

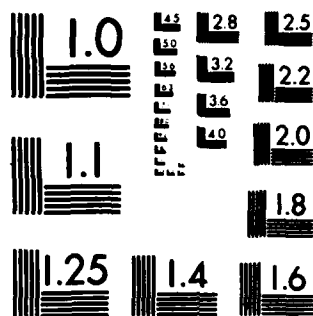
GREAT I STUDY OF THE UPPER MISSISSIPPI RIVER TECHNICAL
APPENDIXES VOLUME 8..(U) GREAT RIVER ENVIRONMENTAL
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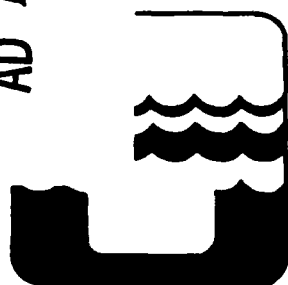
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GREAT I STUDY OF THE UPPER MISSISSIPPI RIVER

TECHNICAL APPENDIXES

VOLUME 8



CHANNEL MAINTENANCE

PART III - POOL PLANS AND SITE DESCRIPTIONS—
POOLS 3 & 4

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18. SUPPLEMENTARY NOTES Volume 8 issues in 5 parts: Part I: narrative; Part II: Pool Plans and Site Descriptions-Minnesota River; St. Croix River, St Anthony Falls, and Pools 1 and 2; Part III: Pools 3 & 4; Part IV: Pools 5, 5A, 6 & 7; Part V: Pools 8, 9, and 10.		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Channels (waterways) Mississippi River Dredged Material		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The channel maintenance plan is composed of a detailed dredged material placement plan (described in part I) and a set of supporting recommend- ations for dredging and channel maintenance. Parts II-V detail the channel maintenance plan by specific sites.		

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- L. CHANNEL MAINTENANCE

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CHANNEL MAINTENANCE APPENDIX

PART III

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↙ This section of the Channel Maintenance Plan (CMP) contains both summarized and detailed information describing GREAT I's selected plan for dredged material placement for various pools. It also contains a qualitative comparison of the selected plan placement sites with other placement sites considered by GREAT I for the pools. ↘

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POOL 3

CHANNEL MAINTENANCE PLAN SUMMARY

POOL 3

Dredge Cut	MPFWOG CY @ 1985-0225	Selected Site	NED Site	EQ Site	RFFP Site	MPFWOG Site	MPFWOG CY @ 1985-2025	Temporary Site
1. Below Diamond Bluff	455,500	3.09	3.07/3.10/ 3.43	3.09	3.09	3.07	557,500	-
2. Coulter's Island	272,500	3.09	3.12	3.09	3.09	3.12	299,000	3.12
3. Morgan's Coulee	457,000	3.09	3.16/3.14	3.09	3.17	3.16/3.14	501,000	3.14
4. Big River	415,500	3.27/3.09/ 3.34/3.46	3.21/3.44	3.09	3.17	3.21	456,500	-
5. 4-Mile Island and Truedale Slough	590,500	3.27/3.09/ 3.34/3.46	3.28/3.40	3.27	3.18	3.28/3.40	646,500	-
6. Pine Coulee	147,000	3.27/3.09/ 3.34/3.46	3.30	3.27	3.03	3.30	159,000	-
7. Prescott, Wisconsin	322,000	3.34/3.46	3.34/3.33	3.46	3.39	3.33	351,500	-
8. Vermillion River	12,000	3.46	3.46	3.46	3.39	3.33	12,000	-
9. Lower Approach to L/D 2	61,500	3.47/3.48/ 3.42	3.42	3.46	3.39	3.42	68,500	-
	2,733,500						3,051,500	

SELECTED PLAN SUMMARY

Total Volume Dredged (cy)	-	2,733,500
Beneficial Use (cy)	-	1,676,000
Potential from Selected sites		
Total Area (acres)	-	102
No. of sites with:		
Recreation Enhancement	-	3
Cultural Resources Impacts	-	0
Wetlands Affected:		
Types 1, 2 (acres)	-	70
Types 3, 4, 5 (acres)	-	4

Table 2-

Pool 1 Dredging Volumes

Item	Cut 1		Cut 2		Cut 3		Cut 4		Cut 5	
	With GREAT	Without GREAT	With GREAT	Without GREAT	With GREAT	Without GREAT	With GREAT	Without GREAT	With GREAT	Without GREAT
Cut Name	Below Diamond Bluff		Coulters Island		Morgan's Coulee		Big River		Four Mile Island- Truedale Slough	
1955 - 1974 average annual dredging volume	19,800	19,800	10,600	10,600	17,800	17,800	16,200	16,200	16,200	16,200
Bed width changes (percent)	-10	-	-	-	-	-	-	-	-442	-442
Adjusted average annual volume	17,800	19,800	10,600	10,600	17,800	17,800	16,200	16,200	23,000	23,000
Change for 1986 - 2000 (percent)	-34	-19	-34	-19	-34	-19	-34	-19	-34	-19
Adjusted average annual volume	11,700	16,000	7,000	8,600	11,800	14,400	10,700	13,100	15,200	18,600
Total volume dredged, 1986 - 2000	175,500	240,000	105,000	129,000	177,000	216,000	160,500	196,500	228,000	279,000
Change for 2001 - 2025 (percent)	-37	-36	-37	-36	-37	-36	-37	-36	-37	-36
Adjusted average annual volume	11,200	12,700	6,700	6,800	11,200	11,400	10,200	10,400	14,500	14,700
Total volume dredged, 2001 - 2025	280,000	317,500	167,500	170,000	280,000	285,000	255,000	260,000	362,500	367,500
Total volume dredged, 1986 - 2025	455,500	557,500	272,500	299,000	457,000	501,000	415,500	456,500	590,500	646,500
Frequency of dredging (percent)	25	25	20	20	20	20	30	30	30	30
Expected number of dredging jobs (1986 - 2025)	10	10	8	8	8	8	12	12	12	12
Average dredging volume per job	45,500	55,800	34,100	37,400	57,100	62,600	34,600	38,000	49,200	53,900

Note: All volumes in Cubic Yards

Table 2- (cont.)

Pool 3 Dredging Volumes

Item	Cut 6			Cut 7			Cut 8			Cut 9		
	With GREAT	Without GREAT		With GREAT	Without GREAT		With GREAT	Without GREAT		With GREAT	Without GREAT	
Cut Name	Pine Coulee			Prescott, Wisconsin			Vermillion River			Lower Approach L/D 2		
1955 - 1974 average annual dredging volume	5,700	5,700		12,500	12,500		400	400		2,100	2,100	
Bed width changes (percent)	--	--		--	--		--	--		--	--	
Adjusted average annual volume	5,700	5,700		12,500	12,500		400	400		2,100	2,100	
Change for 1986 - 2000 (percent)	-34	-19		-34	-19		-34	-19		-24 ⁽¹⁾	-9 ⁽¹⁾	
Adjusted average annual volume	3,800	4,600		8,300	10,100		300	300		1,600	1,900	
Total volume dredged, 1986 - 2000	57,000	69,000		124,500	151,500		4,500	4,500		24,000	28,500	
Change for 2001 - 2025 (percent)	-37	-36		-37	-36		-37	-36		-27 ⁽¹⁾	-26 ⁽¹⁾	
Adjusted average annual volume	3,600	3,600		7,900	8,000		300	300		1,500	1,600	
Total volume dredged, 2001 - 2025	90,000	90,000		197,500	200,000		7,500	7,500		37,500	40,000	
Total volume dredged, 1986 - 2025	147,000	159,000		322,000	351,500		12,000	12,000		61,500	68,500	
Frequency of dredging (percent)	10	10		30	30		10	10		15	15	
Expected number of dredging jobs (1986 - 2025)	4	4		12	12		4	4		6	6	
Average dredging volume per job	36,800	39,800		26,800	29,300		3,000	3,000		10,200	11,400	

(1) Cut in approach to rigid structure.

Note: All volumes in Cubic Yards

DREDGED MATERIAL PLACEMENT SITE

POOL: 3

EXISTING CONDITIONS DESCRIPTION

CUT: 1

SITE: 3.09

SITE: 3.09

Page 1 of 3

CUT LOCATION: 798.9 - 800.5 (Below Diamond Bluff)

PLACEMENT SITE LOCATION: RM 799.6

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 704'
100-year flood: 687.5'
5-year flood: 680.6'
Flat pool: 674.2'

FLOOD STAGE FACTORS:

Site within floodplain: No
Site within floodway (effective flow area): No
Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 0
% Wetland: 100
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: 100'
Wetland: 0
Residence: 500'
Beneficial Use Site: 0
Other: 1,000 ft. to Diamond Bluff, WI., 100 ft. from Backwater slough

VEGETATION CHARACTER: Bottomland hardwoods

SITE OWNER: Private

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other: None

EXISTING USE OF SITE:

Fish and Wildlife: Waterfowl nesting, furbearers, upland game habitat.

Socioeconomic: Development potential

Adjacent land use: Roadways, woods, railroads, backwater slough

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 3
CUT: 1
SITE: 3.09

SITE: 3.09

Page 2 of 3

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 1,330,000
Area at base (acres): 35
Height (feet): 25
Length (feet): 1,325
Width (feet): 1,150
Side slope (ratio): 4:1
Final elevation (feet): 729

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 10/40
Volume dredged per job (cubic yards): 45,500
Beneficial use demand (cubic yards): 258,000
Beneficial Use by: Diamond Bluff, Pierce County
Other cuts using sites: 2,3,4,5,6

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100
Silt (%):
Other (%):
Contaminants: None
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): X

EROSION CONTROL NEEDED:

Riprap: None
Revegetation: None
Other: None
Areas and features protected by erosion control: N/A

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 3
CUT: 1
SITE: 3.09

Page 3 of 3

SITE: 3.09

SPECIAL CONDITIONS FOR SITE USE: Access site must be developed for hydraulic and mechanical placement methods.

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	35	1
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	None	
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

Below Diamond Bluff
POOL: 3
CUT: 1
SITE: 3.09

Frequency: 25 %
 10 /40 yrs
 Volume per job: 45,500 cy

CHANNEL MAINTENANCE PLAN COSTS
 PER DREDGING JOB

	TYPES OF DREDGES					
	PIPELINE			MECHANICAL		
	20 inch	16 inch	12 inch	Backhoe 350 H.P.	Clamshell 700 H.P.	700 H.P.
Basic Dredging Operation	\$267,000*	\$315,000*	\$345,000*	\$235,000*	\$261,000*	\$282,000*
Berming Costs	8,000*	11,000*	14,000*	14,000*	14,000*	14,000*
Diking Costs	8,000	8,000	7,000	7,000	7,000	7,000
Riprapping Costs	0	0	0	0	0	0
Seasonal Removal	0	0	0	0	0	0
Special Construction	0	0	0	0	0	0
Land Acquisition	51,000*	51,000*	51,000*	51,000*	51,000*	51,000*
Total of GREAT recommended Actions	326,000	377,000	413,000	300,000	326,000	347,000
Average Annual Costs	81,500	94,300	103,000	75,000	81,500	86,800

*GREAT recommended actions

DREDGED MATERIAL PLACEMENT SITE

POOL: 3

EXISTING CONDITIONS DESCRIPTION

CUT: 2

SITE: 3.09

SITE: 3.09

Page 1 of 3

CUT LOCATION: 800.8 - 801.8 (Coulter's Island)

PLACEMENT SITE LOCATION: RM 799.6

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 704'
100-year flood: 687.5'
5-year flood: 680.6'
Flat pool: 674.2'

FLOOD STAGE FACTORS:

Site within floodplain: No
Site within floodway (effective flow area): No
Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 0
% Wetland: 100
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: 100'
Wetland: 0'
Residence: 500'
Beneficial Use Site: 0
Other: 1,000 ft. to Diamond Bluff, WI., 100 ft. from backwater slough

VEGETATION CHARACTER: Bottomland headwoods

SITE OWNER: Private

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other: None

EXISTING USE OF SITE:

Fish and Wildlife: Waterfowl nesting, furbearers, upland game habitat

Socioeconomic: Development potential

Adjacent land use: Roadways, woods, railroads, backwater slough

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 3
CUT: 2
SITE: 3.09

Page 2 of 3

SITE: 3.09

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards):	1,330,000
Area at base (acres):	35
Height (feet):	25
Length (feet):	1,325
Width (feet):	1,150
Side slope (ratio):	4:1
Final elevation (feet):	729

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 8/40
Volume dredged per job (cubic yards): 34,100
Beneficial use demand (cubic yards): 258,000
Beneficial Use by: Diamond Bluff, Pierce County
Other cuts using sites: 1, 3, 4, 5, 6

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100
Silt (%):
Other (%):
Contaminants: None
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): X

EROSION CONTROL NEEDED:

Riprap: None
Revegetation: None
Other: None
Areas and features protected by erosion control: N/A

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 3
CUT: 2
SITE: 3.09

Page 3 of 3

SITE: 3.09

SPECIAL CONDITIONS FOR SITE USE: Access site must be developed for
hydraulic and mechanical placement methods.

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	35	1
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	None	
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS PER DREDGING JOB

Coulter's Island

POOL: 3

CUT: 2

SITE: 3.09

Frequency: 20 %

8/40 yrs

Volume per job: 34,100 cy

TYPES OF DREDGES

	PIPELINE	MECHANICAL				
		20 inch	16 inch	12 inch	Backhoe 350 H.P.	Clamshell 700 H.P.
Basic Dredging Operation	\$ 424,000*	\$ 441,000*	\$ 455,000*	\$ 207,000*	\$ 207,000*	\$ 236,000*
Berming Costs (1)	5,000*	6,000*	8,000*	-	-	-
Diking Costs (1)	8,000	7,000	6,000	-	-	-
Riprapping Costs	0	0	0	0	0	0
Seasonal Removal	0	0	0	0	0	0
Special Construction (2)	8,000*	8,000*	8,000*	8,000*	8,000*	8,000*
Land Acquisition	51,000	51,000	51,000	51,000	51,000	51,000
Total of GREAT recommended Actions	437,000	455,000	471,000	215,000	215,000	244,000
Average Annual Costs	87,400	91,000	94,200	43,000	43,000	48,800

*GREAT recommended actions

(1) At 3.12.

(2) Berming at 3.09.

DREDGED MATERIAL PLACEMENT SITE

POOL: 3

EXISTING CONDITIONS DESCRIPTION

CUT: 2

SITE: 3.12

SITE: 3.12

Page 1 of 3

CUT LOCATION: 800.8 - 801.8 (Coulter's Island)

PLACEMENT SITE LOCATION: 801.4

TYPE OF PLACEMENT SITE: Permanent _____ Temporary X _____

ELEVATIONS AT SITE:

Site (1980): 682' (approx)
100-year flood: 687.6'
5-year flood: 680.8'
Flat pool: 675.0'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: ?

SITE CHARACTER:

% Upland: 50
% Wetland: 50
% Open water:

DISTANCE FROM SITE TO:

Open Water: adjacent
Wetland: adjacent
Residence: mile
Beneficial Use Site: 2 miles
Other:

VEGETATION CHARACTER: 1/2 is bottomland hardwoods, 1/2 some willows and grasses.

SITE OWNER: Private

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other:

EXISTING USE OF SITE:

Fish and Wildlife: Furbearers, waterfowl nesting, fish spawning
Socioeconomic: Partially old dredged material site.
Adjacent land use: Main channel, backwaters.

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 3

CUT: 2

SITE: 3.12

Page 2 of 3

SITE: 3.12

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 200,000
Area at base (acres): 12
Height (feet): 15
Length (feet): 1,400
Width (feet): 400
Side slope (ratio): -
Final elevation (feet): 685

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 8/40
Volume dredged per job (cubic yards): 34,100
Beneficial use demand (cubic yards): None
Beneficial Use by: No access
Other cuts using sites: None

DREDGED MATERIAL CHARACTERISTICS:

Sand (%):
Silt (%):
Other (%):
Contaminants:
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): X

EROSION CONTROL NEEDED:

rip: No
Revegetation: No
Other: Material must be removed before next seasonal high water
Areas and features protected by erosion control: adjacent backwaters

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 3
CUT: 2
SITE: 3.12

Page 3 of 3

SITE: 3.12

SPECIAL CONDITIONS FOR SITE USE: Material must be removed from site before the next seasonal high water.

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	6	1
Wetlands altered:	0	
Open water filled:	0	
Upland altered:	6	Old dredged material
Endangered Species habitat lost:	0	
Side channels blocked:	0	
Other:	0	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

Channel Maintenance Plan Costs

Cost figures were not calculated for this site because it is a temporary placement site. Material placed at this site must either be immediately removed to another site or removed to another site after material from several dredging jobs has been placed at the site. Cost for rehandling the material will vary according to demand for material, equipment available for removing the material, how much material must be removed during one rehandling operation, and where the material is ultimately placed.

Due to the number of variables affecting the cost of using this temporary site, calculation of cost estimates would not be meaningful for comparing with placement costs at other sites or with other methods.

DREDGED MATERIAL PLACEMENT SITE

POOL: 3

EXISTING CONDITIONS DESCRIPTION

CUT: 3

SITE: 3.09

SITE: 3.09

Page 1 of 3

CUT LOCATION: 801.9 - 803.0 (Morgan's Coulee)

PLACEMENT SITE LOCATION: RM 799.6

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 704'
100-year flood: 687.5'
5-year flood: 680.6'
Flat pool: 674.2'

FLOOD STAGE FACTORS:

Site within floodplain: No
Site within floodway (effective flow area): No
Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 0
% Wetland: 100
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: 100'
Wetland: 0
Residence: 500'
Beneficial Use Site: 0
Other: 1,000 ft. to Diamond Bluff, WI., 100 ft. from backwater slough

VEGETATION CHARACTER: Bottomland hardwoods

SITE OWNER: Private

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other: None

EXISTING USE OF SITE:

Fish and Wildlife: Waterfowl nesting, furbearers, upland game habitat
Socioeconomic: Development potential
Adjacent land use: Roadways, woods, railroads, backwater slough

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 3
CUT: 3
SITE: 3.09

Page 2 of 3

SITE: 3.09

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards):	1,330,000
Area at base (acres):	35
Height (feet):	25
Length (feet):	1,325
Width (feet):	1,150
Side slope (ratio):	4:1
Final elevation (feet):	729

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 8/40
Volume dredged per job (cubic yards): 57,100
Beneficial use demand (cubic yards): 258,000
Beneficial Use by: Diamond Bluff, Pierce County
Other cuts using sites: 1, 2, 4, 5, 6

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100
Silt (%):
Other (%):
Contaminants: None
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): No (Possible hydraulic rehandling at site.)

EROSION CONTROL NEEDED:

Riprap: None
Revegetation: None
Other: None
Areas and features protected by erosion control: N/A

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 3
CUT: 3
SITE: 3.09

Page 3 of 3

SITE: 3.09

SPECIAL CONDITIONS FOR SITE USE: Access site must be developed for hydraulic and mechanical placement methods.

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	35	1
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	None	
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

Morgan's Coulee
POOL: 3
CUT: 3
SITE: 3.09

Frequency: 20%
8 / 40 yrs
Volume per job: 57,100 cy

	TYPES OF DREDGES						
	PIPELINE			MECHANICAL			
	20 inch	16 inch	12 inch	Backhoe 350 H.P.	700 H.P.	350 H.P.	Clamshell 700 H.P.
Basic Dredging Operation	\$ 586,000*	\$ 602,000*	\$ 570,000*	\$ 310,000*	\$ 350,000*	\$ 375,000*	\$ 467,000*
Berming Costs (1)	6,000*	8,000*	8,000*	-	-	-	-
Diking Costs (1)	9,000	9,000	8,000	-	-	-	-
Riprapping Costs	0	0	0	0	0	0	0
Seasonal Removal	0	0	0	0	0	0	0
Special Construction (2)	8,000*	8,000*	8,000*	8,000*	8,000*	8,000*	8,000*
Land Acquisition	51,000	51,000	51,000	51,000	51,000	51,000	51,000
Total of GREAT recommended Actions	600,000	618,000	586,000	318,000	358,000	383,000	475,000
Average Annual Costs	120,000	123,600	117,200	63,600	71,600	76,600	95,000

*GREAT recommended actions

(1) At 3.14.

(2) Berming at 3.09.

DREDGED MATERIAL PLACEMENT SITE

POOL:3

EXISTING CONDITIONS DESCRIPTION

CUT:3

SITE:3.14

SITE: 3.14

Page 1 of 3

CUT LOCATION: 801.9 - 803.0 (Morgan's Coulee)

PLACEMENT SITE LOCATION: 802.5 RB

TYPE OF PLACEMENT SITE: Permanent _____ Temporary X

ELEVATIONS AT SITE:

Site (1980): 682' (approx)
100-year flood: 687.8'
5-year flood: 682.9'
Flat pool: 675.0'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: ?

SITE CHARACTER:

% Upland: 30
% Wetland: 70
% Open water:

DISTANCE FROM SITE TO:

Open Water: Adjacent
Wetland: 0
Residence: 1 1/2 miles
Beneficial Use Site: 2 1/2 miles
Other:

VEGETATION CHARACTER: Bottomland hardwoods, cattails, lotus, arrowhead

SITE OWNER: Federal

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other:

EXISTING USE OF SITE:

Fish and Wildlife: Waterfowl nesting, rearing and feeding, fish spawning and feeding, furbearers, shorebirds.
Socioeconomic: Partially old dredged material site
Adjacent land use: Navigation channel, backwaters

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 3
CUT: 3
SITE: 3.14

Page 2 of 3

SITE: 3.14

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards):	150,000
Area at base (acres):	10.5
Height (feet):	15
Length (feet):	2,300
Width (feet):	200
Side slope (ratio):	-
Final elevation (feet):	682

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged:	8/40
Volume dredged per job (cubic yards):	57,100
Beneficial use demand (cubic yards):	None
Beneficial Use by:	No access
Other cuts using sites:	None

DREDGED MATERIAL CHARACTERISTICS:

Sand (%):
Silt (%):
Other (%):
Contaminants:
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): X

EROSION CONTROL NEEDED:

Riprap: No
Revegetation: No
Other: Material to be removed before the next seasonal high water.
Areas and features protected by erosion control: Adjacent backwaters,
adjacent side channels.

DREDGED MATERIAL PLACEMENT SITE

POOL:3

CUT:3

SITE DEVELOPMENT DESCRIPTION AND IMPACTS

SITE:3.14

(Continued from previous page)

Page 3 of 3

SITE: 3.14

SPECIAL CONDITIONS FOR SITE USE: Material must be removed from site before the next seasonal high water.

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	3	1
	4	3,4, and 5
Wetlands altered:		
Open water filled:		
Upland altered:		
Endangered Species habitat lost:	3	Old dredged material site
Side channels blocked:		
Other:		

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

Channel Maintenance Plan Costs

Cost figures were not calculated for this site because it is a temporary placement site. Material placed at this site must either be immediately removed to another site or removed to another site after material from several dredging jobs has been placed at the site. Cost for rehandling the material will vary according to demand for material, equipment available for removing the material, how much material must be removed during one rehandling operation, and where the material is ultimately placed.

Due to the number of variables affecting the cost of using this temporary site, calculation of cost estimates would not be meaningful for comparing with placement costs at other sites or with other methods.

DREDGED MATERIAL PLACEMENT SITE

POOL:3

EXISTING CONDITIONS DESCRIPTION

CUT:4

SITE:3.27

SITE: 3.27

Page 1 of 3

CUT LOCATION: 804.2 - 806.1 (Big River)

PLACEMENT SITE LOCATION: RM 808.4

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 714'
100-year flood: 690.5'
5-year flood: 683'
Flat pool: 674.8'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes (of Dry Run Slough)
Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 0
% Wetland: 100
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: less than 500'
Wetland: 0
Residence: more than 500'
Beneficial Use Site: 0
Other:

VEGETATION CHARACTER: Bottomland hardwoods

SITE OWNER: Private

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other: None

EXISTING USE OF SITE:

Fish and Wildlife: Fish spawning grounds, waterfowl nesting, furbearers
Socioeconomic: None
Adjacent land use: Railroad tracks, state highway, navigation channel

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 3
CUT: 4
SITE: 3.27

Page 2 of 3

SITE: 3.27

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 500,000
Area at base (acres): 31
Height (feet): 10
Length (feet): 2,300
Width (feet): 600
Side slope (ratio): 4:1
Final elevation (feet): 724

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 12/40
Volume dredged per job (cubic yards): 34,600
Beneficial use demand (cubic yards): 254,000
Beneficial Use by: Oak Grove Township, Pierce County
Other cuts using sites: 5,6

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100
Silt (%):
Other (%):
Contaminants: None
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): Yes (for rehandling at site)

EROSION CONTROL NEEDED:

Riprap: Yes (along creek bed)
Revegetation: None
Other: None
Areas and features protected by erosion control: Downstream riprap and wing dams.

DREDGED MATERIAL PLACEMENT SITE

POOL: 3

CUT: 4

SITE DEVELOPMENT DESCRIPTION AND IMPACTS

SITE: 3.27

(Continued from previous page)

Page 3 of 3

SITE: 3.27

SPECIAL CONDITIONS FOR SITE USE: Additional beneficial use must be identified for site to be viable.

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	31	1
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	None	
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

Big River
POOL: 3
CUT: 4
SITE: 3.27

Frequency: 30 %
12/40 yrs
Volume per job: 34,600 cy

	TYPES OF DREDGES					
	PIPELINE			MECHANICAL		
	20 inch	16 inch	12 inch	Backhoe 350 H.P.	700 H.P.	Clamshell 350 H.P. 700 H.P.
Basic Dredging Operation	\$ 450,000*	\$ 538,000*	\$ 492,000*	\$ 213,000*	\$ 216,000*	\$ 241,000*
Berming Costs (1)	6,000*	9,000*	10,000*	-	-	-
Diking Costs (1)	8,000	7,000	6,000	-	-	-
Riprapping Costs	0	0	0	0	0	0
Seasonal Removal	0	0	0	0	0	0
Special Construction (2)	10,000*	10,000*	10,000*	10,000*	10,000*	10,000*
Land Acquisition	41,000*	41,000*	41,000*	41,000*	41,000*	41,000*
Total of GREAT recommended Actions	507,000	598,000	553,000	264,000	267,000	292,000
Average Annual Costs	152,100	179,400	165,900	79,200	80,100	87,600

*GREAT recommended actions

(1) At 3.20.

(2) Berming at 3.27.

DREDGED MATERIAL PLACEMENT SITE

POOL: 3

EXISTING CONDITIONS DESCRIPTION

CUT: 4

SITE: 3.09

SITE: 3.09

Page 1 of 3

CUT LOCATION: 804.2 ~ 806.1 (Big River)

PLACEMENT SITE LOCATION: RM 799.6

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 704'
100-year flood: 687.5'
5-year flood: 680.6'
Flat pool: 674.2'

FLOOD STAGE FACTORS:

Site within floodplain: No
Site within floodway (effective flow area): No
Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 0
% Wetland: 100
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: 100'
Wetland: 0
Residence: 500'
Beneficial Use Site: 0
Other: 1,000 ft. to Diamond Bluff, WI., 100 ft. from Backwater slough

VEGETATION CHARACTER: Bottomland hardwoods

SITE OWNER: Private

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other: None

EXISTING USE OF SITE:

Fish and Wildlife: Waterfowl nesting, furbearers, upland game habitat
Socioeconomic: Development potential
Adjacent land use: Roadways, woods, railroads, backwater slough

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 3
CUT: 4
SITE: 3.09

Page 2 of 3

SITE: 3.09

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards):	1,330,000
Area at base (acres):	35
Height (feet):	25
Length (feet):	1,325
Width (feet):	1,150
Side slope (ratio):	4:1
Final elevation (feet):	729

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 12/40
Volume dredged per job (cubic yards): 34,600
Beneficial use demand (cubic yards): 258,000
Beneficial Use by: Diamond Bluff, Pierce County
Other cuts using sites: 1, 2, 3, 5, 6

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100
Silt (%):
Other (%):
Contaminants: None
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): X

EROSION CONTROL NEEDED:

Riprap: None
Revegetation: None
Other: None
Areas and features protected by erosion control: N/A

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 3
CUT: 4
SITE: 3.09

Page 3 of 3

SITE: 3.09

SPECIAL CONDITIONS FOR SITE USE: Access site must be developed for
hydraulic and mechanical placement methods.

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	35	1
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	None	
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

Big River
POOL: 3
CUT: 4
SITE: 3.09

Frequency: 30 %
12/40 yrs
Volume per job: 34,600 cy

	TYPES OF DREDGES						
	PIPELINE 20 inch	16 inch	12 inch	MECHANICAL			
				Backhoe 350 H.P.	Clamshell		
					700 H.P.	350 H.P.	700 H.P.
Basic Dredging Operation	\$ 510,000*	\$ 598,000*	\$ 552,000*	\$ 237,000*	\$ 238,000*	\$ 263,000*	\$ 268,000*
Berming Costs (1)	6,000*	9,000*	10,000*	-	-	-	-
Diking Costs (1)	8,000	7,000	6,000	-	-	-	-
Riprapping Costs	0	0	0	0	0	0	0
Seasonal Removal	0	0	0	0	0	0	0
Special Construction (2)	10,000*	10,000*	10,000*	10,000*	10,000*	10,000*	10,000*
Land Acquisition	51,000*	51,000*	51,000*	51,000*	51,000*	51,000*	51,000*
Total of GREAT recommended Actions	577,000	668,000	623,000	298,000	299,000	324,000	329,000
Average Annual Costs	173,100	200,400	186,900	89,400	89,700	97,200	98,700

*GREAT recommended actions
(1) At 3.20.
(2) Berming at 3.09.

