

Appendix 4 Financial Analysis

Present value calculations of TWI Hennepin Levee District restoration project. Discount rate = 0.03. Number of years = n = 20.

Table A4-1 Present Value Prices for TWI's Hennepin Floodplain Restoration

Year	One Shot Payments	CREP Land Rentals	Present Value of CREP Land Rentals	Other Federal and State payments	Present Value of Other Payments	Restoration
2001	2,265,311	148,320	148,320			-238,824
2002		222,480	216,000	50,000	48,544	-955,296
2003		222,480	209,709	200,000	188,519	-636,864
2004		222,480	203,601	440,000	402,662	-238,824
2005		222,480	197,671	460,000	408,704	-79,608
2006		222,480	191,913	200,000	172,522	-23,882
2007		222,480	186,323	370,000	309,869	
2008		222,480	180,897	370,000	300,844	
2009		222,480	175,628	370,000	292,081	
2010		222,480	170,512	120,000	91,970	
2011		222,480	165,546	20,000	14,882	
2012		222,480	160,724	20,000	14,448	
2013		222,480	156,043	20,000	14,028	
2014		222,480	151,498	20,000	13,619	
2015		222,480	147,085	20,000	13,222	
2016				20,000	12,837	
2017				20,000	12,463	
2018						
2019						
2020						
Total	\$2,265,311.00	\$3,263,040.00	\$2,661,470.35	\$2,720,000.00	\$2,311,215.32	\$2,173,298.00

Table A4-1 Present Value Prices for TWI's Hennepin Floodplain Restoration (Cont.)

Year	Present Value of Restoration Costs	O&M and Administration	Bond Property Purchase	Bond Proceeds	Bond Interest	Present Value of Bond Interest
2001	-238,824	-92,876	-4,569,460	5,000,000	-166,667	-166,667
2002	-927,472	-92,876			-250,000	-242,718
2003	-600,305	-92,876			-250,000	-235,649
2004	-218,558	-92,876			-250,000	-228,785
2005	-70,731	-92,876			-250,000	-222,122
2006	-20,601	-92,876			-175,000	-150,957
2007		-92,876			-165,000	-138,185
2008		-92,876			-155,000	-126,029
2009		-92,876			-145,000	-114,464
2010		-92,876			-135,000	-103,466
2011		-92,876			-125,000	-93,012
2012		-92,876			-115,000	-83,078
2013		-92,876			-105,000	-73,645
2014		-92,876			-95,000	-64,690
2015		-92,876			-85,000	-56,195
2016		-92,876			-75,000	-48,140
2017		-92,876			-62,500	-38,948
2018		-92,876			-50,000	-30,251
2019		-92,876			-37,500	-22,027
2020		-92,876			-25,000	-14,257
Total	\$2,076,490.54	-\$1,857,520.00	\$4,569,460.00	\$5,000,000.00	-\$2,716,667.00	-\$2,253,286.14

(Cont.)

Year	Letter of Credit	Present Value of Letter of Credit	Residual Fund Interest	Present Value of Residual Fund Interest	Purchases	Present Value of Purchases
2001	-33,333	-33,333	42,428	42,428	-493,210	-493,210
2002	-50,000	-48,544	152,683	148,236	-246,200	-239,029
2003	-50,000	-47,130	156,610	147,620		
2004	-50,000	-45,757	186,016	170,231		
2005	-40,000	-35,539	219,882	195,362		
2006	-28,000	-24,153	137,826	118,890		
2007	-26,400	-22,110	151,543	126,915		
2008	-24,800	-20,165	166,905	135,709		
2009	-23,200	-18,314	184,020	145,267		
2010	-21,600	-16,555	190,002	145,621		
2011	-20,000	-14,882	193,876	144,262		
2012	-18,400	-13,293	198,757	143,586		
2013	-16,800	-11,783	204,708	143,578		
2014	-15,200	-10,350	211,800	144,225		
2015	-13,600	-8,991	220,108	145,517		
2016	-12,000	-7,702	215,248	138,160		
2017	-10,000	-6,232	207,764	129,472		
2018	-8,000	-4,840	199,437	120,663		
2019	-6,000	-3,524	191,511	112,493		
2020	-4,000	-2,281	184,012	104,939		

Total -\$471,333.00-**\$395,478.18** \$3,615,136.00**\$2,703,173.74** -\$739,410.00-**\$732,239.13**

Table A4-1 Present Value Prices for TWI's Hennepin Floodplain Restoration (Cont.)

