



Technical Memorandum

To: Ross Bintner, PE
Engineering Services Manager
City of Edina

Chad Milner, PE
Director of Engineering
City of Edina

From: Aaron Vollmer, PE – AE2S
Advanced Engineering & Environmental Services, Inc. (AE2S)

Re: WTP No. 5 Alternatives – Comparison of Opinions of Probable Cost

Date: November 30, 2018 **Project Number:** P05177-2018-002

I. Project Background and Scope of Memo

Ensuring the responsible management of annual operation and maintenance budgets, optimizing short-term capital improvement expenditures, and maximizing the benefits of long-term capital improvements requires a comprehensive direction. To establish a vision for the addition of Water Treatment Plant (WTP) No. 5 to the Edina water treatment system, the City authorized preparation of the WTP Preliminary Design Report (PDR) in March 2017.

The WTP No. 5 PDR (September 2017) was developed through a collaborative planning process with representatives of the City of Edina and the AE2S Project Team. This project initially evaluated four (4) primary alternative WTP locations, and potential alternates at the identified sites. At completion of the WTP Preliminary Design Report, the opinion of probable total project costs ranged from \$10,560,000 to 16,209,000. Based on these cost estimates and the qualitative evaluations of the alternatives, Option 1C was identified as the best option for the future WTP.

Based on recommendations of the PDR, the Project Team initiated the detailed Final Design Phase. Through the Final Design Phase, representatives from AE2S, Oertel Architects, and the City of Edina collaborated frequently to discuss design alternatives, discuss advantages and disadvantages, and align responsible design decisions with the City's vision for the future WTP. Table 1 summarizes the costs for facility construction, integration, engineering, and construction phase services to complete Option 1C. Engineering and construction phase costs include the \$1,043,300 of professional services expended to date, an anticipated engineering design cost to finish and bid Option 1C of \$50,000, and a 5% construction phase costs of \$505,684.

Table 1 – Option 1C Opinion of Probable Total Project Cost

Option	Facility Construction (Including 2.5% Contingencies)	Facility Integration	Engineering & Construction Phases	Total Project Cost
Option 1C	\$9,714,000	\$400,000	\$1,599,300	\$11,713,300



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Consistent with the 60% design direction, Figure 1 below is an illustration of the proposed WTP on the Southdale site at the 95% design milestone.



Figure 1 – Option 1C 95% Rendering

II. Development of Additional Architectural Features (Option 1D)

Based on review of the 95% design documents and architectural rendering, the City Council expressed a desire to increase the architectural impact of the facility to better align with the goals of the Greater Southdale Plan. AE2S, Oertel Architects, and the City of Edina staff worked to prepare an alternate design concept that increased the architectural impact of the proposed WTP at the Southdale site. For the purposes of this Technical Memorandum (TM) this revision is considered Option 1D.

The revised renderings were reviewed by the design team and construction estimates were updated to reflect the anticipated cost to construct the revised facility. The costs in Table 2 below also include engineering and construction phase services to revise the previous design to meet the new architectural modifications. The engineering and construction phase services total includes the \$1,043,300 of professional services expended to date, a \$170,000 design fee increase to upgrade the building and re-design portions of the building that are impacted by the design modifications, and a \$587,000 budget for construction phase services.

Table 2 – Option 1D Opinion of Probable Total Project Cost

Option	Facility Construction (Including 2.5% Contingencies)	Facility Integration	Engineering & Construction Phases	Total Project Cost
Option 1D	\$11,347,000	\$400,000	\$1,800,300	\$13,547,300

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Figure 2, 3, and 4 illustrate the facility with upgraded architectural as prepared by Oertel.



