

SELF-ASSESSMENT AND RISK MANAGEMENT DECISION FRAMEWORK FOR DFO REGULATORY REQUIREMENTS

DESCRIPTION OF AQUATIC ENVIRONMENT:

Federally/provincially listed species present:	No
Fish that are part of commercial, recreational or Aboriginal (CRA) fisheries present:	No
Fish that support a CRA fishery, or have downstream connectivity to a CRA fisheries present:	Yes
Banks and approach slope characteristics:	Sloping banks, low grade.
Riparian characteristics:	Functional Riparian Width (m) at Crossing (<i>i.e.</i> , contribution to fish habitat): L: 20 to 30 m, R: 20 to 30 m

CONSTRUCTION DETAILS:

Construction Schedule:	January to March 2017	
Pipeline Methods:	Isolate if water present/open cut if dry or frozen to bottom	
Contingency Methods:	n/a	
Vehicle Crossing Methods:	Snowfill/ice bridge/clear span bridge/existing	
Estimated Maximum Footprint:	Right-of-Way Width: 45 m	Est. Instream Footprint: 45 m (ROW) x 12.3 m (wetted width) = 5,535 m ²
	Bankfull Width: No defined channel, wetted width 12.3 m	Est. Functional Riparian Footprint: 45 m (ROW) x 60 m (riparian) = 2,700 m ²
	Functional Riparian Width: L: 20 to 30 m, R: 20 to 30 m	Max Instream + Riparian Footprint: 5,535 m ² + 2700 m ² = 8,235 m ²
Zone-of-influence (ZOI):	100 m	
No. Days of Instream Work:	2 to 15 days	

RISK ASSESSMENT RANKING:

Using the risk assessment evaluation criteria, what ranking did the proposed watercourse crossing receive?				Low			
Scale of Negative Effects Evaluation Criteria		Scale of Negative Effect	Sensitivity of Fish and Fish Habitat				
<ul style="list-style-type: none">Fish species present and fish habitat potential within zone of influenceInstream timing windowsPipeline and vehicle/equipment crossing methodOccurrence and duration of instream workFootprint sizeDisturbance to riparian vegetationChannel and fish passage restrictionsChanges to water quality and turbidity parametersChanges to timing, duration and frequency of flowRiparian and bank restoration measuresBeaver activity and associated removals			Extreme Project Unlikely to Proceed	High DFO Authorization	Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required	Low Meets DFO criteria: review not required	Not fish habitat
		Extreme Project Unlikely to Proceed					
		High DFO Authorization					
		Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required				SK-WC77	
		Low Meets DFO criteria: review not required					
		None					
Sensitivity to Fish and Fish Habitat Evaluation Criteria							
<ul style="list-style-type: none">Fish-bearing statusFish stream classificationFederally or provincially listed fish speciesFish species of management concernHabitat potential and/or availability for fish species and/or life stagesRiparian habitat valueWater quality parameters							

SELF-ASSESSMENT DECISION FRAMEWORK:

QUESTION	ANSWER
<i>If YES is answered to Questions 1 and 2 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 1 and 2, proceed to Questions 3 and 4.</i>	
1. Can all of the criteria outlined in DFO's Project Activities for the above pipeline/vehicle methods be met based on the qualified fish biologist's current knowledge?	YES
Provide rationale: <u>Dewatering/Pumping:</u> Temporary isolation dams and pumps with fish screen and a qualified fish biologist-lead fish salvage is recommended if water is present at the time of the isolation. Recommended the site be restored to pre-construction conditions. <u>Bridges:</u> Recommend no earth fill below the high watermark and no obstruction of potential fish passage by vehicle crossing.	
2. Can all applicable mitigation measures listed in DFO's <i>Measures to Avoid Causing Harm to Fish and Fish Habitat</i> be implemented to address the Pathways of Effects based on the qualified fish biologist's current knowledge?	YES
Provide rationale: Construction is to occur outside the restricted activity timing window. It is assumed the remaining mitigation measures for project planning, site selection, contaminant and spill management, erosion and sediment control, revegetation and stabilization, fish protection and operation of machinery can be met and are included in the Project's ESA and the EPP.	

<i>If YES is answered to Questions 3 and 4 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 3 and 4, proceed to Question 5.</i>	
3. Have fisheries management objectives, best management practices and/or plans been considered and applied where applicable?	NA
Provide rationale:	
4. Have additional mitigation measures to avoid causing harm to fish and fish habitat been recommended by a qualified fish biologist and will serious harm to fish be avoided and/or mitigated by the successful implementation of these additional measures?	NA
Provide rationale:	

5. Is further review by NEB/DFO recommended by the qualified fish biologist?	No
Provide rationale:	

Notes:	1	Pending further direction from DFO regarding riparian habitat disturbance at pipeline-associated watercourse crossings, the mitigation measures and best management practices described in the Project's EPP and the guidance of existing provincial standards are assumed to be sufficient to avoid serious harm to fish, unless otherwise specified by a qualified fish biologist.
	2	Functional riparian width is interpreted as the terrestrial area/zone adjacent to a watercourse where vegetation and microclimate are hydrologically influenced by the presence of perennial or intermittent water from the stream or river.

Watercourse (Site#): Montgomery Creek (SK-WC78)
Legal Location: 14-4-13-3 W2M
UTM (Zone 13U): 688727E, 5548559N
SKP (as of June 2014): 890.8

Survey Date: September 11, 2013
Habitat Survey Length (m): 200
Restricted Activity Timing Window: April 1 to May 31
Field Crew: E. Fulcher, L. Olsen

CHANNEL AND FLOW CONDITIONS (No. of Transects: 5)	
Confinement	n/a
Channel Pattern	Irregular, wandering
Bankfull Width (m): Mean, Range	0.6, 0.5-0.8
Wetted Width (m): Mean, Range	Dry
Water Depth (m): Mean, Range	Dry
Ordinary Highwater Mark (m): Mean, Range	0.20,0.15-0.20
Discharge (m³/s)	Dry
Stream Gradient (%)	1-2%
Embeddedness	n/a

CHANNEL AND FLOW CONDITIONS CONTINUED		
Beaver Dams	None	
Native Channel Width (m)	n/a	
BANK CONDITIONS	LEFT BANK	RIGHT BANK
Bank Shape	Sloping	Sloping
Bank Texture	Fines/small gravel	Fines/small gravel
Mean Bank Height (m)	0.2	0.3
Grade of Approach Slopes (%)	<4	<4
Riparian Area Width (m)	5-10	10-20
Riparian Vegetation Type	Grasses	Grasses

SUBSTRATE	%
Organics	24
Fines (<2 mm)	49
Small Gravel (2-20 mm)	5
Large Gravel (21-65 mm)	20
Cobble (66-250 mm)	2
Boulder (>250 mm)	0

HABITAT	No.	Length (m)	%	Velocity (m/s)
Pool 1 (depth >1.00 m)	-	-	-	-
Pool 2 (depth 0.5-1.00 m)	-	-	-	-
Pool 3 (depth <0.5 m)	-	-	-	-
Run 1 (>1.00 m)	-	-	-	-
Run 2 (0.5-1.00 m)	-	-	-	-
Run 3 (<0.5 m)	-	-	-	-
Flat 1 (>1.00 m)	-	-	-	-
Flat 2 (0.5-1.00 m)	-	-	-	-
Flat 3 (<0.5 m)	-	-	-	-
Riffle	-	-	-	-
No defined channel	2	125	63	Dry
Other (dry channel)	2	75	27	Dry
Other	-	-	-	-

COVER TYPES	%
Boulders	-
Undercut Banks	-
Overhanging Vegetation	-
Woody Debris	-
Depth	-
Instream Vegetation	-
Other	-
Other	-
Other	-
Other	-
TOTAL COVER (m²)	Dry
Stream Shading	0 %

FISH HABITAT POTENTIAL RATINGS				
Species	Spawning	Rearing	Overwintering	Migration
northern pike	Unsuitable	Unsuitable	Unsuitable	Unsuitable
walleye	Unsuitable	Unsuitable	Unsuitable	Unsuitable
white sucker	Unsuitable	Unsuitable	Unsuitable	Unsuitable
brassy minnow	Unsuitable	Unsuitable	Unsuitable	Unsuitable

FISH SPECIES PREVIOUSLY DOCUMENTED
Fathead minnow, Iowa darter and spottail shiner have been previously documented (AAR 2007a).

FISH SPECIES PRESENT	No. Captured	No. Observed	Fork Length (mm): Mean, Range
No fish sampling conducted (dry)	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

FISH SAMPLING EFFORT	
Sampling Method	No fish sampling conducted (dry)
No. of seconds/hours	-
Distance (m)/No. of traps	-
No. Captured	-
CPUE	-

ADDITIONAL HABITAT COMMENTS
Dry at time of assessment. Intermittent sections of defined and undefined channel. Cattle impacts evident including at right-of-way centerline. Previous information indicates fish presence and wetter conditions in the spring.

Notes: Catch per unit effort (CPUE) is the number of fish captured per hour of minnow trapping, per m² of seine netting and per 100 seconds of electrofishing.
n/a: not applicable.



Plate 1 Photograph taken at right-of-way looking upstream.



Plate 2 Photograph taken at right-of-way looking downstream.



Plate 3 Photograph taken at right-of-way looking at left bank.



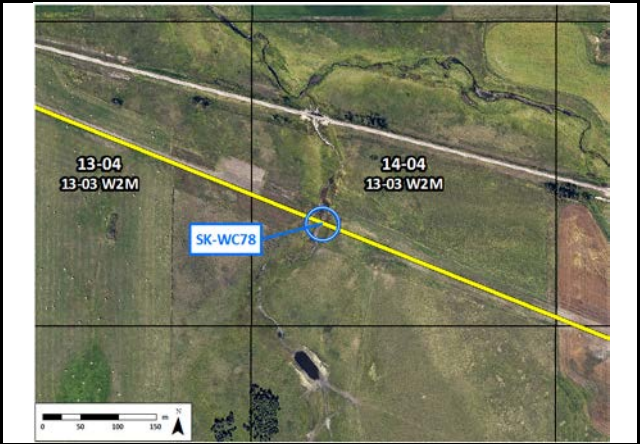
Plate 4 Photograph taken at right-of-way looking at right bank.



Plate 5 Aerial photograph taken of crossing view north (June 26, 2013).



Plate 6 Photograph taken approximately 100 m downstream of the right-of-way looking upstream at dry channel section.



Map illustrating crossing and watercourse.

Line 3 Replacement Program



SELF-ASSESSMENT AND RISK MANAGEMENT DECISION FRAMEWORK FOR DFO REGULATORY REQUIREMENTS

DESCRIPTION OF AQUATIC ENVIRONMENT:

Federally/provincially listed species present:	No
Fish that are part of commercial, recreational or Aboriginal (CRA) fisheries present:	No
Fish that support a CRA fishery, or have downstream connectivity to a CRA fisheries present:	Yes
Banks and approach slope characteristics:	Sloping banks, low grade (<4%). Cattle impacts evident, including at right-of-way centerline.
Riparian characteristics:	Functional Riparian Width (m) at Crossing (<i>i.e.</i> , contribution to fish habitat): L: 5 to 10 m, R: 10 to 20 m

CONSTRUCTION DETAILS:

Construction Schedule:	January to March 2017	
Pipeline Methods:	Isolate if water present/open cut if dry or frozen to bottom	
Contingency Methods:	n/a	
Vehicle Crossing Methods:	Snowfill/ice bridge/clear span bridge/existing	
Estimated Maximum Footprint:	Right-of-Way Width: 45 m	Est. Instream Footprint: 45 m (ROW) x 0.6 m (bankfull) = 27 m ²
	Bankfull Width: 0.6 m	Est. Functional Riparian Footprint: 45 m (ROW) x 30 m (riparian) = 1,350 m ²
	Functional Riparian Width: L: 5 to 10 m, R: 10 to 20 m	Max Instream + Riparian Footprint: 27 m ² + 1,350 m ² = 1,377 m ²
Zone-of-influence (ZOI):	100 m	
No. Days of Instream Work:	2 to 15 days	

RISK ASSESSMENT RANKING:

Using the risk assessment evaluation criteria, what ranking did the proposed watercourse crossing receive?				Low			
Scale of Negative Effects Evaluation Criteria		Scale of Negative Effect	Sensitivity of Fish and Fish Habitat				
<ul style="list-style-type: none">Fish species present and fish habitat potential within zone of influenceInstream timing windowsPipeline and vehicle/equipment crossing methodOccurrence and duration of instream workFootprint sizeDisturbance to riparian vegetationChannel and fish passage restrictionsChanges to water quality and turbidity parametersChanges to timing, duration and frequency of flowRiparian and bank restoration measuresBeaver activity and associated removals			Extreme Project Unlikely to Proceed	High DFO Authorization	Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required	Low Meets DFO criteria; review not required	Not fish habitat
Sensitivity to Fish and Fish Habitat Evaluation Criteria		Extreme Project Unlikely to Proceed					
		High DFO Authorization					
		Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required				SK-WC78	
		Low Meets DFO criteria; review not required					
		None					

SELF-ASSESSMENT DECISION FRAMEWORK:

QUESTION	ANSWER
<i>If YES is answered to Questions 1 and 2 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 1 and 2, proceed to Questions 3 and 4.</i>	
1. Can all of the criteria outlined in DFO's Project Activities for the above pipeline/vehicle methods be met based on the qualified fish biologist's current knowledge?	YES
Provide rationale: <u>Dewatering/Pumping:</u> Temporary isolation dams and pumps with fish screen and a qualified fish biologist-lead fish salvage is recommended if water is present at the time of the isolation. Recommended the site be restored to pre-construction conditions. <u>Bridges:</u> Recommend no earth fill below the high watermark and no obstruction of potential fish passage by vehicle crossing.	
2. Can all applicable mitigation measures listed in DFO's <i>Measures to Avoid Causing Harm to Fish and Fish Habitat</i> be implemented to address the Pathways of Effects based on the qualified fish biologist's current knowledge?	YES
Provide rationale: Construction is to occur outside the restricted activity timing window. It is assumed the remaining mitigation measures for project planning, site selection, contaminant and spill management, erosion and sediment control, revegetation and stabilization, fish protection and operation of machinery can be met and are included in the Project's ESA and the EPP.	

