000
Equivalent annual cost per acre-foot	\$ 170	\$ 173	\$ 177	\$ 182

6 Eliminated Alternatives and Limitations

This section reviews alternatives that were considered and eliminated, the limitations of this paper, and the refinements that require additional data collection and analysis.

6.1 Alternatives Considered and Eliminated

A number of design criteria and alternatives were evaluated earlier in this evaluation or in previous studies and eliminated.

The Conjunctive Use/Stored Water Study (Bookman-Edmonston, 2000) proposed a distribution system for Canal water that was not integrated with the recycled water system. Integration of the two systems as proposed in the current study will allow more recycled water to be used and either reduce the demand on Canal water or allow a further reduction of groundwater pumping.

The Conjunctive Use/Stored Water Study also proposed two goals. In addition to the program described in this paper, a smaller goal of delivering approximately 13,000 acre-feet/year of Canal water to the Mid-Valley area was considered. The Coachella Valley Water Management Plan (Montgomery Watson Harza, 2002a) selected the larger program with a goal of 37,000 acre-feet/year.

Consideration was given to sizing the pump station at the Canal, Pump Station 1, for less than 24-hour a day operation. This option was eliminated due to the impacts of Canal operations. The capacity of the Canal in the vicinity of the proposed pump station is 675 cfs. The pump station would be approximately 150 cfs, 22 percent of the Canal capacity and a much larger percent on normal flow. In addition, the pump station and pipeline would cost more due to the larger size.

6.2 Additional Analysis

As implementation of the Mid-Valley Pipeline proceeds there are a number of issues and opportunities to be addressed in more detail.

The cost estimate for constructing the Transmission Line in the invert of the Stormwater Channel assumes a depth of burial of 10-feet below the existing channel invert. This matches the construction of existing slope protection which was typically constructed to 10-feet below the channel invert. Additional investigation of the potential depth of scour is necessary should the Stormwater Channel Alignment be selected in order for the District to make an informed decision of the risks.

While it is believed that CEQA requirements will not be a significant restraint, there is a possibility that construction in the Stormwater Channel invert could raise some concerns.

Discussions with the regulatory agencies have not been initiated. The Mid-Valley Pipeline is included in the District's *Program Environmental Impact Report for Coachella Valley Water Management Plan and State Water Project Entitlement Transfer (PEIR)*. In that CEQA documentation, the Mid-Valley Pipeline is discussed as two separate projects: Conversion of Upper Valley Golf Courses to Exchange Water and Upper Valley Golf Course Conversion to Recycled Water. The PEIR includes the requirement for project-specific mitigation measures. For the Mid-Valley Pipeline, those measures address construction impacts.)

The on going collaborative effort between the District and the golf courses will provide additional insights into the best implementation.

The location and amount of storage needs additional investigation.

Decisions on the location of storage can significantly affect the sizing of the Canal Water Distribution System. Locating storage at WRP 10 increases the size of Pump Station 2 and of the pipelines in the distribution system.

The District has initiated evaluation of the availability of land for the pump station should the Stormwater Channel alignment be selected. The District is also evaluating their existing easements and land acquisition requirements for construction of the Transmission Line in the Stormwater Channel. This paper presumes that land will be available for Pump Station 1 and Pump Station 3. The District has initiated investigation of the availability of land for Pump Station 1. It is premature to investigate the availability of land for Pump Station 3, unless development in the vicinity proposed for that pump station raises the opportunity for the District to obtain the necessary land by dedication.

The cost of extending the recycled water distribution system has not been addressed. The District typically funds these extensions as part of the contractual agreements made with the golf course that will be served by the extension. The arrangements made for construction and payment are negotiated as part of each agreement and vary.

The route for the Canal Water Distribution System requires additional investigation. Additional review of existing underground utilities may affect route selection. In particular, there are major storm drains in Portola Avenue. The specific arrangement of on-site facilities at each golf course will also affect the layout of the distribution systems. Cook Street may be widened by the city of Palm Desert during the summer of 2006 and may install a storm drain in Portola Street in either 2006 or 2007. This may provide an opportunity to coordinate portions of construction. In general, the city has expressed a preference for construction in the Stormwater channel.

Use of the Mid-Valley Pipeline to return water to the Canal was previously proposed (Bookman-Edmonston, 2000) and is still an option. This paper has not further evaluated the feasibility.

7 Recommendations

The evaluation in this concept paper is adequate to recommend that the District fund implementation of the Mid-Valley Pipeline. The first phase of construction should be the Canal Water Transmission System to deliver Canal water to WRP 10 with deliveries to golf courses where practical.

The on-going collaborative efforts with golf courses should continue to assure timely resolution of challenges with making deliveries to the golf courses.

Planning for the design and construction of expansion the existing recycled system and construction of the proposed Canal Water Distribution System should be initiated in order that deliveries of Canal water to golf courses can start soon after construction of the Transmission Facilities is complete.

A more detailed discussion of these recommendation and the steps required for implementation follows.

7.1 Canal Water Transmission System

The proposed Canal Water Transmission System includes Pump Station 1 at the Coachella Canal, the Transmission Line from the Canal to WRP 10 and a the Receiving Impoundment at WRP 10. These facilities should be sized to allow delivery of up to 37,000 acre-feet of Canal water for irrigation purposes and should be integrated with the existing Recycled Water System. Where feasible, turnouts should be provided to golf courses near the transmission facilities. The cost difference between a 54-inch and 60-inch diameter Transmission Line is small. The smaller diameter reduces capital costs while the larger diameter reduces operation and maintenance costs and provides more flexibility in operations. Further evaluation during pre-design is warranted to select the pipeline diameter.

The Stormwater Channel Alignment is recommended over the Hovely Lane/42nd Avenue Alignment due to reduced construction impacts. Additional investigations will be necessary to determine whether construction in the invert or on the levee – or a combination – is the best option.

District staff has initiated selection of property for the pump station to be located at the canal under the presumption that the Stormwater Channel Alternative will be selected. Once a selection is made, the District should assure that the selected site remains available.

The opportunities to connect golf courses directly to the Canal Water Transmission System have not been fully explored. These opportunities should be explored during predesign and design of the system.

The cost for the transmission facilities, including design and construction management, but not including supervision and administration by District staff is from \$ 30 million for a 54-inch pipeline to \$33 million for a 60-inch pipeline at 2005 price level.

7.2 Expansion of the Recycled Water System

District staff should continue collaboration with golf courses near the existing recycled system with the intent of entering contracts for delivery of water once the transmission system is in operation. Previous expansions have generally been constructed at the expense of the golf courses that the expansion serves. Contractual arrangements have ranged from the golf course constructing the required extension to the golf course paying for construction by the District through their payments for delivered water.

7.3 Canal Water Distribution System

Additional planning is required to determine the best alignment and sizing of the Canal Water Distribution System. This planning effort should include a collaborative effort with the golf courses and extensive coordination with the cities. Cost for the Canal Water Distribution System including design and construction management is estimated at \$37 million to \$45 million at 2005 price level.

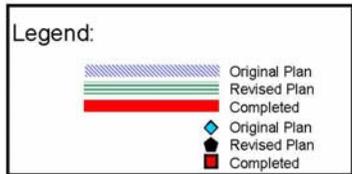
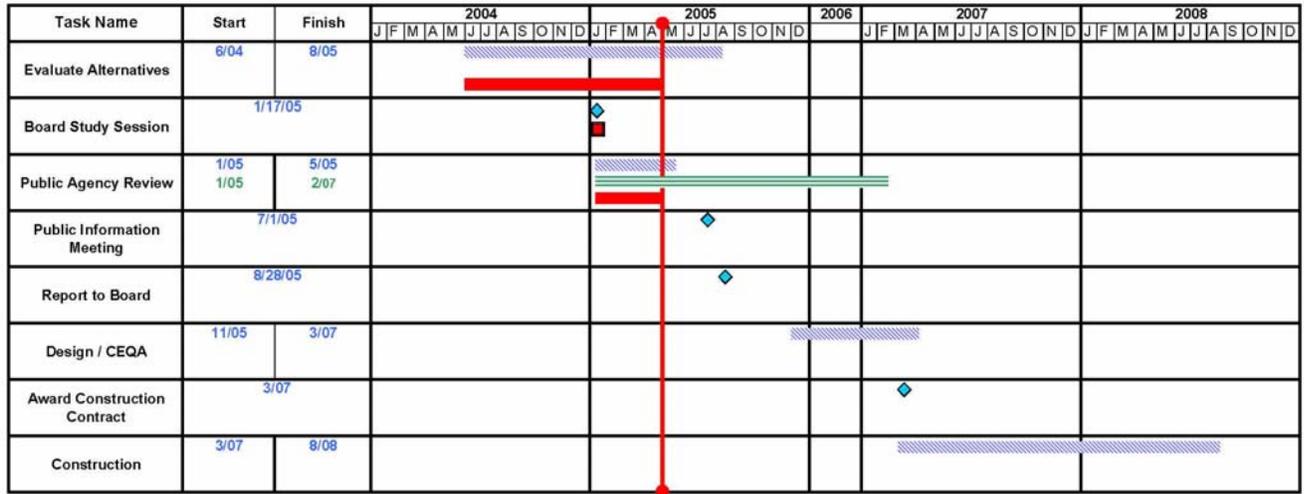
7.4 Phasing of deliveries

Implementation requires significant coordination with the golf courses. During design of the Canal Water Transmission System discussions should occur with golf courses that possibly can be connected to the Canal Water Transmission System. During design and construction, discussions should occur with the golf courses that can be connected to an expanded recycled water system. During construction, discussions should occur with the golf courses that can be connected to the Canal Water Distribution System. Table 4-1 in Section 4 divides the Mid-Valley area golf courses into Phases 1, 2 and 3 respectively based on this criterion.

7.5 Preliminary Schedule

A preliminary design and construction schedule through design and construction of the Transmission system is shown in **Chart 7-1**. Planning and design efforts for construction of the Canal Water Distribution System would continue during this period. Implementation of the distribution system and enlargement of the Recycled Water Distribution System would be initiated with the completion of the Transmission System.

**Chart 7-1
Preliminary Schedule through construction of
Canal Water Transmission System**



Appendix A

References

Bookman-Edmonston, 2000. Conjunctive Use/Surplus Water Storage. Prepared for Coachella Valley Water District and Metropolitan Water District of Southern California.

Coachella Valley Water District, 2002. Resolution no. 2002-213.

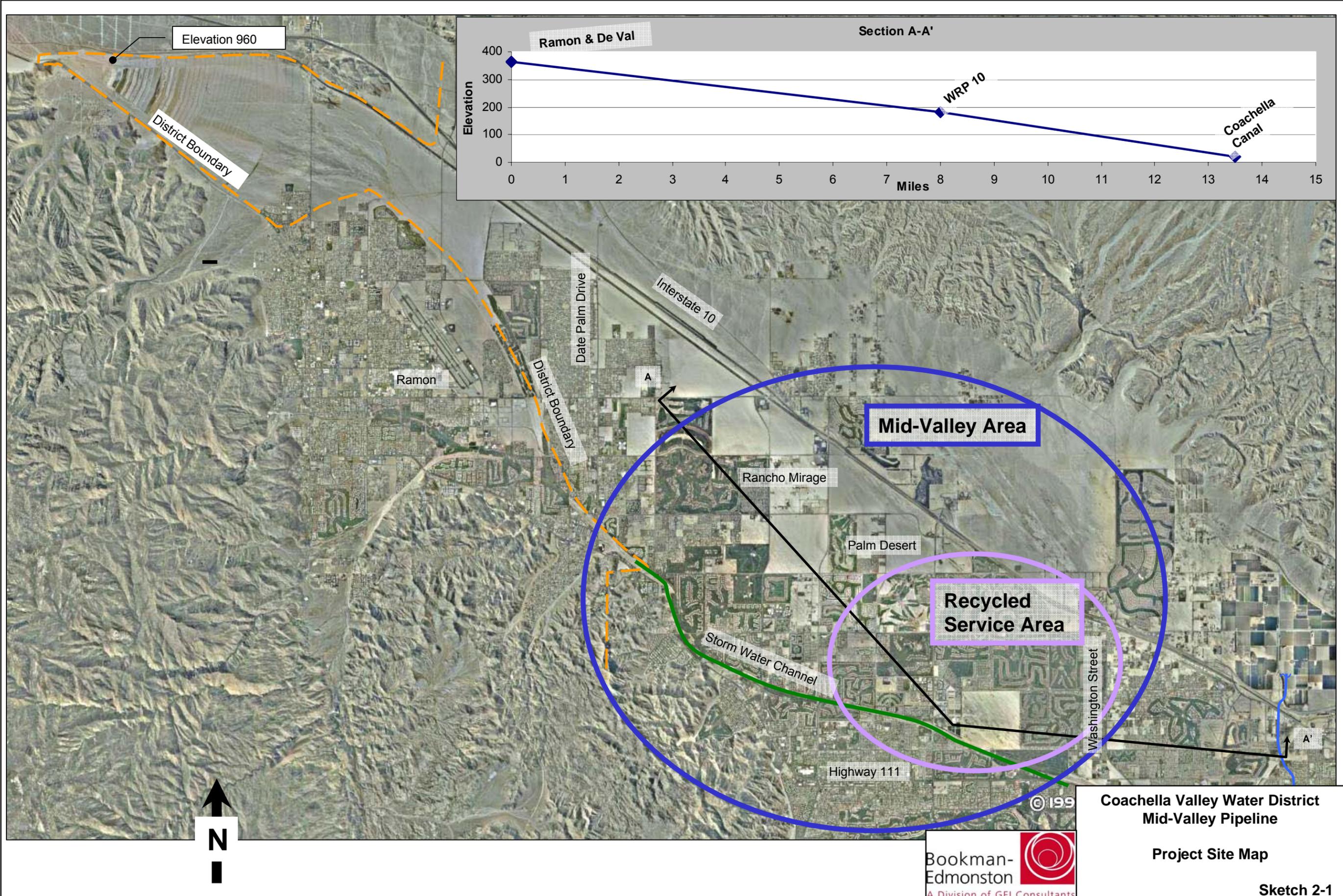
Montgomery Watson Harza, 2002a. Draft Program Environmental Impact Report for Coachella Valley Water Management Plan and State Water Project Entitlement Transfer. Prepared for Coachella Valley Water District.

Montgomery Watson Harza, 2002b. Final Program Environmental Impact Report for Coachella Valley Water Management Plan and State Water Project Entitlement Transfer. Prepared for Coachella Valley Water District.

Montgomery Watson Harza, 2002c. Coachella Valley Final Water Management Plan. Prepared for Coachella Valley Water District.

Appendix B

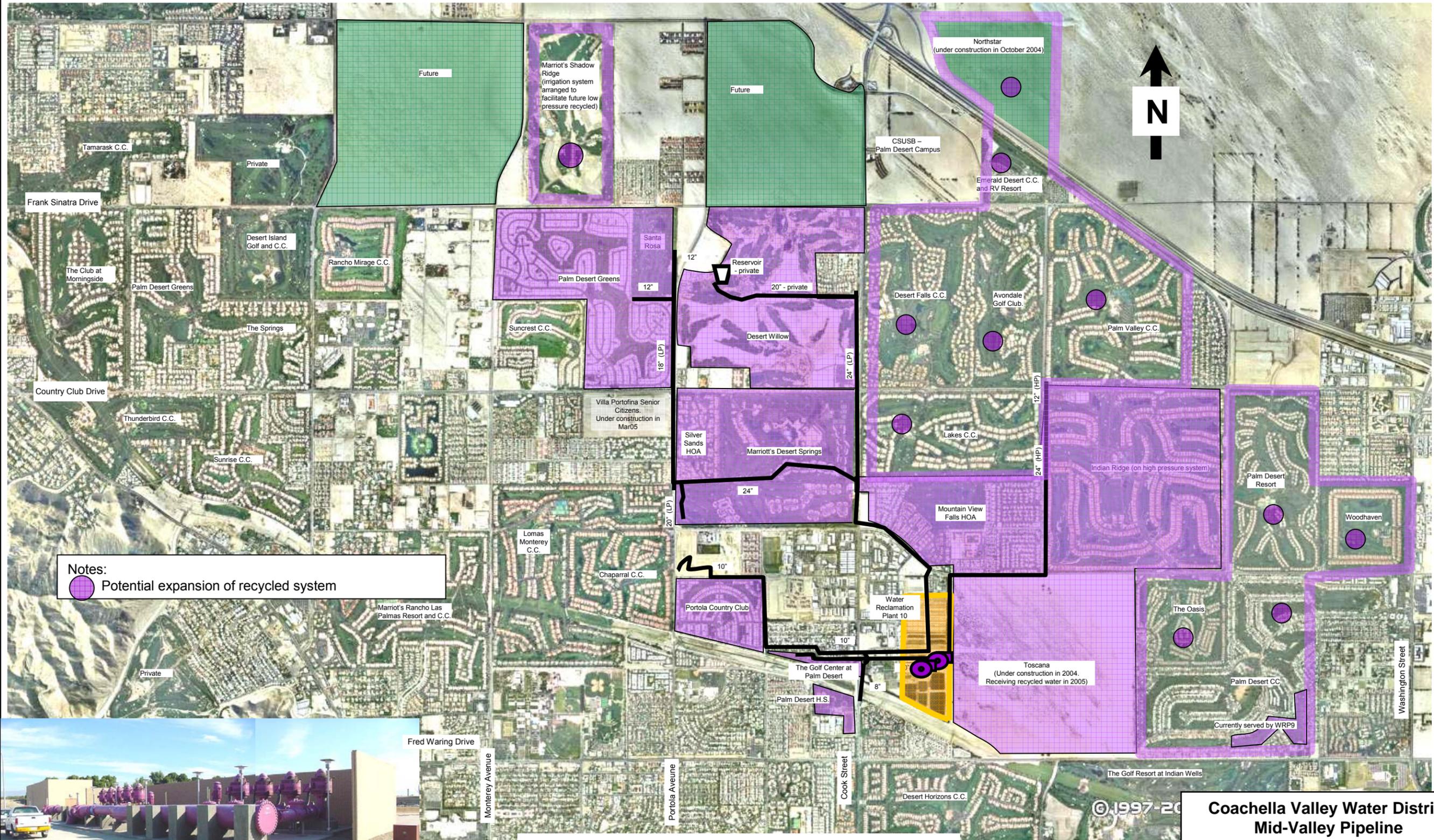
Sketches



Coachella Valley Water District
Mid-Valley Pipeline
Project Site Map



Sketch 2-1



Notes:
 Potential expansion of recycled system



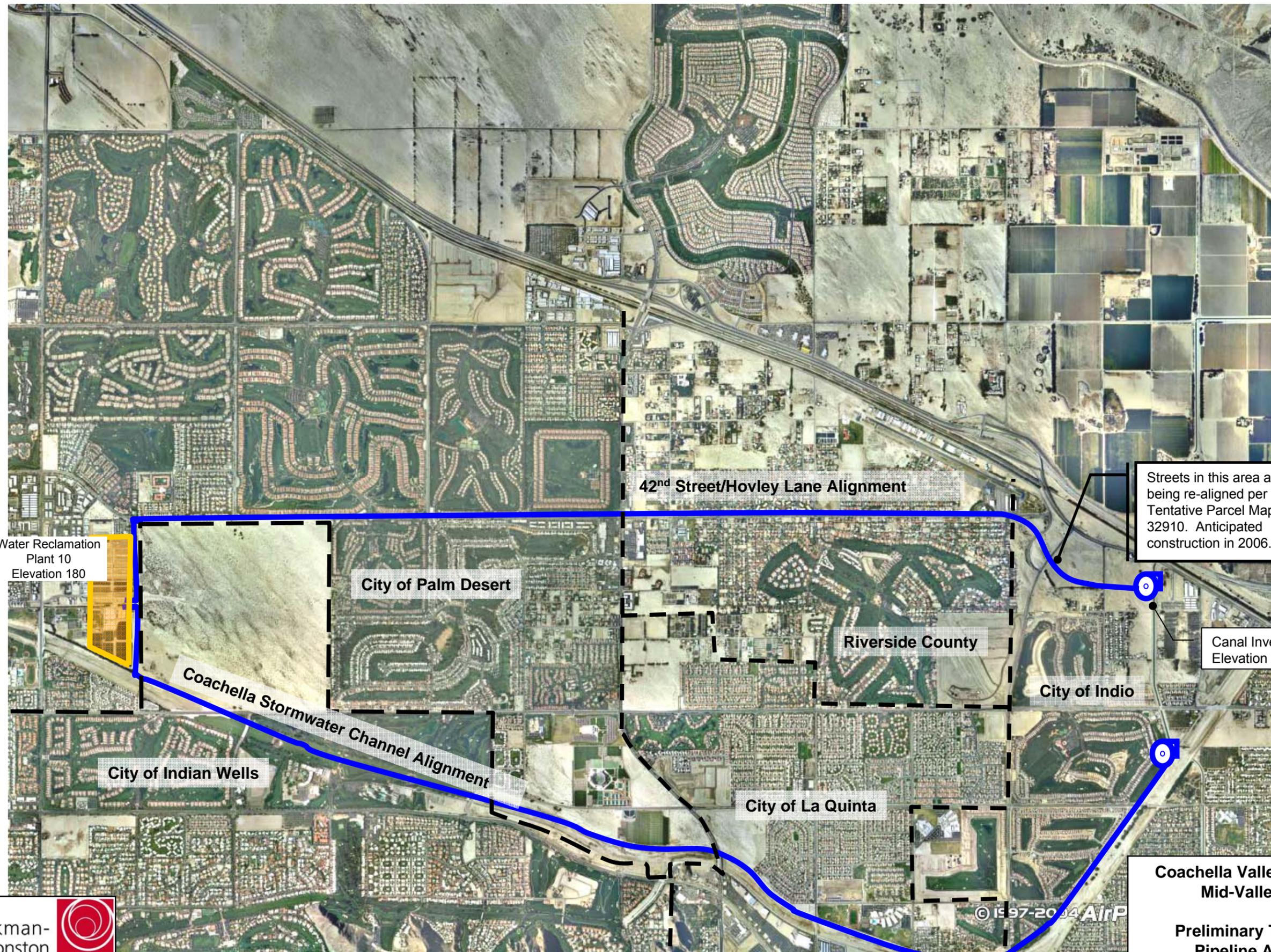
WRP10 Recycled Pump Station. High pressure on left. Low Pressure on right.



**Coachella Valley Water District
 Mid-Valley Pipeline**

**Existing Recycled Water
 Distribution System**

Sketch 3-1



Water Reclamation Plant 10
Elevation 180

City of Palm Desert

Riverside County

City of Indio

City of Indian Wells

City of La Quinta

42nd Street/Hovley Lane Alignment

Coachella Stormwater Channel Alignment

Streets in this area are being re-aligned per Tentative Parcel Map No. 32910. Anticipated construction in 2006.

