- The local share provided by landowners and other cost-share recipients would be about $655,000, $498,000, $153,000, and $102,000, respectively.

At a 75 percent level of participation, the state funds needed to cover capital installation would be about $1,190,000, $845,000, $265,000, and $155,000 for Sheboygan, Fond du Lac, Manitowoc, and Calumet Counties, respectively.

Easement Costs

Chapter Six identifies where nonpoint source program funds can be used to purchase easements. The estimated cost of purchasing easements on eligible lands in Sheboygan, Fond du Lac, Manitowoc, and Calumet Counties is shown in table 7-3a through 7-3d. At 100 percent participation, the estimated purchase price of easements on eligible lands would be $156,000, $226,000, and $52,000 in Sheboygan, Fond du Lac, and Manitowoc Counties, respectively. At 75 percent participation, the cost would be $113,250, $169,500, and $24,000; respectively. The easement costs would be paid for entirely by the state.

(The following sections regarding Staff Needs and Total Project Costs don't include Information and Education at this time. See chapter nine for the hours and costs of staff)

Staff Needs

Table 7-4 lists the total estimated staff needed to implement the project in Sheboygan, Fond du Lac, Manitowoc, and Calumet Counties; respectively. Figures are provided for both the 50 percent and 75 percent levels of participation. A total of about 36,000 staff hours is required (1,820 hours per staff year) in Sheboygan County, 23,000 staff hours in Fond du Lac County, 10,000 staff hours in Manitowoc County, and 4,000 staff hours in Calumet County to implement this plan at a 75 percent landowner participation rate. The estimated cost for staff at this landowner participation rate (see table 7-5) is approximately $583,000, $379,000, $184,000 and $68,000; respectively, in Sheboygan, Fond du Lac, Manitowoc, and Calumet Counties. All of these costs, with the exception of some direct cost items, would be paid for by the state.

Total Project Cost

The total state funding required to meet the rural nonpoint source pollution control needs at a 75 percent level of landowner participation is presented table 7-5. This figure includes the capital cost of practices, staff support, and easement costs presented above. The estimated cost to the state would be $1.8 million, $1.3 million, $0.5 million and $0.2 million in Sheboygan, Fond du Lac, Manitowoc, and Calumet Counties, respectively.

Table 7-3. Cost-Share Budget Needs for Rural Management Practices in the Sheboygan River Watershed

Management Needs	Number	Cost/Unit	Total Cost[1]	100% Participation		75% Participation	
				State Share	Local Share	State Share	Local Share
*Best Management Practices							
Upland Sediment Control							
Change in Crop Rotation	9,350 ac	$ NA[3]	$ 0	$ 0	$ 0	$ 0	$ 0
Contour Cropping	10,771 ac	6	64,626	64,626	[2]	48,470	[2]
Contour Strip Cropping	8,283 ac	12	99,396	99,396	[2]	74,547	[2]
Reduced Tillage[4]	4,210 ac	45	189,450	189,450	[2]	142,088	[2]
Reduced Tillage[5]	2,000 ac	15	30,000	30,000	[2]	22,500	[2]
Critical Area Stabilization	700 ac	150	105,000	73,500	31,500	55,125	23,625
Grass Waterways	211 ac	3,000	633,000	443,100	189,900	332,325	142,425
Field Diversions & Terraces	23,000 ft	4	92,000	64,400	27,600	48,300	20,700
Grade Stabilization	46 ea	3,000	138,000	96,600	41,400	72,450	31,050
Agricultural Sediment Basin	27 ea	3,000	81,000	56,700	24,300	42,525	18,225
Pasture Management	300 ac	NA	0	0	0	0	0
Shoreline Buffers[6]	0 ac	150	0	0	0	0	0
Wetland Restoration	83 ea	2,000	166,000	116,200	49,800	87,150	37,350
Animal Waste Management							
Barnyard Runoff Control							
Complete System	83 ea	17,000	1,411,000	987,700	423,300	740,775	317,475
Clean Water Diversion	35 ea	4,000	140,000	98,000	42,000	73,500	31,500
Manure Storage Facility[7]	73 ea	22,000	1,606,000	730,000	481,800	547,500	361,350
Manure Spreading Management	1,733 ac	NA	0	0	0	0	0
Roofs for Barnyards	4 ea	37,500	150,000	105,000	45,000	78,750	33,750

Table 7-3. Cost-Share Budget Needs for Rural Management Practices in the Sheboygan River Watershed

Management Needs	Number	Cost/Unit	Total Cost[1]	100% Participation		75% Participation	
				State Share	Local Share	State Share	Local Share
Streambank Erosion Control							
Shape and Seeding	6,650 ft	4	26,600	18,620	7,980	13,965	5,985
Fencing	43,910 ft	2	87,820	61,474	26,346	46,105	19,760
Riprap	2,800 ft	25	70,000	49,000	21,000	36,750	15,750
Livestock/Machinery Crossing	44 ea	1,500	66,000	46,200	19,800	34,650	14,850
Totals			$5,155,892	$3,329,966	$1,431,726	$2,497,475	$1,073,795
*Easements	409 ac	1,000	409,000	409,000	0	306,750	0
Totals			$5,564,892	$3,738,966	$1,431,726	$2,804,225	$1,073,795

[1] Total cost to control identified critical pollution sources.
[2] Local share consists of labor and any additional equipment costs.
[3] NA means that cost-share funds are not available for this practice.
[4] This practice is reduced tillage on continuous row, or long rotational croplands
[5] This practice is reduced tillage, including no-till, on short rotation croplands or for establishing forage crops.
[6] Shoreline buffer practice needs will be determined during implementation.
[7] Maximum cost-share is $10,000 of which a maximum of $5,000 can be for waste transfer.

Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture, Trade and Consumer Protection; and Land Conservation Departments of: Sheboygan, Fond du Lac, Manitowoc and Calumet Counties

Table 7-3a. Cost-Share Budget Needs for Rural Management Practices in Sheboygan County

Management Needs	Number	Cost/Unit	Total Cost[1]	100% Participation		75% Participation	
				State Share	Local Share	State Share	Local Share
*Best Management Practices							
Upland Sediment Control							
Change in Crop Rotation	4,700 ac	$ NA[3]	$ 0	$ 0	$ 0	$ 0	$ 0
Contour Cropping	8,000 ac	6	48,000	48,000	[2]	36,000	[2]
Contour Strip Cropping	5,271 ac	12	63,252	63,252	[2]	47,439	[2]
Reduced Tillage[4]	1,950 ac	45	87,750	87,750	[2]	65,813	[2]
Reduced Tillage[5]	750 ac	15	11,250	11,250	[2]	8,438	[2]
Critical Area Stabilization	300 ac	150	45,000	31,500	13,500	23,625	10,125
Grass Waterways	111 ac	3,000	333,000	233,100	99,900	174,825	74,925
Field Diversions & Terraces	14,000 ft	4	56,000	39,200	16,800	29,400	12,600
Grade Stabilization	10 ea	3,000	30,000	21,000	9,000	15,750	6,750
Agricultural Sediment Basin	10 ea	3,000	30,000	21,000	9,000	15,750	6,750
Pasture Management	300 ac	NA	0	0	0	0	0
Shoreline Buffers[6]	ac	150	0	0	0	0	0
Wetland Restoration	43 ea	2,000	86,000	60,200	25,800	64,500	45,000
Animal Waste Management							
Barnyard Runoff Control							
Complete System	47 ea	17,000	799,000	559,300	239,700	419,475	179,775
Clean Water Diversion	15 ea	4,000	60,000	42,000	18,000	31,500	13,500
Manure Storage Facility[7]	28 ea	22,000	616,000	280,000	184,800	210,000	138,600

Table 7-3a. Cost-Share Budget Needs for Rural Management Practices in Sheboygan County

Management Needs	Number	Cost/Unit	Total Cost[1]	100% Participation		75% Participation	
				State Share	Local Share	State Share	Local Share
Manure Spreading Management	614 ea	NA	0	0	0	0	0
Roofs for Barnyards	2 ea	37,500	75,000	52,500	22,500	39,375	16,875
Streambank Erosion Control							
Shape and Seeding	5,600 ft	4	22,400	15,680	6,720	11,760	5,040
Fencing	12,150 ft	2	24,300	17,010	7,290	12,758	5,468
Riprap	2,200 ft	25	55,000	38,500	16,500	28,875	12,375
Livestock/Machinery Crossing	12 ea	1,500	18,000	12,600	5,400	9,450	4,050
Totals			$2,459,952	$1,633,842	$674,910	$1,244,733	$531,833
*Easements	151 ac	1,000	151,000	151,000	0	113,250	0
Totals			$2,610,952	$1,784,842	$674,910	$1,357,983	$531,833

[1] Total cost to control identified critical pollution sources.
[2] Local share consists of labor and any additional equipment costs.
[3] NA means that cost-share funds are not available for this practice.
[4] This practice is reduced tillage on continuous row, or long rotational croplands
[5] This practice is reduced tillage, including no-till, on short rotation croplands or for establishing forage crops.
[6] Shoreline buffer practice needs will be determined during implementation.
[7] Maximum cost-share is $10,000 of which a maximum of $5,000 can be for waste transfer.

Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture, Trade and Consumer Protection; and Land Conservation Departments of: Sheboygan, Fond du Lac, Manitowoc and Calumet Counties

Table 7-3b. Cost-Share Budget Needs for Rural Management Practices in Fond du Lac County

Management Needs	Number	Cost/Unit	Total Cost[1]	100% Participation		75% Participation	
				State Share	Local Share	State Share	Local Share
*Best Management Practices							
Upland Sediment Control							
Change in Crop Rotation	3,400 ac	$ NA[3]	$ 0	$ 0	$ 0	$ 0	$ 0
Contour Cropping	625 ac	6	3,750	3,750	[2]	2,813	[2]
Contour Strip Cropping	2,300 ac	12	27,600	27,600	[2]	20,700	[2]
Reduced Tillage[4]	1,800 ac	45	81,000	81,000	[2]	60,750	[2]
Reduced Tillage[5]	1,000 ac	15	15,000	15,000	[2]	11,250	[2]
Critical Area Stabilization	200 ac	150	30,000	21,000	9,000	15,750	6,750
Grass Waterways	70 ac	3,000	210,000	147,000	63,000	110,250	47,250
Field Diversions & Terraces	5,000 ft	4	20,000	14,000	6,000	10,500	4,500
Grade Stabilization	30 ea	3,000	90,000	63,000	27,000	47,250	20,250
Agricultural Sediment Basin	10 ea	3,000	30,000	21,000	9,000	15,750	6,750
Pasture Management	0 ac	NA	0	0	0	0	0
Shoreline Buffers[6]	ac	150	0	0	0	0	0
Wetland Restoration	25 ea	2,000	50,000	35,000	15,000	26,250	11,250
Animal Waste Management							
Barnyard Runoff Control							
Complete System	19 ea	17,000	323,000	226,100	96,900	169,575	72,675
Clean Water Diversion	14 ea	4,000	56,000	39,200	16800	29,400	12,600
Manure Storage Facility[7]	30 ea	22,000	660,000	300,000	198,000	225,000	148,500

Table 7-3b. Cost-Share Budget Needs for Rural Management Practices in Fond du Lac County

Management Needs	Number	Cost/Unit	Total Cost[1]	100% Participation		75% Participation	
				State Share	Local Share	State Share	Local Share
Manure Spreading Management	865 ea	NA	0	0	0	0	0
Roofs for Barnyards	2 ea	37,500	75,000	52,500	22,500	39,375	16,875
Streambank Erosion Control							
Shape and Seeding	450 ft	4	1,800	1,260	540	945	405
Fencing	30,460 ft	2	60,920	42,644	18,276	31,983	13,707
Riprap	300 ft	25	7,500	5,250	2,250	3,938	1,688
Livestock/Machinery Crossing	30 ea	1,500	45,000	31,500	13,500	23,625	10,125
Totals			$1,786,570	$1,126,804	$497,766	$845,104	$373,325
*Easements	151 ac	1,000	226,000	226,000	0	169,500	0
Totals			$2,012,570	$1,352,804	$497,766	$1,014,604	$373,325

[1] Total cost to control identified critical pollution sources.
[2] Local share consists of labor and any additional equipment costs.
[3] NA means that cost-share funds are not available for this practice.
[4] This practice is reduced tillage on continuous row, or long rotational croplands
[5] This practice is reduced tillage, including no-till, on short rotation croplands or for establishing forage crops.
[6] Shoreline buffer practice needs will be determined during implementation.
[7] Maximum cost-share is $10,000 of which a maximum of $5,000 can be for waste transfer.

Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture, Trade and Consumer Protection; and Land Conservation Departments of: Sheboygan, Fond du Lac, Manitowoc and Calumet Counties

Table 7-3c. Cost-Share Budget Needs for Rural Management Practices in Manitowoc County

Management Needs	Number	Cost/Unit	Total Cost[1]	100% Participation		75% Participation	
				State Share	Local Share	State Share	Local Share
*Best Management Practices							
Upland Sediment Control							
Change in Crop Rotation	1,000 ac	$ NA[3]	$ 0	$ 0	$ 0	$ 0	$ 0
Contour Cropping	2,016 ac	6	12,096	12,096	[2]	9,072	[2]
Contour Strip Cropping	582 ac	12	6,984	6,984	[2]	5,238	[2]
Reduced Tillage[4]	380 ac	45	17,100	17,100	[2]	12,825	[2]
Reduced Tillage[5]	200 ac	15	3,000	3,000	[2]	2,250	[2]
Critical Area Stabilization	100 ac	150	15,000	10,500	4,500	7,875	3,375
Grass Waterways	25 ac	3,000	75,000	52,500	22,500	39,375	16,875
Field Diversions & Terraces	3,000 ft	4	12,000	8,400	3,600	6,300	2,700
Grade Stabilization	4 ea	3,000	12,000	8,400	3,600	6,300	2,700
Agricultural Sediment Basin	5 ea	3,000	15,000	10,500	4,500	7,875	3,375
Pasture Management	0 ac	NA	0	0	0	0	0
Shoreline Buffers[6]	ac	150	0	0	0	0	0
Wetland Restoration	9 ea	2,000	18,000	12,600	5,400	9,800	4,200
Animal Waste Management							
Barnyard Runoff Control							
Complete System	10 ea	17,000	170,000	119,000	51,000	89,250	38,250
Clean Water Diversion	2 ea124	4,000	8,000	5,600	2,400	4,200	1,800
Manure Storage Facility[7]	8 ea	22,000	176,000	80,000	52,800	60,000	39,600

Table 7-3c. Cost-Share Budget Needs for Rural Management Practices in Manitowoc County

Management Needs	Number	Cost/Unit	Total Cost[1]	100% Participation		75% Participation	
				State Share	Local Share	State Share	Local Share
Manure Spreading Management	142 ea	NA	0	0	0	0	0
Streambank Erosion Control							
Shape and Seeding	600 ft	4	2,400	1,680	720	1,260	540
Fencing	1,300 ft	2	2,600	1,820	780	1,365	585
Riprap	300 ft	25	7,500	5,250	2,250	3,938	1,688
Livestock/Machinery Crossing	2 ea	1,500	3,000	2,100	900	1,575	675
Totals			$555,680	$357,530	$154,950	$268,498	$116,363
*Easements	151 ac	1,000	32,000	32,000	0	24,000	0
Totals			$587,680	$389,530	$154,950	$292,498	$116,363

[1] Total cost to control identified critical pollution sources.
[2] Local share consists of labor and any additional equipment costs.
[3] NA means that cost-share funds are not available for this practice.
[4] This practice is reduced tillage on continuous row, or long rotational croplands
[5] This practice is reduced tillage, including no-till, on short rotation croplands or for establishing forage crops.
[6] Shoreline buffer practice needs will be determined during implementation.
[7] Maximum cost-share is $10,000 of which a maximum of $5,000 can be for waste transfer.

Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture, Trade and Consumer Protection; and Land Conservation Departments of: Sheboygan, Fond du Lac, Manitowoc and Calumet Counties

Table 7-3d. Cost-Share Budget Needs for Rural Management Practices in Calumet County

Management Needs	Number	Cost/Unit	Total Cost[1]	100% Participation		75% Participation	
				State Share	Local Share	State Share	Local Share
*Best Management Practices							
Upland Sediment Control							
Change in Crop Rotation	250 ac	$ NA[3]	$ 0	$ 0	$ 0	$ 0	$ 0
Contour Cropping	130 ac	6	780	780	[2]	585	[2]
Contour Strip Cropping	130 ac	12	1,560	1,560	[2]	1,170	[2]
Reduced Tillage[4]	80 ac	45	3,600	3,600	[2]	2,700	[2]
Reduced Tillage[5]	50 ac	15	750	750	[2]	563	[2]
Critical Area Stabilization	100 ac	150	15,000	10,500	4,500	7,875	3,375
Grass Waterways	5 ac	3,000	15,000	10,500	4,500	7,875	3,375
Field Diversions & Terraces	1,000 ft	4	4,000	2,800	1,200	2,100	900
Grade Stabilization	2 ea	3,000	6,000	4,200	1,800	3,150	1,350
Agricultural Sediment Basin	2 ea	3,000	6,000	4,200	1,800	3,150	1,350
Pasture Management	ac	NA	0	0	0	0	0
Shoreline Buffers[6]	ac	150	0	0	0	0	0
Wetland Restoration	6 ea	2,000	12,000	8,400	3,600	6,300	2,700
Animal Waste Management							
Barnyard Runoff Control							
Complete System	7 ea	17,000	119,000	83,300	35,700	62,475	26,775
Clean Water Diversion	4 ea	4,000	16,000	11,200	4,800	8,400	3,600
Manure Storage Facility[7]	7 ea	22,000	154,000	70,000	46,200	52,500	34,650

Table 7-3d. Cost-Share Budget Needs for Rural Management Practices in Calumet County

Management Needs	Number	Cost/Unit	Total Cost[1]	100% Participation		75% Participation	
				State Share	Local Share	State Share	Local Share
Manure Spreading Management	112 ea	NA	0	0	0	0	0
Streambank Erosion Control							
Shape and Seeding	0 ft	4	0	0	0	0	0
Fencing	0 ft	2	0	0	0	0	0
Riprap	0 ft	25	0	0	0	0	0
Livestock/Machinery Crossing	0 ea	1,500	0	0	0	0	0
Totals			$353,690	$211,790	$104,100	$158,843	$78,075
*Easements	0 ac	1,000	0	0	0	0	0
Totals			$353,690	$211,790	$104,100	$158,843	$78,075

[1] Total cost to control identified critical pollution sources.
[2] Local share consists of labor and any additional equipment costs.
[3] NA means that cost-share funds are not available for this practice.
[4] This practice is reduced tillage on continuous row, or long rotational croplands
[5] This practice is reduced tillage, including no-till, on short rotation croplands or for establishing forage crops.
[6] Shoreline buffer practice needs will be determined during implementation.
[7] Maximum cost-share is $10,000 of which a maximum of $5,000 can be for waste transfer.

Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture, Trade and Consumer Protection; and Land Conservation Departments of: Sheboygan, Fond du Lac, Manitowoc and Calumet Counties

Table 7-4. Estimated County LCD Staff Needs for Project Implementation

Activity	Project Years When Work Will Be Done	Sheboygan County		Fond du Lac County		Manitowoc County		Calumet County	
		75% Landowner Participation (Staff Hours)	50% Landowner Participation (Staff Hours)	75% Landowner Participation (Staff Hours)	50% Landowner Participation (Staff Hours)	75% Landowner Participation (Staff Hours)	50% Landowner Participation (Staff Hours)	75% Landowner Participation (Staff Hours)	50% Landowner Participation (Staff Hours)
Project & Financial Mgmt.	1-8	4,800	4,800	3,200	3,200	2,200	2,200	1,600	1,600
Information & Education Program*	1-8								
Pre-Contact Office Inventory; Landowner Contacts, Progress Tracking & Update Inventory	1-3	3,731	2,488	1,856	1,238	983	656	187	125
Conservation Planning; Cost-Share Agrmt. Development	1-3	7,203	4,802	3,150	2,100	1,521	1,014	293	195
Plan Revisions & Status Review & Monitoring	1-8	2,701	1,801	1,181	788	614	410	118	79
Practice Design & Installation	1-8								
Upland Sediment Control		7,322	4,881	5,852	3,901	2,488	1,659	568	379
Barnyard Runoff Control		4,500	3,000	1,962	1,308	948	632	597	398
Manure Spreading Mgmt. & Storage		2,070	1,380	3,450	2,300	885	590	540	360
Streambank Erosion Control		1,339	893	1,750	1,167	164	109	0	0
Training	1-8	1,440	1,440	800	800	320	320	240	240
Total LCD Workload		35,107	25,485	23,201	16,802	10,123	7,590	4,161	3,376
Estimated Staff Hours Per Year Required for Years 1-3		5,990	4,265	3,788	2,699	1,657	1,212	618	491
Estimated Staff Hours Per Year Required for Years 4-8		3,427	2,538	2,368	1,741	1,031	790	457	380

* The staff hours required to carry out the information and education program can be found in Chapter Nine.

Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture Trade and Consumer Protection; and Land Conservation Departments of: Sheboygan, Fond du Lac, Manitowc and Calumet Counties

Table 7-5. Total Project Costs at 75 Percent Landowner Participation Rate					
Item	Costs (State Share)				
	Sheboygan County	Fond du Lac County	Manitowoc County	Calumet County	Watershed Total
Cost-Share Funds: Practices	$1,153,232	$845,103	$258,173	$154,643	$2,411,151
Cost-Share Funds: Easements	151,000	226,000	32,000	0	409,000
Local Assistance Staff Support	573,988[1]	379,338[1]	184,952[2]	67,729[1]	1,206,007
Information/Education Direct[3]					
Other Direct (travel, supplies, etc.)	75,200	51,200	17,600	16,000	160,000
Totals	$1,953,420	$1,501,641	$492,725	$238,372	$4,186,158

1. Salary + Indirect = $34,000/year
2. Salary + Indirect = $38,000/year
3. The staff hours required to carry out the information and education program can be found in Chapter Nine.

Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture Trade and Consumer Protection; and Land Conservation Departments of: Sheboygan, Fond du Lac, Manitowoc and Calumet Counties

Grant Disbursement and Project Management Schedule

Implementation may begin upon approval of this watershed plan by the Sheboygan County Board; Fond du Lac County Board; Manitowoc County Board; Calumet County Board; Wisconsin Department of Agriculture, Trade and Consumer Protection; and the Department of Natural Resources. The priority watershed project implementation period lasts eight years. It includes an initial three year period for contacting eligible landowners and signing cost-share agreements. Practices on any cost-share agreement must be installed within a five year period.

Under extenuating circumstances, the initial period for entering into cost-share agreements can be extended by DNR for a limited period of time if it will result in a significant increase in nonpoint source control. Limited extensions for the installation period for practices on individual cost-share agreements must also be approved by DNR and DATCP.

The disbursement of the grants (Local Assistance and Nonpoint Source) to Sheboygan, Fond du Lac, Manitowoc, and Calumet counties will be based on an annual workload analysis and grant application process. The estimated grant disbursement schedule based on 75 percent participation by eligible landowners can be found in tables 7-6a, 7-6b, 7-6c, 7-6d, 7-6e; for the entire watershed, Sheboygan County, Fond du Lac County, Manitowoc County, and Calumet County, respectively.

