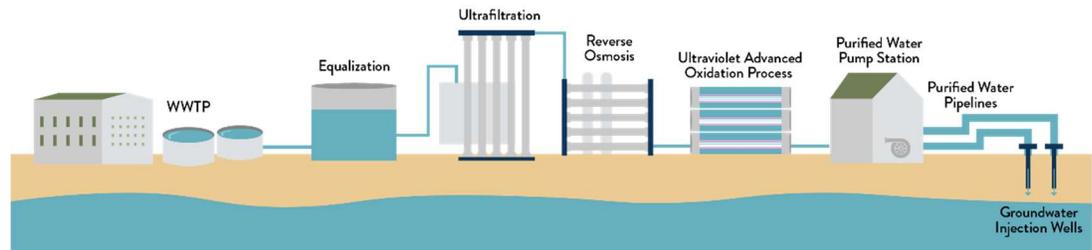


6



PRELIMINARY ENGINEERING REPORT

Cost Estimate

The cost estimates included in this report are based upon the Class 4 Conceptual Report Classification of Opinion of Probable Construction Cost as developed by the Association for the Advancement of Cost Engineering Cost Estimate Classification System.

The purpose of a Class 4 Estimate is to provide a conceptual level effort that has an expected accuracy range from -15% to -30% and +20 to +50% and the inclusion of an appropriate contingency for planning and feasibility studies. Based on the current level of design this cost estimate has an expected accuracy range of -20% to +30%. The cost estimates used for this cost model were developed from the best available information from actual costs of similar projects and adjusted for inflation.

IN THIS SECTION

- Basis of Cost
- Cost Escalations

The conceptual nature of the design concepts and associated costs presented in this report are based upon limited design information available at this stage of the project.

6.1. Basis of Costs

These cost estimates have been developed using a combination of data from RS Means CostWorks®, recent bids, experience with similar projects, current and foreseeable regulatory requirements, and an understanding of the necessary project components. As the project progresses, the design and associated costs could vary significantly from the project components identified in this preliminary engineering report. For example, cost opinions may not fully account for site-specific conditions that will affect the actual costs, such as soils conditions and utility conflicts.

For project components where applicable cost data is available (e.g. pipeline installation), cost data from RS Means CostWorks® is used and escalated to Quarter 1 of 2021 using Engineering News-Record Construction Cost Indexes. Material prices were adjusted in some cases to provide estimates that align closer with actual local bid results. For project components where RS Means CostWorks® data is not available, cost opinions are generally derived from bid prices from similar projects, vendor quotes, material prices, and labor estimates, with adjustments for inflation, size, complexity, and location.

The AWP cost estimate was developed based on vendor quotes, so construction markups included: taxes and fees as 10% of half of the total direct cost; contractor overhead as 15% of the total direct cost; change order costs as 3% of the total construction costs.

Cost estimates are in Q1 2021 dollars with a local adjustment for San Luis Obispo County.

6.1.1. Markups and Contingencies

For the development of the planning level cost estimates, several markups and contingencies are applied to the estimated construction costs to obtain the total estimated project costs. The markups are intended to account for costs of engineering, design, administration, and legal efforts associated with implementing a project (collectively, Implementation Markup).

The Implementation Markup for the AWP engineering, legal, and administration costs is included as 20% of the total construction costs. The Implementation Markup for the distributed infrastructure included final design as 10%, program management as 10%, construction management as 10%, California Environmental Quality Act as 2%, and office engineering during construction as 3% of construction and contingency costs. See Table 6-1 on page 6-3 for a summary of implementation costs.

Table 6-1. Implementation Markup Cost Estimating Assumptions

DESCRIPTION	PERCENT	COST APPLIED TO:
Engineering, Legal, Administrative	25%	AWPF Total Construction Cost
DISTRIBUTED INFRASTRUCTURE		COST APPLIED TO:
Final Design	11%	Distributed Infrastructure Total Construction Cost with Contingency
Program Management	10%	
Construction Management	10%	
California Environmental Quality Act	2%	
Office Engineering During Construction	3%	

Contingency accounts for additional construction costs that could not be anticipated at the time of this analysis. A different contingency is used for the AWPF and the distributed infrastructure since there are different levels of uncertainty associated with each component. A summary of the contingencies applied is presented in Table 6-2.