Canal Invert Elevation 20 feet

Coachella Valley Water District
Mid-Valley Pipeline

Preliminary Transmission
Pipeline Alternatives

Sketch 4-1



© 1997-2004 AIRP

R/W line from drawings 11006-11014. R/W approx 25 feet outside of top of levee

Approx 20'



Miles Avenue

Heritage Palms Golf Course

Concrete Slope Protection District Dwg 22276

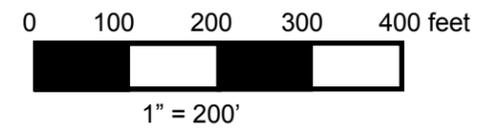
60" Storm Drain District Dwg 22277

Fred Waring Drive

©1997-2004 AirPhotoUSA

N

Four possible pump station locations under evaluation. District is investigating acquisition.



Coachella Valley Water District
Mid-Valley Pipeline

Storm Water Channel Alignment

Sketch 4-2



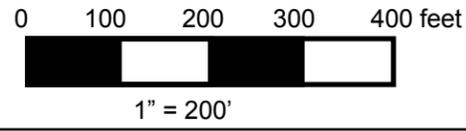
Indian Springs Country Club

City of Indio

Coco Palm Drive

Miles Avenue

© 1997-2004 AITP



Coachella Valley Water District
Mid-Valley Pipeline

Storm Water Channel Alignment

Sketch 4-3



12" Water Line District Dwg 19518

Jefferson Street

Meadow Lake Drive

City of Indio

12" PVC encased Sewer (Valley Sanitary District)
 10" CML&C Water (City of Indio)
 2-4" PVC Telephone (were GTE)
 District Dwg 19512

Concrete Slope Protection
 District Dwg 19511

Right-of-way
 District Dwg 19513

1

2

Jefferson Street Bridge
 construction contract was
 let in February 2005 by
 County of Riverside.
 Anticipated construction
 period of 12 to 14 months.



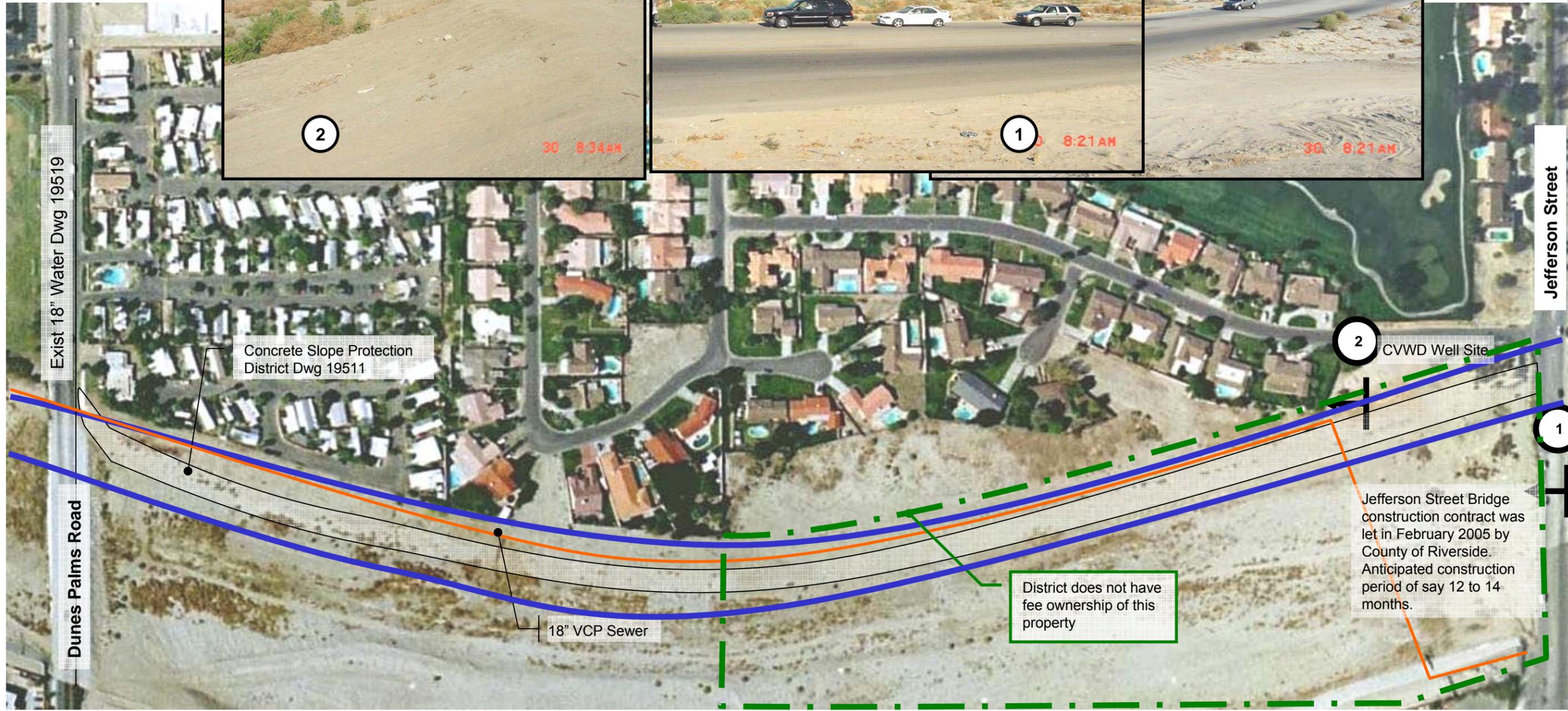
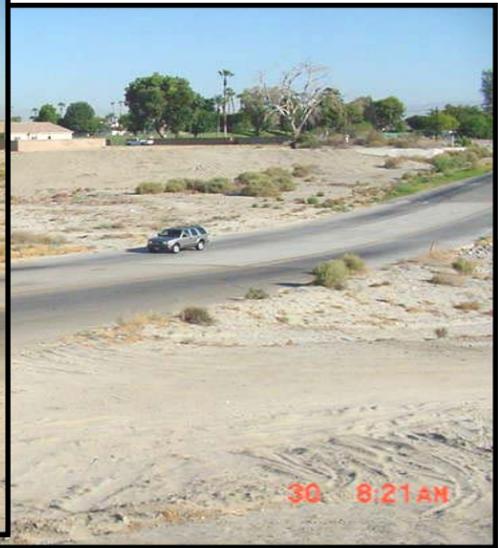
La Quinta Evacuation Channel



Coachella Valley Water District
 Mid-Valley Pipeline

Storm Water Channel Alignment

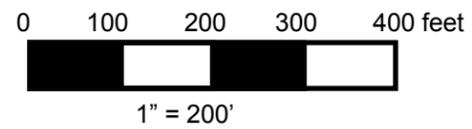
Sketch 4-4



**Coachella Valley Water District
Mid-Valley Pipeline**

Storm Water Channel Alignment

Sketch 4-5



Coachella Valley Water District
Mid-Valley Pipeline

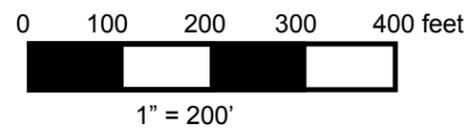
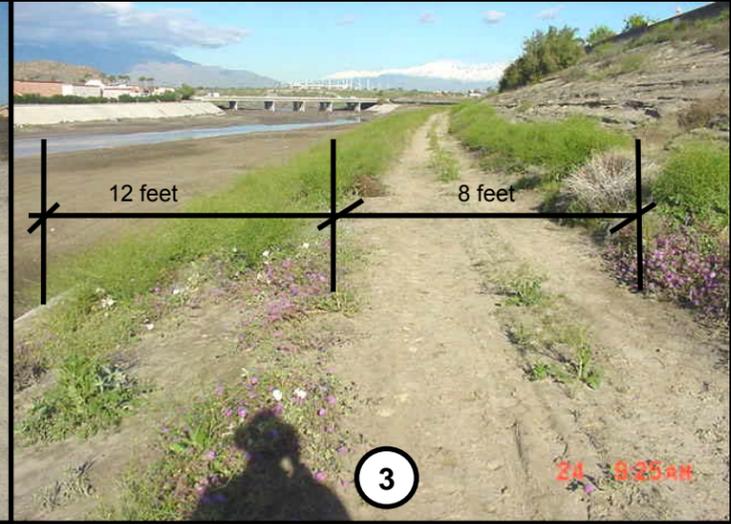
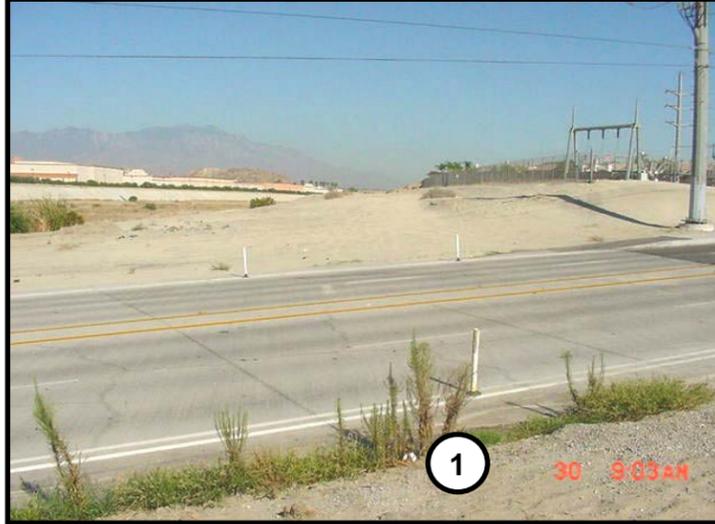
Storm Water Channel Alignment

Sketch 4-6



Limited working area.
Area from top of concrete slope protection to edge of right-of-way is steeply sloped except for a narrow (say 15-foot) roadway

District does not have fee ownership of this property



Coachella Valley Water District
Mid-Valley Pipeline

Storm Water Channel Alignment

Sketch 4-7



Washington Street

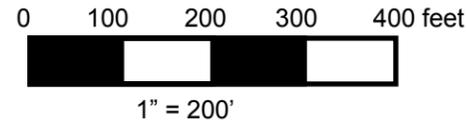
Adams Street

Exist 18" Sewer
District Dwg 24898

District does not have
fee ownership of this
property

Concrete Slope Protection
District Dwg 25736

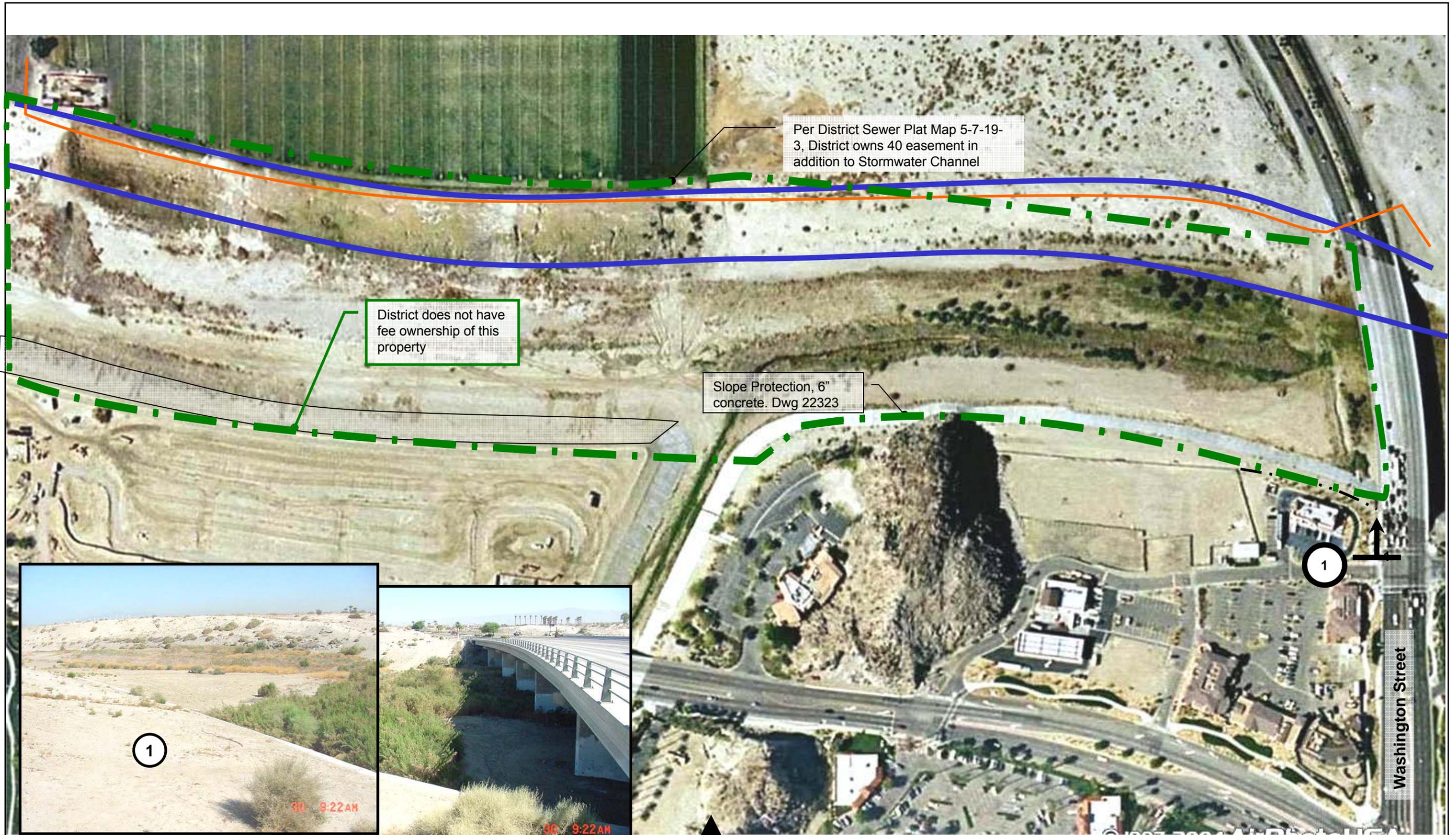
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Coachella Valley Water District
Mid-Valley Pipeline

Storm Water Channel Alignment

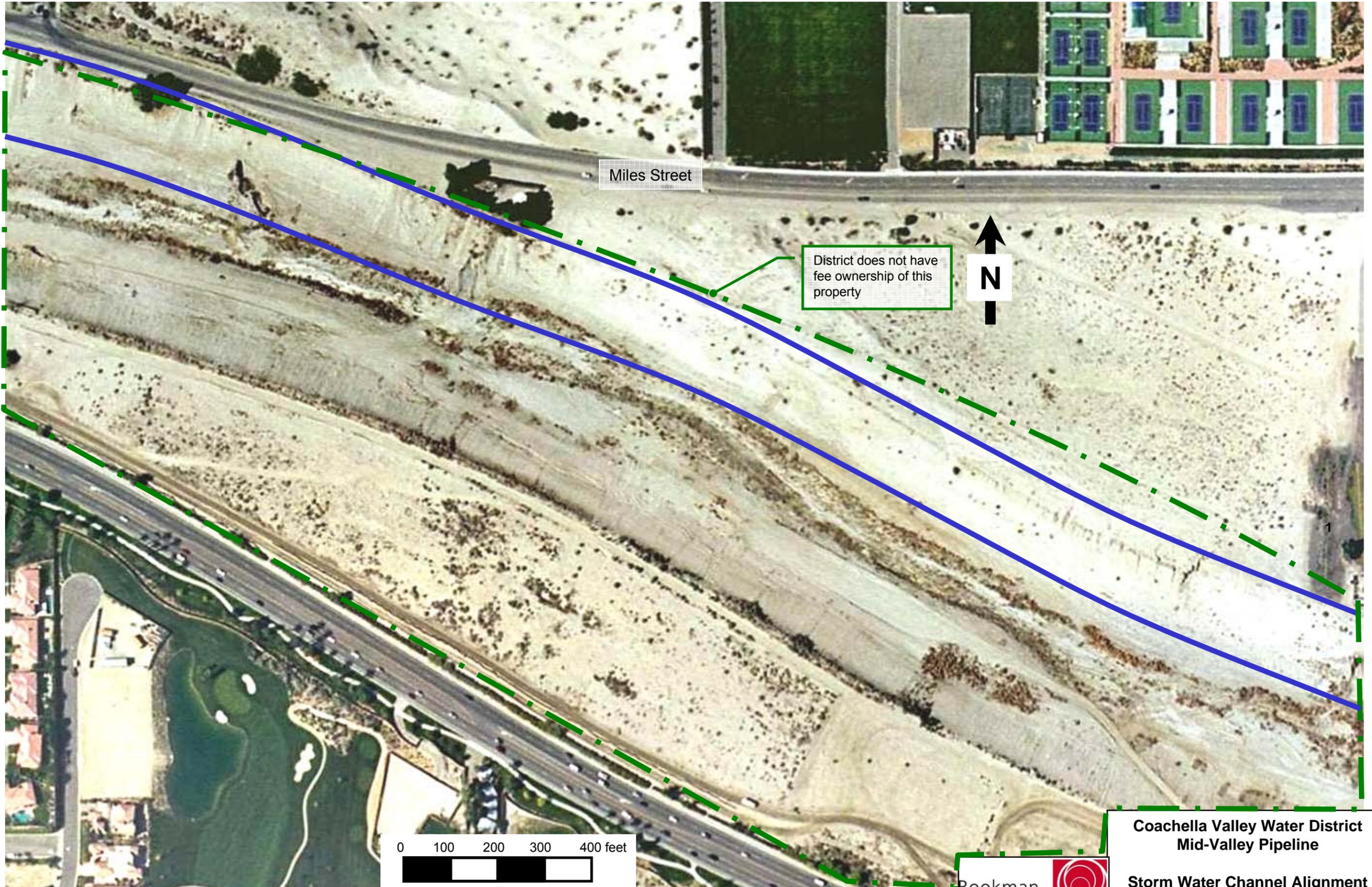
Sketch 4-8



Coachella Valley Water District
Mid-Valley Pipeline

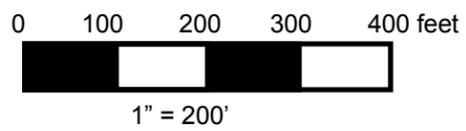
Storm Water Channel Alignment

Sketch 4-9



Miles Street

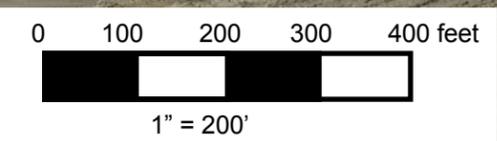
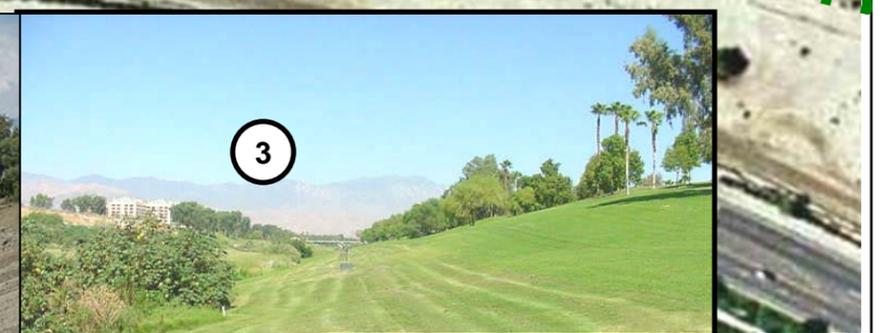
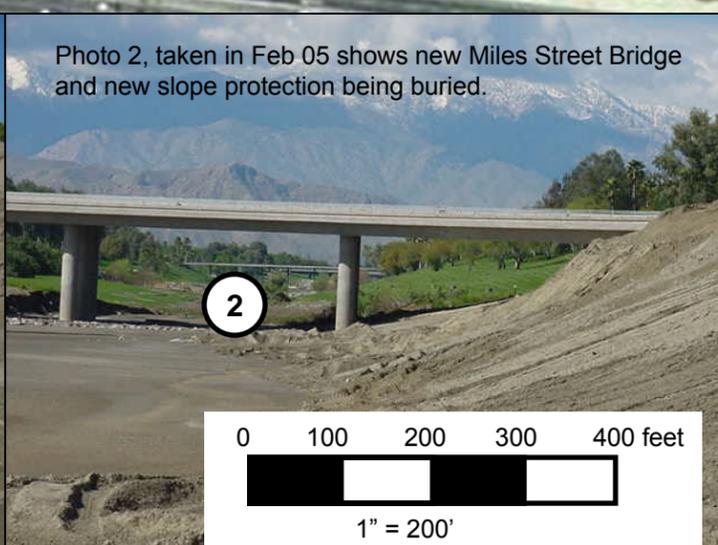
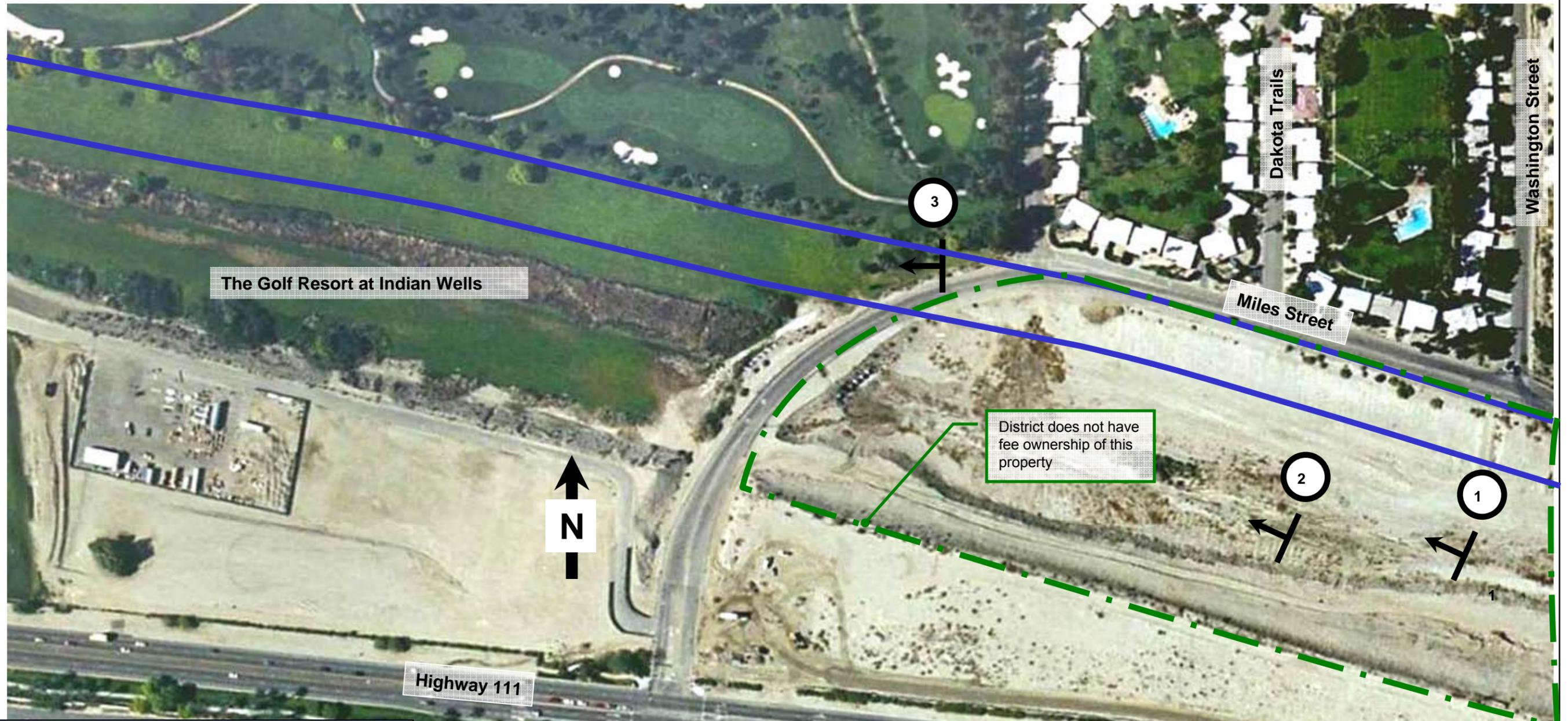
District does not have fee ownership of this property