<i>If YES is answered to Questions 3 and 4 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 3 and 4, proceed to Question 5.</i>	
3. Have fisheries management objectives, best management practices and/or plans been considered and applied where applicable?	NA
Provide rationale:	
4. Have additional mitigation measures to avoid causing harm to fish and fish habitat been recommended by a qualified fish biologist and will serious harm to fish be avoided and/or mitigated by the successful implementation of these additional measures?	NA
Provide rationale:	

5. Is further review by NEB/DFO recommended by the qualified fish biologist?	No
Provide rationale:	

Notes:	1	Pending further direction from DFO regarding riparian habitat disturbance at pipeline-associated watercourse crossings, the mitigation measures and best management practices described in the Project's EPP and the guidance of existing provincial standards are assumed to be sufficient to avoid serious harm to fish, unless otherwise specified by a qualified fish biologist.
	2	Functional riparian width is interpreted as the terrestrial area/zone adjacent to a watercourse where vegetation and microclimate are hydrologically influenced by the presence of perennial or intermittent water from the stream or river.

Watercourse (Site#): Unnamed tributary to Montgomery Creek (SK-WC79)
Legal Location: 5-3-13-3 W2M
UTM (Zone 13U): 690215E, 5548024N
SKP (as of June 2014): 892.3

Survey Date: September 11, 2013
Habitat Survey Length (m): 200
Restricted Activity Timing Window: April 1 to May 31
Field Crew: E. Fulcher, L. Olsen

CHANNEL AND FLOW CONDITIONS (No. of Transects: 5)	
Confinement	Unconfined
Channel Pattern	Irregular, wandering
Bankfull Width (m): Mean, Range	2.5,1.5-3.4
Wetted Width (m): Mean, Range	Dry
Water Depth (m): Mean, Range	Dry
Ordinary Highwater Mark (m): Mean, Range	0.3, 0.2-0.5
Discharge (m³/s)	Dry
Stream Gradient (%)	1-2%
Embeddedness	n/a

CHANNEL AND FLOW CONDITIONS CONTINUED		
Beaver Dams	None	
Native Channel Width (m)	n/a	
BANK CONDITIONS	LEFT BANK	RIGHT BANK
Bank Shape	Sloping	Sloping
Bank Texture	Fines/cobble	Fines/cobble
Mean Bank Height (m)	1.2	0.8
Grade of Approach Slopes (%)	<4	<4
Riparian Area Width (m)	0-5	0-5
Riparian Vegetation Type	Grasses	Grasses

SUBSTRATE	%
Organics	8
Fines (<2 mm)	54
Small Gravel (2-20 mm)	10
Large Gravel (21-65 mm)	4
Cobble (66-250 mm)	22
Boulder (>250 mm)	2

WATER QUALITY PARAMETERS	
Water Temperature (°C)	22.0
pH	9.2
Dissolved Oxygen (mg/L)	4.0 (see comments)
Conductivity (µS/cm)	1350.0
Turbidity (visual)	Moderate

HABITAT	No.	Length (m)	%	Velocity (m/s)
Pool 1 (depth >1.00 m)	-	-	-	-
Pool 2 (depth 0.5-1.00 m)	-	-	-	-
Pool 3 (depth <0.5 m)	-	-	-	-
Run 1 (>1.00 m)	-	-	-	-
Run 2 (0.5-1.00 m)	-	-	-	-
Run 3 (<0.5 m)	-	-	-	-
Flat 1 (>1.00 m)	-	-	-	-
Flat 2 (0.5-1.00 m)	-	-	-	-
Flat 3 (<0.5 m)	-	-	-	-
Riffle	-	-	-	-
No defined channel	3	60	30	-
Other (dry channel)	2	140	70	-
Other	-	-	-	-

COVER TYPES	%
Boulders	-
Undercut Banks	-
Overhanging Vegetation	-
Woody Debris	-
Depth	-
Instream Vegetation	-
Other	-
Other	-
Other	-
Other	-
TOTAL COVER (m²)	-
Stream Shading	0 %

FISH HABITAT POTENTIAL RATINGS				
Species	Spawning	Rearing	Overwintering	Migration
northern pike	Unsuitable	Unsuitable	Unsuitable	Unsuitable
walleye	Unsuitable	Unsuitable	Unsuitable	Unsuitable
white sucker	Unsuitable	Unsuitable	Unsuitable	Unsuitable
brassy minnow	Unsuitable	Unsuitable	Unsuitable	Unsuitable

FISH SPECIES PREVIOUSLY DOCUMENTED
Brook stickleback, fathead minnow and pearl dace have been previously documented (AAR 2007a).

FISH SPECIES PRESENT	No. Captured	No. Observed	Fork Length (mm): Mean, Range
Pearl dace	1	5	20
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

FISH SAMPLING EFFORT	
Sampling Method	Dip netting
No. of minutes	20 minutes
No. Captured	1
CPUE	0.05

ADDITIONAL HABITAT COMMENTS
Isolated pond present within right-of-way where fish were captured and observed. No defined channel at centreline. Dry for remainder of study area at the time of assessment. Sections of dry defined channel and undefined channel. Cattle impacts evident. Dissolved oxygen reading taken with HACH test kit.

Notes: Catch per unit effort (CPUE) is the number of fish captured per hour of minnow trapping, per m² of seine netting, per 100 seconds of electrofishing and per minute of dipnetting. n/a: not applicable.



Plate 1 Photograph taken at right-of-way looking upstream.



Plate 2 Photograph taken at right-of-way looking downstream.



Plate 3 Photograph taken at right-of-way looking at left bank.



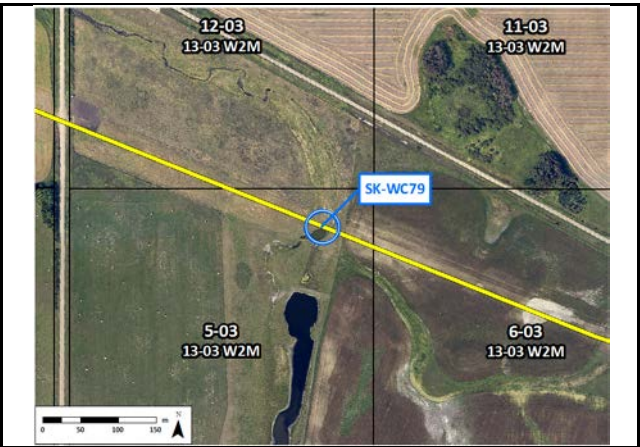
Plate 4 Photograph taken at right-of-way looking at right bank.



Plate 5 Aerial photograph taken of crossing view north (June 26, 2013).



Plate 6 Photograph taken approximately 25 m upstream of the right-of-way looking downstream



Map illustrating crossing and watercourse.

Line 3 Replacement Program



SELF-ASSESSMENT AND RISK MANAGEMENT DECISION FRAMEWORK FOR DFO REGULATORY REQUIREMENTS

DESCRIPTION OF AQUATIC ENVIRONMENT:

Federally/provincially listed species present:	No
Fish that are part of commercial, recreational or Aboriginal (CRA) fisheries present:	No
Fish that support a CRA fishery, or have downstream connectivity to a CRA fisheries present:	Yes
Banks and approach slope characteristics:	Sloping banks, low grade (<4%). Cattle impacts evident.
Riparian characteristics:	Functional Riparian Width (m) at Crossing (<i>i.e.</i> , contribution to fish habitat): 0 to 5 m

CONSTRUCTION DETAILS:

Construction Schedule:	January to March 2017	
Pipeline Methods:	Isolate if water present/open cut if dry or frozen to bottom	
Contingency Methods:	n/a	
Vehicle Crossing Methods:	Snowfill/ice bridge/clear span bridge/existing	
Estimated Maximum Footprint:	Right-of-Way Width: 45 m	Est. Instream Footprint: 45 m (ROW) x 2.5 m (bankfull) = 112.5 m ²
	Bankfull Width: 2.5 m	Est. Functional Riparian Footprint: 45 m (ROW) x 10 m (riparian) = 450 m ²
	Functional Riparian Width: L: 0 to 5 m, R: 0 to 5 m	Max Instream + Riparian Footprint: 112.5 m ² + 450 m ² = 562.5 m ²
Zone-of-influence (ZOI):	100 m	
No. Days of Instream Work:	2 to 15 days	

RISK ASSESSMENT RANKING:

Using the risk assessment evaluation criteria, what ranking did the proposed watercourse crossing receive?				Low			
Scale of Negative Effects Evaluation Criteria		Scale of Negative Effect	Sensitivity of Fish and Fish Habitat				
<ul style="list-style-type: none">Fish species present and fish habitat potential within zone of influenceInstream timing windowsPipeline and vehicle/equipment crossing methodOccurrence and duration of instream workFootprint sizeDisturbance to riparian vegetationChannel and fish passage restrictionsChanges to water quality and turbidity parametersChanges to timing, duration and frequency of flowRiparian and bank restoration measuresBeaver activity and associated removals			Extreme Project Unlikely to Proceed	High DFO Authorization	Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required	Low Meets DFO criteria; review not required	Not fish habitat
		Extreme Project Unlikely to Proceed					
		High DFO Authorization					
		Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required				SK-WC79	
		Low Meets DFO criteria; review not required					
None							
Sensitivity to Fish and Fish Habitat Evaluation Criteria							
<ul style="list-style-type: none">Fish-bearing statusFish stream classificationFederally or provincially listed fish speciesFish species of management concernHabitat potential and/or availability for fish species and/or life stagesRiparian habitat valueWater quality parameters							

SELF-ASSESSMENT DECISION FRAMEWORK:

QUESTION	ANSWER
<i>If YES is answered to Questions 1 and 2 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 1 and 2, proceed to Questions 3 and 4.</i>	
1. Can all of the criteria outlined in DFO's Project Activities for the above pipeline/vehicle methods be met based on the qualified fish biologist's current knowledge?	YES
Provide rationale: <u>Dewatering/Pumping:</u> Temporary isolation dams and pumps with fish screen and a qualified fish biologist-lead fish salvage is recommended if water is present at the time of the isolation. Recommended the site be restored to pre-construction conditions. <u>Bridges:</u> Recommend no earth fill below the high watermark and no obstruction of potential fish passage by vehicle crossing.	
2. Can all applicable mitigation measures listed in DFO's <i>Measures to Avoid Causing Harm to Fish and Fish Habitat</i> be implemented to address the Pathways of Effects based on the qualified fish biologist's current knowledge?	YES
Provide rationale: Construction is to occur outside the restricted activity timing window. It is assumed the remaining mitigation measures for project planning, site selection, contaminant and spill management, erosion and sediment control, revegetation and stabilization, fish protection and operation of machinery can be met and are included in the Project's ESA and the EPP.	

<i>If YES is answered to Questions 3 and 4 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 3 and 4, proceed to Question 5.</i>	
3. Have fisheries management objectives, best management practices and/or plans been considered and applied where applicable?	NA
Provide rationale:	
4. Have additional mitigation measures to avoid causing harm to fish and fish habitat been recommended by a qualified fish biologist and will serious harm to fish be avoided and/or mitigated by the successful implementation of these additional measures?	NA
Provide rationale:	

5. Is further review by NEB/DFO recommended by the qualified fish biologist?	No
Provide rationale:	

Notes:	1	Pending further direction from DFO regarding riparian habitat disturbance at pipeline-associated watercourse crossings, the mitigation measures and best management practices described in the Project's EPP and the guidance of existing provincial standards are assumed to be sufficient to avoid serious harm to fish, unless otherwise specified by a qualified fish biologist.
	2	Functional riparian width is interpreted as the terrestrial area/zone adjacent to a watercourse where vegetation and microclimate are hydrologically influenced by the presence of perennial or intermittent water from the stream or river.

Watercourse (Site#): Unnamed Drainage Ditch (SK-WC80)
Legal Location: 13-36-12-3 W2M
UTM (Zone 13U): 693525E, 5547265N
SKP (as of June 2014): 895.8

Survey Date: July 7, 2013
Habitat Survey Length (m): 200
Restricted Activity Timing Window: April 1 to May 31
Field Crew: J. Evans, S. Courtney

CHANNEL AND FLOW CONDITIONS (No. of Transects: 5)	
Confinement	Unconfined
Channel Pattern	Straight
Bankfull Width (m): Mean, Range	3.6, 2.0 – 6.0
Wetted Width (m): Mean, Range	3.1, 2.0-4.8
Water Depth (m): Mean, Range	0.34, 0.12 – 0.59
Ordinary Highwater Mark (m): Mean, Range	0.05, 0 - 0.10
Discharge (m³/s)	Negligible
Stream Gradient (%)	0.5
Embeddedness	n/a

CHANNEL AND FLOW CONDITIONS CONTINUED		
Beaver Dams	None	
Native Channel Width (m)	n/a	
BANK CONDITIONS	LEFT BANK	RIGHT BANK
Bank Shape	Sloping	Sloping
Bank Texture	Fines	Fines
Mean Bank Height (m)	0.5, 0.3 – 0.6	0.6, 0.3 – 0.7
Grade of Approach Slopes (%)	<4	<4
Riparian Area Width (m)	0 – 5	0 – 5
Riparian Vegetation Type	Grasses/Wetland	Grasses/Wetland

SUBSTRATE	%
Organics	0
Fines (<2 mm)	100
Small Gravel (2-20 mm)	0
Large Gravel (21-65 mm)	0
Cobble (66-250 mm)	0
Boulder (>250 mm)	0

WATER QUALITY PARAMETERS	
Water Temperature (°C)	20.9
pH	8.4
Dissolved Oxygen (mg/L)	7.0
Conductivity (µS/cm)	1015
Turbidity (visual)	Stained

HABITAT	No.	Length (m)	%	Velocity (m/s)
Pool 1 (depth >1.00 m)	-	-	-	-
Pool 2 (depth 0.5-1.00 m)	-	-	-	-
Pool 3 (depth <0.5 m)	-	-	-	-
Run 1 (>1.00 m)	-	-	-	-
Run 2 (0.5-1.00 m)	-	-	-	-
Run 3 (<0.5 m)	-	-	-	-
Flat 1 (>1.00 m)	-	-	-	-
Flat 2 (0.5-1.00 m)	-	-	-	-
Flat 3 (<0.5 m)	-	-	-	-
Riffle	-	-	-	-
No defined channel	-	-	-	-
Anthropogenic channel	1	200	100	Negligible
Other	-	-	-	-

COVER TYPES	%
Boulders	-
Undercut Banks	-
Overhanging Vegetation	-
Woody Debris	-
Depth	-
Instream Vegetation	See comments
Other	-
Other	-
Other	-
Other	-
Other	-
TOTAL COVER	See comments
Stream Shading	0 %

FISH HABITAT POTENTIAL RATINGS				
Species	Spawning	Rearing	Overwintering	Migration
northern pike	Unsuitable	Unsuitable	Unsuitable	Marginal
walleye	Unsuitable	Unsuitable	Unsuitable	Marginal
white sucker	Unsuitable	Unsuitable	Unsuitable	Marginal
brassy minnow	Marginal	Marginal	Marginal	Marginal

FISH SPECIES PREVIOUSLY DOCUMENTED
No species of fish have been previously documented.