Figure 2 – Option 1D Conceptual Rendering (NW View)



Figure 3 – Option 1D Conceptual Rendering (NW View - Night Lighting)

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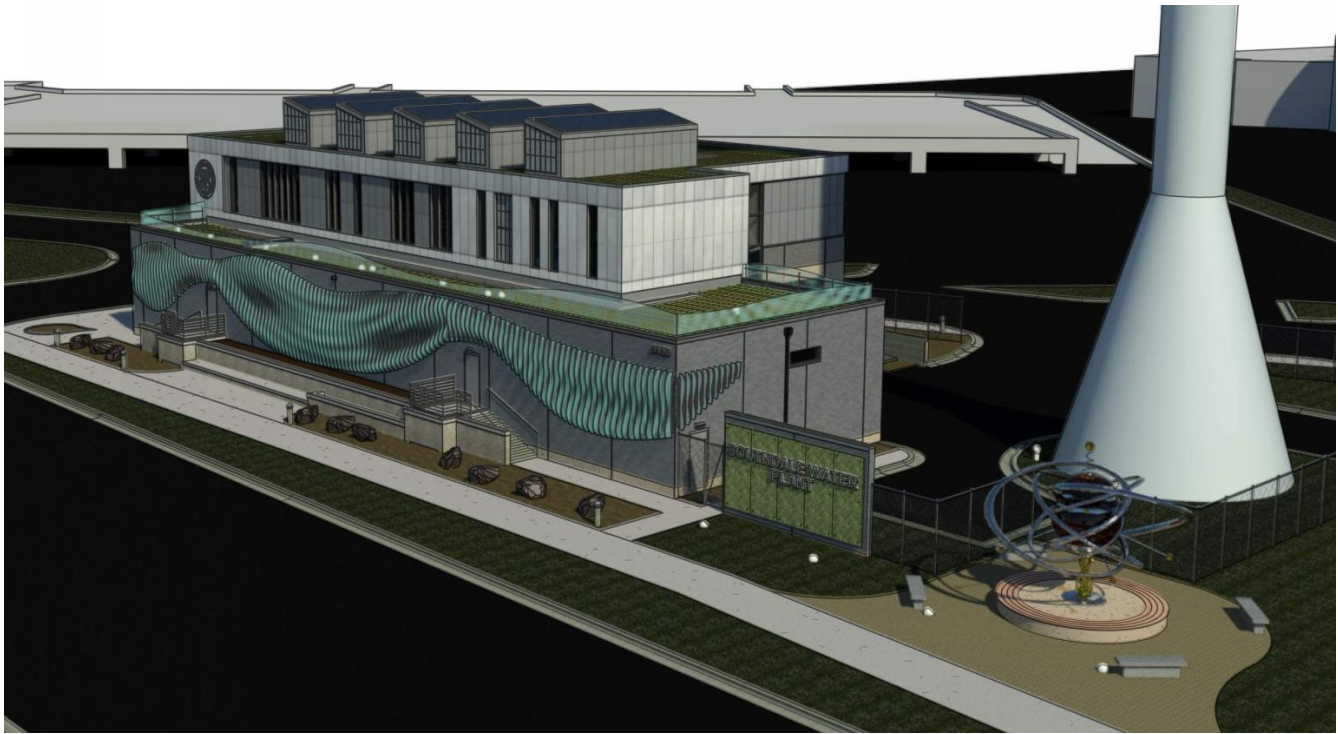


Figure 4 – Option 1D (SW View)

As previously noted, it was important to the City that the architectural aspects of this facility are impactful and establish the new WTP as an iconic piece of city infrastructure. The following upgrades were proposed to the original 95% design to accomplish the goal of creating a more impactful building.

1. Material finish changes = \$50,000
2. Full glass curtain wall on the north side of the WTP = \$176, 000
3. LED educational Wall = 100,000
4. Textured wall panel at north wall = \$32,000
5. Glass railing at parapet = \$50,000
6. Roof light stacks = \$175,000
7. France Avenue fins = \$392,000
8. Parklet site development = \$36,000 (does not include cost for public art)
9. Southdale side green screen and plantings = \$34,000
10. Sign Monument (30,000)
11. Green roof (complete upper green roof)= \$70,000
12. Upgraded plate settler to stainless steel = \$100,000
13. Increased quantity of cast in place concrete to accommodate potential staircase in NE corner of facility = 55,000
14. Increase quantity of structural steel to support modified roof framing = \$60,000
15. Increase in rebar costs for cast in place concrete due to steel tariff = \$87,000
16. Addition of precast beam to accommodate north face modification = \$50,000
17. Additional LED lighting and color changing controls = \$110,000
18. HVAC improvements to control the temperature on the north face = \$25,000

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This revised opinion of cost presented includes the additional items listed above, which total approximately an additional \$1,632,000. A total project cost of \$13,547,300 is anticipated if all the above improvements are implemented. This is approximately \$2,987,300 more than the Preliminary Design Report estimate for Option 1C. All of the presented costs are based on quotations from material/equipment suppliers, standard industry unit prices, recent bid prices from other projects throughout the region, and professional judgment of the Project Team. However, it is imperative to remember that the costs presented are only estimates, and many factors can impact the bid prices submitted by prospective Project Contractors.

