

LINE 3 REPLACEMENT PROJECT

Application for Pipeline Routing Permit

**Minnesota Public Utilities Commission
Appendix N**

**Tables Detailing Construction and Operations
Impacts**

Appendix N: Land Cover and Wetland Detailed Construction and Operations Impacts
 Appendix N.1 : Land Cover - Construction Impacts (page 1 of 4)



Legend	
	Represents existing, permanently maintained pipeline ROW that has been previously disturbed by earlier pipeline projects. This area is also referred to as the non-working side that will be used for topsoil and subsoil storage for this Project (see Appendix G to view typical ROW construction profiles).
	Represents existing, previously disturbed area that has been used as temporary workspace during construction work activities for an earlier pipeline project. Such area will be acquired and converted to new, permanently maintained pipeline ROW for this Project. This area is also referred to as the working side of the Project (see Appendix G to view typical ROW construction profiles).
	Represents existing, previously disturbed area that has been used as temporary workspace during construction work activities for an earlier pipeline project. Such area will be used again as a temporary workspace area for the construction of this Project. This area is also referred to as the working side of the Project that will be restored and allowed to return to its natural habitat (see Appendix G to view typical ROW construction profiles).
	Represents a new area of disturbance that will be used as a temporary workspace area during construction work activities of this Project. This area is also referred to as the working side of the Project that will be restored and allowed to return to its natural habitat (see Appendix G to view typical ROW construction profiles).

Figure N.1-1: West of Clearbrook Line 3 Construction Workspace

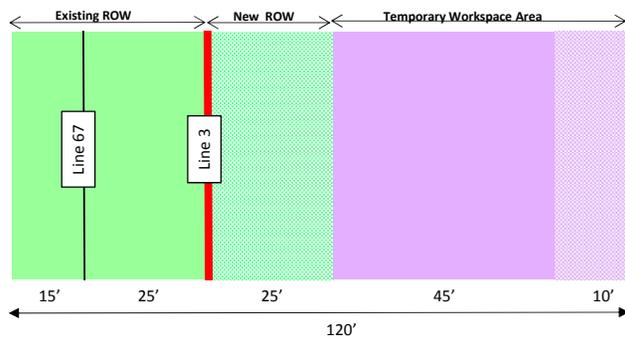


Figure N.1-2: East of Clearbrook Line 3 Construction Workspace

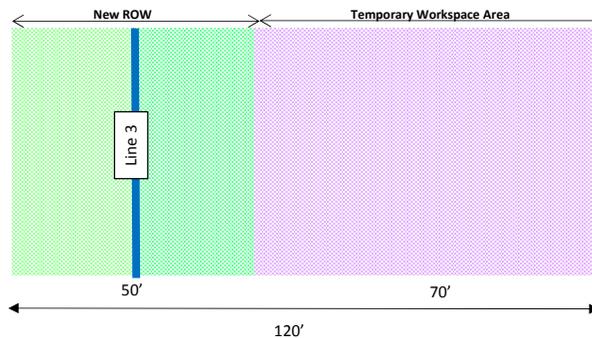


Figure N.1-3: East of Clearbrook Line 3 Construction Workspace (Assumes Sandpiper is Constructed First)

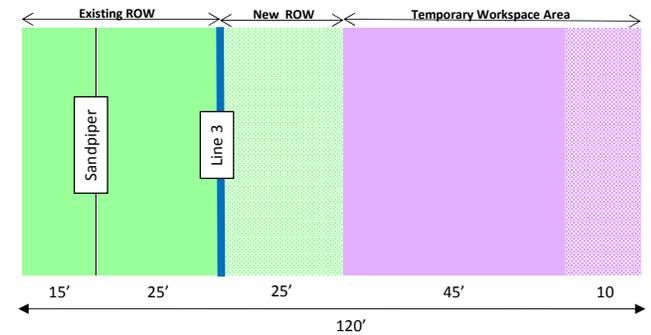


Figure N.1-1 Component	Area of Previous Disturbance			Area of New Disturbance		Total Acres of Disturbance (120')
	Acres of Existing ROW (40')	Acres Converted to New ROW (25')	Acres of Temporary ROW (45')	Acres of Temporary ROW (10')		
Agricultural Land	400.6	247.0	425.3	409.9	1,482.8	
Forest Land	38.3	26.5	37.4	32.6	134.9	
Wetland/ Open Water	7.2	4.7	6.0	14.5	32.4	
Open Land	33.3	19.5	36.5	38.2	127.5	
Developed Land	0.6	0.4	0.7	2.0	3.7	
PROJECT TOTAL^a	479.9	298.2	506.0	497.2	1,781.3	

^a Numbers may not total consistently due to rounding. Calculations in this table are based on USGS GAP digital data only and do not reflect information gathered from field surveys, aerial desktop surveys, or field reconnaissance.

Figure N.1-2 Component	Area of New Disturbance		Total Acres of Disturbance (120')
	Acres Converted to New ROW (50')	Acres of Temporary ROW (70')	
Agricultural Land	216.9	357.6	574.4
Forest Land	932.9	1318.1	2,251.1
Wetland/ Open Water	135.0	148.7	283.7
Open Land	87.8	116.5	204.4
Developed Land	1.7	2.1	3.8
PROJECT TOTAL^a	1,374.3	1,943.0	3,317.3

^a Numbers may not total consistently due to rounding. Calculations in this table are based on USGS GAP digital data only and do not reflect information gathered from field surveys, aerial desktop surveys, or field reconnaissance.

Figure N.1-3 Component	Area of Previous Disturbance			Area of New Disturbance		Total Acres of Disturbance (120')
	Acres of Existing ROW (40')	Acres Converted to New ROW (25')	Acres of Temporary ROW (45')	Acres of Temporary ROW (10')		
Agricultural Land	168.9	102.9	186.2	110.5	568.5	
Forest Land	730.6	465.1	695.5	357.9	2,249.1	
Wetland/ Open Water	100.3	62.8	63.8	57.5	284.4	
Open Land	65.3	36.5	60.5	31.3	193.5	
Developed Land	1.3	0.8	1.2	0.2	3.5	
PROJECT TOTAL^a	1,066.3	668.1	1,007.2	557.4	3,299.0	

^a Numbers may not total consistently due to rounding. Calculations in this table are based on USGS GAP digital data only and do not reflect information gathered from field surveys, aerial desktop surveys, or field reconnaissance.