Coachella Valley Water District
Mid-Valley Pipeline

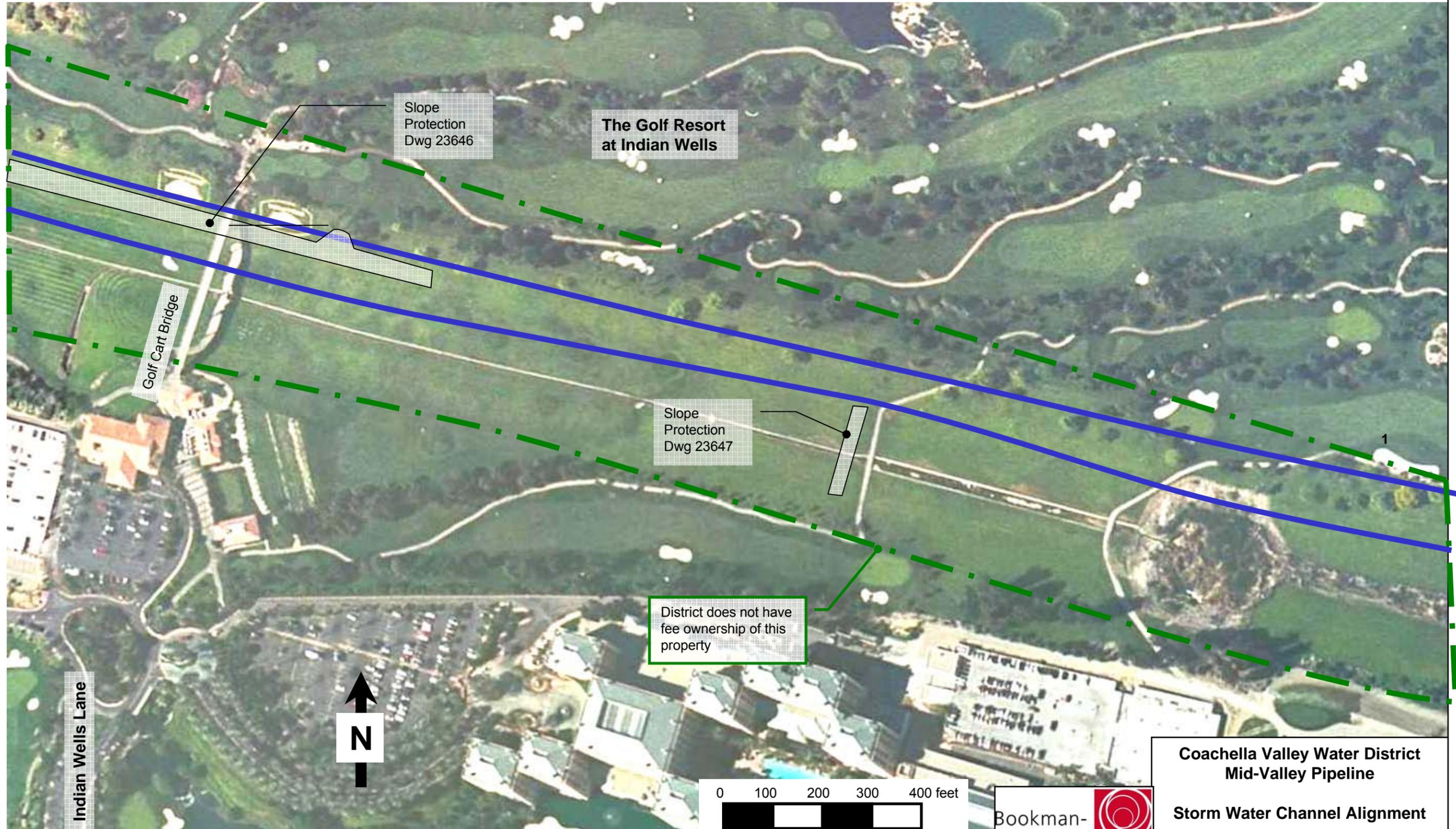
Storm Water Channel Alignment

Sketch 4-10



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A Division of GEL Consultants

Coachella Valley Water District
Mid-Valley Pipeline
Storm Water Channel Alignment
Sketch 4-11



Slope Protection
Dwg 23646

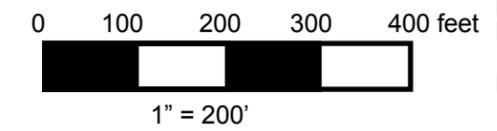
The Golf Resort
at Indian Wells

Golf Cart Bridge

Slope Protection
Dwg 23647

District does not have
fee ownership of this
property

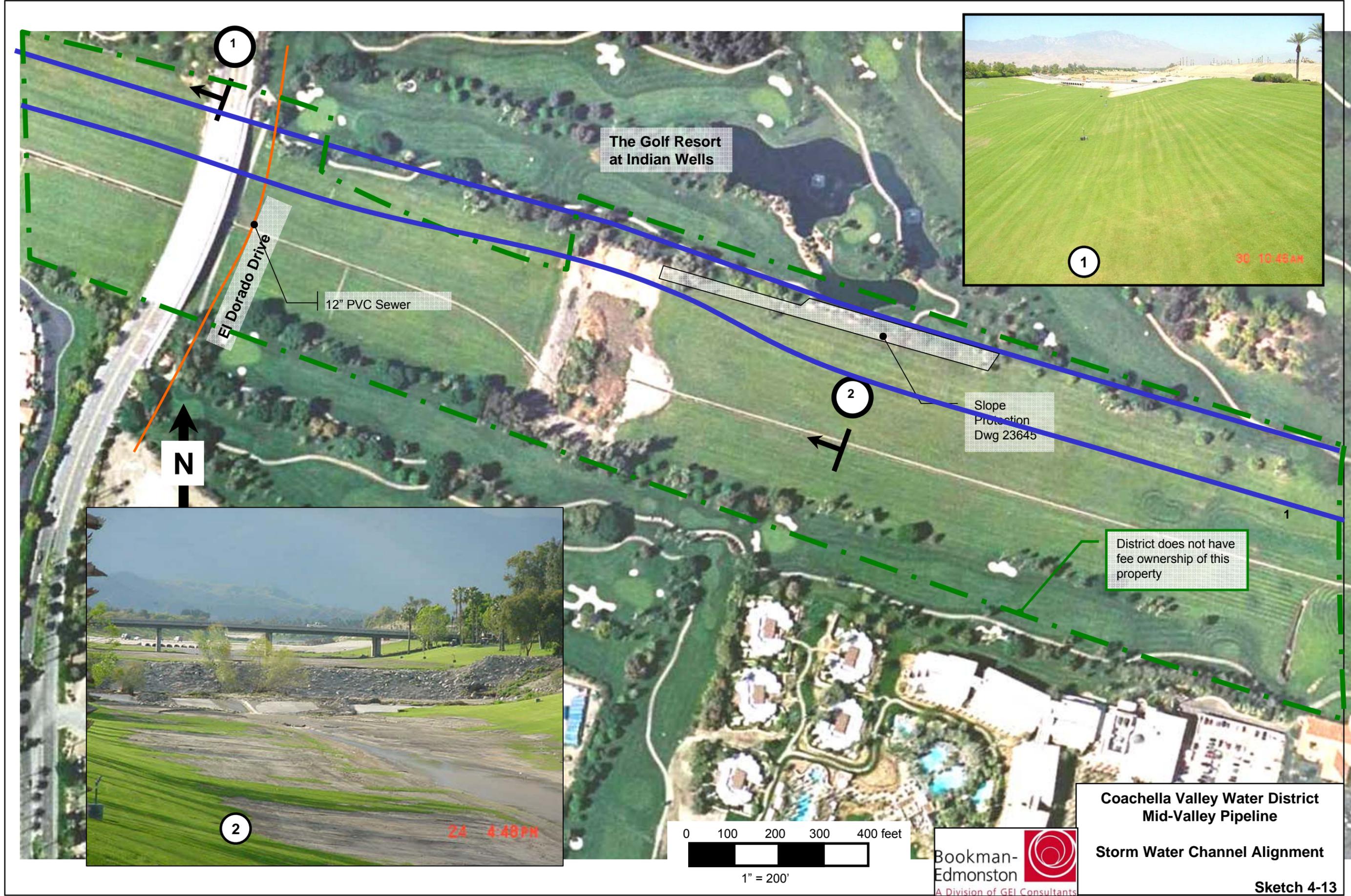
Indian Wells Lane



Coachella Valley Water District
Mid-Valley Pipeline

Storm Water Channel Alignment

Sketch 4-12



The Golf Resort
at Indian Wells

El Dorado Drive

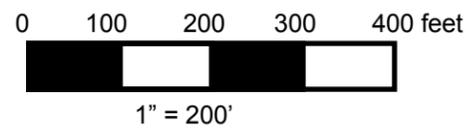
12" PVC Sewer

Slope
Protection
Dwg 23645

District does not have
fee ownership of this
property



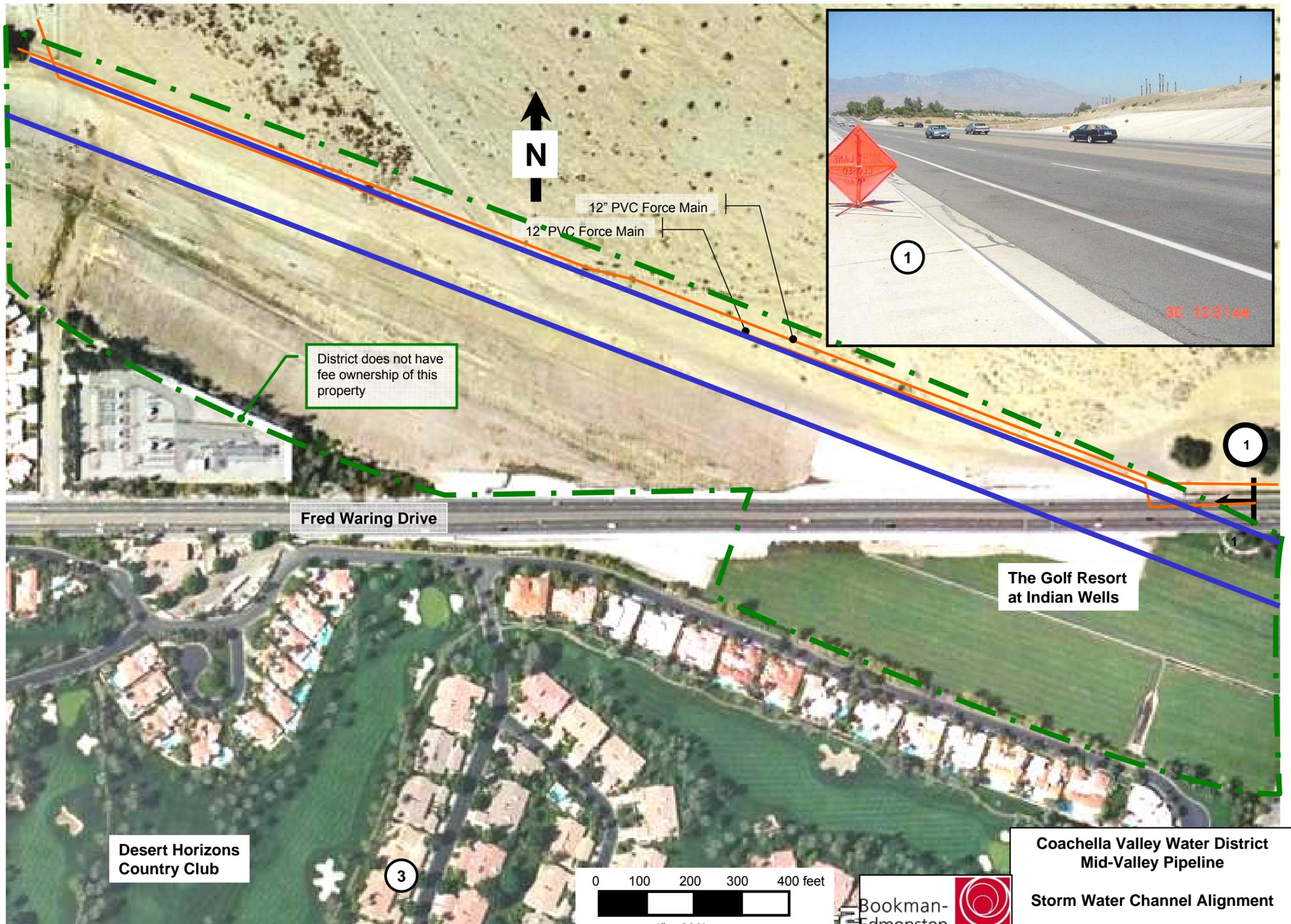
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Coachella Valley Water District
Mid-Valley Pipeline

Storm Water Channel Alignment

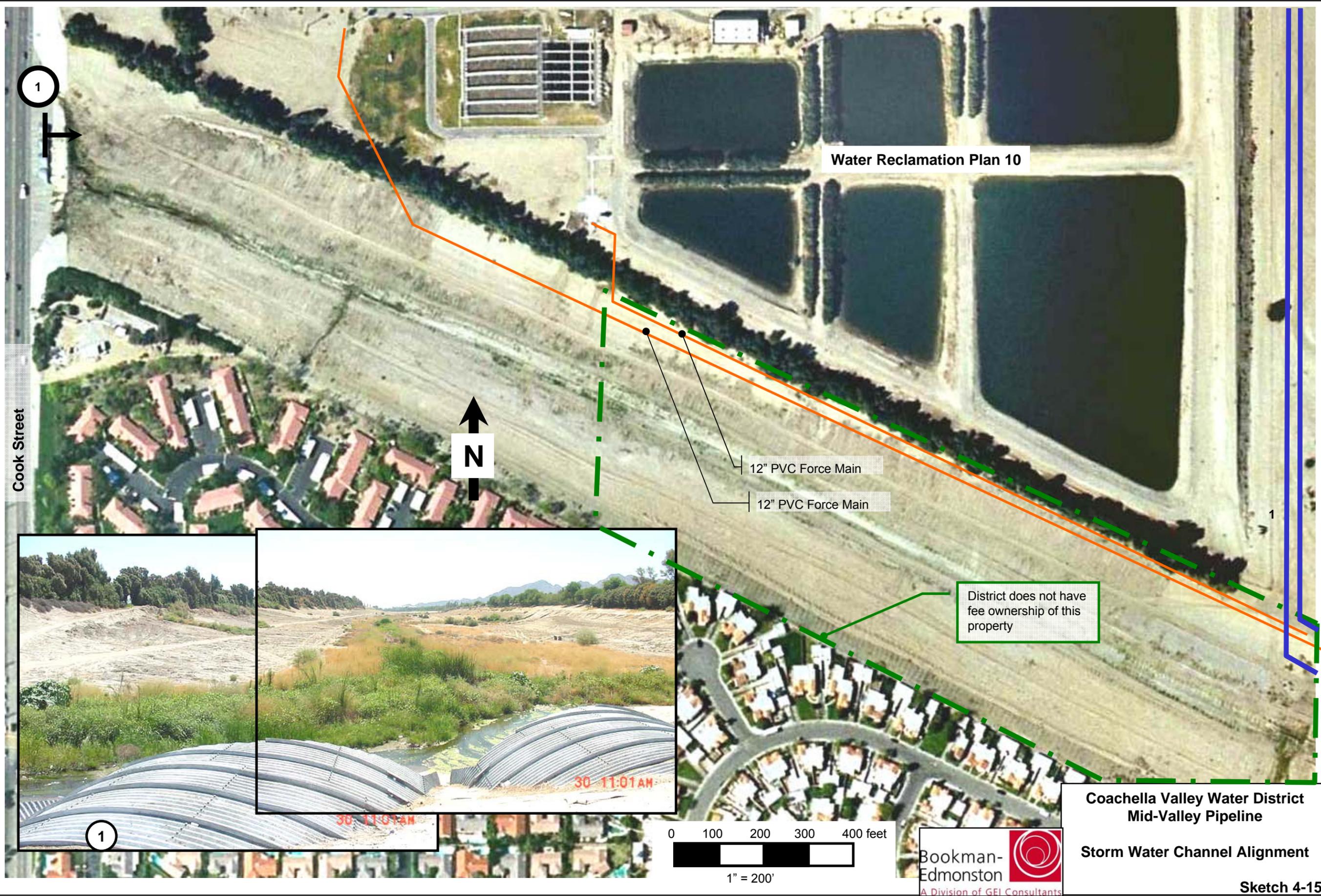
Sketch 4-13



Coachella Valley Water District
Mid-Valley Pipeline

Storm Water Channel Alignment

Sketch 4-14



1

Cook Street

N

Water Reclamation Plan 10

12" PVC Force Main

12" PVC Force Main

District does not have fee ownership of this property



1



Coachella Valley Water District
Mid-Valley Pipeline

Storm Water Channel Alignment

Sketch 4-15



Cook Street

Sheryl Avenue

Water Reclamation Plant 10

Proposed Canal Water Reservoir 4
5 MG/15 af

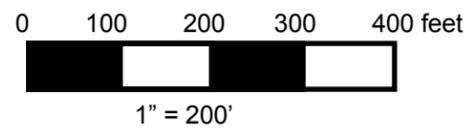
Proposed Canal Water Reservoirs would not all be constructed in the first phase

Proposed Canal Water Reservoir 3
5 MG/15 af

Proposed Canal Water Reservoir 2
5 MG/15 af

Exist 5 MG Recycled Water Reservoir

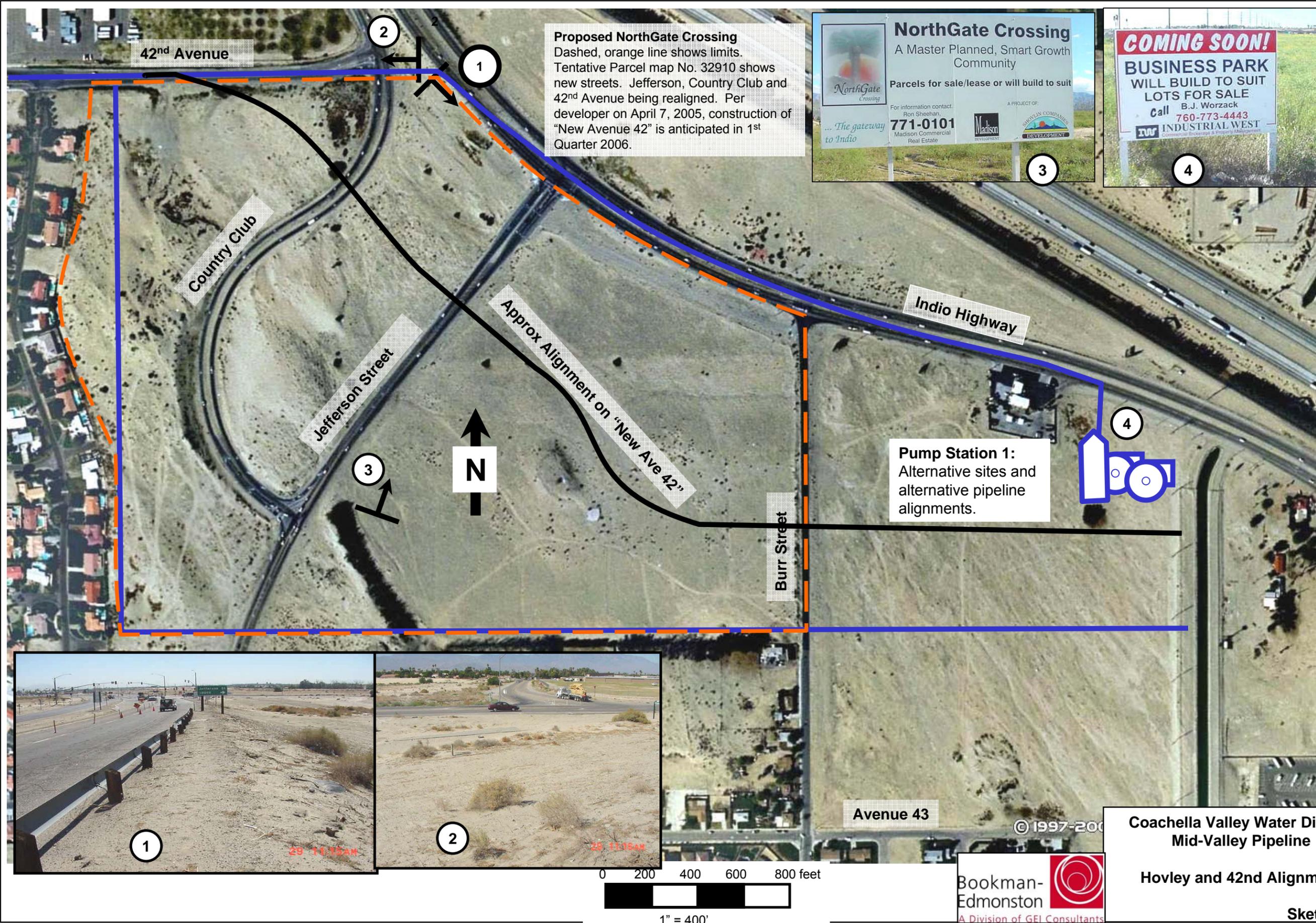
Proposed Receiving Impoundment
5 MG/15 af



Coachella Valley Water District
Mid-Valley Pipeline

Storm Water Channel Alignment

Sketch 4-16



Proposed NorthGate Crossing
 Dashed, orange line shows limits.
 Tentative Parcel map No. 32910 shows new streets. Jefferson, Country Club and 42nd Avenue being realigned. Per developer on April 7, 2005, construction of "New Avenue 42" is anticipated in 1st Quarter 2006.