Coordination With State and Federal Conservation Compliance Programs

The Sheboygan River Priority Watershed Project will be coordinated with the conservation compliance features of the Wisconsin Farmland Preservation Program (FPP) administered by DATCP, and the Federal Food Security Act (FSA) administered by the Soil Conservation Service. DATCP will assist Sheboygan, Fond du Lac, Manitowoc, and Calumet County and the SCS offices to identify landowners within the watershed that are subject to the compliance provisions of FPP and FSA. Conservation Farm Plans were completed for all landowners in FSA on December 31, 1989. Calumet County completed FPP plans in 1988; and Sheboygan, Fond du Lac and Manitowoc county were completed with the FPP conservation compliance plans by December 31, 1990.

There will be a need to implement the conservation plans and in the future amend these plans during the implementation phase of the watershed project. Watershed project supported staff will revise the conservation plans developed for FPP and FSA to include management decisions and the installation of needed BMPs for nonpoint source pollution abatement while addressing other resource conservation problems. This comprehensive approach to farm planning will facilitate consideration of the various goals and objectives for all the programs which the landowner participates.

Some eroding uplands in management categories 1 and 2 may need control, in addition to that required for meeting sediment delivery targets, in order to meet soil erosion program goals established through other state and federal programs. Where this occurs, technical and financial assistance from the Nonpoint Source Program can be used to support practice design and installation on these critical lands. This assistance applies only where the additional control needed to meet soil erosion goals can be achieved using low cost practices.

Table 7-6a. Grant Disbursement Schedule at 75 Percent Landowner Participation Rate for the Sheboygan River Watershed

Item	Project Year			
	1	2	3	3 - 8
Cost-Share Funds: Practices	$491,095	$982,190	$982,190	$ 0
Cost-Share Funds: Easements	61,350	122,700	122,700	0
Local Assistance Staff Support	201,638	201,638	201,638	610,433
Information/Education: Direct*	0	0	0	0
Other Direct: (travel, supplies, etc.)	17,800	17,800	17,800	89,000
Totals	$771,883	$1,324,328	$1,324,328	$699,433

* The information/education direct funding amount can be found in Chapter Nine.

Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture, Trade and Consumer Protection; and Land Conservation Departments of: Sheboygan, Fond du Lac, Manitowoc and Calumet Counties

Table 7-6b. Grant Disbursement Schedule at 75 Percent Landowner Participation Rate for Sheboygan County

Item	Project Year			
	1	2	3	3 - 8
Cost-Share Funds: Practices	$238,146	$476,293	$476,293	$ 0
Cost-Share Funds: Easements	22,650	45,300	45,300	0
Local Assistance Staff Support	99,326	99,326	99,326	285,308
Information/Education: Direct*				
Other Direct: (travel, supplies, etc.)	9,400	9,400	9,400	47,000
Totals	$369,522	$630,319	$630,319	$332,308

* The information/education direct funding amount can be found in Chapter Nine.

Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture, Trade and Consumer Protection; and Land Conservation Departments of: Sheboygan, Fond du Lac, Manitowoc and Calumet Counties

Table 7-6c. Grant Disbursement Schedule at 75 Percent Landowner Participation Rate for Fond du Lac County

Item	Project Year			
	1	2	3	3 - 8
Cost-Share Funds: Practices	$169,021	$338,041	$338,041	$ 0
Cost-Share Funds: Easements	33,900	67,800	67,800	0
Local Assistance Staff Support	61,934	61,934	61,934	193,584
Information/Education: Direct*				
Other Direct: (travel, supplies, etc.)	6,400	6,400	6,400	32,000
Totals	$271,255	$474,175	$474,175	$225,584

* The information/education direct funding amount can be found in Chapter Nine.

Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture, Trade and Consumer Protection; and Land Conservation Departments of: Sheboygan, Fond du Lac, Manitowoc and Calumet Counties

Table 7-6d. Grant Disbursement Schedule at 75 Percent Landowner Participation Rate for Manitowoc County

Item	Project Year			
	1	2	3	3 - 8
Cost-Share Funds: Practices	$53,000	$105,999	$105,999	$ 0
Cost-Share Funds: Easements	4,800	9,600	9,600	0
Local Assistance Staff Support	30,273	30,273	30,273	94,182
Information/Education: Direct*				
Other Direct: (travel, supplies, etc.)	2,200	2,200	2,200	11,000
Totals	90,273	$148,072	$148,072	$105,182

* The information/education direct funding amount can be found in Chapter Nine.

Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture, Trade and Consumer Protection; and Land Conservation Departments of: Sheboygan, Fond du Lac, Manitowoc and Calumet Counties

Table 7-6e. Grant Disbursement Schedule at 75 Percent Landowner Participation Rate for Manitowoc County				
	Project Year			
Item	1	2	3	3 - 8
Cost-Share Funds: Practices	$30,929	$61,857	$61,857	$ 0
Cost-Share Funds: Easements	0	0	0	0
Local Assistance Staff Support	10,104	10,104	10,104	37,360
Information/Education: Direct*				
Other Direct: (travel, supplies, etc.)	2,000	2,000	2,000	10,000
Totals	$43,033	$73,961	$73,961	$47,360

* The information/education direct funding amount can be found in Chapter Nine.

Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture, Trade and Consumer Protection; and Land Conservation Departments of: Sheboygan, Fond du Lac, Manitowoc and Calumet Counties

CHAPTER EIGHT
URBAN IMPLEMENTATION STRATEGY

Introduction

This chapter provides guidance for meeting the nonpoint source control program for the urban portions of the watershed (as described in chapter six). Urban areas are defined as those areas which are currently incorporated or have the potential to be incorporated within the next 20 years. This chapter describes the agencies and governments involved in the implementation process, their responsibilities, and the grants which are used to convey funds for carrying out the implementation of this plan.

Program Participants—Roles and Responsibilities

The specific roles and responsibilities for program participants are summarized below. The primary participants include local units of government (cities and villages); the DNR; other agencies; landowners and land operators. Where applicable, the roles and responsibilities are discussed according to the previously described "core" and "segmented" approaches to project implementation (as described in chapter six). As noted in chapter one, "Plan Purpose and Legal Status", implementation begins following approval of this priority watershed plan by the counties, DATCP, and DNR.

Cities and Villages

"Core" Program Roles and Responsibilities: The following is a schedule for implementing the "core" elements of the urban nonpoint source control strategy for this priority watershed project. These items must be agreed to by the city or village before continuing to the next phase of implementation. Each community wishing to participate must:

1. Identify in writing to DNR an authorized representative for the local unit of government.

2. Adopt an adequate ordinance, develop administrative procedures, and determine needed staff to provide construction site erosion control.

3. Develop and implement a community specific program of urban "housekeeping" practices that reduce urban nonpoint source pollution. This may include but is not limited to a combination of information and education efforts, adoption of ordinances regulating pet wastes, and changes to the timing and scheduling of leaf collection. The content of the community specific program and a schedule for implementation will be negotiated by the local unit of government and the DNR within 12 months of the start of implementation.

4. Prepare and submit to DNR annual work plans for staff needs and activities necessary to implement the project.

5. Prepare and submit to the DNR an annual report for the purposes of monitoring project implementation.

6. Participate in the annual watershed project review meeting.

7. If necessary, enter into a Local Assistance Grant Agreement (described later in this chapter) with the DNR. The responsibilities of the cities and villages related to this agreement is described later in this chapter.

Cities and Villages "Segmented" Program Roles and Responsibilities: The elements of the segmented program are described in Chapter Six. Cities and villages may begin carrying out the segmented portion only upon substantial completion of the "core" program. The installation of approved management practices on private lands (for example: streambank protection or wet detention on a shopping mall) before the completion of the "core" program. The following are the roles and responsibilities of each city or village to carry out the "segmented" program.

1. Develop a community-based implementation approach for carrying out the segmented portion of the program. This approach should include:

   - For existing developed area: the identification of the selected high priority areas (or segments) the community will investigate for the installation of nonpoint source control measures. This list is meant to provide a starting point for where nonpoint source control measures will be used. The list can be amended throughout the 8 year project period.

     Certain industrial areas are excluded from funding of nonpoint pollution control practices through the watershed project. These conditions are defined in detail in NR 120.10.

     Based on discussions with the cities and villages of the project area examples of potential high priority areas are given below:

     City of Sheboygan: The shopping mall and commercial strip development along Taylor Drive will be investigated for the feasibility of nonpoint source control practices.

City of Sheboygan Falls: The dry basin which serves the industrial park on the northwest side of the city will be studied for it's potential for conversion to a wet detention pond.

Village of Kohler: The Kohler Company industrial may not be an appropriate segment to identify because runoff from this area will likely be controlled through the federal stormwater permit program.

City of Kiel: The drainage area which includes Fremont Street between First Street and Seventh Street (downtown area) will be studied for the feasibility of nonpoint source control practices.

Village of Elkhart Lake: The portion of Elkhart Lake which drains to the beach south of East Street will be studied for the feasibility of nonpoint source control practices.

- For the areas planned for development: A description of the authorities and agreements that will be developed among the city or village and the towns and/or county to address the nonpoint control needs of the unincorporated areas most likely to undergo development. The agreements should include how construction erosion will be controlled in the unincorporated areas.

- For both the existing and planned areas: The identification of the funding sources (both public and private) that will be used to pay for the "local share" of the nonpoint source control program.

- For the planned areas: The types of nonpoint source control measures that will be used (on site verses off site control measures)

2. Conduct engineering feasibility and site location studies for urban nonpoint source control practices in high priority areas for existing urban development. The type and manner of practice installation will be guided by these detailed engineering studies. A commitment to implement the recommendations will be required as a condition for financial assistance of subsequent feasibility studies.

3. Adopt, administer, and enforce a comprehensive stormwater management ordinance for planned urban development within 12 months of completion of an approved State "model" ordinance.

4. If necessary enter into Local Assistance Grant Agreement or Nonpoint Source Grant (described later in this chapter) with DNR.

5. Enter into cost-share agreements (described below) for best management practices.

   For practices installed and maintained by private individuals, the cost-share agreement is between the landowner and the city or village.

The local units of government will be required to:

- Design (or contract for the design) of best management practices and verify proper practice installation.
- Reimburse cost-share recipients for the eligible costs of installing BMPs.
- Monitor landowner compliance with requirements of the cost-share agreement.

For practices installed and maintained by the city or village, a Nonpoint Source Grant between the city or village and the DNR is developed. This grant is described later in this chapter.

Department of Natural Resources

The DNR has been statutorily assigned the overall administrative responsibility for the Wisconsin Nonpoint Source Water Pollution Abatement Program. This includes providing financial support for local staff and installation of management practices, assisting local units of government to integrate wildlife and fish management concerns into selection and design of BMPs, and conducting project evaluation activities.

The Department's role in assisting local units of government in carrying out the "core" and "segmented" activities are as follows.

Core Program Roles and Responsibilities

- Assist local units of government to develop and adopt construction erosion control ordinances.
- Review community specific programs of urban "housekeeping" practices for nonpoint source control.
- Review and approve annual work plans for staff and activities necessary to implement the project.
- Review and approve annual project implementation reports.
- Participate in the annual watershed project review meeting.
- Track changes in urban pollutant loads using information supplied by local units of government.

Segmented Program Roles and Responsibilities

- Assist communities to develop priorities, schedules and requirements for segmented activities.

- Assist communities to develop a comprehensive stormwater management ordinance for planned urban development. Assist communities with adoption and enforcement of stormwater management ordinances.

- Participate in the selection of BMPs and approve practice designs. Review nonpoint source cost-share agreements signed by local units of government with eligible landowners.

- Enter into Nonpoint Source Grant Agreements with the eligible lands the local unit of government owns or operates.

- Review designs of urban nonpoint source control practices for which cost-share agreements are signed.

- Reimburse cost-share recipients for the eligible costs of installing BMPs at the rates consistent with administrative rules and those established in this plan.

Landowners and Land Operators

In some situations, private landowners will install BMPs on their property. They can be important participants in the urban implementation strategy. Eligible landowners will participate in the project by signing cost-share agreements with local units of government.

Other Agencies with Urban Implementation Responsibilities

Soil Conservation Service (SCS): This agency works through the local land conservation committee to provide technical assistance for planning and installing conservation practices. The local SCS personnel may work with the local units of government in selected circumstances to provide assistance with technical work.

University of Wisconsin Extension (UWEX): County and Area Extension agents will provide support in developing and conducting a public information and education program aimed at increasing participation in the project.

The UWEX area agent in southeastern Wisconsin specializes in urban information/ education programs and will help the cities and villages develop their programs.

Best Management Practices (BMPs)

BMPs Eligible For Cost-Sharing And Their Rates

Best management practices are those practices identified in NR 120.14 and selected in this watershed plan to be the most effective in reducing nonpoint sources of pollution. Design and installation of the urban and rural best management practices must meet the conditions listed NR 120.14.

Preliminary specifications for the structural urban practices are described in Appendix C. Application of these practices will be guided by technical assistance provided by the DNR. Eligible practices and state cost-share rates are listed below.

Table 8-1. State Cost-share Rates for Urban Management Practices

Best Management Practice	State Cost-Share Rate
Critical Area Stabilization	70%[1]
Grade Stabilization Structures	70%
Shoreline and Streambank Stabilization	70%
Shoreline Buffers	70%[1]
Wetland Restoration	70%[1]
Structural Urban Practices	70%[2]
Upgraded Street Cleaning[3]	50%

[1] Easements may be available in conjunction with these practices.
[2] Applies only to structures for established urban areas.
[3] Described in Appendix C

Source: Wisconsin Department of Natural Resources

Activities and Sources of Pollution Not Eligible for Cost-share Assistance

The following is a partial list of ineligible activities for cost-sharing in urban areas. NR 120.10 contains a more complete list of ineligible activities.

- Operation and maintenance of cost-shared best management practices (BMPs)
- Construction erosion control practices
- Structural BMPs for new urban development

- BMPs installed prior to signing cost-share agreement
- Activities covered under the Wisconsin Pollution Discharge Elimination System (WPDES) Program
- Septic system controls or maintenance
- Dredging activities
- Activities and structures intended primarily for flood control
- Purchase of land
- Storm sewers or re-routing of storm sewers
- Controls for runoff from selected industrial areas

Nonpoint Source Grant Agreement and Administration

The Nonpoint Source Grant Agreement transmits funds from the DNR to the cities or villages to help pay for the installation of BMPs. The agreement usually runs for the full length of the project (8 years) and may be amended as needed. Once this grant is signed by both parties, then the city or village is funded to cost-share practices on municipal land. If a practice is to be installed on private lands, then the funds are passed on to the landowner through a Cost-share agreement. Cost-share agreements are described below. The procedures for administering cost-share agreements and nonpoint source grant agreements are the same as those presented in the rural implementation strategy and contained in NR 120.

Cost-Share Agreement and Administration

Purpose and Responsibilities

Consistent with s. 144.25, Stats., and Chapter NR 120, cost-share funding is available to landowners and local units of government for a percent of the costs of installing BMPs to meet the project objectives. Cost-share agreements must be entered into by a landowner and the city or village within three years after approval of this watershed plan. The DNR may approve an extension to this schedule if circumstances warrant a change. The cost-share agreements are filed as part of the property deed.

In the cases where a BMP is to be installed by a private landowner (on private lands) the city or village enters into the Cost-share agreement with the landowner.

As described in Chapter NR 120.13; practices included on cost-share agreements must be installed within the schedule agreed to on the cost-share agreement. Practices must be maintained for a minimum of ten years from the date of installing the final practice included in the cost-share agreement.

Local, state, or federal permits may be needed prior to installation of some BMPs. Practices affecting wetlands or the shoreline areas of lakes and streams are most likely to require a permit. These permits are needed whether the activity is a part of the watershed project or not. The cost-share recipient is responsible for acquiring the needed permits prior to installation of practices.

Local units of government are responsible for enforcing compliance of cost-share agreements to which they are a party. The responsible party will insure that BMPs installed through the program are maintained in accordance with the operation and maintenance plan for the practice.

Identifying Wildlife and Fishery Needs

The local units of government will consult with DNR's District wildlife management and fisheries management staff to optimize the wildlife and fish management benefits of nonpoint source control BMPs. Specifically, the DNR will be contacted if:

- Streambank protection practices are considered.
- Wetlands or other wildlife habitat components will be adversely affected by installation of BMPs.

The DNR staff will assist by:

- Identifying streambank protection practices that benefit fish and wildlife.
- Identifying wildlife habitat components that could be incorporated into vegetative filter strips along streams or in upland areas.
- Providing technical assistance when the installation of BMPs will require the removal of obstructions or other wildlife habitat by proposing measures to minimize impact on wildlife habitat.
- Assisting in questions concerning effects of nonpoint source BMPs on wetlands.

Cost Containment Procedures

Cost containment procedures for local units of government are governed by state statute. The statutory requirements will apply to the cases where the city or village is the cost-share recipient.

In the cases where a private landowner is the cost-share recipient; a minimum of three competitive bids must be received for the construction of the practice. The landowner must provide copies of the bids to the city or village before initiating construction. Cost-share funding will be provided based upon the lowest bid.

Local Assistance Grant Agreement Administration

General Information

The Local Assistance Grant Agreement (LAGA) is a grant from the DNR to local units of government for supporting their staffing and direct costs of carrying out the urban implementation strategy. Each local unit of government will have its own agreement. Consistent with NR 120.21 these grant funds will be used for:

- additional staff to implement the project
- conduct information and education activities
- design and construction checks of best management practices on land owned by the local unit of government.

Other items such as travel, training, and certain office supplies are also supported by the LAGA. Table 8-2 summarizes the level of support for the various eligible activities. Further clarification of eligible costs supported by this grant is given in Chapter NR 120.14(4) and (6).

Table 8-2. Urban Implementation Activities Eligible for State Funding

Activity	State Funding Rate
Develop Construction Erosion Control Ordinances	100%
Develop Stormwater Management Ordinances	100%
Engineering Feasibility Studies (Existing Urban Area)	100%[1]
Stormwater Management Studies (Planned Urban Area)	100%[1]
Design and Engineering for Structural BMPs	100%
Staff for Enforcing Construction Erosion and Stormwater Management Ordinances	100%[2]

[1] Funding not available for drainage or flood control
[2] Funding limited to 5 years. Staffing level based on approved work plan
Source: Wisconsin Department of Natural Resources

Application Procedures

An annual review of the Local Assistance Grant Agreement is conducted through development of an annual work plan by the local unit of government. This plan estimates the work needed to be accomplished each year. The work plan is provided to the DNR for review and clarification. Along with the work plan, a grant application form is sent. Funds needed to complete the agreed upon annual workload are amended to the local assistance grant agreement.

Fiscal Management Procedures, Reporting Requirements

The local units of government are required to maintain a financial management system that accurately tracks the disbursement of all funds used for the Sheboygan River Watershed Project. The records of all watershed transactions must be retained for 3 years after the date of final project settlement. A more detailed description of the fiscal management procedures can be found in NR 120.25 and NR 120.26. NR 120 requires quarterly reports from each local unit of government accounting for staff time, expenditures, and accomplishments regarding activities funded through the watershed project. Reimbursement requests may be included with the submittal of the quarterly project reports.

Urban Budget and Staffing Needs

The urban program budget and staffing requirements include several key components. These are presented below, along with estimates of budget and staffing needs if available at this time.

Engineering Feasibility/Siting Studies

Table 8-3 estimates that detailed engineering feasibility studies will be needed for about 5,400 acres of existing urban development in order to choose and site practices. Most of these studies will probably be carried out by the private sector, with most of the cost borne by State funding. Among other things, these studies will determine the actual practice needs and costs. No estimate of this cost has been made at this time.

Table 8-3 shows that studies to choose and site stormwater practices in areas of new development will be needed for about 1200 acres. Most of these studies will probably also be carried out by the private sector, with the cost borne partly by state funding and partly by local units of government. No estimate of this cost has been made at this time.

Detailed Engineering Designs

Once practices are sited, designs must be prepared. These designs may be prepared by the private sector or by local government staff. The cost of site designs for structural practices located in existing and planned urban areas is included in cost estimates presented in the following section. It has been assumed that designs are prepared by the private sector.

Design work for BMPs in existing urban areas are supported 100 percent by the DNR and are included under the state's costs.

Cost of Installing Structural Practices in Existing Urban Areas

There are many factors that can affect the cost of constructing practices to control existing urban runoff. Key factors include labor rates, land costs, excavation costs, and cost of re-routing storm sewers.

The relative importance of these costs will vary tremendously on a case-by-case basis. Land costs will vary by community, and include acquisition costs for land procured from the private sector and the opportunity cost of using land currently held in the public domain. Excavation costs for structures that must be put underground, such as detention chambers, are several times greater than if the excavation is for a surface structure. Finally, re-routing storm sewers to get urban stormwater to the site of control practices can be costly.

Table 8-3 presents cost information for wet detention needed to implement the recommended urban program in existing urban areas. This table assumes that all basins are put on open land, and includes only the cost of designing and constructing the practice. Land costs, and the cost of re-routing storm sewers are not included and these costs are not eligible for state cost sharing.

Under these assumptions, the cost of providing detention is about $2.24 million for the entire project. The state share would be $1.14 million and the share paid by local governments and landowners would be $1.09 million.

In densely urbanized areas, the additional cost factors identified above can dramatically increase the cost of detention. Extensive re-routing of storm sewers and variable land values can increase the cost of detention on open land from the $40,000/acre of wet pond surface average used for the costs estimations. These additional costs are not eligible for support under the Nonpoint Source Program, and consequently would become part of the local share.

Cost of Installing Structural Practices in Planned Urban Areas

Table 8-3 presents an estimate of the cost for wet detention in planned urban areas. The factors that make retro-fitting so expensive should not be of concern in developing areas, as good planning can assure that land is set aside and stormwater practices located in harmony with the conveyance systems.

Table 8-3 shows that an estimated $1.52 million will be required to install wet detention in the planned urban areas. Land costs are not included and would be additional. These control measures can be designed into the newly platted areas and the costs borne by the developer and consumers. The entire cost would be borne locally, as Nonpoint Source Program funds are not used for practices in areas of new development.

Table 8-3. Urban Management Practice Needs and Estimated Costs[1]

	Acres[2]	Street Sweeping Miles/Yr.	Street Sweeping Costs/Yr.[3]	Wet Detention Acres	Wet Detention Costs[4]	Total Costs
SHEBOYGAN						
Existing Lands	4,281	418	$10,450	24.5	$1,176,000	$1,186,450
Planned Lands	450	0	0	4.0	192,000	192,000
Total	4,731	418	10,450	28.5	1,368,000	1,378,450
SHEBOYGAN FALLS						
Existing Lands	687	64	1,600	4.0	192,000	193,600
Planned Lands	414	0	0	6.0	288,000	288,000
Total	1,101	64	1,600	10.0	480,000	481,600
KOHLER						
Existing Lands	170	13	320	1.5	72,000	72,320
Planned Lands	108	0	0	0.9	43,200	43,200
Total	278	13	320	2.4	115,200	115,520
KIEL						
Existing Lands	271	54	1,350	1.5	72,000	73,350
Planned Lands	255	0	0	4.0	192,000	192,000
Total	526	54	1,350	5.5	264,000	265,350
ELKHART LAKE						
Existing Lands	25	[5]	0	0.3	12,000	12,000
Planned Lands	[5]	0	0	[5]	0	0
Total	25	0	0	0.3	12,000	12,000
TOTAL URBAN COSTS			$13,720		$2,239,200	$2,252,920

1. This table assumes the full management implementation program (as described in Chapter Six) is carried out by each community.
2. This is acres of critical lands as defined on Table 6-6.
3. This is the sweeping costs for the community to attain the "base level" of sweeping. "Base level" is described in Appendix C.
   Costs based on $25/curb mile; Attaining this level is not eligible for cost sharing.
4. These costs based on: Engineering Design = $8,000/ac; Construction = $40,000/ac; Costs do NOT include land purchase and stormsewer pipe rerouting.
5. These practice needs were not evaluated for the village of Elkhart Lake.

