

## Basis of Design Report - Tables

**Table 2-2. Lower Fox River Locks and Dams**

Lock	Lock Water Elevation <sup>c</sup>		Dam	Dam Water Elevation <sup>c</sup>		Distance Upstream	
	(meters <sup>a</sup> )	(feet <sup>a</sup> )		(meters <sup>a</sup> )	(feet <sup>a</sup> )	Km	Miles
Lake Winnebago	227.3	745.8		227.3	745.8	62.8	39.0
			Neenah Dam <sup>b</sup>	NA	NA	61.5	38.2
Menasha	227.3	745.8	Menasha Dam	227.3	745.8	59.5	37.0
Appleton Lock 1	224.4	736.1	Appleton Upper (Vulcan) Dam	224.4	736.1	51.3	31.9
Appleton Lock 2	221.9	728.1	Appleton Middle Dam <sup>b</sup>	NA	NA	50.9	31.6
Appleton Lock 3	218.5	716.8				50.4	31.3
Appleton Lock 4	215.5	707.0	Appleton Lower Dam	215.5	707.0	49.4	30.7
Cedars Lock	213.2	699.4	Cedars (Kimberly) Dam	213.2	699.4	43.9	27.3
Little Chute Guard Lock	210.2	689.6	Little Chute Dam	210.2	689.6	42.8	26.6
Little Chute Lock 2	210.2	689.6				42.5	26.4
Upper Combined Lock	206.0	676.0	Combined Locks	NA	NA	40.9	25.4
Lower Combined Lock	202.8	665.4				40.9	25.4
Kaukauna Guard Lock	199.2	653.5	Kaukauna Dam	199.2	653.5	38.6	24.0
Kaukauna Lock 1	199.2	653.5	Middle Kaukauna Dam <sup>b</sup>	Abandoned		38.0	23.6
Kaukauna Lock 2	196.1	643.2	Lower Kaukauna <sup>b</sup>	NA	NA	37.7	23.4
Kaukauna Lock 3	193.1	633.6				37.3	23.2
Kaukauna Lock 4	190.0	623.4				37.2	23.1
Kaukauna Lock 5	186.9	613.2				36.7	22.8
Rapide Croche Lock	183.7	602.8	Rapide Croche	183.7	602.8	30.9	19.2
Little Rapids(Little Kaukauna) Lock	180.9	593.5	Little Rapids(Little Kaukauna) Dam	180.9	593.5	21.1	13.1
De Pere Lock	179.0	587.4	De Pere Dam	179.0	587.4	11.4	7.1
Green Bay (River Mouth)	176.0	577.5	Green Bay (River Mouth)	176.0	577.5	0.0	0.0

Notes: Information obtained from the USACE and from the NOAA Recreational Atlas 14916 (1992).

a. IGLD - International Great Lakes Datum, 1985

b. Distance Upstream is Approximate; scaled from WDNR Dam Safety program interactive map (<http://maps.dnr.state.wi.us/dams/viewer.htm>)

c. Water elevations represent water level on the upstream side of the structure

NA: Not Available.

**Table 2-11A. Summary of Consolidation Test Results by SIC Method**

Sample ID	Top Sample Depth	Bottom Sample Depth	Average Sample Depth	Sand (%)	Silt/Clay (%)	Consolidation Model Parameters				
	(ft)	(ft)	(ft)			$e = A(\sigma' + Z)^B$ $k = Ce^D$				
						A	B	Z(kPa)	C (cm/sec)	D
3014-21	0.5	2.5	1.5	7.5	92.5	5.03	-0.221	0.037	1.60E-11	3.36
3018-02	0.5	2	1.3	4.7	95.3	3	-0.137	0.073	5.91E-11	7.32
3044-02	1	3	2	12.1	87.9	4.39	-0.186	0.026	1.15E-11	4.44
3056-02	0.5	2.5	1.5	26.3	73.8	3.84	-0.177	0.02	2.76E-11	3.42
3067-02	0	1	0.5	17.6	82.4	5.06	-0.2	0.09	1.08E-11	4.1
4020-12	1	3	2	40.5	59.5	4.32	-0.156	0.076	4.90E-12	6.55
4030-04	1	3	2	39.4	60.6	5.04	-0.188	0.304	1.30E-11	5.7
4042-02	0	1.5	0.8	46.1	53.9	3.55	-0.187	0.076	5.30E-11	5.31
4046-02	0	6	3	29.7	70.3	4.65	-0.173	0.055	1.40E-11	3.99
4062-03	2	4	3	5.7	94.3	4.04	-0.211	0.006	5.40E-11	3.5
4067-01	0	2	1	15.6	84.4	2.31	-0.245	0.031	2.00E-09	3.3
CNST-301	Composite			32	68	32	68	0.086	7.60E-11	4.05
CNST-302	Composite			20	78.9	20	78.9	0.006	2.00E-10	3.35
CNST-401	Composite			63.5	36.5	63.5	36.5	0.452	7.20E-11	5.17
CNST-402	Composite			44.5	55.5	44.5	55.5	0.028	3.90E-11	3.24

Note: All samples collected as part of Shaw/Anchor RD investigations (Shaw/Anchor 2004 and 2005). Method used: Seepage-Induced Consolidation Test (Liu and Znidarcic 1991).