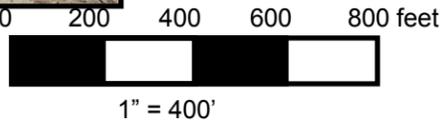
NorthGate Crossing
 A Master Planned, Smart Growth Community
 Parcels for sale/lease or will build to suit
 For information contact:
 Ron Sheehan,
771-0101
 Madison Commercial Real Estate

A PROJECT OF:
 WADISON DEVELOPMENT
 SHERWIN COMPANIES DEVELOPMENT

... The gateway to Indio

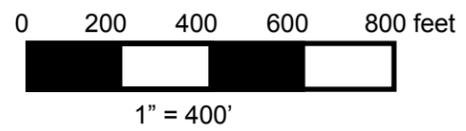
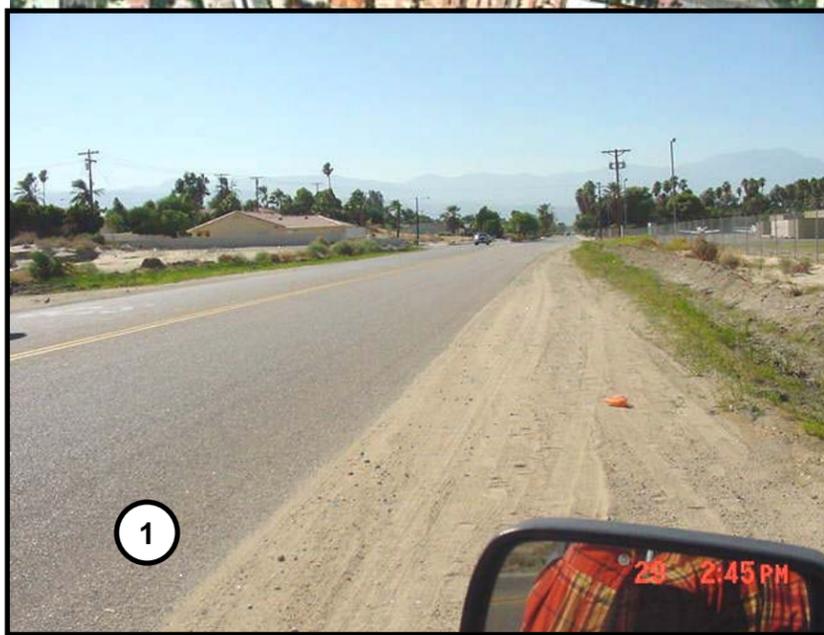
COMING SOON!
BUSINESS PARK
 WILL BUILD TO SUIT
 LOTS FOR SALE
 Call B.J. Worzack
760-773-4443
 INDUSTRIAL WEST
 Commercial Brokers & Property Management

Pump Station 1:
 Alternative sites and alternative pipeline alignments.



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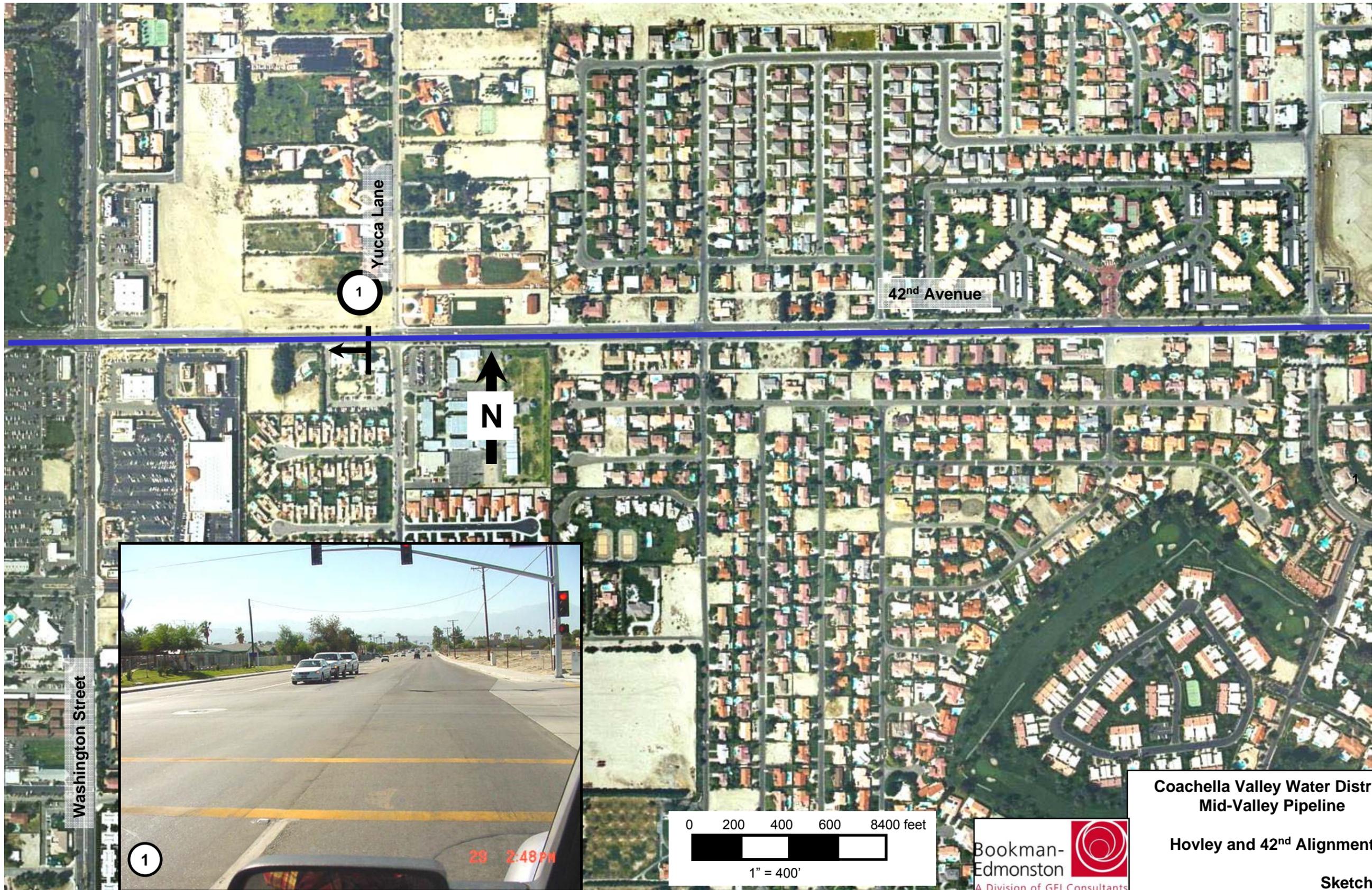
Coachella Valley Water District
Mid-Valley Pipeline
Hovley and 42nd Alignment



Coachella Valley Water District
Mid-Valley Pipeline

Hovley and 42nd Alignment

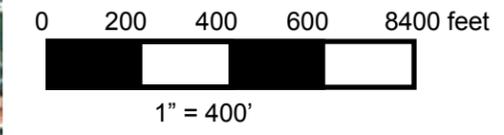
Sketch 4-18



Coachella Valley Water District
Mid-Valley Pipeline

Hovley and 42nd Alignment

Sketch 4-19

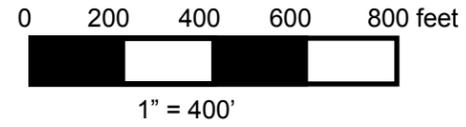
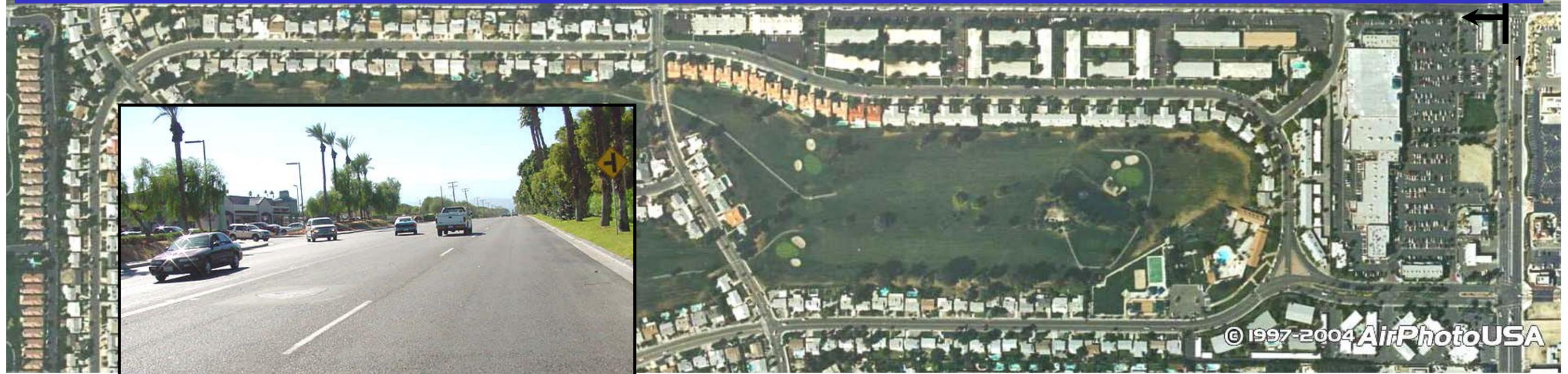


Washington Street

Yucca Lane

42nd Avenue

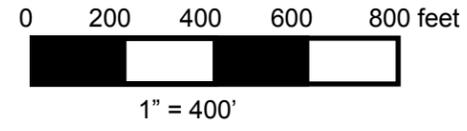
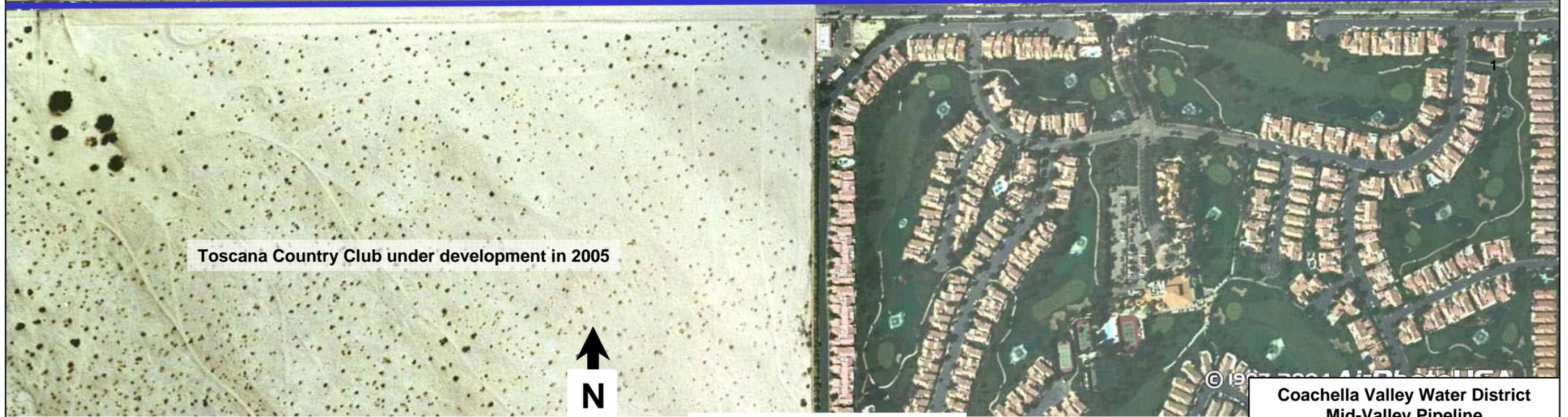
N



Coachella Valley Water District
Mid-Valley Pipeline

Hovley and 42nd Alignment

Sketch 4-20



Coachella Valley Water District
Mid-Valley Pipeline

Hovley and 42nd Alignment

Sketch 4-21



Canal Water Reservoirs would not all be constructed in the first phase.

See Sketch 4-16 for portion of facilities located south of this sketch.

Water Reclamation Plant 10 (WRP 10)

Proposed Canal Water Reservoir 3
5 MG/15 af

Hovley Drive

Toscana Country Club under development in 2005

0 200 400 600 800 feet



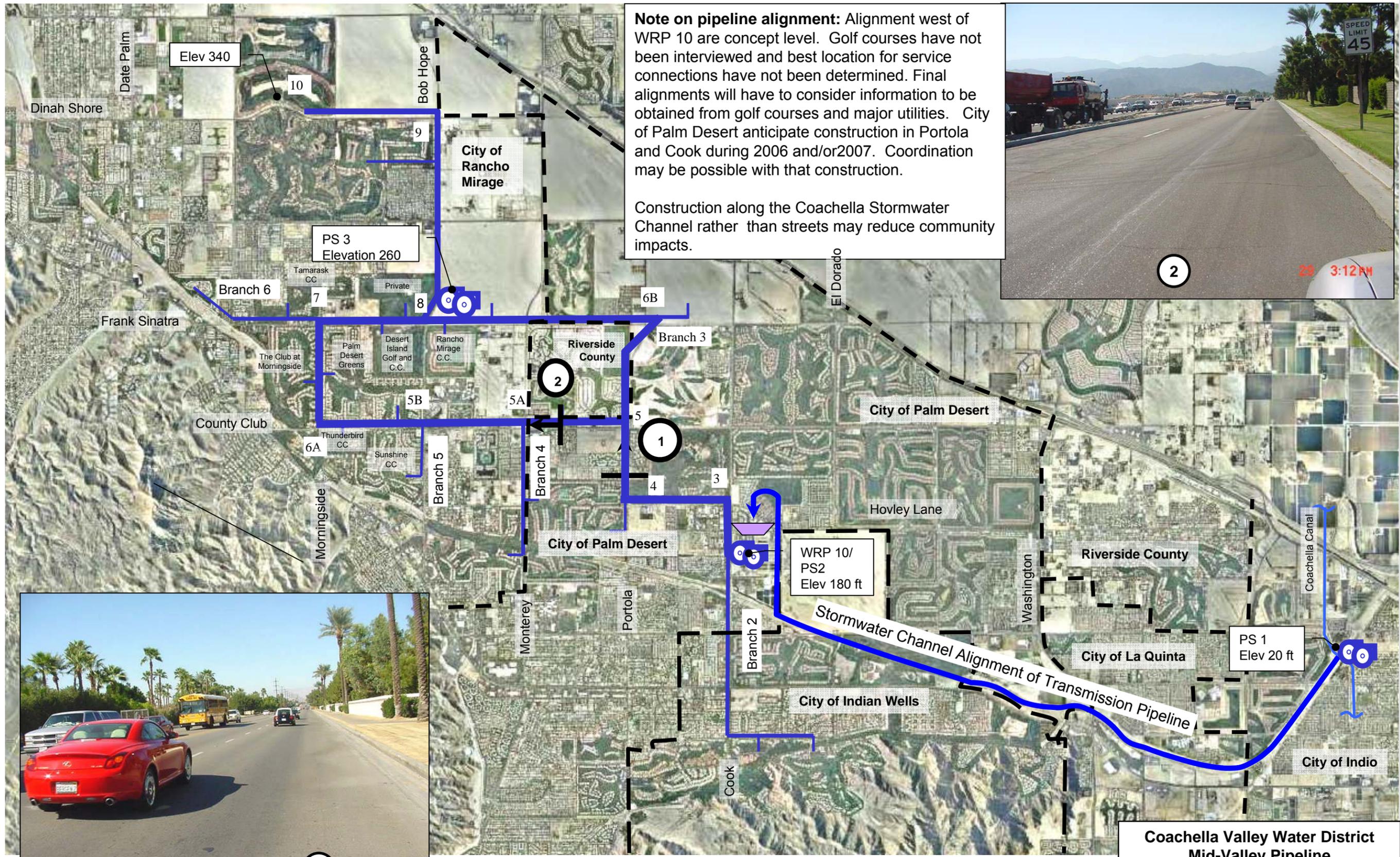
1" = 400'



Coachella Valley Water District
Mid-Valley Pipeline

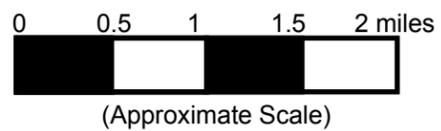
Hovley and 42nd Alignment

Sketch 4-22



Note on pipeline alignment: Alignment west of WRP 10 are concept level. Golf courses have not been interviewed and best location for service connections have not been determined. Final alignments will have to consider information to be obtained from golf courses and major utilities. City of Palm Desert anticipate construction in Portola and Cook during 2006 and/or 2007. Coordination may be possible with that construction.

Construction along the Coachella Stormwater Channel rather than streets may reduce community impacts.



**Coachella Valley Water District
Mid-Valley Pipeline
Canal Water Distribution System**

Sketch 4-23

Appendix C

Cost Estimates

Table C-1: Transmission System with 54" Transmission Line – 42nd Avenue/Hovley Lane Alignment

Table C-2: Transmission System with 54" Transmission Line – Coachella Stormwater Channel Alignment, Invert

Table C-3: Transmission System with 54" Transmission Line – Coachella Stormwater Channel Alignment, Levee

Table C-4: Transmission System with 60" Transmission Line – 42nd Avenue/Hovley Lane Alignment

Table C-5: Transmission System with 60" Transmission Line – Coachella Stormwater Channel Alignment, Invert

Table C-6: Transmission System with 60" Transmission Line – Coachella Stormwater Channel Alignment, Levee

Table C-7: Canal Water Distribution System, 18 hour operation – One Pressure Zone

Table C-8: Canal Water Distribution System, 18 hour operation – Two Pressure Zones

Table C-1
MID-VALLEY IN-LIEU PROGRAM
Pump Station and Transmission from Canal to WRP10
54-INCH DIAMETER TRANSMISSION LINE
42nd Avenue/Hovley Lane Alignment
 Revised: 6Apr05
Delivery 24 hrs/day
Maximum Q 114.0 cfs
Maximum TDH 241.6 TDH

Item	Quantity	Unit	Unit Cost	Amount
Mobilization & General Conditions/General Requirements				
Project Manager (40 hr/wk)	78	wk	2,900.00	226,200
Superintendent (40 hr/wk)	65	wk	2,600.00	169,000
Field Engineer (40 hr/wk)	65	wk	1,450.00	94,250
Main office expense (3.9% of construction)	1	ls	698,423.00	698,423
Layout/engineering survey	1	ls	35,000.00	35,000
Mobilization	1	ls	100,000.00	100,000
Job office	18	mo	1,300.00	23,400
Job toilets (2)	18	mo	87.00	1,566
Storage shed	18	mo	85.00	1,530
Temporary water connection	1	ls	2,800.00	2,800
Temporary water	18	mo	50.00	900
Temporary electricity hookup	1	ls	1,400.00	1,400
Temporary electricity	18	mo	50.00	900
Temporary phone connection	1	ls	300.00	300
Temporary phone service	18	mo	50.00	900
Periodic cleanup	18	mo	500.00	9,000
Final cleanup	120	hr	15.92	1,910
Traffic control	65	wk	4,200.00	273,000
Shoring	1	ls	200,000.00	200,000
Job office supplies	18	mo	200.00	3,600
Pickup trucks/maintenance	18	mo	400.00	7,200
Scheduling	1	ls	7,000.00	7,000
Licenses/permits	1	ls	15,000.00	15,000
Insurance (1% of construction total)	1	ls	179,082.82	179,083
Bonds (0.6% of construction total)	1	ls	107,449.69	107,450
Submittals	120	hr	90.00	10,800
				2,170,612
Pumping Plant (land cost shows separately)				
Pumps and Associated Electrical	4,000	hp	450.00	1,800,000
Earthwork and Structures	114.0	cfs	5,500.00	627,000
Screening Facilities	1	ls	200,000.00	200,000
Electrical Service	1	ls	250,000.00	250,000
Standpipe	1	ls	300,000.00	300,000
Subtotal (Pumping Plant)				3,177,000
Reach 1 (Canal to Jefferson St)				
54 " CML&C Steel Transmission	3,221	lf	229.64	739,625
Appurtenances (10% of pipe)				73,962
Open Area (Earthwork - Site Restoration)				
Pipe Installation	3,169	lf	37.12	117,626
Excavation	19,576	cy	1.36	26,547
Bedding	447	cy	18.18	8,133
Material Disposal	2,661	cy	0.00	-
Backfill & Compaction	17,157	cy	2.23	38,277
Street (Earthwork - Site Restoration)				
Pipe Installation	52	lf	45.83	2,383
Excavation	97	cy	3.63	353
Bedding	6	cy	18.18	116
Material Disposal	43	cy	18.31	780
Backfill & Compaction	59	cy	2.34	137
Asphalt Removal	44	sy	7.00	308
Asphalt Disposal	9	cy	18.31	161
Asphalt Replacement, 6" thick	185	sy	10.94	2,022
Asphalt Cut	52	lf	5.67	295
Curb & Gutter Replacement	2	ea	8.54	17
Subtotal - Reach 1				\$ 1,010,742

Reach 2 Jefferson St to 42nd Ave)				
54 " CML&C Steel Transmission	1,637	lf	229.64	375,875
Appurtenances (10% of pipe)				37,587
Open Area (Earthwork - Site Restoration)				
Pipe Installation	1,617	lf	37.12	60,016
Excavation	9,988	cy	1.36	13,545
Bedding	228	cy	18.18	4,150
Material Disposal	1,358	cy	0.00	-
Backfill & Compaction	8,754	cy	2.23	19,530
Street (Earthwork - Site Restoration)				
Pipe Installation	20	lf	45.83	917
Excavation	37	cy	3.63	136
Bedding	2	cy	18.18	45
Material Disposal	16	cy	18.31	300
Backfill & Compaction	23	cy	2.34	53
Asphalt Removal	17	sy	7.00	119
Asphalt Disposal	3	cy	18.31	62
Asphalt Replacement, 6" thick	71	sy	10.94	778
Asphalt Cut	20	lf	5.67	113
Curb & Gutter Replacement	1	ea	8.54	9
Subtotal - Reach 2			\$	513,232
Reach 3 (42nd St to Adams St)				
54 " CML&C Steel Transmission	5,333	lf	229.64	1,224,624
Appurtenances (10% of pipe)				122,462
Street (Earthwork - Site Restoration)				
Pipe Installation	5,333	lf	45.83	244,402
Excavation	9,977	cy	3.63	36,227
Bedding	654	cy	18.18	11,892
Material Disposal	4,370	cy	18.31	79,998
Backfill & Compaction	6,005	cy	2.34	14,054
Asphalt Removal	4,518	sy	7.00	31,623
Asphalt Disposal	904	cy	18.31	16,543
Asphalt Replacement, 6" thick	18,961	sy	10.94	207,364
Asphalt Cut	5,333	lf	5.67	30,232
Subtotal - Reach 3			\$	2,019,421
Reach 4 (Adams St to Washington St)				
54 " CML&C Steel Transmission	5,491	lf	229.64	1,260,999
Appurtenances (10% of pipe)				126,100
Street (Earthwork - Site Restoration)				
Pipe Installation	5,491	lf	45.83	251,662
Excavation	10,274	cy	3.63	37,303
Bedding	674	cy	18.18	12,245
Material Disposal	4,500	cy	18.31	82,374
Backfill & Compaction	6,183	cy	2.34	14,471
Asphalt Removal	4,652	sy	7.00	32,562
Asphalt Disposal	930	cy	18.31	17,034
Asphalt Replacement, 6" thick	19,524	sy	10.94	213,524
Asphalt Cut	5,491	lf	5.67	31,130
Subtotal - Reach 4			\$	2,079,404
Reach 5 (Washington St to Hemmingway Ct)				
54 " CML&C Steel Transmission	13,675	lf	229.64	3,140,373
Appurtenances (10% of pipe)				314,037
Street (Earthwork - Site Restoration)				
Pipe Installation	13,675	lf	45.83	626,734
Excavation	25,586	cy	3.63	92,898
Bedding	1,678	cy	18.18	30,495
Material Disposal	11,206	cy	18.31	205,144
Backfill & Compaction	15,399	cy	2.34	36,039
Asphalt Removal	11,586	sy	7.00	81,093
Asphalt Disposal	2,317	cy	18.31	42,422
Asphalt Replacement, 6" thick	48,623	sy	10.94	531,756
Asphalt Cut	13,675	lf	5.67	77,525
Subtotal - Reach 5			\$	5,178,515