FISH SPECIES PRESENT	No. Captured	No. Observed	Fork Length (mm): Mean, Range
Fathead minnow	4	0	20
Iowa darter	1	0	45
	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

FISH SAMPLING EFFORT		
Sampling Method	Dip Netting	Minnow Trapping
Time	15 minutes	4 hours
Distance (m)/ No. of Traps	n/a	4
No. Captured	4	1
CPUE	0.27	0.25

ADDITIONAL HABITAT COMMENTS
Drainage ditch, likely anthropogenic. Bull rushes and instream vegetation throughout the study area. Originates in the community of Langbank, SK and continues to the south as an undefined drainage full of bull rushes with little water. Fish likely present in drainage ditch due to flooding from other sources.

Notes: Catch per unit effort (CPUE) is the number of fish captured per hour of minnow trapping, per m² of seine netting, per 100 seconds of electrofishing and per minute of dip netting.
n/a: not applicable.



Plate 1 Photograph taken at right-of-way looking upstream.



Plate 2 Photograph taken at right-of-way looking downstream.



Plate 3 Photograph taken at right-of-way of left bank.



Plate 4 Photograph taken at right-of-way of right bank.



Plate 5 Aerial photograph taken of crossing view north (June 26, 2013).



Plate 6 Photograph taken of Iowa darter captured.

Line 3 Replacement Program



Map illustrating crossing and watercourse.

SELF-ASSESSMENT AND RISK MANAGEMENT DECISION FRAMEWORK FOR DFO REGULATORY REQUIREMENTS

DESCRIPTION OF AQUATIC ENVIRONMENT:

Federally/provincially listed species present:	No
Fish that are part of commercial, recreational or Aboriginal (CRA) fisheries present:	No
Fish that support a CRA fishery, or have downstream connectivity to a CRA fisheries present:	Yes
Banks and approach slope characteristics:	Sloping banks, low grade.
Riparian characteristics:	Functional Riparian Width (m) at Crossing (<i>i.e.</i> , contribution to fish habitat): 0 to 5 m

CONSTRUCTION DETAILS:

Construction Schedule:	January to March 2017	
Pipeline Methods:	Isolate if water present/open cut if dry or frozen to bottom	
Contingency Methods:	n/a	
Vehicle Crossing Methods:	Snowfill/ice bridge/clear span bridge/existing	
Estimated Maximum Footprint:	Right-of-Way Width: 45 m	Est. Instream Footprint: 45 m (ROW) x 3.6 m (bankfull) = 162 m²
	Bankfull Width: 3.6 m	Est. Functional Riparian Footprint: 45 m (ROW) x 10 m (riparian) = 450 m²
	Functional Riparian Width: L: 0 to 5 m, R: 0 to 5 m	Max Instream + Riparian Footprint: 162 m² + 450 m² = 612 m²
Zone-of-influence (ZOI):	100 m	
No. Days of Instream Work:	2 to 15 days	

RISK ASSESSMENT RANKING:

Using the risk assessment evaluation criteria, what ranking did the proposed watercourse crossing receive?				Low			
Scale of Negative Effects Evaluation Criteria		Scale of Negative Effect	Sensitivity of Fish and Fish Habitat				
<ul style="list-style-type: none">Fish species present and fish habitat potential within zone of influenceInstream timing windowsPipeline and vehicle/equipment crossing methodOccurrence and duration of instream workFootprint sizeDisturbance to riparian vegetationChannel and fish passage restrictionsChanges to water quality and turbidity parametersChanges to timing, duration and frequency of flowRiparian and bank restoration measuresBeaver activity and associated removals			Extreme Project Unlikely to Proceed	High DFO Authorization	Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required	Low Meets DFO criteria: review not required	Not fish habitat
		Extreme Project Unlikely to Proceed					
		High DFO Authorization					
		Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required				SK-WC80	
		Low Meets DFO criteria: review not required					
None							
Sensitivity to Fish and Fish Habitat Evaluation Criteria							
<ul style="list-style-type: none">Fish-bearing statusFish stream classificationFederally or provincially listed fish speciesFish species of management concernHabitat potential and/or availability for fish species and/or life stagesRiparian habitat valueWater quality parameters							

SELF-ASSESSMENT DECISION FRAMEWORK:

QUESTION	ANSWER
<i>If YES is answered to Questions 1 and 2 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 1 and 2, proceed to Questions 3 and 4.</i>	
1. Can all of the criteria outlined in DFO's Project Activities for the above pipeline/vehicle methods be met based on the qualified fish biologist's current knowledge?	YES
Provide rationale: <u>Dewatering/Pumping:</u> Temporary isolation dams and pumps with fish screen and a qualified fish biologist-lead fish salvage is recommended if water is present at the time of the isolation. Recommended the site be restored to pre-construction conditions. <u>Bridges:</u> Recommend no earth fill below the high watermark and no obstruction of potential fish passage by vehicle crossing.	
2. Can all applicable mitigation measures listed in DFO's <i>Measures to Avoid Causing Harm to Fish and Fish Habitat</i> be implemented to address the Pathways of Effects based on the qualified fish biologist's current knowledge?	YES
Provide rationale: Construction is to occur outside the restricted activity timing window. It is assumed the remaining mitigation measures for project planning, site selection, contaminant and spill management, erosion and sediment control, revegetation and stabilization, fish protection and operation of machinery can be met and are included in the Project's ESA and the EPP.	

<i>If YES is answered to Questions 3 and 4 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 3 and 4, proceed to Question 5.</i>	
3. Have fisheries management objectives, best management practices and/or plans been considered and applied where applicable?	NA
Provide rationale:	
4. Have additional mitigation measures to avoid causing harm to fish and fish habitat been recommended by a qualified fish biologist and will serious harm to fish be avoided and/or mitigated by the successful implementation of these additional measures?	NA
Provide rationale:	

5. Is further review by NEB/DFO recommended by the qualified fish biologist?	No
Provide rationale:	

Notes:	1	Pending further direction from DFO regarding riparian habitat disturbance at pipeline-associated watercourse crossings, the mitigation measures and best management practices described in the Project's EPP and the guidance of existing provincial standards are assumed to be sufficient to avoid serious harm to fish, unless otherwise specified by a qualified fish biologist.
	2	Functional riparian width is interpreted as the terrestrial area/zone adjacent to a watercourse where vegetation and microclimate are hydrologically influenced by the presence of perennial or intermittent water from the stream or river.

Watercourse (Site#): Little Pipestone Creek (SK-WC87)
Legal Location: 4-26-11-33 WPM
UTM (Zone 14U): 291856E, 5536830N
SKP (as of June 2014): 927.2

Survey Date: September 10, 2013
Habitat Survey Length (m): 200
Restricted Activity Timing Window: April 1 to May 31
Field Crew: E. Fulcher, L. Olsen

CHANNEL AND FLOW CONDITIONS (No. of Transects: 5)	
Confinement	Unconfined
Channel Pattern	Straight
Bankfull Width (m): Mean, Range	n/a
Wetted Width (m): Mean, Range	17.3,2.0-51.8
Water Depth (m): Mean, Range	0.28,0.03-0.70
Ordinary Highwater Mark (m): Mean, Range	0.2
Discharge (m³/s)	Negligible
Stream Gradient (%)	0-1%
Embeddedness	n/a

CHANNEL AND FLOW CONDITIONS CONTINUED		
Beaver Dams	None	
Native Channel Width (m)	n/a	
BANK CONDITIONS	LEFT BANK	RIGHT BANK
Bank Shape	Sloping	Sloping
Bank Texture	Fines/small gravel	Fines/small gravel
Mean Bank Height (m)	n/a	n/a
Grade of Approach Slopes (%)	<4	>14
Riparian Area Width (m)	40-50	0-5
Riparian Vegetation Type	Grasses	Grasses

SUBSTRATE	%
Organics	30
Fines (<2 mm)	70
Small Gravel (2-20 mm)	0
Large Gravel (21-65 mm)	0
Cobble (66-250 mm)	0
Boulder (>250 mm)	0

WATER QUALITY PARAMETERS	
Water Temperature (°C)	20.8
pH	8.2
Dissolved Oxygen (mg/L)	7.0 (see comments)
Conductivity (µS/cm)	1453.0
Turbidity (visual)	Light

HABITAT	No.	Length (m)	%	Velocity (m/s)
Pool 1 (depth >1.00 m)	-	-	-	-
Pool 2 (depth 0.5-1.00 m)	-	-	-	-
Pool 3 (depth <0.5 m)	-	-	-	-
Run 1 (>1.00 m)	-	-	-	-
Run 2 (0.5-1.00 m)	-	-	-	-
Run 3 (<0.5 m)	-	-	-	-
Flat 1 (>1.00 m)	-	-	-	-
Flat 2 (0.5-1.00 m)	-	-	-	-
Flat 3 (<0.5 m)	-	-	-	-
Riffle	-	-	-	-
No defined channel	2	200	100	Negligible
Other (dry channel)	-	-	-	-
Other	-	-	-	-

COVER TYPES	%
Boulders	-
Undercut Banks	-
Overhanging Vegetation	-
Woody Debris	-
Depth	-
Instream Vegetation	See comments
Other	-
Other	-
Other	-
Other	-
Other	-
Other	-
TOTAL COVER (m²)	See comments
Stream Shading	0 %

FISH HABITAT POTENTIAL RATINGS				
Species	Spawning	Rearing	Overwintering	Migration
northern pike	Marginal	Marginal	Unsuitable	Marginal
walleye	Unsuitable	Unsuitable	Unsuitable	Marginal
white sucker	Unsuitable	Marginal	Unsuitable	Marginal
brassy minnow	Marginal	Marginal	Marginal	Marginal

FISH SPECIES PREVIOUSLY DOCUMENTED
White sucker, fathead minnow and lake chub have been previously documented (AAR 2007a).

FISH SPECIES PRESENT	No. Captured	No. Observed	Fork Length (mm): Mean, Range
Pearl dace	95	-	24,12-55
Brook stickleback	3	-	15, 10-18
Fathead minnow	3	-	56, 43-65
White sucker	1	-	138
-	-	-	-
-	-	-	-

FISH SAMPLING EFFORT	
Sampling Method	Backpack electrofishing
No. of seconds/hours	565
Distance (m)/No. of traps	100
No. Captured	102
CPUE	18.05

ADDITIONAL HABITAT COMMENTS
Cattle impacts are evident. No defined channel with limited connectivity. Railway culvert crossing present 50 m downstream causes ponding effects. Instream vegetation present as cover. Dissolved oxygen reading taken with HACH test kit.

Notes: per unit effort (CPUE) is the number of fish captured per hour of minnow trapping, per m² of seine netting and per 100 seconds of electrofishing
n/a: not applicable.



Plate 1 Photograph taken at right-of-way looking upstream.



Plate 2 Photograph taken at right-of-way looking downstream.



Plate 3 Photograph taken at right-of-way looking at left bank.



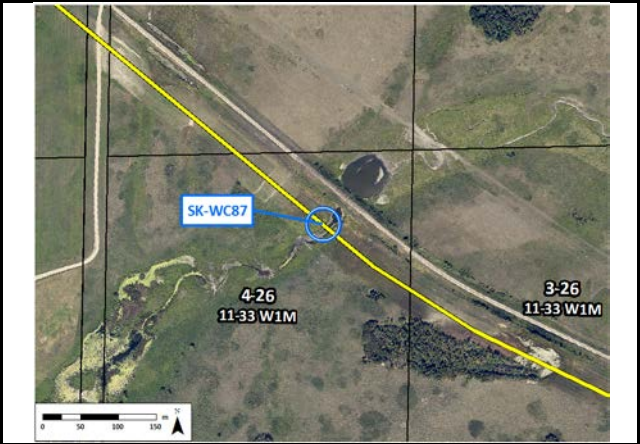
Plate 4 Photograph taken at right-of-way looking at right bank.



Plate 5 Aerial photograph taken of crossing view north (June 26, 2013).



Plate 6 Photograph taken approximately 25 m downstream of the right-of-way looking downstream at culvert railroad crossing.



Map illustrating crossing and watercourse.