Sources: for costs: SEWRPC Technical Report No. 31 (Draft Jan. 1990) and Demonstration detention pond for Bemis Company, Sheboygan Falls.
for practice needs: Wisconsin Department of Natural Resources; cities of Sheboygan, Sheboygan Falls and Kiel; and villages of Kohler and Elkhart Lake

Table 8-4. Estimated State and Local Share of Urban Management Practice Costs						
	Street Sweeping[1]			Wet Detention		
	Total Cost/Yr.	State Share[1]	Local Share	Total Costs	State Share	Local Share[2]
Sheboygan	$10,450	$ 0	$10,450	$1,368,000	$882,000	$486,000
Sheboygan Falls	1,600	0	1,600	480,000	144,000	336,000
Kohler	320	0	320	115,000	54,000	61,000
Kiel	1,350	0	1,350	264,000	54,000	210,000
Elkart Lake	—	0	—	12,000	10,800	1,200
Total Urban Costs	$13,720	$0	$13,720	$2,239,000	$1,144,800	$1,094,200

1. Sweeping costs assume that the full implementation program is carried out and that ½ of the critical lands (industrial, commercial and high density residential) are swept at the base level. Detailed feasibility studies for each critical area within a community will determine the actual street sweeping (and other practice) needs.

2. Figures do not include costs of land acquisition, stormsewer rerouting or maintenance.

Sources: for costs: SEWRPC Technical Report No. 31 (Draft Jan. 1990); and Sheboygan Falls demonstration project costs
for practice needs: Wisconsin Department of Natural Resources; cities of Sheboygan, Sheboygan Falls and Kiel; and villages of Kohler and Elkhart Lake

Operation and Maintenance for Structural Practices

Operation and maintenance costs for detention are about 5 percent of the capital construction cost per year. This cost is not included in table 8-3. This cost is supported locally.

Cost of Street Sweeping in Existing Urban Areas

Table 8-3 shows the estimated cost of sweeping 50 percent of the critical urban land uses as part of a program that phases in the required level of wet detention. The costs presented in the table assume a total cost of $25 per curb mile. Principal component costs include wages and salaries (34 percent), indirect labor benefits and overhead (9 percent), maintenance and fuel (25 percent), equipment depreciation (16 percent), and litter disposal (16 percent). The total annual cost of improving local street sweeping programs to the "base" level recommended in this plan is about $13,720. The "base" level street sweeping program is described in Appendix C. In general, the base level program consists of a once/week sweeping frequency of commercial, industrial, high density residential, and highway streets from March to November. The costs of street sweeping to this level is not eligible for state cost-share funding.

Cost of Preparing Construction Site Erosion Control Plans

This cost has not been estimated. It will be supported primarily by the private sector to meet requirements of local ordinances.

Cost of Installing Construction Erosion Control Practices

This cost has not been estimated. It will be supported primarily by the private sector to meet requirements of local ordinances.

Cost of Administering a Construction and Stormwater Control Ordinances

This is potentially a significant cost for some communities. An estimate has not been made. For the first five years, the local governments costs of providing additional staff to administer and enforce ordinances will be supported 100 percent by the Department of Natural Resources. After the first five years, the cost of continuing the ordinance programs must be supported locally.

CHAPTER NINE
INFORMATION AND EDUCATION STRATEGY

Purpose and Perspectives

The primary purpose of the information and education (I&E) strategy for the Sheboygan River Priority Watershed is to enhance the implementation of watershed plan objectives.

To achieve the most impact with available funds, educational program planning was viewed from several perspectives:

- Key audiences capable of having the greatest impact on the resource because they own, manage, or help govern critical lands.
- Key messages from the watershed project that need to be relayed.
- Potential uses of activities such as providing information, promoting participation, and instruction on specific practices.
- Opportunities for combining public and private efforts.
- Critical time lines associated with phases in the watershed project.
- Educational approaches that are most effective for the purpose.

The resulting educational strategy includes recommendations for both general and specifically targeted activities. It recognizes that certain targeted audiences hold the key to actions that can produce the most immediate and substantial improvements in water resources. At the same time, the plan acknowledges that educational activities designed for general audiences are important. This recognizes that numerous encounters with information are often required to motivate positive action. The general activities also address public "right-to-know" and "momentum-building" objectives. Even so, targeting audiences and refining messages will occur to the greatest degree possible to maximize cost efficiency and program impact.

Key Audiences and Outcomes

Ideally, the watershed project would be able to reach all key audiences throughout project implementation. However, the realities of limited staff and resources require prioritizing activities for each stage of the project. Key audience groups include:

Those who must act:

- business and industry
- local elected and appointed officials
- rural landowners and operators (farmers)
- urban homeowners/residents

Those who can support change:

- agricultural organizations
- civic and service groups
- concerned citizens
- conservation and environmental groups
- fishing, boating and other water resource user groups

Future actors and supporters:

- youth
- teachers and youth leaders
- general public

For the sign-up period, audiences will be addressed according to the following desired outcomes (in order of priority):

1. Watershed project participation, primarily through:
   a. Cost-sharing agreements with local governments or rural landowners, and
   b. Community action through regulation of nonpoint source pollution (ordinances) or proper management (public works programs).

2. Widespread individual action on a voluntary basis without a cost-sharing agreement, including urban residents using good "housekeeping" practices and rural landowners using nutrient and pesticide best management practices.

3. Using other state and federal conservation programs to achieve water quality objectives in ways complementary to the Nonpoint Source Program.

4. Support of the watershed project through understanding, acceptance, and advocacy of project goals.

5. Increased awareness that the project exists and of what is being accomplished.

More than one of these outcomes may apply to an activity and audiences may overlap. Also, priorities will change as the project moves beyond sign-up through implementation to evaluation.

Factors Affecting the I&E Strategy

Strengths

From an information and education perspective, there are factors which may enhance project implementation. The population within the watershed is observed by staff to be more homogeneous than, for example, the nearby Milwaukee River Basin in which Fond du Lac and Sheboygan also have major watershed projects. Although there is some inclination among rural and urban groups to see the other as causing much of the nonpoint source pollution problem, the division is not great and there appears to be a fairly good sense of shared responsibility, both related to problems and solutions. Many communities, for example, have expressed concern and supported ordinances for construction erosion control, while farmers have expressed corresponding views regarding their needed actions.

There is a strong farming tradition with an agriculturally driven economy in large parts of the watershed with few absentee landlords, multiple generations involved in family farming operations, and significant emphasis on continued dairying. These conditions generally favor the acceptance and adoption of soil and water conservation practices, that control nonpoint source pollution.

There are many parks in Sheboygan, a major sport fishing industry on Lake Michigan, large public fishing and hunting areas at the Sheboygan and Kiel marshes, and heavy use of inland lakes. This suggests strong local interest in outdoor recreation. Combined with the prominence of the Sheboygan River, these resources are seen as valuable assets, worth protecting and improving. Also, much of the water-based recreation in the Sheboygan River watershed is by local residents. Such factors tend to elevate the importance of the Priority Watershed Project and encourage make media, thereby enhancing the I&E program.

In the urban area, the concentration of development in the Sheboygan Falls, Kohler, and Sheboygan corridor can be an advantage. A relatively small stretch of river is affected, though significantly, by urban pollutant runoff. While not unique to this watershed, a small percentage of the land under construction at any given time contributes a large portion of the sediment, even when viewed watershed-wide. This should be controllable through properly enforced ordinances. Education will play a key role.

Finally, there is a very active network of civic, service, environmental, and youth groups in the watershed. Each of these groups has the potential to play a positive role in building momentum for watershed plan implementation. The influential and independent Water Quality Task Force for Sheboygan County indicates local interest and support.

Weaknesses

There are also a number of factors that can complicate project implementation or affect future perceptions of success. A number of these factors are beyond the control of the Sheboygan River Priority Watershed Project but recognizing and dealing with them openly and objectively will benefit information and education efforts.

According to the inventory of the lower river, water quality is fair to good and the major nonpoint source pollution problems are turbidity/suspended solids and bacterial contamination. However, water quality and the fishery are substantially impacted by other factors as well, specifically polluted sediments and several impoundments. Therefore, dramatic improvements for fishing, swimming, and aesthetics will require more than nonpoint source pollution control.

In the scope of the nonpoint source pollution control, but beyond the scope of this particular project, is the pollution contribution to the lower Sheboygan River by major tributaries. The heavy sediment and nutrient load from the Onion and Mullet Rivers can greatly affect the Sheboygan River main stem below the Roller Mills Dam. While the Sheboygan River project will alone bring improvements, general information and education on the importance of nonpoint source pollution control could benefit the substantial tributary areas noted. Such I&E activities, however, do not fit within the strategy tables that follow.

In upstream areas, the I&E challenge associated with tributary streams is somewhat different. While the Sheboygan River corridor is generally in good shape, with woods and comparatively little direct cattle access or cropping up to the banks, many small tributaries exhibit the opposite. With high nutrient loadings, there is excessive weed and algae growth. High sediment loading has silted bottoms and eliminated fish habitat. High bacteria counts make recreation inadvisable and low dissolved oxygen levels preclude much aquatic life. In short, many small tributary streams are not recognized as significant water resources. There has been channelization, extensive wetland drainage, and nearly complete loss of a natural stream corridor in some areas. Here, other efforts may need to work in combination with the Priority Watershed Program to restore the integrity of tributary streams.

From an I&E perspective, the value of such streams in functioning as part of a total watershed system must be woven into activities. The quality of the Sheboygan River main stem can only be as good as the collection of its parts, and improvements to previously neglected tributaries should also emphasize improvements to the Sheboygan River.

Effective Methods to Reach Key Audiences

Key audiences have been grouped into four categories for this educational plan:

1. rural landowners and operators
2. local governments
3. urban residents
4. civic, service, environmental and youth organizations

The educational methods selected to reach key audiences in this watershed are methods used, to varying degrees, in other watersheds around the state:

- one-to-one contacts with a folder of materials tailored to each landowner
- watershed newsletters
- demonstration projects and tours
- town and municipal meetings
- agricultural practices meetings
- workshops on construction erosion control and stormwater management
- fact sheets on recommended practices
- local radio talk shows and news programs
- articles in local newspapers
- speakers for various organizations
- exhibits at county fairs and local events, especially water-related ones
- youth group projects

Emphasis placed on certain activities and approaches will characterize the Sheboygan River project I&E strategy.

As a result of agricultural stability and expressed support of the Advisory Committee, meetings will be used quite heavily, more so than in other projects. This will help build momentum and solicit participation in both the cost-sharing program and other contributions to the clean-up effort. Virtually all governmental units and organizations will be reached through such means, as will key groups of rural landowners. A community-to-community and neighbor-to-neighbor support network is viewed as feasible by local watershed project staff. And Advisory Committee members have endorsed and selectively agreed to participate in a Speakers Bureau to help facilitate this network.

The lower river has salmon and lake trout runs. Therefore, the urban section has the potential for a very valuable fishery once PCB contamination and turbidity are reduced and migration barriers removed. Fortunately, remedial actions on the PCB problem are already underway. Again, such actions are beyond the scope of this plan, but the I&E activities can help distinguish important components of the complete water quality picture and promote necessary relationships.

Workshops that are part of an areawide educational effort will be used to complement important one-on-one contacts to help establish crucial construction erosion controls in urban areas.

Table 9-1 indicates the different types of I&E activities included in the educational strategy. They generally fit one or more of the following classifications.

- activities that motivate individuals and/or groups to action
- activities that provide instruction on how to take appropriate action
- activities that develop an understanding of how the priority watershed project works (describing steps involved in signing-up, time lines, etc.)
- activities that share progress, to reinforce awareness and motivate by positive example
- activities that promote project visibility and the need for clean water

Educational Project Workload and Lead County Concept

During the sign-up period under the watershed project, there is a clear need to establish cost-sharing agreements with as many eligible individuals and communities as possible (ordinance development and housekeeping practices can be pursued after this period ends, as

well as during it). In order to accomplish this, county staff must be available to make the necessary contacts and then commit to the necessary follow-through. These one-on-one contacts illustrate a fundamental type of education. However, they are considered a part of the technical implementation process and are budgeted elsewhere. Key educational materials, to make this process more effective, are covered in this plan.

The educational strategy tables reflect a collective decision on the part of the counties to informally practice a "lead county concept." Having Sheboygan and Fond du Lac counties serve as leaders for the multi-county educational activities under the project should result in greater efficiency. This is because Manitowoc County and, especially, Calumet County each contain a small portion of the watershed. Examples of activities affected by this "deferral" to a lead educational county would be tours, newsletter articles, news releases, radio programs, and certain public meetings.

Educational Strategy

The initial years of educational activity within the Sheboygan River Watershed will be the most ambitious because the groundwork needs to be established for a successful and extensive program. Therefore, activities for the first three years (the sign-up period for cost sharing)are set forth in greater detail in tables 9-1 and 9-2 (Appendix D describes the activities). The tables indicate the need for an average of about 1,040 hours and $13,000 per year to support information and education activities for the watershed project during the sign-up period.

Some general information for the remaining years of the watershed project is included in Appendix D, but most details will be filled in during the updating process. The educational strategy will be updated regularly, probably on an annual basis. The first update will rank among the most important because of insights gained during the initial period of project sign-up and implementation.

Table 9-1. Educational Materials and Events--Sheboygan River Watershed

Educational Material/Event	Responsible Parties (hours)[1]												Comments
	Sheboygan County UWEX			Sheboygan County LCD			Fond du Lac County UWEX			Fond du Lac County LCD			
	Year			Year			Year			Year			
	1	2	3	1	2	3	1	2	3	1	2	3	
Printed Materials													
Watershed newsletter editorial leadership	40	40	40	--	--	--	--	--	--	--	--	--	State-level printing and editorial assistance available
Contributing newsletter articles[4]	20	20	20	20	20	20	20	20	20	20	20	20	
Watershed folder[4]	10	5	--	40	20	10	10	5	--	20	10	5	Contents adapted for individual landowners/municipalities
Demonstration project fact sheets	20	--	--	20	--	--	--	--	--	20	--	--	Published through area UWEX See also: Demonstrations
Yard care fact sheets[2]	--	--	--	--	--	--	30	--	--	--	--	--	Published through area UWEX
Fact sheet regarding easements[2]	--	--	--	10	--	--	--	--	--	10	--	--	Review assistance only
Fact sheet regarding wetland restoration[2]	--	--	--	(10)	--	--	--	--	--	(10)	--	--	If suitable material is not pre-existing
Fact sheet regarding wildlife benefits of selected nonpoint control practices[2]	--	--	--	(10)	--	--	--	--	--	(10)	--	--	If suitable material is not pre-existing
Fact sheet/materials for storm sewer stencilling	10	--	--	--	--	--	--	--	--	--	--	--	
Fact sheet adaptation[2]	--	--	--	5	--	--	--	--	--	--	--	--	Logo artwork; various aspects of rural and urban program. Many from Milwaukee River Program
Existing materials (available supplies or reprints)[3,4]	5	--	--	10	5	--	5	--	--	10	5	--	
Brochure on waste oil recycling	5	--	--	--	--	--	5	--	--	--	--	--	
Audio-Visual Materials													
Watershed slides[4]	5	--	--	10	5	5	5	--	--	10	5	5	Helping shoot or assemble
Info source tapes--yard care and waste oil recycling[2]	--	5	--	--	--	--	--	5	--	--	--	--	Part of District-wide UWEX system of educ. via telephone
Videotape purchase	--	--	--	5	--	--	--	--	--	5	--	--	Recent series on NPS control
Video playback/projection equipment purchase	--	--	--	5	--	--	--	--	--	5	--	--	For use with exhibits and meetings
Subtotal Hourly Commitments	115	70	60	145	50	35	75	30	20	120	40	30	

Table 9-1. Educational Materials and Events--Sheboygan River Watershed

Educational Material/Event	Responsible Parties (hours)[1]												Comments
	Sheboygan County UWEX			Sheboygan County LCD			Fond du Lac County UWEX			Fond du Lac County LCD			
	Year			Year			Year			Year			
	1	2	3	1	2	3	1	2	3	1	2	3	
Exhibits													
County fairs--Sheboygan and Fond du Lac	5	--	5	5	--	5	5	--	5	5	--	5	Many more hours, if staffed
Kiel picnic/other event(s)[4]	--	5	--	--	--	--	--	--	--	--	--	--	Lead County could vary
Other smaller setting locations (libraries, courthouse, other public buildings, banks, feed mills, mall(s), etc.)[4]	--	5	5	--	5	5	--	5	5	--	5	5	Commitment could expand significantly
Fond du Lac Co. homebuilders show	--	--	--	--	--	--	5	--	5	10	--	10	
Purchase of needed exhibit components	--	--	--	10	--	--	--	--	--	10	--	--	Panels and equipment; displayable pieces
Media													
Seasonal newspaper coverage--yard care, waste oil recycling, and housekeeping practices[4]	10	10	10	--	--	--	20	20	20	--	--	--	Possible adaptation of Milwaukee River Program columns
News releases[4]	5	5	5	5	5	5	5	5	5	5	5	5	With major events only
Radio public service announcements[2]	5	--	5	--	--	--	5	--	5	--	--	--	Arranging for use, such as waste oil recycling and Milwaukee River Program series
Radio talk shows[5]	5	5	5	--	--	--	5	5	5	--	--	--	
TV spot(s)	--	--	--	--	--	--	5	--	--	--	--	--	Tentative
Tours													
Demonstration project field day/nutrient and pest management tour[4]	25	25	--	25	25	--	25	25	--	25	25	--	
Conservation Tillage Field Day	--	25	--	--	10	--	--	( )	--	--	( )	--	Possible addition in Fond du Lac County
Animal waste operators tour	25	--	--	25	--	--	--	--	--	--	--	--	
Barnyard management tour	--	--	--	--	--	--	25	--	--	25	--	--	In conjunction with Milw. R. North Branch project
Subtotal Hourly Commitments	80	80	35	70	45	15	100	60	50	80	35	25	

Table 9-1. Educational Materials and Events--Sheboygan River Watershed

Educational Material/Event	Responsible Parties (hours)[1]												Comments
	Sheboygan County UWEX			Sheboygan County LCD			Fond du Lac County UWEX			Fond du Lac County LCD			
	Year			Year			Year			Year			
	1	2	3	1	2	3	1	2	3	1	2	3	
Tours (continued)													
Citizens advisory committee/local officials tour	--	50	--	--	15	--	--	30	--	--	15	--	
Category I (& II?) landowners tour(s)	--	--	10	--	--	25	--	--	10	--	--	25	
Urban practices tour	--	--	15	--	--	5	--	--	--	--	--	--	At such time that sufficient practices can be viewed; or in conjunction with other watershed projects
Demonstrations[6]													
Barnyard runoff management[4]	20	10	5	20	10	5	--	--	--	--	--	--	All rural demos to be finalized. Most, if not all, such sites will also have nutrient and pest management components.
Animal waste storage[4]	20	10	5	20	10	5	--	--	--	--	--	--	
Barnyard runoff management with possible waste storage and streamside buffer	--	--	--	--	--	--	--	--	--	30	20	10	
Bemis urban demonstration	--	--	5	--	--	--	--	--	--	--	--	--	Illustrates construction erosion control and urban stormwater management
Model yards--Lake areas (all aspects tentative)[4]													
Signs													
Demonstration projects	--	--	--	10	--	--	--	--	--	10	--	--	With each demonstration (see above)
Rural cooperator signs and visor hats[4,7]	--	--	--	10	10	10	--	--	--	20	10	10	
At key access points[4,5]	--	--	--	50	--	--	--	--	--	50	--	--	Explanatory with watershed logo at locations such as the Sheboygan Marsh
Workshops													
Construction erosion control 1-day workshop for inspection staff, builders, and contractors[2] 3-day workshop for engineers[2]	5	5	--	--	--	--	--	--	--	--	--	--	Assistance with logistics and promotion
Subtotal Hourly Commitments	45	75	40	110	45	50	0	30	10	110	45	45	

Table 9-1. Educational Materials and Events--Sheboygan River Watershed

Educational Material/Event	Responsible Parties (hours)[1]												Comments
	Sheboygan County UWEX			Sheboygan County LCD			Fond du Lac County UWEX			Fond du Lac County LCD			
	Year			Year			Year			Year			
	1	2	3	1	2	3	1	2	3	1	2	3	
Workshops (continued)													
Stormwater management	--	5	5	--	--	--	--	--	--	--	--	--	Assistance with logistics and promotion
4-day workshop for engineers[2]	--	5	5	--	--	--	--	--	--	--	--	--	
Meetings[8]													
Group approach to rural implementation[4] (preceding or during one-on-one contacts)	40	--	40	20	--	20	20	--	20	40	--	40	Five meetings total--two per lead county--per year
Farm "neighborhood" meetings[4]	--	10	--	--	10	--	--	10	--	--	10	--	
Lake district/association meetings[4]	--	--	--	--	--	--	--	--	--	--	--	--	Tentative
Presentations to environmental, civic, and service groups[4,10]	20	20	20	20	20	20	20	20	20	20	20	20	Attempting to reach most/all over 3-year sign-up period
Local governments[4]	--	10	--	--	10	--	--	10	--	--	10	--	Follow-up to pre-implementation town and municipal meetings
Presentations to agricultural groups[4]	5	5	5	--	--	--	15	5	5	--	--	--	
Speakers Bureau for the above[4,5]	20	20	20	10	10	10	10	10	10	5	5	5	Area UWEX and DNR providing materials and suggestions
Youth Education													
Fond du Lac County outdoor classroom	--	--	--	--	--	--	5	5	5	5	5	5	
Streambank or shoreline clean-up projects[4]	--	5	--	--	--	--	--	5	--	--	--	--	
Storm sewer stenciling project(s)[4,10]	--	5	5	--	--	--	--	5	5	--	--	--	
Classroom and group/club presentations[4]	5	5	5	5	5	5	5	5	5	5	5	5	
Educational Strategy Update													
Semi-annual I&E monitoring	10	10	10	10	10	10	10	10	10	10	10	10	
Annual I&E plan revisions[4]	5	5	5	5	5	5	5	5	5	5	5	5	
Subtotal Hourly Commitments	105	105	120	70	70	70	90	90	85	90	70	90	
Total Hourly Commitments[11]	345	330	255	395	210	170	265	210	165	400	190	190	

Table 9-1. Educational Materials and Events--Sheboygan River Watershed Notes

1 Many activities will utilize area UWEX staff leadership or assistance, as reflected in separate annual work plans. This priority watershed educational plan reflects only county time commitments. Sheboygan and Fond du Lac Counties, per prior agreement, jointly serve as lead responsible parties; Manitowoc and Calumet Counties have minimal involvement in watershed-wide information and education, but would have locally important roles as footnoted via "d" below.