Appendix N: Land Cover and Wetland Detailed Construction and Operations Impacts
 Appendix N.1: Land Cover - Construction Impacts (page 2 of 4)

Figure N.1-1 Component	Area of Previous Disturbance				Area of New Disturbance	Total Acres of Disturbance (120')
	County / Land Cover Type	Acres of Existing ROW (40')	Acres Converted to New ROW (25')	Acres of Temporary ROW (45')	Acres of Temporary ROW (10')	
Kittson	59.6	37.2	66.8	101.7	265.2	
Agricultural Land	57.3	35.8	63.9	96.0	252.9	
Forest Land				0.3	0.3	
Wetland/ Open Water	0.1	0.1	0.2	0.7	1.1	
Open Land	2.2	1.4	2.7	4.4	10.6	
Developed Land				0.3	0.3	
Marshall	162.9	102.4	177.3	133.8	576.4	
Agricultural Land	150.7	93.7	159.8	124.6	528.8	
Forest Land	4.5	3.9	6.7	2.4	17.5	
Wetland/ Open Water	0.1	0.1	0.1	1.7	2.0	
Open Land	7.2	4.5	10.4	5.1	27.1	
Developed Land	0.4	0.2	0.3	0.0	0.9	
Pennington	85.5	54.2	90.7	87.1	317.4	
Agricultural Land	68.0	42.0	72.2	72.0	254.3	
Forest Land	11.1	8.4	11.2	8.1	38.8	
Wetland/ Open Water	0.2	0.1	0.2	1.4	2.0	
Open Land	6.1	3.6	7.1	5.6	22.4	
Developed Land	0.1	0.1	0.1	0.5	0.7	
Polk	65.2	37.9	59.7	48.6	211.5	
Agricultural Land	42.6	25.0	40.3	26.9	134.8	
Forest Land	9.9	5.7	8.5	8.2	32.4	
Wetland/ Open Water	0.3	0.2	0.2	0.2	0.9	
Open Land	12.3	6.9	10.6	13.0	42.9	
Developed Land	0.1	0.1	0.1	0.3	0.5	
Clearwater	41.2	25.8	41.3	57.7	166.0	
Agricultural Land	26.0	16.0	28.0	35.1	105.1	
Forest Land	7.0	4.8	6.7	7.7	26.3	
Wetland/ Open Water	5.3	3.3	3.6	9.0	21.2	
Open Land	2.9	1.6	2.7	4.9	12.1	
Developed Land	0.1	0.0	0.3	1.0	1.3	
PROJECT TOTAL^a	479.9	298.2	506.0	497.2	1,781.3	

^a Numbers may not total consistently due to rounding. Calculations in this table are based on USGS GAP digital data only and do not reflect information gathered from field surveys, aerial desktop surveys, or field reconnaissance.

Figure N.1-2 Component	Area of New Disturbance		Total Acres of Disturbance (120')	
	County / Land Cover Type	Acres Converted to New ROW (50')		Acres of Temporary ROW (70')
Clearwater	197.2	280.2	477.4	
Agricultural Land	38.8	64.2	103.0	
Forest Land	123.6	170.1	293.7	
Wetland/ Open Water	18.4	22.3	40.7	
Open Land	16.3	23.6	40.0	
Developed Land	0.0	0.0	0.0	
Hubbard	269.8	419.1	688.9	
Agricultural Land	69.8	121.2	191.1	
Forest Land	156.4	248.6	405.0	
Wetland/ Open Water	21.4	20.9	42.3	
Open Land	21.7	27.8	49.6	
Developed Land	0.5	0.5	1.0	
Wadena	42.9	63.0	105.9	
Agricultural Land	0.1	0.1	0.2	
Forest Land	37.1	56.3	93.3	
Wetland/ Open Water	4.8	4.9	9.7	
Open Land	0.9	1.7	2.7	
Developed Land	0.0	0.0	0.0	
Cass	287.6	420.6	708.2	
Agricultural Land	23.8	39.6	63.4	
Forest Land	223.2	333.7	557.0	
Wetland/ Open Water	22.4	25.6	48.0	
Open Land	18.0	21.5	39.5	
Developed Land	0.1	0.1	0.2	
Crow Wing	29.2	45.1	74.3	
Agricultural Land	3.7	6.6	10.3	
Forest Land	19.6	26.9	46.5	
Wetland/ Open Water	4.8	9.5	14.3	
Open Land	1.1	2.1	3.2	
Developed Land	0.0	0.0	0.0	
Aitkin	308.1	388.5	696.6	
Agricultural Land	46.3	70.1	116.4	
Forest Land	200.1	248.9	449.0	
Wetland/ Open Water	44.6	48.3	92.8	
Open Land	17.0	21.1	38.1	
Developed Land	0.1	0.2	0.3	
Carlton	239.5	326.5	566.0	
Agricultural Land	34.2	55.7	90.0	
Forest Land	172.9	233.6	406.5	
Wetland/ Open Water	18.7	17.2	35.8	
Open Land	12.7	18.7	31.4	
Developed Land	1.0	1.3	2.3	
PROJECT TOTAL^a	1,374.3	1,943.0	3,317.3	

^a Numbers may not total consistently due to rounding. Calculations in this table are based on USGS GAP digital data only and do not reflect information gathered from field surveys, aerial desktop surveys, or field reconnaissance.