Line 3 Replacement Program



SELF-ASSESSMENT AND RISK MANAGEMENT DECISION FRAMEWORK FOR DFO REGULATORY REQUIREMENTS

DESCRIPTION OF AQUATIC ENVIRONMENT:

Federally/provincially listed species present:	No
Fish that are part of commercial, recreational or Aboriginal (CRA) fisheries present:	No
Fish that support a CRA fishery, or have downstream connectivity to a CRA fisheries present:	Yes
Banks and approach slope characteristics:	Sloping banks, low grade on left bank (<4%), high grade on right bank (>14%). Cattle impacts are evident.
Riparian characteristics:	Functional Riparian Width (m) at Crossing (<i>i.e.</i> , contribution to fish habitat): L: 40 to 50 m, R: 0 to 5 m

CONSTRUCTION DETAILS:

Construction Schedule:	January to March, 2017	
Pipeline Methods:	Isolate if water present/open cut if dry or frozen to bottom	
Contingency Methods:	n/a	
Vehicle Crossing Methods:	Snowfill/ice bridge/clear span bridge/existing	
Estimated Maximum Footprint:	Right-of-Way Width: 45 m	Est. Instream Footprint: 45 m (ROW) x 17.3 m (wetted width) = 778.5 m²
	Bankfull Width: No defined channel, wetted width 17.3 m	Est. Functional Riparian Footprint: 45 m (ROW) x 55 m (riparian) = 2475 m²
	Functional Riparian Width: L: 40 to 50 m, R: 0 to 5 m	Max Instream + Riparian Footprint: 778.5 m² + 2,475 m² = 3,253.5 m²
Zone-of-influence (ZOI):	100 m	
No. Days of Instream Work:	2 to 15 days	

RISK ASSESSMENT RANKING:

Using the risk assessment evaluation criteria, what ranking did the proposed watercourse crossing receive?				Low		
Scale of Negative Effects Evaluation Criteria		Scale of Negative Effect	Sensitivity of Fish and Fish Habitat			
<ul style="list-style-type: none">Fish species present and fish habitat potential within zone of influenceInstream timing windowsPipeline and vehicle/equipment crossing methodOccurrence and duration of instream workFootprint sizeDisturbance to riparian vegetationChannel and fish passage restrictionsChanges to water quality and turbidity parametersChanges to timing, duration and frequency of flowRiparian and bank restoration measuresBeaver activity and associated removals			Extreme Project Unlikely to Proceed	High DFO Authorization	Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required	Low Meets DFO criteria: review not required
		Extreme Project Unlikely to Proceed				
		High DFO Authorization				
		Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required				SK-WC87
		Low Meets DFO criteria: review not required				
		None				
Sensitivity to Fish and Fish Habitat Evaluation Criteria						
<ul style="list-style-type: none">Fish-bearing statusFish stream classificationFederally or provincially listed fish speciesFish species of management concernHabitat potential and/or availability for fish species and/or life stagesRiparian habitat valueWater quality parameters						

SELF-ASSESSMENT DECISION FRAMEWORK:

QUESTION	ANSWER
<i>If YES is answered to Questions 1 and 2 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 1 and 2, proceed to Questions 3 and 4.</i>	
1. Can all of the criteria outlined in DFO's Project Activities for the above pipeline/vehicle methods be met based on the qualified fish biologist's current knowledge?	YES
Provide rationale: <u>Dewatering/Pumping:</u> Temporary isolation dams and pumps with fish screen and a qualified fish biologist-lead fish salvage is recommended if water is present at the time of the isolation. Recommended the site be restored to pre-construction conditions. <u>Bridges:</u> Recommend no earth fill below the high watermark and no obstruction of potential fish passage by vehicle crossing.	
2. Can all applicable mitigation measures listed in DFO's <i>Measures to Avoid Causing Harm to Fish and Fish Habitat</i> be implemented to address the Pathways of Effects based on the qualified fish biologist's current knowledge?	YES
Provide rationale: Construction is to occur outside the restricted activity timing window. It is assumed the remaining mitigation measures for project planning, site selection, contaminant and spill management, erosion and sediment control, revegetation and stabilization, fish protection and operation of machinery can be met and are included in the Project's ESA and the EPP.	

<i>If YES is answered to Questions 3 and 4 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 3 and 4, proceed to Question 5.</i>	
3. Have fisheries management objectives, best management practices and/or plans been considered and applied where applicable?	NA
Provide rationale:	
4. Have additional mitigation measures to avoid causing harm to fish and fish habitat been recommended by a qualified fish biologist and will serious harm to fish be avoided and/or mitigated by the successful implementation of these additional measures?	NA
Provide rationale:	

5. Is further review by NEB/DFO recommended by the qualified fish biologist?	No
Provide rationale:	

Notes:	1	Pending further direction from DFO regarding riparian habitat disturbance at pipeline-associated watercourse crossings, the mitigation measures and best management practices described in the Project's EPP and the guidance of existing provincial standards are assumed to be sufficient to avoid serious harm to fish, unless otherwise specified by a qualified fish biologist.
	2	Functional riparian width is interpreted as the terrestrial area/zone adjacent to a watercourse where vegetation and microclimate are hydrologically influenced by the presence of perennial or intermittent water from the stream or river.

Watercourse (Site#): Stony Creek (SK-WC89)
Legal Location: 7-11-10-30 WPM
UTM (Zone 14U): 323729E, 5521460N
SKP (as of June 2014): 963.0

Survey Date: September 9, 2013
Habitat Survey Length (m): 140
Restricted Activity Timing Window: April 1 to May 31
Field Crew: E. Fulcher, L. Olsen

CHANNEL AND FLOW CONDITIONS (No. of Transects: 5)	
Confinement	Unconfined
Channel Pattern	Straight
Bankfull Width (m): Mean, Range	2.9, 2.0-3.3
Wetted Width (m): Mean, Range	Dry
Water Depth (m): Mean, Range	Dry
Ordinary Highwater Mark (m): Mean, Range	0.3,0.2-0.3
Discharge (m³/s)	Dry
Stream Gradient (%)	1-2%
Embeddedness	n/a

CHANNEL AND FLOW CONDITIONS CONTINUED		
Beaver Dams	None	
Native Channel Width (m)	n/a	
BANK CONDITIONS	LEFT BANK	RIGHT BANK
Bank Shape	Sloping	Sloping
Bank Texture	Fines/small gravel	Fines/small gravel
Mean Bank Height (m)	0.6	0.5
Grade of Approach Slopes (%)	<4	<4
Riparian Area Width (m)	10-20	10-20
Riparian Vegetation Type	Grasses	Grasses

SUBSTRATE	%
Organics	0
Fines (<2 mm)	80
Small Gravel (2-20 mm)	4
Large Gravel (21-65 mm)	4
Cobble (66-250 mm)	10
Boulder (>250 mm)	2

HABITAT	No.	Length (m)	%	Velocity (m/s)
Pool 1 (depth >1.00 m)	-	-	-	-
Pool 2 (depth 0.5-1.00 m)	-	-	-	-
Pool 3 (depth <0.5 m)	-	-	-	-
Run 1 (>1.00 m)	-	-	-	-
Run 2 (0.5-1.00 m)	-	-	-	-
Run 3 (<0.5 m)	-	-	-	-
Flat 1 (>1.00 m)	-	-	-	-
Flat 2 (0.5-1.00 m)	-	-	-	-
Flat 3 (<0.5 m)	-	-	-	-
Riffle	-	-	-	-
No defined channel	-	-	-	-
Other (dry channel)	2	140	100	Dry
Other	-	-	-	-

COVER TYPES	%
Boulders	-
Undercut Banks	-
Overhanging Vegetation	-
Woody Debris	-
Depth	-
Instream Vegetation	-
Other	-
Other	-
Other	-
Other	-
TOTAL COVER (m²)	Dry
Stream Shading	0 %

FISH HABITAT POTENTIAL RATINGS				
Species	Spawning	Rearing	Overwintering	Migration
northern pike	Unsuitable	Unsuitable	Unsuitable	Unsuitable
walleye	Unsuitable	Unsuitable	Unsuitable	Unsuitable
white sucker	Unsuitable	Unsuitable	Unsuitable	Unsuitable
brassy minnow	Unsuitable	Unsuitable	Unsuitable	Unsuitable

FISH SPECIES PREVIOUSLY DOCUMENTED
Brook stickleback and fathead minnow have been previously documented (Milani 2013).

FISH SPECIES PRESENT	No. Captured	No. Observed	Fork Length (mm): Mean, Range
No fish sampling conducted (dry)	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

FISH SAMPLING EFFORT	
Sampling Method	No fish sampling conducted (dry)
No. of seconds/hours	-
Distance (m)/No. of traps	-
No. Captured	-
CPUE	-

ADDITIONAL HABITAT COMMENTS
Dry channel present throughout study area at time of assessment. Cattle impacts evident and affect channel definition. Could not access further then 40 m upstream due to lack of land access. No documented fish presence, potential for small bodied fish when flowing.

Notes: Catch per unit effort (CPUE) is the number of fish captured per hour of minnow trapping, per m² of seine netting and per 100 seconds of electrofishing.
n/a: not applicable.



Plate 1 Photograph taken at right-of-way looking upstream.



Plate 2 Photograph taken at right-of-way looking downstream.



Plate 3 Photograph taken at right-of-way looking at left bank.



Plate 4 Photograph taken at right-of-way looking at right bank.



Plate 5 Aerial photograph taken of crossing view north (June 26, 2013).



Plate 6 Photograph taken approximately 40 m upstream of the right-of-way looking at left bank showing cattle impacts.



Map illustrating crossing and watercourse.

Line 3 Replacement Program



SELF-ASSESSMENT AND RISK MANAGEMENT DECISION FRAMEWORK FOR DFO REGULATORY REQUIREMENTS

DESCRIPTION OF AQUATIC ENVIRONMENT:

Federally/provincially listed species present:	No
Fish that are part of commercial, recreational or Aboriginal (CRA) fisheries present:	No
Fish that support a CRA fishery, or have downstream connectivity to a CRA fisheries present:	Yes
Banks and approach slope characteristics:	Sloping banks, low grade. Cattle impacts evident and affect channel definition.
Riparian characteristics:	Functional Riparian Width (m) at Crossing (<i>i.e.</i> , contribution to fish habitat): L: 10 to 20 m, R: 10 to 20 m

CONSTRUCTION DETAILS:

Construction Schedule:	January to March 2017	
Pipeline Methods:	Isolate if water present/open cut if dry or frozen to bottom	
Contingency Methods:	n/a	
Vehicle Crossing Methods:	Snowfill/ice bridge/clear span bridge/existing	
Estimated Maximum Footprint:	Right-of-Way Width: 45 m	Est. Instream Footprint: 45 m (ROW) x 2.9 m (bankfull) = 130.5 m ²
	Bankfull Width: 2.9 m	Est. Functional Riparian Footprint: 45 m (ROW) x 40 m (riparian) = 1,800 m ²
	Functional Riparian Width: L: 10 to 20 m, R: 10 to 20 m	Max Instream + Riparian Footprint: 130.5 m ² + 1,800 m ² = 1,930.5 m ²
Zone-of-influence (ZOI):	100 m	
No. Days of Instream Work:	2 to 15 days	

RISK ASSESSMENT RANKING:

Using the risk assessment evaluation criteria, what ranking did the proposed watercourse crossing receive?				Low			
Scale of Negative Effects Evaluation Criteria		Scale of Negative Effect	Sensitivity of Fish and Fish Habitat				
<ul style="list-style-type: none">Fish species present and fish habitat potential within zone of influenceInstream timing windowsPipeline and vehicle/equipment crossing methodOccurrence and duration of instream workFootprint sizeDisturbance to riparian vegetationChannel and fish passage restrictionsChanges to water quality and turbidity parametersChanges to timing, duration and frequency of flowRiparian and bank restoration measuresBeaver activity and associated removals			Extreme Project Unlikely to Proceed	High DFO Authorization	Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required	Low Meets DFO criteria; review not required	Not fish habitat
		Extreme Project Unlikely to Proceed					
		High DFO Authorization					
		Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required				SK-WC89	
		Low Meets DFO criteria; review not required					
		None					
Sensitivity to Fish and Fish Habitat Evaluation Criteria							
<ul style="list-style-type: none">Fish-bearing statusFish stream classificationFederally or provincially listed fish speciesFish species of management concernHabitat potential and/or availability for fish species and/or life stagesRiparian habitat valueWater quality parameters							

SELF-ASSESSMENT DECISION FRAMEWORK:

QUESTION	ANSWER
<i>If YES is answered to Questions 1 and 2 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 1 and 2, proceed to Questions 3 and 4.</i>	
1. Can all of the criteria outlined in DFO's Project Activities for the above pipeline/vehicle methods be met based on the qualified fish biologist's current knowledge?	YES
Provide rationale: <u>Dewatering/Pumping:</u> Temporary isolation dams and pumps with fish screen and a qualified fish biologist-lead fish salvage is recommended if water is present at the time of the isolation. Recommended the site be restored to pre-construction conditions. <u>Bridges:</u> Recommend no earth fill below the high watermark and no obstruction of potential fish passage by vehicle crossing.	
2. Can all applicable mitigation measures listed in DFO's <i>Measures to Avoid Causing Harm to Fish and Fish Habitat</i> be implemented to address the Pathways of Effects based on the qualified fish biologist's current knowledge?	YES
Provide rationale: Construction is to occur outside the restricted activity timing window. It is assumed the remaining mitigation measures for project planning, site selection, contaminant and spill management, erosion and sediment control, revegetation and stabilization, fish protection and operation of machinery can be met and are included in the Project's ESA and the EPP.	

<i>If YES is answered to Questions 3 and 4 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 3 and 4, proceed to Question 5.</i>	
3. Have fisheries management objectives, best management practices and/or plans been considered and applied where applicable?	NA
Provide rationale:	
4. Have additional mitigation measures to avoid causing harm to fish and fish habitat been recommended by a qualified fish biologist and will serious harm to fish be avoided and/or mitigated by the successful implementation of these additional measures?	NA
Provide rationale:	

5. Is further review by NEB/DFO recommended by the qualified fish biologist?	No
Provide rationale:	

Notes:	1	Pending further direction from DFO regarding riparian habitat disturbance at pipeline-associated watercourse crossings, the mitigation measures and best management practices described in the Project's EPP and the guidance of existing provincial standards are assumed to be sufficient to avoid serious harm to fish, unless otherwise specified by a qualified fish biologist.
	2	Functional riparian width is interpreted as the terrestrial area/zone adjacent to a watercourse where vegetation and microclimate are hydrologically influenced by the presence of perennial or intermittent water from the stream or river.