DREDGED MATERIAL PLACEMENT SITE

POOL: 3

EXISTING CONDITIONS DESCRIPTION

CUT: 4

SITE: 3.34

SITE: 3.34

Page 1 of 3

CUT LOCATION: 804.2 - 806.1 (Big River)

PLACEMENT SITE LOCATION: RM 812

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 705'
100-year flood: 692'
5-year flood: 685'
Flat pool: 675'

FLOOD STAGE FACTORS:

Site within floodplain: No
Site within floodway (effective flow area): No
Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 60
% Wetland: 40
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: less than 200'
Wetland: 0'
Residence: less than 300'
Beneficial Use Site: 0'
Other: Site is adjacent to rail line

VEGETATION CHARACTER: Bottomland hardwoods, and aquatic vegetation

SITE OWNER: Public

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other: None

EXISTING USE OF SITE:

Fish and Wildlife: Fish, furbearers, waterfowl
Socioeconomic: Potential highway development
Adjacent land use: Rail line, navigation channel, state highway

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 3
CUT: 4
SITE: 3.34

Page 2 of 3

SITE: 3.34

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 400,000
Area at base (acres): 10
Height (feet): 25
Length (feet): 1900
Width (feet): 225
Side slope (ratio): 4:1
Final elevation (feet): 730

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 12/40
Volume dredged per job (cubic yards): 34,600
Beneficial use demand (cubic yards): 240,000
Beneficial Use by: Washington County
Other cuts using sites: 4,5,6,7,8

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100
Silt (%):
Other (%):
Contaminants: None
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): Yes
Hydraulic (in slurry): Yes, for rehandling at site only.

EROSION CONTROL NEEDED:

Riprap: None
Revegetation: None
Other: Site is not subject to direct flood flows
Areas and features protected by erosion control: N/A

DREDGED MATERIAL PLACEMENT SITE

POOL: 3

CUT: 4

SITE DEVELOPMENT DESCRIPTION AND IMPACTS

SITE: 3.34

(Continued from previous page)

Page 3 of 3

SITE: 3.34

SPECIAL CONDITIONS FOR SITE USE: Requires special construction to deliver material to site.

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	4	4 and 5
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	6	Woodland
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

Big River
POOL: 3
CUT: 4
SITE: 3.34

Frequency: 30 %
12/40 yrs
Volume per job: 34,600 cy

PIPELINE	TYPES OF DREDGES			
	16 inch	12 inch	Backhoe 350 H.P.	MECHANICAL 700 H.P. 350 H.P. 700 H.P.

Basic Dredging Operation	\$593,000*	\$681,000*	\$635,000*	\$287,000*	\$292,000*	\$301,000*	\$303,000*
Berming Costs (1)	6,000*	9,000*	10,000*	-	-	-	-
Diking Costs (1)	8,000	7,000	6,000	-	-	-	-
Riprapping Costs	0	0	0	0	0	0	0
Seasonal Removal	0	0	0	0	0	0	0
Special Construction (2)	10,000*	10,000*	10,000*	10,000*	10,000*	10,000*	10,000*
Land Acquisition	0	0	0	0	0	0	0
Total of GREAT recommended Actions	609,000	700,000	655,000	297,000	302,000	311,000	313,000
Average Annual Costs	182,700	210,000	196,500	89,100	90,600	93,300	93,900

*GREAT recommended actions
(1) At 3.20.
(2) Berming at 3.34.

DREDGED MATERIAL PLACEMENT SITE

POOL:3

EXISTING CONDITIONS DESCRIPTION

CUT:4

SITE:3.46

SITE: 3.46

Page 1 of 3

CUT LOCATION: 804.2 - 806.1 (Big River)

PLACEMENT SITE LOCATION: RM 813.02 RB

TYPE OF PLACEMENT SITE: Permanent x Temporary

ELEVATIONS AT SITE:

Site (1980): 685'
100-year flood: 693'
5-year flood: 685.5'
Flat pool: 675'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: Partial

SITE CHARACTER:

% Upland: 100
% Wetland: 0
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: adjacent
Wetland: adjacent
Residence: less than 300'
Beneficial Use Site: 0'
Other: Site is adjacent to marina inlet

VEGETATION CHARACTER: Agricultural land

SITE OWNER: Private

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other: None

EXISTING USE OF SITE:

Fish and Wildlife: Shore birds, waterfowl feeding area, some use by small furbearers
Socioeconomic: Agricultural land

Adjacent land use: Rail line, navigation channel, backwater, agricultural land.

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 3
CUT: 4
SITE: 3.46

Page 2 of 3

SITE: 3.46

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 175,000
Area at base (acres): 11
Height (feet): 12
Length (feet): 1,050
Width (feet): 450
Side slope (ratio): 4:1
Final elevation (feet): 697

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 12/40
Volume dredged per job (cubic yards): 34,600
Beneficial use demand (cubic yards): 2,420,000
Beneficial Use by: Hastings, Dakota Co.
Other cuts using sites: 5, 6, 7, 8

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 85
Silt (%): 15
Other (%):
Contaminants: Unknown
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): Yes
Hydraulic (in slurry): Yes, for rehandling at site only.

EROSION CONTROL NEEDED:

Riprap: Yes
Revegetation: None
Other: None
Areas and features protected by erosion control: Adjacent wetlands and downstream riprap.

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 3
CU: 4
SITE: 3.46

Page 3 of 3

SITE: 3.46

SPECIAL CONDITIONS FOR SITE USE:

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	None	
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	11	Agricultural
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS

PER DREDGING JOB

POOL: 3
CUT: 4
SITE: 3.46

Frequency: 30 %
12 /40 yrs
Volume per job: 34,600 cy

	TYPES OF DREDGES					
	PIPELINE	MECHANICAL				
		20 inch	16 inch	12 inch	Backhoe 350 H.P.	Clamshell 700 H.P.
Basic Dredging Operation	\$ 610,000*	\$ 579,000*	\$ -	\$ -	\$ 192,000*	\$ 235,000*
Berming Costs	8,000*	11,000*	-	-	-	-
Diking Costs	-	-	-	-	-	-
Riprapping Costs	18,000	18,000	-	-	18,000	18,000
Seasonal Removal	76,000	76,000	-	-	76,000	76,000
Special Construction	-	-	-	-	-	-
Land Acquisition	24,000	24,000	24,000	24,000	24,000	24,000
Total of GREAT recommended Actions	618,000	590,000	-	-	192,000	235,000
Average Annual Costs	185,400	177,000	-	-	57,600	70,500

*GREAT recommended actions

DREDGED MATERIAL PLACEMENT SITE

POOL: 3

EXISTING CONDITIONS DESCRIPTION

CUT: 5

SITE: 3.27

SITE: 3.27

Page 1 of 3

CUT LOCATION: 807.0 - 808.6 (4 Mile Island and Truedale Slough)

PLACEMENT SITE LOCATION: RM 808.4

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 714'
100-year flood: 690.5'
5-year flood: 683'
Flat pool: 674.8'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes (of Dry Run Slough)
Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 0
% Wetland: 100
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: less than 500'
Wetland: 0
Residence: More than 500'
Beneficial Use Site: 0
Other:

VEGETATION CHARACTER: Bottomland hardwoods

SITE OWNER: Private

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other: None

EXISTING USE OF SITE:

Fish and Wildlife: Fish spawning grounds, waterfowl nesting, furbearers

Socioeconomic: None

Adjacent land use: Railroad tracks, state highway, navigation channel

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 3
CUT: 5
SITE: 3.27

Page 2 of 3

SITE: 3.27

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards):	500,000
Area at base (acres):	31
Height (feet):	10
Length (feet):	2,300
Width (feet):	600
Side slope (ratio):	4:1
Final elevation (feet):	724

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 12/40
Volume dredged per job (cubic yards): 49,200
Beneficial use demand (cubic yards): 254,000
Beneficial Use by: Oak Grove Township, Pierce County
Other cuts using sites: 4, 6

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100
Silt (%):
Other (%):
Contaminants: Noen
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): X

EROSION CONTROL NEEDED:

Riprap: Yes (along creek bed)
Revegetation: None
Other: None
Areas and features protected by erosion control: Downstream riprap
and wing dams.

DREDGED MATERIAL PLACEMENT SITE

POOL: 3

CUT: 5

SITE DEVELOPMENT DESCRIPTION AND IMPACTS

SITE: 3.27

(Continued from previous page)

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SITE: 3.27

SPECIAL CONDITIONS FOR SITE USE:
for site to be viable.

Additional beneficial use must be identified

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	30	1
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	None	
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

Four Mile Island - Truedale Slough

POOL: 3

CUT: 5

SITE: 3.27

Frequency: 30 %

12/40 yrs

Volume per job: 49,200cy

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

	TYPES OF DREDGES						
	PIPELINE 20 inch	16 inch	12 inch	MECHANICAL			
				Backhoe 350 H.P.	700 H.P.	Clamshell 350 H.P. 700 H.P.	
Basic Dredging Operation	\$499,000*	\$439,000*	\$ -	\$254,000*	\$273,000*	\$316,000*	\$316,000*
Berming Costs	10,000*	13,000*	-	10,000*	10,000*	10,000*	10,000*
Diking Costs	9,000	8,000	-	-	-	-	-
Riprapping Costs	0	0	0	0	0	0	0
Seasonal Removal	0	0	0	0	0	0	0
Special Construction	0	0	0	0	0	0	0
Land Acquisition	41,000	41,000	41,000	41,000	41,000	41,000	41,000
Total of GREAT recommended Actions	509,000	452,000	-	264,000	283,000	326,000	326,000
Average Annual Costs	152,700	135,600	-	79,200	84,900	97,800	97,800

*GREAT recommended actions

DREDGED MATERIAL PLACEMENT SITE

POOL: 3

EXISTING CONDITIONS DESCRIPTION

CUT: 5

SITE: 3.09

SITE: 3.09

Page 1 of 3

CUT LOCATION: 807.0 - 808.6 (4 Mile Island + Truedale Slough)

PLACEMENT SITE LOCATION: RM 799.6

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 704'

100-year flood: 687.5'

5-year flood: 680.6'

Flat pool: 674.2'

FLOOD STAGE FACTORS:

Site within floodplain: No

Site within floodway (effective flow area): No

Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 0

% Wetland: 100

% Open water: 0

DISTANCE FROM SITE TO:

Open Water: 100'

Wetland: 0

Residence: 500'

Beneficial Use Site: 0

Other: 1,000 ft. to Diamond Bluff, WI., 100 ft. from Backwater Slough

VEGETATION CHARACTER: bottomland hardwoods

SITE OWNER: Private

SPECIAL CONCERNS:

Endangered species habitat: None

Historical or archeological value: Unknown

Other: None

EXISTING USE OF SITE:

Fish and Wildlife: Waterfowl nesting, furbearers, upland
game habitat

Socioeconomic: potential development

Adjacent land use: Roadways, woods, railroads, backwater slough

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 3
CUT: 5
SITE: 3.09

Page 2 of 3

SITE: 3.09

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 1,330,000
Area at base (acres): 35
Height (feet): 25
Length (feet): 1325
Width (feet): 1150
Side slope (ratio): 4:1
Final elevation (feet): 729

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 12/40
Volume dredged per job (cubic yards): 49,200
Beneficial use demand (cubic yards): 258,000
Beneficial Use by: Diamond Bluff, Pierce County
Other cuts using sites: 1, 2, 3, 4, 6

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100
Silt (%):
Other (%):
Contaminants: None
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): X

EROSION CONTROL NEEDED:

Riprap: None
Revegetation: None
Other: None
Areas and features protected by erosion control: N/A

DREDGED MATERIAL PLACEMENT SITE

POOL: 3

CUT: 5

SITE DEVELOPMENT DESCRIPTION AND IMPACTS

SITE: 3.09

(Continued from previous page)

Page 3 of 3

SITE: 3.09

SPECIAL CONDITIONS FOR SITE USE: Access site must be developed for hydraulic and mechanical placement methods.

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	35	1
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	None	
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

Four Mile Island - Truedale Slough

CHANNEL MAINTENANCE PLAN COSTS

PER DREDGING JOB

POOL: 3

CUT: 5

SITE: 3.09

Frequency: 30%

12/40 yrs

Volume per job: 49,000 cy

TYPES OF DREDGES

PIPELINE	MECHANICAL			
	20 inch	16 inch	12 inch	Backhoe 350 H.P.
				350 H.P.
				700 H.P.
				Clamshell 700 H.P.

Basic Dredging Operation

\$929,000* \$866,000* \$842,000* \$330,000* \$364,000* \$393,000* \$380,000*

Berming Costs ^{1/}

11,000* 19,000* 18,000* - - - -

Diking Costs ^{1/}

9,000 8,000 8,000 - - - -

Riprapping Costs

0 0 0 0 0 0 0

Seasonal Removal

0 0 0 0 0 0 0

Special Construction ^{2/}

18,000* 18,000* 18,000* 18,000* 18,000* 18,000* 18,000*

Land Acquisition

51,000 51,000 51,000 51,000 51,000 51,000 51,000

Total of GREAT

recommended Actions

958,000 903,000 878,000 348,000 382,000 411,000 398,000

Average Annual Costs

287,400 270,900 263,400 104,400 114,600 123,300 119,400

*GREAT recommended actions

^{1/} At 3.40

^{2/} Berming at 3.09

DREDGED MATERIAL PLACEMENT SITE

POOL: 3

CUT: 5

EXISTING CONDITIONS DESCRIPTION

SITE: 3.34

SITE: 3.34

Page 1 of 3

CUT LOCATION: 807.0 - 808.6 (4 Mile Island + Truedale Slough)

PLACEMENT SITE LOCATION: RM 812

TYPE OF PLACEMENT SITE: Permanent X Temporary

ELEVATIONS AT SITE:

Site (1980): 705'

100-year flood: 692'

5-year flood: 685'

Flat pool: 675'

FLOOD STAGE FACTORS:

Site within floodplain: No

Site within floodway (effective flow area): No

Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 60

% Wetland: 40

% Open water: 0

DISTANCE FROM SITE TO:

Open Water: less than 200'

Wetland: 0'

Residence: less than 300'

Beneficial Use Site: 0'

Other: Site is adjacent to rail line

VEGETATION CHARACTER: bottomland hardwoods, and aquatic vegetation

SITE OWNER: Public

SPECIAL CONCERNS:

Endangered species habitat: None

Historical or archeological value: Unknown

Other: None

EXISTING USE OF SITE:

Fish and Wildlife: fish, furbearers, waterfowl

Socioeconomic: None

Adjacent land use: Rail line, navigation channel, state highway

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 3
CUT: 5
SITE: 3.34

Page 2 of 3

SITE: 3.34

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 400,000
Area at base (acres): 10
Height (feet): 25
Length (feet): 1900
Width (feet): 225
Side slope (ratio): 4:1
Final elevation (feet): 730

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 12/40
Volume dredged per job (cubic yards): 49,200
Beneficial use demand (cubic yards): 240,000
Beneficial Use by: Washington County
Other cuts using sites: 4, 6, 7, 8

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100
Silt (%):
Other (%):
Contaminants: None
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): Yes
Hydraulic (in slurry): Yes, for rehandling at site only.

EROSION CONTROL NEEDED:

Riprap: None
Revegetation: None
Other: Site is not subject to direct flood flows
Areas and features protected by erosion control: N/A

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 3
CUT: 5
SITE: 3.34

Page 3 of 3

SITE: 3.34

SPECIAL CONDITIONS FOR SITE USE: requires special construction to deliver material to site.

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	4	4 and 5
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	None	
Endangered Species habitat lost:	6	Woodland
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

Four Mile Island - Truedale Slough

CHANNEL MAINTENANCE PLAN COSTS

PER DREDGING JOB

POOL: 3

CUT: 5

SITE: 3.34

Frequency: 30%

12/40 yrs

Volume per job: 49,200 cy

PIPELINE	TYPES OF DREDGES				
	20 inch	16 inch	12 inch	MECHANICAL	
				Backhoe 350 H.P.	Clamshell 700 H.P.

Basic Dredging Operation

\$1,020,000* \$956,000* \$933,000* \$385,000* \$376,000* \$415,000* \$427,000*

Berming Costs^{1/}

11,000* 15,000* 18,000* - - -

Diking Costs^{1/}

9,000 8,000 8,000 - - -

Riprapping Costs

0 0 0 0 0 0 0

Seasonal Removal

0 0 0 0 0 0 0

Special Construction^{2/}

18,000* 18,000* 18,000* 18,000* 18,000* 18,000* 18,000*

Land Acquisition

0 0 0 0 0 0 0

Total of GREAT

recommended Actions

1,049,000 989,000 969,000 403,000 394,000 433,000 445,000

Average Annual Costs

314,700 296,700 290,700 120,900 118,200 129,900 133,500

*GREAT recommended actions

^{1/} At 3.28

^{2/} Berming at 3.34

DREDGED MATERIAL PLACEMENT SITE

POOL:3

EXISTING CONDITIONS DESCRIPTION

CUT:5

SITE:3.46

SITE: 3.46

Page 1 of 3

CUT LOCATION: 807.0 - 808.6 (4 Mile Island and Truedale Slough)

PLACEMENT SITE LOCATION: RM 813.02 RB

TYPE OF PLACEMENT SITE: Permanent X Temporary

ELEVATIONS AT SITE:

Site (1980): 685'
100-year flood: 693'
5-year flood: 685.5'
Flat pool: 675'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: Partial

SITE CHARACTER:

% Upland: 100
% Wetland: 0
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: adjacent
Wetland: adjacent
Residence: less than 300'
Beneficial Use Site: 0'
Other: Site is adjacent to marina inlet

VEGETATION CHARACTER: Agricultural land.

SITE OWNER: Private

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other: None

EXISTING USE OF SITE:

Fish and Wildlife: Shorebirds, waterfowl feeding area, some use by small furbearers.
Socioeconomic: Agricultural land
Adjacent land use: Rail line, navigation channel, backwater, agricultural land.

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 3

CUT: 5

SITE: 3.46

Page 2 of 3

SITE: 3.46

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 175,000
Area at base (acres): 11
Height (feet): 12
Length (feet): 1,050
Width (feet): 450
Side slope (ratio): 4:1
Final elevation (feet): 697

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 12/40
Volume dredged per job (cubic yards): 49,200
Beneficial use demand (cubic yards): 2,420,000
Beneficial Use by: Hastings, Dakota Co.
Other cuts using sites: 4, 6, 7, 8

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 85
Silt (%): 15
Other (%):
Contaminants: Unknown
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): Yes
Hydraulic (in slurry): Yes, for rehandling at site only.

EROSION CONTROL NEEDED:

Riprap: Yes
Revegetation: None
Other: None
Areas and features protected by erosion control: Adjacent wetlands and downstream riprap.

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 3
CUT: 5
SITE: 3.46

Page 3 of 3

SITE: 3.46

SPECIAL CONDITIONS FOR SITE USE:

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	None	
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	11	Agricultural land
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS

PER DREDGING JOB

POOL: 3
CUT: 5
SITE: 3.46

Frequency: 30%
12/40 yrs
Volume per job: 49,200 cy

PIPELINE	TYPES OF DREDGES			
	16 inch	12 inch	MECHANICAL	
20 inch			Backhoe 350 H.P.	Clamshell 700 H.P.

Basic Dredging Operation	\$ 784,000*	\$ 712,000*	\$ 668,000*	\$ 255,000*	\$ 260,000*	\$ 284,000*	\$ 297,000*
Berming Costs	10,000*	12,000*	14,000*	-	-	-	-
Diking Costs	-	-	-	-	-	-	-
Riprapping Costs	18,000	18,000	18,000	18,000	18,000	18,000	18,000
Seasonal Removal	76,000	76,000	76,000	76,000	76,000	76,000	76,000
Special Construction	-	-	-	-	-	-	-
Land Acquisition	24,000	24,000	24,000	24,000	24,000	24,000	24,000
Total of GREAT recommended Actions	794,000	724,00	682,000	255,000	260,000	284,000	297,000
Average Annual Costs	238,000	217,200	204,600	76,500	78,000	85,200	89,100

*GREAT recommended actions

DREDGED MATERIAL PLACEMENT SITE

POOL: 3

EXISTING CONDITIONS DESCRIPTION

CUT: 6

SITE: 3.27

SITE: 3.27

Page 1 of 3

CUT LOCATION: 809.5 - 809.8 (Pine Coulee)

PLACEMENT SITE LOCATION: RM 808.4 LB

TYPE OF PLACEMENT SITE: Permanent X Temporary

ELEVATIONS AT SITE:

Site (1980): 714'

100-year flood: 690.5'

5-year flood: 683'

Flat pool: 674.8'

FLOOD STAGE FACTORS:

Site within floodplain: Yes

Site within floodway (effective flow area): Yes (of Dry Run Slough)

Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 0

% Wetland: 100

% Open water: 0

DISTANCE FROM SITE TO:

Open Water: less than 500'

Wetland: 0

Residence: More than 500'

Beneficial Use Site: 0

Other:

VEGETATION CHARACTER: bottomland hardwoods

SITE OWNER: Private

SPECIAL CONCERNS:

Endangered species habitat: None

Historical or archeological value: Unknown

Other: None

EXISTING USE OF SITE:

Fish and Wildlife: Fish spawning grounds, waterfowl nesting, furbearers

Socioeconomic: None

Adjacent land use: Railroad tracks, state highway, navigation channel

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 3

CUT: 6

SITE: 3.27

Page 2 of 3

SITE: 3.27

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 500,000

Area at base (acres): 31

Height (feet): 10

Length (feet): 2,300

Width (feet): 600

Side slope (ratio): 4:1

Final elevation (feet): 724

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 4/40

Volume dredged per job (cubic yards): 36,800

Beneficial use demand (cubic yards): 254,000

Beneficial Use by: Oak Grove Township, Pierce

Other cuts using sites: 4,5,6 County

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100

Silt (%):

Other (%):

Contaminants: None

Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X

Hydraulic (in slurry): X

EROSION CONTROL NEEDED:

Riprap: Yes (along creek bed)

Revegetation: None

Other: None

Areas and features protected by erosion control: downstream riprap and
wing dams

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 3
CUT: 6
SITE: 3.27

Page 3 of 3

SITE: 3.27

SPECIAL CONDITIONS FOR SITE USE: Additional beneficial use must be identified for site to be viable.

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	30	1
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	None	
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

Pine Coulee
POOL: 3
CUT: 6
SITE: 3.27

Frequency: 10 %
4/40 yrs
Volume per job: 36,800 cy

TYPES OF DREDGES

PIPELINE	MECHANICAL				
	20 inch	16 inch	12 inch	Backhoe 350 H.P.	Clamshell 700 H.P.

Basic Dredging Operation	\$ 395,000*	\$ 342,000*	\$ 378,000*	\$ 196,000*	\$ 226,000*
Berming Costs	8,000*	11,000*	5,000*	-	-
Diking Costs	8,000	7,000	6,000	-	-
Riprapping Costs	0	0	0	0	0
Seasonal Removal	0	0	0	0	0
Special Construction (1)	0	0	5,000*	0	0
Land Acquisition	41,000*	41,000*	41,000*	41,000*	41,000*
Total of GREAT recommended Actions	444,000	394,000	429,000	237,000	267,000
Average Annual Costs	44,400	39,400	42,900	23,700	26,700

*GREAT recommended actions
(1) Berming at 3.30.

DREDGED MATERIAL PLACEMENT SITE

POOL: 3

EXISTING CONDITIONS DESCRIPTION

CUT: 6

SITE: 3.09

SITE: 3.09

Page 1 of 3

CUT LOCATION: 809.5 - 809.8 (Pine Coulee)

PLACEMENT SITE LOCATION: RM 799.6 LB

TYPE OF PLACEMENT SITE: Permanent X Temporary

ELEVATIONS AT SITE:

Site (1980): 704'

100-year flood: 687.5'

5-year flood: 680.6'

Flat pool: 674.2'

FLOOD STAGE FACTORS:

Site within floodplain: No

Site within floodway (effective flow area): No

Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 0

% Wetland: 100

% Open water: 0

DISTANCE FROM SITE TO:

Open Water: 100'

Wetland: 0

Residence: 500'

Beneficial Use Site: 0

Other: 1,000 ft. to Diamond Bluff, WI., 100 ft. from Backwater Slough

VEGETATION CHARACTER: bottomland hardwoods

SITE OWNER: Private

SPECIAL CONCERNS:

Endangered species habitat: None

Historical or archeological value: Unknown

Other: None

EXISTING USE OF SITE:

Fish and Wildlife: waterfowl nesting, furbearers, upland game habitat

Socioeconomic: development potential

Adjacent land use: Roadways, woods, railroads, back-water slough

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 3
CUT: 6
SITE: 3.09

Page 2 of 3

SITE: 3.09

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 1,330,000
Area at base (acres): 35
Height (feet): 25
Length (feet): 1325
Width (feet): 1150
Side slope (ratio): 4:1
Final elevation (feet): 729

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 4/40
Volume dredged per job (cubic yards): 36,800
Beneficial use demand (cubic yards): 258,000
Beneficial Use by: Diamond Bluff, Pierce County
Other cuts using sites: 1,2,3,4,5,6

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100
Silt (%):
Other (%):
Contaminants: None
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): X (for rehandling at site only)

EROSION CONTROL NEEDED:

Riprap: None
Revegetation: None
Other: None
Areas and features protected by erosion control: N/A

DREDGED MATERIAL PLACEMENT SITE

POOL: 3

CUT: 6

SITE DEVELOPMENT DESCRIPTION AND IMPACTS

SITE: 3.09

(Continued from previous page)

Page 3 of 3

SITE: 3.09

SPECIAL CONDITIONS FOR SITE USE: Access site must be developed for hydraulic and mechanical placement methods.

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	35	1
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	None	
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☒
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

Pine Coulee

POOL: 3

CUT: 6

SITE: 3.09

Frequency: 10%

4/10 yrs

Volume per job: 36,800 cy

CHANNEL MAINTENANCE PLAN COSTS PER DREDGING JOB

TYPES OF DREDGES				
PIPELINE	MECHANICAL			
20 inch	16 inch	12 inch	Backhoe 350 H.P.	Clamshell 350 H.P. 700 H.P.

Basic Dredging Operation

\$506,000* \$ 512,000* \$488,000* \$ 267,000* \$272,000* \$ 285,000* \$298,000*

Berming Costs 1/

4,000* 5,000* 5,000* - - -

Diking Costs 1/

8,000 7,000 6,000 - - -

Riprapping Costs

0 0 0 0 0 0 0

Seasonal Removal

0 0 0 0 0 0 0

Special Construction 2/

5,000* 5,000* 5,000* 5,000* 5,000* 5,000* 5,000*

Land Acquisition

51,000* 51,000* 51,000* 51,000* 51,000* 51,000* 51,000*

Total of GREAT

recommended Actions

566,000 573,000 549,000 323,000 328,000 341,000 354,000

Average Annual Costs

56,600 57,300 54,900 32,300 32,800 34,100 35,400

*GREAT recommended actions

1/ At 3.30

2/ Berming at 3.09

DREDGED MATERIAL PLACEMENT SITE

POOL: 3

EXISTING CONDITIONS DESCRIPTION

CUT: 6

SITE: 3.34

SITE: 3.34

Page 1 of 3

CUT LOCATION: 809.5 - 809.8 (Pine Coulee)

PLACEMENT SITE LOCATION: RM 812 LB

TYPE OF PLACEMENT SITE: Permanent ☒ Temporary ☐

ELEVATIONS AT SITE:

Site (1980): 705'
100-year flood: 692'
5-year flood: 685'
Flat pool: 675'

FLOOD STAGE FACTORS:

Site within floodplain: No
Site within floodway (effective flow area): No
Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 60
% Wetland: 40
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: less than 200'
Wetland: 0
Residence: less than 300'
Beneficial Use Site: 0'
Other: Site is adjacent to rail line

VEGETATION CHARACTER: bottomland hardwoods and aquatic vegetation

SITE OWNER: Public

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other: None

EXISTING USE OF SITE:

Fish and Wildlife: fish, furbearers, waterfowl
Socioeconomic: potential highway development
Adjacent land use: Rail line, navigation channel, state highway

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 3
CUT: 6
SITE: 3.34

Page 2 of 3

SITE: 3.34

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 400,000
Area at base (acres): 10
Height (feet): 25
Length (feet): 1900
Width (feet): 225
Side slope (ratio): 4:1
Final elevation (feet): 730

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 4/40
Volume dredged per job (cubic yards): 36,800
Beneficial use demand (cubic yards): 240,000
Beneficial Use by: Washington County
Other cuts using sites: 4,5,6,7,8

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100
Silt (%):
Other (%):
Contaminants: None
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): Yes
Hydraulic (in slurry): Yes, for rehandling at site only.

EROSION CONTROL NEEDED:

Riprap: None
Revegetation: None
Other: Site is not subject to direct flood flows
Areas and features protected by erosion control: N/A

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 3
CUT: 6
SITE: 3.34

Page 3 of 3

SITE: 3.34

SPECIAL CONDITIONS FOR SITE USE: Requires special construction to deliver material to site.

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	4	4 and 5
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	6	woodland
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

Pine Coulee

POOL: 3

CUT: 6

SITE: 3.34

Frequency: 10%

4/40 yrs

Volume per job: 36,800 cy

CHANNEL MAINTENANCE PLAN COSTS PER DREDGING JOB

TYPES OF DREDGES				
PIPELINE	MECHANICAL			
20 inch	16 inch	12 inch	Backhoe 350 H.P.	Clamshell 350 H.P. 700 H.P.

Basic Dredging Operation	\$518,000*	\$524,000*	\$500,000*	\$269,000*	\$271,000*	\$256,000*	\$302,000*
Berming Costs ^{1/}	4,000*	5,000*	5,000*	-	-	-	-
Diking Costs ^{1/}	8,000	7,000	6,000	-	-	-	-
Riprapping Costs	0	0	0	0	0	0	0
Seasonal Removal	0	0	0	0	0	0	0
Special Construction ^{2/}	5,000*	5,000*	5,000*	5,000*	5,000*	5,000*	5,000*
Land Acquisition	0	0	0	0	0	0	0

Total of GREAT recommended Actions	527,000	534,000	510,000	274,000	276,000	261,000	307,000
Average Annual Costs	52,700	53,400	51,000	27,400	27,600	26,100	30,700

*GREAT recommended actions

^{1/} At 3.30

^{2/} Berming at 3.34

DREDGED MATERIAL PLACEMENT SITE

POOL: 3
CUT: 6
SITE: 3.46

EXISTING CONDITIONS DESCRIPTION

SITE: 3.46

Page 1 of 3

CUT LOCATION: 809.5 - 809.8 (Pine Coulee)

PLACEMENT SITE LOCATION: RM 808.4 LB

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 685'
100-year flood: 693'
5-year flood: 685.5'
Flat pool: 675'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: Partial

SITE CHARACTER:

% Upland: 100
% Wetland: 0
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: Adjacent
Wetland: Adjacent
Residence: less than 300'
Beneficial Use Site: 0'
Other: Site is adjacent to marina inlet.