Table 6-2. Contingency Cost Estimating Assumptions

DESCRIPTION	PERCENT
AWPF Contingency	30%
Distributed Infrastructure Contingency	20%

6.1.2. Financing and Unit Costs

The annual capital payment was calculated using the annual payment method and the factors described below.

- **Project Financing:** Interest Rate & Payback Period: 1% over 30 years.
- **Useful Life of Facilities:** The useful life of facilities will vary based on several factors, including type of facility, operating conditions, design life, and maintenance upkeep. Structural components of most facilities are typically designed to last 50 years or longer. However, mechanical and electrical components tend to have a much shorter lifespan and typically require replacement or rehabilitation at regular intervals. To simplify the lifecycle evaluation, this preliminary engineering report assumes that all facilities have a useful life matching the financing payback period of 30 years.

The unit cost (i.e., cost/AF) is calculated by adding the annual capital payment for borrowed capital costs to the annual O&M cost and dividing by the estimated annual project yield.

6.1.3. Capital, O&M, and Annualized Costs

The capital costs developed for Phase 1 and 2 of Central Coast Blue are shown in Table 6-3. More details on the cost estimating process are provided in Appendix B.

Table 6-3. Capital Cost Estimates for Phase 1 & 2

DESCRIPTION	PHASE 1			PHASE 2		
	CAPACITY /SIZE	UNIT	COST	CAPACITY /SIZE	UNIT	COST ¹
AWPF						
TOTAL DIRECT COST	1.3	MGD	\$15,045,000	5.4	MGD	\$26,481,900
Contingency			\$4,513,500			\$7,944,600
Taxes and Fees, Contractor Overhead and Profit			\$3,009,000			\$5,296,400
TOTAL CONSTRUCTION COST			\$22,567,500			\$39,722,900
Change Order Cost, Engineering, Legal, and Administrative			\$4,212,600			\$7,414,900
TOTAL CAPITAL COST			\$26,780,100			\$47,137,800
DISTRIBUTED INFRASTRUCTURE						
Onsite Connections	866	LF	\$214,800	5,622	LF	\$1,627,300
Purified Water Pump Station	694	gpm	\$1,083,000	2,708	gpm	\$4,225,700
Purified Water Pipelines	9,939	LF	\$2,492,300	10,042	LF	\$2,515,400
Injection Wells	4	qty	\$2,887,100	6	qty	\$4,330,600
Monitoring Wells	9	qty	\$3,740,600	9	qty	\$3,740,600
Storage	80,000	gal	\$872,200	80,000	gal	\$872,200
CONSTRUCTION SUBTOTAL			\$11,290,000			\$17,311,800
Contingency			\$2,258,000			\$3,462,400
Implementation Costs			\$4,809,500			\$7,374,800
TOTAL CAPITAL COST			\$18,357,500			\$28,149,000
AWPF + DISTRIBUTED INFRASTRUCTURE						
TOTAL CAPITAL COST²			\$45,137,600			\$75,286,800
-20%			\$36,110,100			\$60,229,400
+30%			\$58,678,900			\$97,872,800
TOTAL CAPITAL ESCALATED TO MID-POINT OF CONSTRUCTION			\$49,323,100			\$82,267,900

1. Phase 2 costs include Phase 1 and therefore are total project costs.

2. Based on the Class 4 Estimate the expected accuracy range is from -20% to +30% as shown above. This is to account for the level of uncertainty at this level of design.

The O&M costs developed for Phase 1 and 2 of Central Coast Blue are shown in Table 6-4. More details on the cost estimating process are provided in Appendix B.