**Table 3-6. Summary of Recent Water Quality Data in the Lower Fox River**

Survey	Location	Total Suspended Solids (mg/L)				PCB Concentration (ng/L)						
		Number of Samples	Baseflow Average	Mean (All Events)	Standard Deviation	Number of Samples	Mean (Dissolved)	Standard Deviation (Dissolved)	Mean (Particulate)	Standard Deviation (Particulate)	Mean (Total)	Standard Deviation (Total)
1994-95 Lake Michigan Mass Balance Study Tributary Data	Fox River Mouth	68	N/A	32	16	42	15.0	7.8	41.5	25.7	56.5	32.2
1998 FRG Fox River Sediment, Surface Water and Biota Surveys	Fox River Little Lake Butte Des Morts	10	N/A	16	11	10	10.1	4.7	13.3	6.7	23.4	9.7
	Fox River: De Pere Dam to Kaukauna	10	N/A	21	10	10	9.9	3.2	13.2	5.0	23.0	6.6
	Above De Pere Dam	20	N/A	48	30	20	14.7	11.8	23.6	10.9	38.3	21.1
	Downstream of Highway 172 Bridge	21	N/A	37	27	21	15.4	10.4	22.6	11.2	38.0	18.9
	Mouth of Fox River	20	N/A	40	24	20	13.6	6.7	21.4	8.0	35.0	10.9
2000-01 FRG Fox River Surface Water Surveys (lab data)	Neenah Channel	8	15	19	18	12	2.0	1.1	1.8	0.9	3.1	2.1
	Menasha Channel	6	17	17	15	6	1.9	1.1	2.7	1.9	2.8	2.7
	LLBDM Outlet	9	9	17	11	9	2.8	2.1	4.3	2.8	6.6	4.7
	Appleton	14	20	20	14	14	3.3	2.1	3.9	3.0	7.2	4.8
	Kaukauna	10	16	16	11	10	4.1	2.5	3.7	2.4	7.7	4.8
	Little Rapids	11	20	26	21	11	3.8	2.5	4.2	2.8	7.6	4.0
	Upstream of De Pere Dam	14	19	31	20	14	3.9	2.3	6.6	4.8	10.5	6.6
	De Pere STP	11	24	39	47	11	7.4	5.8	13.7	8.1	20.4	12.9
	Upstream of Ft. Howard	10	26	42	51	10	6.8	5.6	12.2	7.8	19.0	12.5
	Downstream of East River	11	23	36	43	11	8.3	7.8	12.7	8.3	20.9	14.1
Upstream of Mouth	14	20	28	18	14	9.3	6.8	17.8	12.1	27.1	17.7	
<b>TOTAL</b>		267				245						

**Table 4-1  
Summary of ROD Remedy Disposal Requirements**

Alternative	OU	<i>In Situ</i> Sediment Dredged (CY) <sup>a</sup>	Sand Separated for Beneficial Reuse (CY) <sup>b</sup>	Material Dewatered to 50% Solids Without Amendment <sup>(c)</sup>			Material Dewatered to 50% Solids With Lime Amendment <sup>(d)</sup>		
				Total Volume (CY)	Total Weight (Tons)	Tons/CY Factor	Total Volume (CY)	Total Weight (Tons)	Tons/CY Factor
<b>Non TSCA</b>									
Hydraulic Dredging and Pumping to NR 213 Settling Basin	2	81,000	---	46,000	55,000	1.20	55,000 <sup>(e)</sup>	65,000 <sup>(e)</sup>	1.18
	3, 4, 5	7,268,000	530,000	3,448,000	4,083,000	1.18	4,050,000 <sup>(e)</sup>	4,808,000 <sup>(e)</sup>	1.19
Subtotal	2-5	7,349,000	530,000	3,494,000	4,138,000	1.18	4,105,000	4,873,000	1.19
with 15% contingency				4,018,000 <sup>(g)</sup>	4,759,000 <sup>(g)</sup>		4,721,000 <sup>(g)</sup>	5,604,000 <sup>(g)</sup>	
<b>TSCA</b>									
Mechanical Dredging with amendment	4	210,000	---	---	---		233,000 <sup>(f)</sup>	279,000 <sup>(f)</sup>	1.20
with 15% contingency							268,000 <sup>(g)</sup>	321,000 <sup>(g)</sup>	

<sup>a</sup> From Anchor Env. Volume estimates as of Jan. 6, 2006. Assumes *in situ* solids of 32.8% for OU 2-3 and 35.5% for OU4-5. Specific gravity is 2.43.

<sup>b</sup> Assumes sand removal of 25% dry weight basis, sand specific gravity of 2.65, and sand porosity of 0.43.

<sup>c</sup> Material quantities used for estimation of dewatering, load-out, and transportation costs.

<sup>d</sup> Material quantities used for estimation of landfill sizing.

<sup>e</sup> Assumes passive dewatering to 42.8% solids, then 5% lime amendment to achieve 50% solids prior to landfilling.

<sup>f</sup> Assumes 15% lime amendment and 50% solids after lime treatment.

<sup>g</sup> Estimated tonnages and volumes of landfilled material are adjusted with a 15% contingency to compensate for uncertainty in sediment properties and dewatering outcomes.