III. Snow Kreilich Architectural Concept Development (Option 1E)

In March 2018, the City of Edina engaged the services of Snow Kreilich Architects to review the Option 1D 95% design documents and provide conceptual alternatives for consideration by the City of Edina and the design team. Snow Kreilich met with City Council members, AE2S, Oertel Architects, and City Staff to discuss potential alternatives for modifications. Through these discussions an alternative layout was proposed and is illustrated in Figure 5 below. For the purposes of this TM this revision is considered Option 1E.

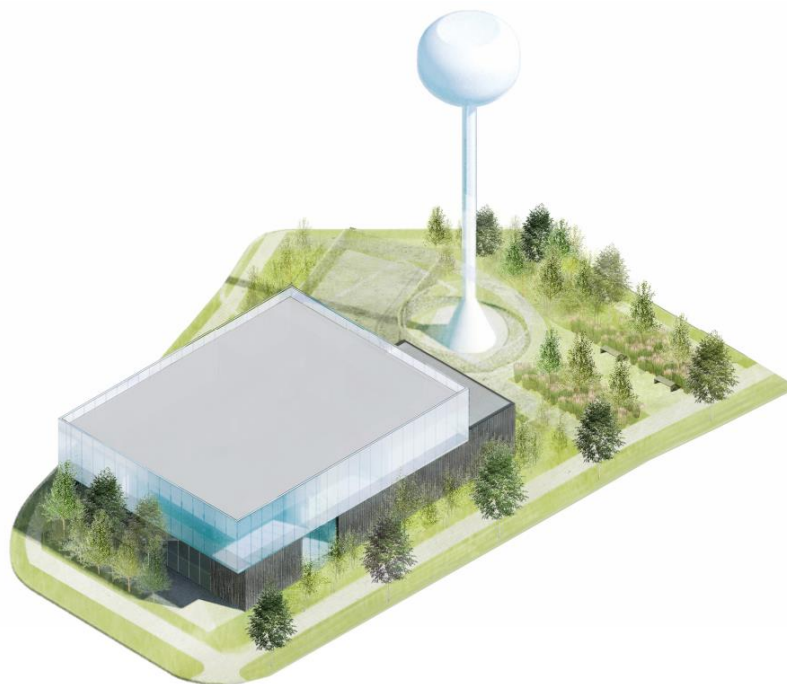


Figure 5 – Option 1E (NW View)

The revised renderings were reviewed by the design team and opinions of total probable project cost were developed to reflect the anticipated cost to construct the conceptual facility. The costs in Table 3 include engineering and construction phase services to revise the previous design and accommodate the proposed structural and architectural modifications. The engineering and construction phase services total also includes the \$1,043,300 of professional services expended to date.

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Table 3 – Option 1E Opinion of Probable Total Project Cost

Option	Facility Construction (Including 20% Contingencies)	Facility Integration	Engineering & Construction Phases	Total Project Cost
Option 1E	\$13,611,000	\$400,000	\$3,145,300	\$17,156,300

In addition to the construction cost estimate that was completed for this alternative, an operational evaluation was also completed to review the proposed floorplans and operational considerations that may impact the WTP design and future operation and maintenance by City staff. In general, the review comments reflect the professional opinions of the AE2S Project Team based on the available information. Detailed design may present additional challenges not identified in the preliminary concepts. Separation distances (only estimated based on the conceptual floorplans provided), revised Code review, and future Owner driven modifications may all further impact design. Images from the Snow Kreilich concept alternative are shown below to summarize the proposed changes. The left layout is the original design and the right layout are the proposed modifications for the First and Second floors. A cursory review of Option 1E is outlined in the following sections.