Figure N.1-3 Component	Area of Previous Disturbance				Area of New Disturbance	Total Acres of Disturbance (120')
	County / Land Cover Type	Acres of Existing ROW (40')	Acres Converted to New ROW (25')	Acres of Temporary ROW (45')	Acres of Temporary ROW (10')	
Clearwater	145.0	92.3	152.7	84.7	474.7	
Agricultural Land	28.3	17.2	33.9	22.0	101.4	
Forest Land	87.3	56.1	90.5	40.9	274.8	
Wetland/ Open Water	18.7	12.5	15.5	12.7	59.5	
Open Land	10.7	6.4	12.8	9.1	39.0	
Developed Land						
Hubbard	204.3	127.7	241.9	112.5	686.5	
Agricultural Land	54.4	32.5	68.7	34.2	189.8	
Forest Land	113.2	73.2	139.0	56.1	381.4	
Wetland/ Open Water	19.6	12.4	18.6	16.9	67.6	
Open Land	16.7	9.4	15.3	5.3	46.7	
Developed Land	0.4	0.2	0.3	0.1	0.9	
Wadena	34.3	21.5	28.6	21.3	105.7	
Agricultural Land	0.1	0.1	0.1	0.0	0.2	
Forest Land	27.0	17.1	25.0	16.9	86.0	
Wetland/ Open Water	6.5	3.8	2.6	4.0	17.0	
Open Land	0.7	0.5	0.9	0.3	2.5	
Developed Land						
Cass	229.6	143.3	233.0	101.2	707.2	
Agricultural Land	19.0	11.5	20.5	12.9	63.9	
Forest Land	162.5	103.1	176.3	69.8	511.7	
Wetland/ Open Water	33.7	21.0	25.1	13.6	93.5	
Open Land	14.2	7.6	11.0	4.9	37.7	
Developed Land	0.1	0.1	0.1	0.0	0.2	
Crow Wing	23.4	14.6	26.8	9.0	73.7	
Agricultural Land	2.9	1.6	4.0	1.6	10.0	
Forest Land	14.3	8.8	13.9	4.4	41.5	
Wetland/ Open Water	5.2	3.6	7.5	2.7	19.0	
Open Land	0.9	0.6	1.5	0.3	3.2	
Developed Land						
Aitkin	241.2	150.7	149.0	151.8	692.7	
Agricultural Land	36.8	23.3	27.4	29.1	116.6	
Forest Land	142.2	89.1	94.0	84.0	409.2	
Wetland/ Open Water	49.7	31.8	18.9	31.7	132.1	
Open Land	12.4	6.5	8.6	7.0	34.5	
Developed Land	0.1	0.1	0.1	0.0	0.2	
Carlton	188.5	118.1	175.2	76.9	558.6	
Agricultural Land	27.3	16.7	31.7	10.7	86.5	
Forest Land	118.8	75.7	115.5	50.9	360.8	
Wetland/ Open Water	32.0	19.6	16.9	10.7	79.3	
Open Land	9.6	5.5	10.3	4.4	29.8	
Developed Land	0.8	0.5	0.7	0.2	2.1	
PROJECT TOTAL^a	1,066.3	668.1	1,007.2	557.4	3,299.0	

^a Numbers may not total consistently due to rounding. Calculations in this table are based on USGS GAP digital data only and do not reflect information gathered from field surveys, aerial desktop surveys, or field reconnaissance.

Appendix N: Land Cover and Wetland Detailed Construction and Operations Impacts
 Appendix N.2 : Land Cover – Operations Impacts (page 1 of 4)

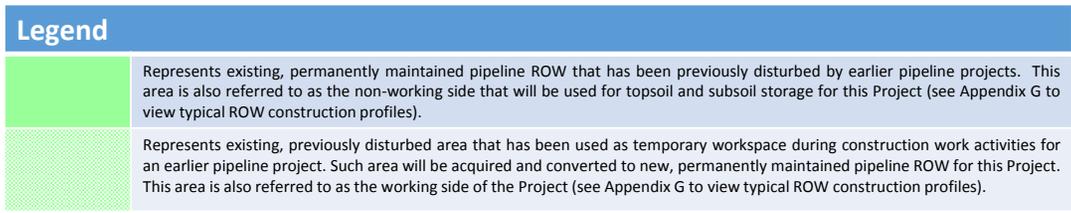


Figure N.2-1: West of Clearbrook Line 3 Operations Workspace

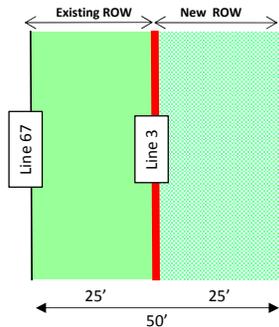


Figure N.2-2: East of Clearbrook Line 3 Operations Workspace

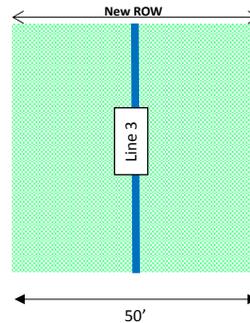


Figure N.2-3: East of Clearbrook Line 3 Operations Workspace (Assumes Sandpiper is Constructed First)

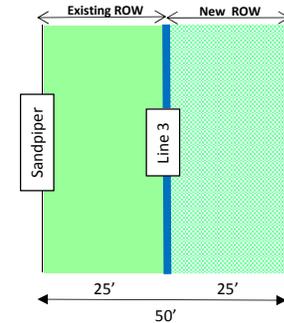


TABLE N.2-1
 West of Clearbrook Operations Impacts by Land Cover Type

Figure N.2-1 Component	Area of Previous Disturbance		Total Area of Permanent ROW (50')
	Existing Permanent ROW (25')	New Permanent ROW (25')	
Agricultural Land	263.8	281.6	545.5
Forest Land	26.7	31.9	58.6
Wetland/ Open Water	6.5	9.6	16.1
Open Land	22.6	24.3	46.9
Developed Land	0.8	1.1	1.9
PROJECT TOTAL^a	320.4	348.5	669.0

^a Numbers may not total consistently due to rounding. Calculations in this table are based on USGS GAP digital data only and do not reflect information gathered from field surveys, aerial desktop surveys, or field reconnaissance.

TABLE N.2-2
 East of Clearbrook Operations Impacts by Land Cover Type

Figure N.2-2 Component	Area of New Disturbance		Total Area of Permanent ROW (50')
	New Permanent ROW (50')		
Agricultural Land	216.9		216.9
Forest Land	932.9		932.9
Wetland/ Open Water	135.0		135.0
Open Land	87.8		87.8
Developed Land	1.7		1.7
PROJECT TOTAL^a	1,374.3		1,374.3

^a Numbers may not total consistently due to rounding. Calculations in this table are based on USGS GAP digital data only and do not reflect information gathered from field surveys, aerial desktop surveys, or field reconnaissance.