**Table 4-2. Summary of Modified Elutriate Test Results, 1-Day Settling Time**

SAMPLE ID		TOC	DO	TSS	Turb	NH4 (N)	BOD	Hard	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Silver	Zinc	Tot PCBs Congener	Tot PCBs Aroclor															
		mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ng/L	ug/L	ug/L	ug/L	ng/L	ng/L														
<b>Water Quality Criteria (Total Recoverable)</b>																																		
WI Acute WQC:					2.7		340												8.6		2930		28		190		830		2220		10.47		202	
WI Chronic WQC:		> 5			2.3		152												3.9		215		20		50		440		247		--		202	
OU 1 Dischg Limits:		10			67		10																											
CM-301	Total	200	0.4	11,000	11,000	28	16	1,400	75	23.0	840	1,300	1,500	12,100	400	6.8	2,400	216	119															
CM-301	Filtered	100							11	0.4	2	24	1	28	3	0.1	39	51	28															
CM-302	Total	320	1.0	18,000	21,000	71	25	1,400	73	73.0	1,300	1,500	2,400	68,100	400	12.0	3,700	17,043	9,374															
CM-302	Filtered	55							12	2.0	9	22	18	1,700	6	0.2	130	216	119															
CM-303	Total	200	4.4	2,300	4,500	26	8	430	24	17.0	420	450	680	27,100	110	4.2	1,000	32,736	18,005															
CM-303	Filtered	48							9	0.7	11	18	21	930	4	0.2	140	1,335	734															
CM-401	Total	210	1.2	17,000	16,000	49	29	2,700	110	81.0	3,200	2,400	4,200	12,100	570	30.0	7,000	206,060	113,333															
CM-401	Filtered	84							6	1.0	19	16	19	378	5	0.3	240	10,640	5,852															
CM-402	Total	180	<0.03	3,300	6,500	72	18	620	25	11.0	700	460	670	14,400	150	5.4	1,200	29,030	15,967															
CM-402	Filtered	60							6	0.4	18	23	14	283	5	0.3	150	3,616	1,989															
CM-403	Total	190	2.7	2,600	6,000	42	14	550	28	12.0	660	530	800	27,300	140	5.7	1,200	37,079	20,393															
CM-403	Filtered	42							9	0.6	31	27	33	1,050	6	0.3	210	6,187	3,403															
CM-404	Total	210	0.3	1,800	2,700	50	27	380	20	5.2	270	200	290	4,440	72	1.9	460	33,930	18,662															
CM-404	Filtered	87							12	0.4	18	14	18	237	6	0.4	86	4,251	2,338															
CM-501	Total	61	<0.03	2,100	3,500	30	18	380	24	7.2	290	330	430	17,100	95	3.8	710	12,748	7,011															
CM-501	Filtered	63							9	0.5	14	23	24	972	5	0.3	86	1,004	552															
<b>Percent Dissolved:</b>		37%								20%		2%		2%		3%		2%		4%		3%		3%		7%		8%						

**Table 4-6 Pancake Column Leaching Test (PCLT) Results**

**Surface Water Quality Criteria**

WDNR Acute	TOTAL	340	190	830	
OU 1 Dischg Lmts	TOTAL				500

**Groundwater Quality Criteria**

Enforcement Standard	10	15	2,000	30
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PARAMETER UNITS	TOC mg/L	Hard mg/L	Arsenic ug/L	Lead ug/L	Mercury ng/L	Tot PCBs Congener ng/L	Tot PCBs Aroclor(1) ng/L
FR-CM-301-01	12					228	126
FR-CM-301-02		160	2.9	51	470		
FR-CM-301-03	10					1	1
FR-CM-301-04		170	1.7	30	95		
FR-CM-301-05	13					4	2
FR-CM-301-06		180	2.1	40	67		
FR-CM-301-07	11					<1	<1
FR-CM-301-08		190	2.3	160	68		
FR-CM-301-09	11					6	3
FR-CM-301-10		180	2.6	240	311		
FR-CM-301-11	37					1	1
FR-CM-301-12		200	2.0	380	256		
FR-CM-301-13	9.3					1	1
FR-CM-301-14		200	2.3	720	297		
FR-CM-301-15	11					1	1
FR-CM-302-01	21					2	1
FR-CM-302-02		160	4.7	60	61		
FR-CM-302-03	13					66	36
FR-CM-302-04		160	4.2	83	33		
FR-CM-302-05	13					61	34
FR-CM-302-06		170	3.9	360	26		
FR-CM-302-07	11					26	14
FR-CM-302-08		180	3.7	370	13		
FR-CM-302-09	11					28	15
FR-CM-302-10		180	2.7	61	11		
FR-CM-302-11	19					25	14
FR-CM-302-12		200	2.2	850	7		
FR-CM-302-13	14					45	25
FR-CM-302-14		200	3.9	830	6		
FR-CM-302-15	11					23	13

= Exceeds **WDNR** chronic water quality criteria

= Exceeds **WDNR** groundwater enforcement limit

**Table 4-6 Pancake Column Leaching Test (PCLT) Results**

FR-CM-303-01	11					81	45
FR-CM-303-02		160	2.2	2.3	230		
FR-CM-303-03	9.5					59	32
FR-CM-303-04		180	1.8	2.4	76		
FR-CM-303-05	12					32	18
FR-CM-303-06		180	1.7	2.5	14		
FR-CM-303-07	12					31	17
FR-CM-303-08		180	2.3	1.8	24		
FR-CM-303-09	11					36	20
FR-CM-303-10		180	1.8	2	106		
FR-CM-303-11	27					50	28
FR-CM-303-12		190	1.4	1.1	12		
FR-CM-303-13	9.7					46	25
FR-CM-303-14		220	2.0	4.3	27		
FR-CM-303-15	10					44	24