Table 6-4. Operations and Maintenance Cost Estimates for Phase 1 & 2

DESCRIPTION	PHASE 1			PHASE 2		
	CAPACITY /SIZE	UNIT	COST	CAPACITY /SIZE	UNIT	COST ¹
AWPF	1.3	MGD	\$753,000	5.4	MGD	\$2,868,000
Purified Water Pump Station Maintenance	694	gpm	\$54,200	2,708	gpm	\$211,300
Purified Water Pump Station Power	76,400	kW-hr/yr	\$9,900	518,500	kW-hr/yr	\$67,400
Onsite Connections & Purified Water Pipelines	10,805	LF	\$27,100	15,664	LF	\$41,400
Injection Wells			\$72,177			\$101,048
Monitoring Wells			\$83,124			\$83,124
Purified Water Storage			\$8,700			\$8,700
Full Time Employee	10	qty	\$911,000	15	qty	\$1,424,000
TOTAL O&M COST			\$1,919,200			\$4,805,000

1. Phase 2 costs include Phase 1 and therefore are total project costs.

Scenario modeling results from the Phase 1B Groundwater Model were utilized to estimate the recovery % and project yield for Phase 1 and Phase 2 of Central Coast Blue. The recovery % were estimated by calculating the amount of additional water (i.e. Post-project pumping minus Pre-project pumping) that could be extracted from the basin by the Central Coast Blue stakeholders without exceeding the criteria established in the Phase 1B Groundwater Model for creating an increased risk of seawater intrusion. The amount of additional water was then divided by amount of water injected to develop estimates of percent recovery from each phase. Estimates of project yield (i.e. AFY) were developed by multiplying the amount of water injected by the recovery %. Phase 1 project yields after injection will be 100–158% yield per AF of injected water. Phase 2 project yields after injection will be approximately 100% yield per AF of injected water. A summary of the capital costs, O&M, and unit costs (\$/AF) for this project is shown in Table 6-5.

Table 6-5. Cost Summary for Phase 1 & 2

DESCRIPTION	PHASE 1	PHASE 2¹
Total Capital	\$45,137,600	\$75,286,800
Annualized Capital ²	\$1,749,000	\$2,917,200
Annualized O&M	\$1,919,200	\$4,805,000
Total Annualized	\$3,668,200	\$7,722,200
Purified Water Produced (AFY) - Before Injection)	1,076	4,390
COST/AF (BEFORE INJECTION)	\$3,400	\$1,800
Yield (AFY) - After Injection	1,700	4,390
COST/AF (AFTER INJECTION)	\$2,400	\$1,800

1. Phase 2 costs include Phase 1 and therefore are total project costs.

2. Includes financing based on 1% interest rate over 30 years.

Planning & Design Assumptions

Below is a detailed summary of the planning and design assumptions used to develop the cost assumptions for this preliminary engineering report. These assumptions were used in combination with those mentioned in Section 6 on page 6-1 of the report.

AWPF Assumptions

Section 6 on page 6-1 contains the preliminary cost estimate for the AWPf. The cost summary for the AWPf is shown in Table B-1 on page B-3. High and low estimates represent the range of manufacturer quotes received for each system. The UV design especially varies based on manufacturer. Costs are shown in Q1 2021 dollars and do not include an adjustment for market conditions. Some items are not well defined at this level of design, so they were included in the cost estimate as a percent value. See assumptions listed below for these items.

The following assumptions were made to develop the capital costs:

- Sitework and yard piping as 10% of the total major capital costs.
- Electrical, instrumentation, and control as 30% of the total major capital costs.
- Taxes and fees as 10% of half of the total direct cost.
- Contractor overhead and profit as 15% of the total direct cost.
- Contingency as 30% of the total direct cost.
- Change order costs as 3% of the total construction cost.
- Engineering, legal, and administration costs as 20% of the total construction cost.

The following assumptions were made to develop the annual O&M costs:

- Life (amortization term) of 30 years.
- Equipment power at 80% efficiency.
- Electricity at \$0.13 per kilowatt hour (kWh).
- Replacement life of UF membranes is 8 years for Phase 1 and 5 years for Phase 2.
- Replacement life of RO membranes is 5 years.
- Replacement life of RO cartridge filters is 6 months.
- Replacement life of UV lamps is 1.5 years.
- Replacement life of UV ballasts is 10 years.
- Replacement life of UV intensity sensors is 5 years.
- Replacement life of UV wipers is 5 years.
- Phase 1 would require 1 Grade-5 Operator, 3 Grade-3 Operators, 3 Grade-2 Operators, 1 administrative assistant, 1 electrician at 75%, and 1 Mechanic II at 25%.
- Phase 2 would require 1 Grade-5 Operator, 5 Grade-3 Operators, 5 Grade-2 Operators, 1 administrative assistant, 2 electricians, and 1 Mechanic II.
- Assumed annual salaries of \$150,000 for a Grade 5 Operator, \$109,000 for a Grade 3 Operator, \$100,000 for a Grade 2 Operator, \$77,000 for an administrative assistant, \$94,000 for an electrician, and \$94,000 for a mechanic.