Reach 6 (Hemmingway Ct to NE Corner of WRP 10)				
54 " CML&C Steel Transmission	2,270	lf	229.64	521,375
Appurtenances (10% of pipe)				52,137
Open Area (Earthwork - Site Restoration)				
Pipe Installation	2,250	lf	37.12	83,535
Excavation	13,902	cy	1.36	18,853
Bedding	318	cy	18.18	5,776
Material Disposal	1,890	cy	0.00	-
Backfill & Compaction	12,184	cy	2.23	27,183
Street (Earthwork - Site Restoration)				
Pipe Installation	20	lf	45.83	917
Excavation	37	cy	3.63	136
Bedding	2	cy	18.18	45
Material Disposal	16	cy	18.31	300
Backfill & Compaction	23	cy	2.34	53
Asphalt Removal	17	sy	7.00	119
Asphalt Disposal	3	cy	18.31	62
Asphalt Replacement, 6" thick	71	sy	10.94	778
Asphalt Cut	20	lf	5.67	113
Subtotal - Reach 6			\$	711,380
Reach 7 (NE Corner of WRP 10 to Treatment Facility)				
54 " CML&C Steel Transmission	475	lf	229.64	109,125
Appurtenances (10% of pipe)				10,912
Open Area (Earthwork - Site Restoration)				
Pipe Installation	475	lf	37.12	17,639
Excavation	2,936	cy	1.36	3,981
Bedding	67	cy	18.18	1,220
Material Disposal	399	cy	0.00	-
Backfill & Compaction	2,573	cy	2.23	5,740
Subtotal - Reach 7			\$	28,580
Receiving Impoundment 15 acre-feet (5MG), earth-berm				
Excavation	9,833	cy	1.36	13,335
Transport	9,833	cy	1.03	10,108
Compaction	9,833	cy	0.87	8,603
Concrete lining	1,483	cy	450.00	667,350
Piping Manifolds/Valving	1	ls	200,000.00	200,000
Subtotal - Storage			\$	899,396
Land Acquisition				
Land for Pump Station 1	2	ac	150,000.00	\$ 60,000
Land between PS1 and 42nd Ave	2.75	ac	150,000.00	\$ 60,000
Subtotal - Land for Pump Station			\$	120,000
PHASE 1:				
Total Construction Costs:			\$	17,908,282
Contingency		30%	\$	5,372,485
Engr./Permitting & Construction Man. (17% of Total Construction Costs)				3,044,400
Capital Costs, 2004 Price Level:			\$	26,325,167
Adjust to 2005 Price Level (Oct 04 to Jun 05)		4.5%	\$	1,184,632
Capital Costs, 2005 Price Level			\$	27,509,799
Adjust to Mid-point of construction, 2007	2	years at 3%	\$	1,650,588
Capital Costs, 2007 Price Level			\$	29,160,387

J:\042720 - Coachella Valley WD\Engineering\PS1 to PS2 Cost\Channel Alignment - Levee & Invert.xls| Levee - 60"

Table C-2
MID-VALLEY IN-LIEU PROGRAM
Pump Station and Transmission from Canal to WRP10
Constructed in the Invert of the Coachella Stormwater Channel Alignment
54-INCH DIAMETER TRANSMISSION LINE

Revised: 17May05

Delivery 24 hrs/day
Maximum Q 114.0 cfs
Maximum TDH 250.7 TDH

Item	Quantity	Unit	Unit Cost	Amount
Mobilization & General Conditions/General Requirements				
Project Manager (40 hr/wk)	65	wk	2,900.00	188,500
Superintendent (40 hr/wk)	52	wk	2,600.00	135,200
Field Engineer (40 hr/wk)	65	wk	1,450.00	94,250
Main office expense (3.9% of construction)	1	ls	759,463.20	759,463
Layout/engineering survey	1	ls	35,000.00	35,000
Mobilization	1	ls	100,000.00	100,000
Job office	15	mo	1,300.00	19,500
Job toilets (2)	15	mo	87.00	1,305
Storage shed	15	mo	85.00	1,275
Temporary water connection	1	ls	2,800.00	2,800
Temporary water	15	mo	50.00	750
Temporary electricity hookup	1	ls	1,400.00	1,400
Temporary electricity	15	mo	50.00	750
Temporary phone connection	1	ls	300.00	300
Temporary phone service	15	mo	50.00	750
Periodic cleanup	15	mo	500.00	7,500
Final cleanup	120	hr	15.92	1,910
Traffic control	1	ls	25,000.00	25,000
Shoring	1	ls	200,000.00	200,000
Job office supplies	15	mo	200.00	3,000
Pickup trucks/maintenance	15	mo	400.00	6,000
Scheduling	1	ls	7,000.00	7,000
Licenses/permits	1	ls	15,000.00	15,000
Insurance (1% of construction total)	1	ls	194,734.15	194,734
Bonds (0.6% of construction total)	1	ls	116,840.49	116,840
Submittals	120	hr	90.00	10,800
				1,929,028
Pumping Plant (Excludes Land)				
Pumps and Associated Electrical	4,100	hp	450.00	1,845,000
Earthwork and Structures	114.0	cfs	5,500.00	627,000
Screening Facilities	1	ls	250,000.00	250,000
Electrical Service	1	ls	200,000.00	200,000
Transient Control	1	ls	300,000.00	300,000
Subtotal (Pumping Plant)				3,222,000
Reach 1 (Canal to Miles Ave, dip crossing at Miles)				
54 " CML&C Steel Transmission	1,848	lf	229.64	424,375
Appurtenances (10% of pipe)				42,437
Open Area (Earthwork - Site Restoration)				
Pipe Installation	1,748	lf	37.12	64,886
Excavation	36,108	cy	1.03	37,120
Bedding	247	cy	18.18	4,486
Material Disposal	1,432	cy	18.31	26,222
Backfill & Compaction	34,774	cy	1.56	54,097
Street (Earthwork - Site Restoration)				
Pipe Installation	100	lf	45.83	4,583
Excavation	187	cy	3.63	679
Bedding	12	cy	18.18	223
Material Disposal	82	cy	18.31	1,500
Backfill & Compaction	113	cy	2.34	264
Asphalt Removal	85	sy	7.00	593
Asphalt Disposal	17	cy	18.31	310
Asphalt Replacement, 6" thick	85	sy	10.94	927
Asphalt Cut	100	lf	5.67	567
Curb & Gutter Replacement	2	ea	8.54	17
Subtotal - Reach 1				\$ 663,286

Table C-2
MID-VALLEY IN-LIEU PROGRAM
Pump Station and Transmission from Canal to WRP10
Constructed in the Invert of the Coachella Stormwater Channel Alignment
54-INCH DIAMETER TRANSMISSION LINE

Reach 2 (Miles Ave to Indian Springs Country Club)				
54 " CML&C Steel Transmission	4,488	lf	229.64	1,030,624
Appurtenances (10% of pipe)				103,062
Open Area (Earthwork - Site Restoration)				
Pipe Installation	4,488	lf	37.12	166,595
Excavation	92,708	cy	1.03	95,305
Bedding	634	cy	18.18	11,519
Material Disposal	3,677	cy	18.31	67,325
Backfill & Compaction	89,282	cy	1.56	138,895
Subtotal - Reach 2				\$ 1,613,325
Reach 3 (Indian Springs Country Club to Jefferson St, bridge at Jefferson)				
54 " CML&C Steel Transmission	1,214	lf	229.64	278,875
Appurtenances (10% of pipe)				27,887
Open Area (Earthwork - Site Restoration)				
Pipe Installation	1,214	lf	37.12	45,079
Excavation	25,086	cy	1.03	25,788
Bedding	171	cy	18.18	3,117
Material Disposal	995	cy	18.31	18,217
Backfill & Compaction	24,159	cy	1.56	37,583
Subtotal - Reach 3				\$ 436,547
Reach 4 (Jefferson St to Dune Palms Rd, dip crossing at Dunes Palms)				
54 " CML&C Steel Transmission	2,587	lf	229.64	594,125
Appurtenances (10% of pipe)				59,412
Open Area (Earthwork - Site Restoration)				
Pipe Installation	2,487	lf	37.12	92,325
Excavation	51,378	cy	1.03	52,817
Bedding	351	cy	18.18	6,384
Material Disposal	2,038	cy	18.31	37,311
Backfill & Compaction	49,479	cy	1.56	76,974
Street (Earthwork - Site Restoration)				
Pipe Installation	100	lf	45.83	4,583
Excavation	187	cy	3.63	679
Bedding	12	cy	18.18	223
Material Disposal	82	cy	18.31	1,500
Backfill & Compaction	113	cy	2.34	264
Asphalt Removal	85	sy	7.00	593
Asphalt Disposal	17	cy	18.31	310
Asphalt Replacement, 6" thick	85	sy	10.94	927
Asphalt Cut	100	lf	5.67	567
Subtotal - Reach 4				\$ 928,993
Reach 5 (Dune Palms Rd to Adams St, dip crossing at Adams)				
54 " CML&C Steel Transmission	2,798	lf	229.64	642,625
Appurtenances (10% of pipe)				64,262
Open Area (Earthwork - Site Restoration)				
Pipe Installation	2,698	lf	37.12	100,165
Excavation	55,740	cy	1.03	57,302
Bedding	381	cy	18.18	6,926
Material Disposal	2,211	cy	18.31	40,479
Backfill & Compaction	53,680	cy	1.56	83,510
Street (Earthwork - Site Restoration)				
Pipe Installation	100	lf	45.83	4,583
Excavation	187	cy	3.63	679
Bedding	12	cy	18.18	223
Material Disposal	82	cy	18.31	1,500
Backfill & Compaction	113	cy	2.34	264
Asphalt Removal	85	sy	7.00	593
Asphalt Disposal	17	cy	18.31	310
Asphalt Replacement, 6" thick	85	sy	10.94	927
Asphalt Cut	100	lf	5.67	567
Subtotal - Reach 5				\$ 1,004,914

Table C-2
MID-VALLEY IN-LIEU PROGRAM
Pump Station and Transmission from Canal to WRP10
Constructed in the Invert of the Coachella Stormwater Channel Alignment
54-INCH DIAMETER TRANSMISSION LINE

Reach 6 (Adams St to Washington St, bridge at Washington)				
54 " CML&C Steel Transmission	3,485	lf	229.64	800,249
Appurtenances (10% of pipe)				80,025
Open Area (Earthwork - Site Restoration)				
Pipe Installation	3,485	lf	37.12	129,356
Excavation	71,985	cy	1.03	74,002
Bedding	492	cy	18.18	8,944
Material Disposal	2,855	cy	18.31	52,276
Backfill & Compaction	69,325	cy	1.56	107,848
Subtotal - Reach 6				\$ 1,252,699
Reach 7 (Washington St to Miles Ave - Golf Resort at Indian Wells, bridge at Miles)				
54 " CML&C Steel Transmission	6,811	lf	229.64	1,564,124
Appurtenances (10% of pipe)				156,412
Open Area (Earthwork - Site Restoration)				
Pipe Installation	6,811	lf	37.12	252,832
Excavation	140,698	cy	1.03	144,639
Bedding	962	cy	18.18	17,481
Material Disposal	5,581	cy	18.31	102,176
Backfill & Compaction	135,498	cy	1.56	210,793
18" VCP Sewer relocation	2,800	lf	14.00	39,200
Subtotal - Reach 7				\$ 2,487,658
Reach 8 (Miles Ave - Golf Resort at Indian Wells to El Dorado Dr, bridge at El Dorado)				
54 " CML&C Steel Transmission	7,181	lf	229.64	1,648,999
Appurtenances (10% of pipe)				164,900
Street (Earthwork - Site Restoration)				
Golf Course (Earthwork - Site Restoration)				
Pipe Installation	7,181	lf	45.83	329,096
Excavation	148,333	cy	1.03	152,488
Bedding	881	cy	18.18	16,013
Material Disposal	5,884	cy	18.31	107,720
Backfill & Compaction	142,851	cy	1.56	222,231
Subtotal - Reach 8				\$ 2,641,447
Reach 9 (El Dorado Dr to Fred Waring Dr, dip at Fred Waring)				
54 " CML&C Steel Transmission	686	lf	229.64	157,625
Appurtenances (10% of pipe)				15,762
Street (Earthwork - Site Restoration)				
Pipe Installation	52	lf	45.83	2,383
Excavation	1,074	cy	1.03	1,104
Bedding	6	cy	18.18	116
Material Disposal	43	cy	18.31	780
Backfill & Compaction	59	cy	2.34	137
Asphalt Removal	44	sy	7.00	308
Asphalt Disposal	9	cy	18.31	161
Asphalt Replacement, 6" thick	44	sy	10.94	482
Asphalt Cut	52	lf	5.67	295
Concrete Removal	85	sy	11.54	978
Concrete Disposal	17	cy	18.31	310
Concrete Work	14	sy	450.00	6,354
Concrete Cut	100	lf	5.67	567
Curb & Gutter Replacement	2	ea	8.54	17
Golf Course (Earthwork - Site Restoration)				
Pipe Installation	634	lf	45.83	29,075
Excavation	1,187	cy	2.79	3,310
Bedding	78	cy	18.18	1,415
Material Disposal	520	cy	18.31	9,517
Backfill & Compaction	12,620	cy	1.56	19,633
Subtotal - Reach 9				\$ 250,329
Reach 10 (Fred Waring Dr to SE corner of WRP 10)				
54 " CML&C Steel Transmission	3,485	lf	229.64	800,249
Appurtenances (10% of pipe)				80,025
Open Area (Earthwork - Site Restoration)				
Pipe Installation	3,485	lf	37.12	129,356
Excavation	71,985	cy	1.03	74,002
Bedding	492	cy	18.18	8,944
Material Disposal	2,855	cy	18.31	52,276
Backfill & Compaction	69,325	cy	1.56	107,848
Subtotal - Reach 10				\$ 1,252,699

Table C-2
MID-VALLEY IN-LIEU PROGRAM
Pump Station and Transmission from Canal to WRP10
Constructed in the Invert of the Coachella Stormwater Channel Alignment
54-INCH DIAMETER TRANSMISSION LINE

Reach 11 (SE corner of WRP 10 to north of perc ponds)				
54 " CML&C Steel Transmission	1,162	lf	229.64	266,750
Appurtenances (10% of pipe)				26,675
Open Area (Earthwork - Site Restoration)				
Pipe Installation	1,162	lf	37.12	43,119
Excavation	23,995	cy	1.03	24,667
Bedding	164	cy	18.18	2,981
Material Disposal	952	cy	18.31	17,425
Backfill & Compaction	23,108	cy	1.56	35,949
Subtotal - Reach 11				\$ 417,566
Reach 12 (NE corner of WRP 10 to Treatment Facility)				
54 " CML&C Steel Transmission	158	lf	229.64	36,375
Appurtenances (10% of pipe)				3,637
Open Area (Earthwork - Site Restoration)				
Pipe Installation	158	lf	37.12	5,880
Excavation	3,272	cy	1.03	3,364
Bedding	22	cy	18.18	407
Material Disposal	130	cy	18.31	2,376
Backfill & Compaction	3,151	cy	1.56	4,902
Subtotal - Reach 12				\$ 56,941
Receiving Impoundment (5 MG, 15 AF)				
Excavation	9,833	cy	2.79	27,422
Haul & Backfill	9,833	cy	1.03	10,108
Compaction	9,833	cy	0.87	8,603
Concrete lining	1,483	cy	450.00	667,350
Piping Manifolds/Valving	1	ls	200,000.00	200,000
Subtotal - Storage				\$ 913,483
Land Acquisition				
Fees				\$ 300,000
Easements				\$ 50,000
Property Acquisition Costs			15%	\$ 52,500
Subtotal - Storage				\$ 402,500
PHASE 1:				
Total Construction Costs:				\$ 19,473,415
Contingency		30%		\$ 5,842,025
Engr./Permitting & Construction Man. (17% of Total Construction Costs)				3,310,500
Capital Costs, 2004 Price Level:				\$ 28,625,940
Adjust to 2005 Price Level (Oct 04 to Jun 05)		4.5%		\$ 1,288,167
Capital Costs, 2005 Price Level				\$ 29,914,107
Adjust to Mid-point of construction, 2007	2	years at	3%	\$ 1,794,846
Capital Costs, 2007 Price Level				\$ 31,708,954

Table C-3
MID-VALLEY IN-LIEU PROGRAM
Pump Station and Transmission from Canal to WRP10
Constructed in the Levee of the Coachella Stormwater Channel Alignment
54-INCH DIAMETER TRANSMISSION LINE
 Revised: 13Apr05
Delivery 24 hrs/day
Maximum Q 114.0 cfs
Maximum TDH 250.7 TDH

Item	Quantity	Unit	Unit Cost	Amount
Mobilization & General Conditions/General Requirements				
Project Manager (40 hr/wk)	65	wk	2,900.00	188,500
Superintendent (40 hr/wk)	52	wk	2,600.00	135,200
Field Engineer (40 hr/wk)	65	wk	1,450.00	94,250
Main office expense (3.9% of construction)	1	ls	743,017.50	743,017
Layout/engineering survey	1	ls	35,000.00	35,000
Mobilization	1	ls	100,000.00	100,000
Job office	15	mo	1,300.00	19,500
Job toilets (2)	15	mo	87.00	1,305
Storage shed	15	mo	85.00	1,275
Temporary water connection	1	ls	2,800.00	2,800
Temporary water	15	mo	50.00	750
Temporary electricity hookup	1	ls	1,400.00	1,400
Temporary electricity	15	mo	50.00	750
Temporary phone connection	1	ls	300.00	300
Temporary phone service	15	mo	50.00	750
Periodic cleanup	15	mo	500.00	7,500
Final cleanup	120	hr	15.92	1,910
Traffic control	1	ls	25,000.00	25,000
Shoring	1	ls	200,000.00	200,000
Job office supplies	15	mo	200.00	3,000
Pickup trucks/maintenance	15	mo	400.00	6,000
Scheduling	1	ls	7,000.00	7,000
Licenses/permits	1	ls	15,000.00	15,000
Insurance (1% of construction total)	1	ls	190,517.31	190,517
Bonds (0.6% of construction total)	1	ls	114,310.38	114,310
Submittals	120	hr	90.00	10,800
				1,905,836
Pumping Plant (Excludes Land)				
Pumps and Associated Electrical	4,100	hp	450.00	1,845,000
Earthwork and Structures	114.0	cfs	5,500.00	627,000
Electrical Service	1	ls	250,000.00	250,000
Screening Facilities	1	ls	200,000.00	200,000
Transient Control	1	ls	300,000.00	300,000
Subtotal (Pumping Plant)				3,222,000
Reach 1 (Canal to Miles Ave, dip crossing at Miles)				
54 " CML&C Steel Transmission	1,848	lf	229.64	424,375
Appurtenances (10% of pipe)				42,437
Open Area (Earthwork - Site Restoration)				
Pipe Installation	1,748	lf	37.12	64,886
Excavation	10,799	cy	2.79	30,115
Bedding	247	cy	18.18	4,486
Material Disposal	1,432	cy	18.31	26,222
Backfill & Compaction	9,464	cy	4.06	38,451
Pipe Installation	100	lf	45.83	4,583
Excavation	187	cy	3.63	679
Bedding	12	cy	18.18	223
Material Disposal	82	cy	18.31	1,500
Backfill & Compaction	113	cy	2.34	264
Asphalt Removal	85	sy	7.00	593
Asphalt Disposal	17	cy	18.31	310
Asphalt Replacement, 6" thick	85	sy	10.94	927
Asphalt Cut	100	lf	5.67	567
Curb & Gutter Replacement	2	ea	8.54	17
Subtotal - Reach 1				\$ 640,635
Reach 2 (Miles Ave to Indian Springs Country Club)				
54 " CML&C Steel Transmission	4,488	lf	229.64	1,030,624
Appurtenances (10% of pipe)				103,062
Open Area (Earthwork - Site Restoration)				
Pipe Installation	4,488	lf	37.12	166,595
Excavation	27,725	cy	2.79	77,319
Bedding	634	cy	18.18	11,519
Material Disposal	3,677	cy	18.31	67,325
Backfill & Compaction	24,299	cy	4.06	98,723
Subtotal - Reach 2				\$ 1,555,168

Table C-3
MID-VALLEY IN-LIEU PROGRAM
Pump Station and Transmission from Canal to WRP10
Constructed in the Levee of the Coachella Stormwater Channel Alignment
54-INCH DIAMETER TRANSMISSION LINE