FR-CM-401-01	20					1,035	569
FR-CM-401-02		160	2.2	4.3	20		
FR-CM-401-03	11					829	456
FR-CM-401-04		160	2.8	5.8	15		
FR-CM-401-05	13					683	376
FR-CM-401-06		170	2.1	4.4	13		
FR-CM-401-07	16					737	405
FR-CM-401-08		180	2.1	3.6	9		
FR-CM-401-09	14					701	386
FR-CM-401-10		170	2.0	5.5	9		
FR-CM-401-11	28					847	466
FR-CM-401-12		180	1.9	7	7		
FR-CM-401-13	12					763	420
FR-CM-401-14		190	1.7	16	6		
FR-CM-401-15	11					860	473

= Exceeds WDNR acute water quality criteria

= Exceeds WDNR groundwater enforcement limit

**Table 4-6 Pancake Column Leaching Test (PCLT) Results**

FR-CM-402-01	14					94	52
FR-CM-402-02		150	2.8	9.2	24		
FR-CM-402-03	12					92	51
FR-CM-402-04		150	3.2	7	12		
FR-CM-402-05	13					84	46
FR-CM-402-06		160	2.5	4.6	9		
FR-CM-402-07	14					93	51
FR-CM-402-08		170	1.8	6.9	7		
FR-CM-402-09	14					80	44
FR-CM-402-10		170	2.0	5.5	8		
FR-CM-402-11	34					108	59
FR-CM-402-12		180	1.6	3.4	8		
FR-CM-402-13	11					99	54
FR-CM-402-14		200	1.8	4.5	6		
FR-CM-402-15	12					105	58
FR-CM-403-01	16					242	133
FR-CM-403-02		160	3.1	6.4	26		
FR-CM-403-03	11					172	95
FR-CM-403-04		160	2.5	4	12		
FR-CM-403-05	12					138	76
FR-CM-403-06		160	3.1	3.9	19		
FR-CM-403-07	11					123	68
FR-CM-403-08		160	3.0	4.6	19		
FR-CM-403-09	16					118	65
FR-CM-403-10		170	2.9	7.4	30		
FR-CM-403-11	26					136	75
FR-CM-403-12		170	1.9	1.7	7		
FR-CM-403-13	12					115	63
FR-CM-403-14		190	2.2	3	5		
FR-CM-403-15	11					105	58

= Exceeds WDNR chronic water quality criteria

= Exceeds WDNR groundwater enforcement limit

**Table 4-6 Pancake Column Leaching Test (PCLT) Results**

FR-CM-404-01	13					143	79
FR-CM-404-02		150	2.7	36	12		
FR-CM-404-03	14					132	73
FR-CM-404-04		140	3.9	18	10		
FR-CM-404-05	14					112	62
FR-CM-404-06		170	1.7	5.8	6		
FR-CM-404-07	11					128	70
FR-CM-404-08		180	1.7	12	4		
FR-CM-404-09	13					137	75
FR-CM-404-10		170	2.0	6.1	6		
FR-CM-404-11	37					113	62
FR-CM-404-12		170	1.7	7.5	3		
FR-CM-404-13	11					146	80
FR-CM-404-14		190	1.4	4.2	11		
FR-CM-404-15	13					133	73
FR-CM-501-01	21					62	34
FR-CM-501-02		160	1.9	62	360		
FR-CM-501-03	13					32	18
FR-CM-501-04		160	1.7	34	280		
FR-CM-501-05	14					21	12
FR-CM-501-06		170	1.6	37	78		
FR-CM-501-07	11					26	14
FR-CM-501-08		180	1.8	18	190		
FR-CM-501-09	21					20	11
FR-CM-501-10		180	1.4	39	103		
FR-CM-501-11	35					27	15
FR-CM-501-12		180	1.5	68	36		
FR-CM-501-13	10					20	11
FR-CM-501-14		200	1.5	330	136		
FR-CM-501-15	9.9					23	13

 = Exceeds WDNR chronic water quality criteria

 = Exceeds WDNR groundwater enforcement limit

Notes:

(1) Aroclors estimated based on regression equation as 55 percent of total congeners