Watercourse (Site#): Pipestone Creek (MB-WC1)
Legal Location: 10-34-9-29 WPM
UTM (Zone 14U):331981E, 5518167N
SKP (as of June 2014):971.9

Survey Date: June 18, 2014
Habitat Survey Length (m): 250
Restricted Activity Timing Window: April 1 to June 30
Field Crew: J. Mouland, S. Layher

CHANNEL AND FLOW CONDITIONS (No. of Transects: 6)	
Confinement	Frequently confined
Channel Pattern	Sinuuous
Bankfull Width (m): Mean, Range	23.2, 14.0-36.0
Wetted Width (m): Mean, Range	19.5, 10.0-31.0
Water Depth (m): Mean, Range	0.75, 0.23-1.26
Ordinary Highwater Mark (m): Mean, Range	0.2, consistent throughout
Discharge (m³/s)	4.41
Stream Gradient (%)	2%
Embeddedness	Low embeddedness

CHANNEL AND FLOW CONDITIONS CONTINUED		
Beaver Dams	No	
Native Channel Width (m)	n/a	
BANK CONDITIONS	LEFT BANK	RIGHT BANK
Bank Shape	Sloping	Vertical
Bank Texture	Fines/cobble	Fines/small gravel
Mean Bank Height (m)	2.0	3.4
Grade of Approach Slopes (%)	>14	>14
Riparian Area Width (m)	150	1
Riparian Vegetation Type	Grasses/shrubs	Grasses/shrubs

SUBSTRATE	%
Organics	0
Fines (<2 mm)	63
Small Gravel (2-20 mm)	12
Large Gravel (21-65 mm)	0
Cobble (66-250 mm)	1
Boulder (>250 mm)	24

WATER QUALITY PARAMETERS	
Water Temperature (°C)	17.8
pH	n/r
Dissolved Oxygen (mg/L)	8.0
Conductivity (µS/cm)	936.0
Turbidity (visual)	Moderately turbid

HABITAT	No.	Length (m)	%	Velocity (m/s)
Pool 1 (depth >1.00 m)	-	-	-	-
Pool 2 (depth 0.5-1.00 m)	-	-	-	-
Pool 3 (depth <0.5 m)	-	-	-	-
Run 1 (>1.00 m)	2	215	83	0.65
Run 2 (0.5-1.00 m)	-	-	-	-
Run 3 (<0.5 m)	-	-	-	-
Flat 1 (>1.00 m)	-	-	-	-
Flat 2 (0.5-1.00 m)	-	-	-	-
Flat 3 (<0.5 m)	-	-	-	-
Riffle	-	-	-	-
No defined channel/lake	-	-	-	-
Rapid	1	45	17	1.5
Other	-	-	-	-

COVER TYPES	%
Boulders	57.7
Undercut Banks	0.4
Overhanging Vegetation	0
Woody Debris	0.2
Depth	41.2
Instream Vegetation	0.5
Other	-
Other	-
Other	-
Other	-
Other	-
Other	-
TOTAL COVER (m²)	971
Stream Shading	1-20%

FISH HABITAT POTENTIAL RATINGS				
Species	Spawning	Rearing	Overwintering	Migration
northern pike	Marginal	Marginal	Marginal	Important
walleye	Marginal	Important	Marginal	Important
white sucker	Important	Important	Marginal	Important
brassy minnow	Marginal	Marginal	Important	Important

FISH SPECIES PREVIOUSLY DOCUMENTED
Northern pike, walleye, yellow perch, white sucker, creek chub, fathead minnow, pearl dace, longnose dace, Iowa darter and brook stickleback have been previously documented (AAR 2007b, Milani 2013, Janusz pers. comm, McCutcheon pers. comm.)

FISH SPECIES PRESENT	No. Captured	No. Observed	Fork Length (mm): Mean, Range
Fathead minnow	4	0	45, 38-50

FISH SAMPLING EFFORT			
Sampling Method	Backpack Electrofishing	Minnow Trap	Seine Netting
No. of seconds/hours/m²	1254	120	4
Distance (m)/# of traps/# of nets	400	6	4
No. Captured	4	0	0
CPUE	0.32	0	0

ADDITIONAL HABITAT COMMENTS
White heelsplitter, cylindrical papershell, giant floater and fatmucket mussel species have been previously documented in Pipestone Creek (Watson <i>et al.</i> 1998).Damage to banks where cattle enter the watercourse is evident throughout the assessment length. Boulder substrate is artificial rip-rap from existing right-of-way. Approach slopes will need to be graded. 150 m downstream is only 20 m linear distance from proposed right-of-way as the site is located at a meander bend. Two fatmucket mussels captured downstream of proposed centerline and large mussel shells were noted throughout the study reach. Mussel shells are suspected of being from white heelsplitter, fatmucket, cylindrical papershell and giant floater. Field crew could only access to 300 m downstream due to landowner concerns. In addition, the outboard motor and generator for the float electrofishing gear were not used due to landowner concerns.

Notes: Catch per unit effort (CPUE) is the number of fish captured per hour of minnow trapping, per m² of seine netting and per 100 seconds of electrofishing.
n/a: not applicable, n/r: not recorded.



Plate 1 Photograph taken at right-of-way looking upstream.



Plate 2 Photograph taken at right-of-way looking downstream.



Plate 3 Photograph taken at right-of-way looking toward left bank.



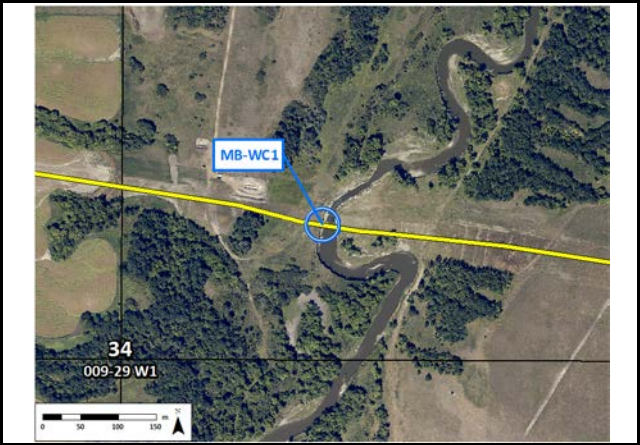
Plate 4 Photograph taken at right-of-way looking toward right bank.



Plate 5 Aerial photograph taken of crossing looking north (June 26, 2014).



Plate 6 Photograph taken of fatmucket mussel captured.



Map illustrating crossing and watercourse.

Line 3 Replacement Program



SELF-ASSESSMENT AND RISK MANAGEMENT DECISION FRAMEWORK FOR DFO REGULATORY REQUIREMENTS

DESCRIPTION OF AQUATIC ENVIRONMENT:

Federally/provincially listed species present:	No
Fish that are part of commercial, recreational or Aboriginal (CRA) fisheries present:	Yes
Fish that support a CRA fishery, or have downstream connectivity to a CRA fisheries present:	Yes
Banks and approach slope characteristics:	Left bank sloping with a low grade of approach slope (<4%). Right bank vertical with a moderate grade of approach slope (4-14%). Right bank was noted to be unstable.
Riparian characteristics:	Functional Riparian Width (m) at Crossing (<i>i.e.</i> , contribution to fish habitat): L: 150 m R: 1 m

CONSTRUCTION DETAILS:

Construction Schedule:	January to March 2017	
Pipeline Methods:	Isolate if water present/open cut if dry or frozen to bottom	
Contingency Methods:	n/a	
Vehicle Crossing Methods:	Snowfill/ice bridge/clear span bridge/existing	
Estimated Maximum Footprint:	Right-of-Way Width: 45 m	Est. Instream Footprint: 45 m (ROW) x 23.2 m (bankfull) = 1,044 m ²
	Bankfull Width: 23.2 m	Est. Functional Riparian Footprint: 45 m (ROW) x 151 m (riparian) = 6,795 m ²
	Functional Riparian Width: L: 150 m, R: 1 m	Max Instream + Riparian Footprint: 1,044 m ² +6,795 m ² = 7,839 m ²
Zone-of-influence (ZOI):	2,700 m	
No. Days of Instream Work:	2 to 15 days	

RISK ASSESSMENT RANKING:

Using the risk assessment evaluation criteria, what ranking did the proposed watercourse crossing receive?				Moderate			
Scale of Negative Effects Evaluation Criteria		Scale of Negative Effect	Sensitivity of Fish and Fish Habitat				
<ul style="list-style-type: none">Fish species present and fish habitat potential within zone of influenceInstream timing windowsPipeline and vehicle/equipment crossing methodOccurrence and duration of instream workFootprint sizeDisturbance to riparian vegetationChannel and fish passage restrictionsChanges to water quality and turbidity parametersChanges to timing, duration and frequency of flowRiparian and bank restoration measuresBeaver activity and associated removals			Extreme Project Unlikely to Proceed	High DFO Authorization	Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required	Low Meets DFO criteria; review not required	Not fish habitat
			Extreme Project Unlikely to Proceed				
			High DFO Authorization				
			Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required		MB-WC1		
			Low Meets DFO criteria; review not required				
Sensitivity to Fish and Fish Habitat Evaluation Criteria							
<ul style="list-style-type: none">Fish-bearing statusFish stream classificationFederally or provincially listed fish speciesFish species of management concernHabitat potential and/or availability for fish species and/or life stagesRiparian habitat valueWater quality parameters							
		None					

SELF-ASSESSMENT DECISION FRAMEWORK:

QUESTION	ANSWER
<i>If YES is answered to Questions 1 and 2 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing unless otherwise stated. If NO is answered for one or more of Questions 1 and 2, proceed to Questions 3 and 4.</i>	
1. Can all of the criteria outlined in DFO's Project Activities for the above pipeline/vehicle methods be met based on the qualified fish biologist's current knowledge?	YES
Provide rationale: <u>Dewatering/Pumping:</u> Temporary isolation dams and pumps with fish screen and a qualified fish biologist-lead fish salvage is recommended if water is present at the time of the isolation. Recommended the site be restored to pre-construction conditions. <u>Bridges:</u> Recommend no earth fill below the high watermark and no obstruction of potential fish passage by vehicle crossing.	
2. Can all applicable mitigation measures listed in DFO's <i>Measures to Avoid Causing Harm to Fish and Fish Habitat</i> be implemented to address the Pathways of Effects based on the qualified fish biologist's current knowledge?	NO
Provide rationale: Construction is to occur outside the restricted activity timing window. Alignment parallels a meander bend and all DFO's <i>Measures to Avoid Causing Harm to Fish and Fish Habitat</i> may not be met due to potential increased riparian disturbance. Proposed centerline is 20 m away from the meander bend. It is assumed the remaining mitigation measures for project planning, site selection, contaminant and spill management, erosion and sediment control, revegetation and stabilization, fish protection and operation of machinery can be met and are included in the Project's ESA and the EPP.	

<i>If YES is answered to Questions 3 and 4 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing unless otherwise stated. If NO is answered for one or more of Questions 3 and 4, proceed to Question 5.</i>	
3. Have fisheries management objectives, best management practices and/or plans been considered and applied where applicable?	YES
Provide rationale: Other standards and best management practices for working in and around water have been incorporated into the Project's EPP and will be implemented where applicable (<i>e.g.</i> , CAPP <i>et al.</i> 2005).	
4. Have additional mitigation measures to avoid causing harm to fish and fish habitat been recommended by a qualified fish biologist and will serious harm to fish be avoided and/or mitigated by the successful implementation of these additional measures?	YES (see below)
Provide rationale: Watercourse was rated as Important walleye rearing habitat potential and northern pike, walleye and yellow perch are previously documented in the watercourse. Maintaining a qualified fish biologist onsite is recommended to facilitate fish passage, if warranted, and conduct water quality monitoring and a fish/mussel salvage during construction. Recommend bank stabilization measures to be implemented are a combination of hard armouring (<i>e.g.</i> , riprap) and bio-engineering (<i>e.g.</i> , live shrub staking). The right bank was noted to be unstable at the proposed crossing location. It is recommend to minimize any disturbance to the riparian vegetation along the meander bend of the watercourse and limit construction activities to the proposed pipeline crossing location.	

5. Is further review by NEB/DFO recommended by the qualified fish biologist?	YES
Provide rationale: With the successful implementation of additional recommendations made by a qualified fish biologist, moderate sensitivity of the study reach and construction timing, it is expected no serious harm to fish will result. However, review by the NEB/DFO is recommended to confirm serious harm will not result due to habitat sensitivity and bank conditions.	

Notes:	1	Pending further direction from DFO regarding riparian habitat disturbance at pipeline-associated watercourse crossings, the mitigation measures and best management practices described in the Project's EPP and the guidance of existing provincial standards are assumed to be sufficient to avoid serious harm to fish, unless otherwise specified by a qualified fish biologist.
	2	Functional riparian width is interpreted as the terrestrial area/zone adjacent to a watercourse where vegetation and microclimate are hydrologically influenced by the presence of perennial or intermittent water from the stream or river. The footprint calculation assumes no additional disturbance as a result of the alignment paralleling a meander bend.

Watercourse (Site#): Black Creek (MB-WC27)
Legal Location: 5-25-7-18 WPM
UTM (Zone 14U): 442348E, 5494205N
SKP (as of June 2014): 1087.6

Survey Date: September 7, 2013
Habitat Survey Length (m): 110
Restricted Activity Timing Window: April 1 to June 30
Field Crew: E. Fulcher, L. Olsen

CHANNEL AND FLOW CONDITIONS (No. of Transects: 5)	
Confinement	n/a
Channel Pattern	n/a
Bankfull Width (m): Mean, Range	n/a
Wetted Width (m): Mean, Range	2.5, 1.6-3.3
Water Depth (m): Mean, Range	0.36, 0.23-0.52
Ordinary Highwater Mark (m): Mean, Range	0.3
Discharge (m³/s)	Negligible
Stream Gradient (%)	3%
Embeddedness	n/a

CHANNEL AND FLOW CONDITIONS CONTINUED		
Beaver Dams	None	
Native Channel Width (m)	n/a	
BANK CONDITIONS	LEFT BANK	RIGHT BANK
Bank Shape	Sloping	Sloping
Bank Texture	Fines	Fines
Mean Bank Height (m)	n/a	n/a
Grade of Approach Slopes (%)	<4	>14
Riparian Area Width (m)	0 - 5	0 - 5
Riparian Vegetation Type	Grasses	Grasses

SUBSTRATE	%
Organics	100
Fines (<2 mm)	0
Small Gravel (2-20 mm)	0
Large Gravel (21-65 mm)	0
Cobble (66-250 mm)	0
Boulder (>250 mm)	0

WATER QUALITY PARAMETERS	
Water Temperature (°C)	16.6
pH	7.1
Dissolved Oxygen (mg/L)	4.5
Conductivity (µS/cm)	2058.0
Turbidity (visual)	Moderate

HABITAT	No.	Length (m)	%	Velocity (m/s)
Pool 1 (depth >1.00 m)	-	-	-	-
Pool 2 (depth 0.5-1.00 m)	-	-	-	-
Pool 3 (depth <0.5 m)	-	-	-	-
Run 1 (>1.00 m)	-	-	-	-
Run 2 (0.5-1.00 m)	-	-	-	-
Run 3 (<0.5 m)	-	-	-	-
Flat 1 (>1.00 m)	-	-	-	-
Flat 2 (0.5-1.00 m)	-	-	-	-
Flat 3 (<0.5 m)	-	-	-	-
Riffle	-	-	-	-
No defined channel	2	110	100	Negligible
Other (LWB)	-	-	-	-
Other	-	-	-	-

COVER TYPES	%
Boulders	-
Undercut Banks	-
Overhanging Vegetation	-
Woody Debris	-
Depth	-
Instream Vegetation	See comments
Other	-
Other	-
Other	-
Other	-
Other	-
TOTAL COVER (m²)	See comments
Stream Shading	0 %

FISH HABITAT POTENTIAL RATINGS				
Species	Spawning	Rearing	Overwintering	Migration
northern pike	Unsuitable	Unsuitable	Unsuitable	Unsuitable
walleye	Unsuitable	Unsuitable	Unsuitable	Unsuitable
white sucker	Unsuitable	Unsuitable	Unsuitable	Unsuitable
brassy minnow	Marginal	Marginal	Marginal	Unsuitable

FISH SPECIES PREVIOUSLY DOCUMENTED
White sucker, fathead minnow, creek chub, common shiner and brook stickleback have been previously documented (Milani 2013).