TABLE N.2-3
 East of Clearbrook Operations Impacts by Land Cover Type (Assumes Sandpiper is Constructed First)

Figure N.2-3 Component	Area of Previous Disturbance		Total Area of Permanent ROW (50')
	Existing Permanent ROW (25')	New Permanent ROW (25')	
Agricultural Land	105.8	107.0	212.8
Forest Land	466.9	479.0	945.9
Wetland/ Open Water	67.1	67.5	134.7
Open Land	40.9	40.0	80.9
Developed Land	0.8	0.8	1.6
PROJECT TOTAL^a	681.6	694.2	1,375.8

^a Numbers may not total consistently due to rounding. Calculations in this table are based on USGS GAP digital data only and do not reflect information gathered from field surveys, aerial desktop surveys, or field reconnaissance.

Appendix N: Land Cover and Wetland Detailed Construction and Operations Impacts
 Appendix N.2 (: Land Cover – Operations Impacts (page 2 of 4)

TABLE N.2-4 West of Clearbrook Operations Impacts by County			
Figure N.2-1 Component	Area of Previous Disturbance		Total Area of Permanent ROW (50')
	Existing Permanent ROW (25')	New Permanent ROW (25')	
County / Land Cover Type			
Kittson	43.1	50.3	93.4
Agricultural Land	41.2	47.2	88.4
Forest Land		0.2	0.2
Wetland/ Open Water	0.1	0.4	0.5
Open Land	1.8	2.3	4.0
Developed Land	0.1	0.1	0.2
Marshall	103.3	109.9	213.2
Agricultural Land	94.4	100.2	194.6
Forest Land	3.1	3.9	7.0
Wetland/ Open Water	0.8	0.9	1.7
Open Land	4.7	4.7	9.4
Developed Land	0.2	0.2	0.5
Pennington	59.4	59.6	119.0
Agricultural Land	46.4	45.8	92.2
Forest Land	8.3	9.3	17.6
Wetland/ Open Water	0.8	0.8	1.5
Open Land	3.9	3.8	7.8
Developed Land	0.0	0.0	0.0
Red Lake	45.7	49.4	95.1
Agricultural Land	38.5	41.4	79.9
Forest Land	4.0	4.5	8.5
Wetland/ Open Water	1.1	1.3	2.4
Open Land	1.9	1.9	3.9
Developed Land	0.2	0.2	0.5
Polk	42.5	42.5	85.0
Agricultural Land	26.9	26.4	53.3
Forest Land	6.8	7.4	14.3
Wetland/ Open Water	0.2	0.2	0.4
Open Land	8.4	8.4	16.8
Developed Land	0.1	0.1	0.2
Clearwater	26.5	36.8	63.3
Agricultural Land	16.4	20.8	37.2
Forest Land	4.5	6.5	11.0
Wetland/ Open Water	3.5	6.1	9.6
Open Land	1.9	3.1	5.0
Developed Land	0.2	0.4	0.5
PROJECT TOTAL ^a	320.4	348.5	669.0

^a Numbers may not total consistently due to rounding. Calculations in this table are based on USGS GAP digital data only and do not reflect information gathered from field surveys, aerial desktop surveys, or field reconnaissance.

TABLE N.2-5 East of Clearbrook Operations Impacts by County			
Figure N.2-2 Component	Area of New Disturbance		Total Area of Permanent ROW (50')
	New Permanent ROW (50')		
County / Land Cover Type			
Clearwater	197.2	197.2	
Agricultural Land	38.8	38.8	
Forest Land	123.6	123.6	
Wetland/Open Water	18.4	18.4	
Open Land	16.3	16.3	
Developed Land	0.0	0.0	
Hubbard	269.8	269.8	
Agricultural Land	69.8	69.8	
Forest Land	156.4	156.4	
Wetland/Open Water	21.4	21.4	
Open Land	21.7	21.7	
Developed Land	0.5	0.5	
Wadena	42.9	42.9	
Agricultural Land	0.1	0.1	
Forest Land	37.1	37.1	
Wetland/Open Water	4.8	4.8	
Open Land	0.9	0.9	
Developed Land	0.0	0.0	
Cass	287.6	287.6	
Agricultural Land	23.8	23.8	
Forest Land	223.2	223.2	
Wetland/Open Water	22.4	22.4	
Open Land	18.0	18.0	
Developed Land	0.1	0.1	
Crow Wing	29.2	29.2	
Agricultural Land	3.7	3.7	
Forest Land	19.6	19.6	
Wetland/Open Water	4.8	4.8	
Open Land	1.1	1.1	
Developed Land	0.0	0.0	
Aitkin	308.1	308.1	
Agricultural Land	46.3	46.3	
Forest Land	200.1	200.1	
Wetland/Open Water	44.6	44.6	
Open Land	17.0	17.0	
Developed Land	0.1	0.1	
Carlton	239.5	239.5	
Agricultural Land	34.2	34.2	
Forest Land	172.9	172.9	
Wetland/Open Water	18.7	18.7	
Open Land	12.7	12.7	
Developed Land	1.0	1.0	
PROJECT TOTAL ^a	1,374.3	1,374.3	

^a Numbers may not total consistently due to rounding. Calculations in this table are based on USGS GAP digital data only and do not reflect information gathered from field surveys, aerial desktop surveys, or field reconnaissance.

TABLE N.2-6 East of Clearbrook Operations Impacts by County (Assumes Sandpiper is Constructed First)			
Figure N.2-3 Component	Area of Previous Disturbance		Total Area of Permanent ROW (50')
	Existing Permanent ROW (25')	New Permanent ROW (25')	
County / Land Cover Type			
Clearwater	93.6	104.7	198.4
Agricultural Land	17.6	20.6	38.2
Forest Land	60.1	66.2	126.2
Wetland/Open Water	8.8	9.6	18.3
Open Land	7.1	8.4	15.6
Developed Land	0.0	0.0	0.0
Hubbard	134.9	134.9	269.8
Agricultural Land	33.9	32.9	66.8
Forest Land	80.2	82.2	162.4
Wetland/Open Water	10.4	10.0	20.4
Open Land	10.2	9.5	19.8
Developed Land	0.2	0.2	0.4
Wadena	21.5	21.5	42.9
Agricultural Land	0.1	0.1	0.1
Forest Land	18.5	18.6	37.2
Wetland/Open Water	2.4	2.3	4.7
Open Land	0.5	0.5	1.0
Developed Land	0.0	0.0	0.0
Cass	143.9	143.7	287.6
Agricultural Land	11.9	11.6	23.6
Forest Land	112.3	113.6	225.9
Wetland/Open Water	11.0	10.8	21.8
Open Land	8.6	7.6	16.2
Developed Land	0.1	0.1	0.1
Crow Wing	14.6	14.6	29.2
Agricultural Land	1.8	1.6	3.4
Forest Land	9.7	9.5	19.2
Wetland/Open Water	2.6	2.9	5.5
Open Land	0.5	0.6	1.1
Developed Land	0.0	0.0	0.0
Aitkin	154.2	153.9	308.1
Agricultural Land	23.4	23.5	46.9
Forest Land	100.0	99.5	199.5
Wetland/Open Water	22.8	23.5	46.3
Open Land	8.0	7.3	15.2
Developed Land	0.1	0.1	0.1
Carlton	118.8	121.0	239.8
Agricultural Land	17.1	16.8	33.8
Forest Land	86.1	89.4	175.5
Wetland/Open Water	9.2	8.4	17.6
Open Land	6.0	6.0	12.0
Developed Land	0.5	0.5	0.9
PROJECT TOTAL ^a	681.6	694.2	1,375.8