2 State or areawide events or materials produced at the District level and perhaps adapted for local use.

3 The identification and purchase or existing bulletin materials (including fact sheets, brochures, newsletters, etc.) will prevent duplication and use already published expertise.

4 Manitowoc and Calumet Counties may directly participate in especially these types of activities, with decreased hourly commitments roughly proportional to their smaller watershed areas. The Kiel area appears appropriate for many activities which are so coded and targeted toward the urban audience or requiring a community forum. (See also footnote "k")

5 Advisory committee members may contribute significantly to these activities.

6 Hourly estimates for demonstrations pertain to their investigation, formal proposal, and documentation with slides and fact sheets only--not to the more time-consuming aspects of establishment, maintenance, and use in tours, etc.

7 Visor hats are considered a type of "sign", because the wearer to whom given (cooperating landowner is capable and presumed willing to explain his/her site.

8 Meetings have been prioritized as a particularly important element of project implementation success. The group approach for rural landowners would complement one-on-one contacts (which are not part of the education strategy, per se) in an attempt to optimize voluntary participation. Local government meetings listed would follow a series of such events undertaken at the conclusion of the planning phase, during which DNR would also have met with the elected governing bodies of the municipalities in the watershed.

9 The extensive network of presentations to all appropriate groups is a conscious attempt to both inform and solicit involvement and support, which initial strategizing indicated might be achievable.

10 Storm sewer stencilling for youth is part of a public awareness campaign to establish a linkage in peoples' minds between urban land management and water quality. A "no dumping-fish downstream" type of message at storm sewer grates may also capture media attention.

11 At the time of plan completion, a clearer and more complete picture of activities and hourly commitments existed for year-one than for subsequent years. The annual updating process will address this matter by providing supplementary detail. In addition, these conservative hourly estimates will likely deviate somewhat from those finally required. Therefore, the entry of specific activities in this table is more important than best estimates to date of the resources needed to complete them. Manitowoc County (see also footnote "d") has estimated a total hourly commitment of 190 hours for year 1, 125 hours for year 2, and 95 hours for year 3, as reflected with detail similar to Table 9 in annual work plans for the county.

Table 9-2. Educational Budget--Sheboygan River Watershed

Educational Material/Event	Responsible Parties (hours)[1]									Comments
	Sheboygan County			Fond du Lac County			Southeast Area UWEX			
	Year			Year			Year			
	1	2	3	1	2	3	1	2	3	
Printed Materials										
Watershed newsletter editorial leadership	--	--	--	--	--	--	--	--	--	County costs minimal unless local printing is pursued; office postage must be increased for bulk mailing, particularly Sheboygan Co.
Watershed folder[4]	$2,000	--	--	--	--	--	--	--	--	
Demonstration project fact sheets	--	--	--	--	--	--	--	--	--	See: Demonstrations
Yard care fact sheets[2]	--	--	--	--	--	--	$1,000	$500	$250	Possible adaptation under Sheboygan River logo
Fact sheet regarding easements[2]	--	--	--	--	--	--	1,000	--	--	Also with Milwaukee River Program
Fact sheet regarding wetland restoration[2]	--	--	--	--	--	--	--	--	--	Possibly no cost--needs being investigated
Fact sheet regarding wildlife benefits of selected nonpoint control practices[2]	--	--	--	--	--	--	--	--	--	Possible no cost--needs being investigated; may be published directly through DNR
Fact sheet/materials for storm sewer stencilling	--	--	--	--	--	--	--	500	--	Likely adaptation of Milwaukee River Program publication
Fact sheet adaptation[2]	--	--	--	--	--	--	1,000	500	--	
Existing materials (available supplies or reprints)[3, 4]	100	$100	$100	$250	$100	$100	--	--	--	
Brochure on waste oil recycling	--	--	--	--	--	--	--	500	--	
Audio-Visual Materials										
Watershed slides[4]	1,400	50	--	100	50	--	--	--	--	Includes audio viewer for Sheboygan County
InfoSource tapes--yard care and waste oil recycling[2]	150	--	--	150	--	--	--	--	--	
Subtotal Costs	$3,650	$150	$100	$500	$150	$100	$3,000	$2,000	$250	

Table 9-2. Educational Budget--Sheboygan River Watershed

Educational Material/Event	Responsible Parties (hours)[1]									Comments
	Sheboygan County			Fond du Lac County			Southeast Area UWEX			
	Year			Year			Year			
	1	2	3	1	2	3	1	2	3	
Audio-Visual Materials (continued)										
Videotape purchase	$150	--	--	$150	--	--	--	--	--	Recent series on NPS control
Video playback/projection equipment purchase	700	$2,800	--	2,800	$700	--	$3,500	--	--	For use with exhibits and meetings
Exhibits										
Fond du Lac Co. homebuilders show booth	--	--	--	100	100	$100	--	--	--	
Purchase of needed exhibit components	1,300	--	--	1,300	--	--	500	$250	$100	
Media										
Radio public service announcements[2]	1,000	--	--	--	--	--	--	--	--	Tentative; possible engineering costs for locally narrating/adapting script(s) developed for the Milwaukee River Program
Tours										
Demonstration project field day/nutrient and pest management tour[4]	500	--	500	100	--	100				Some costs covered by Nutrient and Pest Management Program
Conservation Tillage Field Day	--	500	--	--	--	--	--	--	--	Possible multi-county event with arrangements via Sheboygan County
Animal waste operators tour	250	--	--	250	--	--	--	--	--	
Barnyard management tour	250	--	--	--	--	--	--	--	--	
Citizens advisory committee/local officials tour	--	750	--	--	750	--	--	--	--	
Category I (& II?) landowners tour(s)	--	--	750	--	--	750	--	--	--	
Subtotal Hourly Commitments	$4,150	$4,050	$1,250	$4,700	$1,550	$950	$4,000	$250	$100	

Table 9-2. Educational Budget--Sheboygan River Watershed

Educational Material/Event	Responsible Parties (hours)[1]									Comments
	Sheboygan County			Fond du Lac County			Southeast Area UWEX			
	Year			Year			Year			
	1	2	3	1	2	3	1	2	3	
Tours (continued)										
Urban practices tour	--	--	--	--	--	--	--	--	--	Indefinite future cost
Demonstrations[6]										
Barnyard runoff management[4]	$1,200	--	--	--	--	--	--	--	--	
Animal waste storage[4]	1,200	--	--	--	--	--	--	--	--	
Barnyard runoff management with possible waste storage and streamside buffer	--	--	--	$1,200	--	--	--	--	--	
Bemis urban demonstration	--	--	--	--	--	--	$750	--	--	Fact sheet(s)
Signs										
Demonstration projects	--	--	--	--	--	--	--	--	--	See: demonstrations
Rural cooperator signs and visor hats[4, 8]	--	--	--	--	--	--	--	--	--	
At key access points[4, 8]	--	--	--	--	--	--	--	--	--	
Workshops[9]										
Construction erosion control 1-day workshop for inspection staff,builders, and contractors[2] 3-day workshop for engineers[2]	--	--	--	--	--	--	--	--	--	All under separate budgets
Stormwater management 4-day workshop for engineers[2]	--	--	--	--	--	--	--	--	--	
Group approach to rural implementation[4] (preceding or during one-on-one contacts)	500	--	500	500	--	500	--	--	--	
Subtotal Hourly Commitments	$2,900	$0	$500	$1,700	$0	$500	$750	$0	$0	

Table 9-2. Educational Budget--Sheboygan River Watershed

Educational Material/Event	Responsible Parties (hours)[1]									Comments
	Sheboygan County			Fond du Lac County			Southeast Area UWEX			
	Year			Year			Year			
	1	2	3	1	2	3	1	2	3	
Meetings[8]										
Presentations to environmental, civic, service and agricultural groups[4, 10]	$200	$200	$200	$200	$200	$200	--	--	--	
Youth Education										
Fond du Lac County outdoor classroom	--	--	--	75	75	75	--	--	--	
Streambank or shoreline clean-up projects[4]	--	200	--	--	100	--	--	--	--	Possible equipment or supply needs; most hopefully donated to this program activity
Storm sewer stenciling project(s)[4, 10]	100	--	--	--	--	--	--	--	--	Or stencils provided via area UWEX
Subtotal Hourly Commitments	$300	$400	$200	$275	$375	$275	$0	$0	$0	
Total Hourly Commitments[11]	$11,000	$4,600	$2,050	$7,175	$2,075	$1,825	$7,750	$2,250	$350	

Notes:

[1] Many activities will utilize area UWEX staff leadership or assistance. This priority watershed educational plan reflects only county budgetary needs except for special items listed under the area UWEX column. These items are activities with District or areawide applicability that are important for this watershed project.

[2] Fairly generic fact sheets which would directly apply to the Sheboygan River project if rerun/updated under this logo prospectively include "Quality Actions for Quality Waters" (possibly at conclusion of planning phase 1, "Why you should Participate..", "Rural Cost-Sharing for Cleaner Waters", and Urban Cost Sharing/Practices.

[3] The identification and purchase or existing bulletin materials (including fact sheets, brochures, newsletters, etc.) will prevent unnecessary duplication and make use of already published expertise. Conservation tillage, "sustainable agriculture", and crop rotations are several subjects for which this approach is anticipated.

[4] Manitowoc and Calumet Counties may similarly require funds for this activity, with costs reduced downward proportional to their involvement.

[5] Taped information available by telephone.

[6] Purchase of exhibit board and lights for counties. Update of display materials and replacement of boards for area UWEX.

[7] Cost estimates for new demonstrations pertain to signs and documentation with slides and fact sheets--not to the more costly establishment, maintenance, and use. Fact sheet publication costs may be run through area UWEX budget rather than the counties.

Table 9-2. Educational Budget--Sheboygan River Watershed

Notes (continued):

[8] Costs have not been estimated because project plans are still being formulated. Separate proposals will be developed.

[9] Workshop costs are largely borne by the individuals attending, with associated "up-front" costs incurred by area UWEX under separate proposals or directly by DNR.

[10] Incidental costs anticipated for this important ongoing educational program thrust.

[11] At the time of plan adoption, a clearer and more complete picture of activities and budgetary needs existed for year-one than for subsequent years. The annual updating process will address this matter by providing supplementary detail. In addition, cost estimates may deviate somewhat from those finally required. Therefore, the entry of items in this table is more important than specific cost estimates.

CHAPTER TEN
PROJECT EVALUATION AND MONITORING

Introduction

This chapter briefly summarizes the plan for monitoring the progress and evaluating the effectiveness of the Sheboygan River Priority Watershed Project The evaluation strategy includes three components:

1. administrative review
2. pollution reduction evaluation
3. water resource monitoring

Information on the first two components will be collected by each county Land Conservation Department (LCD) or city/village and reported on a regular basis to the DNR and DATCP. The third component is performed by the DNR. Additional information on the numbers and types of practices on cost-share agreements; funds encumbered on cost-share agreements, and funds expended, will be provided by the DNR's Bureau of Community Assistance.

Upon completion of the landowner sign-up period, an interim report will be prepared cooperatively by the LCD, cities/villages, DATCP, and DNR. This report will summarize the administrative, pollutant load reduction, and water quality information that is available at that time. The report will make preliminary conclusions on the success of the project to date and will recommend actions to be taken during the rest of the implementation phase.

Administrative Review

Rural

The first component, the administrative review, will focus on the progress of the counties in implementing the project. The project will be evaluated with respect to accomplishments, financial expenditures, and staff time spent on project activities.

Accomplishment Reporting

The Computer Assisted Management and Planning System, called CAMPS, is a computer data management system that has been developed by the U.S. Soil Conservation Service (SCS). It is used by SCS, DNR and DATCP to meet the accomplishment reporting requirements of all three agencies. Data on administrative accomplishments will be collected by each county LCD using CAMPS, and will be provided to the DNR and DATCP for program evaluation.

The county LCD will provide the following data to the DNR and DATCP quarterly:

- number of personal contacts made with landowners
- completed I&E activities
- number of farm conservation plans prepared for the project
- number of cost-share agreements signed
- number of farm conservation plan and cost-share agreement status reviews completed, and
- number of farms and acres of cropland checked for proper maintenance of best management practices

In addition to quarterly reports, county LCD representatives will meet with DNR and DATCP staff annually to review progress and plan for the subsequent year.

Financial Expenditures

Each county LCD will provide the following financial data to the DNR and DATCP quarterly:

- number of landowner cost-share agreements signed
- amount of money encumbered in cost-share agreements
- number of landowner reimbursement payments made for the installation of BMPS, and the amount of money paid
- staff travel expenditures
- information and education expenditures
- expenditures for equipment, materials, and supplies
- expenditures for professional services and staff support costs

- total project expenditures for LCD staff
- amount of money paid for installation of BMPS, and money encumbered in cost-share agreements

Each county will also provide both agencies with the following financial data annually:

- staff training expenditures
- interest money earned and expended
- total county LCD budget and expenditures on the project

Time Spend on Project Activities

Each county will provide time summaries to both departments for the following activities on a quarterly basis:

- project and fiscal management
- clerical assistance
- pre-design and conservation planning activities
- technical assistance: practice design, installation, cost-share agreement status review and monitoring
- educational activities
- training activities
- leave time

Urban

Accomplishment Reporting

Evaluation of the urban program components will be conducted jointly by the DNR and local units of government local units of government will report semi-annually to the DNR on progress for "core" program activities. Reports will cover:

- scheduled information and education activities
- completion of construction site erosion control ordinance modification or adoption
- acres of construction activity with adequate erosion control plans

- acres of construction activity monitored for compliance with provisions of ordinance and erosion control plans
- identification of needed changes in housekeeping
- implementation of housekeeping program changes

Local units of government will report annually on progress for "segmented" program activities. Reports will cover:

- acres of new urban development, by land use, covered by plans for controlling urban pollutant loads and stormwater flows
- acres of new urban development, by land use, not covered by plans for controlling urban pollutant loads and stormwater flows
- stormwater ordinance adoption or modification
- feet and tons of eroding streambanks addressed in detailed engineering feasibility studies

In addition, representatives of governments addressing urban pollution issues will meet with DNR staff annually to review progress and identify work plan objectives for the subsequent year.

Financial Expenditures, Time Spent on Project Activities

Reporting on these items will parallel reporting specified in this plan for the rural areas.

Pollutant Load Reduction

Rural

Key Nonpoint Sources for Evaluating Pollutant Load Reductions

The purpose of the second evaluation component, pollutant load reduction, is to calculate reductions in the amount of key pollutants as a result of installing Best Management Practices. Three key sources have been identified for estimating changes in rural pollutant loads that reach creeks in the Sheboygan River Watershed. Chapter six defines the pollutant reductions recommended for each water resource from each of pollutant source.

1. streambank erosion

Streambanks:

Each county LCD staff will calculate changes in streambank sediment in terms of tons of sediment and length of eroding sites. A tally will be kept of landowners contacted, the amount of streambank sediment being generated at the time of contact, and changes in erosion levels estimated after installing best management practices.

2. upland sediment

Upland Sediment Sources:

The DNR will use the WIN (Wisconsin Nonpoint Source) model to estimate sediment reductions due to changes in cropping practices. Data for the WIN model will be provided quarterly by each county LCD through CAMPS, as described above.

3. runoff from barnyards and fields spread with manure.

Barnyard Runoff:

Each county will use the BARNY (Modified ARS) model to estimate phosphorus reductions due to the installation of barnyard control practices. The county will report the information to DNR through CAMPS.

Urban

Local units of government will provide the following information annually to the DNR for evaluation of changes in urban pollutant loading:

- 1988 urban acres, by land use, served by urban stormwater practices, and information requested by the DNR concerning practice characteristics
- acres of post 1988 urban development, by land use, served by stormwater practices, and information requested by the DNR concerning practice characteristics
- post 1988 urban development areas, by land use, not served by stormwater practices
- acres of construction site activity served by adequate erosion control practices
- acres of construction site activity not served by adequate erosion control practices
- changes in streambank erosion, in tons and feet of erosion, due to installation of erosion control and flow reduction practices.

Water Resources Monitoring Plan Summary

Introduction

The primary purpose of the monitoring plan is to evaluate how well the Sheboygan River Priority Watershed Project achieves the identified water quality objectives in selected water resources. The plan identifies the monitoring locations, the methods, and the analysis techniques that the DNR will use. The principal methods include fishery surveys, habitat evaluation, macroinvertebrate sampling, temperature and dissolved oxygen monitoring, flow and water chemistry monitoring, and sedimentation measurements.

This chapter is a summary of the actual watershed monitoring plan, which is available at the DNR Southeast District Headquarters in Milwaukee. The evaluation monitoring activities planned for the Sheboygan River Priority Watershed will consist of physical, chemical and biological data collections. These data will be used to monitor changes of both in-stream and riparian habitat and selected water quality parameters and biological communities before, during and after the installation of best management practices.

The evaluation monitoring plan's objectives are to assess:

- changes in the fish and invertebrate communities after restoration and improvement of instream and riparian habitat (i.e., a decrease in substrate embedded sediment, improved bank stability, and increasing riparian vegetative cover)

- changes in the bacterial and nutrient inputs associated with improved agricultural and barnyard practices

- changes in in-stream temperature, dissolved oxygen and aquatic plant and algae biomass due to restoration of riparian cover and increased streamside shading

The monitoring will be conducted during three periods of the year. The first occurs during the spring (April-June), the second during mid-to late summer (July-August) and the third in late fan (September-November). Depending on the monitoring activity, data will be collected during one, two or all three phases (table 10-1).

The water bodies selected for monitoring include: Elkhart Lake, Otter Creek, Gerber Lakes, Weedens Creek, and Schuett Creek.

Physical Monitoring

Physical data collections will be used to assess the impacts of instream and riparian habitat destruction (pre-implementation) and improvement (post-implementation). Two streams, Otter Creek and Weedens Creek will be monitored specifically to delineate these habitat impacts. Otter Creek monitoring will focus primarily on habitat alteration from cattle access to the stream (i.e., bank destruction, loss of riparian cover, and embeddedness). Weedens Creek monitoring will focus on substrate embeddedness.

The physical data collections will consist of measuring the degree of deposition within riffles (as a measure of embeddedness), run and pool habitats (depth of deposition), the presence or absence of aquatic macrophytes (abundance by percent of habitat covered), the type of periphyton community associated with riffle substrates (diatoms, filamentous algae, etc.) and the percent of coarse particulate organic matter (CPOM) within the depositional substrates. These parameters will be documented using photographs and recordings on data sheets. The riparian habitat will also be inventoried by amount and type of terrestrial vegetation present. In addition, wildlife personnel will be evaluating the riparian habitat and wildlife populations along Otter Creek (Wayside Subwatershed).

Water Chemistry

Water chemistry data will also be collected with sites and sampling period dependent on the water resources and the purpose of the sampling. The parameters to be sampled are listed in Table 10-1 and include nutrients, metals, bacteria, turbidity, suspended solids, chlorophyll a, dissolved oxygen and temperature. These data will be used to document changes in the water chemistry due to changes in riparian and watershed land use.

In addition, Otter Creek and Weedens Creek will be monitored for total suspended solids, nutrients, bacteria, dissolved oxygen, and temperature at seven and three sites respectively. BOD and pesticides will also be collected at one site on Otter Creek.

Elkhart Lake and Gerber Lakes will be monitored to document changes in nutrient enrichment and overall trophic status with the implementation of best management practices within their respective watersheds.

Biological Monitoring

Biological data will consist of both invertebrate and fish collections. The invertebrate samples will be collected from both riffle and pool habitats during spring and mid-late summer. These samples will be collected by hand picking cobble (rock) substrates, kick net and with a hand held coring device. Community diversity, relative abundance, functional feeding group, and Hilsenhoff Biotic Index values will be used to analyze change in the invertebrate population.

Invertebrate samples will be collected from Schuett Creek, Otter Creek and Weedens Creek. These data will be used in conjunction with the physical and chemical data to help delineate changes associated with the installation of best management practices and restoration of instream and riparian habitat

Fish data will be collected during spring and mid-late summer using a backpack or stream shocker. The fish community will be evaluated using the Index of Biotic Integrity (IBI) and also by comparing the number and abundance of indigenous and seasonal species.

Special Monitoring Otter Creek

In addition to the monitoring described above, Otter Creek has been selected as one of seven "Master Monitoring Sites" in the state. This means that an extra monitoring effort will be conducted on this creek. A monitoring station will be established by the United States Geological Survey to automatically sample the water quality and flow. The samples will be analyzed for nutrients and sediment. This system will allow for the measurement of the amount of pollutants in the stream during "high flow" times (periods after rainfalls or snowmelt) and during "low flow" times.

The fish populations of the stream will also be measured and changes in the numbers or types of fish over time will be documented. The monitoring is scheduled to begin in the fall of 1990.

Reporting Procedures

Monitoring results will be reported in an interim report in 1994 and will contain a summary of the pre-implementation data from the watershed. A final report summarizing and evaluating the effectiveness and success of the priority watershed will be completed in 1999. Yearly status reports identifying the monitoring activities completed will also be on file.

The following tables lists the monitoring activities, staff time and costs by evaluation project. These are preliminary figures and may change after site selection.