VEGETATION CHARACTER: Agricultural land.

SITE OWNER: Private

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other: None

EXISTING USE OF SITE:

Fish and Wildlife: Shore birds, waterfowl feeding area, some use by small furbearers.

Socioeconomic: Agricultural land

Adjacent land use: Rail line, navigation channel, backwater, agricultural land.

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 3
CUT: 6
SITE: 3.46

Page 2 of 3

SITE: 3.46

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards):	175,000
Area at base (acres):	11
Height (feet):	12
Length (feet):	1,050
Width (feet):	450
Side slope (ratio):	4:1
Final elevation (feet):	697

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged:	4/40
Volume dredged per job (cubic yards):	36,800
Beneficial use demand (cubic yards):	2,420,000
Beneficial Use by:	Hastings, Dakota Co.
Other cuts using sites:	4, 5, 7, 8

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 85
Silt (%): 15
Other (%):
Contaminants: No Analysis Done
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): Yes
Hydraulic (in slurry): Yes, for rehandling at site only.

EROSION CONTROL NEEDED:

Riprap: Yes
Revegetation: None
Other: None
Areas and features protected by erosion control: Adjacent wetlands and downstream riprap.

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 3
CUT: 6
SITE: 3.46

Page 3 of 3

SITE: 3.46

SPECIAL CONDITIONS FOR SITE USE:

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	None	
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	11	Agricultural land
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

POOL: 3
CUT: 6
SITE: 3.46

Frequency: 10%
4/40 yrs
Volume per job: 36,800 cy

	TYPES OF DREDGES					
	PIPELINE			MECHANICAL		
	20 inch	16 inch	12 inch	Backhoe 350 H.P.	700 H.P.	Clamshell 350 H.P. 700 H.P.
Basic Dredging Operation	\$ 315,000*	\$327,000*	\$ 306,000*	\$ 168,000*	\$ 172,000*	\$200,000* \$196,000*
Berming Costs	4,000*	6,000*	6,000*	-	-	-
Diking Costs	-	-	-	-	-	-
Riprapping Costs	18,000	18,000	18,000	18,000	18,000	18,000
Seasonal Removal	76,000	76,000	76,000	76,000	76,000	76,000
Special Construction	-	-	-	-	-	-
Land Acquisition	24,000	24,000	24,000	24,000	24,000	24,000
Total of GREAT recommended Actions	319,000	333,000	312,000	168,000	172,000	200,000 196,000
Average Annual Costs	31,900	33,000	31,200	16,800	17,200	20,000 19,600

*GREAT recommended actions

DREDGED MATERIAL PLACEMENT SITE

EXISTING CONDITIONS DESCRIPTION

POOL:3
CUT:7
SITE:3.34

SITE: 3.34

Page 1 of 3

CUT LOCATION: 810.3 - 811.7 (Prescott)

PLACEMENT SITE LOCATION: RM 812 LB

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 705'
100-year flood: 692'
5-year flood: 685'
Flat pool: 675'

FLOOD STAGE FACTORS:

Site within floodplain: No
Site within floodway (effective flow area): No
Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 60
% Wetland: 40
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: less than 200'
Wetland: 0'
Residence: less than 300'
Beneficial Use Site: 0'
Other: Site is adjacent to rail line

VEGETATION CHARACTER: Bottomland hardwoods, and aquatic vegetation

SITE OWNER: Public

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other: None

EXISTING USE OF SITE:

Fish and Wildlife: Fish, furbearers, waterfowl

Socioeconomic: None

Adjacent land use: Rail line, navigation channel, state highway

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 3
CUT: 7
SITE: 3.34

Page 2 of 3

SITE: 3.34

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 400,000
Area at base (acres): 10
Height (feet): 25
Length (feet): 1,900
Width (feet): 225
Side slope (ratio): 4:1
Final elevation (feet): 730

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 12/40
Volume dredged per job (cubic yards): 26,800
Beneficial use demand (cubic yards): 240,000
Beneficial Use by: Washington County
Other cuts using sites: 4, 5, 6, 8

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100
Silt (%):
Other (%):
Contaminants: None
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): Yes
Hydraulic (in slurry): Yes

EROSION CONTROL NEEDED:

Riprap: None
Revegetation: None
Other: Site is not subject to direct flood flows
Areas and features protected by erosion control: N/A

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 3
CUT: 7
SITE: 3.34

Page 3 of 3

SITE: 3.34

SPECIAL CONDITIONS FOR SITE USE: Requires special construction to deliver
material to site

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	4	4 and 5
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	6	wooded
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

Prescott
POOL: 3
CUT: 7
SITE: 3.34

Frequency: 30 %
12/40 yrs
Volume per job: 26,800 cy

	TYPES OF DREDGES					
	PIPELINE			MECHANICAL		
	20 inch	16 inch	12 inch	Backhoe 350 H.P.	700 H.P.	Clamshell 350 H.P. 700 H.P.
Basic Dredging Operation	\$ 420,000*	\$ -	\$ -	\$ 173,000*	\$ 184,000*	\$ 199,000*
Berming Costs (1)	9,000	-	-	-	-	-
Diking Costs (1)	7,000	-	-	-	-	-
Riprapping Costs	0	0	0	0	0	0
Seasonal Removal	0	0	0	0	0	0
Special Construction (2)	0	0	0	8,000*	8,000*	8,000*
Land Acquisition	0	0	0	0	0	0
Total of GREAT recommended Actions	420,000	-	-	181,000	192,000	207,000
Average Annual Costs	126,000	-	-	54,300	57,600	62,100

*GREAT recommended actions
(1) At 3.33.
(2) Berming at 3.34.

DREDGED MATERIAL PLACEMENT SITE

POOL: 3

EXISTING CONDITIONS DESCRIPTION

CUT: 7

SITE: 3.46

SITE: 3.46

Page 1 of 3

CUT LOCATION: 810.3 - 811.7 (Prescott)

PLACEMENT SITE LOCATION: RM 813.2 RB

TYPE OF PLACEMENT SITE: Permanent ☒ Temporary ☐

ELEVATIONS AT SITE:

Site (1980): 685'
100-year flood: 693'
5-year flood: 685.5'
Flat pool: 675'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: Partial

SITE CHARACTER:

% Upland: 100
% Wetland: 0
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: adjacent
Wetland: adjacent
Residence: less than 300'
Beneficial Use Site: 0'
Other: Site is adjacent to marina inlet

VEGETATION CHARACTER: Agricultural land

SITE OWNER: Private

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other: None

EXISTING USE OF SITE:

Fish and Wildlife: Shore birds, waterfowl feeding area, some use by small furbearers

Socioeconomic: Agricultural land

Adjacent land use: Rail line, navigation channel, backwater, agricultural land.

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 3
CUT: 7
SITE: 3.46

Page 2 of 3

SITE: 3.46

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards):	175,000
Area at base (acres):	11
Height (feet):	12
Length (feet):	1,050
Width (feet):	450
Side slope (ratio):	4:1
Final elevation (feet):	697

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged:	12/40
Volume dredged per job (cubic yards):	26,800
Beneficial use demand (cubic yards):	2,420,000
Beneficial Use by:	Hastings, Dakota Co.
Other cuts using sites:	4, 5, 6, 8

DREDGED MATERIAL CHARACTERISTICS:

Sand (%):	85
Silt (%):	15
Other (%):	
Contaminants:	Unknown
Contaminant Source:	

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry):	Yes
Hydraulic (in slurry):	Yes, for rehandling at site only

EROSION CONTROL NEEDED:

Riprap:	Yes
Revegetation:	None
Other:	None
Areas and features protected by erosion control:	Adjacent wetlands and downstream riprap.

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 3
CUT: 7
SITE: 3.46

Page 3 of 3

SITE: 3.46

SPECIAL CONDITIONS FOR SITE USE:

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	None	
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	11	Agricultural
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:		

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

Prescott
POOL: 3
CUT: 7
SITE: 3.46

Frequency: 30 %
12/40 yrs
Volume per job: 26,800 cy

	TYPES OF DREDGES					
	PIPELINE 20 inch	16 inch	12 inch	MECHANICAL		
				Backhoe 350 H.P.	350 H.P.	Clamshell 700 H.P.
Basic Dredging Operation	\$ 310,000*	\$ 409,000*	\$ 369,000*	\$ 127,000*	\$ 136,000*	\$ 145,000*
Berming Costs (1)	6,000*	9,000*	10,000*	-	-	-
Diking Costs (1)	7,000	7,000	5,000	-	-	-
Riprapping Costs	128,000	128,000	128,000	128,000	128,000	128,000
Seasonal Removal	59,000	59,000	59,000	59,000	59,000	59,000
Special Construction	0	0	0	0	0	0
Land Acquisition	24,000	24,000	24,000	24,000	24,000	24,000
Total of GREAT recommended Actions	316,000	418,000	379,000	127,000	136,000	145,000
Average Annual Costs	94,800	125,400	113,700	38,100	40,800	43,500
						47,700

*GREAT recommended actions
(1) At 3.33.

DREDGED MATERIAL PLACEMENT SITE

POOL: 3

EXISTING CONDITIONS DESCRIPTION

CUT: 8

SITE: 3.46

SITE: 3.46

Page 1 of 3

CUT LOCATION: 813.0 - 815.5 (Vermillion River)

PLACEMENT SITE LOCATION: RM 813.2 RB

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 685'
100-year flood: 693'
5-year flood: 685.5'
Flat pool: 675'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: Partial

SITE CHARACTER:

% Upland: 100
% Wetland: 0
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: Adjacent
Wetland: Adjacent
Residence: less than 300'
Beneficial Use Site: 0'
Other: Site is adjacent to marina inlet.

VEGETATION CHARACTER: Agricultural land

SITE OWNER: Private

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other: None

EXISTING USE OF SITE:

Fish and Wildlife: Shore birds, waterfowl feeding area, some use by small
furbearers
Socioeconomic: Agricultural land

Adjacent land use: Rail line, navigation channel, backwaters, agricultural
land.

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 3
CUT: 8
SITE: 3.46

Page 2 of 3

SITE: 3.46

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 175,000
Area at base (acres): 11
Height (feet): 12
Length (feet): 1,050
Width (feet): 450
Side slope (ratio): 4:1
Final elevation (feet): 697

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 4/40
Volume dredged per job (cubic yards): 3,000
Beneficial use demand (cubic yards): 2,420,000
Beneficial Use by: Hastings, Dakota Co
Other cuts using sites: 4, 5, 6, 7

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 85
Silt (%): 15
Other (%):
Contaminants: No Analysis Done
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): X

EROSION CONTROL NEEDED:

Riprap: Yes
Revegetation: None
Other: None
Areas and features protected by erosion control: Adjacent wetlands and
downstream riprap.

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 3
CUT: 8
SITE: 3.46

Page 3 of 3

SITE: 3.46

SPECIAL CONDITIONS FOR SITE USE:

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	None	
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	11	Agricultural
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:		

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

Vermillion River
POOL: 3
CUT: 8
SITE: 3.46

Frequency: 10%
 4/40 yrs
 Volume per job: 3,000 cy

CHANNEL MAINTENANCE PLAN COSTS P.L.R. DREDGING JOB

PIPELINE	TYPES OF DREDGES				
	20 inch	16 inch	12 inch	MECHANICAL	
				Backhoe	Clamshell
				350 H.P.	700 H.P. 350 H.P. 700 H.P.

Basic Dredging Operation	\$ 51,000*	\$ 49,000*	\$ 34,000*	\$ 25,000*	\$ 28,000*	\$ 29,000*	\$ 31,000*
Berming Costs	2,000*	2,000*	2,000*	-	-	-	-
Diking Costs	8,000	7,000	6,000	-	-	-	-
Riprapping Costs	128,000	128,000	128,000	128,000	128,000	128,000	128,000
Seasonal Removal	7,000	7,000	7,000	7,000	7,000	7,000	7,000
Special Construction	0	0	0	0	0	0	0
Land Acquisition	24,000	24,000	24,000	24,000	24,000	24,000	24,000
Total of GREAT recommended Actions	53,000	51,000	36,000	25,000	28,000	29,000	31,000
Average Annual Costs	5,300	5,100	3,600	2,500	2,800	2,900	3,100

*GREAT recommended actions

DREDGED MATERIAL PLACEMENT SITE

POOL: 3

EXISTING CONDITIONS DESCRIPTION

CUT: 9

SITE: 3.47

SITE: 3.47

Page 1 of 3

CUT LOCATION: 8.14 - 8.15.2 (Lower Approach L/D 2)

PLACEMENT SITE LOCATION: 814.3 RB

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 676' (approx)
100-year flood 693.9'
5-year flood: 685.9'
Flat pool: 675.0'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: Yes

SITE CHARACTER:

% Upland: 100 (previously disturbed wetland)
% Wetland:
% Open water:

DISTANCE FROM SITE TO:

Open Water: Adjacent
Wetland: 1,000 ft.
Residence: 1,000 ft.
Beneficial Use Site: 0'
Other:

VEGETATION CHARACTER: Some grasses and shrubs.

SITE OWNER: City of Hastings

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other:

EXISTING USE OF SITE:

Fish and Wildlife: Shore birds, muskrats
Socioeconomic: Barge waiting area
Adjacent land use: City park, main channel.

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 3
CUT: 9
SITE: 3.47

Page 2 of 3

SITE: 3.47

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards):	10,000
Area at base (acres):	1.5
Height (feet):	12
Length (feet):	800
Width (feet):	75
Side slope (ratio):	-
Final elevation (feet):	676

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged:	6/40
Volume dredged per job (cubic yards):	10,200
Beneficial use demand (cubic yards):	2,420,000
Beneficial Use by:	City of Hastings, Dakota Co.
Other cuts using sites:	None

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100% Fine to medium
Silt (%):
Other (%):
Contaminants: Mild COD
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): Yes
Hydraulic (in slurry): Yes

EROSION CONTROL NEEDED:

Riprap: No
Revegetation: No
Other: Material removed for beneficial use periodically
Areas and features protected by erosion control: Downstream side channel opening.

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 3
CUT: 9
SITE: 3.47

Page 3 of 3

SITE: 3.47

SPECIAL CONDITIONS FOR SITE USE: Beneficial use removal required

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	0	
Wetlands altered:	0	
Open water filled:	0	
Upland altered:	1.5	Beach
Endangered Species habitat lost:	0	
Side channels blocked:	0	
Other:		

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

Lower Approach L/D 2

POOL: 3

CUT: 9

SITE: 3.47

Frequency: 15 %

6 /40 yrs

Volume per job: 10,200 cy

CHANNEL MAINTENANCE PLAN COSTS PER DREDGING JOB

TYPES OF DREDGES				
PIPELINE	MECHANICAL			
20 inch	16 inch	12 inch	Backhoe 350 H.P.	Clamshell 350 H.P. 700 H.P.

Basic Dredging Operation	\$ 77,000*	\$ 81,000*	\$ 62,000*	\$ 50,000*	\$ 56,000*	\$ 63,000*	\$ 64,000*
Berming Costs	2,000*	3,000*	3,000*	-	-	-	-
Diking Costs	11,000	7,000	3,000	-	-	-	-
Riprapping Costs	260,000	260,000	260,000	260,000	260,000	260,000	260,000
Seasonal Removal	0	0	0	0	0	0	0
Special Construction	0	0	0	0	0	0	0
Land Acquisition	0	0	0	0	0	0	0

Total of GREAT recommended Actions	79,000	84,000	65,000	50,000	56,000	63,000	64,000
Average Annual Costs	11,900	12,600	9,800	7,500	8,400	9,500	9,600

*GREAT recommended actions

DREDGED MATERIAL PLACEMENT SITE

POOL: 3
CUT: 9
SITE: 3.48

EXISTING CONDITIONS DESCRIPTION

SITE: 3.48 (Lake Rebecca Park)

Page 1 of 3

CUT LOCATION: 814.9 - 815.2 (Lower Approach L/D 2)

PLACEMENT SITE LOCATION: 814.5 RB

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 680'
100-year flood: 694.0'
5-year flood: 686.0'
Flat pool: 675.0'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): No
Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 100
% Wetland:
% Open water:

DISTANCE FROM SITE TO:

Open Water: 1,000 ft.
Wetland: adjacent
Residence: 1,000 ft.
Beneficial Use Site: 0'
Other:

VEGETATION CHARACTER: Park lawn and shrubbery

SITE OWNER: City of Hastings

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other:

EXISTING USE OF SITE:

Fish and Wildlife: Passarine birds

Socioeconomic: City park

Adjacent land use: Park land

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 3
CUT: 9
SITE: 3.48

Page 2 of 3

SITE: 3.48 (Lake Rebecca Park)

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): ? (Depends upon possible beneficial use demand
Area at base (acres): by City of Hastings.)
Height (feet):
Length (feet):
Width (feet):
Side slope (ratio):
Final elevation (feet):

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 6/40
Volume dredged per job (cubic yards): 10,200
Beneficial use demand (cubic yards): 2,420,000
Beneficial Use by: Hastings, Dakota Co.
Other cuts using sites:

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100% fine to medium
Silt (%):
Other (%):
Contaminants: Mild COD
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): X

EROSION CONTROL NEEDED:

Riprap: NO
Revegetation: NO
Other:
Areas and features protected by erosion control: N/A

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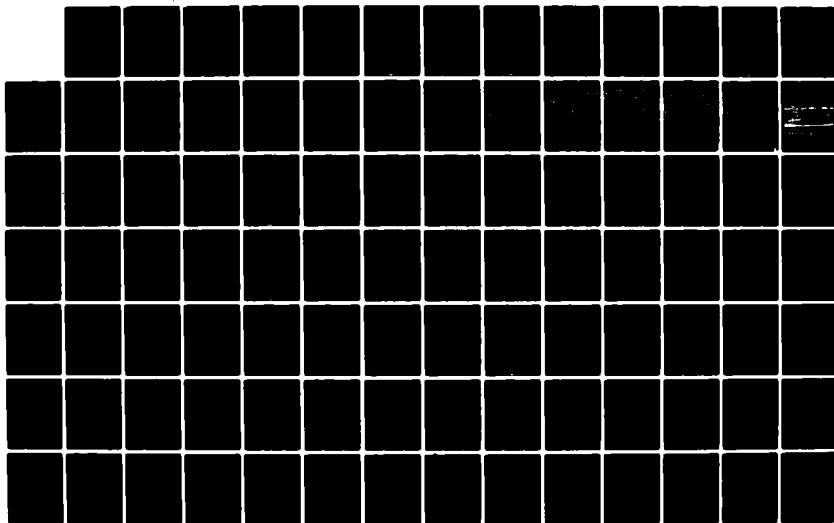
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APPENDICES VOLUME 8..(U) GREAT RIVER ENVIRONMENTAL
ACTION TEAM SEP 80

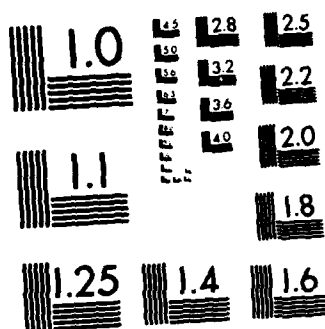
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS

(Continued from previous page)

POOL: 3

CUT: 9

SITE: 3.48

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SITE: 3.48

SPECIAL CONDITIONS FOR SITE USE: Beneficial use demand by City of Hastings
must be established.

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	0	
Wetlands altered:	0	
Open water filled:	0	
Upland altered:	?	City Park land
Endangered Species habitat lost:	0	
Side channels blocked:	0	
Other:		

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

Lower Approach L/D 2
POOL: 3
CUT: 9
SITE: 3.48

Frequency: 15 %
6 /40 yrs
Volume per job: 10,200 cy

TYPES OF DREDGES

PIPELINE		MECHANICAL	
20 inch	16 inch	12 inch	
		Backhoe	Clamshell
		350 H.P.	700 H.P.
			350 H.P. 700 H.P.

Basic Dredging Operation	\$ 92,000*	\$ 95,000*	\$ 91,000*	\$ 69,000*	\$ 78,000*	\$ 82,000*	\$ 81,000*
Berming Costs	-	-	-	-	-	-	-
Diking Costs	-	-	-	-	-	-	-
Riprapping Costs	128,000	128,000	128,000	128,000	128,000	128,000	128,000
Seasonal Removal	0	0	0	0	0	0	0
Special Construction (1)	-	-	-	-	-	-	-
Land Acquisition	0	0	0	0	0	0	0
Total of GREAT recommended Actions	92,000	95,000	91,000	69,000	78,000	82,000	81,000
Average Annual Costs	13,800	14,300	13,700	10,400	11,700	12,300	12,200

*GREAT recommended actions

(1) See site development plan for park development around Lake Rebecca

DREDGED MATERIAL PLACEMENT SITE

POOL: 3

EXISTING CONDITIONS DESCRIPTION

CUT: 9

SITE: 3.42

SITE: 3.42

Page 1 of 3

CUT LOCATION: 814.9 - 815.2 (Lower Approach L/D 2)

PLACEMENT SITE LOCATION: RM 814.7 LB

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 675'
100-year flood: 694'
5-year flood: 686'
Flat pool: 675'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: Yes

SITE CHARACTER:

% Upland: 0
% Wetland: 100
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: adjacent
Wetland: 0'
Residence: less than 200'
Beneficial Use Site: 0' (for beach)
Other: None

VEGETATION CHARACTER: Bottomland Hardwoods

SITE OWNER: Private

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other: None

EXISTING USE OF SITE:

Fish and Wildlife: Shore birds, fish and waterfowl feeding area, some use by small furbearers
Socioeconomic: Recreation - some use as beach
Adjacent land use: Rail line, navigation channel

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 3
CUT: 9
SITE: 3.42

Page 2 of 3

SITE: 3.42

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards):	68,000
Area at base (acres):	8.5
Height (feet):	5
Length (feet):	3,500
Width (feet):	105
Side slope (ratio):	recreational beach guide lines
Final elevation (feet):	680

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged:	6/40
Volume dredged per job (cubic yards):	10,200
Beneficial use demand (cubic yards):	? (recreational beach)
Beneficial Use by:	Public
Other cuts using sites:	None

DREDGED MATERIAL CHARACTERISTICS:

Sand (%):	
Silt (%):	100
Other (%):	
Contaminants:	Unknown
Contaminant Source:	

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry):	X
Hydraulic (in slurry):	X

EROSION CONTROL NEEDED:

Riprap:	None (site would be beach)
Revegetation:	None
Other:	None
Areas and features protected by erosion control:	

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 3
CUT: 9
SITE: 3.42

Page 3 of 3

SITE: 3.42

SPECIAL CONDITIONS FOR SITE USE: Short term suspension of turbidity and
suspended solids standards

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	4	1
Wetlands altered:	None	
Open water filled:	4.5	shoreline
Upland altered:	None	
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

Lower Approach L/D 2
POOL: 3
CUT: 9
SITE: 3.42

Frequency: 15 %
6/40 yrs
Volume per job: 10,200 cy

TYPES OF DREDGES

PIPELINE	MECHANICAL				
	20 inch	16 inch	12 inch	Backhoe 350 H.P.	Clamshell 700 H.P.
Basic Dredging Operation	\$ 85,000*	\$ 88,000*	\$ 73,000*	\$ 50,000*	\$ 64,000*
Berming Costs	-	-	-	-	-
Diking Costs	-	-	-	-	-
Riprapping Costs	260,000	260,000	260,000	260,000	260,000
Seasonal Removal	0	0	0	0	0
Special Construction	0	0	0	0	0
Land Acquisition	18,000	18,000	18,000	18,000	18,000
Total of GREAT recommended Actions	85,000	88,000	73,000	50,000	64,000
Average Annual Costs	12,800	13,200	11,000	7,500	9,600

*GREAT recommended actions

COMPARISON OF ALTERNATIVE PLAN SITES

Pool 3 Cut 1

Alternative Plan	Selected, EQ RFFP	NED, MPFW/OG	NED	NED	
Placement Site No.	3.09	3.07	3.10	3.43	
Site Capacity (cy)	1,330,000	289,000	170,000	9,000	
Site Acreage	35		14	33	
Site Height (ft)	25	25	10	25	
Potential Beneficial use removal (cy)	258,000	-	-	-	
Conditions ¹ favoring use of site	2	1	1	1	
	4	6	4	6	
	5	7	5	7	
	26	8	6	8	
	8	9	27	9	
	29	11	8	11	
	10	32	29	32	
	32	33	11	33	
	33		32		
	35		33		
	36		15*		
Conditions ¹ adverse to use of site	41	62	42	42	
	43	63	43	43	
	47	64	70	64	
	71	65	54	65	
	74	70	76	70	
		54	* for some of material	54	
		75		75	
		76		76	

¹ Code numbers in columns represent
conditions listed on pages ____.

COMPARISON OF ALTERNATIVE PLAN SITES

Pool 3 Cut 2

Alternative Plan	Selected, EQ RFFP	NED, MPFW/OG			
Placement Site No.	3.09	3.12 ⁽²⁾			
Site Capacity (cy)	1,330,000	200,000			
Site Acreage	35	12			
Site Height (ft)	25	15			
Potential Beneficial use removal (cy)	258,000	-			
Conditions ¹ favoring use of site	2	1			
	4	6			
	5	27			
	28	8			
	10	9			
	32	30			
	33	11			
	35	32			
	36	33			
		16*			
Conditions ¹ adverse to use of site	41	42			
	43	43			
	46	64			
	47	65			
	49	54			
	71	75			
	74				
*When used as temporary site. (2) Temporary site. 1 Code numbers in columns represent conditions listed on pages ____.					
100					

COMPARISON OF ALTERNATIVE PLAN SITES

Pool 3 Cut 3

Alternative Plan	Selected, EQ	NED, MPFW/OG	NED, MPFW/OG	RFFP	
Placement Site No.	3.09	3.16	3.14 ⁽²⁾	3.17	
Site Capacity (cy)	1,330,000	264,000	265,000	2,000,000	
Site Acreage	35	11	11	58	
Site Height (ft)	25	15	15	25	
Potential Beneficial use removal (cy)	258,000	-	-	-	
Conditions ¹ favoring use of site	2	1	1	21	
	4	26	6	2	
	5	7	7	24	
	28	8	8	25	
	10	9	9	27	
	32	30	30	68	
	33	11	11	69	
	35	32	32	10	
	36	33	33	32	
				33	
				16	
Conditions ¹ adverse to use of site	41	42	42	43	
	43	63	63	46	
	46	64	64	71	
	47	65	65	54	
	49	54	54	55	
	71	75	75		
	74	76	76		

¹ Code numbers in columns represent conditions listed on pages ____.

(2) Temporary site.

COMPARISON OF ALTERNATIVE PLAN SITES

Pool 3 Cut 4

Alternative Plan	Selected	Selected, EQ	Selected	Selected	NED, MPFW/OG
Placement Site No.	3.27	3.09	3.34	3.46	3.21
Site Capacity (cy)	500,000	1,330,000	400,000	175,000	488,000
Site Acreage	31	35	10	9	15
Site Height (ft)	10	25	25	12	20
Potential Beneficial use removal (cy)	254,000	258,000	240,000	2,420,000	-
Conditions ¹ favoring use of site	4	2	1	4	24
	25	4	2	5	25
	33	5	4	30	6
	35**	28	25	11	8
		10	27	32	29
		32	12	33	30
		33	33	35	12
		35	15	16	33
		36			16
Conditions ¹ adverse to use of site	41	41	63	41	41
	62*	43	66	42	42
	43	46	68	43	63
	66	47	49	66	47
	47	49	10	47	71
	68	71	71	68	54
	49	74	54	49	55
	50		56	54	
	71				
	52				
¹ Code numbers in columns represent conditions listed on pages ____. 54 76 *of Dry Run Slough **for a small amount of the material 102					

COMPARISON OF ALTERNATIVE PLAN SITES

Pool 3 Cut 4

(Continued)

Alternative Plan	NED	RFFD			
Placement Site No.	3.44	3.17			
Site Capacity (cy)	19,000	2,000,000			
Site Acreage	2.3	58			
Site Height (ft)	5	25			
Potential Beneficial use removal (cy)	-	-			
Conditions ¹ favoring use of site	1	21			
	6	2			
	7	24			
	8	25			
	9	27			
	11	68			
	32	69			
	33	10			
		32			
		33			
Conditions ¹ adverse to use of site		16			
	42	43			
	43	66			
	64	71			
	65	54			
	70	55			
	54				
	75				
	76				
¹ Code numbers in columns represent conditions listed on pages _____.					

COMPARISON OF ALTERNATIVE PLAN SITES

Pool 3 Cut 5

Alternative Plan	Selected, EQ	Selected	Selected	Selected	NED, MPFW/OG
Placement Site No.	3.27	3.09	3.34	3.46	3.28
Site Capacity (cy)	500,000	1,330,000	400,000	175,000	195,000
Site Acreage	31	35	10	9	8
Site Height (ft)	10	25	25	12	15
Potential Beneficial use removal (cy)	254,000	258,000	240,000	2,420,000	-
Conditions ¹ favoring use of site	4	2	1	4	1
	25	4	2	5	26
		5	4	30	8
	26	28	25	11	29
	33	10	27	32	11
	35**	32	12	33	32
		33	33	35	33
		35	15	16	35
		36			
Conditions ¹ adverse to use of site	41	41	63	41	62
	62	43	66	42	43
	43	46	68	43	44
	47	47	49	66	45
	48	49	10	47	47
	49	71	71	68	70
	50	74	54	49	54
	71		56	54	76
	52				
	54				
	76				

¹ Code numbers in columns represent conditions listed on pages ____.