Reach 3 (Indian Springs Country Club to Jefferson St, bridge at Jefferson)				
54 " CML&C Steel Transmission	1,214	lf	229.64	278,875
Appurtenances (10% of pipe)				27,887
Street (Earthwork - Site Restoration)				
Pipe Installation	100	lf	45.83	4,583
Excavation	187	cy	3.63	679
Bedding	12	cy	18.18	223
Material Disposal	82	cy	18.31	1,500
Backfill & Compaction	113	cy	2.34	264
Asphalt Removal	85	sy	7.00	593
Asphalt Disposal	17	cy	18.31	310
Asphalt Replacement, 6" thick	85	sy	10.94	927
Asphalt Cut	100	lf	5.67	567
Curb & Gutter Replacement	2	ea	8.54	17
Golf Course (Earthwork - Site Restoration)				
Pipe Installation	1,114	lf	45.83	51,073
Excavation	2,085	cy	2.79	5,815
Bedding	137	cy	18.18	2,485
Material Disposal	913	cy	18.31	16,717
Backfill & Compaction	1,255	cy	4.06	5,098
Subtotal - Reach 3			\$	397,613
Reach 4 (Jefferson St to Dune Palms Rd, dip crossing at Dunes Palms)				
54 " CML&C Steel Transmission	2,587	lf	229.64	594,125
Appurtenances (10% of pipe)				59,412
Open Area (Earthwork - Site Restoration)				
Pipe Installation	2,487	lf	37.12	92,325
Excavation	15,365	cy	2.79	42,850
Bedding	351	cy	18.18	6,384
Material Disposal	2,038	cy	18.31	37,311
Backfill & Compaction	13,466	cy	4.06	54,711
18" VCP Sewer relocation	2,087	lf	14.00	29,221
Street (Earthwork - Site Restoration)				
Pipe Installation	100	lf	45.83	4,583
Excavation	187	cy	3.63	679
Bedding	12	cy	18.18	223
Material Disposal	82	cy	18.31	1,500
Backfill & Compaction	113	cy	2.34	264
Asphalt Removal	85	sy	7.00	593
Asphalt Disposal	17	cy	18.31	310
Asphalt Replacement, 6" thick	85	sy	10.94	927
Asphalt Cut	100	lf	5.67	567
Subtotal - Reach 4			\$	925,984
Reach 5 (Dune Palms Rd to Adams St, dip crossing at Adams)				
54 " CML&C Steel Transmission	2,798	lf	229.64	642,625
Appurtenances (10% of pipe)				64,262
Open Area (Earthwork - Site Restoration)				
Pipe Installation	2,698	lf	37.12	100,165
Excavation	16,670	cy	2.79	46,488
Bedding	381	cy	18.18	6,926
Material Disposal	2,211	cy	18.31	40,479
Backfill & Compaction	14,610	cy	4.06	59,357
18" VCP Sewer relocation	5,397	lf	14.00	75,555
Street (Earthwork - Site Restoration)				
Pipe Installation	100	lf	45.83	4,583
Excavation	187	cy	3.63	679
Bedding	12	cy	18.18	223
Material Disposal	82	cy	18.31	1,500
Backfill & Compaction	113	cy	2.34	264
Asphalt Removal	85	sy	7.00	593
Asphalt Disposal	17	cy	18.31	310
Asphalt Replacement, 6" thick	85	sy	10.94	927
Asphalt Cut	100	lf	5.67	567
Subtotal - Reach 5			\$	1,045,502

Table C-3
MID-VALLEY IN-LIEU PROGRAM
Pump Station and Transmission from Canal to WRP10
Constructed in the Levee of the Coachella Stormwater Channel Alignment
54-INCH DIAMETER TRANSMISSION LINE

Reach 6 (Adams St to Washington St, bridge at Washington)				
54" CML&C Steel Transmission	3,485	lf	229.64	800,249
Appurtenances (10% of pipe)				80,025
Open Area (Earthwork - Site Restoration)				
Pipe Installation	3,385	lf	37.12	125,644
Excavation (limited space, double unit cost)	20,910	cy	5.58	116,627
Bedding	478	cy	18.18	8,687
Material Disposal	2,774	cy	18.31	50,776
Backfill & Compaction	18,326	cy	4.06	74,456
18" VCP Sewer relocation	3,385	lf	14.00	47,387
Street (Earthwork - Site Restoration)				
Pipe Installation	100	lf	45.83	4,583
Excavation	187	cy	3.63	679
Bedding	12	cy	18.18	223
Material Disposal	82	cy	18.31	1,500
Backfill & Compaction	113	cy	2.34	264
Asphalt Removal	85	sy	7.00	593
Asphalt Disposal	17	cy	18.31	310
Asphalt Replacement, 6" thick	85	sy	10.94	927
Asphalt Cut	100	lf	5.67	567
Curb & Gutter Replacement	2	ea	8.54	17
Subtotal - Reach 6				\$ 1,313,514
Reach 7 (Washington St to Miles Ave - Golf Resort at Indian Wells, bridge at Miles)				
54" CML&C Steel Transmission	6,811	lf	229.64	1,564,124
Appurtenances (10% of pipe)				156,412
Open Area (Earthwork - Site Restoration)				
Pipe Installation	6,711	lf	37.12	249,120
Excavation	41,460	cy	2.79	115,621
Bedding	948	cy	18.18	17,225
Material Disposal	5,499	cy	18.31	100,676
Backfill & Compaction	36,336	cy	4.06	147,627
18" VCP Sewer relocation	2,800	lf	14.00	39,200
Street (Earthwork - Site Restoration)				
Pipe Installation	100	lf	45.83	4,583
Excavation	187	cy	3.63	679
Bedding	12	cy	18.18	223
Material Disposal	82	cy	18.31	1,500
Backfill & Compaction	113	cy	2.34	264
Asphalt Removal	85	sy	7.00	593
Asphalt Disposal	17	cy	18.31	310
Asphalt Replacement, 6" thick	85	sy	10.94	927
Asphalt Cut	100	lf	5.67	567
Curb & Gutter Replacement	2	ea	8.54	17
Subtotal - Reach 7				\$ 2,399,667
Reach 8 (Miles Ave - Golf Resort at Indian Wells to El Dorado Dr, bridge at El Dorado)				
54" CML&C Steel Transmission	7,181	lf	229.64	1,648,999
Appurtenances (10% of pipe)				164,900
Street (Earthwork - Site Restoration)				
Pipe Installation	100	lf	45.83	4,583
Excavation	187	cy	3.63	679
Bedding	12	cy	18.18	223
Material Disposal	82	cy	18.31	1,500
Backfill & Compaction	113	cy	2.34	264
Asphalt Removal	85	sy	7.00	593
Asphalt Disposal	17	cy	18.31	310
Asphalt Replacement, 6" thick	85	sy	10.94	927
Asphalt Cut	100	lf	5.67	567
Curb & Gutter Replacement	2	ea	8.54	17
Golf Course (Earthwork - Site Restoration)				
Pipe Installation	7,081	lf	45.83	324,513
Excavation	13,248	cy	2.79	36,945
Bedding	869	cy	18.18	15,790
Material Disposal	5,802	cy	18.31	106,220
Backfill & Compaction	7,973	cy	4.06	32,394
Subtotal - Reach 8				\$ 2,339,424

Table C-3
MID-VALLEY IN-LIEU PROGRAM
Pump Station and Transmission from Canal to WRP10
Constructed in the Levee of the Coachella Stormwater Channel Alignment
54-INCH DIAMETER TRANSMISSION LINE

Reach 9 (El Dorado Dr to Fred Waring Dr, dip at Fred Waring)				
54" CML&C Steel Transmission	686	lf	229.64	157,625
Appurtenances (10% of pipe)				15,762
Street (Earthwork - Site Restoration)				
Pipe Installation	100	lf	45.83	4,583
Excavation	187	cy	3.63	679
Bedding	12	cy	18.18	223
Material Disposal	82	cy	18.31	1,500
Backfill & Compaction	113	cy	2.34	264
Asphalt Removal	85	sy	7.00	593
Asphalt Disposal	17	cy	18.31	310
Asphalt Replacement, 6" thick	85	sy	10.94	927
Asphalt Cut	100	lf	5.67	567
Concrete Removal	85	sy	11.54	978
Concrete Disposal	17	cy	18.31	310
Concrete Work	14	sy	450.00	6,354
Concrete Cut	100	lf	5.67	567
Curb & Gutter Replacement	2	ea	8.54	17
Golf Course (Earthwork - Site Restoration)				
Pipe Installation	586	lf	45.83	26,875
Excavation	1,097	cy	2.79	3,060
Bedding	72	cy	18.18	1,308
Material Disposal	480	cy	18.31	8,797
Backfill & Compaction	660	cy	4.06	2,683
Subtotal - Reach 9				\$ 233,980
Reach 10 (Fred Waring Dr to SE corner of WRP 10)				
54" CML&C Steel Transmission	3,485	lf	229.64	800,249
Appurtenances (10% of pipe)				80,025
Open Area (Earthwork - Site Restoration)				
Pipe Installation	3,485	lf	37.12	129,356
Excavation	21,528	cy	2.79	60,036
Bedding	492	cy	18.18	8,944
Material Disposal	2,855	cy	18.31	52,276
Backfill & Compaction	18,868	cy	4.06	76,656
Subtotal - Reach 10				\$ 1,207,542
Reach 11 (SE corner of WRP 10 to north of perc ponds)				
54" CML&C Steel Transmission	1,426	lf	229.64	327,375
Appurtenances (10% of pipe)				32,737
Open Area (Earthwork - Site Restoration)				
Pipe Installation	1,426	lf	37.12	52,918
Excavation	8,807	cy	2.79	24,560
Bedding	201	cy	18.18	3,659
Material Disposal	1,168	cy	18.31	21,386
Backfill & Compaction	7,719	cy	4.06	31,359
Subtotal - Reach 11				\$ 493,994
Reach 12 (East edge of WRP 10 to Storage)				
54" CML&C Steel Transmission	158	lf	229.64	36,375
Appurtenances (10% of pipe)				3,637
Open Area (Earthwork - Site Restoration)				
Pipe Installation	158	lf	37.12	5,880
Excavation	979	cy	2.79	2,729
Bedding	22	cy	18.18	407
Material Disposal	130	cy	18.31	2,376
Backfill & Compaction	858	cy	4.06	3,484
Subtotal - Reach 12				\$ 54,888
Receiving Impoundment (5 MG, 15 AF)				
Excavation	9,833	cy	2.79	27,422
Haul & Backfill	9,833	cy	1.03	10,108
Compaction	9,833	cy	0.87	8,603
Concrete lining	1,483	cy	450.00	667,350
Piping Manifolds/Valving	1	ls	200,000.00	200,000
Subtotal - Storage				\$ 913,483
Land Acquisition				
Fees				\$ 300,000
Easements				\$ 50,000
Property Acquisition Costs		15%		\$ 52,500
Subtotal - Storage				\$ 402,500
PHASE 1:				
Total Construction Costs:				\$ 19,051,731
Contingency		30%		\$ 5,715,519
Engr./Permitting & Construction Man. (17% of Total Construction Costs)				3,238,800
Capital Costs, 2004 Price Level:				\$ 28,006,050
Adjust to 2005 Price Level (Oct 04 to Jun 05)		4.5%		\$ 1,260,272
Capital Costs, 2005 Price Level				\$ 29,266,322
Adjust to Mid-point of construction, 2007	2	years at	3%	\$ 1,755,979
Capital Costs, 2007 Price Level				\$ 31,022,302

Table C-4
MID-VALLEY IN-LIEU PROGRAM
Pump Station and Transmission from Canal to WRP10
60-INCH DIAMETER TRANSMISSION LINE
42nd Avenue/Hovley Lane Alignment
 Revised: 6Apr05
Delivery 24 hrs/day
Maximum Q 114.0 cfs
Maximum TDH 212.3 TDH

Item	Quantity	Unit	Unit Cost	Amount
Mobilization & General Conditions/General Requirements				
Project Manager (40 hr/wk)	78	wk	2,900.00	226,200
Superintendent (40 hr/wk)	65	wk	2,600.00	169,000
Field Engineer (40 hr/wk)	65	wk	1,450.00	94,250
Main office expense (3.9% of construction)	1	ls	769,980.90	769,981
Layout/engineering survey	1	ls	35,000.00	35,000
Mobilization	1	ls	100,000.00	100,000
Job office	18	mo	1,300.00	23,400
Job toilets (2)	18	mo	87.00	1,566
Storage shed	18	mo	85.00	1,530
Temporary water connection	1	ls	2,800.00	2,800
Temporary water	18	mo	50.00	900
Temporary electricity hookup	1	ls	1,400.00	1,400
Temporary electricity	18	mo	50.00	900
Temporary phone connection	1	ls	300.00	300
Temporary phone service	18	mo	50.00	900
Periodic cleanup	18	mo	500.00	9,000
Final cleanup	120	hr	15.92	1,910
Traffic control	65	wk	4,200.00	273,000
Shoring	1	ls	200,000.00	200,000
Job office supplies	18	mo	200.00	3,600
Pickup trucks/maintenance	18	mo	400.00	7,200
Scheduling	1	ls	7,000.00	7,000
Licenses/permits	1	ls	15,000.00	15,000
Insurance (1% of construction total)	1	ls	197,431.00	197,431
Bonds (0.6% of construction total)	1	ls	118,458.60	118,459
Submittals	120	hr	90.00	10,800
				2,271,527
Pumping Plant (land cost shown separately)				
Pumps and Associated Electrical	3,500	hp	450.00	1,575,000
Earthwork and Structures	114.0	cfs	5,500.00	627,000
Screening Facilities	1	ls	200,000.00	200,000
Electrical Service	1	ls	250,000.00	250,000
Standpipe	1	ls	300,000.00	300,000
Subtotal (Pumping Plant)				2,952,000
Reach 1 (Canal to Jefferson St) (Land cost shown separately)				
60 " CML&C Steel Transmission	3,221	lf	278.13	895,801
Appurtenances (10% of pipe)				89,580
Open Area (Earthwork - Site Restoration)				
Pipe Installation	3,169	lf	41.02	129,984
Excavation	22,290	cy	1.36	30,227
Bedding	477	cy	18.18	8,666
Material Disposal	3,188	cy	0.00	-
Backfill & Compaction	19,392	cy	2.23	43,264
Street (Earthwork - Site Restoration)				
Pipe Installation	52	lf	49.73	2,586
Excavation	111	cy	3.63	405
Bedding	7	cy	18.18	125
Material Disposal	51	cy	18.31	938
Backfill & Compaction	65	cy	2.34	152
Asphalt Removal	47	sy	7.00	329
Asphalt Disposal	9	cy	18.31	172
Asphalt Replacement, 6" thick	185	sy	10.94	2,022
Asphalt Cut	52	lf	5.67	295
Curb & Gutter Replacement	2	ea	9.10	18
Subtotal - Reach 1				\$ 1,204,564

Table C-4
MID-VALLEY IN-LIEU PROGRAM
Pump Station and Transmission from Canal to WRP10
60-INCH DIAMETER TRANSMISSION LINE
42nd Avenue/Hovley Lane Alignment

Reach 2 Jefferson St to 42nd Ave)				
60 " CML&C Steel Transmission	1,637	lf	278.13	455,243
Appurtenances (10% of pipe)				45,524
Open Area (Earthwork - Site Restoration)				
Pipe Installation	1,617	lf	41.02	66,321
Excavation	11,373	cy	1.36	15,423
Bedding	243	cy	18.18	4,422
Material Disposal	1,626	cy	0.00	-
Backfill & Compaction	9,894	cy	2.23	22,074
Street (Earthwork - Site Restoration)				
Pipe Installation	20	lf	49.73	995
Excavation	43	cy	3.63	156
Bedding	3	cy	18.18	48
Material Disposal	20	cy	18.31	361
Backfill & Compaction	25	cy	2.34	58
Asphalt Removal	18	sy	7.00	126
Asphalt Disposal	4	cy	18.31	66
Asphalt Replacement, 6" thick	71	sy	10.94	778
Asphalt Cut	20	lf	5.67	113
Curb & Gutter Replacement	1	ea	9.10	9
Subtotal - Reach 2			\$	611,717
Reach 3 (42nd St to Adams St)				
60 " CML&C Steel Transmission	5,333	lf	278.13	1,483,212
Appurtenances (10% of pipe)				148,321
Street (Earthwork - Site Restoration)				
Pipe Installation	5,333	lf	49.73	265,200
Excavation	11,434	cy	3.63	41,515
Bedding	704	cy	18.18	12,789
Material Disposal	5,256	cy	18.31	96,222
Backfill & Compaction	6,656	cy	2.34	15,577
Asphalt Removal	4,814	sy	7.00	33,697
Asphalt Disposal	963	cy	18.31	17,628
Asphalt Replacement, 6" thick	18,961	sy	10.94	207,364
Asphalt Cut	5,333	lf	5.67	30,232
Subtotal - Reach 3			\$	2,351,757
Reach 4 (Adams St to Washington St)				
60 " CML&C Steel Transmission	5,491	lf	278.13	1,527,267
Appurtenances (10% of pipe)				152,727
Street (Earthwork - Site Restoration)				
Pipe Installation	5,491	lf	49.73	273,077
Excavation	11,774	cy	3.63	42,749
Bedding	725	cy	18.18	13,169
Material Disposal	5,412	cy	18.31	99,080
Backfill & Compaction	6,854	cy	2.34	16,040
Asphalt Removal	4,957	sy	7.00	34,698
Asphalt Disposal	991	cy	18.31	18,151
Asphalt Replacement, 6" thick	19,524	sy	10.94	213,524
Asphalt Cut	5,491	lf	5.67	31,130
Subtotal - Reach 4			\$	2,421,611
Reach 5 (Washington St to Hemmingway Ct)				
60 " CML&C Steel Transmission	13,675	lf	278.13	3,803,483
Appurtenances (10% of pipe)				380,348
Street (Earthwork - Site Restoration)				
Pipe Installation	13,675	lf	49.73	680,068
Excavation	29,321	cy	3.63	106,460
Bedding	1,804	cy	18.18	32,796
Material Disposal	13,478	cy	18.31	246,747
Backfill & Compaction	17,068	cy	2.34	39,946
Asphalt Removal	12,346	sy	7.00	86,410
Asphalt Disposal	2,469	cy	18.31	45,203
Asphalt Replacement, 6" thick	48,623	sy	10.94	531,756
Asphalt Cut	13,675	lf	5.67	77,525
Subtotal - Reach 5			\$	6,030,743

Table C-4
MID-VALLEY IN-LIEU PROGRAM
Pump Station and Transmission from Canal to WRP10
60-INCH DIAMETER TRANSMISSION LINE
42nd Avenue/Hovley Lane Alignment

Reach 6 (Hemmingway Ct to NE Corner of WRP 10)				
60 " CML&C Steel Transmission	2,270	lf	278.13	631,466
Appurtenances (10% of pipe)				63,147
Open Area (Earthwork - Site Restoration)				
Pipe Installation	2,250	lf	41.02	92,311
Excavation	15,830	cy	1.36	21,467
Bedding	339	cy	18.18	6,154
Material Disposal	2,264	cy	0.00	-
Backfill & Compaction	13,772	cy	2.23	30,725
Street (Earthwork - Site Restoration)				
Pipe Installation	20	lf	49.73	995
Excavation	43	cy	3.63	156
Bedding	3	cy	18.18	48
Material Disposal	20	cy	18.31	361
Backfill & Compaction	25	cy	2.34	58
Asphalt Removal	18	sy	7.00	126
Asphalt Disposal	4	cy	18.31	66
Asphalt Replacement, 6" thick	71	sy	10.94	778
Asphalt Cut	20	lf	5.67	113
Subtotal - Reach 6			\$	847,971
Reach 7 (NE Corner of WRP 10 to Treatment Facility)				
60 " CML&C Steel Transmission	475	lf	278.13	132,167
Appurtenances (10% of pipe)				13,217
Open Area (Earthwork - Site Restoration)				
Pipe Installation	475	lf	41.02	19,493
Excavation	3,343	cy	1.36	4,533
Bedding	72	cy	18.18	1,300
Material Disposal	478	cy	0.00	-
Backfill & Compaction	2,908	cy	2.23	6,488
Subtotal - Reach 7			\$	31,813
Receiving Impoundment 15 acre-feet (5MG), earth-berm				
Excavation	9,833	cy	1.36	13,335
Transport	9,833	cy	1.03	10,108
Compaction	9,833	cy	0.87	8,603
Concrete lining	1,483	cy	450.00	667,350
Piping Manifolds/Valving	1	ls	200,000.00	200,000
Subtotal - Storage			\$	899,396
Land Acquisition				
Land for Pump Station 1	2	ac	150,000.00	\$ 60,000
Land between PS1 and 42nd Ave	2.75	ac	150,000.00	\$ 60,000
Subtotal - Land for Pump Station			\$	120,000
PHASE 1:				
Total Construction Costs:			\$	19,743,100
Contingency			30%	\$ 5,922,930
Engr./Permitting & Construction Man. (17% of Total Construction Costs)				3,356,300
Capital Costs, 2004 Price Level:				\$ 29,022,330
Adjust to 2005 Price Level (Oct 04 to Jun 05)			4.5%	\$ 1,306,005
Capital Costs, 2005 Price Level				\$ 30,328,335
Adjust to Mid-point of construction, 2007	2	years at	3%	\$ 1,819,700
Capital Costs, 2007 Price Level				\$ 32,148,035

Table C-5
MID-VALLEY IN-LIEU PROGRAM
Pump Station and Transmission from Canal to WRP10
Constructed in the Invert of the Coachella Stormwater Channel Alignment
60-INCH DIAMETER TRANSMISSION LINE

Revised: 17May05

Delivery 24 hrs/day
Maximum Q 114.0 cfs
Maximum TDH 217.7 TDH

Item	Quantity	Unit	Unit Cost	Amount
Mobilization & General Conditions/General Requirements				
Project Manager (40 hr/wk)	65	wk	2,900.00	188,500
Superintendent (40 hr/wk)	52	wk	2,600.00	135,200
Field Engineer (40 hr/wk)	65	wk	1,450.00	94,250
Main office expense (3.9% of construction)	1	ls	835,012.28	835,012
Layout/engineering survey	1	ls	35,000.00	35,000
Mobilization	1	ls	100,000.00	100,000
Job office	15	mo	1,300.00	19,500
Job toilets (2)	15	mo	87.00	1,305
Storage shed	15	mo	85.00	1,275
Temporary water connection	1	ls	2,800.00	2,800
Temporary water	15	mo	50.00	750
Temporary electricity hookup	1	ls	1,400.00	1,400
Temporary electricity	15	mo	50.00	750
Temporary phone connection	1	ls	300.00	300
Temporary phone service	15	mo	50.00	750
Periodic cleanup	15	mo	500.00	7,500
Final cleanup	120	hr	15.92	1,910
Traffic control	1	ls	25,000.00	25,000
Shoring	1	ls	200,000.00	200,000
Job office supplies	15	mo	200.00	3,000
Pickup trucks/maintenance	15	mo	400.00	6,000
Scheduling	1	ls	7,000.00	7,000
Licenses/permits	1	ls	15,000.00	15,000
Insurance (1% of construction total)	1	ls	214,105.71	214,106
Bonds (0.6% of construction total)	1	ls	128,463.43	128,463
Submittals	120	hr	90.00	10,800
				2,035,572
Pumping Plant (Excludes Land)				
Pumps and Associated Electrical	3,600	hp	450.00	1,620,000
Earthwork and Structures	114.0	cfs	5,500.00	627,000
Screening Facilities	1	ls	250,000.00	250,000
Electrical Service	1	ls	200,000.00	200,000
Transient Control	1	ls	300,000.00	300,000
Subtotal (Pumping Plant)				2,997,000
Reach 1 (Canal to Miles Ave, dip crossing at Miles)				
60 " CML&C Steel Transmission	1,848	lf	278.13	513,984
Appurtenances (10% of pipe)				51,398
Open Area (Earthwork - Site Restoration)				
Pipe Installation	1,748	lf	41.02	71,703
Excavation	36,108	cy	1.03	37,120
Bedding	247	cy	18.18	4,486
Material Disposal	1,432	cy	18.31	26,222
Backfill & Compaction	34,774	cy	1.56	54,097
Street (Earthwork - Site Restoration)				
Pipe Installation	100	lf	49.73	4,973
Excavation	187	cy	3.63	679
Bedding	12	cy	18.18	223
Material Disposal	82	cy	18.31	1,500
Backfill & Compaction	113	cy	2.34	264
Asphalt Removal	85	sy	7.00	593
Asphalt Disposal	17	cy	18.31	310
Asphalt Replacement, 6" thick	85	sy	10.94	927
Asphalt Cut	100	lf	5.67	567
Curb & Gutter Replacement	2	ea	9.10	18
Subtotal - Reach 1				\$ 769,065