**Table 4-7 - Initial Inventory of Disposal Sites within 60 mile Radius of River Mile 3.5**

Existing or Proposed Landfills	Lic. #	Location	Owner	(1) Stage of Development	(2) Approximate Distance From OU4 Centroid at River Mile 3.5
<b>Non-TSCA (&lt;50 ppm)</b>					
[1] Appleton Coated	3458	Calumet County	Appleton Coated, LLC	Active	22.0
[2] Appleton Coated Locks Mill LF	3036	Outagamie County	Appleton Coated, LLC	Active	19.0
[3] Bay Port Material Disposal Facility	2523	Brown County	Brown County	Active	3.5
[4] Brown County East	2569	Brown County	Brown County	Closed	3.5
[5A] Brown County South - MSW	None	Brown County	Brown County	Permitted/ Not Constructed <sup>(3)</sup>	14.5
[5B] Brown County South - Wet Process Residue	None	Brown County	Brown County	Not Permitted <sup>(4)</sup>	14.5
[6A] Brown County VandeHey - MSW	None	Brown County	Brown County	Not Permitted <sup>(5)</sup>	11.0
[6B] Brown County VandeHey - Wet Process Residue	None	Brown County	Brown County	Not Permitted <sup>(5)</sup>	11.0
[7] Fort James Green Bay West LF	2332	Brown County	Fort James Oper. Co.	Active	4.5
[8] Fort James Northland LF	2893	Brown County	Fort James Oper. Co.	Active	2.5
[9] General Chemical Alum LFI	1907	Winnebago County	General Chem. Corp.	Active	31.0
[10] Georgia-Pacific North LF @ Vinland	3275	Winnebago County	Georgia-Pacific	Permitted/Inactive	37.0
[11] Hickory Meadows Landfill, LLC	3134	Calumet County	Onyx North America	Active	29.0
[12] Kewaunee County Balefill	2975	Kewaunee County	Kewaunee County	Active	22.0
[13] Maroco LF	3095	Marinette County	Marinette & Oconto Co.	Active	45.0
[14] Outagamie County LF	2484	Outagamie County	Outagamie County	Active	21.0
[15] Ridgeview Recycl. & Disposal Fac.	3041	Manitowoc County	Waste Mgmt. of WI	Active	25.0
[16] Sadoff and Rudoy Industries LF	1554	Fond du Lac County	Sadoff & Rudoy Ind.	Permitted/ Not Constructed	54.0
[17] Shawano Municipal Phase II LF	3069	Shawano County	City of Shawano	Active	35.0
[18] Thilmany/Red Hills LF	3251	Outagamie County	International Papers	Active	18.0
[19] Valley Trail Recycl. & Disposal Fac.	3066	Green Lake County	Waste Mgmt. of WI	Active	59.0
[20] Waupaca Foundry LF #3	3412	Waupaca County	Waupac Foundry	Active	53.0
[21] Winnebago County Sunnyview LF	3175	Winnebago County	Winnebago County	Active	38.0
<b>TSCA</b>					
EQ Wayne Disposal, Inc. <sup>(6)</sup>	USEPA ID # MID 048 090 633	Belleville, MI	Wayne Disposal, Inc.	Active	N/A
Peoria Disposal Company (6)	USEPA ID # IDL 000 805 812	Peoria, IL	Peoria Disposal, Co.	Active	N/A

(1) Based on WDNR input, October 2004 unless otherwise noted.

(2) Straight line distance.

(3) Has received WDNR Plan of Operation approval.

(4) Has received WDNR feasibility approval.

(5) Has received favorable initial site inspection, and submitted Feasibility Report, November 1994, which was later withdrawn.

(6) Disposal facilities in U.S. EPA Region 5 that are approved to accept material with 50 ppm PCB's or greater.

**Table 4-8. Disposal Site Threshold Evaluation**

Existing or Proposed Landfills	Location	Owner	(1) NR500 Feasibil. Addressed River Sediments	(1) Stage of Development	(2) Initial Design Capacity (cy)	(2) Remaining Capacity as of 1/05 (cy)	(2) Current Rate of Fill (cy/yr)	(3) Projected Capacity Remaining in 2008 (cy)	(1) Total Site Acreage	(1) Current Permitted Acreage	(4) Possibility of Landfill Expansion	(1) Is Facility in a Siting Process?	Siting Stage	(1) Liner Type	(1) Surrounding Land Use	(1) Proposed Capacity (cy)	(5a) Year Capacity Could Be Available	Comments
<b>Non-TSCA (&lt;50 ppm)</b>																		
Bay Port Material Disposal Facility	Brown County	Brown County	Yes*	Active	2,500,000**	1,750,000 (est.)	150,000**	1,300,000 (est.)	190**	110**	Yes	No	--	Clay	Industrial	NA	NA	Demonstration project underway to justify steeper final cover grades.
Brown County South - MSW	Brown County	Brown County	No	Permitted/ Not Constructed (6a)	6,366,000 (6c)	N/A	0	6,366,000	314 (6c)	76 (6c)	Yes	Yes	POO	Composite	Agricultural	6,366,000 (6c)	2009 2021 (7)	MSW site has Plan of Operation approval. Landfill not constructed. MSW site is part of Tri-County Solid Waste Agreement.
Brown County South - Wet Process Residue	Brown County	Brown County	No	Not Permitted (6b)	3,696,000 (6d)	N/A	0	3,696,000	314 (6d)	38 (6d)	Yes	Yes	Feasibility	Composite	Agricultural	3,696,000 (6d)	2009	Wet process residue site has Feasibility Study approval. Plan of Operation dropped at request of County. Wet process residue site is not part of Tri-County Solid Waste Agreement.
Brown County VandeHey - MSW	Brown County	Brown County	No	Not Permitted (6e)	7,291,000 (8)	N/A	0	7,291,000 (8)	154	52 (8)	No	Yes	ISR	Composite	Agricultural	7,291,000 (8)	2010	Feasibility Study on hold at request of County. Not part of Tri-County Solid Waste Agreement. Residential development around the site has increased in recent years.
Brown County VandeHey - Wet Process Residue	Brown County	Brown County	No	Not Permitted (6e)	3,700,000 (8)	N/A	0	3,700,000 (8)	154	38 (8)	No	Yes	ISR	Composite	Agricultural	3,700,000 (8)	2010	Feasibility Study on hold at request of County. Not part of Tri-County Solid Waste Agreement. Residential development around the site has increased in recent years.
Georgia-Pacific North LF @ Vinland	Winnebago County	Georgia-Pacific	No	Permitted/Inactive	3,062,000	10,317,000		10,317,000	358	133	Yes	No	--	Clay/ Composite	Agricultural	--	--	
Hickory Meadows Landfill, LLC	Calumet County	Onyx North America	Yes	Active	7,546,000	5,210,000	480,000	3,770,000	655	59	Yes	No	Pre-ISR	Composite	Agricultural	7,000,000(9)	2010	Facility contemplating expansion.
Outagamie County LF	Outagamie County	Outagamie County	No	Active	5,450,000 (10)	160,000	391,000	0	450	112	Yes	Yes	Feasibility (Pending)	Clay/ Composite	Residential/ Commercial	8,000,000	2008 2011 (7)	8,000,000 cy, 54 acre expansion proposed. Feasibility Study not yet approved. Part of Tri-County Agreement.
Ridgeview Recycl. & Disposal Fac.	Manitowoc County	Waste Mgmt. of WI	No	Active	9,689,000	1,781,000	546,000	143,000	701	54	Yes	Yes	Feasibility (Pending)	Clay/ Composite	Agriculture	10,338,000	2008	10,338,000 cy expansion proposed, Feasibility Study not yet approved.
Sadoff and Rudoy Industries LF	Fond du Lac County	Sadoff & Rudoy Ind.	No	Permitted/ Not Constructed	700,000 (4)	500,000	0	500,000	70	20	Yes	No	--	Clay	Agricultural/ Commercial	--	--	Permitted for shredder fluff only. Former landfill closed. Approved capacity for a new landfill is 1,454,200 cy. Landfill not constructed.
Thilmany/Red Hills LF	Outagamie County	International Papers	No	Active	2,750,000	1,930,000	139,000	1,513,000	46	36	Yes	No	--	Clay	City Owned/ Open	--	--	
Valley Trail Recycl. & Disposal Fac.	Green Lake County	Waste Mgmt. of WI	No	Active	2,813,000	1,080,000	406,000	0	201	52	Yes	Yes	Feasibility (pending)	Composite	Agricultural/ Industrial	6,340,000	2007	6,340,000 cy expansion proposed. Feasibility not yet approved.
Waupaca Foundry LF #3	Waupaca County	Waupac Foundry	No	Active	1,339,000	2,330,000	170,000	1,820,000	207	51	Yes	No	--	Clay	Agricultural	--	--	
Winnebago County Sunnyview LF	Winnebago County	Winnebago County	No	Active	4,400,000	3,378,000	46,000	3,240,000	213	92	No	No	--	Composite	Industrial	--	--	Part of Tri-County Solid Waste Agreement.
<b>TSCA</b>																		
EQ Wayne Disposal, Inc. (11)	Belleville, MI	Wayne Disposal, Inc.	N/A	Active	unknown	3,200,000	variable	approx. 14yrs	435	120	Yes	No	--	double composite	Industrial/ Commercial	--	--	PCB TSCA wastes allowed by permit. Licensee must notify US EPA prior to disposing any PCB waste in the landfill.
Peoria Disposal Company (11)	Peoria, IL	Peoria Disposal Co.	N/A	Active	2,638,580	450,000 (approx.)	variable	1,000,000+ (see comments)	unknown	90	Yes	Yes	See comments	double composite	agricultural	2,300,000	2007	The facility is going through a siting process and expects approval for 2,300,000 cy additional capacity June 2006.