The following assumptions were made to develop the amortized costs:

- Inflation rate of 3%.
- Discount rate of 5.5%.

Table B-1. AWPf Capital and O&M Cost Estimate for Phase 1 & 2

MAJOR CAPITAL COSTS	PHASE 1 HIGH	PHASE 1 LOW	PHASE 2 HIGH	PHASE 2 LOW
Admin building (Phase 1 low – no building)	\$812,500	\$-	\$-	\$812,500
Phase 1 UF feed tank (high – deep geotechnical foundation system; low – above grade pre-stressed concrete tank)	\$2,000,000	\$800,000	\$-	\$-
Phase 2 UF feed tank (high - deep geotechnical foundation system; low – above grade poured-in-place concrete tank)	\$-	\$-	\$2,475,000	\$1,650,000
UF system (high and low – different UF vendors)	\$1,815,000	\$1,623,000	\$1,749,000	\$1,458,000
RO feed tank	\$350,000	\$350,000	\$ -	\$-
RO system (high and low – different RO original equipment manufacturers)	\$1,059,000	\$825,000	\$2,585,000	\$1,672,000
UV feed tank	\$ 54,000	\$ 54,000	\$-	\$-
UV system (high and low – different UV reactors)	\$900,000	\$500,000	\$300,000	\$750,000 ⁽⁴⁾
Process building	\$2,722,500	\$2,722,500	\$ -	\$-
Chemical systems (Phase 1 low – no chemical containment area; use double-walled tanks and totes)	\$1,265,000	\$ 695,597	\$1,060,000	\$491,000
SUBTOTAL	\$10,978,000	\$7,570,097	\$ 8,169,000	\$6,833,500
Sitework and yard piping (10 %)	\$1,017,000	\$757,000	\$ 816,900	\$602,000
Electrical instrumentation & controls (30 %)	\$3,050,000	\$2,271,000	\$2,451,000	\$2,207,000
TOTAL DIRECT COST	\$15,045,000	\$10,598,097	\$11,436,900	\$9,642,500
Taxes and fees (10 %)	\$752,000	\$ 530,000	\$572,000	\$482,000
Contractor overhead and profit (15 %)	\$2,257,000	\$ 1,590,000	\$ 1,716,000	\$1,446,000
Contingency (30 %)	\$4,514,000	\$3,179,000	\$ 3,431,000	\$2,893,000
TOTAL CONSTRUCTION COST	\$22,568,000	\$15,897,097	\$17,155,900	\$14,463,500
Change order cost (3 %)	\$451,000	\$ 318,000	\$ 343,000	\$289,000
Engineering, legal, administration (20 %)	\$3,761,000	\$ 2,650,000	\$2,859,000	\$2,411,000
TOTAL CAPITAL COST	\$26,780,000	\$18,865,097	\$20,357,900	\$17,163,500
PHASE 1 + PHASE 2 CAPITAL COST			\$47,137,900	\$36,028,597

MAJOR O&M COSTS¹	PHASE 1 HIGH	PHASE 1 LOW	PHASE 2 HIGH	PHASE 2 LOW
Chemical	\$179,000	\$177,000	\$845,000	\$802,000
Electrical ²	\$432,000	\$430,000	\$1,338,000	\$1,314,000
Consumables	\$142,000	\$125,000	\$685,000	\$655,000
Labor ³	\$911,000	\$911,000	\$1,424,000	\$1,424,000
TOTAL O&M COST	\$1,664,000	\$1,643,000	\$4,292,000	\$4,195,000

1. Phase 2 costs include Phase 1.

2. Assumed power cost of \$0.13/kWh.

3. Assuming annual salaries of \$150K for a Grade 5 Operator, \$109K for a Grade 3 Operator, \$100K for a Grade 2 Operator, \$77K for an administrative assistant, \$94K for an electrician and \$94K for a mechanic.

4. The higher Phase 2 UV costs that are slotted into the "Low" column are accurate, as the lower cost Phase 1 UV system results in the higher cost Phase 2 expansion.