FISH SPECIES PRESENT	No. Captured	No. Observed	Fork Length (mm): Mean, Range
Brook stickleback	6	-	45.5,40-50
Pearl dace	13	-	38.5,29-46
-	-	-	-
-	-	-	-
-	-	-	-

FISH SAMPLING EFFORT	
Sampling Method	Backpack electrofishing
No. of seconds/hours	304
Distance (m)/No. of traps	25
No. Captured	19
CPUE	6.25

ADDITIONAL HABITAT COMMENTS
No defined channel. Isolated pockets of water with fish present at time of assessment. Instream vegetation is the dominant form of cover.

Notes: Catch per unit effort (CPUE) is the number of fish captured per hour of minnow trapping, per m² of seine netting and per 100 seconds of electrofishing.
n/a - not applicable.



Plate 1 Photograph taken at right-of-way looking upstream.



Plate 2 Photograph taken at right-of-way looking downstream.



Plate 3 Photograph taken at right-of-way of left bank.



Plate 4 Photograph taken at right-of-way of right bank.



Plate 5 Aerial photograph taken of crossing view north (June 26, 2013).



Plate 6 Photograph taken approximately 25 m upstream of the right-of-way looking upstream at ponding.



Map illustrating crossing and watercourse.

Line 3 Replacement Program



SELF-ASSESSMENT AND RISK MANAGEMENT DECISION FRAMEWORK FOR DFO REGULATORY REQUIREMENTS

DESCRIPTION OF AQUATIC ENVIRONMENT:

Federally/provincially listed species present:	No
Fish that are part of commercial, recreational or Aboriginal (CRA) fisheries present:	No
Fish that support a CRA fishery, or have downstream connectivity to a CRA fisheries present:	Yes
Banks and approach slope characteristics:	Sloping banks. Approach slope of left bank is low (<2%), while right bank is high (>14%).
Riparian characteristics:	Functional Riparian Width (m) at Crossing (<i>i.e.</i> , contribution to fish habitat): 0 to 5 m

CONSTRUCTION DETAILS:

Construction Schedule:	August to December 2017	
Pipeline Methods:	Isolate if water present/open cut if dry or frozen to bottom	
Contingency Methods:	n/a	
Vehicle Crossing Methods:	Snowfill/ice bridge/clear span bridge/existing	
Estimated Maximum Footprint:	Right-of-Way Width: 45 m	Est. Instream Footprint: 45 m (ROW) x 2.5 m (wetted width) = 112.5 m ²
	Bankfull Width: No defined channel, wetted width 2.5 m	Est. Functional Riparian Footprint: 45 m (ROW) x 10 m (riparian) = 450 m ²
	Functional Riparian Width: L: 0 to 5 m, R: 0 to 5 m	Max Instream + Riparian Footprint: 112.5 m ² + 450 m ² = 562.5 m ²
Zone-of-influence (ZOI):	100 m	
No. Days of Instream Work:	2 to 15 days	

RISK ASSESSMENT RANKING:

Using the risk assessment evaluation criteria, what ranking did the proposed watercourse crossing receive?	Low
--	-----

Scale of Negative Effects Evaluation Criteria		Sensitivity of Fish and Fish Habitat				
<ul style="list-style-type: none">Fish species present and fish habitat potential within zone of influenceInstream timing windowsPipeline and vehicle/equipment crossing methodOccurrence and duration of instream workFootprint sizeDisturbance to riparian vegetationChannel and fish passage restrictionsChanges to water quality and turbidity parametersChanges to timing, duration and frequency of flowRiparian and bank restoration measuresBeaver activity and associated removals	Scale of Negative Effect	Extreme Project Unlikely to Proceed	High DFO Authorization	Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required	Low Meets DFO criteria: review not required	Not fish habitat
	Extreme Project Unlikely to Proceed					
	High DFO Authorization					
	Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required				MB-WC27	
	Low Meets DFO criteria: review not required					
None						
Sensitivity to Fish and Fish Habitat Evaluation Criteria						
<ul style="list-style-type: none">Fish-bearing statusFish stream classificationFederally or provincially listed fish speciesFish species of management concernHabitat potential and/or availability for fish species and/or life stagesRiparian habitat valueWater quality parametersFreshwater mussel presence						

SELF-ASSESSMENT DECISION FRAMEWORK:

QUESTION	ANSWER
<i>If YES is answered to Questions 1 and 2 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 1 and 2, proceed to Questions 3 and 4.</i>	
1. Can all of the criteria outlined in DFO's Project Activities for the above pipeline/vehicle methods be met based on the qualified fish biologist's current knowledge?	YES
Provide rationale: <u>Dewatering/Pumping:</u> Temporary isolation dams and pumps with fish screen and a qualified fish biologist-lead fish salvage is recommended if water is present at the time of the isolation. Recommended the site be restored to pre-construction conditions. <u>Bridges:</u> Recommend no earth fill below the high watermark and no obstruction of potential fish passage by vehicle crossing.	
2. Can all applicable mitigation measures listed in DFO's <i>Measures to Avoid Causing Harm to Fish and Fish Habitat</i> be implemented to address the Pathways of Effects based on the qualified fish biologist's current knowledge?	YES
Provide rationale: Construction is to occur outside the restricted activity timing window. It is assumed the remaining mitigation measures for project planning, site selection, contaminant and spill management, erosion and sediment control, revegetation and stabilization, fish protection and operation of machinery can be met and are included in the Project's ESA and the EPP.	

If YES is answered to Questions 3 and 4 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 3 and 4, proceed to Question 5.

3. Have fisheries management objectives, best management practices and/or plans been considered and applied where applicable?	NA
Provide rationale:	
4. Have additional mitigation measures to avoid causing harm to fish and fish habitat been recommended by a qualified fish biologist and will serious harm to fish be avoided and/or mitigated by the successful implementation of these additional measures?	NA
Provide rationale:	

5. Is further review by NEB/DFO recommended by the qualified fish biologist?	No
Provide rationale:	

- Notes:
- 1 Pending further direction from DFO regarding riparian habitat disturbance at pipeline-associated watercourse crossings, the mitigation measures and best management practices described in the Project's EPP and the guidance of existing provincial standards are assumed to be sufficient to avoid serious harm to fish, unless otherwise specified by a qualified fish biologist.
 - 2 Functional riparian width is interpreted as the terrestrial area/zone adjacent to a watercourse where vegetation and microclimate are hydrologically influenced by the presence of perennial or intermittent water from the stream or river.

Watercourse (Site#): Souris River (MB-WC32)
Legal Location: 10-22-7-17WPM
UTM (Zone 14U): 449807 E, 5492649 N
SKP (as of June 2014): 1095.3

Survey Date: June 20, 2014
Habitat Survey Length (m): 550
Restricted Activity Timing Window: April 1 to June 30
Field Crew: J. Mouland, S. Layher

CHANNEL AND FLOW CONDITIONS (No. of Transects: 6)	
Confinement	Frequently confined
Channel Pattern	Sinuuous
Bankfull Width (m): Mean, Range	53.5, 41.0-67.0
Wetted Width (m): Mean, Range	52.0, 39.0-66.0
Water Depth (m): Mean, Range	1.99, 1.20-3.00
Ordinary Highwater Mark (m): Mean, Range	0
Discharge (m³/s)	104.6
Stream Gradient (%)	1-2
Embeddedness	Unembedded

CHANNEL AND FLOW CONDITIONS CONTINUED		
Beaver Dams	No	
Native Channel Width (m)	n/a	
BANK CONDITIONS	LEFT BANK	RIGHT BANK
Bank Shape	Vertical	Vertical
Bank Texture	Fines/large gravel	Fines/large gravel
Mean Bank Height (m)	5.9, 3.9-12.5	6.1, 3.5-9.0
Grade of Approach Slopes (%)	<4	4-14
Riparian Area Width (m)	30-50	5-40
Riparian Vegetation Type	Deciduous/grasses	Deciduous/grasses

SUBSTRATE	%
Organics	0
Fines (<2 mm)	16
Small Gravel (2-20 mm)	30
Large Gravel (21-65 mm)	40
Cobble (66-250 mm)	14
Boulder (>250 mm)	0

HABITAT	No.	Length (m)	%	Velocity (m/s)
Pool 1 (depth >1.00 m)	-	-	-	-
Pool 2 (depth 0.5-1.00 m)	-	-	-	-
Pool 3 (depth <0.5 m)	-	-	-	-
Run 1 (>1.00 m)	1	550	100	1.3
Run 2 (0.5-1.00 m)	-	-	-	-
Run 3 (<0.5 m)	-	-	-	-
Flat 1 (>1.00 m)	-	-	-	-
Flat 2 (0.5-1.00 m)	-	-	-	-
Flat 3 (<0.5 m)	-	-	-	-
Riffle	-	-	-	-
No defined channel/lake	-	-	-	-
Rapid	-	-	-	-
Other	-	-	-	-

COVER TYPES	%
Boulders	0.5
Undercut Banks	0
Overhanging Vegetation	0.1
Woody Debris	3.4
Depth	96
Instream Vegetation	0
Other	-
Other	-
Other	-
Other	-
Other	-
Other	-
TOTAL COVER (m²)	20,845
Stream Shading (%)	1-2%

FISH HABITAT POTENTIAL RATINGS				
Species	Spawning	Rearing	Overwintering	Migration
northern pike	Marginal	Marginal	Important	Important
walleye	Essential	Important	Important	Essential
white sucker	Marginal	Important	Important	Important
Brassy minnow	Marginal	Marginal	Marginal	Marginal

FISH SPECIES PREVIOUSLY DOCUMENTED
Goldeye, northern pike, walleye, yellow perch, burbot, rock bass, central mudminnow, common carp, common shiner, pearl dace, golden shiner, river shiner, bigmouth shiner, blacknose shiner, blackchin shiner, spottail shiner, sand shiner, northern redbelly dace, fathead minnow, flathead chub, western blacknose dace, longnose dace, creek chub, white sucker, shorthead redhorse, black bullhead, brown bullhead, stonecat, tadpole madtom, trout-perch, brook stickleback, Iowa darter, Johnny darter and blackside darter have been previously documented (McCulloch and Franzin 1996, AAR 2007b, 2008a, Milani 2013).

FISH SPECIES PRESENT	No. Captured	No. Observed	Fork Length (mm): Mean, Range
walleye	2	0	343.5, 187-500
white sucker	2	0	285.5, 176-395
yellow perch	1	0	97
black bullhead	1	0	290

FISH SAMPLING EFFORT	
Sampling Method	Float Electrofishing
No. of seconds/hours	3669
Distance (m)/No. of traps	1000
No. Captured	6
CPUE	0.16

ADDITIONAL HABITAT COMMENTS
Field crew could not traverse to 875 m downstream due to shallow stream section. Electrofishing was restricted to the area near the boat launch due to high flows and the decreased performance of the boat in these conditions. Existing right-of-way looks like a trenched crossing although this likely resulted in substantial sediment mobilization and any attempt to do so would also result in sediment mobilization both during construction and after.

Notes: Catch per unit effort (CPUE) is the number of fish captured per hour of minnow trapping, per m² of seine netting and per 100 seconds of electrofishing.
n/a: not applicable, n/r: not recorded.



Plate 1 Photograph taken at right-of-way looking upstream.



Plate 2 Photograph taken at right-of-way looking downstream.



Plate 3 Photograph taken at right-of-way looking toward left bank.



Plate 4 Photograph taken at right-of-way looking toward right bank.



Plate 5 Photograph taken of adult walleye captured.



Plate 6 Photograph taken approximately 50 m downstream of right-of-way looking upstream.



Map illustrating crossing and watercourse.