^a Numbers may not total consistently due to rounding. Calculations in this table are based on USGS GAP digital data only and do not reflect information gathered from field surveys, aerial desktop surveys, or field reconnaissance.

Appendix N: Land Cover and Wetland Detailed Construction and Operations Impacts
 Appendix N.3 : Wetlands - Construction Impacts (page 1 of 4)



Legend	
	Represents existing, permanently maintained pipeline ROW that has been previously disturbed by earlier pipeline projects. This area is also referred to as the non-working side that will be used for topsoil and subsoil storage for this Project (see Appendix G to view typical ROW construction profiles).
	Represents existing, previously disturbed area that has been used as temporary workspace during construction work activities for an earlier pipeline project. Such area will be acquired and converted to new, permanently maintained pipeline ROW for this Project. This area is also referred to as the working side of the Project (see Appendix G to view typical ROW construction profiles).
	Represents existing, previously disturbed area that has been used as temporary workspace during construction work activities for an earlier pipeline project. Such area will be used again as a temporary workspace area for the construction of this Project. This area is also referred to as the working side of the Project that will be restored and allowed to return to its natural habitat (see Appendix G to view typical ROW construction profiles).
	Represents a new area of disturbance that will be used as a temporary workspace area during construction work activities of this Project. This area is also referred to as the working side of the Project that will be restored and allowed to return to its natural habitat (see Appendix G to view typical ROW construction profiles).

Figure N.3-1: West of Clearbrook Line 3 Construction Workspace

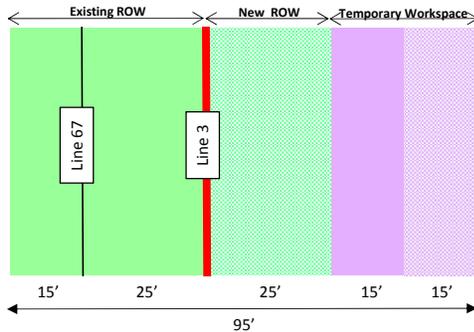


Figure N.3-2: East of Clearbrook Line 3 Construction Workspace

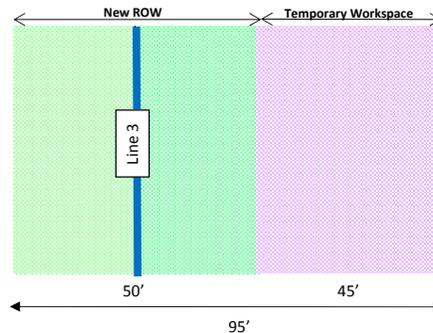


Figure N.3-3: East of Clearbrook Line 3 Construction Workspace (Assumes Sandpiper is Constructed First)

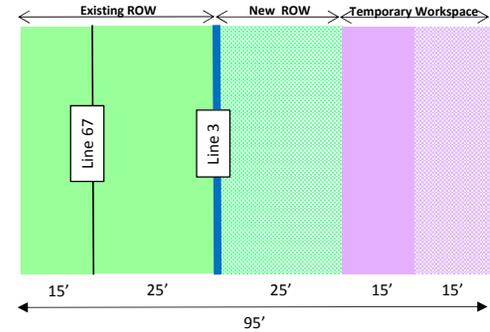


TABLE N.3-1 West of Clearbrook Temporary Construction Impacts by Wetland Type							
Figure N.3-1 Component	Wetland Type	Crossing Length (miles) ^a	Area of Previous Disturbance			Area of New Disturbance	Total Area of Disturbance (95')
			Existing Permanent ROW (40')	New Permanent ROW (25')	Temporary ROW (varies)	Temporary ROW (varies)	
	PEM	11.1	41.5	24.5	25.3	43.8	135.2
	PFO	0.3	0.1	0.3	1.0	2.2	3.5
	PSS	0.3	0.1	0.2	1.2	5.1	6.6
	PUB	0.3	1.9	0.5	0.3	0.1	2.8
	PROJECT TOTAL^c	11.9	43.6	25.5	27.8	51.2	148.0

^a Crossing length of proposed pipeline centerline across wetlands.

^b Area of temporary impact where new construction ROW, not previously disturbed by Line 67, is required.

^c Numbers may not total consistently due to rounding.

TABLE N.3-2 East of Clearbrook Temporary Construction Impacts by Wetland Type					
Figure N.3-2 Component	Wetland Type	Crossing Length (miles) ^a	Area of New Disturbance		Total Area of Disturbance (95')
			Permanent ROW (50')	Temporary ROW (45')	
	PEM	29.1	178.5	144.1	322.6
	PFO	21.7	129.5	145.0	274.5
	PSS	18.3	111.1	114.1	225.2
	PUB	0.5	3.0	3.3	6.3
	PROJECT TOTAL^b	69.5	422.2	406.4	828.6

^a Crossing length of proposed pipeline centerline across wetlands.

^b Numbers may not total consistently due to rounding.

TABLE N.3-3 East of Clearbrook Temporary Construction Impacts by Wetland Type (Assumes Sandpiper is Constructed First)							
Figure N.3-3 Component	Wetland Type	Crossing Length (miles) ^a	Area of Previous Disturbance			Area of New Disturbance	Total Area of Disturbance (95')
			Existing Permanent ROW (40')	New Permanent ROW (25')	Temporary ROW (varies)	Temporary ROW (varies)	
	PEM	25.5	130.0	71.3	48.6	59.0	309.0
	PFO	24.6	103.2	73.8	48.7	59.0	284.7
	PSS	19.2	85.3	56.7	38.0	47.7	227.7
	PUB	0.6	2.4	1.8	1.4	0.7	6.4
	PROJECT TOTAL^c	69.9	321.1	203.7	136.7	166.4	827.9

^a Crossing length of proposed pipeline centerline across wetlands.