Table 10-1. Evaluation Monitoring Sites by River and Location

Water Body Location	Monitoring Activity	# of Reading Samples /visit/site	Sample Site[1]	Schedule[2] 1990 S M F	1991 S M F	1994 S M F	1995 S M F	1998 S M F	1999 S M F
OTTER CREEK	CHEMICAL Nutrients Total P	1	A,B,C,D,E,F,G	M-F	S-M	M-F	S-M	M-F	S-M
A) Otter Creek WP002 CTH E	Dissolved P Total Kjel-N Ammonia-N NO2-N + NO3-N								
B) Otter Creek WP003 STH 57	Bacteria	1	A,B,C,D,E,F,G	M-F	S-M	M-F	S-M	M-F	S-M
	Others Turbidity TSS	1	A,B,C,D,E,F,G	M-F	S-M	M-F	S-M	M-F	S-M
C) Unna. Trib. WP010 STH57	Chloro a BOD TDS Dis. Silica								
D) Otter Creek WP005 CTH J	PHYSICAL Riparian -Data Sheet		A,B,D,G	M	S	M	S	M	S
E) Unna. Trib. WP008 CTH J	-Photograph Instream Veg. -Data Sheet -Photograph		A,B,D,G	M		M		M	
F) Unna. Trib. WP009 Willow Rd.	Embededness -Data Sheet -Photograph		A,B,D,G	M	S	M	S	M	S
G) Otter Creek WP005 Willow Rd.	Stream Energy -Sieving-Pool	3							
	-Periphyton -Data Sheet	1							
	BIOLOGICAL Fish -Data Sheet	3	A,B,D,G	M	S	M	S	M	S
	Invertebrates HBI kick net -Data Sheet	5	A,B,D,G	M	S	M	S	M	S
	Cobble -Data Sheet	5	A,B,D,G	M	S	M	S	M	S
	Core -Data Sheet	5	A,B,D,G	M	S	M	S	M	S
WEEDENS CR.	CHEMICAL Nutrients Total P	1	A,B	M-F	S-M	M-G	S-M	M-F	S-M

Table 10-1. Evaluation Monitoring Sites by River and Location

Water Body Location	Monitoring Activity	# of Reading Samples /visit/site	Sample Site[1]	Schedule[2] 1990 S M F	1991 S M F	1994 S M F	1995 S M F	1998 S M F	1999 S M F
A) Weedens Cr. CTH EE	Bacteria	1	A,B	M-F	S-M	M-F	S-M	M-F	S-M
	Others Turbidity TSS	1	A,B	M-F	S-M	M-F	S-M	M-F	S-M
B) Weedens Cr. CTH PP	TDS Dis. Silica								
	PHYSICAL Riparian -Data Sheet -Photograph		A,B	M	S	M	S	M	S
	BIOLOGICAL Fish -Data Sheet								
	Invertebrates HBI kick net -Data Sheet		A,B	M	S	M	S	M	S
	Core -Data Sheet	5	A,B	M	S	M	S	M	S
Schuett Cr.	CHEMICAL Nutrients Total P	2	C	S-M	S-M	S-M			

Notes:
1. Sample site letter corresponds to sites listed in first column
2. Schedule: S = Spring; M = Midsummer; F = Fall

Table 10-2. Evaluation Monitoring Sites for Lakes

Water Body Location	Monitoring Activity	# of Samples or Readings /visit/site	Sample Site[1]	Schedule[2] 1990 S M F	1991 S M F	1994 S M F	1995 S M F	1998 S M F
GER Bureau of Endangered Resources LAKES	CHEMICAL Nutrients Total P	1	A,B,C,D,E	S-M-F		S-M-F		S-M-F
A) Victory School Creek Gerber Lake Rd	Dissolved P Total Kjel-N Ammonia-N NO2-N + NO3-N							
B) Upper Gerber L.	Bacteria	1	A,D,E	S-M-F		S-M-F		S-M-F
	Chlorophyll a	1	A,B,C,D,E	S-M-F		S-M-F		S-M-F
	Others Turbidity	1	B,C,E	S		S		S
	TSS							
C) Lower Gerber L.	pH Lab Alkalinity Calcium							
D) Unnamed Trib. to Otter Cr. Greentree Rd.	Color True PT-CO Hardness Iron, ICP Magnesium, ICP Manganese, ICP							
E) Elkhart Lk.	Potassium, ICP Silica Dis. Sodium, ICP Sulfate							
	Biological Zooplankton	1	B,C,E	S-M-F		S-M-F		S-M-F

1. Sample site letter corresponds to sites listed in first column
2. Schedule: S = Spring; M = Midsummer; F = Fall

Table 10-3. Staff Time and Costs for Monitoring/Evaluation Activities

Evaluation Project	Monitoring Activity	Number of Sites	Visits/ Year	Staff Needs	Staff Time/Yr.	Staff Time/Total	Equipment Cost
Schuett Creek	Chemical	2	2	1LTE	5	15	450
	Invertebrate	2	2	1FTE-1 LTE	172	516	3900
Otter Creek	Chemical	5	8	1LTE	41	123	16700
	Physical	4	2	1FTE-1LTE	64	192	
	Fish	4	2	1FTE-1LTE	64	192	
	Invertebrate	4	2	1FTE-1LTE	372	1116	7800
Weedens Creek	Chemical	3	2	1LTE	7	21	800
	Physical	3	2	1FTE-1LTE	48	144	
	Fish	3	2	1FTE-1LTE	48	144	
	Invertebrate	3	2	1FTE-1LTE	280	840	5850
Gerber Lakes	Chemical	4	4	2LTE	16	48	5425
	Zooplankton	2	4	2LTE			
Elkhart Lake	Chemical	2	4	2LTE	8	24	2700
				Totals:	1,125	3,375	$43,625

BIBLIOGRAPHY

Ball. J. 1982. "Stream Classification Guidelines for Wisconsin." Unpublished Draft Technical Bulletin, Wisconsin Department of Natural Resources. 13 pages.

Carlson, R.E. 1977. "A Trophic Status Index for Lakes," *Limnology and Oceanography*. 22:361-369.

Delfino, J.J. 1977. "Contamination of Potable Water Supplies in Rural Areas." In R. B. Pojasek (ed.), *Drinking Water Quality Enhancement Through Source Protection*. Ann Arbor Science Publishers. Ann Arbor, Michigan. pp 276-295.

Dillon, R.J. and F.H. Rigler. 1975. "A Simple Method For Predicting the Capacity of a Lake for Development Based on Lake Trophic Status," *Journal of Fisheries Research Board of Canada*, 32:1519-31.

Hilsenhoff, W. 1982. "Using a Biotic Index to Evaluate Water Quality in Streams." Wisc. Dept. of Nat. Resources. Technical Bulletin 132.

Kaiser, R. 1989. *Sheboygan Urbanized Area Water Sewer Service Plan*. Final Draft. Bay Lakes Regional Planning Commission.

Kammer, P.A. Jr. 1984. "An Overview of Groundwater Quality Data in Wisconsin." U.S. Geological Survey Water Resources Investigations Report 83-4239. 58 pages.

Maack, L., J. Bode, N. O'Reilly, D. Meyer, L. Person, S. Skavroneck. 1988. *Sheboygan River Remedial Action Plan*. PUBL WR 211-88. Wisc. Dept. of Nat. Resources.

Wisconsin Department of Natural Resources. 1980. *Areawide Water Quality Management Plan for the Sheboygan River Basin*. PUBL WR 077-80. Wisc. Dept. of Nat. Resources.

Wisconsin Department of Natural Resources. 1988. *Sheboygan River Basin Water Quality Management Plan*. PUBL WR-200-88. 185 pages.

Wisconsin Department of Natural Resources. 1989a. *Water Resources Appraisals and Stream Classifications for the Sheboygan River Watershed*. Unpublished.

Wisconsin Department of Natural Resources. 1989b. *Upland Resources Inventory*. Sheboygan, Fond du Lac, Calumet and Manitowoc counties. Unpublished.

APPENDIX A
ASSESSMENT METHODS

Water Resource Assessment Methods

Introduction

As part of the watershed planning process, considerable time and effort was given to the determination of the current water quality and water use conditions of the streams and lakes in the project area. Then, an assessment was made of the potential changes in water quality and use that might be expected as a result of the control of nonpoint source pollution. This assessment was made based on many sources of information including: chemical and biological water quality data from DNR files, the "Surface Water Resources of Sheboygan, Fond du Lac, Calumet, and Manitowoc County" publications (1968-1971, publication numbers 1000-40, 1000-42, and 1000-43); along with input from county LCD and SCS staff, DNR fish managers, and DNR water quality specialists. Three of the tools used in this assessment are discussed in more detail below.

Biotic Index

The type of insects found living on rocks and other habitats in a stream, indicates the water conditions of that stream. Certain species of insects will only tolerate unpolluted waters while others are able to survive various degrees of water pollution. The term pollution in this discussion means organic material in the water. Two ways organic pollution affects water quality are: the organic material adds nutrients to the water that may result in nuisance growth of algae or weeds, and the breakdown of the organic material by bacteria can deplete the water of its dissolved oxygen (which is required for fish survival).

The system used indicates the degree of organic pollution in a stream by the types of insects living in the stream. The procedure is called the Hilsenhoff Biotic Index (HBI). Organic pollution tolerance values are assigned to various species of insects. The scale of these values is 0-5 with 0 being the least tolerant (insects least tolerant to organic pollution in the stream). The number and types of insects found at a stream site are used to calculate an HBI value for the stream. Qualitative descriptions of water quality for the index values are given on table A-1.

Table A-1. Qualitative Descriptions for the Biotic Index		
HBI Range	Water Quality	Degree of Organic Pollution
0.00 - 1.75	Excellent	No organic pollution
1.76 - 2.25	Very Good	Possible slight organic pollution
2.26 - 2.75	Good	Some organic pollution
2.76 - 3.50	Fair	Significant organic pollution
3.51 - 4.25	Poor	Very significant organic pollution
4.26 - 5.00	Very Poor	Severe organic pollution

Source: DNR Technical Bulletin No. 132 (1982)

Stream Fishery Habitat Assessment

In order to determine present and potential future fishery uses of the streams, a procedure developed by Joe Ball of the DNR described in the publication: *Stream Classification Guidelines for Wisconsin* (1982) was used. The system uses an inventory of the stream's physical fish habitat (stream flow, bed, amount of riffles and pools, streambank conditions, etc) along with water quality, water temperature, pH, and current stream biotic conditions to classify the present fishery use of the stream. Then this information is modified to simulate the conditions that may be present as a result of a successful nonpoint source control project in the watershed. This second step results in an indication of the fishery which may be expected after a successful nonpoint source control project.

Table A-2 indicates the general conditions that need to be present in order for a stream to support a certain type of fishery.

Lake Trophic Status

An assessment of the lakes in the watershed was also conducted. The water quality conditions of lakes is often referred to as the lake's "trophic status". In general, this refers to the nutrient level in the lake's waters. A lake with high levels of nutrients will support nuisance algae and weed growth and is termed "eutrophic". A lake low in nutrients that has clear water during the summer is called "oligotrophic". A level between these two classes is called "mesotrophic".

Table A-2. Physical and Chemical Criteria Guidelines for Aquatic Life Use Classes

	Use Class and Criteria				
Parameter	A	B	C	D	E
Flow (cfs)	>.5	>.3	>.2	>.1	>0
Water Quality Dissolved Oxygen (mg/l)	>4	>3	>3	>1	<1
Temperature (F)	<75	<86	<86	<90	>90
pH	5-9.5	5-10.5	5-10.5	4-11	4-11
Toxics	<acute	<acute	<acute	acute	>acute
Habitat Rating	<144	<144	<144	>144	>200

A: Cold Water Sport Fishery
B: Warm Water Sport Fishery
C: Valuable Tolerant Forage Fishery
D: Rough Fish

"<" means "less than"
">" means "greater than

Source: DNR Technical Bulletin DRAFT (Ball, 1982)

Three indicators are commonly used to establish the "trophic status" of a lake. One is the in-lake phosphorus concentration. In Wisconsin lakes, phosphorus is usually the most significant nutrient limiting the growth of algae and weeds. The higher the concentration of phosphorus in the water, the greater the potential for nuisance growth of algae and weeds. The level of a substance called Chlorophyll a is a second indicator of the trophic status of a lake. Chlorophyll a is a substance found in algae. The concentration of Chlorophyl a in the water can be correlated with the amount of algae in the water.

The third indicator is a measurement of the secchi disc depth. A secchi disc is an 8 inch diameter weighted plate with black and white markings on it. The depth to which the disc can be lowered and be seen in the lake's water is called the secchi depth. This depth can vary depending on the roughness of the water, the angle of the sun, and the technique of the observer. However, it does measure the depth of sunlight penetration, and the turbidity of the water which could be due to algae or other suspended material.

Using these three indicators, plus some other information on a lake's physical characteristics, several models have been developed which can determine the trophic status of a lake and predict the trophic status given a change in the amount of nutrients entering into the lake on a yearly basis. Thus, if we know the amount of nutrient control that can be achieved with the installation of practices in a lake's watershed, a model can predict the changes in the

lake's trophic status. Table A-3 shows the values that could be expected for the parameters discussed above in various lake water quality situations. It must be emphasized that the values given on table A-3 are only very general guidelines.

Table A-3. Water Quality Index for Wisconsin Lakes Based on Total Phosphorus, Chlorophyll a Concentrations, and Water Quality.

Water Quality	Approximate Total Phosphorus (mg/l)	Approximate Water Clarity (ft)	Approximate Chlorophyll *a* (µg/l)	Approximate Trophic Status Index*
Excellent	<.001	>20	<1	<34
V. Good	.001 - .01	10 - 20	1 - 5	34 - 44
Good	.01 - .03	6 - 10	5 - 10	44 - 50
Fair	. 03 - .05	5 - 6	10 - 15	50 - 54
Poor	.05 - .15	3 - 5	15 - 30	54 - 60
V. Poor	> .15	< 3	> 30	>60

Source: DNR Technical Bulletin 138 (1983)

Summary

The biotic index, stream habitat assessment, and lake model are important tools for helping to set water quality and water use objectives in the project. Although no water quality assessment tool can predict with 100 percent accuracy the changes in water quality and water use, these tools can be useful in appraising the current and potential future conditions of the water resources in the watershed project area.

Pollutant Source Assessment Methods

Introduction

Another part of the watershed planning process was the collection of information on the various nonpoint sources of pollution in the watershed. These were conducted under the supervision of the County Land Conservation Departments (LCDs) with funding support from the DNR. Staff were hired by the LCDs to gather the field data. The quality of these data were reviewed and approved by the LCDs. Then the data was sent to the DNR for analysis. The inventory methods used for each nonpoint pollutant source are described below.

Before the inventories were conducted, the watershed was divided into sub-watersheds. The divisions were based upon individual water resources which could be protected or improved as a result of the control of nonpoint sources of pollution. The data from each of the inventories was organized by subwatersheds. With this information, objectives could be set for each water body and the corresponding reduction in pollutants to meet the objectives could be determined.

Upland Sediment

Upland sediment is of concern because it can be the main contributor of sediment in the streams and lakes of a watershed. Sediment in streams and lakes, in turn, adversely impacts the water resources in many ways. The suspended sediment can make it difficult for fish to feed, and it can abrade fish gills making the fish more susceptible to disease. The suspended sediment also causes the water to be warmer in the summer, and warm water cannot hold as much oxygen as cold water. Sediment that settles out to the stream or lake bottom can fill up pools in streams (destroying the fish habitat) and can fill up the bays in lakes (promoting excess aquatic weed growth.). Soil from cropland entering the water can also contain nutrients and pesticides which can both increase the algae and weed growth in lakes and harm the aquatic life of a water body.

Upland sediment (for this project) includes only the condition that results from the overland flow of water on fields. It does not include the gully and streambank types of sediment sources.

Sediment from upland sources was estimated using the Wisconsin Nonpoint Model (WIN) developed by DNR. This model uses factors such as land cover, slope, management, soil type, overland flow path, and channel system to estimate the quantity and rate of sediment loss from each parcel inventoried. The model "routes" the sediment to the nearest channelized flow system. Results of the model are given for each field as measured by the sediment loss in tons per acre per year.

The entire watershed was inventoried for upland sediment loss potential. On a parcel by parcel basis, the WIN factors, plus the location, landowner identification code, and present practice information was collected. A parcel was defined as a field with homogenous individual factors and was bounded by landowner property lines and watershed or sub-watershed lines. The parcels generally ranged from 2 to 50 acres.

Streambank Erosion Survey

Streambank erosion is bank failure along channels caused by the cutting action of water on the banks. This erosion is important because of its direct impact on fish habitat in terms of bank shade and cover in addition to the impact of the sediment filling up the stream's pools. Streambank erosion can be caused by cultural activities (such as grazing cattle) or it can be a natural condition.

The inventory method used was a modification of the Phase II of the Land Inventory Monitoring process (SCS). The main channels of 14 streams totaling 68.7 stream miles were assessed with this method. For each erosion site, the method estimates the volume, and tons of sediment lost on a yearly average. This was done through measuring the length, height, and recessional rate of each erosion site. Recession rates were determined based on the physical characteristics of the eroded site. The volume of sediment was then multiplied by the density of the sediment to obtain the tons of soil loss from the site. Along with this data, information on the location, landowner identification, and cattle access was collected for each site. This information was collected by field personnel wading the streams. Each erosion site was located on the ASCS 8-inch to the mile air photos.

Barnyard Runoff

Dairy operations are a major type of agriculture in the watershed. All of the barnyards were inventoried for their potential to impact water quality from their runoff. Runoff from these yards can carry manure to the streams and lakes of the watershed. The manure contains several components that can adversely affect the water quality and aquatic life. Manure contains nitrogen which can breakdown to ammonia in the streams and lakes. In high enough concentrations the ammonia can be toxic to fish and other aquatic life.

When the manure enters a water system the breakdown of organic matter results in a depletion of oxygen in the water which fish require to survive. Also, the nutrients in manure (including nitrogen and phosphorus) will promote nuisance algae and weed growth in the streams and lakes. Finally, the bacteria found in livestock manure can be harmful to other livestock drinking the water, and humans using the water for recreation.

The United States Department of Agriculture Agriculture Research Service developed a computer model to estimate the amount of pollutants coming from a barnyard as a result of a rainstorm. This model was modified by the Wisconsin DNR Nonpoint Source Section and has been used to indicate which barnyards within a watershed have the greatest potential to impact water quality from a rainfall washing through a barnyard. The model does not assess any needs for manure storage or the impact from manure runoff from spread fields. It only assesses the barnyard runoff pollutant quantities.

Information to run this model was collected on all of the barnyards in the watershed. The data required by this model includes the types and numbers of livestock, yard size, the physical characteristics of the area that contributes surface runoff waters to the yard, and the physical characteristics of the area through which the runoff waters leaving the barnyard flow before becoming channelized. A rainfall amount is assigned to the model. The 10-year, 24-hour rain event (4.0.inches) was selected. With this information the model calculates the pounds of phosphorus and pounds of Chemical Oxygen Demand (COD) for each barnyard as a result of the selected rainfall event. (Chemical Oxygen Demand is a measure of the amount of organic material in the barnyard runoff).

Manure Spreading Runoff

The disposal of livestock wastes on land can be a concern for water quality when it is done on frozen land with steep slopes or in a floodplain. Under these conditions, the spread manure can runoff with melting snow or winter rain and enter the streams and lakes of the watershed. The impacts from this runoff are the same as those mentioned in the barnyard runoff discussion.

The information collected for the upland erosion and the barnyard runoff inventory was combined and used to estimate the amount of unsuitable land used for manure spreading during the winter. Lands unsuitable for winter spreading of manure were defined as parcels with slopes greater than 6 percent or having soil types indicative of being prone to flooding.

The first step in this evaluation was to estimate how much land was required by each livestock operation to dispose of the manure generated over a 180 day period (the frozen ground period). The amount of manure generated by each operation was determined based on the animal type and number of animals. Using a rate of 25 tons per acre per year, the number of acres required for manure disposal was calculated for each operation. This number was compared to the acres of land suitable for winter spreading for each landowner according to the upland erosion inventory information. Lands unsuitable for winter spreading were those field with greater than 6 percent slope or those fields in the floodway. In this manner it was estimated, on an average annual basis, how many acres of unsuitable land was used for manure disposal during the winter. This procedure assumed every field had an equal chance for manure disposal from the landowner. The procedure could not account for the fact that livestock operators do not evenly spread their manure across all of their property. In general, the most accessible land is used for disposal of the manure.

Urban Runoff

Rainfall and snow-melt runoff from urban areas carries with it sediment, salt, metals, litter, and nutrients from city streets, parking lots, roof tops, and construction sites to the water resources of the area. Pollutant loads from the developed areas of the watershed were evaluated using the Source Loading and Management Model (SLAMM) developed by the DNR. Each community is subdivided into drainage basins according to the storm sewer system. The following information is then collected for each drainage basin: land use, the management presently done by the community (street sweeping, detention basins, etc), and the type of drainage system (curb and gutter vs. grass swale). Pollutant loads for each drainage basin and each land use within a drainage basin are estimated and reported in terms of tons per year. Loadings for sediment and lead are calculated.

The impacts of sediment from construction sites is estimated based on amount of acres under construction for each community over the past 5 years. A rate of 30 tons per acre per year for sediment loading from construction sites was used to quantify the pollutant loads from these sites.

Point Sources of Pollution

Unlike the activities mentioned above, the point sources of pollution in Wisconsin are regulated by the state. For each municipal or industrial wastewater discharge, a permit is issued by the DNR, defining the quantity and the quality of the wastewater allowed from each site. The point sources have been the most significant, and the most obvious sources of water quality impairment in the past. With the large scale effort, and funding directed at cleaning up point source pollution in the past 20 years, the water quality impacts from these sources in the watershed have been minimized.

Each municipal or industrial discharger has a permit file with the DNR. These files were reviewed to determine how well the treatment plant is meeting its permit requirements. If a facility is not in compliance with its permit, there are regulatory measures which can be employed to insure that clean up of the nonpoint sources of pollution will not be compromised by the wastewater treatment facilities.

APPENDIX B
SURFACE WATER, BIOLOGICAL AND RECREATIONAL USE CLASSIFICATIONS

Biological Stream Use Classification and Water Quality Standards

Biological stream use classes describe the fish species or other aquatic organisms supported by a stream system. Designation is based on the ability of a stream to provide suitable habitat and water quality conditions for those fish and other forms of life. The following biological stream use classification system is used statewide and was applied to surface waters in the Sheboygan River Watershed.

Use Classification Description

Full Fish & Aquatic Life Category (FAL)

FAL A — Capable of supporting cold water sport fish (trout and other salmonid species) to the following extent:

- (Class I) Trout fishery sustained by natural reproduction
- (Class II) Trout fishery sustained by natural reproduction and periodic stocking
- (Class III) Trout fishery sustained entirely by stocking

FAL B — Capable of supporting or serving as a spawning area for warmwater sport fish (walleye, bluegill, smallmouth bass)

FAL C — Capable of supporting forage fish (shiners, minnows) and aquatic invertebrates (insects, clams, crayfish) intolerant of pollution, or forage fish tolerant of pollution

Variance Categories

Limited Forage Fish (Intermediate D): Capable of supporting forage fish or rough fish (carp) tolerant or very tolerant of pollution and aquatic invertebrates tolerant of pollution.

Limited Aquatic Life (Marginal E): Capable of supporting aquatic invertebrates which are very tolerant of pollution or no aquatic life. They may support amphibians, reptiles, waterfowl, and other wildlife.

FAL A Cold Water Sport Fish: These streams are capable of supporting a cold water sport fishery, or as serving as a spawning area for salmonid (trout, salmon) species. The presence of an occasional trout or salmon does not justify classifying it as supporting a cold water sport fishery.

FAL B Warmwater Sport Fish: These streams are capable of supporting a warm water sport fishery or serving as a spawning area for warm water sport fish (walleye, bluegill, smallmouth bass). Although warm water fish are occasionally found in many small streams, fish must commonly be found in a water body for it to be classified under this category.

FAL C Cold/Warmwater Forage Fish: These streams are capable of supporting an abundant, usually diverse, population of forage fish (shiners, minnows) and/or aquatic invertebrates (insects, clams, crayfish) which are intolerant of pollution. They are generally too small to support cold or warm water sport fish and/or aquatic invertebrates. Streams capable of supporting valuable populations of tolerant forage fish are also included in this category.

Intermediate D: These streams are capable of supporting small populations of forage fish tolerant of pollution, or fish and aquatic invertebrates tolerant of pollution. The aquatic community is usually limited by small physical stream size and reduced stream flow.

Marginal E: These streams are capable at best, of supporting aquatic invertebrates or occasionally very tolerant fish species. These streams are usually small--intermittent streams and ditches--and the capacity to support aquatic life is extremely limited.

Water Quality Standards: Water quality necessary to support stream biological uses has been quantified by certain measurable standards. These standards are statements of the characteristics of surface waters which must be maintained to enable the stream to continually meet its designated use. Generally, the best water quality supports the highest level of aquatic life. The standards are set forth in Chapters NR 102 and NR 104 of Wisconsin Administrative Code.

Recreational Stream Use Classification and Water Quality Standards

Recreational stream use classifications are described by a level of human body contact determined to be safe and reasonable. The system applies to all surface waters including those categorized as intermediate or marginal under the above referenced biological use classification system. Three designations are used under the recreational stream classification system—full body contact, partial body contact, and noncontact.