Table C-5
MID-VALLEY IN-LIEU PROGRAM
Pump Station and Transmission from Canal to WRP10
Constructed in the Invert of the Coachella Stormwater Channel Alignment
60-INCH DIAMETER TRANSMISSION LINE

Reach 2 (Miles Ave to Indian Springs Country Club)				
60 " CML&C Steel Transmission	4,488	lf	278.13	1,248,247
Appurtenances (10% of pipe)				124,825
Open Area (Earthwork - Site Restoration)				
Pipe Installation	4,488	lf	41.02	184,098
Excavation	92,708	cy	1.03	95,305
Bedding	634	cy	18.18	11,519
Material Disposal	3,677	cy	18.31	67,325
Backfill & Compaction	89,282	cy	1.56	138,895
Subtotal - Reach 2				\$ 1,870,213
Reach 3 (Indian Springs Country Club to Jefferson St, bridge at Jefferson)				
60 " CML&C Steel Transmission	1,214	lf	278.13	337,761
Appurtenances (10% of pipe)				33,776
Open Area (Earthwork - Site Restoration)				
Pipe Installation	1,214	lf	41.02	49,815
Excavation	25,086	cy	1.03	25,788
Bedding	171	cy	18.18	3,117
Material Disposal	995	cy	18.31	18,217
Backfill & Compaction	24,159	cy	1.56	37,583
Subtotal - Reach 3				\$ 506,058
Reach 4 (Jefferson St to Dune Palms Rd, dip crossing at Dunes Palms)				
60 " CML&C Steel Transmission	2,587	lf	278.13	719,578
Appurtenances (10% of pipe)				71,958
Open Area (Earthwork - Site Restoration)				
Pipe Installation	2,487	lf	41.02	102,025
Excavation	51,378	cy	1.03	52,817
Bedding	351	cy	18.18	6,384
Material Disposal	2,038	cy	18.31	37,311
Backfill & Compaction	49,479	cy	1.56	76,974
Street (Earthwork - Site Restoration)				
Pipe Installation	100	lf	49.73	4,973
Excavation	187	cy	3.63	679
Bedding	12	cy	18.18	223
Material Disposal	82	cy	18.31	1,500
Backfill & Compaction	113	cy	2.34	264
Asphalt Removal	85	sy	7.00	593
Asphalt Disposal	17	cy	18.31	310
Asphalt Replacement, 6" thick	85	sy	10.94	927
Asphalt Cut	100	lf	5.67	567
Subtotal - Reach 4				\$ 1,077,081
Reach 5 (Dune Palms Rd to Adams St, dip crossing at Adams)				
60 " CML&C Steel Transmission	2,798	lf	278.13	778,319
Appurtenances (10% of pipe)				77,832
Open Area (Earthwork - Site Restoration)				
Pipe Installation	2,698	lf	41.02	110,688
Excavation	55,740	cy	1.03	57,302
Bedding	381	cy	18.18	6,926
Material Disposal	2,211	cy	18.31	40,479
Backfill & Compaction	53,680	cy	1.56	83,510
Street (Earthwork - Site Restoration)				
Pipe Installation	100	lf	49.73	4,973
Excavation	187	cy	3.63	679
Bedding	12	cy	18.18	223
Material Disposal	82	cy	18.31	1,500
Backfill & Compaction	113	cy	2.34	264
Asphalt Removal	85	sy	7.00	593
Asphalt Disposal	17	cy	18.31	310
Asphalt Replacement, 6" thick	85	sy	10.94	927
Asphalt Cut	100	lf	5.67	567
Subtotal - Reach 5				\$ 1,165,092

Table C-5
MID-VALLEY IN-LIEU PROGRAM
Pump Station and Transmission from Canal to WRP10
Constructed in the Invert of the Coachella Stormwater Channel Alignment
60-INCH DIAMETER TRANSMISSION LINE

Reach 6 (Adams St to Washington St, bridge at Washington)				
60 " CML&C Steel Transmission	3,485	lf	278.13	969,227
Appurtenances (10% of pipe)				96,923
Open Area (Earthwork - Site Restoration)				
Pipe Installation	3,485	lf	41.02	142,947
Excavation	71,985	cy	1.03	74,002
Bedding	492	cy	18.18	8,944
Material Disposal	2,855	cy	18.31	52,276
Backfill & Compaction	69,325	cy	1.56	107,848
Subtotal - Reach 6				\$ 1,452,166
Reach 7 (Washington St to Miles Ave - Golf Resort at Indian Wells, bridge at Miles)				
60 " CML&C Steel Transmission	6,811	lf	278.13	1,894,399
Appurtenances (10% of pipe)				189,440
Open Area (Earthwork - Site Restoration)				
Pipe Installation	6,811	lf	41.02	279,395
Excavation	140,698	cy	1.03	144,639
Bedding	962	cy	18.18	17,481
Material Disposal	5,581	cy	18.31	102,176
Backfill & Compaction	135,498	cy	1.56	210,793
18" VCP Sewer relocation	2,800	lf	14.00	39,200
Subtotal - Reach 7				\$ 2,877,524
Reach 8 (Miles Ave - Golf Resort at Indian Wells to El Dorado Dr, bridge at El Dorado)				
60 " CML&C Steel Transmission	7,181	lf	278.13	1,997,196
Appurtenances (10% of pipe)				199,720
Street (Earthwork - Site Restoration)				
Golf Course (Earthwork - Site Restoration)				
Pipe Installation	7,181	lf	49.73	357,101
Excavation	148,333	cy	1.03	152,488
Bedding	881	cy	18.18	16,013
Material Disposal	5,884	cy	18.31	107,720
Backfill & Compaction	142,851	cy	1.56	222,231
Subtotal - Reach 8				\$ 3,052,469
Reach 9 (El Dorado Dr to Fred Waring Dr, dip at Fred Waring)				
60 " CML&C Steel Transmission	686	lf	278.13	190,908
Appurtenances (10% of pipe)				19,091
Street (Earthwork - Site Restoration)				
Pipe Installation	52	lf	49.73	2,586
Excavation	1,074	cy	1.03	1,104
Bedding	6	cy	18.18	116
Material Disposal	43	cy	18.31	780
Backfill & Compaction	59	cy	2.34	137
Asphalt Removal	44	sy	7.00	308
Asphalt Disposal	9	cy	18.31	161
Asphalt Replacement, 6" thick	44	sy	10.94	482
Asphalt Cut	52	lf	5.67	295
Concrete Removal	90	sy	11.54	1,042
Concrete Disposal	18	cy	18.31	331
Concrete Work	15	sy	450.00	6,771
Concrete Cut	100	lf	5.67	567
Curb & Gutter Replacement	2	ea	9.10	18
Golf Course (Earthwork - Site Restoration)				
Pipe Installation	634	lf	49.73	31,549
Excavation	1,187	cy	2.79	3,310
Bedding	78	cy	18.18	1,415
Material Disposal	520	cy	18.31	9,517
Backfill & Compaction	12,620	cy	1.56	19,633
Subtotal - Reach 9				\$ 290,121
Reach 10 (Fred Waring Dr to SE corner of WRP 10)				
60 " CML&C Steel Transmission	3,485	lf	278.13	969,227
Appurtenances (10% of pipe)				96,923
Open Area (Earthwork - Site Restoration)				
Pipe Installation	3,485	lf	41.02	142,947
Excavation	71,985	cy	1.03	74,002
Bedding	492	cy	18.18	8,944
Material Disposal	2,855	cy	18.31	52,276
Backfill & Compaction	69,325	cy	1.56	107,848
Subtotal - Reach 10				\$ 1,452,166

Table C-5
MID-VALLEY IN-LIEU PROGRAM
Pump Station and Transmission from Canal to WRP10
Constructed in the Invert of the Coachella Stormwater Channel Alignment
60-INCH DIAMETER TRANSMISSION LINE

Reach 11 (SE corner of WRP 10 to north of perc ponds)				
60 " CML&C Steel Transmission	1,162	lf	278.13	323,076
Appurtenances (10% of pipe)				32,308
Open Area (Earthwork - Site Restoration)				
Pipe Installation	1,162	lf	41.02	47,649
Excavation	23,995	cy	1.03	24,667
Bedding	164	cy	18.18	2,981
Material Disposal	952	cy	18.31	17,425
Backfill & Compaction	23,108	cy	1.56	35,949
Subtotal - Reach 11				\$ 484,055
Reach 12 (NE corner of WRP 10 to Treatment Facility)				
60 " CML&C Steel Transmission	158	lf	278.13	44,056
Appurtenances (10% of pipe)				4,406
Open Area (Earthwork - Site Restoration)				
Pipe Installation	158	lf	41.02	6,498
Excavation	3,272	cy	1.03	3,364
Bedding	22	cy	18.18	407
Material Disposal	130	cy	18.31	2,376
Backfill & Compaction	3,151	cy	1.56	4,902
Subtotal - Reach 12				\$ 66,008
Receiving Impoundment (5 MG, 15 AF)				
Excavation	9,833	cy	2.79	27,422
Haul & Backfill	9,833	cy	1.03	10,108
Compaction	9,833	cy	0.87	8,603
Concrete lining	1,483	cy	450.00	667,350
Piping Manifolds/Valving	1	ls	200,000.00	200,000
Subtotal - Storage				\$ 913,483
Land Acquisition				
Fees				\$ 300,000
Easements				\$ 50,000
Property Acquisition Costs			15%	\$ 52,500
Subtotal - Storage				\$ 402,500
PHASE 1:				
Total Construction Costs:				\$ 21,410,571
Contingency		30%		\$ 6,423,171
Engr./Permitting & Construction Man. (17% of Total Construction Costs)				3,639,800
Capital Costs, 2004 Price Level:				\$ 31,473,543
Adjust to 2005 Price Level (Oct 04 to Jun 05)		4.5%		\$ 1,416,309
Capital Costs, 2005 Price Level				\$ 32,889,852
Adjust to Mid-point of construction, 2007	2	years at	3%	\$ 1,973,391
Capital Costs, 2007 Price Level				\$ 34,863,243

Table C-6
MID-VALLEY IN-LIEU PROGRAM
Pump Station and Transmission from Canal to WRP10
Constructed in the Levee of the Coachella Stormwater Channel Alignment
60-INCH DIAMETER TRANSMISSION LINE
 Revised: 13Apr05
Delivery 24 hrs/day
Maximum Q 114.0 cfs
Maximum TDH 217.7 TDH

Item	Quantity	Unit	Unit Cost	Amount
Mobilization & General Conditions/General Requirements				
Project Manager (40 hr/wk)	65	wk	2,900.00	188,500
Superintendent (40 hr/wk)	52	wk	2,600.00	135,200
Field Engineer (40 hr/wk)	65	wk	1,450.00	94,250
Main office expense (3.9% of construction)	1	ls	830,619.17	830,619
Layout/engineering survey	1	ls	35,000.00	35,000
Mobilization	1	ls	100,000.00	100,000
Job office	15	mo	1,300.00	19,500
Job toilets (2)	15	mo	87.00	1,305
Storage shed	15	mo	85.00	1,275
Temporary water connection	1	ls	2,800.00	2,800
Temporary water	15	mo	50.00	750
Temporary electricity hookup	1	ls	1,400.00	1,400
Temporary electricity	15	mo	50.00	750
Temporary phone connection	1	ls	300.00	300
Temporary phone service	15	mo	50.00	750
Periodic cleanup	15	mo	500.00	7,500
Final cleanup	120	hr	15.92	1,910
Traffic control	1	ls	25,000.00	25,000
Shoring	1	ls	200,000.00	200,000
Job office supplies	15	mo	200.00	3,000
Pickup trucks/maintenance	15	mo	400.00	6,000
Scheduling	1	ls	7,000.00	7,000
Licenses/permits	1	ls	15,000.00	15,000
Insurance (1% of construction total)	1	ls	212,979.27	212,979
Bonds (0.6% of construction total)	1	ls	127,787.56	127,788
Submittals	120	hr	90.00	10,800
				2,029,376
Pumping Plant (Excludes Land)				
Pumps and Associated Electrical	3,600	hp	450.00	1,620,000
Earthwork and Structures	114.0	cfs	5,500.00	627,000
Electrical Service	1	ls	250,000.00	250,000
Screening Facilities	1	ls	200,000.00	200,000
Transient Control	1	ls	300,000.00	300,000
Subtotal (Pumping Plant)				2,997,000
Reach 1 (Canal to Miles Ave, dip crossing at Miles)				
60 " CML&C Steel Transmission	1,848	lf	278.13	513,984
Appurtenances (10% of pipe)				51,398
Open Area (Earthwork - Site Restoration)				
Pipe Installation	1,748	lf	41.02	71,703
Excavation	12,296	cy	2.79	34,290
Bedding	263	cy	18.18	4,781
Material Disposal	1,723	cy	18.31	31,540
Backfill & Compaction	10,697	cy	4.06	43,461
Pipe Installation	100	lf	49.73	4,973
Excavation	214	cy	3.63	778
Bedding	13	cy	18.18	240
Material Disposal	99	cy	18.31	1,804
Backfill & Compaction	125	cy	2.34	292
Asphalt Removal	90	sy	7.00	632
Asphalt Disposal	18	cy	18.31	331
Asphalt Replacement, 6" thick	90	sy	10.94	987
Asphalt Cut	100	lf	5.67	567
Curb & Gutter Replacement	2	ea	9.10	18
Subtotal - Reach 1				\$ 761,779
Reach 2 (Miles Ave to Indian Springs Country Club)				
60 " CML&C Steel Transmission	4,488	lf	278.13	1,248,247
Appurtenances (10% of pipe)				124,825
Open Area (Earthwork - Site Restoration)				
Pipe Installation	4,488	lf	41.02	184,098
Excavation	31,569	cy	2.79	88,039
Bedding	675	cy	18.18	12,274
Material Disposal	4,423	cy	18.31	80,979
Backfill & Compaction	27,465	cy	4.06	111,586
Subtotal - Reach 2				\$ 1,850,048

Table C-6
MID-VALLEY IN-LIEU PROGRAM
Pump Station and Transmission from Canal to WRP10
Constructed in the Levee of the Coachella Stormwater Channel Alignment
60-INCH DIAMETER TRANSMISSION LINE

Reach 3 (Indian Springs Country Club to Jefferson St, bridge at Jefferson)				
60" CML&C Steel Transmission	1,214	lf	278.13	337,761
Appurtenances (10% of pipe)				33,776
Street (Earthwork - Site Restoration)				
Pipe Installation	100	lf	49.73	4,973
Excavation	214	cy	3.63	778
Bedding	13	cy	18.18	240
Material Disposal	99	cy	18.31	1,804
Backfill & Compaction	125	cy	2.34	292
Asphalt Removal	90	sy	7.00	632
Asphalt Disposal	18	cy	18.31	331
Asphalt Replacement, 6" thick	90	sy	10.94	987
Asphalt Cut	100	lf	5.67	567
Curb & Gutter Replacement	2	ea	9.10	18
Golf Course (Earthwork - Site Restoration)				
Pipe Installation	1,114	lf	49.73	55,419
Excavation	2,389	cy	2.79	6,663
Bedding	147	cy	18.18	2,673
Material Disposal	1,098	cy	18.31	20,108
Backfill & Compaction	1,391	cy	4.06	5,651
Subtotal - Reach 3				\$ 472,673
Reach 4 (Jefferson St to Dune Palms Rd, dip crossing at Dunes Palms)				
60" CML&C Steel Transmission	2,587	lf	278.13	719,578
Appurtenances (10% of pipe)				71,958
Open Area (Earthwork - Site Restoration)				
Pipe Installation	2,487	lf	41.02	102,025
Excavation	17,495	cy	2.79	48,790
Bedding	374	cy	18.18	6,802
Material Disposal	2,451	cy	18.31	44,878
Backfill & Compaction	15,221	cy	4.06	61,840
18" VCP Sewer relocation	2,087	lf	14.00	29,221
Street (Earthwork - Site Restoration)				
Pipe Installation	100	lf	49.73	4,973
Excavation	214	cy	3.63	778
Bedding	13	cy	18.18	240
Material Disposal	99	cy	18.31	1,804
Backfill & Compaction	125	cy	2.34	292
Asphalt Removal	90	sy	7.00	632
Asphalt Disposal	18	cy	18.31	331
Asphalt Replacement, 6" thick	90	sy	10.94	987
Asphalt Cut	100	lf	5.67	567
Subtotal - Reach 4				\$ 1,095,695
Reach 5 (Dune Palms Rd to Adams St, dip crossing at Adams)				
60" CML&C Steel Transmission	2,798	lf	278.13	778,319
Appurtenances (10% of pipe)				77,832
Open Area (Earthwork - Site Restoration)				
Pipe Installation	2,698	lf	41.02	110,688
Excavation	18,981	cy	2.79	52,933
Bedding	406	cy	18.18	7,380
Material Disposal	2,659	cy	18.31	48,688
Backfill & Compaction	16,513	cy	4.06	67,091
18" VCP Sewer relocation	5,397	lf	14.00	75,555
Street (Earthwork - Site Restoration)				
Pipe Installation	100	lf	49.73	4,973
Excavation	214	cy	3.63	778
Bedding	13	cy	18.18	240
Material Disposal	99	cy	18.31	1,804
Backfill & Compaction	125	cy	2.34	292
Asphalt Removal	90	sy	7.00	632
Asphalt Disposal	18	cy	18.31	331
Asphalt Replacement, 6" thick	90	sy	10.94	987
Asphalt Cut	100	lf	5.67	567
Subtotal - Reach 5				\$ 1,229,091

Table C-6
MID-VALLEY IN-LIEU PROGRAM
Pump Station and Transmission from Canal to WRP10
Constructed in the Levee of the Coachella Stormwater Channel Alignment
60-INCH DIAMETER TRANSMISSION LINE

Reach 6 (Adams St to Washington St, bridge at Washington)				
60" CML&C Steel Transmission	3,485	lf	278.13	969,227
Appurtenances (10% of pipe)				96,923
Open Area (Earthwork - Site Restoration)				
Pipe Installation	3,385	lf	41.02	138,845
Excavation (limited space, double unit cost)	23,809	cy	5.58	132,796
Bedding	509	cy	18.18	9,257
Material Disposal	3,336	cy	18.31	61,073
Backfill & Compaction	20,714	cy	4.06	84,157
18" VCP Sewer relocation	3,385	lf	14.00	47,387
Street (Earthwork - Site Restoration)				
Pipe Installation	100	lf	49.73	4,973
Excavation	214	cy	3.63	778
Bedding	13	cy	18.18	240
Material Disposal	99	cy	18.31	1,804
Backfill & Compaction	125	cy	2.34	292
Asphalt Removal	90	sy	7.00	632
Asphalt Disposal	18	cy	18.31	331
Asphalt Replacement, 6" thick	90	sy	10.94	987
Asphalt Cut	100	lf	5.67	567
Curb & Gutter Replacement	2	ea	9.10	18
Subtotal - Reach 6				\$ 1,550,288
Reach 7 (Washington St to Miles Ave - Golf Resort at Indian Wells, bridge at Miles)				
60" CML&C Steel Transmission	6,811	lf	278.13	1,894,399
Appurtenances (10% of pipe)				189,440
Open Area (Earthwork - Site Restoration)				
Pipe Installation	6,711	lf	41.02	275,293
Excavation	47,208	cy	2.79	131,651
Bedding	1,010	cy	18.18	18,354
Material Disposal	6,614	cy	18.31	121,093
Backfill & Compaction	41,070	cy	4.06	166,862
18" VCP Sewer relocation	2,800	lf	14.00	39,200
Street (Earthwork - Site Restoration)				
Pipe Installation	100	lf	49.73	4,973
Excavation	214	cy	3.63	778
Bedding	13	cy	18.18	240
Material Disposal	99	cy	18.31	1,804
Backfill & Compaction	125	cy	2.34	292
Asphalt Removal	90	sy	7.00	632
Asphalt Disposal	18	cy	18.31	331
Asphalt Replacement, 6" thick	90	sy	10.94	987
Asphalt Cut	100	lf	5.67	567
Curb & Gutter Replacement	2	ea	9.10	18
Subtotal - Reach 7				\$ 2,846,914
Reach 8 (Miles Ave - Golf Resort at Indian Wells to El Dorado Dr, bridge at El Dorado)				
60" CML&C Steel Transmission	7,181	lf	278.13	1,997,196
Appurtenances (10% of pipe)				199,720
Street (Earthwork - Site Restoration)				
Pipe Installation	100	lf	49.73	4,973
Excavation	214	cy	3.63	778
Bedding	13	cy	18.18	240
Material Disposal	99	cy	18.31	1,804
Backfill & Compaction	125	cy	2.34	292
Asphalt Removal	90	sy	7.00	632
Asphalt Disposal	18	cy	18.31	331
Asphalt Replacement, 6" thick	90	sy	10.94	987
Asphalt Cut	100	lf	5.67	567
Curb & Gutter Replacement	2	ea	9.10	18
Golf Course (Earthwork - Site Restoration)				
Pipe Installation	7,081	lf	49.73	352,128
Excavation	15,182	cy	2.79	42,339
Bedding	934	cy	18.18	16,981
Material Disposal	6,979	cy	18.31	127,762
Backfill & Compaction	8,838	cy	4.06	35,906
Subtotal - Reach 8				\$ 2,782,654

Table C-6
MID-VALLEY IN-LIEU PROGRAM
Pump Station and Transmission from Canal to WRP10
Constructed in the Levee of the Coachella Stormwater Channel Alignment
60-INCH DIAMETER TRANSMISSION LINE