Figure 6 – Option 1E Snow Kreilich Concept Alternatives for 1st Floor

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Figure 7 – Option 1E Snow Kreilich Concept Alternatives for 2nd Floor

A. MECHANICAL EQUIPMENT AND VENTING CONSIDERATIONS

There are a significant number of exterior penetrations required to provide chemical venting, make-up air, HVAC features, etc. to the building to meet code requirements. The original design attempted to keep the equipment and vent penetrations off of the roof, by utilizing the vertical walls to accommodate the vent/louver systems. It appears that the lower level of the conceptual architectural rendering could still accommodate wall penetrations for chemical feed room venting, but the second level glass may necessitate that the other vents/louvers are directed through the roof. The appearance of the roof (especially from the adjacent Restoration Hardware and potential future high rise residences) has been a consistent topic of concern. Location of the visible mechanical appurtenances will need to be carefully managed.

Previous discussions with City staff and Officials had directed the team to avoid roof mounted equipment and/or penetrations whenever possible. The original design could likely locate any required mechanical equipment either within the building or hidden on the roof of the Garage, but there would need to be some provision for the vents/louvers.

B. GLASS MAINTENANCE AND LOGISTICAL CHALLENGES

Similar to the challenges noted with the mechanical equipment, the large amount of glass on the upper portion of the facility may create structural challenges for mounting and hanging piping and equipment inside of the building. A significant amount of mechanical piping, water piping, and electrical conduit will need to be installed within the facility to accommodate the needs of the required systems. Glass walls will not easily allow for equipment mounting and may increase construction costs.

In addition to the construction issues, there are also ongoing maintenance concerns. This facility will likely be very humid in the summer months. The humidity, together with the temperature differential, may cause fogging

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and condensation on the glass. Similarly, in the winter months the significant temperature differential and internal humidity may cause ice buildup around the glass that needs to be removed regularly.

C. OVERFLOWS

There are currently two (2) overflow pipes directed toward France Avenue. These overflow pipes are required by the Minnesota Department of Health and the elevation of the overflow pipes are critical, which was identified as a problematic design element. It should be considered how to best manage/hide the overflow pipes while still accommodating the architectural concepts. The discharge assemblies could likely be recessed into the structure, but we will still need to provide an outfall to the building exterior.

D. BUILDING EXITS

Building exits were a challenge for the team during meetings with the City Building Officials. The direction from the Building Officials to the design team was that the exits needed to lead directly to a “public way”, to provide the highest level of safety and security. During design meetings, the only area that was considered a “public way” was France Avenue. The future design will need to ensure that the exits lead directly to the “public way”, which may require additional doors on the west side of the building facing France Avenue.

E. SIMON PROPERTY REVIEW

The design/construction of a Water Treatment Plant on this property is subject to some level of review by representatives of Simon Properties. The primary item of concern indicated by Simon properties during design was the proximity of the northeast corner of the facility to the Southdale Ring Road. They have consistently reinforced the importance of maintaining the “maximum possible” separation distance to the Southdale Ring Road. The proposed revised concept encroaches on this corner and increases the depth of excavation near the road.

F. OFFICE/LAB AND ELECTRICAL ROOM MOVE TO THE SECOND LEVEL

In general, there are no technical restrictions with moving the office, lab, and electrical room to the Second Floor but it is important to consider the following items:

1. Electrical Room - Conduits would need to be cast in concrete to reach the second level. This would thicken one of the walls, but not otherwise impact design.
2. Electrical Room - Provisions should be considered for future access to install large, heavy electrical gear when removal/replacement is necessary. This may include wider walkways to move equipment to/from elevator, bridge crane access, or removal panels to the exterior.
3. Office/Laboratory - Most water samples will be collected on the main floor requiring operational staff to travel up and down the stairs frequently.

G. ADD ELEVATOR

The addition of an elevator would be necessary to meet Americans with Disabilities Act (ADA) Code requirements, since the Office and Laboratory spaces would be located on the Second Floor. If an elevator is added to the building it would be prudent to consider a freight elevator with the size and capacity to accommodate movement

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of electrical and process equipment. It would also be potentially beneficial to make the elevator a 3-stop elevator that could access 1) Ground Level, 2) Main Operating Floor, and 3) Upper Level.

