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**Preliminary Cost Comparison**



Scenario 1: SBR Present Worth  
 King County DNRP  
 Carnation Wastewater Treatment Facility

Date: 2/9/2005  
 By: S. Leung  
 Checked: B. Einfeld

DESCRIPTION	QTY.	UNIT	UNIT PRICE	INSTALL	TOTAL
<b>Capital Costs</b>					
Mobilization	1	LS	\$650,000		\$650,000
<b>Sitework</b>					
Excavation	1	LS	\$360,000		\$360,000
Backfill	3,600	CY	\$30		\$108,000
Paving	31,250	SF	\$3		\$93,750
Misc. utilities	1	LS	\$200,000		\$200,000
Landscaping	1	LS	\$150,000		\$150,000
Fencing	2,700	LF	\$20		\$54,000
<b>Treatment Facility &amp; Lab/Admin Area</b>					
Base slab concrete	1,300	CY	\$300		\$390,000
Wall concrete	700	CY	\$600		\$420,000
Elevated concrete	100	CY	\$900		\$90,000
Screening Equipment	1	LS	\$250,000	\$30,000	\$280,000
Headworks Building	1,800	SF	\$100		\$180,000
Pre-engineered building	4,500	SF	\$40		\$180,000
Post-equalization basin	1	LS	\$10,000		\$10,000
SBR Equipment	1	LS	\$500,000	\$50,000	\$550,000
Filtration	1	LS	\$450,000	\$20,000	\$470,000
UV Disinfection	1	LS	\$450,000	\$40,000	\$490,000
Effluent standpipe equipment	1	LS	\$100,000		\$100,000
Lab Equipment	1	LS	\$100,000		\$100,000
Finish Lab/Admin Area	1,200	SF	\$50		\$60,000
Solids Handling	1	LS	\$600,000		\$600,000
Chemical storage	1	LS	\$100,000		\$100,000
HVAC	1	LS	\$100,000		\$100,000
Electrical and Controls (18% of total)	1	LS	\$1,152,100		\$1,152,100
<b>Odor Control</b>					
Scrubber	1	LS	\$400,000		\$400,000
Ductwork	1	LS	\$265,000		\$265,000
Estimating Contingency (10%)					\$755,300
Subtotal					\$8,308,150
Overhead and Profit @ 15%					\$1,246,200
Sales Tax (8.8%)					\$840,800
<b>Direct Construction Cost Subtotal</b>					<b>\$10,395,200</b>



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DESCRIPTION	QTY.	UNIT	UNIT PRICE	INSTALL	TOTAL
<b>Allied Costs</b>					
30% design					
30% design (10.5%)					\$1,091,000
Final design (12.5%)					\$1,300,000
CM Support Serv's (4%)					\$416,000
KC Admin and other allied costs					\$1,000,000
<b>Subtotal Allied Costs</b>					<b>\$3,807,000</b>
<b>Total WWTF Project Costs (July 2004)</b>					<b>\$14,202,200</b>
<b>Operations and Maintenance Costs</b>					
Labor*	2,080	HR	\$43		\$90,000
Energy	775,000	KWH	\$0.065		\$51,000
Maintenance Equipment/Structural	1	LS	\$102,500		\$102,500
Chemicals	1	LS	\$70,000		\$70,000
Miscellaneous	1	LS	\$20,000		\$20,000
<b>Total O&amp;M Costs (July 2004)</b>					<b>\$333,500</b>
<b>Present Worth, \$ in Millions</b>					
<b>Capital</b>					\$14.2
<b>Operations and Maintenance</b>					\$4.1
Discount Rate	5.875%				
Period of Analysis (2007 - 2030)	22	YR			
<b>Total Present Worth (July 2004)</b>					<b>\$18.3</b>

\* Labor estimate for WWTF independent of scenario



Scenario 2: Oxidation Ditch Present Worth  
 King County DNRP  
 Carnation Wastewater Treatment Facility

Date: 2/9/2005  
 By: S. Leung  
 Checked: B. Einfeld

DESCRIPTION	QTY.	UNIT	UNIT PRICE	INSTALL	TOTAL
<b>Capital Costs</b>					
Mobilization	1	LS	\$600,000		\$600,000
<b>Sitework</b>					
Excavation	1	LS	\$320,000		\$320,000
Backfill	3,200	CY	\$30		\$96,000
Paving	31,250	SF	\$3		\$93,750
Misc. utilities	1	LS	\$200,000		\$200,000
Landscaping	1	LS	\$150,000		\$150,000
Fencing	2,400	LF	\$20		\$48,000
<b>Treatment Facility &amp; Lab/Admin Area</b>					
Base slab concrete	1,200	CY	\$300		\$360,000
Wall concrete	600	CY	\$600		\$360,000
Elevated concrete	100	CY	\$900		\$90,000
Screening Equipment	1	LS	\$250,000	\$30,000	\$280,000
Headworks Building	1,800	SF	\$100		\$180,000
Pre-engineered building	4,500	SF	\$40		\$180,000
Secondary Clarifiers	2	LS	\$90,000	\$15,000	\$210,000
Oxidation Ditch Equipment	1	LS	\$450,000	\$50,000	\$500,000
Filtration	1	LS	\$450,000	\$20,000	\$470,000
UV Disinfection	1	LS	\$450,000	\$40,000	\$490,000
Effluent standpipe equipment	1	LS	\$100,000		\$100,000
Lab Equipment	1	LS	\$100,000		\$100,000
Finish Lab/Admin Area	1,200	SF	\$50		\$60,000
Solids Handling	1	LS	\$500,000		\$500,000
Chemical storage	1	LS	\$100,000		\$100,000
HVAC	1	LS	\$100,000		\$100,000
Electrical and Controls (18% of total)	1	LS	\$1,113,800		\$1,113,800
<b>Odor Control</b>					
Scrubber	1	LS	\$350,000		\$350,000
Ductwork	1	LS	\$250,000		\$250,000
Estimating Contingency (10%)					\$730,200
Subtotal					\$8,031,750
Overhead and Profit @ 15%					\$1,204,800
Sales Tax (8.8%)					\$812,800
<b>Direct Construction Cost Subtotal</b>					<b>\$10,049,400</b>



