

Alternative 1: Disinfection

Evaluate present worth costs of a new UV disinfection system relative to the existing chlorine gas disinfection system (and dechlorination).

Chlorine Contact Tanks:

Number:	2 (existing)	
Length:	23.50 ft	
Width:	10.67 ft	
Depth:	13.67 ft	
Volume:	51,256 gal	CCT
Volume:	27,470 gal	reaeration
Total CCT Volume:	78,726 gal	
MMAF:	4.73 MGD	
PHF:	8.59 MGD	
Contact Period:	23.97 min	(@ MMAF; >30)
	13.20 min	(A PHF; > 15)

Chlorinators:

Number:	2	
Capacity:	200 lb/day	(each)
	400 lb/day	(total)
Dosage:	10 ppm	
	394 lb/day	(MMAF)
	716 lb/day	(PHF)

New CCT tank and chlorination equipment required for expansion.

Present Worth Analysis

Install New UV System in Existing Chlorine Contact Tank

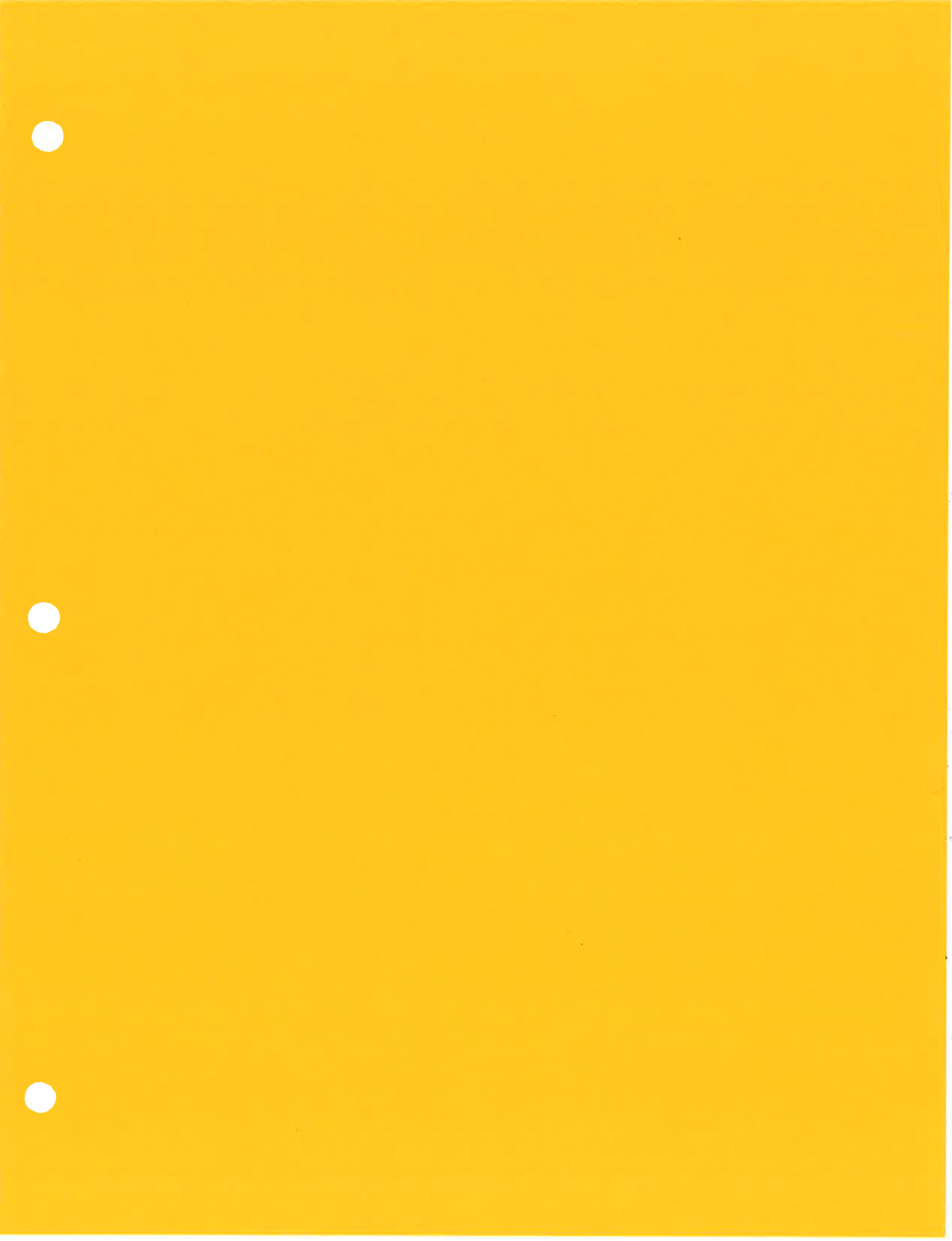
UV System	\$ 344,000.00	
		<i>(\$225,000 from Trojan, 15% Markup, 25% Installation; +10% inflationary factor)</i>
CCT Channel Modification	\$ 50,000.00	
Total:	\$ 394,000.00	
Total Annual O&M Cost:	\$ 15,752.81	
Present Worth (20-Yr; 3%)	\$ 234,362.06	
Total Cost:	\$ 628,362.06	