*of Dry Run Slough

**for a small amount of the material

COMPARISON OF ALTERNATIVE PLAN SITES

Pool 3 Cut 5 (Continued)

Alternative Plan	NED, MPFW/OG	RFFP			
Placement Site No.	3.40	3.18			
Site Capacity (cy)	475,000	500,000			
Site Acreage	15	30			
Site Height (ft)	20	10			
Potential Beneficial use removal (cy)	-	-			
Conditions ¹ favoring use of site	1	2			
	26	4			
	8	25			
	9	10			
	11	11			
	32	12			
	33	33			
		35			
Conditions ¹ adverse to use of site	42	41			
	43	43			
	64	66			
	65	47			
	27	68			
	50	69			
	54	74			
	75	56			
	76				
¹ Code numbers in columns represent conditions listed on pages _____.					
		105			

COMPARISON OF ALTERNATIVE PLAN SITES

Pool 3 Cut 6

Alternative Plan	Selected, EQ	Selected	Selected	Selected	NED, MPFW/OG
Placement Site No.	3.27	3.09	3.34	3.46	3.30
Site Capacity (cy)	500,000	1,330,000	400,000	175,000	210,000
Site Acreage	31	35	10	9	9
Site Height (ft)	10	25	25	12	15
Potential Beneficial use removal (cy)	254,000	258,000	240,000	2,420,000	-
Conditions ¹ favoring use of site	4	2	1	4	1
	25	4	2	5	6
	26	5	4	30	8
	33	28	25	11	9
	35**	10	27	32	11
	16	32	12	33	32
		33	33	35	33
		35	15	16	35
		16	16		36
Conditions ¹ adverse to use of site	41	41	63	41	62
	62*	43	66	42	63
	43	46	68	43	44
	47	47	49	66	45
	48	49	10	47	47
	49	71	71	48	50
	50	74	54	49	54
	71			54	
	52				
	54				
¹ Code numbers in columns represent conditions listed on pages ____. *of Dry Run Slough **for a small amount of the material					

COMPARISON OF ALTERNATIVE PLAN SITES

Pool 3 Cut 6

(Continued)

Alternative Plan	RFFP				
Placement Site No.	3.03				
Site Capacity (cy)	150,000				
Site Acreage	12				
Site Height (ft)	8				
Potential Beneficial use removal (cy)	-				
Conditions ¹ favoring use of site	21				
	2				
	4				
	25				
	10				
	12				
	33				
	35				
	36				
Conditions ¹ adverse to use of site	43				
	66				
	47				
	68				
	69				
	71				
	74				
¹ Code numbers in columns represent conditions listed on pages ____.					
107					

COMPARISON OF ALTERNATIVE PLAN SITES

Pool 3 Cut 7

Alternative Plan	Selected, EQ	Selected, NED	NED, MPFW/OG	RFFP	
Placement Site No.	3.46	3.34	3.33	3.39	
Site Capacity (cy)	175,000	400,000	450,000	555,000	
Site Acreage	9	10	14	14	
Site Height (ft)	12	15	20	25	
Potential Beneficial use removal (cy)	2,420,000	240,000	-	-	
Conditions ¹ favoring use of site		1	1	21	
	4	2	6	2	
	5	4	7	4	
	30	25	8	25	
	11	27	9	10	
	32	29	11	11	
	33	12	32	12	
	35	33	33	33	
	16	15	16	35	
		16		36	
Conditions ¹ adverse to use of site	41	63	62	63	
	42	46	43	66	
	43	48	64	47	
	66	10	65	68	
	47	71	50	69	
	48	54	54	54	
	49		65		
	54				
¹ Code numbers in columns represent conditions listed on pages _____.					
		108			

COMPARISON OF ALTERNATIVE PLAN SITES

Pool 3 Cut 8

Alternative Plan	Selected, NED EQ	RFFP	MPFW/OG		
Placement Site No.	3.46	3.39	3.33		
Site Capacity (cy)	175,000	555,000	450,000		
Site Acreage	9	14	14		
Site Height (ft)	12	25	20		
Potential Beneficial use removal (cy)	2,420,000	-	-		
Conditions ¹ favoring use of site	4	21	1		
	5	2	7		
	6	4	11		
	28	25	32		
	9	10	33		
	30	11?	16		
	11	12			
	32	33			
	33	35			
	35	36			
	16				
Conditions ¹ adverse to use of site	41	63	62		
	42	46	43		
	43	47	64		
	47	48	65		
	54	69	46		
		54	48		
			49		
			50		
			54		
			65		
¹ Code numbers in columns represent conditions listed on pages _____.					
		109			

COMPARISON OF ALTERNATIVE PLAN SITES

Pool 3 Cut 9

Alternative Plan	Selected	Selected ⁽²⁾	Selected, NED MPFW/OG	RFFP	EQ
Placement Site No.	3.47	3.48	3.42	3.39	3.46
Site Capacity (cy)	10,000	?	68,000	555,000	175,000
Site Acreage	1.5	?	8.5	14	9
Site Height (ft)	12	?	5	25	12
Potential Beneficial use removal (cy)	2,420,000	2,420,000	-	-	2,420,000
Conditions ¹ favoring use of site	4	23	1	21	4
	5	24	4	2	5
	26	5	5	4	30
	27	26	6	25	11
	28	27	7	26	32
	29	28	8	10	35
	30	30	9	11?	16
	11	11?	11	12	
	32	32	12	35	
	35		15 16	16	
Conditions ¹ adverse to use of site	41	61	42	63	41
	62	42	43	47	42
	43	49	50	68	43
	53	53	53	49	66
	74	74	54	53	47
	56	55*		54	48
		76			49
					53
					54

(2) Lake Rebecca Park.

*B.U. to part development if park needs it.

¹ Code numbers in columns represent
conditions listed on pages ____.

Key to Conditions Used in Site Comparisons

1. Recreation enhancement
2. Remove from floodplain
3. Fish and wildlife enhancement
4. Beneficial use identified
5. Existing road access
6. Adjacent to cut
7. No land acquisition required
8. Provides flexibility of equipment
9. Least cost to dredge
10. No erosion potential
11. No special construction required
12. No diking of berming
13. No water quality concerns
14. Aesthetic enhancement
15. Beneficial use on the site
16. Sufficient capacity on the site

21. No adverse impacts on recreation use
22. Potential for removal from floodplain
23. No adverse fish and wildlife impacts
24. Potential for identifying a beneficial user
25. Road access can be constructed
26. Within $\frac{1}{2}$ mile of cut (easy reach of cutterhead dredges)
27. No apparent problem in acquiring land or easement
28. Slight limitation on equipment choice
29. Less costly than dredging to most other sites
30. Some erosion potential
31. (Unused)
32. Berming required
33. No water quality concern expected
34. (Unused)
35. Know of area where material can be put to beneficial use
36. Sufficient capacity site but less impact if beneficial use demand is developed

41. Some adverse impacts on recreation use
42. In floodplain - no effect on flood flows
43. Some adverse impacts on fish and wildlife
44. No suspected beneficial user can be identified
45. Poor access to the site
46. Within 2 miles of cut (barely within reach of hydraulic dredges)
47. Land or easement acquisition required
48. Equipment choice limited to just a few options
49. More costly than dredging to most of the other sites
50. Severe erosion potential
51. (Unused)
52. Diking required
53. Suspected water quality concerns
54. Some aesthetic problems
55. Potential market for beneficial use suspected but not identified
56. Sufficient capacity on site with removal by identified users

61. Severe adverse impacts on recreation use
62. Placement would cause suspected constriction on flood flows
63. Severe adverse impacts on fish and wildlife
64. No potential for identifying beneficial user
65. No access to the site
66. Beyond 2 miles from cut (cannot be reached directly by cutterhead dredges)
67. Land or easement acquisition required but does not seem likely
68. Severe restrictions on choice of equipment
69. Most costly to dredge
70. Severe erosion potential with severe consequences if failure occurs
71. Special construction required to use the site
72. Berming or diking required with severe consequences if failure occurs
73. Known water quality concerns
74. Adverse aesthetic impacts
75. No potential market for beneficial use
76. Sufficient capacity on site only if potential beneficial use, not now identified, develops

RECOMMENDED CHANNEL MAINTENANCE PLAN

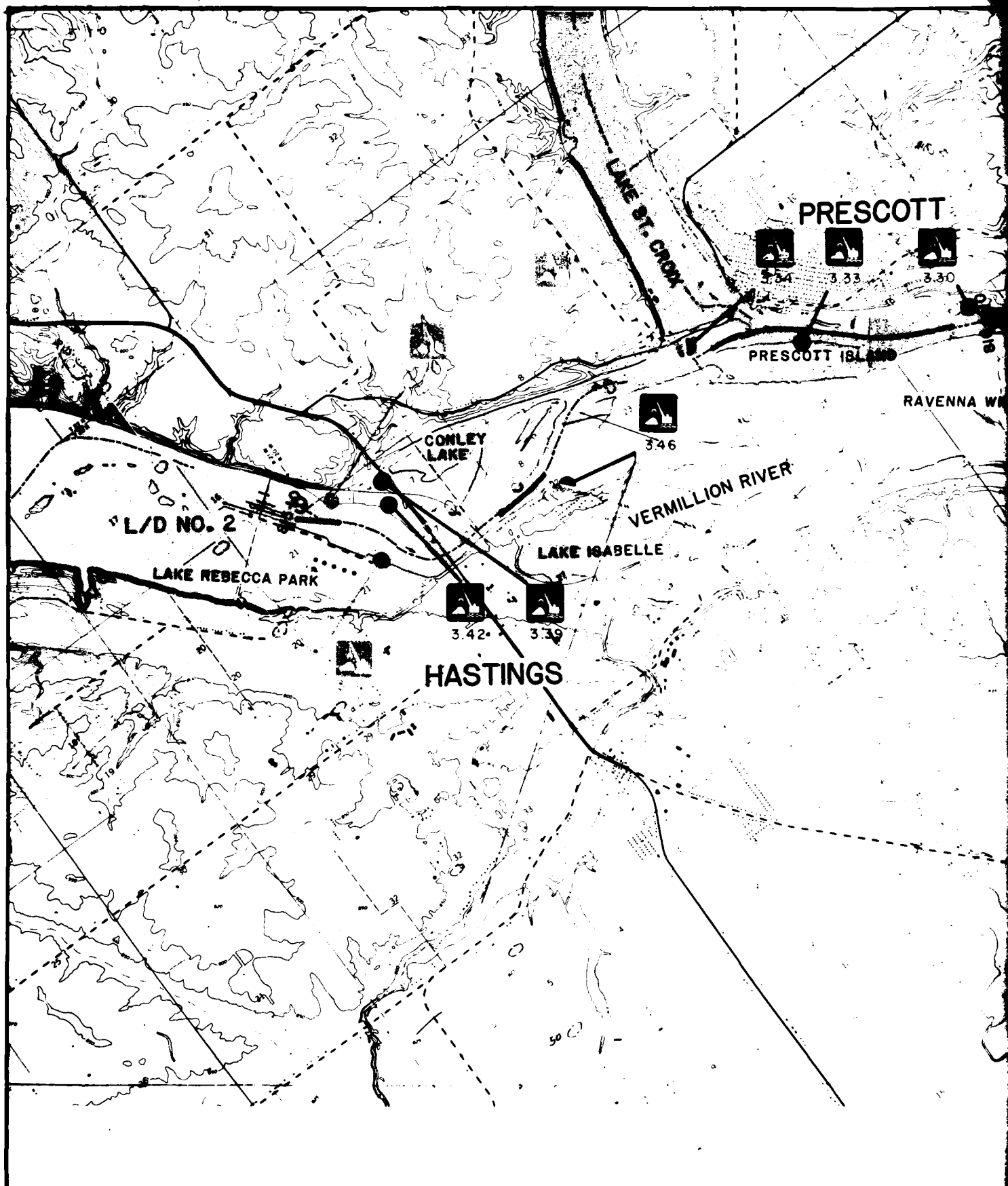
Parentheses if site is used for placement of material from a cut in another pool

Site number

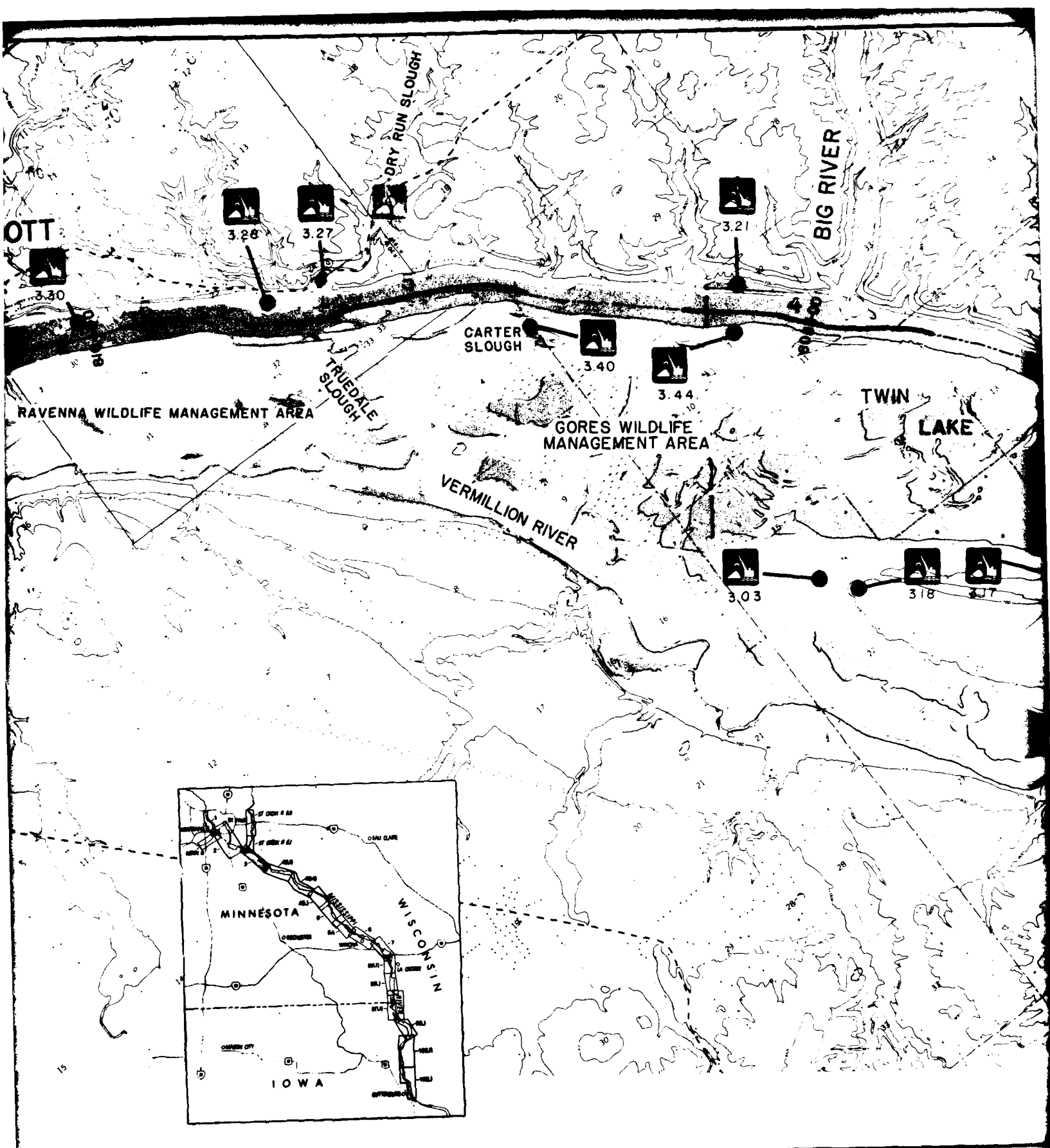
M = Most probable future without GREAT
N = National economic development
E = Environmental quality
R = Removal from floodplain

SCALE: 1" = 4,000'

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929



LEGEND

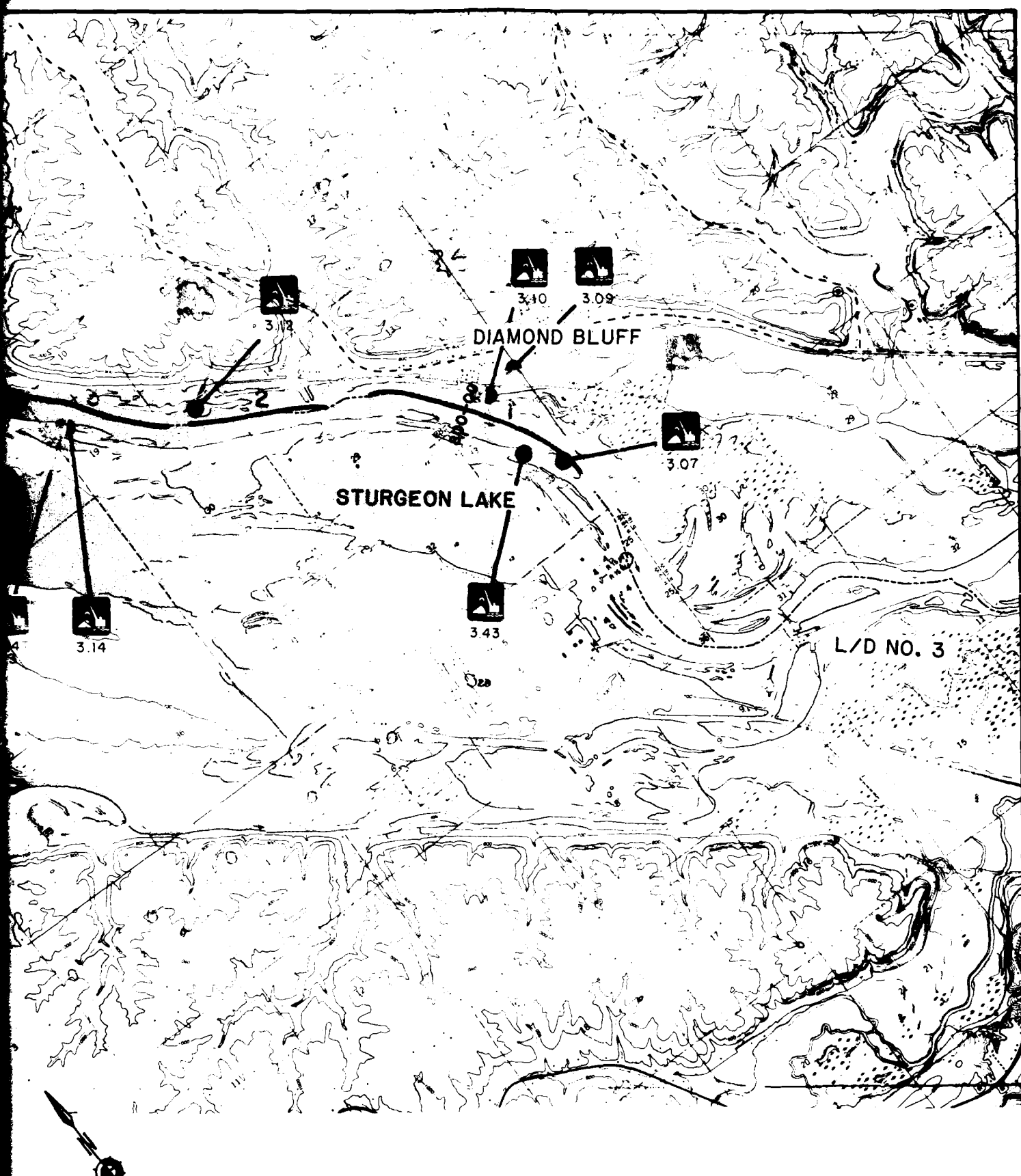




GREAT RIVER ENVIRONMENTAL ACTION
UPPER MISSISSIPPI RIVER
(POOL 3—MILE 797 TO MILE 816)

10

3



GREAT RIVER ENVIRONMENTAL ACTION TEAM
UPPER MISSISSIPPI RIVER
(POOL 3—MILE 797 TO MILE 816)

3 4



POOL 4

CHANNEL MAINTENANCE PLAN SUMMARY

POOL 4

Dredge Cut	NPFNOG CY @ 1985-0225	Selected Site	NED Site	EQ Site	RFPF Site	MPTMOG Site	NPFNOG CY @ 1985-2025	Temporary Site
1. Beef Slough	235,000	4.02/4.20	4.04	4.04	4.04	4.04	308,500	--
2. Grand Encampment	522,500	4.02/4.20	4.10/4.04	4.04	4.04	4.09/4.10	704,500	4.10
3. Above Teepeeota Point	972,000	4.02/4.20/ 4.18*	4.13	4.04	4.04/4.25	4.13	1,320,000	4.13
4. Above Crat's Island	800,500	4.25/4.24/4.20/ 4.19/4.18*	4.16	4.20/4.18	4.25/4.24	4.16/4.17	1,592,000	--
5. Read's Landing	2,264,000	4.24/4.25	4.29	4.24	4.24	4.29	3,185,500	4.29
6. Macouta Point	274,000	4.37/4.38/ 4.48*	4.68	4.37	4.34/4.35/ 4.36	4.68	302,000	--
7. Below Red Wing Highway Bridge	395,500	4.57/4.49/ 4.47/4.54	4.47/4.48/ 4.49/4.51	4.54/4.57	4.34/4.35/ 4.36	4.51	435,000	--
8. Above Red Wing Highway Bridge	85,500	4.57	4.54/4.55/ 4.56	4.54/4.57	4.34/4.35/ 4.36	4.52	93,000	--
9. Cannon River	427,500	4.57	4.52/4.58/ 4.59	4.54/4.57	4.34/4.35/ 4.36	4.58	466,000	--
10. Trenton	179,000	4.63	4.60/4.63	4.57	4.62/4.65	4.63	198,000	--
11. Above Trenton	93,500	4.57	4.67	4.57	4.62/4.65	4.67	101,000	--
	6,249,000						8,705,500	

SELECTED PLAN SUMMARY

* Sites 4.18 and 4.48 are rehandle sites only.

No. of sites with:

Recreation Enhancement - 6

Cultural Resources Impacts - 0

Wetlands Affected:

Types 1, 2 (acres) 70

Types 3, 4, 5 (acres) - 4

Total Volume Dredged (cy) - 6,249,000

Beneficial Use (cy) Potential from Selected Sites - 2,427,000

Total Area (acres) - 170

Table 2-

Lower Pool 4 Dredging Volumes

Item	Cut 1		Cut 2		Cut 3		Cut 4		Cut 5	
	With GREAT	Without GREAT	With GREAT	Without GREAT	With GREAT	Without GREAT	With GREAT	Without GREAT	With GREAT	Without GREAT
Cut Name	Beef Slough		Grand Encampment		Above Tepeesota Pt.		Above Crat's Island		Read's Landing	
1955 - 1974 average annual dredging volume	11,000	11,000	25,000	25,000	46,900	46,900	56,600	56,600	79,700	79,700
Bend width changes (percent)	-	-	-	-	-	-	-31	-	+42	+42
Adjusted average annual volume	11,000	11,000	25,000	25,000	46,900	46,900	39,100	56,600	113,200	113,200
Change for 1986 - 2000 (percent)	-41	-19	-44	-19	-45	-19	-47	-19	-50	-19
Adjusted average annual volume	6,500	8,900	14,000	20,300	25,800	38,000	20,700	45,800	56,600	91,700
Total volume dredged, 1986 - 2000	97,500	133,500	210,000	304,500	387,000	570,000	310,500	687,000	849,000	1,375,500
Change for 2001 - 2025 (percent)	-50	-36	-50	-36	-50	-36	-50	-36	-50	-36
Adjusted average annual volume	5,500	7,000	12,500	16,000	23,400	30,000	19,600	36,200	56,600	72,400
Total volume dredged, 2001 - 2025	137,500	175,000	312,500	400,000	585,000	750,000	490,000	905,000	1,415,000	1,810,000
Total volume dredged, 1986 - 2025	235,000	308,500	522,500	704,500	972,000	1,320,000	800,500	1,592,000	2,264,000	3,185,500
Frequency of dredging (percent)	40	40	35	35	75	75	70	70	65	65
Expected number of dredging jobs (1986 - 2025)	16	16	14	14	30	30	28	28	26	26
Average dredging volume per job	14,700	19,300	37,300	50,300	32,400	44,000	28,600	56,900	87,100	122,500

Note: All volumes in Cubic Yards. All changes in volumes resulting from actions taken on the tributaries would include and, in effect supersede other factors contributing to reduced dredging volumes.

Table 2--
Upper Pool 4 Dredging Volumes

Item	Cut 6		Cut 7		Cut 8	
	With GREAT	Without GREAT	With GREAT	Without GREAT	With GREAT	Without GREAT
Cut Name	Wacouta Point		Below Red Wing Highway Bridge		Above Red Wing Highway Bridge	
1955 - 1974 average annual dredging volume	9,300	9,300	15,400	15,400	3,300	3,300
Bend width changes (percent)	+16	+16	-	-	-	-
Adjusted average annual volume	10,700	10,700	15,400	15,400	3,300	3,300
Changes for 1986 - 2000 (percent)	-34	-19	-34	-19	-34	-19
Adjusted average annual volume	7,100	8,700	10,200	12,500	2,200	2,700
Total volume dredged, 1986 - 2000	106,500	130,500	153,000	187,500	33,000	40,500
Change for 2001 - 2025 (percent)	-37	-36	-37	-36	-37	-36
Adjusted average annual volume	6,700	6,800	9,700	9,900	2,100	2,100
Total volume dredged, 2001 - 2025	167,500	171,500	242,500	247,500	52,500	52,500
Total volume dredged, 1986 - 2025	274,000	302,000	395,500	435,000	5,500	93,000
Frequency of dredging (percent)	10	10	25	25	10	10
Expected number of dredging jobs (1986 - 2025)	4	4	10	10	4	4
Average dredging volume per job	68,500	75,500	39,600	43,500	21,400	23,300

Note: All volumes in Cubic Yards

Table 2- (cont.)
Upper Pool 4 Dredging Volumes

Item	Cut 9		Cut 10		Cut 11	
	With GREAT	Without GREAT	With GREAT	Without GREAT	With GREAT	Without GREAT
Cut Name	Cannon River		Trenton		Above Trenton	
1955 - 1974 average annual dredging volume	16,600	16,600	7,000	7,000	3,600	3,600
Bend width changes (percent)	-	-	-	-	-	-
Adjusted average annual volume	16,600	16,600	7,000	7,000	3,600	3,600
Changes for 1986 - 2000 (percent)	-34	-19	-34	-19	-34	-19
Adjusted average annual volume	11,000	13,400	4,600	5,700	2,400	2,900
Total volume dredged, 1986 - 2000	165,000	201,000	69,000	85,500	36,000	43,500
Change for 2001 - 2025 (percent)	-37	-36	-37	-36	-37	-36
Adjusted average annual volume	10,500	10,600	4,400	4,500	2,300	2,300
Total volume dredged, 2001 - 2025	262,500	265,000	110,000	112,500	57,500	57,500
Total volume dredged, 1986 - 2025	427,500	466,000	179,000	198,000	93,500	101,000
Frequency of dredging (percent)	20	20	10	10	10	10
Expected number of dredging jobs (1986 - 2025)	8	8	4	4	4	4
Average dredging volume per job	53,400	58,300	44,800	49,500	23,400	25,300

Note: All volumes in Cubic Yards

DREDGED MATERIAL PLACEMENT SITE

EXISTING CONDITIONS DESCRIPTION

POOL: 4
CUT: 1
SITE: 4.02

SITE: 4.02

Page 1 of 3

CUT LOCATION: 753.5 - 754.6 (Beef Slough)

PLACEMENT SITE LOCATION: 753.8 LB

TYPE OF PLACEMENT SITE: Permanent X Temporary

ELEVATIONS AT SITE:

Site (1980):	660 (approx.)
100-year flood:	676.6
5-year flood:	669.4
Flat pool:	667.0

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: Yes

SITE CHARACTER:

% Upland: 0
% Wetland: 0
% Open water: 100

DISTANCE FROM SITE TO:

Open Water: 0'
Wetland: 200'
Residence: 700'
Beneficial Use Site: 0'
Other:

VEGETATION CHARACTER: Sparse submerged aquatic vegetation

SITE OWNER: Federal

SPECIAL CONCERNS:

Endangered species habitat: Possibly a mussel bed
Historical or archeological value: unknown
Other:

EXISTING USE OF SITE:

Fish and Wildlife: fish feeding and spawning, waterfowl resting, furbearers.
Socioeconomic: none presently
Adjacent land use: City park, county road, main channel

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 4
CUT: 1
SITE: 4.02

Page 2 of 3

SITE: 4.02

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 500,000
Area at base (acres): 10.3
Height (feet): 30
Length (feet): 900 } triangle
Width (feet): 1,000 }
Side slope (ratio): --
Final elevation (feet):

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 16/40
Volume dredged per job (cubic yards): 14,700
Beneficial use demand (cubic yards): 1,231,000
Beneficial Use by: Alma, Alma Twp., Wis DOT, Buffalo County ($\frac{1}{2}$ Buffalo Co. demand Assigned to 4.02 $\frac{1}{2}$ to site 5.26)
Other cuts using sites: 2, 3

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100% medium
Silt (%):
Other (%):
Contaminants: None
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): X

EROSION CONTROL NEEDED:

Riprap: Yes
Revegetation:
Other: Possible sheet piling needed
Areas and features protected by erosion control: Downstream riprap

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 4
CUT: 1
SITE: 4.02

Page 3 of 3

SITE: 4.02

SPECIAL CONDITIONS FOR SITE USE: Alma must provide truck access to site
for beneficial use removal.