H. DETENTION TANK

The Minnesota Department of Health will not allow the Detention Tank to be located above the Finished Water Clearwell (located on the below grade level). The conflict could likely be addressed by reconfiguring one or both basins, or potentially increasing the depth of excavation to maintain adequate Clearwell capacity. Another alternative may be to locate the Clearwell beneath the Filters, but this approach would significantly increase the depth of excavation immediately adjacent to the Southdale Ring Road potentially complicating construction and adding project cost. The capacity of the Detention Basin was increased slightly in the conceptual layout but that is not required. It is acceptable to increase the capacity to achieve architectural objectives, align walls, etc. But, increasing the capacity of the basin is not valuable to improving the treatment process.

I. MAIN FLOOR AREA SLIGHTLY SMALLER AND OPEN TO FRANCE

The High Service and Backwash Pumps (and related piping systems) are located (partially) in the space proposed for the relocated Detention Basin. AE2S would propose orienting the (relocated) Detention Basin from north to south, in the northwest corner of the facility. We acknowledge that this would eliminate the transparency/window facing France Avenue. But, we could relocate the transparency/window feature to the north face. The transparency/window could be wider and potentially taller and open up a viewing corridor that extended from north to south through much of the facility. The viewing location would also be located in an area of "slower" vehicle traffic. This adjustment, although a significant architectural change, would address much of our concern about the pumps/piping and the Clearwell item noted above.

Normally, we would discourage use of "glass" on the ground level of a Water Treatment Facility. It can compromise security and result in potentially expensive vandalism. However, we also understand the direction of the project in trying to achieve a level of transparency, so we would request consideration of reasonable measures to address safety/security.

J. MINIMIZED DRIVEWAY TO MAXIMIZE OPEN SITE

Review of the proposed turning radius appears to be adequate, but consideration should be given for a City truck parking while a chemical delivery truck is using most of the drive space to turn and access the garage.

K. RELOCATION OF THE GENERATOR AND TRANSFORMER

Consider the location of the Electrical equipment (specifically the transformer), currently proposed to be located immediately south of the Garage. The generator should have a minimum of 10-feet of clearance on all sides for airflow, as well as access for refueling. Typically the fuel access is on the side of the generator, but it would likely work to access the end of the generator, if it remained oriented as shown. The transformer needs to be located such that is accessible by the electrical utility (Xcel) and has at least 10-feet of clear space in front of the double doors. AE2S would recommend potentially locating the transformer to the south of the proposed generator and screening it with bushes. The transformer does not need to be located on a paved surface.

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L. MAIN ENTRANCE

The loading dock feature at the main entrance (when combined with the double doors) provided a valuable feature for future removal and replacement of equipment, for future maintenance. Losing the loading dock feature and transporting materials and equipment up/down stairs is less desirable.

M. PERIMETER FENCE

The perimeter fence around the building/property is not required, but typical for buildings of this nature. The decision for installation of any perimeter fence is at the discretion of the Owner depending on their concern for site safety/security. A fence may potentially reduce liability issues on City property.

IV. Dublin Site

The Water Supply Plan recently completed as part of the City's Comprehensive Plan update identified a fifth site option for WTP No. 5 that provided the opportunity to improve overall water system performance and better utilize the existing Dublin Reservoir. An amendment to the original PDR was prepared by AE2S to evaluate this site for the same non-financial and financial considerations analyzed for the original four sites. This report is named the WTP No. 5 Feasibility Study for the Dublin Reservoir Site.

The Dublin Site Feasibility Study identified two options; Option 5A and Option 5B. Each of these options would provide 3,000 gpm of treated capacity upon completion of the WTP construction, with Option 5A including gravity filtration and Option 5B including pressure filtration.

Discussions with City staff around finalizing a recommendation for the continued design of WTP No. 5 initiated the development of a third option for the Dublin Site. This option, referred to as Option 5C, would be a WTP that provides 4,000 gpm of treated capacity by bringing a fourth well to the site. Based on current water use projections into 2040, this option would provide additional filtered water capacity to meet all typical summer demands and reduce the likelihood of needing another water treatment plant in the future.

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V. Conclusions

The attached table summarizes the alternatives considered throughout the design of WTP No. 5. Ultimately, evaluation considered five (5) unique sites and various options for each site, including considerations for alternative treatment technology (gravity versus pressure filtration or traditional versus above grade plate settler backwash reclamation) and/or level of architectural investment.