Scenario 2: Oxidation Ditch Present Worth  
 King County DNRP  
 Carnation Wastewater Treatment Facility

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DESCRIPTION	QTY.	UNIT	UNIT PRICE	INSTALL	TOTAL
<b>Allied Costs</b>					
30% design					
30% design (10.5%)					\$1,055,000
Final design (12.5%)					\$1,260,000
CM Support Serv's (4%)					\$402,000
KC Admin and other allied costs					\$1,000,000
<b>Subtotal Allied Costs</b>					<b>\$3,717,000</b>
<b>Total WWTF Project Costs (July 2004)</b>					<b>\$13,766,400</b>
<b>Operations and Maintenance Costs</b>					
Labor*	2,080	HR	\$43		\$90,000
Energy	780,000	KWH	\$0		\$51,000
Maintenance Equipment/Structural	1	LS	\$97,500		\$97,500
Chemicals	1	LS	\$70,000		\$70,000
Miscellaneous	1	LS	\$20,000		\$20,000
<b>Total O&amp;M Costs (July 2004)</b>					<b>\$328,500</b>
<b>Present Worth, \$ in Millions</b>					
Capital					\$13.8
Operations and Maintenance					\$4.0
Discount Rate	5.875%				
Period of Analysis (2007 - 2030)	22	YR			
<b>Total Present Worth (July 2004)</b>					<b>\$17.765</b>
* Labor estimate for WWTF independent of scenario					



Scenario 3: MBR Present Worth  
 King County DNRP  
 Carnation Wastewater Treatment Facility

Date: 2/9/2005  
 By: S. Leung  
 Checked: B. Einfeld

DESCRIPTION	QTY.	UNIT	UNIT PRICE	INSTALL	TOTAL
<b>Capital Costs</b>					
Mobilization	1	LS	\$500,000		\$500,000
<b>Sitework</b>					
Excavation	1	LS	\$200,000		\$200,000
Backfill	2,000	CY	\$30		\$60,000
Paving	25,000	SF	\$3		\$75,000
Misc. utilities	1	LS	\$200,000		\$200,000
Landscaping	1	LS	\$100,000		\$100,000
Fencing	1,500	LF	\$20		\$30,000
<b>Treatment Facility &amp; Lab/Admin Area</b>					
Base slab concrete	700	CY	\$300		\$210,000
Wall concrete	350	CY	\$600		\$210,000
Elevated concrete	100	CY	\$900		\$90,000
Screening Equipment	1	LS	\$250,000	\$30,000	\$280,000
Headworks Building	1,800	SF	\$100		\$180,000
Pre-engineered building	4,500	SF	\$40		\$180,000
Metal roof structure over membrane area	5,000	SF	\$30		\$150,000
MBR Treatment equipment	1	LS	\$1,155,580	\$300,000	\$1,455,580
Aeration system	1	LS	\$150,000	\$50,000	\$200,000
UV Disinfection	1	LS	\$300,000	\$30,000	\$330,000
Effluent standpipe equipment	1	LS	\$100,000		\$100,000
Lab Equipment	1	LS	\$100,000		\$100,000
Finish Lab/Admin Area	1,200	SF	\$50		\$60,000
Chemical storage	1	LS	\$100,000		\$100,000
HVAC	1	LS	\$100,000		\$100,000
Electrical and Controls (18% of total)	1	LS	\$973,900		\$973,900
<b>Odor Control</b>					
Scrubber	1	LS	\$300,000		\$300,000
Ductwork	1	LS	\$200,000		\$200,000
Estimating Contingency (10%)					\$638,400
Subtotal					\$7,022,880
Overhead and Profit @ 15%					\$1,053,400
Sales Tax (8.8%)					\$710,700
<b>Direct Construction Cost Subtotal</b>					<b>\$8,787,000</b>



Scenario 3: MBR Present Worth  
 King County DNRP  
 Carnation Wastewater Treatment Facility

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 By: S. Leung  
 Checked: B. Einfeld

DESCRIPTION	QTY.	UNIT	UNIT PRICE	INSTALL	TOTAL
<b><u>Allied Costs</u></b>					
Consultant services					
30% design (10.5%)					\$923,000
Final design (12.5%)					\$1,100,000
CM Support Serv's (4%)					\$351,000
KC Admin and other allied costs					\$1,000,000
<b>Subtotal Allied Costs</b>					<b>\$3,374,000</b>
<b>Total WWTF Project Costs (July 2004)</b>					<b>\$12,161,000</b>
<b><u>Operations and Maintenance Costs</u></b>					
Labor*	2,080	HR	\$43		\$90,000
Energy	1,200,000	KWH	\$0.065		\$78,000
Maintenance Equipment/Structural	1	LS	\$129,340		\$129,340
Chemicals	1	LS	\$72,000		\$72,000
Miscellaneous	1	LS	\$20,000		\$20,000
<b>Total O&amp;M Costs (July 2004)</b>					<b>\$389,340</b>
<b><u>Present Worth, \$ in Millions</u></b>					
Capital					\$12.2
Operations and Maintenance					\$4.7
Discount Rate	5.875%				
Period of Analysis (2007 - 2030)	22	YR			
<b>Total Present Worth (July 2004)</b>					<b>\$16.9</b>
* Labor estimate for WWTF independent of scenario					