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	0	
Wetlands altered:	0	
Open water filled:	10.3	Area adjacent to shore
Upland altered:	0	
Endangered Species habitat lost:	0	
Side channels blocked:	0	
Other:	0	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

	TYPES OF DREDGES						
	PIPELINE			MECHANICAL			
	20 inch	16 inch	12 inch	Backhoe 350 H.P.	700 H.P.	350 H.P.	Clamshell 700 H.P.
Basic Dredging Operation	\$ 97,000*	\$114,000*	\$110,000*	\$ 58,000*	\$ 63,000*	\$ 76,000*	\$ 75,000*
Berming Costs	3,000	4,000	5,000	-	-	-	-
Diking Costs	8,000	6,000	4,000	-	-	-	-
Riprapping Costs	0	0	0	0	0	0	0
Seasonal Removal	0	0	0	0	0	0	0
Special Construction	0	0	0	0	0	0	0
Land Acquisition	0	0	0	0	0	0	0
Total of GREAT recommended Actions	97,000	114,000	110,000	58,000	63,000	76,000	75,000
Average Annual Costs	38,800	45,600	44,000	23,200	25,200	30,400	30,000

*GREAT recommended actions

DREDGED MATERIAL PLACEMENT SITE

POOL: 4

EXISTING CONDITIONS DESCRIPTION

CUT: 1

SITE: 4.20

SITE: 4.20

Page 1 of 3

CUT LOCATION: 753.5 - 754.6 (Beef Slough)

PLACEMENT SITE LOCATION: RM 760.2

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 676'
100-year flood: 678'
5-year flood: 672'
Flat pool: 666.9'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 100
% Wetland: 0
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: adjacent
Wetland: across channel (1,000')
Residence: 200'
Beneficial Use Site: 0
Other:

VEGETATION CHARACTER: Developed bottomland hardwood

SITE OWNER: Private

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other:

EXISTING USE OF SITE:

Fish and Wildlife: Limited

Socioeconomic: Potential development

Adjacent land use: Marina, residential area, main channel

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 4
CUT: 1
SITE: 4.20

Page 2 of 3

SITE: 4.20

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 323,000
Area at base (acres): 6.4
Height (feet): 20
Length (feet): 70
Width (feet): 400
Side slope (ratio): 4:1
Final elevation (feet): 696

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 16/40
Volume dredged per job (cubic yards): 14,700
Beneficial use demand (cubic yards): 85,000
Beneficial Use by: Wabasha City & County
Other cuts using sites: 2,3,4

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 91% medium to fine sand
Silt (%):
Other (%):
Contaminants: See WQWG Appendix, page 56-58
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): No

EROSION CONTROL NEEDED:

Riprap: Yes
Revegetation: None
Other:
Areas and features protected by erosion control: Downstream wing dams and
backwaters

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 4
CUT: 1
SITE: 4.20

Page 3 of 3

SITE: 4.20

SPECIAL CONDITIONS FOR SITE USE:

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	None	
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	10	bottomland hardwood
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS PER DREDGING JOB

Beef Slough'
POOL: 4
CUT: 1
SITE: 4.20

Frequency: 40%
16/40 yrs
Volume per job: 14,700 cy

	TYPES OF DREDGES						
	PIPELINE			MECHANICAL			
	20 inch	16 inch	12 inch	Backhoe 350 H.P.	700 H.P.	350 H.P.	Clamshell 700 H.P.
Basic Dredging Operation	\$ 184,000*	\$ 200,000*	\$ 196,000*	\$ 76,000*	\$ 80,000*	\$ 85,000*	\$ 89,000*
Berming Costs (1)	3,000*	4,000*	5,000*	-	-	-	-
Diking Costs	8,000	6,000	4,000	-	-	-	-
Riprapping Costs	72,000	72,000	72,000	72,000	72,000	72,000	72,000
Seasonal Removal	0	0	0	0	0	0	0
Special Construction	0	0	0	0	0	0	0
Land Acquisition	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Total of GREAT recommende' Actions	187,000	204,000	201,000	76,000	80,000	85,000	89,000
Average Annual Costs	74,800	81,600	80,400	30,400	32,000	34,000	35,600

*GREAT recommended actions (1) At 4.04

DREDGED MATERIAL PLACEMENT SITE

POOL: 4

EXISTING CONDITIONS DESCRIPTION

CUT: 2

SITE: 4.02

SITE: 4.02

Page 1 of 3

CUT LOCATION: 755.7 - 756.4 (Grand Encampment)

PLACEMENT SITE LOCATION: 753.8 LB

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 660 (approx.)
100-year flood: 676.6
5-year flood: 669.4
Flat pool: 667.0

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: Yes

SITE CHARACTER:

% Upland:
% Wetland:
% Open water: 100

DISTANCE FROM SITE TO:

Open Water: 0'
Wetland: 200'
Residence: 700'
Beneficial Use Site: 0'
Other:

VEGETATION CHARACTER: Sparse submerged aquatic vegetation

SITE OWNER: Federal

SPECIAL CONCERNS:

Endangered species habitat: possible a mussel bed
Historical or archeological value: unknown
Other:

EXISTING USE OF SITE:

Fish and Wildlife: fish feeding and spawning, waterfowl resting,
furbearers
Socioeconomic: none presently
Adjacent land use: city park, county road, main channel

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 4
CUT: 2
SITE: 4.02

Page 2 of 3

SITE: 4.02

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards):	500,000	
Area at base (acres):	10.3	
Height (feet):	30	} triangle
Length (feet):	900	
Width (feet):	1,000	
Side slope (ratio):	--	
Final elevation (feet):		

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 14/40
Volume dredged per job (cubic yards): 37,300
Beneficial use demand (cubic yards): 1,231,000
Beneficial Use by: Alma, Alma Twp., Wis. DOT, Buffalo County ($\frac{1}{2}$ Buff. Co.
Other cuts using sites: 1,3 demand assigned
to 4.02 $\frac{1}{2}$ to
site 5.26)

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100% medium
Silt (%):
Other (%):
Contaminants: None
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): X

EROSION CONTROL NEEDED:

Riprap: Yes
Revegetation:
Other: Possibly sheet piling needed
Areas and features protected by erosion control: downstream riprap

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 4
CUT: 2
SITE: 4.02

Page 3 of 3

SITE: 4.02

SPECIAL CONDITIONS FOR SITE USE: Alma must provide truck access to site for beneficial use removal.

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	0	
Wetlands altered:	0	
Open water filled:	10.3	area adjacent to shore
Upland altered:	0	
Endangered Species habitat lost:	0	
Side channels blocked:	0	
Other:	0	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

Grand Encompment

POOL: 4

CUT: 2

SITE: 4.02

Frequency: 35 %

14/40 yrs

Volume per job: 37,300 cy

	TYPES OF DREDGES					
	PIPELINE				MECHANICAL	
		20 inch	16 inch	12 inch	Backhoe 350 H.P.	Clamshell 700 H.P.
Basic Dredging Operation	\$357,000*	\$388,000*	\$413,000*	\$165,000*	\$165,000*	\$188,000*
Berming Costs (1)	6,000*	8,000*	10,000*	-	-	-
Diking Costs	8,000	8,000	6,000	-	-	-
Riprapping Costs	0	0	0	0	0	0
Seasonal Removal	0	0	0	0	0	0
Special Construction	0	0	0	0	0	0
Land Acquisition	0	0	0	0	0	0
Total of GREAT recommended Actions	363,000	396,000	423,000	165,000	165,000	188,000
Average Annual Costs	127,100	138,600	148,100	57,800	57,800	65,800

*GREAT recommended actions

(1)

DREDGED MATERIAL PLACEMENT SITE

POOL: 4

EXISTING CONDITIONS DESCRIPTION

CUT: 2

SITE: 4.20

SITE: 4.20

Page 1 of 3

CUT LOCATION: 755.7 - 756.9 (Grand Encampment)

PLACEMENT SITE LOCATION: RM 760.2

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 676'
100-year flood: 678'
5-year flood: 672'
Flat pool: 666.9'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 100
% Wetland: 0
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: adjacent
Wetland: across channel (1,000')
Residence: 200'
Beneficial Use Site: 0
Other:

VEGETATION CHARACTER: Developed bottomland hardwood

SITE OWNER: Private

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other:

EXISTING USE OF SITE:

Fish and Wildlife: Limited

Socioeconomic: Potential development

Adjacent land use: Marina, residential area, main channel

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 4
CUT: 2
SITE: 4.20

Page 2 of 3

SITE: 4.20

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 323,000
Area at base (acres): 6.4
Height (feet): 20
Length (feet): 70
Width (feet): 400
Side slope (ratio): 4:1
Final elevation (feet): 696

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 14/40
Volume dredged per job (cubic yards): 37,300
Beneficial use demand (cubic yards): 85,000
Beneficial Use by: Wabasha City and County
Other cuts using sites: 1,2,3,4

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100% medium sand
Silt (%):
Other (%):
Contaminants:
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): No

EROSION CONTROL NEEDED:

Riprap: Yes
Revegetation: None
Other:
Areas and features protected by erosion control: Downstream wing dams
and backwaters

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 4
CUT: 2
SITE: 4.20

Page 3 of 3

SITE: 4.20

SPECIAL CONDITIONS FOR SITE USE:

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	None	
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	6.4	Bottomland hardwood
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

Grand Encompment
POOL: 4
CUT: 2
SITE: 4.20

Frequency: 35 %
14/40 yrs
Volume per job: 37,300 cy

	TYPES OF DREDGES					
	PIPELINE			MECHANICAL		
	20 inch	16 inch	12 inch	Backhoe 350 H.P.	700 H.P.	Clamshell 350 H.P. 700 H.P.
Basic Dredging Operation	\$394,000*	\$425,000*	\$450,000*	\$165,000*	\$165,000*	\$203,000*
Berming Costs ⁽¹⁾	6,000*	8,000*	10,000*	-	-	-
Diking Costs	8,000	8,000	6,000	-	-	-
Riprapping Costs	72,000	72,000	72,000	72,000	72,000	72,000
Seasonal Removal	0	0	0	0	0	0
Special Construction	0	0	0	0	0	0
Land Acquisition	5,000	5,000	5,000	5,000	5,000	5,000
Total of GREAT recommended Actions	400,000	433,000	460,000	165,000	211,000	203,000
Average Annual Costs	140,000	151,600	161,000	57,800	73,900	71,100

*GREAT recommended actions

(1) At 4.10.

DREDGED MATERIAL PLACEMENT SITE

POOL: 4

EXISTING CONDITIONS DESCRIPTION

CUT: 2

SITE: 4.10

SITE: 4.10

Page 1 of 3

CUT LOCATION: 755.5 - 757.2 (Grand Encampment)

PLACEMENT SITE LOCATION: 756.4

TYPE OF PLACEMENT SITE: Permanent _____ Temporary X

ELEVATIONS AT SITE:

Site (1980): 678' (approx)
100-year flood: 677.2'
5-year flood: 670.3'
Flat pool: 667.0'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: Partially

SITE CHARACTER:

% Upland: 100 (previously filled wetland)
% Wetland: 0
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: adjacent
Wetland: adjacent
Residence: 1/2 mile
Beneficial Use Site: 2 1/4 miles
Other:

VEGETATION CHARACTER: Some willow, grasses and maples

SITE OWNER: Federal

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other:

EXISTING USE OF SITE:

Fish and Wildlife: Turtle nesting

Socioeconomic: Dredged material disposal

Adjacent land use: Navigation channel, backwaters

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND DETAILS

Pool: 4
Cell: 2
Site: 4.10

Page 2 of 3

SITE: 4.10

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 96,000 (1980)
Area at base (acres): 4
Height (feet): N/A
Length (feet): -
Width (feet): -
Side slope (ratio): -
Final elevation (feet): 678

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 14/40
Volume dredged per job (cubic yards): 37,300
Beneficial use demand (cubic yards): 0
Beneficial Use by: -
Other cuts using sites: None

DREDGED MATERIAL CHARACTERISTICS:

Sand (%):
Silt (%):
Other (%):
Contaminants:
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): X

EROSION CONTROL NEEDED:

Riprap: No
Revegetation: No
Other: Material must be removed before next seasonal high water
Areas and features protected by erosion control: adjacent backwaters

DREDGED MATERIAL PLACEMENT SITE

POOL: 4

CUT: 2

SITE DEVELOPMENT DESCRIPTION AND IMPACTS

SITE: 4.10

(Continued from previous page)

Page 3 of 3

SITE: 4.10

SPECIAL CONDITIONS FOR SITE USE: Material must be removed from the site before the next seasonal high water.

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	0	
Wetlands altered:	0	
Open water filled:	0	
Upland altered:	4	Old dredged material site
Endangered Species habitat lost:	0	
Side channels blocked:	0	
Other:	0	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

Channel Maintenance Plan Costs

Cost figures were not calculated for this site because it is a temporary placement site. Material placed at this site must either be immediately removed to another site or removed to another site after material from several dredging jobs has been placed at the site. Cost for rehandling the material will vary according to demand for material, equipment available for removing the material, how much material must be removed during one rehandling operation, and where the material is ultimately placed.

Due to the number of variables affecting the cost of using this temporary site, calculation of cost estimates would not be meaningful for comparing with placement costs at other sites or with other methods.

DREDGED MATERIAL PLACEMENT SITE

POOL: 4

EXISTING CONDITIONS DESCRIPTION

CUT: 3

SITE: 4.02

SITE: 4.02

Page 1 of 3

CUT LOCATION: 757.1 - 758.0 (Above Teepeota Point)

PLACEMENT SITE LOCATION: 753.8 LB

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 660 (approx.)
100-year flood: 676.6
5-year flood: 669.4
Flat pool: 667.0

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: Yes

SITE CHARACTER:

Upland:
Wetland:
Open water: 100

DISTANCE FROM SITE TO:

Open Water: 0'
Wetland: 200'
Residence: 700'
Beneficial Use Site: 0'
Other:

VEGETATION CHARACTER: Sparse submerged aquatic vegetation.

SITE OWNER: Federal

SPECIAL CONCERNS:

Endangered species habitat: Possibly a mussel bed
Historical or archeological value: Unknown
Other:

EXISTING USE OF SITE:

Fish and Wildlife: Fish feeding and spawning, waterfowl resting, furbearers.

Socioeconomic: None presently

Adjacent land use: City park, county road, main channel

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 4
CUT: 3
SITE: 4.02

Page 2 of 3

SITE: 4.02

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 500,000
Area at base (acres): 10.3
Height (feet): 30
Length (feet): 900 } triangle
Width (feet): 1,000 }
Side slope (ratio): --
Final elevation (feet):

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 30/40
Volume dredged per job (cubic yards): 32,400
Beneficial use demand (cubic yards): 1,231,000
Beneficial Use by: Alma, Alma Twp., Wis. DOT, Buffalo County ($\frac{1}{2}$ Buff. Co.
Other cuts using sites: 1, 2, demand assigned
to 4.02 $\frac{1}{2}$ to site
5.26)

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100% medium sand
Silt (%):
Other (%):
Contaminants: None
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): X

EROSION CONTROL NEEDED:

Riprap: Yes
Revegetation:
Other: Possibly sheet piling needed
Areas and features protected by erosion control: downstream riprap

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 4
CUT: 3
SITE: 4.02

Page 3 of 3

SITE: 4.02

SPECIAL CONDITIONS FOR SITE USE: Alma must provide truck access to site
for beneficial use removal.

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	0	
Wetlands altered:	0	
Open water filled:	10.3	area adjacent to shore
Upland altered:	0	
Endangered Species habitat lost:	0	
Side channels blocked:	0	
Other:	0	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

Above Teepeeota Point
POOL: 4
CUT: 3
SITE: 4.02

Frequency: 75 %
30/40 yrs
Volume per job: 32,400 cy

	TYPES OF DREDGES					
	PIPELINE 20 inch	16 inch	12 inch	MECHANICAL		
				Backhoe 350 H.P.	700 H.P.	Clamshell 700 H.P.
Basic Dredging Operation	\$ 323,000*	\$ 380,000*	\$ 375,000*	\$ 148,000*	\$ 144,000*	\$ 191,000* \$ 187,000*
Berming Costs	5,000*	8,000*	9,000*	-	-	-
Diking Costs	8,000	7,000	6,000	-	-	-
Riprapping Costs	0	0	0	0	0	0
Seasonal Removal	0	0	0	0	0	0
Special Construction	0	0	0	0	0	0
Land Acquisition	0	0	0	0	0	0
Total of GREAT recommended Actions	328,000	388,000	384,000	148,000	144,000	191,000 187,000
Average Annual Costs	246,000	291,000	288,000	111,000	108,000	143,000 140,300

*GREAT recommended actions
(1) At 4.13.

DREDGED MATERIAL PLACEMENT SITE

POOL: 4

EXISTING CONDITIONS DESCRIPTION

CUT: 3

SITE: 4.20

SITE: 4.20

Page 1 of 3

CUT LOCATION: 757.1 - 758.0 (Above Teepeota Point)

PLACEMENT SITE LOCATION: RM 760.2

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 676'
100-year flood: 678'
5-year flood: 672'
Flat pool: 666.9'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 100
% Wetland: 0
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: Adjacent
Wetland: across channel (1,000')
Residence: 200'
Beneficial Use Site: 0'
Other:

VEGETATION CHARACTER: Developed bottomland hardwood

SITE OWNER: Private

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other:

EXISTING USE OF SITE:

Fish and Wildlife: limited
Socioeconomic: Potential development
Adjacent land use: Marina, Residential area, main channel

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 4
CUT: 3
SITE: 4.20

Page 2 of 3

SITE: 4.20

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 323,000
Area at base (acres): 6.4
Height (feet): 20
Length (feet): 70
Width (feet): 400
Side slope (ratio): 4:1
Final elevation (feet): 696

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 30/40
Volume dredged per job (cubic yards): 32,400
Beneficial use demand (cubic yards): 85,000
Beneficial Use by: Wabasha City and County
Other cuts using sites: 1,2,3,4

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100% medium sand
Silt (%):
Other (%):
Contaminants: None
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): No

EROSION CONTROL NEEDED:

Riprap: Yes
Revegetation: None
Other:
Areas and features protected by erosion control: Downstream wing dams and backwaters.

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 4
CUT: 3
SITE: 4.20

Page 3 of 3

SITE: 4.20

SPECIAL CONDITIONS FOR SITE USE:

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	None	
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	10	Bottomland Hardwood
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

Above Teepeota Point
POOL: 4
CUT: 3
SITE: 4.20

Frequency: 75 %
 30 /40 yrs
 Volume per job: 32,400 cy

	TYPES OF DREDGES					
	PIPELINE				MECHANICAL	
		16 inch	12 inch	Backhoe 350 H.P.	700 H.P.	Clamshell 350 H.P. 700 H.P.
Basic Dredging Operation	\$ 304,000*	\$ 344,000*	\$ 339,000*	\$ 143,000*	\$ 153,000*	\$ 167,000* \$ 182,000*
Berming Costs	5,000*	8,000*	9,000*	-	-	-
Diking Costs	8,000	7,000	6,000	-	-	-
Riprapping Costs	72,000	72,000	72,000	72,000	72,000	72,000
Seasonal Removal	0	0	0	0	0	0
Special Construction	0	0	0	0	0	0
Land Acquisition	5,000	5,000	5,000	5,000	5,000	5,000
Total of GREAT recommended Actions	309,000	352,000	348,000	143,000	153,000	167,000 182,000
Average Annual Costs	231,000	264,000	261,000	107,300	114,800	125,300 136,500

*GREAT recommended actions
 (1) At 4.13.

DREDGED MATERIAL PLACEMENT SITE

POOL: 4

EXISTING CONDITIONS DESCRIPTION

CUT: 3

SITE: 4.13

SITE: 4.13

Page 1 of 3

CUT LOCATION: 757.3 - 758.0 (Above Teepeeota Point)

PLACEMENT SITE LOCATION: 757.8

TYPE OF PLACEMENT SITE: Permanent _____ Temporary X _____

ELEVATIONS AT SITE:

Site (1980): 678'
100-year flood: 677.7'
5-year flood: 671.2'
Flat pool: 667.0'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: Partially

SITE CHARACTER:

% Upland: 100 (previously filled wetland)
% Wetland:
% Open water:

DISTANCE FROM SITE TO:

Open Water: adjacent
Wetland: adjacent
Residence: 1/2 mile
Beneficial Use Site: 3 1/4 miles
Other:

VEGETATION CHARACTER: Some willows, grasses, and maples

SITE OWNER: Federal

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other:

EXISTING USE OF SITE:

Fish and Wildlife: Turtle nesting

Socioeconomic: Dredge material disposal

Adjacent land use: Navigation channel, backwaters

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 4
CUT: 3
SITE: 4.13

page 2 of 3

SITE: 4.13

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 180,000 (1980)
Area at base (acres): 7.5
Height (feet): -
Length (feet): -
Width (feet): -
Side slope (ratio): -
Final elevation (feet): 678

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 30/40
Volume dredged per job (cubic yards): 32,400
Beneficial use demand (cubic yards): 0
Beneficial Use by: -
Other cuts using sites: None

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100% medium sand
Silt (%):
Other (%):
Contaminants: None
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): X

EROSION CONTROL NEEDED:

Riprap: No
Revegetation: No
Other: Material must be removed before the next seasonal high water
Areas and features protected by erosion control: Adjacent backwaters

DREDGED MATERIAL PLACEMENT SITE

POOL: 4

CUT: 3

SITE DEVELOPMENT DESCRIPTION AND IMPACTS

SITE: 4.13

(Continued from previous page)

Page 3 of 3

SITE: 4.13

SPECIAL CONDITIONS FOR SITE USE: Material must be removed from the site
before the next seasonal high water

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	0	
Wetlands altered:	0	
Open water filled:	0	
Upland altered:	7.5	Old dredged material site
Endangered Species habitat lost:	0	
Side channels blocked:	0	
Other:	0	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

Channel Maintenance Plan Costs

Cost figures were not calculated for this site because it is a temporary placement site. Material placed at this site must either be immediately removed to another site or removed to another site after material from several dredging jobs has been placed at the site. Cost for rehandling the material will vary according to demand for material, equipment available for removing the material, how much material must be removed during one rehandling operation, and where the material is ultimately placed.

Due to the number of variables affecting the cost of using this temporary site, calculation of cost estimates would not be meaningful for comparing with placement costs at other sites or with other methods.

DREDGED MATERIAL PLACEMENT SITE

POOL: 4

EXISTING CONDITIONS DESCRIPTION

CUT: 4

SITE: 4.25

SITE: 4.25

Page 1 of 3

CUT LOCATION: 758.5 - 759.5 (Above Crats Island)

PLACEMENT SITE LOCATION: RM 761.2 RB

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): ? Upland gravel pit
100-year flood: 679.8'
5-year flood: 674.0'
Flat pool: 667.0'

FLOOD STAGE FACTORS:

Site within floodplain: No
Site within floodway (effective flow area): No
Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 100
% Wetland: 0
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: 700'
Wetland: 800'
Residence: 300'
Beneficial Use Site: 0'
Other:

VEGETATION CHARACTER: Trees, shrubs, grasses

SITE OWNER: Private

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other:

EXISTING USE OF SITE:

Fish and Wildlife: Upland game birds, furbearers.

Socioeconomic: Abandoned quarry

Adjacent land use: Agricultural, residential

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL:4
CUT:4
SITE:4.25

Page 2 of 3

SITE: 4.25

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 950,000
Area at base (acres): 18
Height (feet): 30
Length (feet): 900
Width (feet): 950
Side slope (ratio): -
Final elevation (feet): ?

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 28/40
Volume dredged per job (cubic yards): 28,600
Beneficial use demand (cubic yards): 85,000+
Beneficial Use by: Wabasha, Wabasha County
Other cuts using sites: 5

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100% medium sand
Silt (%):
Other (%):
Contaminants: None
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): No (possible hydraulic rehandling)

ROSION CONTROL NEEDED:

Riprap: No
Revegetation: No
Other:
Areas and features protected by erosion control: N/A

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 4
CUT: 4
SITE: 4.25

Page 3 of 3

SITE: 4.25

SPECIAL CONDITIONS FOR SITE USE:

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	0	
Wetlands altered:	0	
Open water filled:	0	
Upland altered:	18	old quarry
Endangered Species habitat lost:	0	
Side channels blocked:	0	
Other:		

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

Above Crat's Island

POOL: 4

CUT: 4

SITE: 4.25

Frequency: 70 %

28 /40 yrs

Volume per job: 28,600 cy

CHANNEL MAINTENANCE PLAN COSTS PER DREDGING JOB

PIPELINE	TYPES OF DREDGES				
	20 inch	16 inch	12 inch	MECHANICAL	
				Backhoe 350 H.P.	Clamshell 700 H.P.

Basic Dredging Operation

Berming Costs (1)

Diking Costs

Riprapping Costs

Seasonal Removal

Special Construction

Land Acquisition

Total of GREAT

recommended Actions

Average Annual Costs

*GREAT recommended actions

(1) At 4.16

\$ 238,000*	\$ 376,000*	\$ 379,000	\$ 164,000	\$ 188,000	\$ 205,000	\$ 205,000
5,000*	7,000*	9,000*				
10,000	10,000	9,000				
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
343,000	383,000	388,000	164,000	138,000	205,000	205,000
240,100	268,100	271,600	114,800	131,600	143,500	143,500

DREDGED MATERIAL PLACEMENT SITE

POOL: 4

EXISTING CONDITIONS DESCRIPTION

CUT: 4

SITE: 4.24

SITE: 4.24

Page 1 of 3

CUT LOCATION: 758.5 - 759.5 (Above Crats Island)

PLACEMENT SITE LOCATION: RM 761 RB

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): ? (upland gravel pit)
100-year flood: 679.8'
5-year flood: 674.0'
Flat pool: 667.0'

FLOOD STAGE FACTORS:

Site within floodplain: No
Site within floodway (effective flow area): No
Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 100
% Wetland: 0
% Open water 0

DISTANCE FROM SITE TO:

Open Water: 1,500'
Wetland: 3,000'
Residence: less than 1 mile
Beneficial Use Site: 0
Other:

VEGETATION CHARACTER: Large gravel pit, trees shrubs, grasses

SITE OWNER: Milwaukee Road

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other:

EXISTING USE OF SITE:

Fish and Wildlife: Furbearers, upland game birds, passerine birds
Socioeconomic: Abandoned quarry
Adjacent land use: Railroad, state highway, gravel pit operation

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 4
CUT: 4
SITE: 4.24

Page 2 of 3

SITE: 4.24

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 2,417,000
Area at base (acres): 60
Height (feet): 25
Length (feet): 2,900
Width (feet): 900
Side slope (ratio):
Final elevation (feet): ?

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 28/40
Volume dredged per job (cubic yards): 28,600
Beneficial use demand (cubic yards): 85,000
Beneficial Use by: Wabasha City and County
Other cuts using sites: 5

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100% medium sand
Silt (%):
Other (%):
Contaminants: None
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X (from cut to rehandling site)
Hydraulic (in slurry): X (from rehandling site to quarry)

EROSION CONTROL NEEDED:

Riprap: None
Revegetation: None
Other:
Areas and features protected by erosion control: N/A

DREDGED MATERIAL PLACEMENT SITE

POOL: 4

CUT: 4

SITE DEVELOPMENT DESCRIPTION AND IMPACTS

SITE: 4.24

(Continued from previous page)

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SITE: 4.24

SPECIAL CONDITIONS FOR SITE USE: Need to find rehandling site for getting material from the cut to 4.24.

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	None	
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	60	Upland meadow
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

Above Crat's Island
POOL: 4
CUT: 4
SITE: 4.24

Frequency: 70 %
 28 /40 yrs
 Volume per job: 28,600 cy

CHANNEL MAINTENANCE PLAN COSTS
 PER DREDGING JOB

PIPELINE	TYPES OF DREDGES				
	20 inch	16 inch	12 inch	MECHANICAL	
				Backhoe 350 H.P.	Clamshell 700 H.P.

Basic Dredging Operation	\$ 354,000 *	\$ 335,000 *	\$ 311,000 *	\$ -	\$ -	\$ -
Berming Costs (1)	7,000	10,000	11,000			
Diking Costs (1)	7,000	7,000	5,000			
Riprapping Costs	0	0	0	0	0	0
Seasonal Removal	0	0	0	0	0	0
Special Construction			11,000			
Land Acquisition	0	0	0	0	0	0
Total of GREAT recommended Actions	354,000	335,000	311,000	-	-	-
Average Annual Costs	247,800	234,500	217,700	-	-	-

*GREAT recommended actions (1) At 4.29

Note: These costs are highly subjective. See Read's Landing Pipeline discussion and references in the St. Paul District Engineers report on implementation of the GREAT I study findings.

DREDGED MATERIAL PLACEMENT SITE

POOL: 4
CUT: 4
SITE: 4.20

EXISTING CONDITIONS DESCRIPTION

SITE: 4.20

Page 1 of 3

CUT LOCATION: 758.5 - 759.5 (Above Crats Island)

PLACEMENT SITE LOCATION: RM 760.2

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 676'
100-year flood: 678'
5-year flood: 672'
Flat pool: 666.9'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 100
% Wetland: 0
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: Adjacent
Wetland: Across channel (1,000')
Residence: 200'
Beneficial Use Site: 0'
Other:

VEGETATION CHARACTER: Developed bottomland hardwood

SITE OWNER: Private

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other:

EXISTING USE OF SITE:

Fish and Wildlife: Limited
Socioeconomic: potential development
Adjacent land use: marina, residential area, main channel

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 4
CUT: 4
SITE: 4.20

Page 2 of 3

SITE: 4.20

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 323,000
Area at base (acres): 6.4
Height (feet): 20
Length (feet): 70
Width (feet): 400
Side slope (ratio): 4:1
Final elevation (feet): 696

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 28/40
Volume dredged per job (cubic yards): 28,600
Beneficial use demand (cubic yards): 85,000
Beneficial Use by: Wabasha City and County
Other cuts using sites: 1,2,3

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100% medium sand
Silt (%):
Other (%):
Contaminants: None
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): No

EROSION CONTROL NEEDED:

Riprap: Yes
Revegetation: None
Other:
Areas and features protected by erosion control:
Downstream wing dams and backwaters

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 4

CUT: 4

SITE: 4.20

Page 3 of 3

SITE: 4.20

SPECIAL CONDITIONS FOR SITE USE:

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	None	
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	10	Bottomland hardwood
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

Above Crat's Island
POOL: 4
CUT: 4
SITE: 4.20

Frequency: 70%
28 /40 yrs
Volume per job: 28,600 cy

	TYPES OF DREDGES					
	PIPELINE			MECHANICAL		
	20 inch	16 inch	12 inch	Backhoe 350 H.P.	700 H.P.	Clamshell 350 H.P. 700 H.P.
Basic Dredging Operation	\$ 354,000*	\$335,000*	\$311,000*	\$109,000*	\$119,000*	\$141,000*
Berming Costs	7,000*	10,000*	8,000*			
Diking Costs	7,000	7,000	5,000			
Riprapping Costs	72,000	72,000	72,000	72,000	72,000	72,000
Seasonal Removal (1)	65,000	65,000	65,000	65,000	65,000	65,000
Special Construction						
Land Acquisition	5,000	5,000	5,000	5,000	5,000	5,000
Total of GREAT recommended Actions	361,000	345,000	319,000	109,000	119,000	141,000
Average Annual Costs	252,700	241,500	223,300	76,300	83,300	98,700

*GREAT recommended actions

(1) By local community for sanding streets

DREDGED MATERIAL PLACEMENT SITE

POOL: 4

EXISTING CONDITIONS DESCRIPTION

CUT: 4

SITE: 4.19

SITE: 4.19

Page 1 of 3

CUT LOCATION: 758.5 - 759.5 (Above Crats Island)

PLACEMENT SITE LOCATION: RM 759.3 RB

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 678' (approx)
100-year flood: 678.3'
5-year flood: 672.3'
Flat pool: 667.0

FLOOD STAGE FACTORS:

Site within floodplain:	Partially
Site within floodway (effective flow area):	No
Site below ordinary high water mark:	No

SITE CHARACTER:

% Upland: 100
% Wetland: 0
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: 200'
Wetland: 1,000'
Residence: 200'
Beneficial Use Site: 0'
Other:

VEGETATION CHARACTER: Agricultural, some trees and shrubs.