New CCT

Structure	\$ 108,000.00	
Piping/Weirs	\$ 30,000.00	(assumed)
Additional Cl ₂ /Dechlor Equipment:	\$ 60,000.00	(assumed)
Total:	\$ 198,000.00	
Chlorine/Bisulfate	\$ 128.35 /day	(EPA cost guidance)
	\$ 46,848.70 /yr	
Present Worth (20-Yr; 3%)	\$ 696,990.34	
Total Cost:	\$ 894,990.34	

SELECTED ALTERNATIVE: Construct a new UV System installed within the UV Channel

Basis for evaluation and projected costs is a Trojan UV3000Plus





OPINION OF PROBABLE CONSTRUCTION COST

Date: January 8, 2010 Computed By: MDW
 Project Number: 7026.00 Checked By: _____
 Project Name: Amity Twp - STP: Act 537 Plan
ALTERNATIVE 2 (1 of 2)

Item No.	Description	Qty.	Unit	Unit Price	Total Cost
1	Site Work and Demolition	1	L.S.	\$ 300,000.00	\$ 300,000.00
2	Additional Yard and Process Piping	1	L.S.	\$ 400,000.00	\$ 400,000.00
3	Construct new Headworks				
3a	Building	1	L.S.	\$ 320,000.00	\$ 320,000.00
3b	Construct 1 new Grit Separator				
3c	Equipment	1	L.S.	\$ 216,000.00	\$ 216,000.00
3d	Structural Components	1	L.S.	\$ 25,000.00	\$ 25,000.00
3e	Construct 1 new Screening Unit				
3f	Structural Components	1	L.S.	\$ 25,000.00	\$ 25,000.00
3g	Equipment	1	L.S.	\$ 223,000.00	\$ 223,000.00
4	Convert EQ Basin to Activated Sludge Lagoon				
4a	Aerators and Process Control System	1	L.S.	\$ 485,000.00	\$ 485,000.00
4b	Interior Basin Wall	1	L.S.	\$ 170,000.00	\$ 170,000.00
4c	Replace EQ Basin Liner	1	L.S.	\$ 250,000.00	\$ 250,000.00
4d	Aerator Mooring Equipment	1	L.S.	\$ 30,000.00	\$ 30,000.00
4e	Modifications to Flow D-Box 1	1	L.S.	\$ 50,000.00	\$ 50,000.00
4f	New Lagoon Effluent PS	1	L.S.	\$ 180,000.00	\$ 180,000.00
5	Construct 1 New 50-ft Diameter Final Clarifier				
5a	Structure	1	L.S.	\$ 198,000.00	\$ 198,000.00
5b	Equipment	1	L.S.	\$ 172,000.00	\$ 172,000.00
5c	Scump Pump	1	L.S.	\$ 20,000.00	\$ 20,000.00
5d	Retaining Wall	1	L.S.	\$ 50,000.00	\$ 50,000.00
6	Install New RAS and WAS Pumps and Pit				
6a	Structure	1	L.S.	\$ 25,000.00	\$ 25,000.00
6b	Pumps	1	L.S.	\$ 25,000.00	\$ 25,000.00
7	Convert All Primaries Clarifiers to Aerobic Digesters				
7a	Demolition/Structural Work	1	L.S.	\$ 45,000.00	\$ 45,000.00
7b	Diffusers, Air Headers and other Mechanical Equipment	1	L.S.	\$ 140,000.00	\$ 140,000.00
7c	Addition Digester Blower(s)	1	L.S.	\$ 60,000.00	\$ 60,000.00
8	Convert An. Digesters to Aerated Tanks				
8a	Demolition/Structural Work	1	L.S.	\$ 100,000.00	\$ 100,000.00
8b	Diffusers and other Mechanical Equipment	1	L.S.	\$ 140,000.00	\$ 140,000.00

Alternative 2: Disinfection

Evaluate present worth costs of a new UV disinfection system relative to the existing chlorine gas disinfection system (and dechlorination).