^b Area of temporary impact where new construction ROW, not previously disturbed by Sandpiper, is required.

^c Numbers may not total consistently due to rounding.

Appendix N: Land Cover and Wetland Detailed Construction and Operations Impacts
 Appendix N.3 : Wetlands - Construction Impacts (page 2 of 4)

Figure N.3-1 Component	County / Wetland Type	Crossing Length (miles) ^a	Area of Previous Disturbance			Area of New Disturbance	Total Area of Disturbance (95')
			Existing Permanent ROW (40')	New Permanent ROW (25')	Temporary ROW (30')	Temporary ROW (25')	
Kittson	0.6	1.4	0.7	1.2	6.3	9.5	
PEM	0.6	1.4	0.7	1.1	5.9	9.1	
PFO	0.0	0.0	0.0	0.0	0.4	0.4	
Marshall	1.9	8.9	5.4	6.4	2.5	23.2	
PEM	1.8	8.8	5.3	6.0	1.8	22.0	
PFO	0.0	0.0	0.0	0.1	0.4	0.5	
PSS	0.0	0.1	0.1	0.4	0.3	0.7	
Pennington	2.2	8.8	6.6	6.9	3.3	25.5	
PEM	2.1	8.6	6.2	6.0	2.3	23.1	
PFO	0.1	0.1	0.3	0.7	0.7	1.8	
PSS	0.0	0.0	0.0	0.1	0.2	0.3	
PUB	0.0	0.1	0.1	0.1	0.0	0.3	
Red Lake	1.9	4.8	3.0	3.2	13.6	24.5	
PEM	1.8	4.8	3.0	2.9	10.6	21.3	
PFO	0.0	0.0	0.0	0.1	0.1	0.2	
PSS	0.1	0.0	0.0	0.2	2.9	3.1	
PUB	0.0	0.0	0.0	0.0	0.0	0.0	
Polk	3.1	13.2	5.2	5.3	13.8	37.5	
PEM	3.1	13.2	5.1	5.0	13.5	36.8	
PFO	0.0	0.0	0.0	0.0	0.1	0.2	
PSS	0.0	0.0	0.1	0.3	0.2	0.6	
Clearwater	2.1	6.6	4.6	4.9	11.7	27.8	
PEM	1.8	4.7	4.2	4.3	9.8	23.0	
PFO	0.0	0.0	0.0	0.1	0.4	0.5	
PSS	0.1	0.0	0.1	0.3	1.5	1.9	
PUB	0.2	1.8	0.4	0.2	0.0	2.5	
PROJECT TOTAL ^b	11.9	43.6	25.5	27.8	51.2	148.0	

^a Crossing length of proposed pipeline centerline across wetlands. No crossing length indicates the wetland is within the construction workspace, but is not crossed by the proposed pipeline.
^b Numbers may not total consistently due to rounding.

Figure N.3-2 Component	County / Wetland Type	Crossing Length (miles) ^a	Area of New Disturbance		Total Area of Disturbance (95')
			Permanent ROW (50')	Temporary ROW (45')	
Clearwater	8.4	50.5	49.3	99.8	99.8
PEM	6.1	34.6	19.9	54.5	54.5
PFO	1.2	8.6	16.6	25.3	25.3
PSS	1.0	6.4	11.9	18.3	18.3
PUB	0.1	0.9	0.8	1.7	1.7
Hubbard	6.5	39.7	33.0	72.7	72.7
PEM	3.5	21.4	14.2	35.5	35.5
PFO	1.4	8.6	10.0	18.6	18.6
PSS	1.6	9.5	8.3	17.8	17.8
PUB	0.0	0.3	0.5	0.7	0.7
Wadena	1.0	5.9	5.4	11.3	11.3
PEM	0.7	4.1	3.9	8.0	8.0
PFO	0.0	0.2	0.2	0.4	0.4
PSS	0.3	1.7	1.3	3.0	3.0
PUB	0.0	0.0	0.0	0.0	0.0
Cass	10.8	65.9	61.4	127.3	127.3
PEM	5.4	34.6	28.2	62.8	62.8
PFO	3.1	18.1	19.9	37.9	37.9
PSS	2.2	12.6	12.6	25.2	25.2
PUB	0.1	0.7	0.7	1.4	1.4
Crow Wing	0.9	5.3	4.9	10.2	10.2
PEM	0.6	3.7	2.7	6.4	6.4
PFO	0.1	0.7	1.3	2.0	2.0
PSS	0.0	0.2	0.3	0.5	0.5
PUB	0.1	0.7	0.6	1.3	1.3
Aitkin	27.4	166.9	166.1	333.0	333.0
PEM	10.1	62.3	61.1	123.5	123.5
PFO	9.3	55.4	55.7	111.1	111.1
PSS	8.1	48.9	48.9	97.8	97.8
PUB	0.0	0.2	0.3	0.6	0.6
Carlton	14.5	88.0	86.3	174.3	174.3
PEM	2.8	17.9	13.9	31.8	31.8
PFO	6.6	37.9	41.3	79.3	79.3
PSS	5.1	31.9	30.7	62.6	62.6
PUB	0.0	0.2	0.3	0.5	0.5
PROJECT TOTAL ^b	69.5	422.2	406.4	828.6	828.6

^a Crossing length of proposed pipeline centerline across wetlands. No crossing length indicates the wetland is within the construction workspace, but is not crossed by the proposed pipeline.
^b Numbers may not total consistently due to rounding.