The cost estimate herein is based on our perception of current conditions at the project location. This estimate reflects our professional opinion of accurate costs at this time and is subject to change as the project design matures. Carollo has no control over variances in the cost of labor, materials, equipment; nor services provided by others, contractor's means and methods of executing the work or of determining prices, competitive bidding or market conditions, practices or bidding strategies. Carollo cannot and does not warrant or guarantee that proposals, bids or actual construction costs will not vary from the costs presented as shown.

Purified Water Storage

The purified water storage criteria and cost estimate are shown in Table B-2. The purified water storage was sized for 30 minutes of the design flows. The Phase 2 storage volume is assumed to be constructed in Phase 1. The purified water storage capital cost was developed using vendor quotes and costs from similar projects. It was assumed that the O&M will be 1% of capital cost.

Table B-2. Purified Water Storage Cost Development

DESCRIPTION	UNIT	PHASE 1	PHASE 2	ASSUMPTION
Storage Volume	gal	80,000	80,000	Sized for 30 minutes of AWPf product water (5.4 MGD)
DESCRIPTION	COST CALCULATION	PHASE 1	PHASE 2 ¹	REFERENCE
Capital Cost	n/a	\$872,200	\$872,200	Vendor Quotes
Annual O&M Cost	1% * capital cost	\$8,700	\$8,700	Developed from similar projects

1. Phase 2 costs include Phase 1 and therefore are total project costs.

Purified Water Pump Station

The purified water pump station sizing criteria and cost estimate are shown in Table B-3. The purified water pump station sizing was based on the maximum flow that will be injected into the groundwater basin for each phase and the capital cost estimate was based on costs from similar projects. The O&M costs were developed using the maintenance associated with the pump station, which was assumed to be 5% of capital cost based on similar projects, and the electricity costs required to pump the anticipated volume of purified water. Electricity was assumed to cost \$0.13 per kW-hr.

Table B-3. Purified Water Pump Station Cost Development

DESCRIPTION	UNIT	PHASE 1	PHASE 2	ASSUMPTION
Maximum Flow (Q)	gpm	694	2,708	Maximum flow to be delivered to the injection wells
Power	kW-hr/yr	76,400	518,500	75% pump efficiency; 24/7 operation
DESCRIPTION	COST CALCULATION	PHASE 1	PHASE 2 ¹	REFERENCE
Capital Cost	n/a	\$1,083,000	\$4,225,700	Developed from similar projects
Annual Maintenance Cost	5%*capital cost	\$54,200	\$211,300	Developed from similar projects
Annual Power Cost	\$0.13*kW-hr	\$9,900	\$67,400	Developed from similar projects

1. Phase 2 costs include Phase 1 and therefore are total project costs

Onsite Connections & Purified Water Pipeline Assumptions

The purified water pipelines cost estimates were based on preliminary unit costs per LF from RS Means CostWorks® plus construction and contingency assumptions. The construction assumptions included cover depth varied based on pipeline diameter. The pipeline includes three fittings (a tee, 90-degree, and 45-degree), and an air release valve for each 1,000 ft segment of pipe. These assumptions are summarized in Table B-4 on page B-8. A comprehensive pipeline unit costs that incorporates these assumptions is in Table B-5 on page B-9. Based on these unit costs, capital costs for the purified water pipelines were estimated, as shown in Table B-6 on page B-9. Annual O&M costs for the purified water pipelines were estimated based on 1% of the capital cost and are shown in Table B-7 on page B-10.

Table B-4. Onsite Connections & Purified Water Pipeline Construction and Contingency Assumptions