Full Body Contact: These waters are used for human recreation where immersion of the head is expected and occurs often. Recreation activities classified as full body contact including swimming, waterskiing, sailboarding and other similar activities where frequent and significant contact with the water occurs. Water quality standards for full body contact use are applicable from May through September.

Partial Body Contact: These waters are used for human recreation where immersion of the head is not frequent and contact is most often incidental or accidental. Recreational activities classified as partial body contact include boating, canoeing, fishing, and wading. Water quality standards for partial body contact use are applicable year round.

Noncontact: These waters should not be used for human recreation. The category is used infrequently when extenuating circumstances such as high concentrations or in-place pollutants, an uncontrollable pollution source, or other conditions dictate that contact with the water would be an unnecessary health risk. Typically, surface waters included in this classification would ordinarily be considered to be capable of supporting partial body contact uses.

APPENDIX C
DESCRIPTION AND PERFORMANCE STANDARDS/GUIDELINES FOR URBAN BEST MANAGEMENT PRACTICES

Introduction

This appendix describes four classes of urban best management practices. The four general classes of management practices are source reduction practices, infiltration practices, wet detention practices and streambank erosion control practices. Secondly, it provides guidance for the design and use of these urban best management practices. At the end of this appendix there is a discussion on street cleaning. An explanation of the terms "base level" and "accelerated level" as they relate to the street sweeping practice found there.

Classes of Urban Management Practices

Source Reduction Practices

Source reduction best management practices curb the generation of urban pollutants at the source. Ideally, pollutant generation is stopped. At a minimum, pollutants that are generated are controlled prior to entering the storm sewer system.

In commercial and residential areas, source reduction controls are generally non-structural, relying instead on changes in products people use and in the way people live. The current federal programs removing lead from gasoline and asbestos from automobile brake linings are examples of source reduction practices. In other cases, such as for industrial materials storage areas, control of pollutants may require structural practices.

Source reduction practices that prevent the generation of pollutants, such as the removal of lead from gasoline and asbestos from brake linings, are ultimately the most effective. This type of control cannot be readily initiated at the local level, however. Regional and often national action is required.

Effective source reduction practices relying on better housekeeping practices, such as pet waste control programs and judicious use of lawn and garden products, can be initiated

locally. These practices are an inexpensive and vital component of any urban nonpoint source control program. Several source control alternatives identified in this watershed are:

- Reducing use of galvanized roof materials and gutters, a major source of zinc in urban runoff.
- Removing pet wastes immediately from lawns, sidewalks, and streets to reduce bacteria contamination from urban runoff.
- Managing the timing, amount and type of fertilizer and pesticide applications on lawns.
- Properly disposing of automobile waste fluids, such as radiator water and engine oil, to keep them out of the storm sewer system.
- Removing leaves and street dirt from street and parking lot surfaces through municipal sweeping and leaf collection.
- Zoning land use based, in part, on site suitability for best management practices.
- Strictly limiting construction site erosion.
- Keeping the use of street de-icing compounds to a minimum.

Infiltration Practices

The amount of pollutants in urban runoff is often directly related to the volume of urban runoff. The volume of urban runoff is directly related to the amount of impervious urban area that is directly connected to the storm sewer system. Impervious areas include rooftops, parking lots, streets, and sidewalks. Directly connected areas are those that drain directly to storm sewer pipes or concrete channels.

Urban best management practices which reduce the amount of runoff (such as infiltration practices) also reduce the amount of pollutants reaching lakes and streams. Practices that promote on-site infiltration include porous pavements, redirecting roof downspouts to grassy areas, and directing runoff waters to infiltration trenches. These practices are generally most applicable to small source areas such as rooftops and parking lots. Grassed swale drainage systems, may also be an effective infiltration practice. Finally, infiltration basins can be located at storm sewer outlets for larger drainage areas. In this case, the basin is considered an off-site, or end-of-pipe control measure.

In addition to reducing pollutant loads, groundwater infiltration can help stabilize the hydrology of small urban streams. This occurs because infiltration helps maintain stream base flows during dry periods, and will decrease peak flow discharges responsible for streambank erosion and habitat scouring. In addition, infiltration can be used in the drainage area to a wet pond in order to reduce the pond size required to control stormwater pollutants.

To be effective, infiltration practices must be located very close to the pollutant source area. For example, infiltration trenches located along a parking lot or large rooftop.

Not all sites are appropriate for the use of infiltration practices. Heavy or poorly drained soils may limit the effectiveness of infiltration devices or result in practices too large to be practical. Slopes may limit the use of grassed swales in residential areas. Heavy soils are common in this watershed and may preclude the use of grass swales or other infiltration practices.

Precautions must be taken when infiltrating urban stormwater to prevent groundwater contamination. Runoff from residential rooftops and driveways, and from rooftops in institutional, commercial, and non-manufacturing industrial areas have the lowest potential for groundwater contamination. Runoff from parking lots in institutional and commercial areas, and from separate employee or visitor parking lots in non-manufacturing industrial areas have a higher contamination potential. The potential for groundwater contamination can be reduced however, by using a pre-treatment device (such as a grass buffer area before the infiltration area).

Highly contaminated runoff, such as that from storage and loading areas in commercial and industrial areas should not be infiltrated.

Table C-1 gives more information on the use and placement of infiltration devices for various land uses.

Wet Detention Ponds

Wet detention ponds are constructed basins that collect runoff from an area and allow some of the pollutants to settle out before the runoff reaches a water resource. These basins are constructed so there is a permanent pool of water even during non-runoff periods. The wet detention ponds are effective at controlling particulate pollutants and can be designed to control peak flow discharges. Consequently, they can be employed to serve many needs including pollution control, flood control, and control of stormwater flows that may be causing streambank erosion and streambed scour. These ponds have limited effectiveness in controlling dissolved urban pollutants and cannot effectively reduce the total stormwater volume or enhance stream base flows. The wet pond can be situated near a small source area, such as a parking lot, but are more commonly used to control runoff coming from a larger area.

Streambank Erosion Control Practices

A combination of traditional and innovative techniques will be needed to control streambank erosion and scour in urban streams.

Practices such as riprap or gabions may be most appropriate in some places. Innovative approaches that are less expensive and provide better shoreline habitat than rock riprap are also being proposed for this project. Reshaping upper channel banks to allow dissipation of

stream energy, and use of vegetation for stabilizing eroding banks may be promising approaches, either as alternatives or additions to more traditional techniques.

Performance and Design Guidance For Urban Structural Practices

The guidelines in this section are presented to facilitate the urban practice design, review, and approval phases that are required before controls can be installed and cost-shared through the nonpoint source program. The design standards contained in this section are preliminary, and will need to be augmented by existing engineering references and design manuals. Also, the DNR's Nonpoint Source and Land Management Section should be contacted prior to the start of practice design activities, in accordance with NR 120.

In planned urban areas throughout the watershed, impacts on stream hydrology must be minimized. Conforming individual practices to the following guidelines will assure that the total level of control is adequate, provided the recommended plan is fully implemented.

Standards

The following preliminary standards should be used to guide the design of practices. They will be superseded by standards developed as part of the model ordinance for stormwater, being prepared by the Department of Natural Resources.

Wet Detention Ponds

The permanent pool of the wet pond must have a surface area equal to "x" percent of the impervious surfaces plus "y" percent of the pervious surfaces of the contributing drainage area. (Table C-2 gives the percentages for various land uses). A permanent pool with this surface area will control 90 percent of the incoming suspended sediment load. This will be achieved by trapping the five micron particle size. This will also provide approximately 70 percent control of the annual lead load from lands tributary to the pond. Where retro-fitted, ponds should be located to control runoff coming primarily the critical land uses. Where planned as part of new development, ponds should be located to control runoff from all land uses.

The outlet of the wet detention ponds must be designed to maintain peak flows for the 2-year, 24-hour storm at pre-development levels.

Infiltration Practices

Infiltration Practices must infiltrate all runoff from the one-inch storm.

Other design guidance is given on table C-2.

Table C-1. Nonpoint Source Pollution Control Guidelines for Infiltration Devices in Urban Areas				
	Industrial (Manufacturing)[4]			
Infiltration Device Type	Rooftop Runoff		Separate Employee & Visitor Parking Lot Runoff	Storage and Loading Area Runoff[5]
	0-10,000 sq. ft.	> 10,000 sq. ft.		
Infiltration Basin[1]	Infiltration prohibited.	Infiltration prohibited.	Infiltration prohibited.	Infiltration prohibited.
Infiltration Basin[1]	Infiltration prohibited.	Infiltration prohibited.	Infiltration prohibited.	Infiltration prohibited.
Grassed Swale[2]	Pretreatment[3]. Depth to GW > 3 ft. GW monitoring recommended.	Pretreatment[3]. Depth to GW > 3 ft. GW monitoring recommended.	Pretreatment[3]. Depth to GW > 3 ft. GW monitoring recommended.	Pretreatment[3]. Depth to GW > 3 ft. GW monitoring recommended.
Other Control Practices				

Notes:

1. Infiltration should take place through a surface layer of soil where feasible, to minimize risk of groundwater contamination.
2. Special construction techniques are required to maintain original soil permeability.
3. Pretreatment is considered for infiltration devices to minimize maintenance. There may be incidental protection to groundwater from pretreatment devices. All pretreatment devices should be equipped with oil and grease traps.
4. For the purpose of this table, industrial (manufacturing) consists of production industries. An example would be an industry with smokestacks that have the potential for emitting particulates that will settle on building rooftops and parking lots.
5. Good materials management practices should be practiced to prevent the risk of generating contaminated runoff in the first place.

Table C-1 (continued). Nonpoint Source Pollution Control Guidelines for Infiltration Devices

	Commercial[4]					
	Rooftop Runoff		Parking Lot Runoff			
Infiltrating Device Type[3]	0-10,000 sq. ft.	> 10,000 sq. ft.	0-5,000 sq. ft.	5,000-500,000 sq. ft.	> 500,000 sq. ft.	Storage and Loading Acres Runoff[5]
Infiltration Basin[1]	No pretreatment. Depth to GW > 3 ft.	No pretreatment. Depth to GW > 3 ft.	Pretreatment[3] Depth to GW > 3 ft.	Pretreatment[3] Depth to GW > 3 ft. GW monitoring recommended.	Pretreatment[3] Depth to GW > 3 ft. GW monitoring recommended.	Pretreatment[3] Depth to GW > 3 ft. GW monitoring recommended.
Infiltration Trench[1]	No pretreatment. Depth to GW > 3 ft.	No pretreatment. Depth to GW > 3 ft.	Pretreatment with grit chamber.[3] Depth to GW > 3 ft.	Pretreatment[3] Depth to GW > 3 ft. GW monitoring recommended.	Pretreatment[3] Depth to GW > 3 ft. GW monitoring recommended.	Pretreatment[3] Depth to GW > 3 ft. GW monitoring recommended.
Grassed Swale[2]	No pretreatment. Depth to GW > 3 ft.	No pretreatment. Depth to GW > 3 ft.	Pretreatment with grit chamber.[3] Depth to GW > 3 ft.	Pretreatment[3] Depth to GW > 3 ft. GW monitoring recommended.	Pretreatment[3] Depth to GW > 3 ft. GW monitoring recommended.	Pretreatment[3] Depth to GW > 3 ft. GW monitoring recommended.
Other Control Practices	Redirect downspouts to lawn for infiltration. No pretreatment.		Slope lots to grass buffer strip.			

Notes:

1. Infiltration should take place through a surface layer of soil where feasible, to minimize risk of groundwater contamination.
2. Special construction techniques are required to maintain original soil permeability.
3. Pretreatment is considered for infiltration devices to minimize maintenance. There may be incidental protection to groundwater from pretreatment devices. Grit chambers remove particles down to 100 u and wet sedimentation removes particles down to 40-100 u. All pretreatment devices should be equipped with oil and grease traps.
4. Retail and service operations.
5. The use of infiltration practices in storage areas must be reviewed on a case-by-case basis.

Table C-1. Nonpoint Source Pollution Control Guidelines for Infiltration Devices (continued)

Industrial (Non-Manufacturing)					
Infiltrating Device[3]	Rooftop Runoff		Separate Employee & Visitor Parking Lot Runoff		Storage and Loading Area Runoff[4]
	0-10,000 sq. ft.	> 10,000 sq. ft.	5,000-500,000 sq. ft.	> 500,000 sq. ft.	
Infiltration Basin[1]	No pretreatment. Depth to GW > 3 ft.	No pretreatment. Depth to GW > 3 ft.	Pretreatment[3] Depth to GW > 3 ft. GW monitoring recommended.	Pretreatment[3] Depth to GW > 3 ft. GW monitoring recommended.	Infiltration prohibited.
Infiltration Trench[1]	No pretreatment. Depth to GW > 3 ft.	No pretreatment. Depth to GW > 3 ft.	Pretreatment[3] Depth to GW > 3 ft. GW monitoring recommended.	Pretreatment[3] Depth to GW > 3 ft. GW monitoring recommended.	Infiltration prohibited.
Grassed Swale[2]	No pretreatment. Depth to GW > 3 ft.	No pretreatment. Depth to GW > 3 ft.	Pretreatment[3] Depth to GW > 3 ft. GW monitoring recommended.	Pretreatment[3] Depth to GW > 3 ft. GW monitoring recommended.	Pretreatment required.[3] Depth to GW > 3 ft. GW monitoring recommended.
Other Control Practices	Redirect downspouts and driveways to lawn for infiltration. No pretreatment.				

Notes:
1. Infiltration should take place through a surface layer of soil where feasible, to minimize risk of groundwater contamination.
2. Special construction techniques are required to maintain original soil permeability.
3. Pretreatment is considered for infiltration devices to minimize maintenance. There may be incidental protection to groundwater from pretreatment devices. All pretreatment devices should be equipped with oil and grease traps.
4. Good materials management practices should be practiced to prevent the risk of generating contaminated runoff in the first place.

Table C-1 (continued). Nonpoint Source Pollution Control Guidelines for Infiltration Devices

Infiltration Device Type	Residential[4]	Institutional[5]		
		Rooftop	Parking Lot	
			0-5,000 sq. ft.	5,000-500,000 sq. ft.
Infiltration Basin[1]	Pretreatment[3] Depth to GW > 3 ft.	No Pretreatment Depth to GW > 3 ft.	Pretreatment[3] Depth to GW > 3 ft.	Pretreatment[3] Depth to GW > 3 ft. GW monitoring recommended
Infiltration Trench[1]	Pretreatment[3] Depth to GW > 3 ft.	No Pretreatment Depth to GW > 3 ft.	Pretreatment Depth to GW > 3 ft.	Pretreatment[3] Depth to GW > 3 ft. GW monitoring recommended
Grassed Swale[2]	Pretreatment[3] Depth to GW > 3 ft.	No Pretreatment Depth to GW > 3 ft.	Pretreatment Depth to GW > 3 ft.	Pretreatment with grit chamber.[3] Depth to GW > 3 ft. GW monitoring recommended.
Other Infiltration Practices	Redirect downspouts and slope driveways to lawn, for infiltration. No pretreatment.	Redirect downspouts to lawn for infiltration. No pretreatment.	Slope lots to grass buffer strip.	

Notes:

1. Infiltration should take place through a surface layer of soil where feasible, to minimize risk of groundwater contamination.
2. Special construction techniques are required to maintain original soil permeability.
3. Pretreatment is considered for infiltration devices to minimize maintenance. There may be incidental protection to groundwater from pretreatment devices. All pretreatment devices should be equipped with oil and grease traps.
4. Multi- and single-family dwellings.
5. Churches, schools and hospitals.

Design Criteria

NR 120.14(22) requires that the Department of Natural Resources participate in the practice design process, and approve detailed practice designs. Selected preliminary design criteria for wet detention ponds and infiltration devices are presented below.

It is important to note the inclusion of pretreatment and groundwater monitoring in the practice design for infiltration devices. Providing pretreatment for these devices will greatly reduce required maintenance to reduce clogging and restore infiltration. Pretreatment could be a sediment trap, a wet detention pond, a grass filter strip, or street sweeping. Selected practices should be equipped with groundwater monitoring wells to assure that groundwater contamination remains within acceptable limits.

Finally, all detention and infiltration urban structural practices should be equipped with signs that clearly identify that the site contains urban stormwater pollutants. Such signs should also carry warnings, where appropriate, against using stormwater practices in ways that could endanger public health.

Wet detention ponds should not be used for consumptive fishing, swimming, or wading. Infiltration basins might pose a hazard if used during dry periods as open recreational space, due to possible suspension of contaminated dust. These risks should be further investigated.

Specifications and Cost Sharing For Accelerated Street Sweeping

Practice Description

Use of a vacuum style sweeper to remove leaf litter and accumulated dirt from street surfaces on an accelerated schedule designed for improving quality of surface waters.

Purpose

Accelerated street sweeping may provide a moderate level or pollution control within specific areas of a community. This practice may also help to extend the effective "life" of a wet detention basin by removing some of the pollutants on the streets before they reach the basin.

Conditions

Cost sharing is authorized to support a portion of an accelerated street sweeping program for existing critical land uses. This practice will be eligible for cost sharing if it is identified as needed through a feasibility study.

Accelerated sweeping is defined as that meeting the schedule set forth in tables C-3 and C-4. It consists of two parts; the "base level" and the "additional level." The "base level" portion

of the accelerated program is not eligible for support. The "additional level" portion of the accelerated program is eligible for support.

Existing urban areas are those in existence as of the date the Department of Natural Resources approves this watershed plan.

Critical land uses are those defined for each subwatershed in table 6-7 of this watershed plan.

Cost sharing will be effective for a 5-year period for each municipality, beginning when the community first accepts cost-share funds for sweeping. Eligible cost components include:

- direct and indirect staff costs to operate the sweeper including wages, salaries, benefits, and overhead (Only cost of "additional staff", as defined in NR 120.02, is eligible)
- fuel, equipment maintenance, and equipment depreciation
- litter disposal

Eligible staff related costs will be supported 100 percent through the Local Assistance Grant Agreement. Other costs will be supported at a cost-share rate of 50 percent. The community may negotiate with the Department of Natural Resources a flat fee cost-share amount per curb mile. Cost sharing will be on a reimbursement basis. Following the five-year period of cost-share eligibility, the community must maintain at its own expense an accelerated street sweeping schedule in those areas for which it received cost sharing.

Table C-2. Selected Preliminary Design Criteria for Infiltration Devices and Wet Detention Basins	
Practice	Design Criteria
Wet Detention	1. Percent of drainage required as permanent pond surface for 90% control of solids: Freeways 2.8% Institutional 1.7% Industrial 2.0% Residential 0.8% Commercial 1.7% Open Space 0.6% 2. Permanent pond minimum 5 ft. deep when constructed. 3. Minimum 10 ft. shelf around pond perimeter. 4. Minimum 5:1 side slope to edge of pond. 5. Pond shape must be minimum 3:1 length to width ration 6. Maintain minimum pond depth of 3 feet. 7. Minimum 25 ft. vegetated buffer strip 8. Protect outlet channel from erosion 9. Minimum depth to groundwater 3 ft.*
Infiltration Devices	
Grass Swales	1. Minimum grade of 0.5% and maximum of 5.0% 2. Maximum side slopes of 3:1 3. Minimum depth to groundwater 3 ft.* 4. Maximum flow velocity 6 ft/sec 5. Check infiltration rates annually 6. Prevent compaction during construction. 7. Sweep streets of drainage area to prevent clogging of infiltration device
Infiltration Trenches	1. Minimum depth to groundwater 3 ft.* 2. Pretreatment necessary (eg. grass filter strip, wet detention basin, trap, etc.) 3. Trench must be wider than it is deep 4. Observation well(s) must be installed 5. Check infiltration rates annually. 6. Do not put near water supply wells
Infiltration Basins	1. Minimum depth to groundwater 3 ft.* 2. Pretreatment necessary (eg. grass filter strip, wet detention basin, trap, etc.) 3. Test soil infiltration rates at least 5 ft. below the surface. 4. Observation well(s) must be installed 5. Check infiltration rates annually. 6. Do not put near water supply wells 7. Prevent compaction of soil during construction.
* As measured from bottom of practice to seasonally high groundwater	

Table C-3. Components of Accelerated Street Sweeping Schedules for Critical Urban Land Uses - Curb and Gutter Drainage

Season[1]	Program Description	Freeway	Commercial, Industrial	High Density Residential
Spring	Accelerated Program[2]	-once/week: vacuum	-once/week: alternate brush and vacuum	-once/week: alternate and vacuum
	Base component[3]	-once/ week: brush	-once/week: brush	-twice/month: brush
	Additional component[4]	-convert to vacuum	-convert to vacuum on alternate passes	-two added passes with vacuum
Summer	Accelerated Program	-once/week: vacuum	-once/week: alternate brush and vacuum	-twice/month: alternate brush and vacuum
	Base component[3]	-once/week: brush	-once/week: brush	twice/month: brush
	Additional component[4]	-convert to vacuum	-convert to vacuum on alternate passes	-convert to vacuum on alternate passes
Fall	Accelerated Program	-once/week: alternate brush and vacuum	-once/week: alternate brush and vacuum	-twice/month: brush and vacuum
	Base component[3]	-twice/month: brush	-once/week: brush	-twice/month: brush
	Additional component[4]	-two added passes with vacuum	-convert to vacuum on alternate passes	-convert to vacuum on alternate passes

Table C-4. Components of Accelerated Street Sweeping Schedules for Critical Urban Land Uses - Grassed Swale Drainage

Season[1]	Program Description	Commercial, Industrial	High Density Residential
Spring	Accelerated Program[2]	-once/week: alternate brush & vacuum	-once/month: vacuum
	Base component[3]	-twice/month: brush	-once/month: brush
	Additional component[4]	-two added passes with vacuum	-convert to vacuum
Summer	Accelerated Program	-once/week: alternate brush & vacuum	-once/month: vacuum
	Base component[3]	-twice/month: brush	-once/month: brush
	Additional component[4]	-two added passes with vacuum	-convert to vacuum
Fall	Accelerated Program	-once/week: alternate brush and vacuum	-once/month: vacuum
	Base component[3]	-twice/month: brush	-once/month: brush
	Additional component[4]	-two added passes with vacuum	-convert to vacuum

Notes for tables C-3 and C-4:

1. Spring is considered to be one month (March).
2. The Accelerated Program is made up of the base component and the additional component.
3. This component is not eligible for cost-share assistance.
4. This component is eligible for cost-share assistance.

APPENDIX D
DESCRIPTION OF WATERSHED SPECIFIC INFORMATION AND EDUCATION MATERIALS AND EVENTS

Newsletters

Newsletters will be used to convey information to targeted groups such as local government officials, rural landowners, civic and environmental groups, fishing and boating groups, business and industry associations, interested citizens and other likely participants in the Sheboygan River Priority Watershed. The objectives of newsletters will be to:

- Supply basic information on the project.
- Provide updates on important elements of the project including dates of upcoming events.
- Improve understanding of nonpoint source pollution problems and causes.
- Increase appreciation of lakes, streams and related natural resources in the watershed.
- Introduce landowners to recommended management practices.
- Provide information on available assistance including cost-sharing.
- Build a sense of momentum by providing information on participation and implemented practices.

Newsletters will be distributed to key audiences within the watershed and used as handouts at public meetings, tours and exhibits.

The lead responsible party for watershed newsletters will be Sheboygan County UW-Extension working with area UW-Extension Water Quality staff and state specialist assistance. Other UW-Extension, DNR and LCD staff will also be involved in newsletter preparation and distribution.