- (1) Based on WDNR input, October 2004, unless otherwise noted.
- (2) Landfill information obtained from the WDNR 2004 LF Tonnage Capacity Report unless otherwise noted.
- (3) Based upon 2003 waste loading unless otherwise noted.
- (4) Based on discussion with WDNR and property availability not considering environmental factors.
- (5a) Based upon typical landfill development process in Wisconsin, unless otherwise noted.
- (5b) From Department of Administration (Waste Facility Siting Board) records as of 11/2/04.
- (5c) Straight line distance.
- (6a) Has received WDNR Plan of Operation approval.
- (6b) Has received WDNR feasibility approval.
- (6c) Information from Brown County South Plan of Operation approval, April 1999.
- (6d) Information from Brown County South Plan of Operation, February 1998.
- (6e) Has received favorable initial site inspection, and submitted Feasibility Report, November 1994, which was later withdrawn.
- (7) Anticipated date based upon the Tri-County landfill regionalization plan.
- (8) Design capacity information obtained from the Brown County VandeHey site Feasibility Report, November 1994. 52 acres and 7,291,000 cubic yards MSW site, and 38 acres and 3,700,000 cy wet process residue monofill.
- (9) Based on public information from Onyx, September 2004.
- (10) Volume from Outagamie County Landfill 1997 Plan Modification Report.
- (11) Disposal facilities in U.S. EPA Region 5 that are approved to accept material with 50 ppm PCB or greater. Information from EQ Wayne Disposal or Peoria Disposal, respectively.

\* Facility approved under NR500 Grant of Exemption specifically to receive river sediment from Lower Fox River and shipping channel of Green Bay.

\*\* Information from 3/31/97 Plan of Operational approval or 5/16/96 Conditional Grant of Exemption.