DESCRIPTION	UNIT	CONSTRUCTION ASSUMPTIONS
T-Section Length	ft	1
Saw Cut Depth	in	5
Shoring (SF per ft Depth per ft Length)	SF	2
Bedding Swell	%	20
LF/Day	LF/d	250
DESCRIPTION	UNIT	DEPTH TO COVER
Pipeline Diameter – 4-in	ft	4.8
Pipeline Diameter – 6-in	ft	5.0
Pipeline Diameter – 8-in	ft	5.2
Pipeline Diameter – 10-in	ft	5.3
Pipeline Diameter – 12-in	ft	5.5
Pipeline Diameter – 14-in	ft	6.2
Pipeline Diameter – 16-in	ft	6.3
DESCRIPTION	UNIT	CONTINGENCY ASSUMPTIONS
Unaccounted for Costs	%	10
Construction Phase Contingency	%	25
Project Development	%	25
Utility Conflict Resolution	%	10
Mobilization	%	6
Insurance Bonds	%	3
Survey	%	1
Site Clear/Restore	%	1
Stormwater Pollution Prevention Plan/LF	\$	2
Traffic Control/Length	\$	18
DESCRIPTION	APPURTENANCES ASSUMPTIONS	
Fittings (Tee, 90, 45)	3 per 1,000 LF	
Air Release Valve	1 per 1,000 LF	

Table B-5. Onsite Connections & Purified Water Pipeline Unit Cost

SIZE (IN)	COST/LF
4	\$183
6	\$201
8	\$224
10	\$248
12	\$277
14	\$278
16	\$297

Table B-6. Onsite Connections & Purified Water Pipeline Capital Cost Breakdown Per Segment

SEGMENT	SIZE (IN)	LENGTH (LF)	COST
PHASE 1			
AWPF Feed	10	433	\$107,400
0	14	185	\$51,400
1	14	431	\$119,800
2	12	1,814	\$502,500
3	10	3,219	\$798,300
4	8	10	\$2,200
6	8	541	\$121,200
7	8	205	\$45,900
8	12	167	\$46,300
9	8	23	\$5,200
10	10	1,822	\$451,900
11	10	193	\$47,900
12	8	24	\$5,400
15	8	1,179	\$264,100
16	8	89	\$19,900
17	14	37	\$10,300
Concentrate Discharge	10	433	\$107,400
PHASE 1 TOTAL		10,805	\$2,707,100

SEGMENT	SIZE (IN)	LENGTH (LF)	COST
PHASE 2			
5	8	34	\$7,600
13	8	32	\$7,200
14	8	37	\$8,300
AWPF Feed from District	16	4,756	\$1,412,500
PHASE 2 TOTAL		4,859	\$1,435,600
PHASE 1 + PHASE 2 TOTAL		15,664	\$4,142,700

Table B-7. Onsite Connections & Purified Water Pipelines O&M Costs

DESCRIPTION	COST CALCULATION	PHASE 1	PHASE 2 ¹	REFERENCE
Annual O&M Cost	1%*capital cost	\$27,100	\$41,400	Developed from similar projects

1. Phase 2 costs include Phase 1 and therefore are total project costs

Injection & Monitoring Well Assumptions

The injection well and associated monitoring well costs were estimated based upon evaluating previous bids for purified water injection well and drinking water production well projects within California. The estimated unit costs by item for construction of injection wells and monitoring wells are presented in Table B-8 on page B-12 and Table B-9 on page B-13, respectively. Table B-10 on page B-13 shows the estimated costs for permitting, bidding, and well construction oversight.