Line 3 Replacement Program



SELF-ASSESSMENT AND RISK MANAGEMENT DECISION FRAMEWORK FOR DFO REGULATORY REQUIREMENTS

DESCRIPTION OF AQUATIC ENVIRONMENT:

Federally/provincially listed species present:	No
Fish that are part of commercial, recreational or Aboriginal (CRA) fisheries present:	Yes
Fish that support a CRA fishery, or have downstream connectivity to a CRA fisheries present:	Yes
Banks and approach slope characteristics:	Both banks vertical. Grade of left approach slope low (<4%), grade of right approach slope moderate (4-14%).
Riparian characteristics:	Functional Riparian Width (m) at Crossing (<i>i.e.</i> , contribution to fish habitat): L: 30 m to 50 m, R: 5 m to 40 m

CONSTRUCTION DETAILS:

Construction Schedule:	August to December 2017	
Pipeline Methods:	Trenchless	
Contingency Methods:	Contingency trenchless location	
Vehicle Crossing Methods:	Existing	
Estimated Maximum Footprint*:	Right-of-Way Width: 45 m	Est. Instream Footprint: 0 m ² (trenchless)
	Bankfull Width: 53.5 m	Est. Functional Riparian Footprint: 0 m ² (trenchless)
	Functional Riparian Width: L: 30m to 50m, R: 5m to 40m	Max Instream + Riparian Footprint: 0 m ² (trenchless)
Zone-of-influence (ZOI):	10,000 m (high flows at time of assessment, likely to be lower during construction)	
No. Days of Instream Work:	0	

RISK ASSESSMENT RANKING:

Using the risk assessment evaluation criteria, what ranking did the proposed watercourse crossing receive?			Low				
Scale of Negative Effects Evaluation Criteria			Sensitivity of Fish and Fish Habitat				
<ul style="list-style-type: none">Fish species present and fish habitat potential within zone of influenceInstream timing windowsPipeline and vehicle/equipment crossing methodOccurrence and duration of instream workFootprint sizeDisturbance to riparian vegetationChannel and fish passage restrictionsChanges to water quality and turbidity parametersChanges to timing, duration and frequency of flowRiparian and bank restoration measuresBeaver activity and associated removals							
Sensitivity to Fish and Fish Habitat Evaluation Criteria			Extreme Project Unlikely to Proceed	High DFO Authorization	Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required	Low Meets DFO criteria; review not required	Not fish habitat
<ul style="list-style-type: none">Fish-bearing statusFish stream classificationFederally or provincially listed fish speciesFish species of management concernHabitat potential and/or availability for fish species and/or life stagesRiparian habitat valueWater quality parameters			Extreme Project Unlikely to Proceed				
			High DFO Authorization				
			Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required				
			Low Meets DFO criteria; review not required		MB-WC32		
			None				

SELF-ASSESSMENT DECISION FRAMEWORK:

QUESTION	ANSWER
<i>If YES is answered to Questions 1 and 2 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 1 and 2, proceed to Questions 3 and 4.</i>	
1. Can all of the criteria outlined in DFO's Project Activities for the above pipeline/vehicle methods be met based on the qualified fish biologist's current knowledge?	YES
Provide rationale: <u>Trenchless methods:</u> No instream work anticipated. <u>Bridges:</u> Recommend no earth fill below the high watermark and no obstruction of potential fish passage by vehicle crossing.	
2. Can all applicable mitigation measures listed in DFO's <i>Measures to Avoid Causing Harm to Fish and Fish Habitat</i> be implemented to address the Pathways of Effects (POE) based on the qualified fish biologist's current knowledge?	YES
Provide rationale: The mitigation measures for project planning, timing, site selection, contaminant and spill management, erosion and sediment control, revegetation and stabilization, fish protection and operation of machinery can be met and are included in the Project's ESA and the EPP. The mitigation measures outlined above and in the EPP for the Project address the POEs. Water quality monitoring during trenchless construction is recommended. Preparation for contingency crossing location is recommended in the event trenchless crossing methods are unsuccessful.	

<i>If YES is answered to Questions 3 and 4 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 3 and 4, proceed to Question 5.</i>	
3. Have fisheries management objectives, best management practices and/or plans been considered and applied where applicable?	NA
Provide rationale:	
4. Have additional mitigation measures to avoid causing harm to fish and fish habitat been recommended by a qualified fish biologist and will serious harm to fish be avoided and/or mitigated by the successful implementation of these additional measures?	NA
Provide rationale:	

5. Is further review by NEB/DFO recommended by the qualified fish biologist?	NO
Provide rationale:	

Notes:	1	Pending further direction from DFO regarding riparian habitat disturbance at pipeline-associated watercourse crossings, the mitigation measures and best management practices described in the Project's EPP and the guidance of existing provincial standards are assumed to be sufficient to avoid serious harm to fish, unless otherwise specified by a qualified fish biologist.
	2	Functional riparian width is interpreted as the terrestrial area/zone adjacent to a watercourse where vegetation and microclimate are hydrologically influenced by the presence of perennial or intermittent water from the stream or river.

Watercourse (Site#): Spring Brook (MB-WC36)
Legal Location: 12-18-7-16 WPM
UTM (Zone 14U): 453931E, 5491228N
SKP (as of June 2014): 1100.4

Survey Date: September 6, 2013
Habitat Survey Length (m): 200
Restricted Activity Timing Window: April 1 to June 30
Field Crew: E. Fulcher, L. Olsen

CHANNEL AND FLOW CONDITIONS (No. of Transects: 5)	
Confinement	Occasionally confined
Channel Pattern	Irregular, wandering
Bankfull Width (m): Mean, Range	3.0, 2.0-3.8
Wetted Width (m): Mean, Range	1.9, 0.3-3.2
Water Depth (m): Mean, Range	0.23, 0.01 – 0.80
Ordinary Highwater Mark (m): Mean, Range	0.2, 0.1-0.3
Discharge (m³/s)	Negligible
Stream Gradient (%)	0-1%
Embeddedness	Highly embedded

CHANNEL AND FLOW CONDITIONS CONTINUED		
Beaver Dams	None	
Native Channel Width (m)	n/a	
BANK CONDITIONS	LEFT BANK	RIGHT BANK
Bank Shape	Vertical	Sloping
Bank Texture	Fines	Fines
Mean Bank Height (m)	0.7	0.8
Grade of Approach Slopes (%)	<4	4 – 14
Riparian Area Width (m)	0 - 5	5 - 10
Riparian Vegetation Type	Grasses	Grasses

SUBSTRATE	%
Organics	0
Fines (<2 mm)	50
Small Gravel (2-20 mm)	33
Large Gravel (21-65 mm)	16
Cobble (66-250 mm)	1
Boulder (>250 mm)	0

HABITAT	No.	Length (m)	%	Velocity (m/s)
Pool 1 (depth >1.00 m)	1	25	12.5	Negligible
Pool 2 (depth 0.5-1.00 m)	-	-	-	-
Pool 3 (depth <0.5 m)	-	-	-	-
Run 1 (>1.00 m)	-	-	-	-
Run 2 (0.5-1.00 m)	-	-	-	-
Run 3 (<0.5 m)	-	-	-	-
Flat 1 (>1.00 m)	-	-	-	-
Flat 2 (0.5-1.00 m)	4	135	67.5	Negligible
Flat 3 (<0.5 m)	2	35	17.5	Negligible
Riffle	-	-	-	-
No defined channel				
Low water barrier	1	5	2.5	-
Other	-	-	-	-

COVER TYPES	%
Boulders	-
Undercut Banks	10
Overhanging Vegetation	5.5
Woody Debris	1.5
Depth	45
Instream Vegetation	38
Other	-
Other	-
Other	-
Other	-
TOTAL COVER (m²)	448
Stream Shading	0

WATER QUALITY PARAMETERS	
Water Temperature (°C)	21.0
pH	7.7
Dissolved Oxygen (mg/L)	5.2
Conductivity (µS/cm)	1940.0
Turbidity (visual)	Moderate

FISH HABITAT POTENTIAL RATINGS				
Species	Spawning	Rearing	Overwintering	Migration
northern pike	Important	Important	Important	Marginal
walleye	Unsuitable	Unsuitable	Unsuitable	Marginal
white sucker	Marginal	Important	Important	Marginal
brassy minnow	Important	Important	Important	Marginal

FISH SPECIES PREVIOUSLY DOCUMENTED
Northern pike, lake chub, creek chub, fathead minnow, pearl dace and brook stickleback have been previously documented (AAR 2007b, RL&L 1998c).

FISH SPECIES PRESENT	No. Captured	No. Observed	Fork Length (mm): Mean, Range
Northern pike	7	20	200,190 - 215
Creek chub	1	-	205
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

FISH SAMPLING EFFORT	
Sampling Method	Backpack electrofishing
No. of seconds/hours	1017
Distance (m)/No. of traps	200
No. Captured	8
CPUE	0.79

ADDITIONAL HABITAT COMMENTS
Low water barrier present at right-of-way centreline and 100 m downstream which disrupts connectivity. Deep pool present and starting at approximately 65 m downstream (greater than 1.3 m deep and 8 m by 25 m in size) where juvenile northern pike were captured. Abundant instream vegetation and habitat potential for northern pike spawning.

Notes: Catch per unit effort (CPUE) is the number of fish captured per hour of minnow trapping, per m² of seine netting and per 100 seconds of electrofishing.
n/a: not applicable.



Plate 1 Photograph taken at right-of-way looking upstream.



Plate 2 Photograph taken at right-of-way looking downstream.



Plate 3 Photograph taken at right-of-way of left bank.



Plate 4 Photograph taken at right-of-way of right bank.



Plate 5 Aerial photograph taken of crossing view northeast (June 26, 2013).



Plate 6 Photograph taken approximately 100 m downstream of the right-of-way looking upstream (deep pool is visible through the vegetation).



Map illustrating crossing and watercourse.

Line 3 Replacement Program



SELF-ASSESSMENT AND RISK MANAGEMENT DECISION FRAMEWORK FOR DFO REGULATORY REQUIREMENTS

DESCRIPTION OF AQUATIC ENVIRONMENT:

Federally/provincially listed species present:	No
Fish that are part of commercial, recreational or Aboriginal (CRA) fisheries present:	Yes
Fish that support a CRA fishery, or have downstream connectivity to a CRA fisheries present:	Yes
Banks and approach slope characteristics:	Left bank vertical with low grade of approach slope (<4%). Right bank sloping with moderate grade of approach slope (4-14%).
Riparian characteristics:	Functional Riparian Width (m) at Crossing (<i>i.e.</i> , contribution to fish habitat): L: 0 to 5 m, R: 5 to 10 m

CONSTRUCTION DETAILS:

Construction Schedule:	August to December 2017	
Pipeline Methods:	Isolate if water present/open cut if dry or frozen to bottom	
Contingency Methods:	n/a	
Vehicle Crossing Methods:	Snowfill/ice bridge/clear span bridge/existing	
Estimated Maximum Footprint:	Right-of-Way Width: 45 m	Est. Instream Footprint: 45 m (ROW) x 3.0 m (bankfull) = 135 m²
	Bankfull Width: 3.0 m	Est. Functional Riparian Footprint: 45 m (ROW) x 15 m (riparian) = 675 m²
	Functional Riparian Width: L: 0 to 5 m, R: 5 to 10 m	Max Instream + Riparian Footprint: 135 m² + 675 m² = 810 m²
Zone-of-influence (ZOI):	100 m	
No. Days of Instream Work:	2 to 15 days	

RISK ASSESSMENT RANKING:

Using the risk assessment evaluation criteria, what ranking did the proposed watercourse crossing receive?				Moderate			
Scale of Negative Effects Evaluation Criteria		Scale of Negative Effect	Sensitivity of Fish and Fish Habitat				
<ul style="list-style-type: none">Fish species present and fish habitat potential within zone of influenceInstream timing windowsPipeline and vehicle/equipment crossing methodOccurrence and duration of instream workFootprint sizeDisturbance to riparian vegetationChannel and fish passage restrictionsChanges to water quality and turbidity parametersChanges to timing, duration and frequency of flowRiparian and bank restoration measuresBeaver activity and associated removals			Extreme Project Unlikely to Proceed	High DFO Authorization	Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required	Low Meets DFO criteria: review not required	Not fish habitat
		Extreme Project Unlikely to Proceed					
		High DFO Authorization					
		Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required			MB-WC36		
		Low Meets DFO criteria: review not required					
		None					
Sensitivity to Fish and Fish Habitat Evaluation Criteria							
<ul style="list-style-type: none">Fish-bearing statusFish stream classificationFederally or provincially listed fish speciesFish species of management concernHabitat potential and/or availability for fish species and/or life stagesRiparian habitat valueWater quality parametersFreshwater mussel presence							

SELF-ASSESSMENT DECISION FRAMEWORK:

QUESTION	ANSWER
<i>If YES is answered to Questions 1 and 2 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 1 and 2, proceed to Questions 3 and 4.</i>	
1. Can all of the criteria outlined in DFO's Project Activities for the above pipeline/vehicle methods be met based on the qualified fish biologist's current knowledge?	YES
Provide rationale: <u>Dewatering/Pumping</u> : Temporary isolation dams and pumps with fish screen and a qualified fish biologist-lead fish salvage is recommended if water is present at the time of the isolation. Recommended the site be restored to pre-construction conditions. <u>Bridges</u> : Recommend no earth fill below the high watermark and no obstruction of potential fish passage by vehicle crossing.	
2. Can all applicable mitigation measures listed in DFO's <i>Measures to Avoid Causing Harm to Fish and Fish Habitat</i> be implemented to address the Pathways of Effects based on the qualified fish biologist's current knowledge?	YES (however, see below)
Provide rationale: Construction is to occur outside the restricted activity timing window. It is assumed the remaining mitigation measures for project planning, site selection, contaminant and spill management, erosion and sediment control, revegetation and stabilization, fish protection and operation of machinery can be met and are included in the Project's ESA and the EPP.	

<i>If YES is answered to Questions 3 and 4 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 3 and 4, proceed to Question 5.</i>	
3. Have fisheries management objectives, best management practices and/or plans been considered and applied where applicable?	YES
Provide rationale: Other standards and best management practices for working in and around water have been incorporated into the Project's EPP and will be implemented where applicable (<i>e.g.</i> , CAPP <i>et al.</i> 2005).	
4. Have additional mitigation measures to avoid causing harm to fish and fish habitat been recommended by a qualified fish biologist and will serious harm to fish be avoided and/or mitigated by the successful implementation of these additional measures?	YES
Provide rationale: Watercourse was rated as Important northern pike rearing, spawning and overwintering habitat potential and juvenile northern pike were captured within the study reach. An overwintering pool was also present downstream of the proposed crossing location. Maintaining a qualified fish biologist onsite is recommended to facilitate fish passage, if required, and conduct water quality monitoring and a fish salvage during construction.	

5. Is further review by NEB/DFO recommended by the qualified fish biologist?	NO
Provide rationale: With the successful implementation of additional recommendations made by a qualified fish biologist and construction timing (<i>i.e.</i> , outside restricted activity timing window), it is expected no serious harm to fish will result.	