Figure N.3-3 Component	County / Wetland Type	Crossing Length (miles) ^a	Area of Previous Disturbance			Area of New Disturbance	Total Area of Disturbance (95')
			Existing Permanent ROW (25')	New Permanent ROW (25')	Temporary ROW (20')	Temporary ROW (25')	
Clearwater	8.4	36.2	23.3	20.9	19.9	100.3	
PEM	3.9	23.9	9.3	7.9	9.3	50.4	
PFO	2.6	7.0	8.2	7.8	5.1	28.0	
PSS	1.7	4.6	5.4	4.9	5.4	20.2	
PUB	0.2	0.7	0.5	0.3	0.1	1.7	
Hubbard	6.7	24.8	16.3	14.3	17.9	73.3	
PEM	3.0	14.1	7.3	6.3	6.2	33.9	
PFO	1.9	5.3	4.7	3.9	6.1	20.1	
PSS	1.8	5.1	4.1	3.8	5.5	18.6	
PUB	0.1	0.2	0.2	0.2	0.1	0.8	
Wadena	0.9	4.7	2.9	0.8	2.8	11.1	
PEM	0.7	3.2	2.1	0.6	2.0	7.9	
PFO	0.0	0.2	0.1	0.0	0.1	0.4	
PSS	0.2	1.3	0.7	0.1	0.7	2.9	
Cass	10.8	52.3	32.8	23.7	17.6	126.4	
PEM	5.0	26.0	15.1	10.4	8.5	60.0	
PFO	3.6	15.4	10.9	7.6	5.4	39.3	
PSS	2.1	10.4	6.4	5.3	3.6	25.7	
PUB	0.1	0.6	0.4	0.3	0.2	1.4	
Crow Wing	0.8	4.1	2.6	2.3	1.2	10.2	
PEM	0.5	2.7	1.5	1.2	0.6	6.1	
PFO	0.2	0.6	0.7	0.6	0.3	2.3	
PSS	0.0	0.2	0.1	0.1	0.1	0.5	
PUB	0.1	0.6	0.3	0.3	0.2	1.3	
Aitkin	27.7	130.2	82.5	40.0	79.5	332.2	
PEM	9.9	48.1	29.3	16.4	27.2	121.1	
PFO	9.5	43.2	28.3	11.7	29.1	112.3	
PSS	8.3	38.6	24.7	11.7	23.1	98.2	
PUB	0.1	0.2	0.2	0.1	0.1	0.6	
Carlton	14.5	68.8	43.2	34.7	27.6	174.3	
PEM	2.6	12.0	6.7	5.7	5.3	29.6	
PFO	6.9	31.6	21.0	17.0	12.9	82.4	
PSS	5.0	25.1	15.3	11.9	9.4	61.7	
PUB	0.1	0.2	0.2	0.1	0.1	0.6	
PROJECT TOTAL ^a	69.9	321.1	203.7	136.7	166.4	827.9	

^a Crossing length of proposed pipeline centerline across wetlands. No crossing length indicates the wetland is within the construction workspace, but is not crossed by the proposed pipeline.
^b Numbers may not total consistently due to rounding.

Appendix N: Land Cover and Wetland Detailed Construction and Operations Impacts
 Appendix N.4: Wetlands – Operations Impacts (page 1 of 4)



Legend

- Represents existing, permanently maintained pipeline ROW that has been previously disturbed by earlier pipeline projects. This area is also referred to as the non-working side that will be used for topsoil and subsoil storage for this Project (see Appendix G to view typical ROW construction profiles).
- Represents existing, previously disturbed area that has been used as temporary workspace during construction work activities for an earlier pipeline project. Such area will be acquired and converted to new, permanently maintained pipeline ROW for this Project. This area is also referred to as the working side of the Project (see Appendix G to view typical ROW construction profiles).

Figure N.4-1: West of Clearbrook Line 3 Operations Workspace

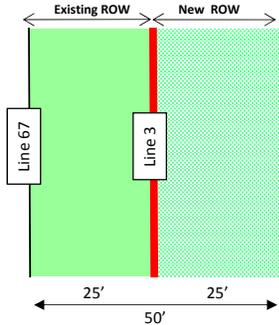


Figure N.4-2: East of Clearbrook Line 3 Operations Workspace

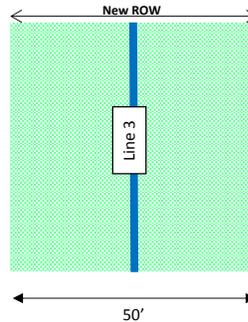


Figure N.4-3: East of Clearbrook Line 3 Operations Workspace (Assumes Sandpiper is Constructed First)

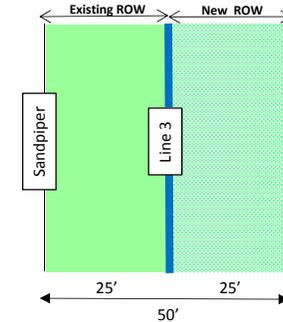


TABLE N.4-1 West of Clearbrook Operations Impacts by Wetland Type				
Figure N.4-1 Component	Area of Previous Disturbance		Total Area of Permanent ROW (50')	Total Area Permanent Wetland Impacts ^a
	Existing Permanent ROW (25')	New Permanent ROW (25')		
Wetland Type				
PEM	30.7	36.8	67.4	0.0
PFO	0.4	1.1	1.6	1.6
PSS	0.3	1.6	1.9	0.0
PUB	1.1	0.5	1.5	0.0
PROJECT TOTAL ^b	32.5	39.9	72.4	1.6

^a Permanent wetland impacts within the new portion of the permanent easement (typically 25 feet of the 50-foot easement) will result from the conversion of PFO wetlands where the pipeline corridor will be maintained by periodic clearing activities.
^b Numbers may not total consistently due to rounding.

TABLE N.4-2 East of Clearbrook Operations Impacts by Wetland Type			
Figure N.4-2 Component	Area of New Disturbance	Total Area of Permanent ROW (50')	Total Area Permanent Wetland Impacts ^a
	New Permanent ROW (50')		
Wetland Type			
PEM	178.5	178.5	0.0
PFO	129.5	129.5	129.5
PSS	111.1	111.1	0.0
PUB	3.0	3.0	0.0
PROJECT TOTAL ^b	422.2	422.2	129.5

^a Permanent wetland impacts within the new portion of the permanent easement (typically 25 feet of the 50-foot easement) will result from the conversion of PFO wetlands where the pipeline corridor will be maintained by periodic clearing activities.
^b Numbers may not total consistently due to rounding.