**Table 4-9. Disposal Site Implementability Evaluation**

Existing or Proposed Landfills	(1) NR500 Feasibil. Addressed River Sediments	(2) Projected Capacity Remaining in 2008 (cy)	(3) Year Capacity Could Be Available	(4) Local Siting Agreement  Yes / No?	PCB Status: Approved, Excluded, or Silent?	(5) Approximate Distance From OU4 Centroid at River Mile 3.5	Comments
<b>Non-TSCA (&lt;50 ppm)</b>							
Brown County South - Wet Process Residue	No	3,696,000 <sup>(6)</sup>	2009	Yes /	Approved	14.5	Wet process residue site has Feasibility approval. Plan of Operation dropped at request of County. Note: Wet process residue site is not part of Tri-County Agreement.
Brown County VandeHey - MSW/wet process residual	No	7,291,000 <sup>(7)</sup>	2010	Negotiation Dropped		11.0	Residential development encroaching on landfill. Feasibility on hold at request of County. Not part of Tri-County Agreement.
Hickory Meadows Landfill, LLC	Yes	3,770,000	2008	Yes /	Approved	29.0	7 million cy expansion contemplated. Requires Feasibility and Plan of Operation approval. Expect capacity could be available 2010. Plan Modification for monofill likely would be required at existing facility.
<b>TSCA</b>							
EQ Wayne Disposal, Inc. <sup>(8)</sup>	N/A	Approximately 14yrs	2007	Yes /	Approved	465 road miles (approx)	PCB TSCA wastes allowed by permit. Licensee must notify US EPA prior to disposing any PCB waste in the landfill. Current quotation for transportation & disposal is \$165/ton.
Peoria Disposal Company <sup>(8)</sup>	N/A	1,000,000+	2007	See Comments		330 road miles (approx)	Facility approved for PCB TSCA waste. Facility is going through a siting process and expects approval for 2,300,000 cy expansion June 2006.

(1) Based on WDNR input, October 2004, unless otherwise noted.

(2) Based upon 2003 waste loading unless otherwise noted.

(3) Based upon typical landfill siting process in Wisconsin per NR 500, unless otherwise noted.

(4) From Department of Administration (Waste Facility Siting Board) records as of 11/2/04.

(5) Straight line distance.

(6) Has received WDNR Feasibility Study approval.

(7) Design capacity information obtained from the Brown County VandeHey site draft Feasibility Study, November 1994. 52 acre 7,291,000 cubic yards MSW site or 38 acre 3,700,000 cy wet process residue monofill (not both).

(8) Disposal facilities in U.S. EPA Region 5 that are approved to accept material with 50 ppm PCB or greater. Information from EQ Wayne Disposal or Peoria Disposal, respectively.

**Table 4-10 Beneficial Reuse Screening Process**

Evaluation Category	Criterion/Question	Answer	Alternatives									
			Bayport	Beach Nourish	Cat Island	Landfill	Mfg'd Soil	Renard Island	Roads	Sed Cap	Upland Develop	Wetland
Initial Screening	Compliance with regulatory requirements	yes/no										
	Need for ESD or ROD amendment	yes/no										
	Technical feasibility	yes/no										
	Compatibility with surrounding land use	yes/no										
	Siting/permitability	easy/difficult										
	Capacity of alternative (compared to 1 MCY)	big/small										
	Constructability	easy/difficult										
	Compatible with dredge schedule	yes/no										
	Cost	lo/med/hi										
	Sociopolitical acceptance	lo/hi										
Threshold Criteria	Impact on Human health	yes/no										
	Impact on terrestrial species (meets soil standards)	yes/no										
	Toxicity to aquatic species (meets surface water standards)	yes/no										
	Impact on wetlands (NR 103)	yes/no										
	Impact on critical habitat	yes/no										
	Effect on surface water	yes/no										
	Effect on groundwater (NR 140)	yes/no										
	Air emissions (NR 445.03)	yes/no										
Implementability Criteria	Precedent with alternative within Great Lakes	yes/no										
	Precedent with alternative within Wisconsin	yes/no										
	Permitting schedule	short/long										
	Compatibility with dredge construction schedule	yes/no										
	Distance from dredge location	short/long										
	Transportation (pipeline, barge, truck)	easy/difficult										
	Preliminary cost (\$/cy)	lo/med/hi										
Modifying Criteria	Are key stakeholders identified ?	yes/no										
	Discussions with Land Owner/jurisdiction ?	yes/no										
	Net environmental benefit	yes/no										
	Aesthetics	good/bad										
	Public support	yes/no										
	Score											
	Rank											

red	no, difficult, high cost	1
yellow	neutral, needs further evaluation	2
green	yes, easy, low cost	3

Table 5-1  
Summary of Optimized Remedy Disposal Requirements

Alternative	OU	<i>In Situ</i> Sediment Dredged (CY) <sup>a</sup>	Sand Separated for Beneficial Reuse (CY) <sup>b</sup>	Total Volume of Landfilled Material (After Dewatering) (CY)	Total Weight of Material (After Dewatering) (Tons)	Tons/CY Factor
<b>Non TSCA</b>						
Primary Option: Mechanical Dredging, Barge, Mechanical Dewatering at Shell Property	2,3	30,000	400	12,900 <sup>(c)</sup>	16,000 <sup>(c)</sup>	1.24
Primary Option: Hydraulic Dredging with Mechanical Dewatering at Shell Property	3, 4, 5	3,456,000	225,100	1,270,800 <sup>(c)</sup>	1,562,600 <sup>(c)</sup>	1.23
Subtotal - OU2 and Primary Option for OU3 and OU4		3,486,000	225,500	1,283,700	1,578,600	
with 15% contingency				1,476,000 <sup>(f)</sup>	1,815,000 <sup>(f)</sup>	
Secondary Option: Mechanical Dredging and Load-out to Dewatering Landfill	2,3	30,000	0	15,600 <sup>(d)</sup>	18,500 <sup>(d)</sup>	1.19
Secondary Option: Hydraulic Dredging and Pipeline Transport to Dewatering Landfill	3, 4, 5	3,456,000	225,100	1,456,300 <sup>(d)</sup>	1,718,800 <sup>(d)</sup>	1.18
Subtotal - OU2 and Secondary Option for OU3 and OU4		3,486,000	225,100	1,471,900	1,737,300	
with 15% contingency				1,693,000 <sup>(f)</sup>	1,998,000 <sup>(f)</sup>	
<b>TSCA</b>						
Hydraulic Dredging with Mechanical Dewatering at Shell Property	4	200,000	---	97,500 <sup>(c)</sup>	121,100 <sup>(c)</sup>	1.24
with 15% contingency				112,000 <sup>(f)</sup>	139,000 <sup>(f)</sup>	
Mechanical Dredging with Lime Amendment	4	200,000	---	195,900 <sup>(c)</sup>	234,400 <sup>(c)</sup>	1.20
with 15% contingency				225,000 <sup>(f)</sup>	270,000 <sup>(f)</sup>	