SITE OWNER: Private

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other:

EXISTING USE OF SITE:

Fish and Wildlife: Furbearers, waterfowl nesting and feeding, passerine birds, raptors.
Socioeconomic: Agricultural

Adjacent land use: Marina, agricultural lands

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 4
CUT: 4
SITE: 4.19

Page 2 of 2

SITE: 4.19

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 231,000
Area at base (acres): 5.7
Height (feet): 25
Length (feet): 500
Width (feet): 500
Side slope (ratio):
Final elevation (feet): 698

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 28/40
Volume dredged per job (cubic yards): 28,600
Beneficial use demand (cubic yards): 85,000
Beneficial Use by: Wabasha, Wabasha Co.
Other cuts using sites: None

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100% medium sand
Silt (%):
Other (%):
Contaminants: None
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): X

EROSION CONTROL NEEDED:

Riprap:
Revegetation: X
Other:
Areas and features protected by erosion control: Downstream backwaters and wing dams

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 4
CUT: 4
SITE: 4.19

Page 3 of 3

SITE: 4.19

SPECIAL CONDITIONS FOR SITE USE:

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	0	
Wetlands altered:	0	
Open water filled:	0	
Upland altered:	5.7	Agricultural land
Endangered Species habitat lost:	0	
Side channels blocked:	0	
Other:		

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

Above Crat's Island

POOL: 4
CUT: 4
SITE: 4.19

Frequency: 70 %
28 /40 yrs
Volume per job: 28,600 cy

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

TYPES OF DREDGES				
PIPELINE				MECHANICAL
20 inch	16 inch	12 inch	Backhoe	Clamshell
			350 H.P.	350 H.P. 700 H.P.

Basic Dredging Operation	\$ 182,000 *	\$ 234,000 *	\$ 287,000 *	\$ 109,000 *	\$ 117,000 *	\$ 143,000 *	\$ 141,000 *
Berming Costs	6,000 *	8,000 *	11,000 *	-	-	-	-
Diking Costs	7,000 *	7,000 *	5,000 *	-	-	-	-
Riprapping Costs	0	0	0	0	0	0	0
Seasonal Removal (1)	65,000	65,000	65,000	65,000	65,000	65,000	65,000
Special Constuction	0	0	0	0	0	0	0
Land Acquisition	0	0	0	0	0	0	0
Total of GREAT recommended Actions	188,000	242,000	298,000	109,000	117,000	143,000	141,000
Average Annual Costs	131,600	169,400	208,600	76,300	81,900	100,100	98,700

*GREAT recommended actions

(1) By local community for sanding streets

DREDGED MATERIAL PLACEMENT SITE

POOL: 4

EXISTING CONDITIONS DESCRIPTION

CUT: 4

SITE: 4.18

SITE: 4.18

Page 1 of 3

CUT LOCATION: 758.5 -759.5 (Above Crats Island)

PLACEMENT SITE LOCATION: RM 759.5

TYPE OF PLACEMENT SITE: Permanent _____ Temporary X _____

ELEVATIONS AT SITE:

Site (1980): 676'
100-year flood: 678'
5-year flood: 672'
Flat pool: 667'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 100
% Wetland: 0
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: adjacent
Wetland: 600'
Residence: less than 1 mile
Beneficial Use Site: 0
Other:

VEGETATION CHARACTER: Old placement site, sparse vegetation

SITE OWNER: Private

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other:

EXISTING USE OF SITE:

Fish and Wildlife: Limited

Socioeconomic: None (vacant)

Adjacent land use: Small boat harbor, navigation channel

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 4
CUT: 4
SITE: 4.18

Page 2 of 3

SITE: 4.18

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 323,000
Area at base (acres): 3
Height (feet): 20
Length (feet): 500
Width (feet): 250
Side slope (ratio): 4:1
Final elevation (feet): 696

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 28/40
Volume dredged per job (cubic yards): 28,600
Beneficial use demand (cubic yards): 85,000
Beneficial Use by: Wabasha City & County
Other cuts using sites: 3,4

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 91% medium to fine sand
Silt (%):
Other (%):
Contaminants: See WQWG appendix, pages 56-58
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): No (Site too small)

EROSION CONTROL NEEDED:

Riprap: Yes
Revegetation: None
Other: None
Areas and features protected by erosion control: Downstream wing dams and backwaters

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 4
CUT: 4
SITE: 4.18

Page 3 of 3

SITE: 4.18

SPECIAL CONDITIONS FOR SITE USE: Site is to be used only as a rehandling site

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	None	
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	3	Existing placement site
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

Channel Maintenance Plan Costs

Cost figures were not calculated for this site because it is a temporary placement site. Material placed at this site must either be immediately removed to another site or removed to another site after material from several dredging jobs has been placed at the site. Cost for rehandling the material will vary according to demand for material, equipment available for removing the material, how much material must be removed during one rehandling operation, and where the material is ultimately placed.

Due to the number of variables affecting the cost of using this temporary site, calculation of cost estimates would not be meaningful for comparing with placement costs at other sites or with other methods.

DREDGED MATERIAL PLACEMENT SITE

POOL: 4

EXISTING CONDITIONS DESCRIPTION

CUT: 5

SITE: 4.24

SITE: 4.24

Page 1 of 3

CUT LOCATION: 761.8 - 763.8 (Read's Landing)

PLACEMENT SITE LOCATION: RM 761

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): ? (upland gravel pit)
100-year flood: 679.8'
5-year flood: 674.0'
Flat pool: 667.0'

FLOOD STAGE FACTORS:

Site within floodplain: No
Site within floodway (effective flow area): No
Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 100
% Wetland: 0
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: 1500'
Wetland: 3000'
Residence: less than 1 mile
Beneficial Use Site: 0
Other:

VEGETATION CHARACTER: Large gravel pit, trees, shrubs, grasses

SITE OWNER: Milwaukee Road

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other:

EXISTING USE OF SITE:

Fish and Wildlife: Furbearers, upland game birds, passerine birds
Socioeconomic: Abandoned quarry
Adjacent land use: Railroad, state highway, gravel pit operation.

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 4
CUT: 5
SITE: 4.24

Page 2 of 3

SITE: 4.24

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards):	2,417,900
Area at base (acres):	60
Height (feet):	25
Length (feet):	2,900
Width (feet):	900
Side slope (ratio):	-
Final elevation (feet):	?

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 26/40
Volume dredged per job (cubic yards): 87,100
Beneficial use demand (cubic yards): 85,000
Beneficial Use by: Wabasha City & County
Other cuts using sites: 4

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100% medium coarse sand
Silt (%):
Other (%):
Contaminants: None
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X (from cut to rehandling site)
Hydraulic (in slurry): X (from rehandling site to quarry)

EROSION CONTROL NEEDED:

Riprap: None
Revegetation: None
Other:
Areas and features protected by erosion control: N/A

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 4
CUT: 5
SITE: 4.24

Page 3 of 3

SITE: 4.24

SPECIAL CONDITIONS FOR SITE USE:

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	None	
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	60	Upland meadow
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

Read's Landing
POOL: 4
CUT: 5
SITE: 4.24 (1)

Frequency: 65%

26/40 yrs

Volume per job: 87,100 cy

	TYPES OF DREDGES						
	PIPELINE			MECHANICAL			
	20 inch	16 inch	12 inch	Backhoe 350 H.P.	700 H.P.	350 H.P.	Clamshell 700 H.P.
Basic Dredging Operation	\$ 1,161,000 *	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Berming Costs	20,000	-	-	-	-	-	-
Diking Costs	10,000	-	-	-	-	-	-
Riprapping Costs	0	0	0	0	0	0	0
Seasonal Removal	0	0	0	0	0	0	0
Special Construction							
Land Acquisition	0	0	0	0	0	0	0
Total of GREAT recommended Actions	1,161,000	-	-	-	-	-	-
Average Annual Costs	754,700	-	-	-	-	-	-

*GREAT recommended actions

(1) Assumes direct dredging to the site by hydraulic dredge thru on-land discharge line. See discussion on Read's Landing

DREDGED MATERIAL PLACEMENT SITE

POOL: 4

EXISTING CONDITIONS DESCRIPTION

CUT: 5

SITE: 4.25

SITE: 4.25

Page 1 of 3

CUT LOCATION: 761.8 - 763.8 (Read's Landing)

PLACEMENT SITE LOCATION: 761.2 RB

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): ? (upland gravel pit)
100-year flood: 679.8'
5-year flood: 674.0'
Flat pool: 667.0'

FLOOD STAGE FACTORS:

Site within floodplain: No
Site within floodway (effective flow area): No
Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 100
% Wetland: 0
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: 700'
Wetland: 800'
Residence: 300'
Beneficial Use Site: 0'
Other:

VEGETATION CHARACTER: Trees, shrubs, grasses

SITE OWNER: Private

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other:

EXISTING USE OF SITE:

Fish and Wildlife: Upland game birds, furbearers.

Socioeconomic: Abandoned quarry

Adjacent land use: Agricultural, residential

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 4
CUT: 5
SITE: 4.25

Page 2 of 3

SITE: 4.25

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 950,000
Area at base (acres): 18
Height (feet): 30
Length (feet): 900
Width (feet): 950
Side slope (ratio): -
Final elevation (feet): ?

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 26/40
Volume dredged per job (cubic yards): 87,100
Beneficial use demand (cubic yards): 85,000+
Beneficial Use by: Wabasha, Wabasha County
Other cuts using sites: 4

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100% medium to coarse sand
Silt (%):
Other (%):
Contaminants: None
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): No (possible hydraulic rehandling)

EROSION CONTROL NEEDED:

Riprap: No
Revegetation: No
Other:
Areas and features protected by erosion control: N/A

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 4
CUT: 5
SITE: 4.25

Page 3 of 3

SITE: 4.25

SPECIAL CONDITIONS FOR SITE USE:

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	0	
Wetlands altered:	0	
Open water filled:	0	
Upland altered:	18	old quarry
Endangered Species habitat lost:	0	
Side channels blocked:	0	
Other:		

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

Read's Landing
POOL: 4
CUT: 5
SITE: 4.25

Frequency: 65 %
26/40 yrs
Volume per job: 87,100 cy

	TYPES OF DREDGES					
	PIPELINE					MECHANICAL
		20 inch	16 inch	12 inch	Backhoe 350 H.P.	Clamshell 700 H.P.
Basic Dredging Operation	\$ 911,000*	\$ 841,000*	\$ 787,000*	\$ 336,000*	\$ 402,000*	\$ 449,000*
Berming Costs (1)	11,000*	14,000*	16,000*	-	-	-
Diking Costs	10,000	10,000	9,000	-	-	-
Riprapping Costs	0	0	0	0	0	0
Seasonal Removal	0	0	0	0	0	0
Special Construction	0	0	0	0	0	0
Land Acquisition	0	0	0	0	0	0
Total of GREAT recommended Actions	922,000	855,000	803,000	336,000	402,000	449,000
Average Annual Costs	599,300	555,800	522,000	218,400	261,300	291,900

431,000
280,200

*GREAT recommended actions

(1) At 4.29

DREDGED MATERIAL PLACEMENT SITE

POOL: 4

EXISTING CONDITIONS DESCRIPTION

CUT: 5

SITE: 4.29

SITE: 4.29

Page 1 of 3

CUT LOCATION: 761.8 - 763.8 (Read's Landing)

PLACEMENT SITE LOCATION: RM 763.0

TYPE OF PLACEMENT SITE: Permanent _____ Temporary X _____

ELEVATIONS AT SITE:

Site (1980): 730' +
100-year flood: 681'
5-year flood: 676'
Flat pool: 667'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 100
% Wetland: 0
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: adjacent
Wetland: adjacent
Residence: less than 1 mile
Beneficial Use Site: less than 2 miles
Other:

VEGETATION CHARACTER: Existing containment area without vegetation, bordered by backwater slough and bottomland hardwood.

SITE OWNER: Federal

SPECIAL CONCERNS:

Endangered species habitat: Bald Eagle winter roosting area.
Historical or archeological value: Unknown
Other:

EXISTING USE OF SITE:

Fish and Wildlife: Limited on site but bordering on valuable backwater area and trees used for winter roosting by eagles.

Socioeconomic: Channel side is used as recreational beach.

Adjacent land use: Navigation channel, fish and wildlife refuge, recreation.

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 4
CUT: 5
SITE: 4.29

Page 2 of 3

SITE: 4.29

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 156,000 (1980)
Area at base (acres): 9.5
Height (feet): 60 (approx total with past uses)
Length (feet): -
Width (feet): -
Side slope (ratio): -
Final elevation (feet): ?

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 26/40
Volume dredged per job (cubic yards): 87,100
Beneficial use demand (cubic yards): None
Beneficial Use by: No land access
Other cuts using sites: None

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 80% coarse to medium sand
Silt (%):
Other (%):
Contaminants:
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): No (site presently too steep)
Hydraulic (in slurry): X

EROSION CONTROL NEEDED:

Riprap: Yes
Revegetation: None
Other: None
Areas and features protected by erosion control: Backwaters, slough and downstream side channel may be filled; adjacent bottomland hardwoods.

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 4
CUT: 5
SITE: 4.29

Page 3 of 3

SITE: 4.29

SPECIAL CONDITIONS FOR SITE USE: Site must be emptied before next seasonal high water.

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	None	
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	9.5	existing containment site
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

Channel Maintenance Plan Costs

Cost figures were not calculated for this site because it is a temporary placement site. Material placed at this site must either be immediately removed to another site or removed to another site after material from several dredging jobs has been placed at the site. Cost for rehandling the material will vary according to demand for material, equipment available for removing the material, how much material must be removed during one rehandling operation, and where the material is ultimately placed.

Due to the number of variables affecting the cost of using this temporary site, calculation of cost estimates would not be meaningful for comparing with placement costs at other sites or with other methods.

DREDGED MATERIAL PLACEMENT SITE

POOL: 4

EXISTING CONDITIONS DESCRIPTION

CUT: 6

SITE: 4.37

SITE: 4.37

Page 1 of 3

CUT LOCATION: 783.3-785.5 (Wacouta Point)

PLACEMENT SITE LOCATION: RM 785

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): N/A
100-year flood: N/A
5-year flood: N/A
Flat pool: N/A

FLOOD STAGE FACTORS:

Site within floodplain: No
Site within floodway (effective flow area): No
Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 100
% Wetland: 0
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: 1 mile from main channel
Wetland: < 1/2 mile
Residence: 4 miles
Beneficial Use Site: 0'
Other: None

VEGETATION CHARACTER: Existing gravel pit, some trees & shrubs

SITE OWNER: Private

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other: None

EXISTING USE OF SITE:

Fish and Wildlife: Minimal

Socioeconomic: Abandoned gravel pit

Adjacent land use: State highway, Minnesota State Forest, Milwaukee Railroad

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 4
CUT: 6
SITE: 4.37

Page 2 of 3

SITE: 4.37

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 581,000
Area at base (acres): 8
Height (feet): ?
Length (feet): ?
Width (feet): ?
Side slope (ratio): N/A
Final elevation (feet): N/A

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 4/40
Volume dredged per job (cubic yards): 68,500
Beneficial use demand (cubic yards): None (polluted material)
Beneficial Use by: ---
Other cuts using sites: None

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 85%
Silt (%): 15%
Other (%):
Contaminants: Minor Nutrients, PCB's
Contaminant Source: Twin Cities point discharges, Agricultural

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): No

EROSION CONTROL NEEDED:

Riprap: None
Revegetation: None
Other: None
Areas and features protected by erosion control:

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GREAT I STUDY OF THE UPPER MISSISSIPPI RIVER TECHNICAL
APPENDIXES VOLUME '8..(U) GREAT RIVER ENVIRONMENTAL
ACTION TEAM SEP 80

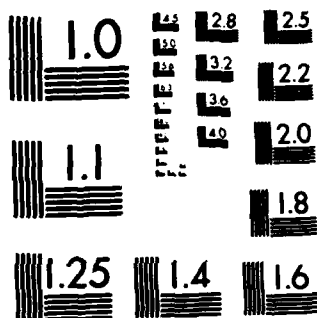
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DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 4
CUT: 6
SITE: 4.37

Page 3 of 3

SITE: 4.37

SPECIAL CONDITIONS FOR SITE USE:

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	None	
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	8	abandoned quarry
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

Macouta Point

POOL: 4

CUT: 6

SITE: 4.37

Frequency: 10 %

4 /40 yrs

Volume per job: 68,500 cy

PIPELINE	TYPES OF DREDGES				
	20 inch	16 inch	12 inch	MECHANICAL	
				Backhoe 350 H.P.	Clamshell 700 H.P.

Basic Dredging Operation (1)

\$	-	\$	-	\$	-	\$ 297,000*	\$ 304,000*	\$ 346,000*	\$ 346,000*
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Berming Costs

Diking Costs

Riprapping Costs

Seasonal Removal

Special Construction (2)

Land Acquisition

Total of GREAT
recommended Actions

Average Annual Costs

*GREAT recommended actions

(1) Dredging material into 4.48

(2) Trucking material from 4.48 to 4.37

DREDGED MATERIAL PLACEMENT SITE

POOL: 4
CUT: 6
SITE: 4.38

EXISTING CONDITIONS DESCRIPTION

SITE: 4.38

Page 1 of 3

CUT LOCATION: 783.3-785.5 (Wacouta Point)

PLACEMENT SITE LOCATION: RM785.3

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): N/A
100-year flood: N/A
5-year flood: N/A
Flat pool: N/A

FLOOD STAGE FACTORS:

Site within floodplain: No
Site within floodway (effective flow area): No
Site below ordinary high water mark: No

SITE CHARACTER:

% Upland: 100
% Wetland: 0
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: 1.5 miles from main channel
Wetland: less than ½ mile
Residence: 500+
Beneficial Use Site: 0'
Other: Adjacent to Ballard Creek

VEGETATION CHARACTER: Existing gravel pit

SITE OWNER: State of Minnesota

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: None
Other: None

EXISTING USE OF SITE:

Fish and Wildlife: Minimal

Socioeconomic: Gravel pit used by Minnesota DOT

Adjacent land use: State highway, Milwaukee Railroad, Minnesota State Forest

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 4
CUT: 6
SITE: 4.38

Page 2 of 3

SITE: 4.38

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 363,000
Area at base (acres): 5
Height (feet): ?
Length (feet): ?
Width (feet): ?
Side slope (ratio): N/A
Final elevation (feet): ?

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 26/40
Volume dredged per job (cubic yards): 68,500
Beneficial use demand (cubic yards): None
Beneficial Use by: Material is polluted
Other cuts using sites: None

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 85%
Silt (%): 15%
Other (%):
Contaminants: Minor Nutrients & PCB's
Contaminant Source: Twin Cities, point discharges, Agricultural

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): No

EROSION CONTROL NEEDED:

Riprap: None
Revegetation: None
Other: None
Areas and features protected by erosion control: N/A

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 4
CUT: 6
SITE: 4.38

Page 3 of 3

SITE: 4.38

SPECIAL CONDITIONS FOR SITE USE:

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	None	
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	5	abandoned quarry
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☒
Historical/Archeological survey not made: ☐

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

Wocouta Point

POOL: 4

CUT: 6

SITE: 4.38

Frequency: 10 %

4 /40 yrs

Volume per job: 68,500 cy

TYPES OF DREDGES

	PIPELINE	MECHANICAL				
		20 inch	16 inch	12 inch	Backhoe 350 H.P.	Clamshell 700 H.P.
Basic Dredging Operation (1)	\$	-	\$	-	\$ 297,000*	\$ 346,000* \$ 346,000*
Berming Costs	-	-	-	-	-	-
Diking Costs	-	-	-	-	-	-
Riprapping Costs	0	0	0	0	0	0
Seasonal Removal	0	0	0	0	0	0
Special Construction (2)	-	-	-	-	140,000*	140,000* 140,000*
Land Acquisition	0	0	0	0	0	0
Total of GREAT recommended Actions	-	-	-	-	437,000	444,000 486,000
Average Annual Costs	-	-	-	-	43,700	44,400 48,600

*GREAT recommended actions

(1) Dredging material into 4.48

(2) Trucking from 4.48 to 4.38

DREDGED MATERIAL PLACEMENT SITE

POOL: 4

EXISTING CONDITIONS DESCRIPTION

CUT: 7

SITE: 4.57

SITE: 4.57

Page 1 of 3

CUT LOCATION: 789.5-790.3 (Below Red Wing Bridge)

PLACEMENT SITE LOCATION: RM 792

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 670'
100-year flood: 685'
5-year flood: 679'
Flat pool: 667'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: ?

SITE CHARACTER:

% Upland: 100 (area previously filled)
% Wetland:
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: Adjacent
Wetland: Adjacent
Residence: less than 1000'
Beneficial Use Site: 0'
Other:

VEGETATION CHARACTER: Weeds

SITE OWNER: City of Red Wing

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other: None

EXISTING USE OF SITE:

Fish and Wildlife: Minimal

Socioeconomic: Industrial development potential

Adjacent land use: Railroad, industrial harbor, wetlands

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 4

CUT: 7

SITE: 4.57

Page 2 of 3

SITE: 4.57

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 605,000

Area at base (acres): 16

Height (feet): 25

Length (feet): 1200

Width (feet): 600

Side slope (ratio): 4.1

Final elevation (feet): 695'

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 10/40

Volume dredged per job (cubic yards): 39,600

Beneficial use demand (cubic yards): 360,000

Beneficial Use by: City of Red Wing, Goodhue County

Other cuts using sites: 8, 9, 11

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 97% medium to fine sand

Silt (%):

Other (%):

Contaminants: No Analysis done

Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X

Hydraulic (in slurry): No (possible hydraulic rehandling)

EROSION CONTROL NEEDED:

Riprap: Yes

Revegetation: None

Other: None

Areas and features protected by erosion control: adjacent creek & wetlands.

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 4
CUT: 7
SITE: 4.57

Page 3 of 3

SITE: 4.57

SPECIAL CONDITIONS FOR SITE USE: Close coordination with Red Wing
Harbor Commission

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	None	
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	16	old landfill
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

Below Red Wing Highway Bridge

POOL: 4

CUT: 7

SITE: 4.57

Frequency: 25 %
10 / 40 yrs
Volume per job: 39,600 cy

CHANNEL MAINTENANCE PLAN COSTS PER DREDGING JOB

	TYPES OF DREDGES						
	PIPELINE			MECHANICAL			
	20 inch	16 inch	12 inch	Backhoe 350 H.P.	700 H.P.	350 H.P.	Clamshell 700 H.P.
Basic Dredging Operation	\$ 471,000 *	\$ 519,000 *	\$ 502,000 *	\$ 234,000 *	\$ 241,000 *	\$ 264,000 *	\$ 275,000 *
Be. 'ag Costs (1)	6,000 *	9,000 *	11,000 *	-	-	-	-
Diking Costs (1)	8,000	7,000	7,000	-	-	-	-
Riprapping Costs	43,000 *	43,000 *	43,000 *	43,000 *	43,000 *	43,000 *	43,000 *
Seasonal Removal	0	0	0	0	0	0	0
Special Construction (2)	11,000 *	11,000 *	11,000 *	11,000 *	11,000 *	11,000 *	11,000 *
Land Acquisition	0	0	0	0	0	0	0
Total of GREAT recommended Actions	531,000	582,000	567,000	288,000	295,000	318,000	329,000
Average Annual Costs	132,800	145,500	141,800	72,000	73,800	79,500	82,300

*GREAT recommended actions (1) At 4.49
(2) Berming at 4.57

DREDGED MATERIAL PLACEMENT SITE

POOL: 4

EXISTING CONDITIONS DESCRIPTION

CUT: 7

SITE: 4.49

SITE: 4.49

Page 1 of 3

CUT LOCATION: 789.5-790.3 (Below Red Wing Railroad Bridge)

PLACEMENT SITE LOCATION: RM790

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 670'
100-year flood: 674'
5-year flood: 678'
Flat pool: 667'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: Yes

SITE CHARACTER:

% Upland: 0
% Wetland: 100
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: adjacent
Wetland: less than 1/4 mile on low end of island
Residence: 1,500'
Beneficial Use Site: 0 beach nourishment
Other: None

VEGETATION CHARACTER: bottomland hardwoods

SITE OWNER: Isaak Walton League

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other: None

EXISTING USE OF SITE:

Fish and Wildlife: Fish feeding and spawning, waterfowl nesting
Socioeconomic: Recreation
Adjacent land use: Navigation channel, recreation

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 4
CUT: 7
SITE: 4.49

Page 2 of 3

SITE:4.49

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 300,000
Area at base (acres): 8
Height (feet): 25
Length (feet): 1100
Width (feet): 300
Side slope (ratio): 4.1
Final elevation (feet): 692

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 10/40
Volume dredged per job (cubic yards): 39,600
Beneficial use demand (cubic yards): all material
Beneficial Use by: Red Wing Conservation Club
Other cuts using sites: None

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 97% medium to fine sand
Silt (%):
Other (%):
Contaminants: No Analysis done
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): X

EROSION CONTROL NEEDED:

Riprap: Yes
Revegetation: None
Other:
Areas and features protected by erosion control: downstream side channels
and wetlands.

DREDGED MATERIAL PLACEMENT SITE

POOL: 4

CUT: 7

SITE DEVELOPMENT DESCRIPTION AND IMPACTS

SITE: 4,49

(Continued from previous page)

Page 3 of 3

SITE: 4.49

SPECIAL CONDITIONS FOR SITE USE: Only material requested by Conservation Club should be placed on island.

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	8	1
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	None	
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

Below Red Wing Highway Bridge
POOL: 4
CUT: 7
SITE: 4.49

Frequency: 25 %
 10/40 yrs
 Volume per job: 39,600 cy

CHANNEL MAINTENANCE PLAN COSTS PER DREDGING JOB

PIPELINE	TYPES OF DREDGES				
	20 inch	16 inch	12 inch	MECHANICAL	
				Backhoe 350 H.P.	Clamshell 700 H.P.

Basic Dredging Operation	\$175,000*	\$224,000*	\$207,000*	\$150,000*	\$165,000*	\$200,000*	\$194,000*
Berming Costs	6,000*	9,000*	11,000*	-	-	-	-
Diking Costs	8,000	7,000	7,000	-	-	-	-
Riprapping Costs	139,000*	139,000*	139,000*	139,000*	139,000*	139,000*	139,000*
Seasonal Removal	0	0	0	0	0	0	0
Special Construction	0	0	0	0	0	0	0
Land Acquisition	0	0	0	0	0	0	0
Total of GREAT recommended Actions	320,000	372,000	357,000	289,000	304,000	339,000	333,000
Average Annual Costs	80,000	93,000	89,300	72,300	76,000	84,800	83,300

*GREAT recommended actions

DREDGED MATERIAL PLACEMENT SITE

POOL: 4
CUT: 7
SITE: 4.47

EXISTING CONDITIONS DESCRIPTION

SITE: 4.47

Page 1 of 3

CUT LOCATION: 789.5-790.3 (Below Red Wing Bridge)

PLACEMENT SITE LOCATION: RM 778.5

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 670'
100-year flood: 683'
5-year flood: 678'
Flat pool: 667'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: ?

SITE CHARACTER:

% Upland: 50
% Wetland: 50
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: less than 100'
Wetland: 0
Residence: less than 1 mile
Beneficial Use Site: 0
Other: Site is adjacent to boat ramp and in a park

VEGETATION CHARACTER: Recreational site dominated by bottomland hardwoods

SITE OWNER: City of Red Wing

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other: Previously used site

EXISTING USE OF SITE:

Fish and Wildlife: fish spawning and feeding, waterfowl nesting.

Socioeconomic: Site is located within Colville Park

Adjacent land use: City park, navigation channel, U.S. Highway

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 4
CUT: 7
SITE: 4.47

Page 2 of 3

SITE: 4.47

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 90,000
Area at base (acres): 11
Height (feet): 5
Length (feet): 700
Width (feet): 700
Side slope (ratio): < 4:1
Final elevation (feet): ---

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 10/40
Volume dredged per job (cubic yards): 39,600
Beneficial use demand (cubic yards): 360,000
Beneficial Use by: City of Red Wing, Goodhue County
Other cuts using sites: None

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 97% medium to fine sand
Silt (%):
Other (%):
Contaminants: No Analysis done
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): X

EROSION CONTROL NEEDED:

Riprap: Yes
Revegetation: None
Other: None
Areas and features protected by erosion control: downstream backwater slough,
adjacent wetlands.