Each alternative assumes a facility with a 3,000 gallon per minute (gpm) treatment capacity, except for Option 5C, which would provide a 4,000 gpm capacity. The costs presented in the attached table represent the “all-in” costs for constructing WTP No. 5. This responsibly compares each alternative to help the City understand the full investment required to construct the facility. For the Southdale, Yorktown, Median, and Fred Richards sites, costs include the development and routing of the third 1,000 gpm well to the proposed facility.

In general, each option is summarized by the following:

1. **Southdale Site** – Treatment of Wells No. 5, 18, and future Well No. 21
 - a. **Option 1A** – Gravity filtration with below grade, traditional backwash reclaim system.
 - b. **Option 1B** – Pressure filtration with below grade, traditional backwash reclaim system.
 - c. **Option 1C** – Gravity filtration with above grade plate settler backwash reclaim system.
 - d. **Option 1D** – Option 1C with upgraded architectural as of the 95% final design milestone.
 - e. **Option 1E** – Option 1C with enhanced architectural proposed by Snow Kreilich.
2. **Yorktown Site** – Treatment of Wells No. 5, 18, and future Well No. 21
 - a. **Option 2A** – Gravity filtration with below grade, traditional backwash reclaim system.
 - b. **Option 2B** – Pressure filtration with below grade, traditional backwash reclaim system.
3. **Median Site** – Treatment of Wells No. 5, 18, and future Well No. 21
 - a. **Option 3A** – Pressure filtration with below grade, traditional backwash reclaim system.
4. **Fred Richards Site** – Treatment of Wells No. 5, 18, and future Well No. 21
 - a. **Option 4A** – Gravity filtration with below grade, traditional backwash reclaim system.
 - b. **Option 4B** – Pressure filtration with below grade, traditional backwash reclaim system.
5. **Dublin Site** – Treatment of Wells No. 16, 19, and 20
 - a. **Option 5A** – Gravity filtration with below grade, traditional backwash reclaim system.
 - b. **Option 5B** – Pressure filtration with below grade, traditional backwash reclaim system.
 - c. **Option 5C** – Gravity filtration with below grade, traditional backwash reclaim system and a 4,000 gpm treated capacity.

Based on the attached table total project costs, Option 1C maintains the lowest comprehensive cost, but does not address the architectural concerns of the City council. Option 5A is approximately \$2.5M higher than Option 1C but provides the opportunity to better utilize the existing Dublin Reservoir and reduce water age within the City’s water distribution system. Additional cost savings may be realized with this option if portions of the project are timed with other infrastructure improvements such as roadway reconstruction or Citywide fiber installation. For an additional \$2.1M, the facility capacity could be increased to 4,000 gpm (Option 5C) to reduce the need for another water treatment plant in the foreseeable future.