Chlorine Contact Tanks:

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Width:	10.67 ft	
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Volume:	51,256 gal	CCT
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MMAF:	4.73 MGD
PHF:	8.59 MGD

Contact Period:	23.97 min	(@ MMAF; >30)
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Chlorinators:

Number:	2	
Capacity:	200 lb/day	(each)
	400 lb/day	(total)
Dosage:	10 ppm	
	394 lb/day	(MMAF)
	716 lb/day	(PHF)

New CCT tank and chlorination equipment required for expansion.

Present Worth Analysis

Install New UV System in Existing Chlorine Contact Tank

UV System	\$ 344,000.00	
		<i>(\$225,000 from Trojan, 15% Markup, 25% Installation; +10% inflationary factor)</i>
CCT Channel Modification	\$ 50,000.00	
Total:	\$ 394,000.00	

Total Annual O&M Cost:	\$ 15,752.81
Present Worth (20-Yr; 3%)	\$ 234,362.06

Total Cost:	\$ 628,362.06
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New CCT

Structure	\$ 108,000.00	
Piping/Weirs	\$ 30,000.00	(assumed)
Additional Cl ₂ /Dechlor Equipment:	\$ 60,000.00	(assumed)
Total:	\$ 198,000.00	

Chlorine/Bisulfate	\$ 128.35 /day	(EPA cost guidance)
	\$ 46,848.70 /yr	
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Total Cost:	\$ 894,990.34
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SELECTED ALTERNATIVE: Construct a new UV System installed within the UV Channel

Basis for evaluation and projected costs is a Trojan UV3000Plus

Alternative 2: Sludge Dewatering

Demolish reed beds (footprint for new oxidation ditch) and compare a new centrifuge dewatering unit to the existing belt filter press unit to reduce operator time.

Sludge Loading		3,518 lb/day	(dry solids)
Capacity		600 lb/hr	(dry solids)
Operation (at Plant Capacity)		5.86 hr/day	
New Centrifuge Dewatering System			
Centrifuge	\$	400,000.00	
Modifications to Digested Sludge Transfer Pumps:	\$	40,000.00	
Modifications to Polymer System:	\$	20,000.00	
Operational Savings:			
Centrifuge Operation		2.00 hr/day	
Belt Press Operation		5.86 hr/day	
Additional		3.86 hr/day	
Operator Cost	\$	30 /hr	
	\$	116 /day	
	\$	42,311 /yr	
Present Worth (20-Yr; 3%)	\$	629,488	

SELECTED ALTERNATIVE: Install Centrifuge Dewatering Unit (basis of evaluation and cost analysis is Alfa Laval).





OPINION OF PROBABLE CONSTRUCTION COST

Date: January 8, 2010 Computed By: MDW
 Project Number: 7026.00 Checked By: _____
 Project Name: Amity Twp - STP: Act 537 Plan
ALTERNATIVE 3 (1 of 2)

Item No.	Description	Qty.	Unit	Unit Price	Total Cost
1	Site Work and Demolition	1	L.S.	\$ 300,000.00	\$ 300,000.00
2	Additional Yard and Process Piping	1	L.S.	\$ 350,000.00	\$ 350,000.00
3	Construct new Headworks				
3a	Building	1	L.S.	\$ 320,000.00	\$ 320,000.00
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3g	Equipment	1	L.S.	\$ 223,000.00	\$ 223,000.00
4	Convert EQ Basin to Activated Sludge Lagoon				
4a	Aerators and Process Control System	1	L.S.	\$ 357,000.00	\$ 357,000.00
4b	Interior Basin Wall	1	L.S.	\$ 170,000.00	\$ 170,000.00
4c	Replace EQ Basin Liner	1	L.S.	\$ 250,000.00	\$ 250,000.00
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4e	Modifications to Flow D-Box 1	1	L.S.	\$ 50,000.00	\$ 50,000.00
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