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 4
CUT: 7
SITE: 4.47

Page 3 of 3

SITE: 4.47

SPECIAL CONDITIONS FOR SITE USE:

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	6	1 and 3
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	5	developed woodland
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☒
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

Below Red Wing Highway Bridge
POOL: 4
CUT: 7
SITE: 4.47

Frequency: 25 %
 10/40 yrs
 Volume per job: 39,600 cy

CHANNEL MAINTENANCE PLAN COSTS
 PER DREDGING JOB

	TYPES OF DREDGES					
	PIPELINE	MECHANICAL				
		16 inch	12 inch	Backhoe 350 H.P.	700 H.P.	Clamshell 350 H.P. 700 H.P.
Basic Dredging Operation	\$ 555,000*	\$ 416,000*	\$ 400,000*	\$ 154,000*	\$ 167,000*	\$ 198,000*
Berming Costs	11,000*	9,000*	11,000*	-	-	-
Diking Costs	8,000	7,000	7,000	-	-	-
Riprapping Costs	104,000*	104,000*	104,000*	104,000*	104,000*	104,000*
Seasonal Removal	0	0	0	0	0	0
Special Construction	0	0	0	0	0	0
Land Acquisition	0	0	0	0	0	0
Total of GREAT recommended Actions	670,000	529,000	515,000	258,000	271,000	302,000
Average Annual Costs	167,500	132,300	128,800	64,500	67,800	75,500

*GREAT recommended actions
 (1) At 4.49.

DREDGED MATERIAL PLACEMENT SITE

POOL: 4

EXISTING CONDITIONS DESCRIPTION

CUT: 7

SITE: 4.54

SITE: 4.54

Page 1 of 3

CUT LOCATION: 784.5-790.3 (Below Red Wing Bridge)

PLACEMENT SITE LOCATION: RM 791.5

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 670'
100-year flood: 685'
5-year flood: 679'
Flat pool: 667'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): No
Site below ordinary high water mark: ?

SITE CHARACTER:

% Upland: 60%
% Wetland: 40%
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: Adjacent
Wetland: 0
Residence: less than 1/2 mile
Beneficial Use Site: 0
Other: Adjacent to Bay Point Park

VEGETATION CHARACTER: Shrub, willow, cattail, open field with grasses

SITE OWNER: City of Red Wing

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other: None

EXISTING USE OF SITE:

Fish and Wildlife: Minimal

Socioeconomic: Industrial development potential

Adjacent land use: Park land

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 4

CUT: 7

SITE: 4.54

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SITE: 4.54

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 300,000

Area at base (acres): 8

Height (feet): 25

Length (feet): 1,500

Width (feet): 300

Side slope (ratio): 4:1

Final elevation (feet): 695

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 10/40

Volume dredged per job (cubic yards): 39,600

Beneficial use demand (cubic yards): 360,000

Beneficial Use by: City of Red Wing, Goodhue County

Other cuts using sites: None

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 97% medium to fine sand

Silt (%):

Other (%):

Contaminants: No Analysis Done

Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X

Hydraulic (in slurry): No (possible hydraulic rehandling ro side)

EROSION CONTROL NEEDED:

Riprap: None

Revegetation: None

Other: None

Areas and features protected by erosion control: N/A

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 4
CUT: 7
SITE: 4.54

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SITE: 4.54

SPECIAL CONDITIONS FOR SITE USE: Some removal of material for beneficial use necessary to provide adequate capacity.

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	3	1 and 3
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	5	open field
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

Below Red Wing Highway Bridge
POOL: 4
CUT: 7
SITE: 4.54

Frequency: 25 %
 10/40 yrs
 Volume per job: 39,600 cy

	TYPES OF DREDGES					
	PIPELINE	MECHANICAL				
		16 inch	12 inch	Backhoe 350 H.P.	700 H.P.	Clamshell 350 H.P. 700 H.P.
Basic Dredging Operation	\$357,000*	\$405,000*	\$388,000*	\$178,000*	\$167,000*	\$205,000* \$223,000*
Berming Costs ⁽¹⁾	6,000*	9,000*	11,000*	-	-	-
Diking Costs	8,000	7,000	7,000	-	-	-
Riprapping Costs	21,000*	21,000*	21,000*	21,000*	21,000*	21,000* 21,000*
Seasonal Removal	0	0	0	0	0	0
Special Construction	0	0	0	0	0	0
Land Acquisition	0	0	0	0	0	0
Total of GREAT recommended Actions	384,000	435,000	420,000	199,000	188,000	226,000 244,000
Average Annual Costs	96,000	108,800	105,000	49,800	47,000	56,500 61,000

*GREAT recommended actions

(1) At 4.49.

DREDGED MATERIAL PLACEMENT SITE

POOL: 4

EXISTING CONDITIONS DESCRIPTION

CUT: 8

SITE: 4.57

SITE: 4.57

Page 1 of 3

CUT LOCATION: 790.8-791.2 (Above Red Wing Bridge)

PLACEMENT SITE LOCATION: RM 792

TYPE OF PLACEMENT SITE: Permanent X Temporary

ELEVATIONS AT SITE:

Site (1980): 670'
100-year flood: 685'
5-year flood: 679'
Flat pool: 667'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: ?

SITE CHARACTER:

% Upland: 100 (area previously filled)
% Wetland:
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: Adjacent
Wetland: Adjacent
Residence: less than 1000'
Beneficial Use Site: 0
Other:

VEGETATION CHARACTER: Weeds

SITE OWNER: City of Red Wing

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other: None

EXISTING USE OF SITE:

Fish and Wildlife: Minimal

Socioeconomic: Industrial development potential

Adjacent land use: Railroad, industrial harbor, wetlands

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 4
CUT: 8
SITE: 4.57

Page 2 of 3

SITE: 4.57

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards): 605,000
Area at base (acres): 16
Height (feet): 25
Length (feet): 1,200
Width (feet): 600
Side slope (ratio): 4:1
Final elevation (feet): 695'

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged: 4/40
Volume dredged per job (cubic yards): 21,400
Beneficial use demand (cubic yards): 360,000
Beneficial Use by: City of Red Wing, Goodhue County
Other cuts using sites: 7,9,11

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 100% medium to fine sand
Silt (%):
Other (%):
Contaminants: No Analysis Done
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): No (possible hydraulic rehandling at site).

EROSION CONTROL NEEDED:

Riprap: Yes
Revegetation: None
Other: None
Areas and features protected by erosion control: adjacent creek and wetlands

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 4
CUT: 8
SITE: 4.57

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SITE: 4.57

SPECIAL CONDITIONS FOR SITE USE: Close coordination with Red Wing
Harbor Commission

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	None	
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	16	old landfill
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

Above Red Wing Highway Bridge
POOL: 4
CUT: 8
SITE: 4.57

Frequency: 10 %
4/40 yrs
Volume per job: 21,400 cy

	TYPES OF DREDGES					
	PIPELINE					MECHANICAL
		20 inch	16 inch	12 inch	Backhoe 350 H.P.	Clamshell 700 H.P.
Basic Dredging Operation	\$358,000*	\$335,000*	\$318,000*	\$119,000*	\$128,000*	\$141,000*
Berming Costs (1)	-	-	7,000*	-	-	-
Diking Costs (1)	-	-	4,000	-	-	-
Riprapping Costs	43,000*	43,000*	43,000*	43,000*	43,000*	43,000*
Seasonal Removal	0	0	0	0	0	0
Special Construction (2)	7,000*	10,000*	7,000*	7,000*	7,000*	7,000*
Land Acquisition	0	0	0	0	0	0
Total of GREAT recommended Actions	408,000	388,000	368,000	169,000	178,000	191,000
Average Annual Costs	40,800	38,800	36,800	16,900	17,800	19,100

*GREAT recommended actions

(1) At 4.51.

(2) Berming at 4.57.

DREDGED MATERIAL PLACEMENT SITE

POOL: 4

EXISTING CONDITIONS DESCRIPTION

CUT: 9

SITE: 4.57

SITE: 4.57

Page 1 of 3

CUT LOCATION: 792.0 - 793.5 (Cannon River)

PLACEMENT SITE LOCATION: RM 792

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 670'
100-year flood: 685'
5-year flood: 679'
Flat pool: 667'

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: Yes

SITE CHARACTER:

% Upland: 100 (area previously filled)
% Wetland:
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: Adjacent
Wetland: Adjacent
Residence: less than 1000'
Beneficial Use Site: 0'
Other:

VEGETATION CHARACTER: Weeds

SITE OWNER: City of Red Wing

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other: None

EXISTING USE OF SITE:

Fish and Wildlife: Minimal

Socioeconomic: Industrial development potential

Adjacent land use: Railroad, industrial harbor, wetlands

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 4

CUT: 9

SITE: 4.57

Page 2 of 3

SITE: 4.57

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards):	605,000
Area at base (acres):	16
Height (feet):	25
Length (feet):	1,200
Width (feet):	600
Side slope (ratio):	4:1
Final elevation (feet):	695'

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged:	8/40
Volume dredged per job (cubic yards):	53,400
Beneficial use demand (cubic yards):	360,000
Beneficial Use by:	City of Red Wing, Goodhue County
Other cuts using sites:	7, 8, 11

DREDGED MATERIAL CHARACTERISTICS:

Sand (%):	97% medium to fine sand
Silt (%):	
Other (%):	
Contaminants:	Very Mild PCB pressure
Contaminant Source:	Twin Cities, Agricultural

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry):	X
Hydraulic (in slurry):	Partially, possible hydraulic rehandling

EROSION CONTROL NEEDED:

Riprap:	Yes
Revegetation:	None
Other:	None
Areas and features protected by erosion control:	adjacent creek & wetlands

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 4
CUT: 9
SITE: 4,57
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SITE: 4.57

SPECIAL CONDITIONS FOR SITE USE: Close coordination with Red Wing Harbor
Commission

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	None	
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	16	old landfill
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

Cannon River
 POOL: 4
 CUT: 9
 SITE: 4.57

Frequency: 20 %
 8/40 yrs
 Volume per job: 53,400 cy

CHANNEL MAINTENANCE PLAN COSTS PER DREDGING JOB

	TYPES OF DREDGES					
	PIPELINE		MECHANICAL			
	20 inch	16 inch	12 inch	Backhoe 350 H.P.	700 H.P.	Clamshell 350 H.P. 700 H.P.
Basic Dredging Operation	\$877,000*	\$913,000*	\$932,000*	\$312,000*	\$310,000*	\$354,000*
Berming Costs (1)	7,000*	10,000*	12,000*	-	-	-
Diking Costs (1)	9,000	9,000	8,000	-	-	-
Riprapping Costs	43,000*	43,000*	43,000*	43,000*	43,000*	43,000*
Seasonal Removal	0	0	0	0	0	0
Special Construction (2)	12,000*	12,000*	12,000*	12,000*	12,000*	12,000*
Land Acquisition	0	0	0	0	0	0
Total of GREAT recommended Actions	939,000	978,000	999,000	367,000	365,000	409,000
Average Annual Costs	187,800	185,600	199,800	73,400	73,000	81,800

*GREAT recommended actions
 (1) At 4.58.
 (2) Berming at 4.57.

DREDGED MATERIAL PLACEMENT SITE

EXISTING CONDITIONS DESCRIPTION

POOL: 4
CUT: 10
SITE: 4.63

SITE: 4.63

Page 1 of 3

CUT LOCATION: 794.0-794.6 (Trenton)

PLACEMENT SITE LOCATION: RM 794

TYPE OF PLACEMENT SITE: Permanent X Temporary

ELEVATIONS AT SITE:

Site (1980): 670
100-year flood: 685.5
5-year flood: 679
Flat pool: 667

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: ?

SITE CHARACTER:

% Upland: 64
% Wetland: 36
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: Adjacent
Wetland: Adjacent
Residence: less than 1,500'
Beneficial Use Site: 0
Other: Adjacent to side channel

VEGETATION CHARACTER: Site is a revegetated river island

SITE OWNER: Red Wing Yacht Club

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other: None

EXISTING USE OF SITE:

Fish and Wildlife: turtle nesting, raptors, passerine birds

Socioeconomic: private recreational area

Adjacent land use: Main channel navigation; side channels, backwaters.

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 4
CUT: 10
SITE: 4.63

Page 2 of 3

SITE: 4.63

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards):	90,000
Area at base (acres):	11
Height (feet):	8
Length (feet):	750
Width (feet):	400
Side slope (ratio):	4:1
Final elevation (feet):	695

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged:	4/40
Volume dredged per job (cubic yards):	44,800
Beneficial use demand (cubic yards):	beach development (?cy)
Beneficial Use by:	Red Wing Conservation Organization
Other cuts using sites:	None

DREDGED MATERIAL CHARACTERISTICS:

Sand (%):	98% medium to fine sand
Silt (%):	
Other (%):	
Contaminants:	No Analysis done, disposal method causes short-term water
Contaminant Source:	quality impacts

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry):	X
Hydraulic (in slurry):	X

EROSION CONTROL NEEDED:

Riprap:	Yes (along back side of site)
Revegetation:	None
Other:	
Areas and features protected by erosion control:	adjacent side channel and backwaters.

DREDGED MATERIAL PLACEMENT SITE
SITE DEVELOPMENT DESCRIPTION AND IMPACTS
(Continued from previous page)

POOL: 4
CUT: 10
SITE: 4.63

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SITE: 4.63

SPECIAL CONDITIONS FOR SITE USE:

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	4, will very likely be effected.	4 or 5
Wetlands altered:	None	
Open water filled:	Unknown	
Upland altered:	7	old spoil site
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

irenton
Pool: 4
CUT: 10
SIDE: 4.63

Frequency: 10%
4/40 yrs
Volume per job: 44,800 cy

	TYPES OF DREDGES					
	PIPELINE 20 inch	16 inch	12 inch	MECHANICAL		
				Backhoe 350 H.P.	700 H.P.	Clamshell 350 H.P. 700 H.P.
Basic Dredging Operation	\$ 218,000*	\$ 274,000*	\$ 299,000*	\$ 169,000*	\$ 185,000*	\$ 228,000* \$ 221,000*
Berming Costs	7,000*	11,000*	14,000*			
Diking Costs	8,000	8,000	7,000			
Riprapping Costs	137,000	137,000	137,000	137,000	137,000	137,000
Seasonal Removal	0	0	0	0	0	0
Special Construction						
Land Acquisition	6,000*	6,000*	6,000*	6,000*	6,000*	6,000*
Total of GREAT recommended Actions	231,000	291,000	319,000	175,000	191,000	334,000 227,000
Average Annual Costs	23,100	29,100	31,900	17,500	19,100	33,400 22,700

*GREAT recommended actions

DREDGED MATERIAL PLACEMENT SITE

POOL: 4
CUT: 11
SITE: 4.57

EXISTING CONDITIONS DESCRIPTION

SITE: 4.57

Page 1 of 3

CUT LOCATION 795.5-796.4 (Above Trenton)

PLACEMENT SITE LOCATION: RM 792

TYPE OF PLACEMENT SITE: Permanent X Temporary _____

ELEVATIONS AT SITE:

Site (1980): 670'
100-year flood: 685'
5-year flood: 679'
Flat pool: 667

FLOOD STAGE FACTORS:

Site within floodplain: Yes
Site within floodway (effective flow area): Yes
Site below ordinary high water mark: ?

SITE CHARACTER:

% Upland: 100 (area previously filled)
% Wetland:
% Open water: 0

DISTANCE FROM SITE TO:

Open Water: Adjacent
Wetland: Adjacent
Residence: less than 1,000'
Beneficial Use Site: 0
Other:

VEGETATION CHARACTER: Weeds

SITE OWNER: City of Red Wing

SPECIAL CONCERNS:

Endangered species habitat: None
Historical or archeological value: Unknown
Other: None

EXISTING USE OF SITE:

Fish and Wildlife: Minimal
Socioeconomic: Industrial development potential
Adjacent land use: Railroad, and industrial harbor, wetlands

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS

POOL: 4

CUT: 11

SITE: 4.57

Page 2 of 3

SITE: 4.57

MAXIMUM SITE DEVELOPMENT DIMENSIONS:

Volume capacity (cubic yards):	605,000
Area at base (acres):	16
Height (feet):	25
Length (feet):	1,200
Width (feet):	600
Side slope (ratio):	4:1
Final elevation (feet):	695'

ESTIMATED SITE USE SCHEDULE:

Frequency cut is dredged:	4/40
Volume dredged per job (cubic yards):	23,400
Beneficial use demand (cubic yards):	360,000
Beneficial Use by:	City of Red Wing, Goodhue County
Other cuts using sites:	7, 8, 9,

DREDGED MATERIAL CHARACTERISTICS:

Sand (%): 97% medium to fine sand
Silt (%):
Other (%):
Contaminants: No Analysis Done
Contaminant Source:

DREDGED MATERIAL PLACEMENT METHODS:

Mechanical (semidry): X
Hydraulic (in slurry): X

EROSION CONTROL NEEDED:

Riprap: Yes
Revegetation: None
Other: None
Areas and features protected by erosion control: Adjacent creek and wetlands

DREDGED MATERIAL PLACEMENT SITE

SITE DEVELOPMENT DESCRIPTION AND IMPACTS

(Continued from previous page)

POOL: 4

CUT: 11

SITE: 4.57

Page 3 of 3

SITE: 4.57

SPECIAL CONDITIONS FOR SITE USE: Close coordination with Red Wing Harbor
Commission

WILDLIFE HABITAT IMPACTS:

	<u>Acres</u>	<u>Type</u>
Wetlands filled:	None	
Wetlands altered:	None	
Open water filled:	None	
Upland altered:	16	old landfill
Endangered Species habitat lost:	None	
Side channels blocked:	None	
Other:	None	

HISTORICAL/ARCHEOLOGICAL IMPACTS:

Historical/Archeological sites known to exist: ☐
Historical/Archeological sites were not found: ☐
Historical/Archeological survey not made: ☒

CHANNEL MAINTENANCE PLAN COSTS
PER DREDGING JOB

Above Trenton
POOL: 4
CUT: 11
SITE: 4.57

Frequency: 10 $\frac{1}{4}$ yrs
Volume per job: 23,400 cy

	TYPES OF DREDGES						
	PIPELINE				MECHANICAL		
		20 inch	16 inch	12 inch	Backhoe 350 H.P.	350 H.P.	Clamshell 700 H.P.
Basic Dredging Operation	\$ 392,000*	\$ 425,000*	\$ 455,000*	\$ 150,000*	\$ 159,000*	\$ 172,000*	\$ 171,000*
Berming Costs (1)	5,000*	7,000*	8,000*	-	-	-	-
Diking Costs (1)	7,000	6,000	5,000	-	-	-	-
Riprapping Costs	43,000*	43,000*	43,000*	43,000*	43,000*	43,000*	43,000*
Seasonal Removal	0	0	0	0	0	0	0
Special Construction (2)	8,000*	8,000*	8,000*	8,000*	8,000*	8,000*	8,000*
Land Acquisition	0	0	0	0	0	0	0
Total of GREAT recommended actions	448,000	483,000	514,000	161,000	170,000	223,000	222,000
Average Annual Costs	44,800	48,300	51,400	16,100	17,000	22,300	22,200

*GREAT recommended actions

(1) At 4.67.

(2) Berming at 4.57.

COMPARISON OF ALTERNATIVE PLAN SITES

Pool 4 Cut 1

Alternative Plan	Selected	Selected	NED, EQ, RFFP MPFW/OG		
Placement Site No.	4.02	4.20	4.04		
Site Capacity (cy)	500,000	323,000	367,000		
Site Acreage	10.3	6.4	10		
Site Height (ft)	30	20	20		
Potential Beneficial use removal (cy)	1,232,000	85,000	1,231,000		
Conditions ¹ favoring use of site	1. 4. 25. 6. 7. 8. 9. 11 32. 33. 35.	21 22 4 5 11 12 33 35 16*	1. 22. 4. 5. 6. 27. 8. 29. 11 32. 33. 35.		
Conditions ¹ adverse to use of site	62 63. 50. 54. 56.	43 66 47 68 69 50 74	43. 50 74. 56.		
* for this cut only ¹ Code numbers in columns represent conditions listed on pages ____.					
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COMPARISON OF ALTERNATIVE PLAN SITES

Pool 4 Cut 2

Alternative Plan	Selected	Selected	NED, MPFW/OG	NED, EQ, RFFP MPFW/OG	
Placement Site No.	4.02	4.20	4.10 ²	4.04	
Site Capacity (cy)	500,000	323,000	425,000	367,000	
Site Acreage	10.3	6.4	11	10	
Site Height (ft)	30	20	25	20	
Potential Beneficial use removal (cy)	1,231,000	55,000	-	-	
Conditions ¹ favoring use of site	1. 4. 25. 7. 11 32. 33. 35.	21 22 4 5 11 12 33 35	1 6 7 8 9 11 32 33 16	1. 22. 4. 5. 27 32. 33. 35.	
Conditions ¹ adverse to use of site	62. 63. 66 68 49 50. 54. 56.	43 66 47 68 69 50 74 76	62 63 64 65 70 54 75	43. 66 68 49 50 74. 56.	
			2 Temporary Site		
1 Code numbers in columns represent conditions listed on pages ____.					
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COMPARISON OF ALTERNATIVE PLAN SITES

Pool 4 Cut 3

ernative Plan	Selected	Selected	NED, MPFW/OG	EQ, RFFP	RFFP
cement Site No.	4.02	4.20	4.13 ²	4.04	4.25
e Capacity (cy)	500,000	323,000	2,559,000	367,000	435,000
e Acreage	10.3	6.4	70	10	18
e Height (ft)	30	10	30	20	15
ential Beneficial removal (cy)	1,231,000	85,000	-	-	85,000
ditions ¹ favoring of site	1. 4. 25. 7. 32. 33. 35.	21 22 4 5 11 12 33 35	1 6 7 8 11 33 16	1. 22. 4. 5. 27. 32. 33. 35.	21. 2 24. 5. 10 12. 33. 35. 16.
ditions ¹ adverse use of site	62 63 66 68 49 50. 54. 56.	43 66 47 68 69 50 74 76	42 43 64 65 69 70 54 75	43. 66 68 49 50 74. 56.	43. 66. 47 48. 49. 71 54
			2 Temporary Site		
1 Code numbers in columns represent conditions listed on pages ____.					

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COMPARISON OF ALTERNATIVE PLAN SITES

Pool 4 Cut 3 (Cont)

Alternative Plan	Selected				
Placement Site No.	4.18 ³				
Site Capacity (cy)	129,000				
Site Acreage	4				
Site Height (ft)	20				
Potential Beneficial use removal (cy)	85,000				
Conditions ¹ favoring use of site	2 4 5 30 11 12 33 35				
Conditions ¹ adverse to use of site	41 43 66 47 48 49 74 56 3 Rehandle Site only				
¹ Code numbers in columns represent conditions listed on pages _____.					
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COMPARISON OF ALTERNATIVE PLAN SITES

Pool 4 Cut 4

Alternative Plan	Selected, RFFP	Selected, RFFP	Selected, EQ	Selected	Selected, EQ
Placement Site No.	4.25	4.24	4.20	4.19	4.18 ²
Site Capacity (cy)	950,000	2,417,000	323,000	161,000	129,000
Site Acreage	18	60	6.4	5	4
Site Height (ft)	30	25	20	20	20
Potential Beneficial use removal (cy)	85,000	85,000	85,000	85,000	85,000
Conditions ¹ favoring use of site	21 2 4 5 27 10 12 33 35* 16	21. 2. 4. 5. 27. 10. 12. 33. 35* 16.	21. 22. 4. 5. 26. 28. 29. 11. 32 33. 35.	2. 4 5. 26. 28. 29. 10. 32. 33. 35.*	2. 4. 25. 26. 28. 29. 30. 11. 32. 33. 35.
Conditions ¹ adverse to use of site	43 66 68 49 71 54	43. 66. 68. 49. 71. 54	43. 47. 50 74. 56.	41 43. 47. 71. 74. 76	41 43 47. 74. 56.
	*for small amount	*for small amount		* for small amount	2 Rehandle Site Only
¹ Code numbers in columns represent conditions listed on pages _____.					

Pool 4 Cut 4 (Cont)

COMPARISON OF ALTERNATIVE PLAN SITES

Pool 4 Cut 5

Alternative Plan	Selected, EQ RFFP	Selected	NED, MPF W/OG		
Placement Site No.	4.24	4.25	4.29 ²		
Site Capacity (cy)	2,417,000	950,000	156,000		
Site Acreage	60	18	9.5		
Site Height (ft)	25	30	?		
Potential Beneficial use removal (cy)	85,000	85,000	-		
Conditions ¹ favoring use of site	21. 2 4 5 27 29 10 12 33 35* 16	21 2 4 5 27 29 10 12 33 35* 16	6. 7 8* 11 33 16**		
Conditions ¹ adverse to use of site	43. 66 68 71 54	43 66 68 71 54	42 43 64 65 49 70 72 74 75		
*for some of the material			2 Temporary Site		
			* only for first stage of site use		
1 Code numbers in columns represent conditions listed on pages ____.			** if regularly emptied		

COMPARISON OF ALTERNATIVE PLAN SITES

Pool 4 Cut 6

Alternative Plan	Selected, EQ	Selected	Selected	NED, MPFW/OG	RFFP
Placement Site No.	4.37	4.38	4.48 ^{2/}	4 68	4.34, 4.35, ^{or} 4.36
Site Capacity (cy)	944,000		200,000	1,016,000	1,032,000
Site Acreage	13		8	21	32
Site Height (ft)	45		15	30	20
Potential Beneficial use removal (cy)	- 0 - material	considered polluted	-	-	-
Conditions ¹ favoring use of site	21 2 5 10 11 12 16		21 22 5 30 11 12 16*	1 26 28 29 11 16	2 5 10 32 16
Conditions ¹ adverse to use of site	43 64 66 47 68 49 73 54 75 56		43 64 66 47 48 49 73 54 75	62 43 64 65 47 70 72 73 74 75	41 43 64 46 47 48 49 71 73 74 75

^{2/} Rehandle Site Only
* When material removed to site 4.37.

¹ Code numbers in columns represent conditions listed on pages ____.

COMPARISON OF ALTERNATIVE PLAN SITES

Pool 4 Cut 7

Alternative Plan	Selected, EQ	Selected, NED	Selected, NED	Selected, EQ	NED
Placement Site No.	4.57	4.49	4.47	4.54	4.48
Site Capacity (cy)	605,000	300,000	90,000	300,000	200,000
Site Acreage	15	8	11	8	8
Site Height (ft)	25	25	5	25	15
Potential Beneficial use removal (cy)	360,000	-	360,000	360,000	360,000
Conditions ¹ favoring use of site	21	1	1	21	21
	22	6	4	22	22
	4	27	5	4	4
	5	8	27	5	5
	27	9	28	27	28
	30	11	11	30	29
	11	32	32	11	30
	12	33	33	12	11
	33	15*	15	33	32
	35			15	33
	16				35
Conditions ¹ adverse to use of site	43	42	42	43	43
	66	43	43	66	46
	48	64	46	48	47
	49	65	49	49	54
	54	50	50	54	56
		54	54	56	
		76	56		
* for small amount					
1 Code numbers in columns represent conditions listed on pages ____.					
231					

COMPARISON OF ALTERNATIVE PLAN SITES

Pgol 4 Cut 7 (Continued)

Alternative Plan	NED,MPFW/OG	RFFP	RFFP	RFFP	
Placement Site No.	4.51	4.34	4.35	4.36 /	
Site Capacity (cy)	450,000	1,032,000			
Site Acreage	18	32			
Site Height (ft)	15	20			
Potential Beneficial use removal (cy)	-	-			
Conditions ¹ favoring use of site	1 4 5 26 27 28 29 11 32 33 35 36	2 4 5 10 32 33 35 16			
Conditions ¹ adverse to use of site	62 43 70 54	41 43 46 47 48 69 71 74			
¹ Code numbers in columns represent conditions listed on pages _____.					
		232			

COMPARISON OF ALTERNATIVE PLAN SITES

Pool 4 Cut 8

Alternative Plan	Selected, EQ	NED, EQ	NED	NED	MPFW/OG
Placement Site No.	4.57	4.54	4.55	4.56	4.52
Site Capacity (cy)	605,000	300,000	333,333	416,600	565,000
Site Acreage	15	8	13	10	35
Site Height (ft)	25	25	15	25	10
Potential Beneficial use removal (cy)	360,000	360,000	360,000+	360,000	-
Conditions ¹ favoring use of site	21	21	21	21	1
	22	22	24	24	4
	4	4	5	5	5
	5	5	27	27	26
	27	27	28	28	27
	30	30	29	29	28
	11	11	30	30	29
	12	12	11	11	11
	33	33	32	32	32
	35	15	33	33	33
	16	16	15	15	15
			16	16	16
Conditions ¹ adverse to use of site	43	43	42	42	62
	46	46	63	43	43
	48	48	46	46	50
	49	49	74	74	54
	54	54			
¹ Code numbers in columns represent conditions listed on pages ____.					

COMPARISON OF ALTERNATIVE PLAN SITES

Pool 4 Cut 8 (Continued)

Alternative Plan	RFFP	RFFP	RFFP		
Placement Site No.	4.34	4.35	4.36		
Site Capacity (cy)			1,032,000		
Site Acreage			32		
Site Height (ft)			20		
Potential Beneficial use removal (cy)			-		
Conditions ¹ favoring use of site			2 4 5 10 32 33 35 16		
Conditions ¹ adverse to use of site			41 43 46 47 48 69 71 74		
¹ Code numbers in columns represent conditions listed on pages ____.					
234					

COMPARISON OF ALTERNATIVE PLAN SITES

Pool 4 Cut 9

Alternative Plan	Selected, EQ	NED	NED, MPFW/OG	NED	EQ
Placement Site No.	4.57	4.52	4.58	4.59	4.54
Site Capacity (cy)	605,000	565,000	648,000	72,000	300,000
Site Acreage	15	15	16	9	7.5
Site Height (ft)	25	30	25	5	25
Potential Beneficial use removal (cy)	360,000	-	-	250,000+	360,000
Conditions ¹ favoring use of site	21	1	1	1	21
	22	4	6	24	22
	4	5	8	5	4
	5	26	9	6	5
	27	27	11	8	27
	30	28	32	9	30
	11	29	33	11	11
	12	11	16	32	12
	33	32		33	33
	35	33		35	15
	16	15			16
		16			
Conditions ¹ adverse to use of site	43	62	62	62	43
	46	43	43	43	46
	48	50	64	47	48
	49	54	65	50	49
	54		47	74	54
			60	76	
			74		
			75		
¹ Code numbers in columns represent conditions listed on pages ____.					
		235			

COMPARISON OF ALTERNATIVE PLAN SITES

Pool 4 Cut 9 (Continued)

Alternative Plan	RFFP	RFFP	RFFP		
Placement Site No.	4.34	4.35	4.36		
Site Capacity (cy)	1,032,000				
Site Acreage	32				
Site Height (ft)	20				
Potential Beneficial use removal (cy)	-				
Conditions ¹ favoring use of site	2 4 5 10 32 33 35 16				
Conditions ¹ adverse to use of site	41 43 46 47 48 69 71 74				
¹ Code numbers in columns represent conditions listed on pages _____.					