Attachment: Edina WTP No. 5 Opinion of Probable Construction Cost

Edina WTP No. 5 Opinion of Probable Construction Cost													
Site Site Option Estimate Source	Southdale					York Town		Median	Fred Richards		Dublin		
	1A - Gravity Original PDR	1B - Pressure Original PDR	1C - Gravity* 95% Final Design	1D - Upgrade Southdale TM	1E - Snow Southdale TM	2A - Gravity Original PDR	2B - Pressure Original PDR	3A - Pressure Original PDR	4A - Gravity Original PDR	4B - Pressure Original PDR	5A - Gravity Dublin Study	5B - Pressure Dublin Study	5C - Gravity 4,000gpm Option
Subtotal 00/01 0000 Contracting and General Requirements	\$757,105	\$763,883	\$805,377	\$894,800	\$906,960	\$719,620	\$726,398	\$746,400	\$726,165	\$734,847	\$745,817	\$771,913	\$768,191
Subtotal 02 0000 Existing Conditions	\$40,000	\$40,000	\$10,000	\$10,000	\$10,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$20,000	\$20,000	\$20,000
Subtotal 03 0000 Concrete	\$1,680,000	\$1,332,800	\$2,234,656	\$2,455,856	\$1,891,000	\$1,680,000	\$1,332,800	\$1,330,000	\$1,680,000	\$1,332,800	\$2,485,600	\$1,909,580	\$2,592,800
Subtotal 04 0000 Masonry	\$262,250	\$262,250	\$103,001	\$103,001	\$127,221	\$262,250	\$262,250	\$262,250	\$262,250	\$262,250	\$129,387	\$82,987	\$129,387
Subtotal 05 0000 Metals	\$208,000	\$41,000	\$263,000	\$373,000	\$638,000	\$208,000	\$41,000	\$41,000	\$208,000	\$41,000	\$238,000	\$238,000	\$238,000
Subtotal 06 0000 Carpentry	\$44,000	\$44,000	\$48,810	\$48,810	\$48,810	\$44,000	\$44,000	\$44,000	\$44,000	\$44,000	\$30,600	\$18,000	\$30,600
Subtotal 07 0000 Thermal and Moisture Protection	\$218,800	\$202,800	\$299,650	\$322,635	\$126,840	\$218,800	\$202,800	\$202,800	\$218,800	\$202,800	\$213,000	\$213,000	\$213,000
Subtotal 08 0000 Doors and Windows	\$187,000	\$147,000	\$248,405	\$321,280	\$1,152,420	\$187,000	\$147,000	\$115,000	\$187,000	\$147,000	\$202,500	\$202,500	\$202,500
Subtotal 09 0000 Finishes	\$135,500	\$110,500	\$121,455	\$121,455	\$121,455	\$135,500	\$110,500	\$110,500	\$135,500	\$110,500	\$114,989	\$114,989	\$114,989
Subtotal 10 0000 Specialties	\$20,000	\$20,000	\$199,345	\$892,345	\$302,000	\$20,000	\$20,000	\$19,000	\$20,000	\$20,000	\$18,000	\$18,000	\$18,000
Subtotal 12 0000 Furnishings	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
Subtotal 21 0000 Fire Protection	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000
Subtotal 22 0000 Plumbing	\$150,000	\$150,000	\$150,000	\$150,000	\$250,000	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000
Subtotal 23 0000 Mechanical	\$300,000	\$300,000	\$300,000	\$325,000	\$500,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000
Subtotal 26 0000 Electrical	\$1,256,710	\$1,214,710	\$1,366,990	\$1,615,640	\$1,615,640	\$1,256,710	\$1,214,710	\$1,124,710	\$1,256,710	\$1,256,710	\$1,525,040	\$1,521,040	\$1,525,040
Subtotal 31 0000 Earthwork	\$1,090,000	\$1,090,000	\$520,000	\$520,000	\$620,000	\$460,000	\$460,000	\$1,500,000	\$340,000	\$330,000	\$420,000	\$420,000	\$420,000
Subtotal 32 0000 Exterior Improvements	\$200,000	\$200,000	\$290,000	\$300,000	\$360,000	\$200,000	\$200,000	\$290,000	\$410,000	\$410,000	\$140,000	\$140,000	\$140,000
Subtotal 33 0000 Utilities	\$100,000	\$100,000	\$200,000	\$200,000	\$200,000	\$100,000	\$100,000	\$120,000	\$120,000	\$120,000	\$100,000	\$100,000	\$100,000
Subtotal 40 0000 Process Integration	\$744,900	\$799,880	\$1,099,160	\$1,067,690	\$1,067,690	\$744,900	\$799,880	\$559,440	\$744,900	\$799,880	\$733,700	\$784,700	\$1,100,550
Subtotal 43 0000 Process Gas and Liquid Handling, Purification, and Storage Equipment	\$393,600	\$260,760	\$342,960	\$318,960	\$318,960	\$393,600	\$260,760	\$45,120	\$393,600	\$260,760	\$328,440	\$328,440	\$328,440
Subtotal 46 0000 Water and Wastewater Equipment	\$769,748	\$1,598,728	\$814,361	\$969,038	\$969,038	\$769,748	\$1,598,728	\$1,366,768	\$769,748	\$1,598,728	\$461,534	\$1,488,144	\$661,534