Watershed Folders and Fact Sheets

Watershed folders will be used to communicate basic information about the watershed project and serve as "cover pieces" for educational packets assembled to meet the needs of rural landowners/operators and local government officials. Folders will contain different sets of information and education materials, including fact sheets, depending upon the audience groups to which it will be given.

Many fact sheets will have DNR Southeast District or statewide applicability and be produced at those levels. An exception will be demonstration project fact sheets and fact sheets adapted for the Sheboygan River project and bearing its logo.

County LCD staff will assemble the rural watershed folder contents and, in conjunction with County UW-Extension staff, draft fact sheets on demonstrations. DNR staff, with county or area UW-Extension staff assistance, will assemble the local government folder contents. Area UW-Extension staff will have the lead responsibility for publishing demonstration project fact sheets with draft materials submitted by the pertinent county. State UW-Extension specialists, the Nutrient and Pest Management Program, DNR and DATCP staff will develop or assist with the development of fact sheets on rural and urban best management practices with statewide applicability.

Watershed Slides and Video Playback Equipment

County LCD and UW-Extension staff will provide slides and information for the watershed-specific portions of a slide collection, and use the slides for public meetings, community group programs and volunteer training sessions. Many slides, especially graphic summaries of surveys, inventory data and plan recommendations, will be prepared by DNR or state or area UW-Extension staff. Area UW-Extension Water Quality staff will be responsible assembling the slide collection.

A video wall projection unit and self-contained player-monitor designed to maximize use of recently completed nonpoint source pollution control videotapes will be purchased. These will enhance presentations to large groups, and in smaller rooms or with exhibits, respectively. Other tapes in a growing collection of this valuable medium would also be used to enhance awareness, build momentum, and further project participation. The purchased units would readily be available for use in the lead educational counties of Sheboygan and Fond du Lac.

Local Exhibits

Exhibits on the Sheboygan River Project, urban and rural nonpoint source pollution, specific watershed plans and best management practices will be used at county fairs, public buildings, shows and other special events in the watershed. The purpose or focus of these exhibits will change as the program progresses. Thus interchangeable groups of exhibit components will be developed to cover a variety of themes.

Arrangements for use of exhibits in local areas will be the responsibility of county UW-Extension and LCD staff with assistance from area UW-Extension and district DNR staff. Most materials for the exhibits will be developed by area UW-Extension and district DNR staff. Exhibits will be staffed by watershed advisory committee members and other volunteers whenever possible to augment staff resources.

Media Contacts

An effort to involve the media in covering watershed events begins with conferences on the major newspapers and radio stations in the watershed to further acquaint editors and reporters with the Sheboygan River Project. The lead responsible parties for this activity are UW-Extension staff and Advisory Committee members. Assistance is available from the Public Information Officer for the DNR Southeast District.

News releases will be distributed to local newspapers and radio stations to announce watershed events such as tours, public information meetings, plan completion/amendment, demonstration project installations and grant awards. The lead responsible agency for the news releases will vary depending on which agency or private group is responsible for a particular event.

Newspaper seasonal articles and appearances on radio talk shows will be sought to provide broader coverage of the program. Special features or interview shows may involve direct participation by state or district DNR or UW-Extension staff. County UW-Extension staff/Advisory Committee members will be responsible for covering water quality issues in their regular radio talk shows and newspaper columns. Background material for radio programs and newspaper columns will often be prepared at the District or state level, although county staff will prepare and share materials related to their field of expertise. Columns may also be distributed for publication in local civic and environmental group newsletters.

Series of Newspaper Articles and Radio Public Service Announcements

A series of newspaper articles and radio public service announcements will be used to inform people about nonpoint source pollution and best management practices. The series may focus on homeowner practices such as yard care, household hazardous waste, stream corridor and lakeshore management, automobile maintenance, and pet waste disposal. General information on the Sheboygan River Project, nonpoint source pollution and best management practices for municipalities could also be included.

Development of the material for such newspaper articles and radio public service announcements will be coordinated with the adjoining Milwaukee River watersheds. County UW-Extension agents will arrange for distribution to local newspapers and radio stations. Supportive educational materials such as fact sheets will be available, upon request, through County Extension offices. Such fact sheets and other written materials will generally be prepared at the District or state level.

Demonstration Site and Key Rural Tours

Meetings and tours will be conducted for the existing barnyard runoff management and nutrient and pest management demonstration sites and for future demonstrations of good practices, such as conservation tillage. Priority landowners needing specific information and first-hand exposure to the demonstrated practices will be invited to the event(s). Transportation to and from the sites and organization around a social event such as a meal will be utilized as advisable and approved (also see Meetings section).

In addition, watershed tours including best management practices will be pursued as appropriate for other audiences. During implementation, a meeting/tour will be used to update local officials and Advisory Committee members on progress, to encourage more participation, and to inform the media and the public about implemented practices and water quality improvements. Rural and urban demonstration projects and other implemented practices will be featured. Implementation meetings and tours may be combined for adjacent watersheds where sign-up periods overlap.

County LCD and UW-Extension staff are identified as having the major responsibility for these tours with Area and State UW-Extension staff providing organizational and/or subject matter specialty assistance.

Demonstration Projects

The need for demonstrations of nonpoint source pollution control practices is being evaluated in the watershed on an ongoing basis. Where appropriate, demonstrations will be designed to enhance related natural resources such as fish and wildlife habitat as well as to improve water quality. Watershed demonstrations are evaluated according to the following criteria:

- Does the practice address an identified, major source of water pollution?
- Is the practice needed in a variety of areas in the watershed (or other parts of the southeastern Wisconsin) to achieve water quality goals.
- Is the practice unfamiliar and/or untested in the vicinity or in southeastern Wisconsin?
- Does the practice require further research and refinement before widespread application? Would a demonstration aid this process?
- Is the site proposed for the demonstration highly visible, easily accessible, or located where there would be credibility ascribed to the practice?

Staff, with the advice of watershed advisory committees and local governments, will identify and actively pursue needed demonstrations. Implementation of specific demonstrations will be the responsibility of appropriate DNR, LCD, local government, UW-Extension, and Nutrient and Pest Management Program staff. Part of the plan for each demonstration will be

an information and education element including, at a minimum, signs, slides, fact sheets and tours.

Area UW-Extension Water Quality staff will be the lead responsible party for reviewing demonstration project plans for information and education elements and printing fact sheets. County LCD staff will be the lead responsible parties for documenting costs and project progress, drafting fact sheets, taking slides and conducting tours.

Signs

Signs with the Sheboygan River logo will be used at selected locations to increase public awareness of the watershed project. Potential sites for signs will be selected and prioritized with assistance from the Advisory Committee. Signs will be produced via separate outside contracts. Primary responsibility for coordinating sign usage will belong to Sheboygan and Fond du Lac Counties, with assistance from area UW-Extension and DNR staffs.

Signs identifying demonstration projects and cooperating landowners will also be used. Wherever possible, more detailed signs explaining the watershed project and associated practices will be put up in prominent public locations such as parks, waysides, boat and fishing access sites, and river walkways.

Construction Erosion Control and Stormwater Management Workshops

One specific type of technical education and training assistance offered to local governments will be construction erosion control and stormwater management workshops. The workshops will be designed to provide technical information on these practices to local government staff, developers, builders, contractors and consultants. The most effective time to schedule them will be winter or early spring, before the busiest construction season.

The Area UW-Extension Urban Water Quality Educator will be responsible for organizing these workshops. Materials for use in the workshops will be developed on a District or state level. The Wisconsin Construction Site Best Management Practice Handbook will be the basic text for the workshop. DNR will provide copies of the handbook, but fees will cover remaining out-of-pocket expenses. DNR and LCD staff will assist with the workshops by speaking, developing handouts, evaluating results and providing publicity. County UW-Extension offices will assist with publicity and registration.

Meetings/Presentations

Meetings have been prioritized as a particularly important element of project implementation success. The group approach for rural landowners would complement one-on-one contacts (which are not part of the educational strategy, per se) in an attempt to optimize voluntary participation. Local government (town) meetings would follow a series of such events undertaken at the conclusion of the planning phase, during which DNR would also have met with the elected governing bodies of the municipalities in the watershed.

The primary purpose of meetings scheduled for the first years of the project will be to indicate that implementation is underway and to highlight means of participation. For local officials, they will also be a "courtesy call" as officials may, in turn, be contacted by their constituents. Future meetings could be used to advise that sign-up for cost-sharing will end shortly and to offer suggestions for future involvement.

County UW-Extension and LCD staff will be responsible for these meetings and presentations. Area UW-Extension and DNR staff assistance will be available as needed for specific topics or the production of handout materials.

City and Village Meetings

Meetings will also be scheduled with each city and village in the watershed. Purposes of the meetings scheduled during the first year of the project are to: present inventory results, urban residents survey results and plan recommendations for each community; develop appropriate local assistance and cost-sharing agreements for implementation of the plan in each community.

Staff may present the same information to municipal staff before meeting with the village board or city council. Separate meetings may also be scheduled with committees, commissions or boards of the village or city upon request.

The lead responsible party for scheduling meetings with municipal staff and elected officials will be the DNR Nonpoint Source Coordinator. Other DNR and county or area Extension staff responsible for the watershed will provide assistance at these meetings as needed.

Individual City and Village Educational Programs

Each city and village will have an information and education element included in any local assistance or cost-sharing agreement. This is part of the urban implementation strategy, but also explained here because of its importance to the I&E strategy. At a minimum, associated activities should include:

- Publicity for leaf collection & street sweeping programs.
- Publicity for pet waste cleanup ordinances.
- Publicity for local waste oil recycling and hazardous waste collection programs.
- Information for the construction industry about new or changed local construction erosion control and stormwater management ordinances.
- Training of local government staff for construction erosion control, stormwater management, and streambank stabilization.

City and village staff will be responsible for implementing their community's information and education program. Appropriate county or area UW-Extension and DNR staff will assist local governments in the development and implementation of activities for their residents, businesses and industries. DNR and Extension staff will also provide information on urban best management practices to city and village officials through telephone contacts, attending local government meetings, providing workshops, or other educational means.

The watershed project educational program for municipalities will also require a series of fact sheets or brochures on urban "housekeeping" practices for water quality protection addressing some of the above and the following additional subjects:

- Proper use and disposal of car care products and lawn-garden chemicals.
- Encouragement of precipitation infiltration and detention rather than runoff.
- Landscape planning, establishment, and maintenance for reduced nonpoint pollution runoff.

Many of these printed materials have been initiated through the "Yard Care and the Environment" fact sheet series under the leadership of Area UW-Extension staff. They will be formatted to allow easy adaptation, if desired, for the Sheboygan River Project.

Presentations for Local Groups

An extensive network of presentations planned to reach all appropriate groups is a conscious attempt to both inform and solicit involvement and support, which initial strategizing indicated might be achievable.

To provide an organized approach for soliciting and meeting program requests from local groups, the Sheboygan River Project is developing a speakers bureau. Members of the speakers bureau will include District and local staffs and members of the Advisory Committee. Videotapes, slide programs and supportive educational materials for use by the speakers bureau will have been developed largely by area UW-Extension staff or through county staff in working with the slide collection.

The primary responsibility for maintaining the speakers bureau database will belong to the County UW-Extension. Area UW-Extension staff will play a role in developing or coordinating the development of needed materials. UW-Extension, LCD, and DNR staff and Advisory Committee members will publicize and participate in the speakers bureau and the development of information and education materials according to their areas of interest and available time.

Youth Education

Presentations will be given in the classroom and youth group meetings, as well as references to effective water quality curricula. In addition, youth education will include community events and service projects. One proposal submitted to youth groups will be the application of a storm sewer stencilling project originally used in Seattle. The objectives of this project are to teach youth and adults that storm sewers carry materials directly to local lakes and streams and to discourage dumping of pollutants such as waste oil, antifreeze and paint into them.

The lead responsible party for this project will be county UW-Extension staff who work with youth groups. Area UW-Extension and DNR staff will provide assistance in procuring materials and developing associated educational programs. Information on hazardous waste reduction, recycling and proper disposal will also be provided through this program.

Monitoring and Annual Educational Strategy Update

The Sheboygan River Watershed educational strategy will be reviewed and updated annually. Annual updates will further define educational materials and events, costs, and timing, and include estimates for the fourth through eighth years of the project. Informal monitoring of progress will occur on at least a semi-annual basis, with staff meetings, interim progress reports, and plan adjustments utilized as necessary to continue charting a positive course.

Area UW-Extension staff will provide the leadership role in this plan updating process, and will be assisted by County UW-Extension and LCD staff. DNR and DATCP staff and the Advisory Committee will also play important roles in the needs identification process.

APPENDIX E
GLOSSARY

ACUTE TOXICITY:
Any poisonous effect produced by a single short-term exposure to a chemical that results in a rapid onset of severe symptoms.

ADVANCED WASTEWATER TREATMENT:
The highest level of wastewater treatment for municipal treatment systems. It requires removal of all but 10 parts per million of suspended solids and biological oxygen and/or 50 percent of the total nitrogen. Advanced wastewater treatment is also known as " tertiary treatment."

AGRICULTURAL CONSERVATION PROGRAM (ACP):
A federal cost-sharing program to help landowners install measures to conserve soil and water resources. ACP is administered by the USDA ASCS through county ACP committees.

ALGAE:
A group of microscopic, photosynthetic water plants. Algae give off oxygen during the day as a product of photosynthesis and consume oxygen during the night as a result of respiration. Thus algae effect the oxygen content of water. Nutrient-enriched water increases algae growth.

AMMONIA:
A form of nitrogen (NH_3) found in human and animal wastes. Ammonia can be toxic to aquatic life.

ANAEROBIC:
Without oxygen.

AREA OF CONCERN:
Areas of the Great Lakes identified by the International Joint Commission (IJC) as having serious water pollution problems.

AREAWIDE WATER QUALITY MANAGEMENT PLANS (208 PLANS):
A plan to document water quality conditions in a drainage basin and make recommendations to protect and improve basin water quality. Each basin in Wisconsin must have a plan prepared for it, according to section 208 of the Clean Water Act.

ANTIDEGRADATION:
A policy which states that water quality will not be lowered below background levels unless justified by economic and social development considerations. Wisconsin's antidegradation policy is currently being revised to make it more specific and meet EPA guidelines.

AVAILABILITY:
The degree to which toxic substances or other pollutants that are present in sediments or elsewhere in the ecosystem are available to affect or be taken up by organisms. Some pollutants may be "bound up" or unavailable because they are attached to clay particles or are buried by sediment. The amount of oxygen, pH, temperature and other conditions in the water can affect availability.

BACTERIA:
Single-cell, microscopic organisms. Some can cause disease, and some are important in the stabilization of organic wastes.

BASIN PLAN:
See "Areawide Water Quality Management Plan".

BENTHIC ORGANISMS (BENTHOS):
The organisms living in or on the bottom of a lake or stream.

BEST MANAGEMENT PRACTICE (BMP):
The most effective, practical measures to control nonpoint sources of pollutants that runoff from land surfaces.

BIOACCUMULATION:
The uptake and retention of substances by an organism from its surrounding medium and from its food. Chemicals move through the food chain and tent to end up at higher concentrations in organisms at the upper end of the food chain such as predator fish, or in people or birds that eat these fish.

BIOASSAY STUDY:
A test for pollutant toxicity. Tanks of fish or other organisms are exposed to varying doses of treatment plant effluent; lethal doses of pollutants in the effluent are thus determined.

BIOCHEMICAL OXYGEN DEMAND (BOD):
A measure of the amount of oxygen consumed in the biological processes that break down organic matter in water. BOD_5 is the biochemical oxygen demand measured in a five day test. The greater the degree of pollution, the higher the BOD_5.

BIODEGRADABLE:
Waste which can be broken down by bacteria into basic elements. Most organic wastes such as food remains and paper are biodegradable.

BIOTA:
All living organisms that exist in an area.

BUFFER STRIPS:
Strips of grass or other erosion-resisting vegetation between disturbed areas and a stream or lake.

BULKHEAD LINES:
Legally established lines which indicate how far into a stream or lake an adjacent property owner has the right to fill. Many of these lines were established many years ago and allow substantial filling of the bed of the River and Bay. Other environmental laws may limit filling to some degree.

CARCINOGENIC:
A chemical capable of causing cancer.

CATEGORICAL LIMITS:
All point source discharges are required to provide a basic level of treatment. For municipal wastewater treatment plants this is secondary treatment (30 mg/1 effluent limits for SS and BOD). For industry the level is dependent on the type of industry and the level of production. More stringent effluent limits are required if necessary to meet water quality standards.

CHLORINATION:
The application of chlorine to wastewater to disinfect it and kill bacteria and other organisms.

CHLORORGANIC COMPOUNDS (CHLORORGANICS):
A class of chemicals which contain chlorine, carbon and hydrocarbon. Generally refers to pesticides and herbicides that can be toxic. Examples include PCB's and pesticides such as DDT and dieldrin.

CHRONIC TOXICITY:
The effects of long-term exposure of organisms to concentrations of a toxic chemical that are not lethal is injurious or debilitating to an organism in one or more ways. An example of the effect of chronic toxicity could be reduced reproductive success.

CLEAN WATER ACT:
See "Public Law 92-500."

COMBINED SEWERS:
A wastewater collection system that carries both sanitary sewage and stormwater runoff. During dry weather, combined sewers carry only wastewater to the treatment plant; during heavy rainfall, the sewer becomes swollen with stormwater. Because the treatment plant cannot process the excess flow, untreated sewage is discharged to the plant's receiving waters, i.e., combined sewer outflow.

CONFINED DISPOSAL FACILITY (CDF):
A structure built for the containment and disposal of dredged material.

CONGENERS:
Chemical compounds that have the same molecular composition, but have different molecular structures and formula. For example, the congeners of PCB have chlorine located at different spots on the molecule. These differences can cause differences in the properties and toxicity of the congeners.

CONSERVATION TILLAGE:
Planting row crops while disturbing the soil only slightly. In this way a protective layer of plant residue says in the surface; erosion is decreases.

CONSUMPTION ADVISORY:
A health warning issues by DNR and WDHSS that recommends that people limit the fish they eat from some rivers and lakes based on the levels of toxic contaminants found in the fish.

CONTAMINANT:
Some material that has been added to water that is not normally present. This is different from a pollutant, as a pollutant suggests that there is too much of the material present.

CONVENTIONAL POLLUTANT:
Refers to suspended solids, fecal coliforms, biochemical oxygen demand, and pH, as opposed to toxic pollutants

COST-EFFECTIVE:
A level of treatment or management with the greatest incremental benefit for the money spent.

CRITERIA:
See water quality standard criteria.

DDT:
A chlorinated hydrocarbon insecticide that has been banned because of its persistence in the environment.

DIOXIN (2,3,7,8-tetrachlorodibenso-p-dioxin):
A chlorinated organic chemical which is highly toxic.

DISINFECTION:
A chemical or physical process that kills organism that cause disease. Chlorine is often used to disinfect wastewater.

DISSOLVED OXYGEN (DO):
Oxygen dissolved in water. Low levels of dissolved oxygen cause bad smelling water and threaten fish survival. Low levels of dissolved oxygen are often due to inadequate wastewater treatment. The Department of Natural Resources considers 5 ppm DO necessary for fish and aquatic life.

DREDGING:
Removal of sediment from the bottom of water bodies.

ECOSYSTEM:
The interacting system of biological community and its nonliving surrounding.

EFFLUENT:
Solid, liquid or gas wastes (byproducts) which are disposed on land, in water or in air. As used in the RAP generally means wastewater discharges.

EFFLUENT LIMITS:
The Department of Natural Resources issues WPDES permits that establish the maximum amount of pollutant that can be discharged to a receiving stream. Limits depend on the pollutant involved and the water quality standards that apply for the receiving waters.

EMBEDDEDNESS:
Embeddedness rates the degree that the larger particles (boulder, rubble or gravel) are surrounded or covered by fine sediment. The rating is a measurement of how much of the surface area of the larger sized particles is covered by fine sediment. This should allow evaluation of the channel substrate's suitability for spawning, egg incubation and habitats for aquatic invertebrates and overwintering fish. The rearing quality of the instream cover provided by the substrate can be evaluated also. As the percent of embeddedness decreases, the biotic productivity is also thought to decrease.

EMISSION:
A direct (smokestack particles) or indirect (busy shopping center parking lot) release of any contaminant into the air.

ENVIRONMENTAL PROTECTION AGENCY (USEPA):
The federal agency responsible for enforcing federal environmental regulations. The Environmental Protection Agency delegates some of its responsibilities for water, air and solid waste pollution control to state agencies.

ENVIRONMENTAL REPAIR FUND:
A fund established by the Wisconsin Legislature to deal with abandoned landfills.

EPIDEMIOLOGY:
The study of diseases as they affect populations rather than individuals, including the distribution and incidence of a disease mortality and morbidity rated, and the relationship of climate, age, sex, race and other factors. EPA uses such data to establish national air quality standards.

EROSION:
The wearing away of the land surface by wind or water.

EUTROPHIC:
Refers to a nutrient-rich lake. Large amounts of algae and weeds characterize a eutrophic lake (see also "Oligotrophic" and "Mesotrophic").

EUTROPHICATION:
The process of nutrient enrichment of a lake loading to increased production of aquatic organisms. Eutrophication can be accelerated by human activity such as agriculture and improper waste disposal.

FACILITY PLAN:
A preliminary planning and engineering document that identifies alternative solutions to a community's wastewater treatment problems.

FECAL COLIFORM:
A group of bacteria used to indicate the presence of other bacteria that cause disease. The number of coliform is particularly important when water is used for drinking and swimming.

FISHABLE AND SWIMMABLE:
Refers to the water quality goal set for the nation's surface waters by Congress in the Clean Water Act. All waters were to meet this goal by 1984.

FLOURANTHENE:
A polyaromatic hydrocarbon (PHA) with toxic properties.

FLY ASH:
Particulates emitted from coal burning and other combustion, such as wood burning, and exited into the air from stacks, or more likely, collected by electrostatic precipitators.

FOOD CHAIN:
A sequence of organisms in which each uses the next as a food source.

FURANS (2,3,7,8-tetra-chloro-dibenzpfurans):
A chlorinated organic compound which is highly toxic.

GREEN STRIPS:
See buffer strip.

GROUNDWATER:
Underground water-bearing areas generally within the boundaries of a watershed, which fill internal passageways of porous geologic formations (aquifers) with water which flows in response to gravity and pressure. Often used by the source of water for communities and industries.

HABITAT:
The place or type of site where a plant or animal naturally lives and grows.

HEAVY METALS:
Metals present in municipal and industrial wastes that pose long-tern environmental hazards if not properly disposed. Heavy metals can contaminate ground and surface waters, fish and other food stuffs. The metals of most concern are: arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium and zinc (see also separate listings of these metals for their health effects).

HERBICIDE:
A type of pesticide that is specifically designed to kill plants and can also be toxic to other organisms.

HYDROCARBONS:
Any of a large family of chemicals containing carbon and hydrogen in various combinations.

INCINERATOR:
A furnace designed to burn wastes.

INFLUENT:
Influent for an industry would be the river water that the plant intakes for use in its processing. Influent to a municipal treatment plant is untreated wastewater.

IN-PLACE POLLUTION:
As used in the RAP refers to pollution from contaminated sediments. These sediments are polluted from post discharges from municipal and industrial sources.