COMPARISON OF ALTERNATIVE PLAN SITES

Pool 4 Cut 10

Alternative Plan	Selected, NED MPEW/OC	NED	EQ	RFFP	RFFP
Placement Site No.	4.63	4.60	4.57	4.62	4.65
Site Capacity (cy)	90,000	104,000	605,000	?	213,000
Site Acreage	7	6	15		5
Site Height (ft)	8	5	25		25
Potential Beneficial use removal (cy)	180,000	-	360,000	-	-
Conditions ¹ favoring use of site	1	1	21	21	21
	4	26	22	2	2
	6	27	4	24	24
	27	8	5	5	5
	8	29	27	10	10
	9	11	30	11	11
	11	12	11	12	12
	32	33	12	33	33
	33		33	35*	35*
	15		35	16	16
			16		
Conditions ¹ adverse to use of site	62	42	43	43	43
	63	43	66	46	46
	65	64	48	47	47
	50	65	49	68	68
	74	70	54	69	69
	76	54		54	54
		75			
		76			
				*for some of the material	*for some of the material
¹ Code numbers in columns represent conditions listed on pages _____.					

COMPARISON OF ALTERNATIVE PLAN SITES

Pool ⁴ _____ Cut ¹¹ _____

Alternative Plan	Selected, EQ	NED, MPFW/OG	RFFP	RFFP	
Placement Site No.	4.57	4.67	4.62	4.65	
Site Capacity (cy)	605,000	104,000	?	213,000	
Site Acreage	15	6.4		5	
Site Height (ft)	25	10		25	
Potential Beneficial use removal (cy)	360,000	-	-	-	
Conditions ¹ favoring use of site	21 22 4 5 27 30 11 12 33 35 16	1 26 7 8 9 11 32 33 16	21 2 24 5 10 11 12 33 35* 16	21 2 24 5 10 11 12 33 35* 16	
Conditions ¹ adverse to use of site	43 66 48 49 54	62 63 64 65 70 54 75	43 46 47 68 69 54	43 46 47 68 69 54	
			*for some of the material	* for some of the material	
¹ Code numbers in columns represent conditions listed on pages _____.					
					238

Key to Conditions Used in Site Comparisons

1. Recreation enhancement
 2. Remove from floodplain
 3. Fish and wildlife enhancement
 4. Beneficial use identified
 5. Existing road access
 6. Adjacent to cut
 7. No land acquisition required
 8. Provides flexibility of equipment
 9. Least cost to dredge
 10. No erosion potential
 11. No special construction required
 12. No diking of berming
 13. No water quality concerns
 14. Aesthetic enhancement
 15. Beneficial use on the site
 16. Sufficient capacity on the site
-
21. No adverse impacts on recreation use
 22. Potential for removal from floodplain
 23. No adverse fish and wildlife impacts
 24. Potential for identifying a beneficial user
 25. Road access can be constructed
 26. Within $\frac{1}{2}$ mile of cut (easy reach of cutterhead dredges)
 27. No apparent problem in acquiring land or easement
 28. Slight limitation on equipment choice
 29. Less costly than dredging to most other sites
 30. Some erosion potential
 31. (Unused)
 32. Berming required
 33. No water quality concern expected
 34. (Unused)
 35. Know of area where material can be put to beneficial use
 36. Sufficient capacity site but less impact if beneficial use demand is developed

LEGEND



Alternative placement site

4 09

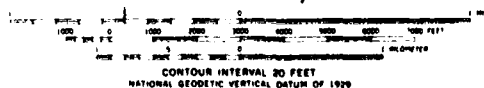
Site number

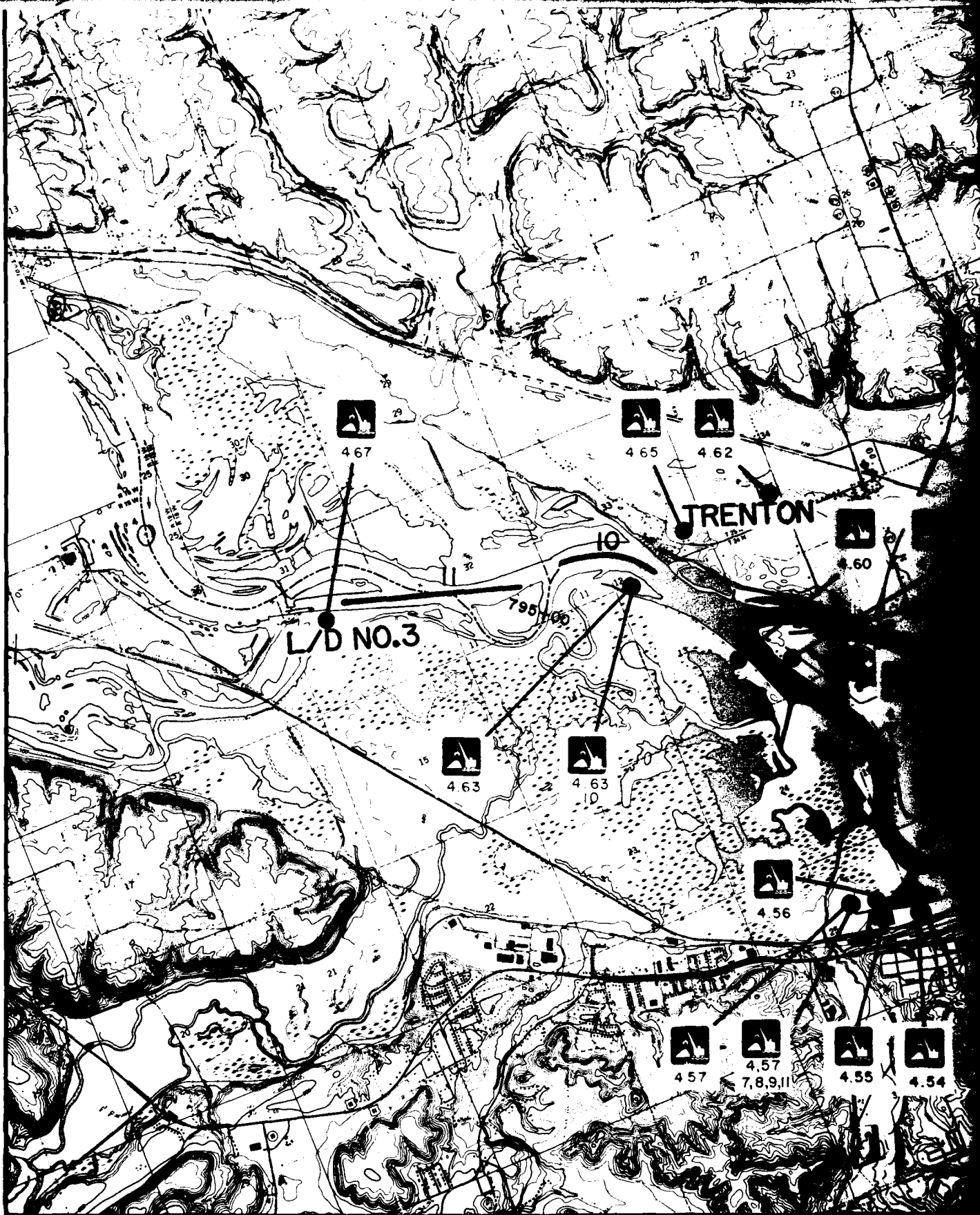
ALTERNATIVE MATERIAL PLACEMENT PLANS

POOL 4(U)				
DREDGE CUT	ALTERNATIVE PLACEMENT PLANS			
	MPFW/OG	NED	EQ	RFFP
1	4.68	4.68	4.37	4.34/4.35/4.36
2	4.51	4.47/4.48/ 4.49/4.51	4.54/4.57	4.34/4.35/4.36
3	4.52	4.54/4.55/4.56	4.54/4.57	4.34/4.35/4.36
4	4.58	4.52/4.58/4.59	4.54/4.57	4.34/4.35/4.36
5	4.63	4.60/4.63	4.57	4.62/4.65
6	4.67	4.67	4.57	4.62/4.65

M = Most probable future without GREAT
 N = National economic development
 E = Environmental quality
 R = Removal from floodplain

SCALE: 1" = 4,000'





BAY CITY

4 59

4 59

4 68

4 37

4 49

4 51

4 49

4 485

4 47

4 47

4 37

RED WING

COLVILLE PARK

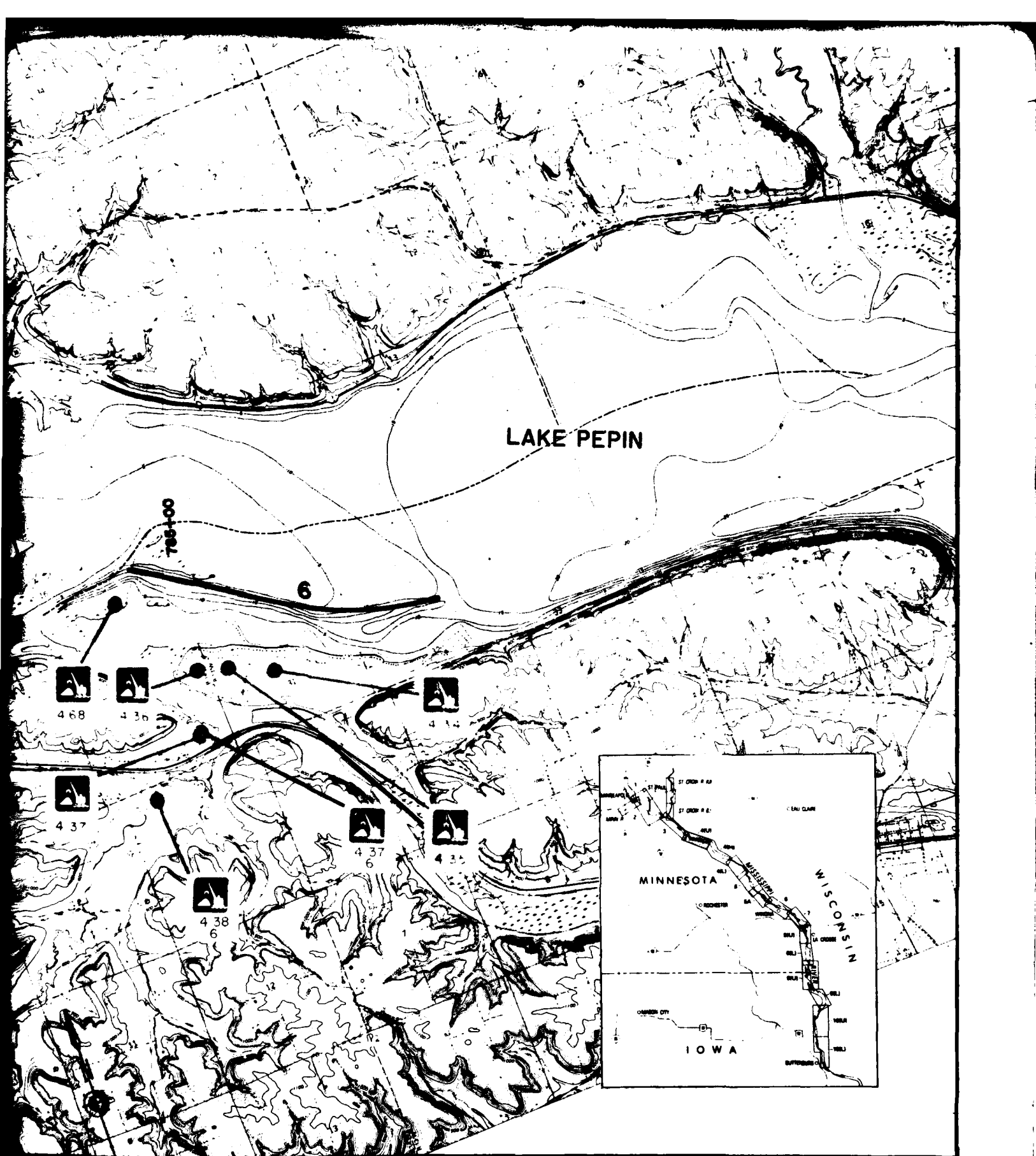
4 55

4 54

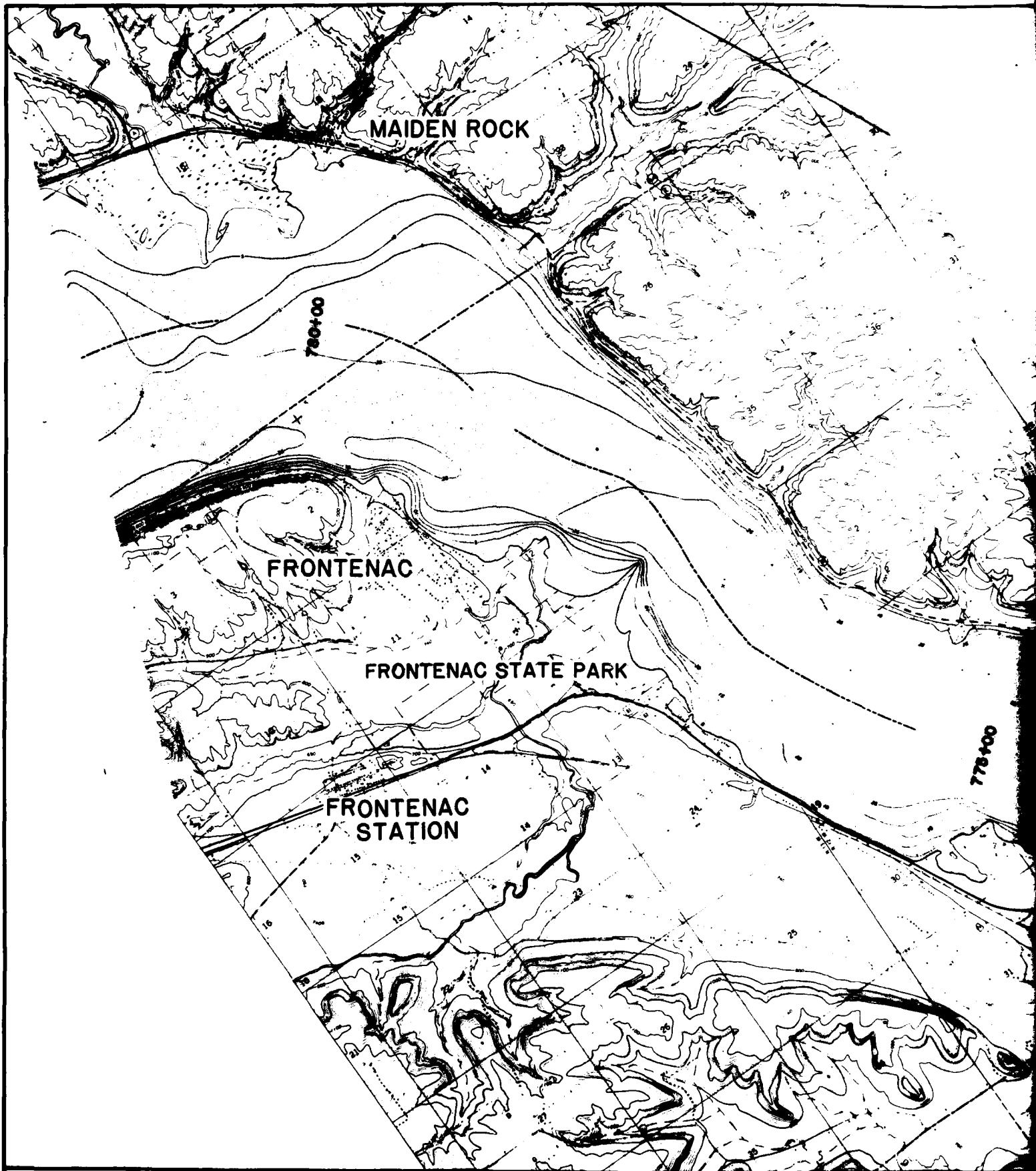
4 54

4 52

4 48



GREAT RIVER ENVIRONMENTAL ACTION TEAM
UPPER MISSISSIPPI RIVER
 (POOL 4(U)—MILE 781 TO MILE 797)



STOCKHOLM

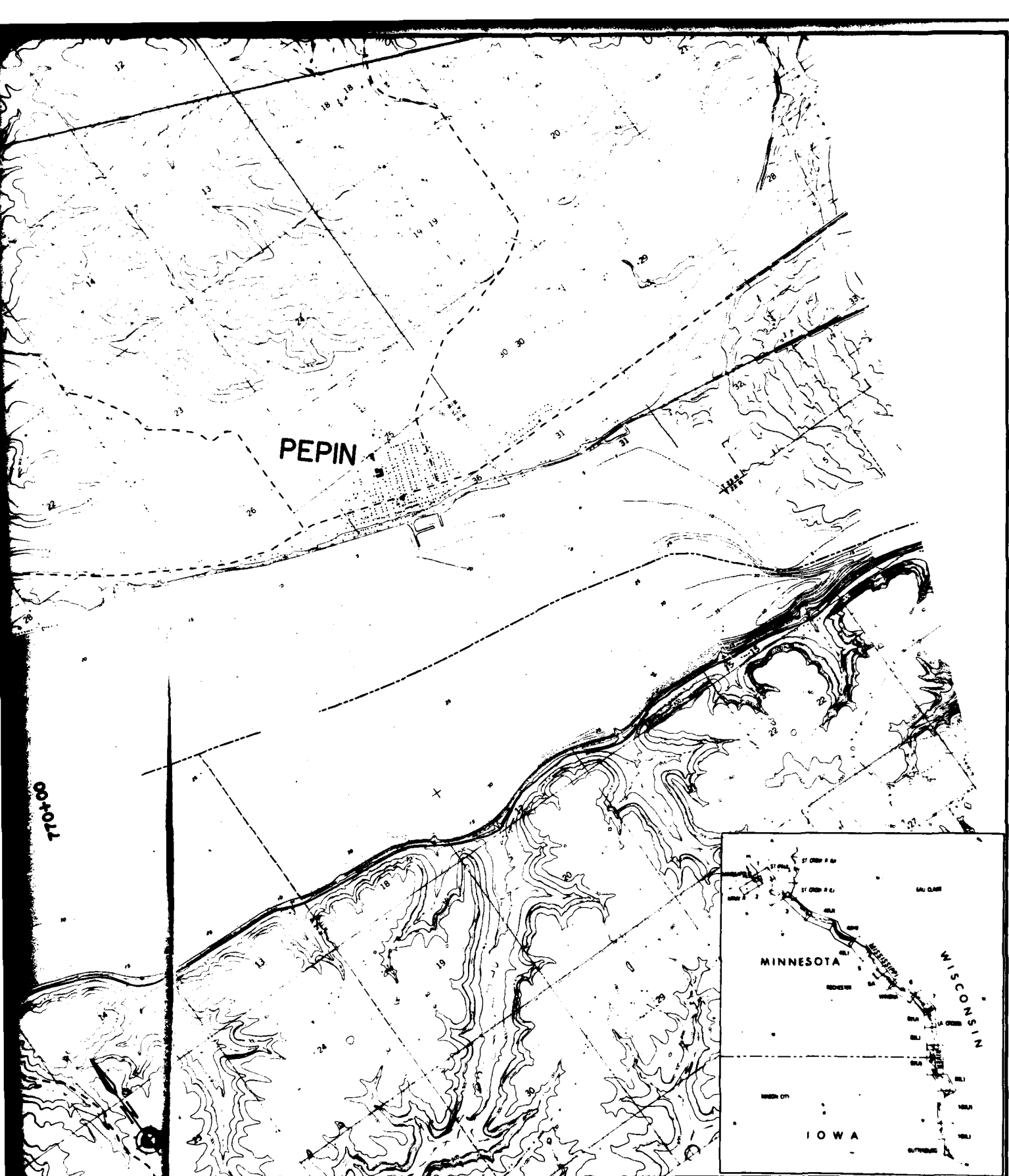
LAKE PEPIN

LAKE CITY

775+00

770+00

2



GREAT RIVER ENVIRONMENTAL ACTION TEAM
UPPER MISSISSIPPI RIVER
(POOL 4(M)-MILE 766 TO MILE 780)

LEGEND

ECOMMENDED CHANNEL MAINTENANCE PLAN

- 5 ————— Dredge cut number
- Location of dredge cut
-  ————— Recommended placement site
- 2 0 6 T ————— Site number
- 3, 4, 5 ————— S = Special conditions on use
T = Temporary use site
- Dredge cuts for which site is used
- Parentheses if site is used for placement of material from a cut in another pool

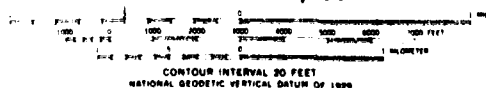
ALTERNATIVE MATERIAL PLACEMENT PLANS

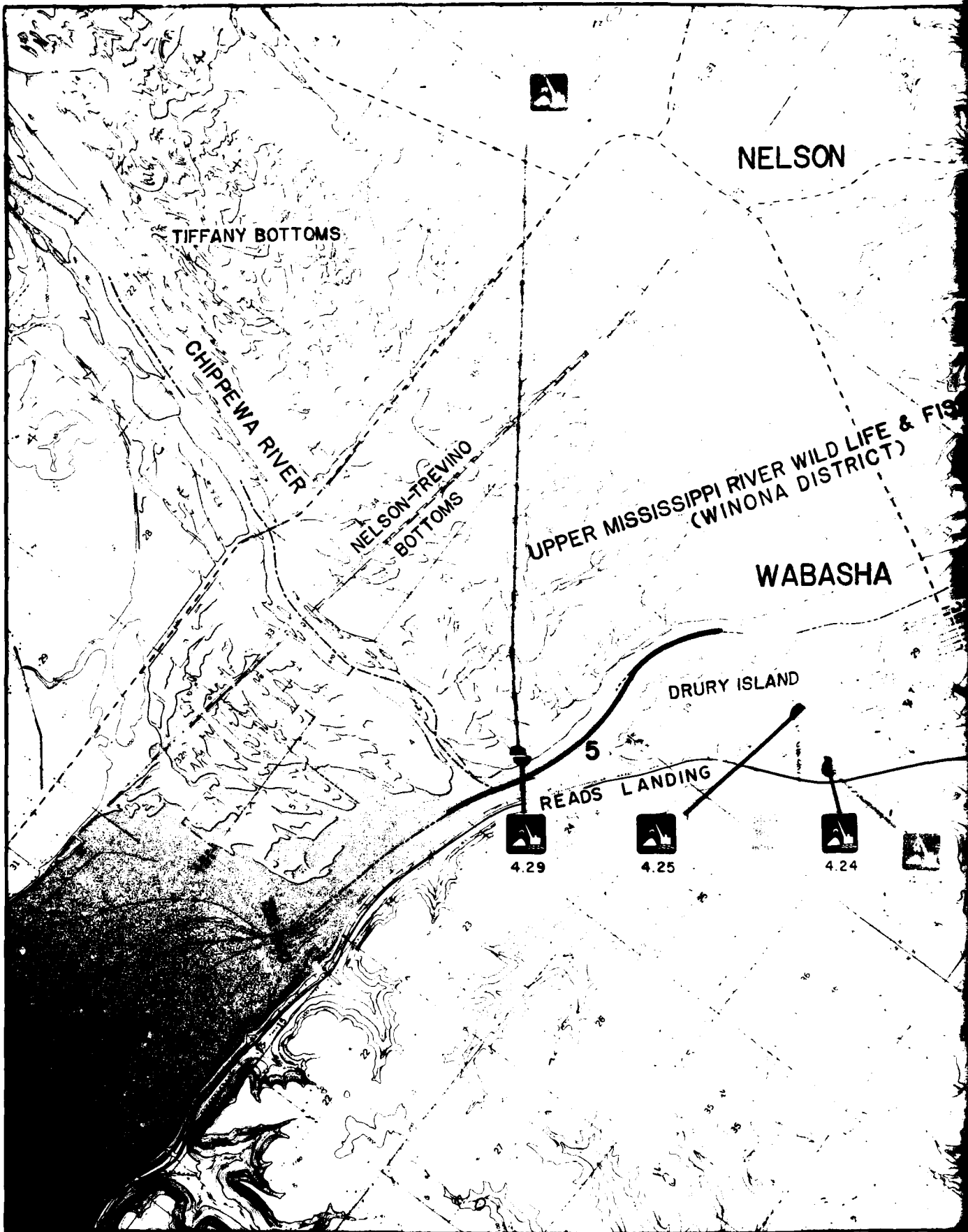
-  ————— Alternative placement site
- 4 0 9 ————— Site number

POOL 4(L)				
DREDGE CUT	ALTERNATIVE PLACEMENT PLANS			
	MPFW/OG	NED	EQ	RFFP
1	4.04	4.04	4.04	4.04
2	4.04/4.10	4.04/4.10	4.04	4.04
3	4.13	4.13	4.04	4.04/4.25
4	4.16/4.17	4.16	4.20/4.18	4.25/4.24
5	4.29	4.29	4.24	4.24

M = Most probable future without GREAT
 N = National economic development
 E = Environmental quality
 R = Removal from floodplain

SCALE: 1" = 4,000'





ON

WILDLIFE & FISH REFUGE
(STRICT)

ASHA

BUFFALO (BEEF)
SLOUGH

PEERSON LAKE

SAND PRAIRIE

ROBINSON LAKE

TEEPEEOTA
POINT

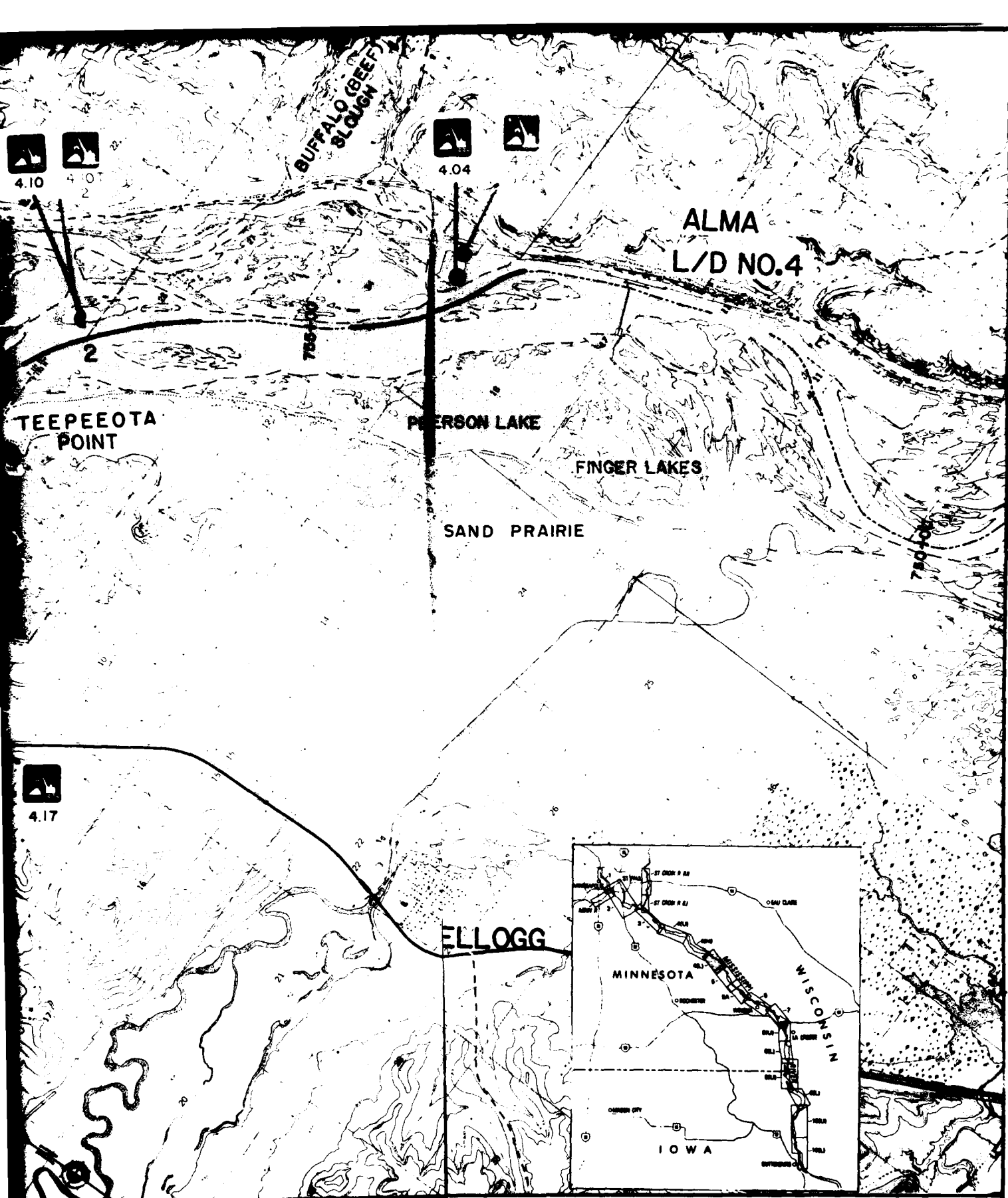
ELLOGG

GREAT RIVER ENVIRONMENTAL

UPPER MISSOURI
(POOL 4/L)

1

2



GREAT RIVER ENVIRONMENTAL ACTION TEAM
UPPER MISSISSIPPI RIVER
(POOL 4(L)-MILE 752 TO MILE 766)

2

1

3

**ATE
LMED**