	\$8,608,000	\$8,728,000	\$9,467,000	\$11,060,000	\$11,276,000	\$7,940,000	\$8,061,000	\$8,417,000	\$8,057,000	\$8,211,000	\$8,407,000	\$8,871,000	\$9,103,000
Required Integration Costs													
Raw Water Pipeline	\$145,000	\$145,000				\$65,000	\$65,000	\$35,000	\$2,300,000	\$2,300,000	\$2,350,000	\$2,350,000	\$2,350,000
Raw Water Pipeline Premium Alignment on City ROW											\$450,000	\$450,000	\$450,000
Finished Water Pipeline	\$55,000	\$55,000	\$100,000	\$100,000	\$100,000	\$90,000	\$90,000	\$135,000	\$1,700,000	\$1,700,000	\$50,000	\$50,000	\$50,000
Sanitary and Storm Sewer Relocation						\$1,750,000	\$1,750,000	\$1,000,000					
Distribution System improvements						\$1,500,000	\$1,500,000						
Well 5 Rehab	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000			
Well 5 Conversion to Submersible			\$100,000	\$100,000	\$100,000								
Well 18 Rehab	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000			
Well 16 Rehab - CIP Allocated \$120,000 for Rehab in 2019													
Well 19 Rehab- CIP Allocated \$120,000 for Rehab in 2020													
Well 20 Rehab - Not Required to Meet Design Point													
Dublin Reservoir Reduction/Repurposing													
Concrete Removal											\$135,000	\$135,000	\$135,000
Void Wall Construction											\$150,000	\$150,000	\$150,000
Required Integration Subtotal	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$3,605,000	\$3,605,000	\$1,370,000	\$4,200,000	\$4,200,000	\$3,135,000	\$3,135,000	\$3,135,000
Applied Contingency (%)	15.0%	15.0%	2.5%	2.5%	20.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15%	15%	15%
Contingencies	\$1,351,000	\$1,369,000	\$247,000	\$287,000	\$2,335,000	\$1,732,000	\$1,750,000	\$1,468,000	\$1,839,000	\$1,862,000	\$1,731,000	\$1,801,000	\$1,836,000
Estimated Total WTP Construction Costs	\$10,359,000	\$10,497,000	\$10,114,000	\$11,747,000	\$14,011,000	\$13,277,000	\$13,416,000	\$11,255,000	\$14,096,000	\$14,273,000	\$13,273,000	\$13,807,000	\$14,074,000
Professional Services To Date (includes study, report, and design phases)	\$1,043,300	\$1,043,300	\$1,043,300	\$1,043,300	\$1,043,300	\$1,043,300	\$1,043,300	\$1,043,300	\$1,043,300	\$1,043,300	\$1,043,300	\$1,043,300	\$1,043,300
Engineering Design Phase Services Remaining (% of Construction Total)	10%	10%	*	*	10%	10%	10%	10%	10%	10%	10%	10%	10%
Remaining WTP Engineering Design Phase Services*	\$1,036,000	\$1,050,000	\$50,000	\$170,000	\$1,401,000	\$1,328,000	\$1,342,000	\$1,126,000	\$1,410,000	\$1,427,000	\$1,327,000	\$1,381,000	\$1,407,000
WTP Construction Phase Services	5%	\$518,000	\$506,000	\$587,000	\$701,000	\$664,000	\$671,000	\$563,000	\$705,000	\$714,000	\$664,000	\$690,000	\$704,000
Estimated Total Project Costs	\$12,956,300	\$13,115,300	\$11,713,300	\$13,547,300	\$17,156,300	\$16,312,300	\$16,472,300	\$13,987,300	\$17,254,300	\$17,457,300	\$16,307,300	\$16,921,300	\$17,228,300
Other Infrastructure Investments													
Previously Constructed Raw Watermain Piping to Southdale Site	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000					
Future Additional 1,000 gpm Well to Reach 3,000 gpm Facility	\$1,700,000	\$1,700,000	\$1,700,000	\$1,700,000	\$1,700,000	\$1,700,000	\$1,700,000	\$1,700,000	\$1,700,000	\$1,700,000			
Fourth Well Connection													\$1,200,000
Estimated "ALL IN" Infrastructure Investment	\$15,056,000	\$15,215,000	\$13,813,000	\$15,647,000	\$19,256,000	\$18,412,000	\$18,572,000	\$16,087,000	\$18,954,000	\$19,157,000	\$16,307,000	\$16,921,000	\$18,428,000
* Remaining Engineering Design Phase Services for Option 1C and 1D based on amount to complete design of current progress to the option extent.													
Optional Premium Costs													
Chlorine Scrubber								\$90,000			\$90,000	\$90,000	\$90,000
Dublin Reservoir Improvements													
FRP Baffling											\$410,000	\$410,000	\$410,000