Year	Debt Service	Bond Repayment	Present Value of Bond Repayment	Barge Mooring Rentals	Private Sector Fund Raising
2001	-3,588,000			10,000	1,000,000
2002				15,000	900,000
2003				15,000	700,000
2004				15,000	500,000
2005		-1,500,000	-1,293,913	15,000	300,000
2006		-200,000	-167,497	15,000	100,000
2007		-200,000	-162,618	15,000	100,000
2008		-200,000	-157,882	15,000	100,000
2009		-200,000	-153,283	15,000	100,000
2010		-200,000	-148,819	15,000	100,000
2011		-200,000	-144,484	15,000	100,000
2012		-200,000	-140,276	15,000	100,000
2013		-200,000	-136,190	15,000	100,000
2014		-200,000	-132,224	15,000	100,000
2015		-200,000	-128,372	15,000	100,000
2016		-250,000	-155,792	15,000	100,000
2017		-250,000	-151,254	15,000	100,000
2018		-250,000	-146,849	15,000	100,000
2019		-250,000	-142,572	15,000	100,000
2020		-500,000	-276,838	15,000	100,000
Total	-\$3,588,000.00	-\$5,000,000.00	-\$3,638,862.64	\$295,000.00	\$4,900,000.00

Table A4-2 TWI's Present Value Income and Expenses

Scenario 1	Income	Expenses
Interest Rate	\$2,265,311.00	-\$2,076,490.54
0.03	\$2,661,470.35	-\$1,857,520.00
	\$2,311,215.32	-\$4,569,460.00
	\$5,000,000.00	-\$2,253,286.14
	\$2,703,173.74	-\$395,478.18
		-\$732,239.13
		-\$3,588,000.00
		-\$3,638,862.64
Total Income	\$14,941,170.42	Total Cost-\$19,111,336.61
		-\$4,170,166.20

Annualized cost calculations for TWI's Hennepin Levee District floodplain restoration. Present value numbers are taken from the tables above. Discount rate = 0.03. The calculations use a 20 year time horizon.

Scenario 1 (Section 3.3.3)

Present value cost of restoration = **\$4,139,207**

Annualized cost of restoration = **\$278,219.73**

Annualized cost per ton = **\$563.20**

Scenario 2 (Section 3.3.3)

Present value cost of restoration = **\$19,080,377**

Annualized cost of restoration = **\$1,282,501.04**

Annualized cost per ton = **\$2596.16**

Scenario 3 (Section 3.3.3)

Table A4-2. Annualized cost comparison for hypothetical nitrate credit trading between TWI and a wastewater treatment facility. (Same table as 3.3.3-1)

	TWI		Treatment Facility
<i>Cost per ton reduced</i>	\$2596	<i>Cost per ton reduced</i>	\$36,000
<i>Tons reduced</i>	494	<i>Tons reduced</i>	494
<i>Net costs</i>	\$1,282,424	<i>Cost of nitrate reduction without trade</i>	\$17,784,000
<i>Tons sold</i>	494	<i>Tons purchased</i>	494
<i>Sale price</i>	\$16,702	<i>Purchase price</i>	\$16,702
<i>Gross revenue</i>	\$8,250,788	<i>Cost of nitrate reduction with trade</i>	\$8,250,788
<i>Net revenue</i>	\$6,968,364	<i>Net savings</i>	\$9,533,212

Present value of TWI net revenue stream over twenty years = \$103,671,660.20.

Present value per ton = \$103,671,660.20/(494 x 20) = \$10,493.08.

Equations:

Present value calculation: $PV = (B/r)((1-(1/(1+r)^n))$

Annualized calculation: $B \text{ (or C)} = (PVr)/((1-(1/(1+r)^n))$

Present Value = PV

B = Value of a benefit before discounting.

C = Value of a cost before discounting.

r = Discount rate

n = the year in which the benefit or cost occurs.