INTERNATIONAL JOINT COMMISSION (IJC):
An agency formed by the United States and Canada to guide management of the Great Lakes and resolve border issues.

ISOROPYLBIPHENYL:
A chemical compound used as a substitute for PCB.

LANDFILL:
A conventional sanitary landfill is "a land disposal site employing an engineered method of disposing of solid wastes on land in a manner that minimizes environmental hazards by spreading solid wastes in thin layers, materials at the end of each operating day". Hazardous wastes frequently require various types of pretreatment before they are disposed of, i.e., neutralization chemical fixation encapsulation. Neutralizing and disposing of wastes should be considered a last resort. Repurifying and reusing waste materials or recycling them for another use may be less costly.

LC-1:
The concentration that results in 1 percent mortality of the test animal populations exposed to the contaminant.

LC_{50}:
Lethal concentration for 50 percent of the test population exposed to a toxicant substance.

LD_{50}:
Lethal dose for 50 percent of the test population exposed to a toxicant substance.

LEACHATE:
The contaminated liquid which seeps from a pile or cell of solid materials and which contains water, dissolved and decomposing solids. Leachate may enter the groundwater and contaminate or inking water supplies.

LOAD:
The total amount of materials or pollutants reaching a given local.

MACROPHYTE:
A rooted aquatic plant.

MASS:
The amount of material a substance contains after measured by its weight (in a gravitational field).

MASS BALANCE:
A study that examines all parts of the ecosystem to determine the amount of toxic or other pollutant present, its sources, and the processes by which the chemical moves through the ecosystem.

MESOTROPHIC:
Refers to a moderately fertile nutrient level of a lake between the oligotrophic and eutrophic levels. (See also "Eutrophic" and "Oligotrohpic.")

MILLIGRAMS PER LITER (mg/1):
A measure of the concentration of substance in water. For most pollution measurement this is the equivalent to "parts per million".

MITIGATION:
The effort to lessen the damages caused, by modifying a project, providing alternatives, compensating for losses. or replacing lost values.

MIXING ZONE:
The portion of a stream or lake in which effluent is allowed to mix with the receiving water. The size of the area depends on the volume and flow of the discharge and receiving water. For streams the mixing zone is one-third of the lowest flow that occurs once every 10 years for a seven day period.

NONPOINT SOURCE POLLUTION (NSP):
Pollution whose sources cannot be traced to a single point such as a municipal or industrial wastewater treatment plant discharge pipe. Nonpoint sources include eroding farmland and construction sites, urban streets, and barnyards. Pollutants from these sources reach water bodies in runoff, which can best be controlled by proper land management.

NPS:
See nonpoint source pollution.

OLIGOTROPHIC:
Refers to an unproductive and nutrient-poor lake. Such lakes typically have very clear water. (See also "Eutrophic" and "Mesotrophic.")

OUTFALL:
The mouth of a sewer, drain, or pipe where effluent from a wastewater treatment plant is discharged.

PATHOGEN:
Any infective agent capable of producing disease; may be a virus, bacterium, protozoan, etc.

PELAGIC:
Referring to open water portion of a lake.

PESTICIDE:
Any chemical agent used for control of specific organisms, such as insecticides, herbicides, fungicides, etc.

PH:
A measure of acidity or alkalinity, measured on a scale of 0 to 14 with 7 being neutral and 0 being most acid, and 14 being most alkaline.

PHENOLS:
Organic compounds that are byproducts of petroleum refining, textile, dye, and resin manufacture. High concentrations can cause taste and odor problems in fish. Higher concentration can be toxic to fish and aquatic life.

PHOSPHORUS:
A nutrient that when reaching lakes in excess amounts can lead to overfertile conditions and algae blooms.

PLANKTON:
Tiny plants and animals that live in water.

POINT SOURCES:
Sources of pollution that have discrete discharges, usually from a pipe or outfall.

POLLUTION:
The presence of materials or energy whose nature, location, or quantity produces undesired environmental effects.

POLYCHLORINATED BIPHENYLS(PCBs):
A group of 209 compounds, PCBs have been manufactured since 1929 for such common uses as electrical insulation and heating/cooling equipment, because they resist wear and chemical breakdown. Although banned in 1979 because of their toxicity, they have been detected on air, land and water, and recent surveys have found PCBs in every section for the country, even those remote from PCB manufacturers.

POLYCHLORINATED ORGANIC COMPOUNDS:
A group of toxic chemicals which contains several chlorine atoms.

PRETREATMENT:
A partial wastewater treatment required from some industries. Pretreatment removes some types of industrial pollutants before the wastewater is discharged to a municipal wastewater treatment plant.

PRIORITY POLLUTANT:
A list of toxic chemicals identified by the federal government because of their potential impact in the environment and human health. Major discharges are required to monitor for all or some of these chemicals when their WPDES permits are reissued.

PRIORITY WATERSHED:
A drainage area about 100,000 acres in size selected to receive Wisconsin Fund money to help pay the cost of controlling nonpoint source pollution. Because money is limited, only watersheds where problems are critical, control is practical, and cooperation is likely are selected for funding.

PRODUCTIVITY:
A measure of the amount of living matter which is supported by an environment over a specific period of time. Often described in terms of algae production for a lake.

PUBLIC LAW 92-500 (CLEAN WATER ACT):
The federal law that set national policy for improving and protecting the quality of the nation's waters. The law set a timetable for the cleanup of the nation's waters and stated that they are to be fishable and swimmable. This also required all discharges of pollutants to obtain a permit and meet the conditions of the permit. To accomplish this pollution cleanup billions of dollars have been made available to help communities pay the cost of building sewage treatment facilities. Amendments in the Clean Water Act were made in 1977 by passage of Public Law 95-217, and in 1987.

PUBLIC PARTICIPATION:
The active involvement of interested and affected citizens in governmental decision-making.

PUBLICLY OWNED TREATMENT WORKS (POTW):
A wastewater treatment plan owned by a city, village or other unit of government.

RAP:
See Remedial Action Plan.

RECYCLING:
The process by which waste materials are transformed into new products.

REMEDIAL ACTION PLAN:
A plan designed to restore beneficial uses to a Great Lakes Area of Concern.

REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RF/FS):
An investigation of problems and assessment of management options conducted as part of a superfund project.

RESOURCE CONSERVATION AND RECOVERY ACT OF 1976 (RCRA):
This federal law amends the Solid Waste Disposal Act of 1965 and expands on the Resource Recovery Act of 1970 to provide a program which regulates hazardous wastes, to eliminate open dumping and to promote solid waste management programs.

RETRO-FIT:
The placement of an urban structural practice in an existing urban area, which may involve rerouting existing storm sewers and/or relocating existing buildings or other structures.

RIPARIAN:
Belonging or relating to the bank of a lake, river or stream.

RIPRAP:
Broken rock, cobbles, or boulders placed on the bank of a stream to protect it against erosion.

RULE:
Refers to Wisconsin administrative rules. See Wisconsin Administrative Code.

RUNOFF:
Water from rain, snowmelt, or irrigation that flows over the ground surface and returns to streams. Runoff can collect pollutants from air or land and carry them to receiving waters.

SECONDARY IMPACTS:
The indirect effects that an action can have on the health of the ecosystem or the economy.

SECONDARY TREATMENT:
Two-stage wastewater treatment that allows the coarse particles to settle out, as in primary treatment, followed by biological breakdowns of the remaining impurities. Secondary treatment commonly removes 90 percent of the impurities. Sometimes "secondary treatment" refers simply to the biological part of the treatment process.

SEDIMENT:
Soil particles suspended in and carried by water as a result of erosion.

SEICHES:
Changes in water levels due to the tipping of water in an elongated lake basin whereby water is raised in one end of the basin and lowered in the other.

SEPTIC SYSTEM:
Sewage treatment and disposal for homes not connected to sewer lines. Usually the system includes a tank and drain field. Solids settle to the bottom of the tank; liquid percolates through the drain field.

SLUDGE:
A byproduct of wastewater treatment; waste solids suspended in water.

SOLID WASTE:
Unwanted or discharged material with insufficient liquid to be free flowing.

STANDARDS:
See water quality standards.

STORM SEWERS:
A system of sewers that collect and transport rain and snow runoff. In areas that have separated sewers, such stormwater is not mixed with sanitary sewage.

SUPERFUND:
A federal program which provides for cleanup of major hazardous landfills and land disposal areas.

SUSPENDED SOLIDS (SS):
Small particles of solid pollutants suspended in water.

SYNERGISM:
The characteristic property of a mixture of toxicants that exhibits a greater-that-additive cumulative toxic effect.

TACs:
Technical advisory committees that assisted in the development of the Remedial Action Plan.

TERTIARY TREATMENT:
See advanced wastewater treatment.

TOP-DOWN MANAGEMENT:
A management theory that uses biomanipulation, specifically the stocking of predator species of fish to improve water quality.

TOTAL MAXIMUM DAILY LOADS:
The maximum amount of a pollutant that can be discharged into a stream without causing a violation of water quality standards.

TOXIC:
An adjective that describes a substance which is poisonous, or can kill or injure a person or plants and animals upon direct contact or long-term exposure. (Also, see toxic substance.)

TOXIC SUBSTANCE:
A chemical or mixture of chemicals which through sufficient exposure, or ingestion, inhalation of assimilation by an organism, either directly from the environment or indirectly by ingestion through the food chain, will, on the basis of available information cause death, disease, behavioral or immunologic abnormalities, cancer, genetic mutations, or development of physiological malfunctions, including malfunctions in reproduction or physical deformations, in organisms or their offspring.

TOXICANT:
See toxic substance.

TOXICITY:
The degree of danger posed by a toxic substance to animal or plant life. Also see acute toxicity, chronic toxicity and additivity.

TOXICITY REDUCTION EVALUATION:
A requirement for a discharger that the causes of toxicity in an effluent be determined and measures taken to eliminate the toxicity. The measures may be treatment, product substitution, chemical use reduction or other actions that will achieve the desired result.

TREATMENT PLANT:
See wastewater treatment plant.

TROPHIC STATUS:
The level of growth or productivity of a lake as measured by phosphorus content, algae abundance, and depth of light penetration.

TURBIDITY:
Lack of water clarity. Turbidity is usually closely related to the amount of suspended solids in water.

UNIVERSITY OF WISCONSIN-EXTENSION (UWEX):
A special outreach, education branch of the state university system.

VARIANCE:
Government permission for a delay or exception in the application of a given law, ordinance or regulation. Also, see water quality standard variance.

VOLATILE:
Any substance that evaporates at a low temperature.

WASTELOAD ALLOCATION:
Division of the amount of waste a stream can assimilate among the various dischargers to the stream. Results in the limit on the amount (in pounds) of chemical or biological constituent discharged from a wastewater treatment plant to a water body.

WASTEWATER:
Water that has become contaminated as a byproduct of some human activity. Wastewater includes sewage, washwater and the water-borne wastes of industrial processes.

WASTE:
Unwanted materials left over from manufacturing processes, refuse from places of human habitation or animal habitation.

WASTEWATER TREATMENT PLANT:
A facility for purifying wastewater. Modern wastewater treatment plants are capable of removing 95 percent of organic pollutants.

WATER QUALITY AGREEMENT:
The Great Lakes Water Quality agreement was initially signed by Canada and the United States in 1972 and was subsequently revised in 1978 and 1987. It proves guidance for the management of water quality, specifically phosphorus and toxics, in the Great Lakes.

WATER QUALITY LIMITED SEGMENT:
A section of river where water quality standards will not be met if only categorical effluent standards are met.

WATER QUALITY CRITERIA:
A measure of the physical, chemical or biological characteristics of a water body necessary to protect and maintain different water uses (fish and aquatic life, swimming, etc.).

WATER QUALITY STANDARDS:
The legal basis and determination of the use of a water body and the water quality criteria, physical, chemical, or biological characteristics of a water body, that must be met to make it suitable for the specified use.

WATER QUALITY STANDARD VARIANCE:
When natural conditions of a water body preclude meeting all conditions necessary to maintain full fish and aquatic life and swimming a variance may be granted.

WATERSHED:
The land area that drains into a lake or river.

WETLANDS:
Those areas that are inundates or saturated by surface or groundwater at a frequency and duration sufficient to support a variety of vegetative or aquatic life. Wetland vegetation requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs and csimilar areas.

WISCONSIN ADMINISTRATIVE CODE:
The set of rules written and used by state agencies to implement state statutes. Administrative codes are subject to public hearing and have the force of law.

WISCONSIN FUND:
A state program that helps pay the cost of reducing water pollution. Funding for the program comes from general revenues and bonds and is based on a percentage of the state;s taxable property value. The Wisconsin Fund includes these programs:

Point Source Water Pollution Abatement Grant Program - Provides grants for 60 percent of the cost of constructing wastewater treatment facilities. Most of this program's money goes for treatment plant construction, but three percent of this fund is available for repair or replacement of private , on-site sewer systems.

Nonpoint Source Water Pollution Abatement Grant Program - Funds to share the cost of reducing water pollution nonspecified sources are available in selected priority watersheds.

Solid Waste Grant Program - Communities planning for solid waste disposal sites are eligible for grant money. $500,000 will be available each year to help with planning costs.

WISCONSIN NONPOINT SOURCE WATER POLLUTION ABATEMENT GRANT PROGRAM:
A state cost-share program established by the State Legislature in 1978 to help pay the costs of controlling nonpoint source pollution. Also known as the nonpoint source element of the Wisconsin Fund or the Priority Watershed Program.

WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM (WPDES):
A permit system to monitor and control the point source dischargers of wastewater in Wisconsin. Dischargers are required to have a discharge permit and meet the conditions it specifies.

PRIORITY WATERSHED PROJECTS IN WISCONSIN
1992

Map Number	Large-scale Priority Watershed Project	County(ies)	Year Project Selected
79-1	Galena River*	Grant, Lafayette	1979
79-2	Elk Creek*	Trempealeau	1979
79-3	Hay River*	Barron, Dunn	1979
79-4	Lower Manitowoc River*	Manitowoc, Brown	1979
79-5	Root River*	Racine, Milwaukee, Waukesha	1979
80-1	Onion River*	Sheboygan, Ozaukee	1980
80-2	Sixmile-Pheasant Branch Creek*	Dane	1980
80-3	Big Green Lake*	Green Lake, Fond du Lac	1980
80-4	Upper Willow River*	Polk, St. Crox	1980
81-1	Upper West Branch Pecatonica River*	Iowa, Lafayette	1981
81-2	Lower Black River	La Crosse, Trempealeau	1981
82-1	Kewaunee River*	Kewaunee, Brown	1982
82-2	Turtle Creek	Walworth, Rock	1982
83-1	Oconomowoc River	Waukesha, Washington, Jefferson	1983
83-2	Little River	Oconto, Marinette	1983
83-3	Crossman Creek/Little Baraboo River	Sauk, Juneau, Richland	1983
83-4	Lower Eau Claire River	Eau Claire	1983
84-1	Beaver Creek	Trempealeau, Jackson	1984
84-2	Upper Big Eau Pleine River	Marathon, Taylor, Clark	1984
84-3	Sevenmile-Silver Creeks	Manitowoc, Sheboygan	1984
84-4	Upper Door Peninsula	Door	1984
84-5	East & West Branch Milwaukee River	Fond du Lac, Washington, Sheboygan, Dodge, Ozaukee	1984
84-6	North Branch Milwaukee River	Sheboygan, Washington, Ozaukee, Fond du Lac	1984
84-7	Milwaukee River South	Ozaukee, Milwaukee	1984
84-8	Cedar Creek	Washington, Ozaukee	1984
84-9	Menomonee River	Milwaukee, Waukesha, Ozaukee, Washington	1984
85-1	Black Earth Creek	Dane	1985
85-2	Sheboygan River	Sheboygan, Fond du Lac, Manitowoc, Calumet	1985
85-3	Waumandee Creek	Buffalo	1985
86-1	East River	Brown, Calumet	1986
86-2	Yahara River - Lake Monona	Dane	1986
86-3	Lower Grant River	Grant	1986
89-1	Yellow River	Barron	1989
89-2	Lake Winnebago East	Calumet, Fond du Lac	1989
89-3	Upper Fox River (Ill.)	Waukesha	1989
89-4	Narrows Creek - Baraboo River	Sauk	1989
89-5	Middle Trempealeau River	Trempealeau, Buffalo	1989
89-6	Middle Kickapoo River	Vernon, Monroe, Richland	1989
89-7	Lower East Branch Pecatonica River	Green, Lafayette	1989
90-1	Arrowhead River & Daggets Creek	Winnebago, Outagamie, Waupaca	1990
90-2	Kinnickinnic River	Milwaukee	1990
90-3	Beaverdam River	Dodge, Columbia, Green Lake	1990
90-4	Lower Big Eau Pleine River	Marathon	1990
90-5	Upper Yellow River	Wood, Marathon, Clark	1990
90-6	Duncan Creek	Chippewa, Eau Claire	1990
91-1	Upper Trempealeau River	Jackson, Trempealeau	1991
91-2	Neenah Creek	Adams, Marquette, Columbia	1991
92-1	Balsam Branch	Polk	1992
92-2	Red River - Little Sturgeon Bay	Door, Brown, Kewaunee	1992

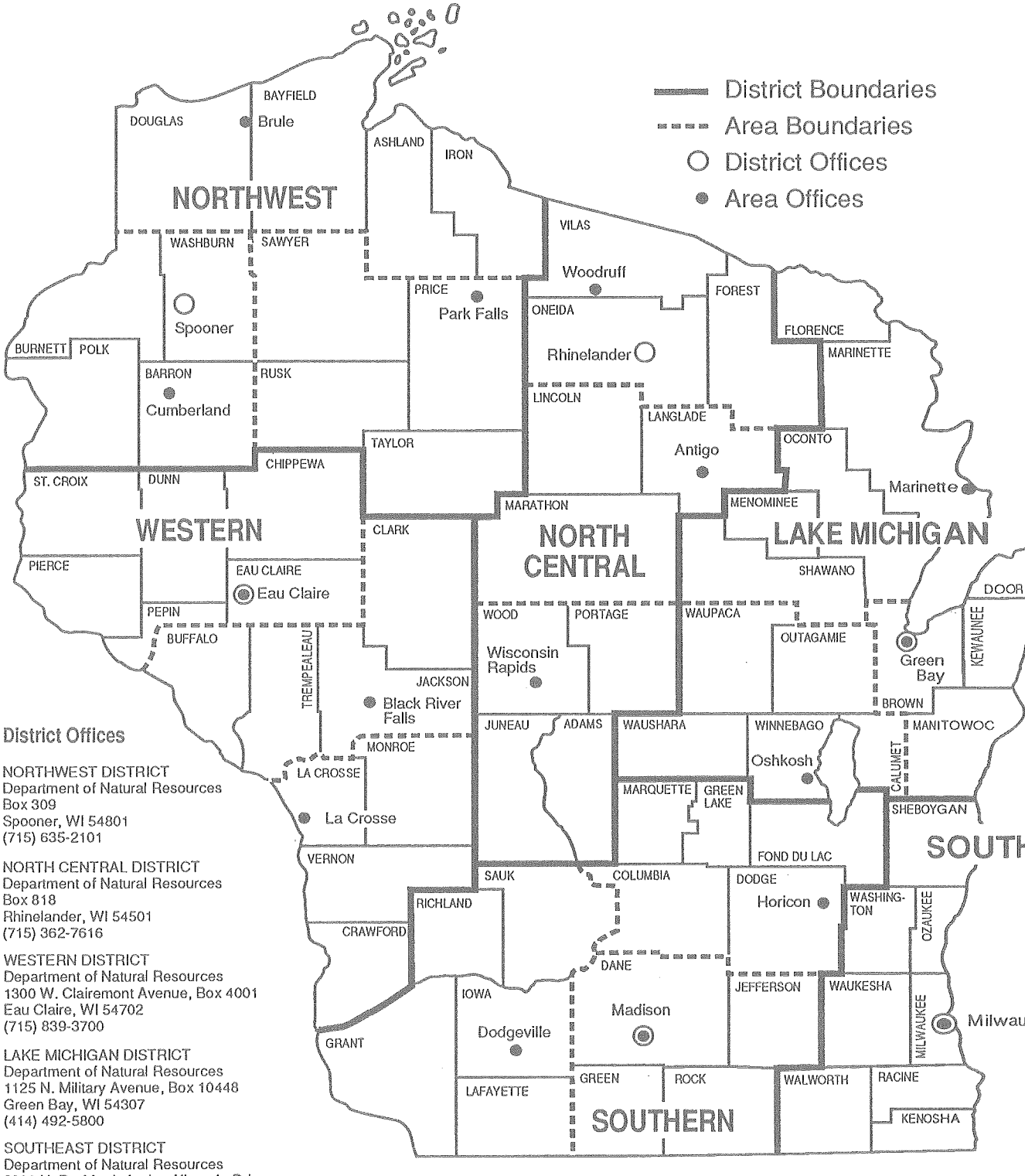
Map Number	Small-scale Priority Watershed Project	County(ies)	Year Project Selected
SS-1	Bass Lake*	Marinette	1985
SS-90-1	Dunlap Creek	Dane	1990
SS-90-2	Lowes Creek	Eau Claire	1990
SS-90-3	Port Edwards - Groundwater Prototype	Wood	1990
SS-91-1	Whittlesey Creek	Bayfield	1991
SS-91-2	Spring Creek	Rock	1991

Map Number	Priority Lake Project	County(ies)	Year Project Selected
PL-90-1	Minocqua Lake	Oneida	1990
PL-90-2	Lake Tomah	Monroe	1990
PL-91-1	Little Muskego, Big Muskego and Wind Lakes	Waukesha, Racine, Milwaukee	1991
PL-92-1	Lake Noquebay	Marinette	1992
PL-92-2	Lake Ripley	Jefferson	1992

** Project completed*

Priority Watershed Projects in Wisconsin
1992

DNR Field Districts and Areas



District Offices

NORTHWEST DISTRICT
Department of Natural Resources
Box 309
Spooner, WI 54801
(715) 635-2101

NORTH CENTRAL DISTRICT
Department of Natural Resources
Box 818
Rhinelander, WI 54501
(715) 362-7616

WESTERN DISTRICT
Department of Natural Resources
1300 W. Clairemont Avenue, Box 4001
Eau Claire, WI 54702
(715) 839-3700

LAKE MICHIGAN DISTRICT
Department of Natural Resources
1125 N. Military Avenue, Box 10448
Green Bay, WI 54307
(414) 492-5800

SOUTHEAST DISTRICT
Department of Natural Resources
2300 N. Dr. Martin Luther King, Jr. Drive
Box 12436
Milwaukee, WI 53212
(414) 263-8500

SOUTHERN DISTRICT
Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg, WI 53711
(608) 275-3266

Our Mission:

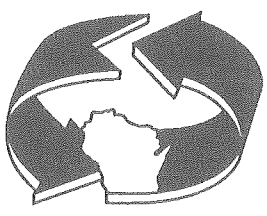
To protect and enhance our Natural Resources—
our air, land and water;
our wildlife, fish and forests.

To provide a clean environment
and a full range of outdoor opportunities.

To insure the right of all Wisconsin citizens
to use and enjoy these resources in
their work and leisure.

And in cooperation with all our citizens
to consider the future
and those who will follow us.

WISCONSIN
DEPT. OF NATURAL RESOURCES



Printed on Recycled Paper