<sup>a</sup> From Anchor Env. Volume estimates as of Feb. 7, 2006. Non-TSCA volumes are 24,000 CY for OU2, 204,000 CY for OU3, and 3,258,000 CY for OU4/5. Assumes *in situ* solids of 30.2% for OU2-3 and 32.1% for OU 4. Specific gravity is 2.43.

<sup>b</sup> Assumes sand removal of 25% dry weight basis, sand specific gravity of 2.65, and sand porosity of 0.43.

<sup>c</sup> Assumes mechanical dewatering (plate-frame presses) to 55% solids.

<sup>d</sup> Assumes passive dewatering to 50% solids after consolidation. Additional volume for operational considerations will be added as part of facility design.

<sup>e</sup> Assumes 15% lime amendment and 50% solids after lime treatment.

<sup>f</sup> Estimated tonnages and volumes of landfilled material are adjusted with a 15% contingency to compensate for uncertainty in sediment properties and dewatering outcomes.

**Table 8-1. Summary of Construction Cost Estimates**

No.	Item	Task	ROD Remedy	Optimized Remedy	Difference Between ROD and Optimized Remedy
1	I.1.1	Mob & Demob - Mech Debris	\$ -	\$ -	\$ -
2	I.1.2	Mob & Demob - TSCA Mechanical Dredge	\$ 960,000	\$ -	\$ 960,000
3	I.1.2	Mob & Demob - Mechanical Dredge	\$ -	\$ 206,000	\$ -206,000
4	I.1.3	Mob & Demob - Hydraulic Dredging	\$ 51,910,000	\$ 12,460,000	\$ 39,450,000
5	I.1.4	Mob/Demob -Capping Equipment	\$ 2,514,000	\$ 1,640,000	\$ 874,000
6	I.2.1	Site Prep - Shell Property OU 4	\$ 8,720,000	\$ 30,190,000	\$ -21,470,000
7	I.3.1	NR 213 Dewatering Facility Development	\$ 65,273,000	\$ -	\$ 65,273,000
8	I.3.2	NR 500 Disposal Facility Development	\$ 62,567,000	\$ -	\$ 62,567,000
9	I.4.1	Construction Work Plans	\$ 540,000	\$ 540,000	\$ -
10	II.1.1	Mechanical Debris Removal	\$ 4,000,000	\$ 2,541,000	\$ 1,459,000
11	II.2.1	TSCA Dredging & Disposal	\$ 60,170,000	\$ 24,894,000	\$ 35,276,000
12	II.2.2	Hydraulic Dredging	\$ 123,060,000	\$ 33,270,000	\$ 89,790,000
13	II.2.3	Mechanical Dredging	\$ -	\$ 580,000	\$ -580,000
14	II.3.1	Beneficial Reuse	\$ 25,460,000	\$ 6,150,000	\$ 19,310,000
15	II.3.2	Dewatering/Water Treatment of TSCA Sediment	\$ 4,810,000	\$ 5,837,000	\$ -1,027,000
16	II.3.2	Sediment Processing - Non-TSCA	\$ -	\$ 99,340,000	\$ -99,340,000
17	II.4.1	NR 213 Settling Basin C&O	\$ 56,225,000	\$ -	\$ 56,225,000
18	II.4.2	NR 500 Landfill C&O	\$ 8,430,000	\$ 67,590,000	\$ -59,160,000
19	II.5.1	Mechanical Capping - OU 3	\$ -	\$ 10,800,000	\$ -10,800,000
20	II.5.2	Mechanical Capping - OU 4	\$ -	\$ 18,280,000	\$ -18,280,000
21	II.5.3	Shoreline Capping	\$ 4,260,000	\$ 3,260,000	\$ 1,000,000
22	II.5.4	Residuals Cover	\$ 17,875,000	\$ 10,795,000	\$ 7,080,000
23	III.1.1	Construction Monitoring & Surveys	\$ 5,990,000	\$ 4,420,000	\$ 1,570,000
24	III.1.2	Contractor CQ/Monitoring	\$ 44,170,000	\$ 32,740,000	\$ 11,430,000
25	III.1.3	Long-Term Monitoring	\$ 8,020,000	\$ 5,640,000	\$ 2,380,000
26	IV.1	Engineering and Design	\$ 10,000,000	\$ 10,000,000	\$ -
27	IV.2	Construction Support	\$ 14,350,000	\$ 9,130,000	\$ 5,220,000
		<b>Total</b>	<b>\$ 579,304,000</b>	<b>\$ 390,303,000</b>	<b>\$ 189,001,000</b>