Table B-8. Injection Well Unit Costs

ITEM	UNIT	UNIT PRICE	INJECTION WELL IW-1¹
Temporary Above Ground Piping and Connections, per Site Plans	Lump Sum	\$3,000	\$3,000
Mobilization and Demobilization	Lump Sum	\$70,000	\$70,000
34 in Surface Casing	LF	\$480	\$24,000
Pilot Hole Drilling	LF	\$90	\$30,600
Geophysical Logging	Lump Sum	\$4,500	\$4,500
Cement Grout Pilot Hole	LF	\$65	\$650
Reaming 24 in Borehole	LF	\$110	\$12,100
Reaming 20 in Borehole	LF	\$100	\$17,000
Caliper Survey	Lump Sum	\$3,500	\$3,500
12 in Diameter x 1/4 in wall thickness 304L SS Blank Casing	LF	\$360	\$43,200
12 in Diameter x 1/4 in wall thickness 316L SS Well Screen	LF	\$251	\$42,670
4 in Diameter Camera Port SS Pipe and Casing Entrance Box	LF	\$75	\$12,750
3 in Diameter Gravel Feed Tube	LF	\$70	\$7,700
Class "G" Cement Annular Seal	LF	\$350	\$7,000
Gravel Pack	LF	\$100	\$19,000
Intermediate Bentonite Seal	LF	\$87	\$1,740
Grout Surface Seal	LF	\$83	\$9,960
Plumbness and Alignment Testing	Lump Sum	\$3,000	\$3,000
Air-Lift Swabbing	Hourly	\$495	\$23,760
Install/Remove Test Pump with 2 1/2 in Diameter Access Tube	Lump Sum	\$12,000	\$12,000
Development and Test Pumping	Hourly	\$300	\$36,000
Spinner/Flow Profile Logging	Lump Sum	\$5,000	\$5,000
Final Water Quality Testing	Lump Sum	\$5,500	\$5,500
Install/Remove Injection Equipment	Lump Sum	\$30,000	\$30,000
Aquifer Testing	Lump Sum	\$16,950	\$16,950
Waste Disposal	Lump Sum	\$25,000	\$25,000
Television Well Survey	Lump Sum	\$3,000	\$3,000
Pilot Injection Well Disinfection and Capping	Lump Sum	\$3,000	\$3,000
Site Clean Up	Lump Sum	\$5,000	\$5,000
Authorized Drill Rig Standby Time	Hourly	\$200	\$2,400
Well Equipping - Includes down-well flow control valve and a dedicated backwash pump (all stainless) with remote control via telemetry, electrical, and purified water pipeline interconnection	Lump Sum	\$300,000	\$300,000

1. IW-1 is a representative cost for the injection wells. The exact cost varies from well to well due to varying site conditions. Cost estimates for each well are available upon request. An average of the injection well costs was used in the cost estimate.

Table B-9. Monitoring Well Costs

ITEM	UNIT	UNIT PRICE	MONITORING WELL MW-1 ¹
Mobilization, Demobilization, and Site Restoration	Lump Sum	\$15,000	\$15,000.00
Traffic Control	Lump Sum	\$15,000	\$15,000.00
Stormwater Pollution Control Plan	Lump Sum	\$4,750	\$4,750.00
Noise Control	Lump Sum	\$10,000	\$10,000.00
Conductor Casing 12 in x 1/4 in mild steel	Lump Sum	\$395	\$7,900.00
Pilot Borehole	LF	\$90	\$31,500.00
Drilling Fluid	Lump Sum	\$7,500	\$7,500.00
Geophysical Logs	Lump Sum	\$4,500	\$4,500.00
Caliper Survey	Lump Sum	\$3,500	\$-
Well Casings (4 in sch 40 PVC)	LF	\$17	\$3,500.00
Well Screen (4 in sch 40 0.02 slot PVC)	LF	\$19	\$6,765.00
Well Cap	Each	\$25	\$2,867.50
End Caps	Each	\$25	\$50.00
Gravel Pack	LF	\$35	\$50.00
Bentonite Seal 3/8 in plug	LF	\$40	\$5,950.00
Cement Grout	LF	\$80	\$6,200.00
Alignment Tests	Lump Sum	\$3,000	\$1,600.00
Well Development	Hourly	\$200	\$3,000.00
Aquifer Test	Hourly	\$200	\$19,200.00
Video Camera Survey	Lump Sum	\$3,000	\$9,600.00
Well Disinfection	Lump Sum	\$2,500	\$3,000.00
Vault	Lump Sum	\$10,000	\$2,500.00

1. MW-1 is a representative cost for the monitoring wells. The exact cost varies from well to well due to varying site conditions. Cost estimates for each well are available upon request. An average of the monitoring well costs was used in the cost estimate.

Table B-10: Permitting, Bidding Support, and Oversight for Well Construction

ITEM	UNIT	UNIT PRICE
Permitting Support	Lump Sum	\$30,000
Bidding Support	Lump Sum	\$40,000
Monitoring Well Construction Management Oversight	Per Well	\$27,000
Injection Well Construction Management Oversight	Per Well	\$38,800

The annual O&M costs for the injection and monitoring wells were assumed to be 2% of the capital cost based on similar projects. These costs are described in Table B-11 below.

Table B-11. Injection and Monitoring Well Operation and Maintenance Costs

ITEM	COST CALCULATION	PHASE 1	PHASE 2	REFERENCE
Annual O&M Cost	2%*capital cost	\$125,000	\$142,000	Developed from similar projects