TABLE N.4-3 East of Clearbrook Operations Impacts by Wetland Type (Assumes Sandpiper is Constructed First)				
Figure N.4-3 Component	Area of Previous Disturbance		Total Area of Permanent ROW (50')	Total Area Permanent Wetland Impacts ^a
	Existing Permanent ROW (25')	New Permanent ROW (25')		
Wetland Type				
PEM	81.0	77.0	158.0	0.0
PFO	70.1	76.6	146.7	146.7
PSS	56.7	59.6	116.3	0.0
PUB	1.6	1.8	3.4	0.0
PROJECT TOTAL ^b	209.4	215.0	424.5	146.7

^a Permanent wetland impacts within the new portion of the permanent easement (typically 25 feet of the 50-foot easement) will result from the conversion of PFO wetlands where the pipeline corridor will be maintained by periodic clearing activities.
^b Numbers may not total consistently due to rounding.

Appendix N: Land Cover and Wetland Detailed Construction and Operations Impacts
 Appendix N.4 (: Wetlands - Operations Impacts (page 2 of 4))

Figure N.4-1 Component	Area of Previous Disturbance		Total Area of Permanent ROW (50')	Total Area Permanent Wetland Impacts ^a	
	County / Wetland Type	Existing Permanent ROW (25')			New Permanent ROW (25')
Kittson	1.4	2.6	4.0		
PEM	1.4	2.3	3.7		
PFO	0.0	0.3	0.3	0.3	
Marshall	5.5	6.0	11.5		
PEM	5.3	5.7	11.0		
PFO	0.2	0.2	0.3	0.3	
PSS	0.0	0.1	0.1		
Pennington	6.3	6.9	13.2		
PEM	6.0	6.3	12.3		
PFO	0.3	0.5	0.7	0.7	
PSS	0.0	0.0	0.0		
PUB	0.1	0.1	0.2		
Red Lake	5.4	6.3	11.7		
PEM	5.2	5.4	10.6		
PFO	0.0	0.1	0.1	0.1	
PSS	0.2	0.8	1.0		
Polk	9.5	9.4	18.8		
PEM	9.4	9.3	18.7		
PSS	0.0	0.1	0.1	0.1	
Clearwater	4.3	8.8	13.1		
PEM	3.3	7.7	11.1		
PFO	0.0	0.1	0.1	0.1	
PSS	0.0	0.6	0.6		
PUB	1.0	0.4	1.4		
PROJECT TOTAL ^b	32.5	39.9	72.4	1.6	

^a Permanent wetland impacts within the new portion of the permanent easement (typically 25 feet of the 50-foot easement) will result from the conversion of PFO wetlands where the pipeline corridor will be maintained by periodic clearing activities.

^b Numbers may not total consistently due to rounding.

Figure N.4-2 Component	Area of New Disturbance		Total Area of Permanent ROW (50')	Total Area Permanent Wetland Impacts ^a	
	County / Wetland Type	Existing Permanent ROW (50')			New Permanent ROW (50')
Clearwater	50.5	50.5			
PEM	34.6	34.6			
PFO	8.6	8.6		8.6	
PSS	6.4	6.4			
PUB	0.9	0.9			
Hubbard	39.7	39.7			
PEM	21.4	21.4			
PFO	8.6	8.6		8.6	
PSS	9.5	9.5			
PUB	0.3	0.3			
Wadena	5.9	5.9			
PEM	4.1	4.1			
PFO	0.2	0.2		0.2	
PSS	1.7	1.7			
Cass	65.9	65.9			
PEM	34.6	34.6			
PFO	18.1	18.1		18.1	
PSS	12.6	12.6			
PUB	0.7	0.7			
Crow Wing	5.3	5.3			
PEM	3.7	3.7			
PFO	0.7	0.7		0.7	
PSS	0.2	0.2			
PUB	0.7	0.7			
Aitkin	166.9	166.9			
PEM	62.3	62.3			
PFO	55.4	55.4		55.4	
PSS	48.9	48.9			
PUB	0.2	0.2			
Carlton	88.0	88.0			
PEM	17.9	17.9			
PFO	37.9	37.9		37.9	
PSS	31.9	31.9			
PUB	0.2	0.2			
PROJECT TOTAL ^b	422.2	422.2		129.5	

^a Permanent wetland impacts within the new portion of the permanent easement (typically 25 feet of the 50-foot easement) will result from the conversion of PFO wetlands where the pipeline corridor will be maintained by periodic clearing activities.

^b Numbers may not total consistently due to rounding.

Figure N.4-3 Component	Area of Previous Disturbance		Total Area of Permanent ROW (50')	Total Area Permanent Wetland Impacts ^a	
	County / Wetland Type	Existing Permanent ROW (25')			New Permanent ROW (25')
Clearwater	24.6	26.9	51.4		
PEM	14.8	11.5	26.3		
PFO	5.6	8.7	14.2	14.2	
PSS	3.8	6.2	9.9		
PUB	0.5	0.5	1.0		
Hubbard	20.0	20.8	40.9		
PEM	9.8	8.6	18.4		
PFO	4.8	6.2	11.0	11.0	
PSS	5.3	5.9	11.1		
PUB	0.2	0.2	0.4		
Wadena	3.0	2.9	5.8		
PEM	2.0	2.1	4.1		
PFO	0.1	0.1	0.2	0.2	
PSS	0.8	0.7	1.5		
Cass	32.5	32.8	65.3		
PEM	15.5	15.1	30.6		
PFO	10.1	10.9	21.1	21.1	
PSS	6.5	6.4	12.9		
PUB	0.4	0.4	0.7		
Crow Wing	2.5	2.6	5.1		
PEM	1.6	1.5	3.1		
PFO	0.5	0.7	1.1	1.1	
PSS	0.1	0.1	0.3		
PUB	0.3	0.3	0.7		
Aitkin	83.5	84.2	167.8		
PEM	30.0	30.0	59.9		
PFO	28.6	29.0	57.6	57.6	
PSS	24.9	25.0	49.9		
PUB	0.1	0.2	0.3		
Carlton	43.4	44.8	88.2		
PEM	7.4	8.2	15.6		
PFO	20.5	21.1	41.6	41.6	
PSS	15.4	15.3	30.7		
PUB	0.1	0.2	0.3		
PROJECT TOTAL ^b	209.4	215.0	424.5	146.7	

^a Permanent wetland impacts within the new portion of the permanent easement (typically 25 feet of the 50-foot easement) will result from the conversion of PFO wetlands where the pipeline corridor will be maintained by periodic clearing activities.

^b Numbers may not total consistently due to rounding.