Reach 9 (El Dorado Dr to Fred Waring Dr, dip at Fred Waring)				
60" CML&C Steel Transmission	686	lf	278.13	190,908
Appurtenances (10% of pipe)				19,091
Street (Earthwork - Site Restoration)				
Pipe Installation	100	lf	49.73	4,973
Excavation	214	cy	3.63	778
Bedding	13	cy	18.18	240
Material Disposal	99	cy	18.31	1,804
Backfill & Compaction	125	cy	2.34	292
Asphalt Removal	90	sy	7.00	632
Asphalt Disposal	18	cy	18.31	331
Asphalt Replacement, 6" thick	90	sy	10.94	987
Asphalt Cut	100	lf	5.67	567
Concrete Removal	90	sy	11.54	1,042
Concrete Disposal	18	cy	18.31	331
Concrete Work	15	sy	450.00	6,771
Concrete Cut	100	lf	5.67	567
Curb & Gutter Replacement	2	ea	9.10	18
Golf Course (Earthwork - Site Restoration)				
Pipe Installation	586	lf	49.73	29,162
Excavation	1,257	cy	2.79	3,506
Bedding	77	cy	18.18	1,406
Material Disposal	578	cy	18.31	10,581
Backfill & Compaction	732	cy	4.06	2,974
Subtotal - Reach 9				<u>\$ 276,960</u>
Reach 10 (Fred Waring Dr to SE corner of WRP 10)				
60" CML&C Steel Transmission	3,485	lf	278.13	969,227
Appurtenances (10% of pipe)				96,923
Open Area (Earthwork - Site Restoration)				
Pipe Installation	3,485	lf	41.02	142,947
Excavation	24,513	cy	2.79	68,360
Bedding	524	cy	18.18	9,530
Material Disposal	3,435	cy	18.31	62,878
Backfill & Compaction	21,326	cy	4.06	86,643
Subtotal - Reach 10				<u>\$ 1,436,507</u>
Reach 11 (SE corner of WRP 10 to north of perc ponds)				
60" CML&C Steel Transmission	1,426	lf	278.13	396,502
Appurtenances (10% of pipe)				39,650
Open Area (Earthwork - Site Restoration)				
Pipe Installation	1,426	lf	41.02	58,478
Excavation	10,028	cy	2.79	27,965
Bedding	215	cy	18.18	3,899
Material Disposal	1,405	cy	18.31	25,723
Backfill & Compaction	8,724	cy	4.06	35,445
Subtotal - Reach 11				<u>\$ 587,662</u>
Reach 12 (East edge of WRP 10 to Storage)				
60" CML&C Steel Transmission	158	lf	278.13	44,056
Appurtenances (10% of pipe)				4,406
Open Area (Earthwork - Site Restoration)				
Pipe Installation	158	lf	41.02	6,498
Excavation	1,114	cy	2.79	3,107
Bedding	24	cy	18.18	433
Material Disposal	156	cy	18.31	2,858
Backfill & Compaction	969	cy	4.06	3,938
Subtotal - Reach 12				<u>\$ 65,296</u>
Receiving Impoundment (5 MG, 15 AF)				
Excavation	9,833	cy	2.79	27,422
Haul & Backfill	9,833	cy	1.03	10,108
Compaction	9,833	cy	0.87	8,603
Concrete lining	1,483	cy	450.00	667,350
Piping Manifolds/Valving	1	ls	200,000.00	200,000
Subtotal - Storage				<u>\$ 913,483</u>
Land Acquisition				
Fees				\$ 300,000
Easements				\$ 50,000
Property Acquisition Costs		15%		\$ 52,500
Subtotal - Storage				<u>\$ 402,500</u>
PHASE 1:				
Total Construction Costs:				\$ 21,297,927
Contingency		30%		\$ 6,389,378
Engr./Permitting & Construction Man. (17% of Total Construction Costs)				3,620,600
Capital Costs, 2004 Price Level:				<u>\$ 31,307,906</u>
Adjust to 2005 Price Level (Oct 04 to Jun 05)		4.5%		\$ 1,408,856
Capital Costs, 2005 Price Level				<u>\$ 32,716,761</u>
Adjust to Mid-point of construction, 2007	2	years at	3%	\$ 1,963,006
Capital Costs, 2007 Price Level				<u>\$ 34,679,767</u>

Table C-7
MID-VALLEY IN-LIEU PROGRAM
18 Hour Delivery - Single Lift
 Revised: 13May05

Delivery 18 hrs/day
Maximum Q of Pump Station 2 95.8 cfs
Maximum TDH of Pump Station 2 410.9 TDH

Item	Quantity	Unit	Unit Cost	Amount
Mobilization & General Conditions/General Requirements				
Project Manager (20 hr/wk)	48	wk	1,450.00	69,600
Superintendent (40 hr/wk)	48	wk	2,600.00	124,800
Field Engineer (40 hr/wk)	48	wk	1,450.00	69,600
Main office expense (3.9% of construction)	1	ls	1,018,902.00	1,018,902
Layout/engineering survey	1	ls	35,000.00	35,000
Mobilization	1	ls	100,000.00	100,000
Job office	12	mo	1,300.00	15,600
Job toilets (2)	12	mo	87.00	1,044
Storage shed	12	mo	85.00	1,020
Temporary water connection	1	ls	2,800.00	2,800
Temporary water	12	mo	50.00	600
Temporary electricity hookup	1	ls	1,400.00	1,400
Temporary electricity	12	mo	50.00	600
Temporary phone connection	1	ls	300.00	300
Temporary phone service	12	mo	50.00	600
Periodic cleanup	12	mo	500.00	6,000
Final cleanup	40	hr	15.92	637
Traffic control	1	ls	25,000.00	25,000
Shoring	1	ls	200,000.00	200,000
Job office supplies	12	mo	200.00	2,400
Pickup trucks/maintenance	12	mo	400.00	4,800
Scheduling	1	ls	7,000.00	7,000
Licenses/permits	1	ls	15,000.00	15,000
Insurance (1% of construction total)	1	ls	261,256.92	261,257
Bonds (0.6% of construction total)	1	ls	156,754.15	156,754
Submittals	120	hr	90.00	10,800
Subtotal (Mobilization + GC/GR)				\$ 2,131,514
Pumping Plant No. 2 (WRP10)				
Pumps and Associated Electrical	6,379	hp	450.00	2,870,550
Earthwork and Structures	96	cfs	5,500.00	526,900
Electrical Service	1	ls	100,000.00	100,000
Standpipe	1	ls	300,000.00	300,000
Subtotal Pumping Plan No. 2 (WRP10)				\$ 3,797,450
Line PS2 - 3 (WRP10 to Hovley and Cook)				
48-in CML&C Steel Transmission (Note 1)	3,520	lf	261.55	920,656
Appurtenances (10% of pipe)	1	ls	92,065.60	92,066
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)		ls	60,000.00	-
Subtotal Line PS2 - 3				\$ 1,012,722
Line 3 - 4 (Hovley between Cook and Portola)				
48-in CML&C Steel Transmission	5,280	lf	261.55	1,380,984
Appurtenances (10% of pipe)	1	ls	138,098.40	138,098
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	1	ls	60,000.00	60,000
Subtotal Line 3 - 4				\$ 1,579,082
Line 4 - 5 (Portola between Hovley and Country Club)				
48-in CML&C Steel Transmission	4,270	lf	261.55	1,116,819
Appurtenances (10% of pipe)	1	ls	111,681.85	111,682
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	-	ls	60,000.00	-
Subtotal Line 4 - 5				\$ 1,228,501

**Table C-7
MID-VALLEY IN-LIEU PROGRAM
18 Hour Delivery - Single Lift**

Line 5 - 5A (Country Club between Portola and Monterey)				
36-in CML&C Ductile Iron Transmission	5,280	lf	200.92	1,060,858
Appurtenances (10% of pipe)	1	ls	106,085.76	106,086
Large Diameter Valve	1	ea	15,000.00	15,000
Service Connection (meter, vault & SCADA)	1	ls	60,000.00	60,000
Subtotal Line 5 - 5A			\$	1,241,943
Line 5A - 5B (Country Club between Monterey and Bob Hope)				
36-in CML&C Ductile Iron Transmission	5,280	lf	200.92	1,060,858
Appurtenances (10% of pipe)	1	ls	106,085.76	106,086
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	-	ls	60,000.00	-
Subtotal Line 5A - 5B			\$	1,166,943
Line 5B - 6A (Country Club between Bob Hope and Morningside)				
30-in CML&C Ductile Iron Transmission	5,280	lf	156.44	826,003
Appurtenances (10% of pipe)	1	ls	82,600.32	82,600
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	2	ls	60,000.00	120,000
Subtotal Line 5B - 6A			\$	1,028,604
Line 6A - 7 (Morningside between Country Club and Frank Sinatra)				
30-in CML&C Ductile Iron Transmission	5,280	lf	156.44	826,003
Appurtenances (10% of pipe)	1	ls	82,600.32	82,600
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	2	ls	60,000.00	120,000
Subtotal Line 6A - 7			\$	1,028,604
Line 7 - 8 (Frank Sinatra between Morningside and Bob Hope)				
30-in CML&C Ductile Iron Transmission	5,280	lf	156.44	826,003
Appurtenances (10% of pipe)	1	ls	82,600.32	82,600
Large Diameter Valve	1	ea	12,500.00	12,500
Service Connection (meter, vault & SCADA)	2	ls	60,000.00	120,000
Subtotal Line 7 - 8			\$	1,041,104
Line 5 - 6B (Portola between Country Club and Frank Sinatra)				
30-in CML&C Ductile Iron Transmission	6,000	lf	156.44	938,640
Appurtenances (10% of pipe)	1	ls	93,864.00	93,864
Large Diameter Valve	1	ea	12,500.00	12,500
Service Connection (meter, vault & SCADA)	-	ls	60,000.00	-
Subtotal Line 5 - 6B			\$	1,045,004
Line 6B - 8 (Frank Sinatra between Portola and Bob Hope)				
30-in CML&C Ductile Iron Transmission	12,500	lf	156.44	1,955,500
Appurtenances (10% of pipe)	1	ls	195,550.00	195,550
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	2	ls	60,000.00	120,000
Subtotal Line 6B - 8			\$	2,271,050
Line 8 - 9 (Bob Hope between Frank Sinatra and Dinah Shore)				
30-in CML&C Ductile Iron Transmission	11,320	lf	156.44	1,770,901
Appurtenances (10% of pipe)	1	ls	177,090.08	177,090
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	1	ls	60,000.00	60,000
Subtotal Line 8 - 9			\$	2,007,991

**Table C-7
MID-VALLEY IN-LIEU PROGRAM
18 Hour Delivery - Single Lift**

Line 9 - 10 (Frank Sinatra between Morningside and Bob Hope)				
24-in CML&C Ductile Iron Transmission	8,800	lf	117.43	1,033,384
Appurtenances (10% of pipe)	1	ls	103,338.40	103,338
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	2	ls	60,000.00	120,000
Subtotal Line 9 - 10			\$	1,256,722
Branch 2 (Cook between WRP10 and Fairway)				
12-in CML&C Ductile Iron Transmission	12,300	lf	60.60	745,380
Appurtenances (10% of pipe)	1	ls	74,538.00	74,538
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	2	ls	60,000.00	120,000
Subtotal Branch 2			\$	939,918
Branch 3 (Frank Sinatra between Portola and Cook)				
18-in CML&C Ductile Iron Transmission	4,280	lf	86.26	369,193
Appurtenances (10% of pipe)	1	ls	36,919.28	36,919
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	2	ls	60,000.00	120,000
Subtotal Branch 3			\$	526,112
Branch 4 (Monterey between Country Club and White Water River)				
18-in CML&C Ductile Iron Transmission	7,050	lf	86.26	608,133
Appurtenances (10% of pipe)	1	ls	60,813.30	60,813
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	2	ls	60,000.00	120,000
Subtotal Branch 4			\$	788,946
Branch 5 (Bob Hope between Country Club and White Water River)				
14-in CML&C Ductile Iron Transmission	3,770	lf	68.87	259,640
Appurtenances (10% of pipe)	1	ls	25,963.99	25,964
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	1	ls	60,000.00	60,000
Subtotal Branch 5			\$	345,604
Branch 6 (Frank Sinatra between Morningside and 111 HWY)				
12-in CML&C Ductile Iron Transmission	4,530	lf	60.60	274,518
Appurtenances (10% of pipe)	1	ls	27,451.80	27,452
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	2	ls	60,000.00	120,000
Subtotal Branch 6			\$	421,970
Storage at Pump Station 2				
15-acre-foot reservoir	3	ls	421,969.80	\$ 1,265,909
Subtotal - Storage at Pump Station 2			\$	1,265,909
Total Construction Costs:				26,125,692
Contingency				30% 7,837,708
Engr./Permitting & Construction Man. (15% of Total Construction Costs)				17% 4,441,368
Capital Costs:				\$ 38,404,768
Adjust to 2005 Price Level (Oct 04 to Jun 05)		4.5%		\$ 1,728,215
Capital Costs, 2005 Price Level				\$ 40,132,982
Adjust to Mid-point of construction, 2008	3	years at 3%		\$ 3,611,968
Capital Costs, 2008 Price Level				\$ 43,744,951

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Table C-8
MID-VALLEY IN-LIEU PROGRAM
 18 Hour Delivery - Dual Lift
 Revised: 13May05

	PS2	PS3
Delivery	18	18 hrs/day
Maximum Q of Pump Station 2	95.8	26.3 cfs
Maximum TDH of Pump Station 2	324.0	292.8 TDH

Item	Quantity	Unit	Unit Cost	Amount
Mobilization & General Conditions/General Requirements				
Project Manager (20 hr/wk)	48	wk	1,450.00	69,600
Superintendent (40 hr/wk)	48	wk	2,600.00	124,800
Field Engineer (40 hr/wk)	48	wk	1,450.00	69,600
Main office expense (3.9% of construction)	1	ls	1,133,691.97	1,133,692
Layout/engineering survey	1	ls	35,000.00	35,000
Mobilization	1	ls	100,000.00	100,000
Job office	12	mo	1,300.00	15,600
Job toilets (2)	12	mo	87.00	1,044
Storage shed	12	mo	85.00	1,020
Temporary water connection	1	ls	2,800.00	2,800
Temporary water	12	mo	50.00	600
Temporary electricity hookup	1	ls	1,400.00	1,400
Temporary electricity	12	mo	50.00	600
Temporary phone connection	1	ls	300.00	300
Temporary phone service	12	mo	50.00	600
Periodic cleanup	12	mo	500.00	6,000
Final cleanup	40	hr	15.92	637
Traffic control	1	ls	25,000.00	25,000
Shoring	1	ls	200,000.00	200,000
Job office supplies	12	mo	200.00	2,400
Pickup trucks/maintenance	12	mo	400.00	4,800
Scheduling	1	ls	7,000.00	7,000
Licenses/permits	1	ls	15,000.00	15,000
Insurance (1% of construction total)	1	ls	290,690.25	290,690
Bonds (0.6% of construction total)	1	ls	174,414.15	174,414
Submittals	120	hr	90.00	10,800
Subtotal (Mobilization + GC/GR)				\$ 2,293,397
Pumping Plant No. 2 (WRP10)				
Pumps and Associated Electrical	5,031	hp	450.00	2,263,770
Earthwork and Structures	96	cfs	5,500.00	526,845
Electrical Service	1	ls	100,000.00	100,000
Standpipe	1	ls	300,000.00	300,000
Subtotal Pumping Plant No. 2				\$ 3,190,615
Pumping Plant No. 3 (Intersection of Hope and Frank Sinatra)				
Pumps and Associated Electrical	1,246	hp	450.00	560,835
Earthwork and Structures	26	cfs	5,500.00	144,485
Electrical Service	1	ls	100,000.00	100,000
Standpipe	1	ls	300,000.00	300,000
Subtotal Pumping Plant No. 3				\$ 1,105,320
Line PS2 - 3 (WRP10 to Hovley and Cook)				
48-in CML&C Steel Transmission (Note 1)	3,520	lf	261.55	920,656
Appurtenances (10% of pipe)	1	ls	92,065.60	92,066
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)		ls	60,000.00	-
Subtotal Line PS2 - 3				\$ 1,012,722
Line 3 - 4 (Hovley between Cook and Portola)				
48-in CML&C Steel Transmission	5,280	lf	261.55	1,380,984
Appurtenances (10% of pipe)	1	ls	138,098.40	138,098
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	1	ls	60,000.00	60,000
Subtotal Line 3 - 4				\$ 1,579,082
Line 4 - 5 (Portola between Hovley and Country Club)				
48-in CML&C Steel Transmission	4,270	lf	261.55	1,116,819
Appurtenances (10% of pipe)	1	ls	111,681.85	111,682
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	-	ls	60,000.00	-
Subtotal Line 4 - 5				\$ 1,228,500

**Table C-8
MID-VALLEY IN-LIEU PROGRAM
18 Hour Delivery - Dual Lift**

Line 5 - 5A (Country Club between Portola and Monterey)				
36-in CML&C Ductile Iron Transmission	5,280	If	200.92	1,060,858
Appurtenances (10% of pipe)	1	ls	106,085.76	106,086
Large Diameter Valve	1	ea	15,000.00	15,000
Service Connection (meter, vault & SCADA)	1	ls	60,000.00	60,000
Subtotal Line 5 - 5A			\$	1,241,943
Line 5A - 5B (Country Club between Monterey and Bob Hope)				
36-in CML&C Ductile Iron Transmission	5,280	If	200.92	1,060,858
Appurtenances (10% of pipe)	1	ls	106,085.76	106,086
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	-	ls	60,000.00	-
Subtotal Line 5A - 5B			\$	1,166,943
Line 5B - 6A (Country Club between Bob Hope and Morningside)				
30-in CML&C Ductile Iron Transmission	5,280	If	156.44	826,003
Appurtenances (10% of pipe)	1	ls	82,600.32	82,600
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	2	ls	60,000.00	120,000
Subtotal Line 5B - 6A			\$	1,028,604
Line 6A - 7 (Morningside between Country Club and Frank Sinatra)				
30-in CML&C Ductile Iron Transmission	5,280	If	156.44	826,003
Appurtenances (10% of pipe)	1	ls	82,600.32	82,600
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	2	ls	60,000.00	120,000
Subtotal Line 6A - 7			\$	1,028,604
Line 7 - 8 (Frank Sinatra between Morningside and Bob Hope)				
24-in CML&C Ductile Iron Transmission	5,280	If	117.43	620,030
Appurtenances (10% of pipe)	1	ls	62,003.04	62,003
Large Diameter Valve	1	ea	12,500.00	12,500
Service Connection (meter, vault & SCADA)	2	ls	60,000.00	120,000
Subtotal Line 7 - 8			\$	814,533
Line 5 - 6B (Portola between Country Club and Frank Sinatra)				
30-in CML&C Ductile Iron Transmission	6,000	If	156.44	938,640
Appurtenances (10% of pipe)	1	ls	93,864.00	93,864
Large Diameter Valve	1	ea	12,500.00	12,500
Service Connection (meter, vault & SCADA)	-	ls	60,000.00	-
Subtotal Line 5 - 6B			\$	1,045,004
Line 6B - 8 (Frank Sinatra between Portola and Bob Hope)				
24-in CML&C Ductile Iron Transmission	12,500	If	117.43	1,467,875
Appurtenances (10% of pipe)	1	ls	146,787.50	146,788
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	2	ls	60,000.00	120,000
Subtotal Line 6B - 8			\$	1,734,663
Line 8 - 9 (Bob Hope between Frank Sinatra and Dinah Shore)				
24-in CML&C Ductile Iron Transmission	11,320	If	117.43	1,329,308
Appurtenances (10% of pipe)	1	ls	132,930.76	132,931
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	1	ls	60,000.00	60,000
Subtotal Line 8 - 9			\$	1,522,238
Line 9 - 10 (Frank Sinatra between Morningside and Bob Hope)				
24-in CML&C Ductile Iron Transmission	8,800	If	117.43	1,033,384
Appurtenances (10% of pipe)	1	ls	103,338.40	103,338
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	2	ls	60,000.00	120,000
Subtotal Line 9 - 10			\$	1,256,722
Branch 2 (Cook between WRP10 and Fairway)				
12-in CML&C Ductile Iron Transmission	12,300	If	60.60	745,380
Appurtenances (10% of pipe)	1	ls	74,538.00	74,538
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	2	ls	60,000.00	120,000
Subtotal Branch 2			\$	939,918

**Table C-8
MID-VALLEY IN-LIEU PROGRAM
18 Hour Delivery - Dual Lift**

Branch 3 (Frank Sinatra between Portola and Cook)				
18-in CML&C Ductile Iron Transmission	4,280	lf	86.26	369,193
Appurtenances (10% of pipe)	1	ls	36,919.28	36,919
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	2	ls	60,000.00	120,000
Subtotal Branch 3			\$	526,112
Branch 4 (Monterey between Country Club and White Water River)				
18-in CML&C Ductile Iron Transmission	7,050	lf	86.26	608,133
Appurtenances (10% of pipe)	1	ls	60,813.30	60,813
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	2	ls	60,000.00	120,000
Subtotal Branch 4			\$	788,946
Branch 5 (Bob Hope between Country Club and White Water River)				
14-in CML&C Ductile Iron Transmission	3,770	lf	68.87	259,640
Appurtenances (10% of pipe)	1	ls	25,963.99	25,964
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	1	ls	60,000.00	60,000
Subtotal Branch 5			\$	345,604
Branch 6 (Frank Sinatra between Morningside and 111 HWY)				
12-in CML&C Ductile Iron Transmission	4,530	lf	60.60	274,518
Appurtenances (10% of pipe)	1	ls	27,451.80	27,452
Large Diameter Valve		ea		-
Service Connection (meter, vault & SCADA)	2	ls	60,000.00	120,000
Subtotal Branch 6			\$	421,970
Storage at Pump Station 3 (15 acre-feet)				
Excavation	9,833	cy	1.36	13,335
Transport	9,833	cy	1.03	10,108
Compaction	9,833	cy	0.87	8,603
Concrete lining	1,483	cy	450.00	667,350
Piping Manifolds/Valving	1	ls	50,000.00	200,000
Subtotal - Storage at Pump Station 3			\$	899,396
Storage at Pump Station 2				
15-acre-foot reservoir	3	ls	899,395.98	2,698,188
Subtotal - Storage at Pump Station 2			\$	2,698,188
Land Acquisition for Pump Station 3				
Fee Purchase	2	ac	600,000.00	1,200,000
Subtotal - Land Acquisition			\$	1,200,000
Total Construction Costs:				29,069,025
Contingency				30% 8,720,707
Engr./Permitting & Construction Man. (15% of Total Construction Costs)				17% 4,941,734
Capital Costs:				\$ 42,731,467
Adjust to 2005 Price Level (Oct 04 to Jun 05)		4.5%	\$	1,922,916
Capital Costs, 2005 Price Level				\$ 44,654,383
Adjust to Mid-point of construction, 2008	3	years at	3%	\$ 4,018,894
Capital Costs, 2008 Price Level				\$ 48,673,277

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