Notes:	1	Pending further direction from DFO regarding riparian habitat disturbance at pipeline-associated watercourse crossings, the mitigation measures and best management practices described in the Project's EPP and the guidance of existing provincial standards are assumed to be sufficient to avoid serious harm to fish, unless otherwise specified by a qualified fish biologist.
	2	Functional riparian width is interpreted as the terrestrial area/zone adjacent to a watercourse where vegetation and microclimate are hydrologically influenced by the presence of perennial or intermittent water from the stream or river.

Watercourse (Site#): Oak Creek (MB-WC42)
Legal Location: 2-13-7-16 WPM
UTM (Zone 14U): 462988E, 5490342N
SKP (as of June 2014): 1109.5

Survey Date: June 17, 2014
Habitat Survey Length (m): 200
Restricted Activity Timing Window: April 1 to June 30
Field Crew: J. Mouland, S. Layher

CHANNEL AND FLOW CONDITIONS (No. of Transects: 5)	
Confinement	Occasionally confined
Channel Pattern	Irregular meandering
Bankfull Width (m): Mean, Range	11.0, 6.0-15.0
Wetted Width (m): Mean, Range	8.2, 6.0-11.0
Water Depth (m): Mean, Range	0.56, 0.20-1.10
Ordinary Highwater Mark (m): Mean, Range	0.1, 0.05-0.1
Discharge (m³/s)	0.66
Stream Gradient (%)	1-2
Embeddedness	NA

CHANNEL AND FLOW CONDITIONS CONTINUED		
Beaver Dams	Yes	
Native Channel Width (m)	n/a	
BANK CONDITIONS	LEFT BANK	RIGHT BANK
Bank Shape	Vertical	Vertical
Bank Texture	Fines	Fines
Mean Bank Height (m)	2.1	2.8
Grade of Approach Slopes (%)	<4	<4
Riparian Area Width (m)	50-160	50-60
Riparian Vegetation Type	Grasses/shrubs	Grasses

SUBSTRATE	%
Organics	0
Fines (<2 mm)	92
Small Gravel (2-20 mm)	6
Large Gravel (21-65 mm)	0
Cobble (66-250 mm)	0
Boulder (>250 mm)	2

WATER QUALITY PARAMETERS	
Water Temperature (°C)	21.1
pH	n/r
Dissolved Oxygen (mg/L)	7.7
Conductivity (µS/cm)	796
Turbidity (visual)	Stained

HABITAT	No	Length (m)	%	Velocity (m/s)
Pool 1 (depth >1.00 m)	2	12	6	1.15
Pool 2 (depth 0.5-1.00 m)	-	-	-	-
Pool 3 (depth <0.5 m)	-	-	-	-
Run 1 (>1.00 m)	-	-	-	-
Run 2 (0.5-1.00 m)	3	27	13.5	0.24
Run 3 (<0.5 m)	4	93	46.5	0.42
Flat 1 (>1.00 m)	3	68	34	0.20
Flat 2 (0.5-1.00 m)	-	-	-	-
Flat 3 (<0.5 m)	-	-	-	-
Riffle	-	-	-	-
No defined channel/lake	-	-	-	-
Other (LWB)	-	-	-	-
Other	-	-	-	-

COVER TYPES	%
Boulders	0
Undercut Banks	2
Overhanging Vegetation	6
Woody Debris	24
Depth	47
Instream Vegetation	21
Other	-
Other	-
Other	-
Other	-
Other	-
TOTAL COVER (m²)	109.5
Stream Shading	1-20%

FISH HABITAT POTENTIAL RATINGS				
Species	Spawning	Rearing	Overwintering	Migration
northern pike	Important	Important	Marginal	Important
walleye	Marginal	Important	Marginal	Important
white sucker	Important	Important	Important	Important
brassy minnow	Important	Important	Important	Important

FISH SPECIES PREVIOUSLY DOCUMENTED	
Northern pike, white sucker, Johnny darter, Iowa darter, blackside darter, pearl dace, western blacknose dace, emerald shiner, bigmouth shiner, common shiner, fathead minnow, longnose dace, creek chub, trout-perch and brook stickleback were previously documented (AAR 2007b, RL&L 1998c, Milani 2013). Chestnut lamprey were also documented approximately 12 km downstream (Milani 2013).	

FISH SPECIES PRESENT	No. Captured	No. Observed	Fork Length (mm): Mean, Range
Fathead minnow	453	>1000	39, 17-55
Longnose dace	3	0	55
Sand shiner	2	0	42.5, 40-45
Common shiner	1	0	73
White sucker	3	0	187, 178-201
Chestnut lamprey	1	0	140
Northern pike	1	0	75
Western blacknose dace	1	0	55
Rock bass	1	0	54

Sampling Method	Backpack Electrofishing	Minnow Trap	Dip-netting
No. of seconds/hours/minutes	1008	48	5
Distance (m)/# of traps	750	6	n/a
No. Captured	65	386	16
CPUE	6.05	8.04	3.20

ADDITIONAL HABITAT COMMENTS	
Wabash pigtoe, white heelsplitter, cylindrical papershell, giant floater and fatmucket have all been previously documented (Watson <i>et al.</i> 1998). The current proposed right-of-way is on a meander bend. Right bank is relatively unstable at 50 m upstream of right-of-way. Very good habitat throughout reach, although overwintering potential is limited within assessment reach. Over 1000 minnows were observed, most likely fathead minnows. 10 small mussels were found after sampling 20 m² 100 m and 150 m downstream of proposed right-of-way, and it is expected that mussels would be found in sandy/muddy areas throughout entire study reach. It is recommended that a mussel salvage be done.	

Notes: Catch per unit effort (CPUE) is the number of fish captured per hour of minnow trapping, per m² of seine netting and per 100 seconds of electrofishing.
n/a: not applicable, n/r: not recorded.



Plate 1 Photograph taken at right-of-way looking upstream.



Plate 2 Photograph taken at right-of-way looking downstream and toward suggested alternate right-of-way.



Plate 3 Photograph taken at right-of-way looking toward left bank.



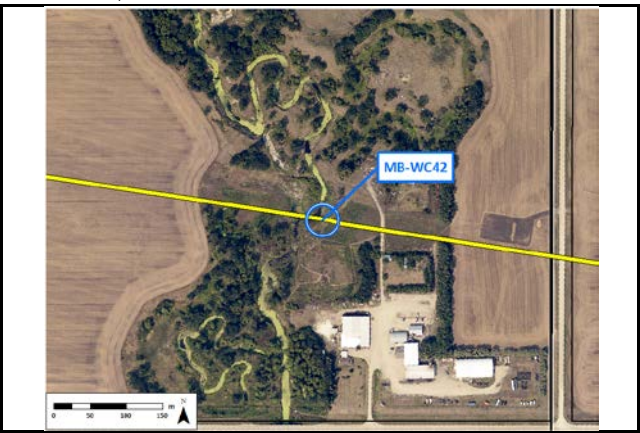
Plate 4 Photograph taken at right-of-way looking toward right bank.



Plate 5 Aerial photograph taken of crossing looking north (June 26, 2013).



Plate 6 Photograph taken of juvenile rock bass captured.



Map illustrating crossing and watercourse.

Line 3 Replacement Program



SELF-ASSESSMENT AND RISK MANAGEMENT DECISION FRAMEWORK FOR DFO REGULATORY REQUIREMENTS

DESCRIPTION OF AQUATIC ENVIRONMENT:

Federally/provincially listed species present:	No
Fish that are part of commercial, recreational or Aboriginal (CRA) fisheries present:	Yes
Fish that support a CRA fishery, or have downstream connectivity to a CRA fisheries present:	Yes
Banks and approach slope characteristics:	Vertical banks. Low grade of approach slopes (<4%).
Riparian characteristics:	Functional Riparian Width (m) at Crossing (<i>i.e.</i> , contribution to fish habitat): L: 50m to 160m, R: 50m to 60m

CONSTRUCTION DETAILS:

Construction Schedule:	August to December 2017	
Pipeline Methods:	Isolate if water present/open cut if dry or frozen to bottom	
Contingency Methods:	n/a	
Vehicle Crossing Methods:	Snowfill/ice bridge/clear span bridge/existing	
Estimated Maximum Footprint:	Right-of-Way Width: 45 m	Est. Instream Footprint: 45 m (ROW) x 11 m (bankfull) = 495 m ²
	Bankfull Width: 11 m	Est. Functional Riparian Footprint: 45 m (ROW) x 220 m (riparian) = 9,900 m ²
	Functional Riparian Width: L: 50m-160m, R: 50m-60m	Max Instream + Riparian Footprint: 495 m ² + 9,900 m ² = 10,395 m ²
Zone-of-influence (ZOI):	500 m	
No. Days of Instream Work:	2 to 15 days	

RISK ASSESSMENT RANKING:

Using the risk assessment evaluation criteria, what ranking did the proposed watercourse crossing receive?					Moderate		
Scale of Negative Effects Evaluation Criteria		Scale of Negative Effect	Sensitivity of Fish and Fish Habitat				
<ul style="list-style-type: none">Fish species present and fish habitat potential within zone of influenceInstream timing windowsPipeline and vehicle/equipment crossing methodOccurrence and duration of instream workFootprint sizeDisturbance to riparian vegetationChannel and fish passage restrictionsChanges to water quality and turbidity parametersChanges to timing, duration and frequency of flowRiparian and bank restoration measuresBeaver activity and associated removals			Extreme Project Unlikely to Proceed	High DFO Authorization	Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required	Low Meets DFO criteria; review not required	Not fish habitat
Sensitivity to Fish and Fish Habitat Evaluation Criteria		Extreme Project Unlikely to Proceed					
<ul style="list-style-type: none">Fish-bearing statusFish stream classificationFederally or provincially listed fish speciesFish species of management concernHabitat potential and/or availability for fish species and/or life stagesRiparian habitat valueWater quality parameters		High DFO Authorization					
		Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required			MB-WC42		
		Low Meets DFO criteria; review not required					
		None					

SELF-ASSESSMENT DECISION FRAMEWORK:

QUESTION	ANSWER
<i>If YES is answered to Questions 1 and 2 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing unless otherwise stated. If NO is answered for one or more of Questions 1 and 2, proceed to Questions 3 and 4.</i>	
1. Can all of the criteria outlined in DFO's Project Activities for the above pipeline/vehicle methods be met based on the qualified fish biologist's current knowledge?	YES
Provide rationale: <u>Dewatering/Pumping:</u> Temporary isolation dams and pumps with fish screen and a qualified fish biologist-lead fish salvage is recommended if water is present at the time of the isolation. Recommended the site be restored to pre-construction conditions. <u>Bridges:</u> Recommend no earth fill below the high watermark and no obstruction of potential fish passage by vehicle crossing.	
2. Can all applicable mitigation measures listed in DFO's <i>Measures to Avoid Causing Harm to Fish and Fish Habitat</i> be implemented to address the Pathways of Effects based on the qualified fish biologist's current knowledge?	NO
Provide rationale: Construction is to occur outside the restricted activity timing window. Alignment parallels a meander bend and all DFO's <i>Measures to Avoid Causing Harm to Fish and Fish Habitat</i> may not be met due to potential increased riparian disturbance. It is assumed the remaining mitigation measures for project planning, site selection, contaminant and spill management, erosion and sediment control, revegetation and stabilization, fish protection and operation of machinery can be met and are included in the Project's ESA and the EPP.	

<i>If YES is answered to Questions 3 and 4 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing unless otherwise stated. If NO is answered for one or more of Questions 3 and 4, proceed to Question 5.</i>	
3. Have fisheries management objectives, best management practices and/or plans been considered and applied where applicable?	YES
Provide rationale: Other standards and best management practices for working in and around water have been incorporated into the Project's EPP and will be implemented where applicable (<i>e.g.</i> , CAPP <i>et al.</i> 2005).	
4. Have additional mitigation measures to avoid causing harm to fish and fish habitat been recommended by a qualified fish biologist and will serious harm to fish be avoided and/or mitigated by the successful implementation of these additional measures?	YES (See below)
Provide rationale: Watercourse was rated as Important northern pike spawning, rearing and migration habitat potential and juvenile northern pike and rock bass were captured in the study reach. Watercourse also contains high species diversity (nine species captured). Maintaining a qualified fish biologist onsite is recommended to facilitate fish passage, if required, and conduct water quality monitoring and a fish/mussel salvage during construction. Recommend bank stabilization measures that are implemented are a combination of hard armouring (<i>e.g.</i> , riprap) and bio-engineering (<i>e.g.</i> , live shrub staking). It is recommend to minimize any disturbance to the riparian vegetation along the meander bend of the watercourse and limit construction activities to the proposed pipeline crossing location.	

5. Is further review by NEB/DFO recommended by the qualified fish biologist?	YES
Provide rationale: With the successful implementation of additional recommendations made by a qualified fish biologist, moderate sensitivity of the study reach and construction timing, it is expected no serious harm to fish will result. However, review by the NEB/DFO is recommended to confirm serious harm will not result due to habitat sensitivity.	

Notes:	1	Pending further direction from DFO regarding riparian habitat disturbance at pipeline-associated watercourse crossings, the mitigation measures and best management practices described in the Project's EPP and the guidance of existing provincial standards are assumed to be sufficient to avoid serious harm to fish, unless otherwise specified by a qualified fish biologist.
	2	Functional riparian width is interpreted as the terrestrial area/zone adjacent to a watercourse where vegetation and microclimate are hydrologically influenced by the presence of perennial or intermittent water from the stream or river.

Watercourse (Site #): Oak Creek (MB-WC43)
Legal Location: 6-31-6-13 WPM
UTM (Zone 14U): 484685E, 5485686N
SKP (as of June 2014): 1132.0

Survey Date: July 4, 2013
Habitat Survey Length (m): 300
Restricted Activity Timing Window: April 1 to June 30
Field Crew: J. Evans, S. Courtney

CHANNEL AND FLOW CONDITIONS (No. of Transects: 5)	
Confinement	Unconfined
Channel Pattern	Sinuuous
Bankfull Width (m): Mean, Range	17.2, 13.0 – 22.0
Wetted Width (m): Mean, Range	41.6, 28.0 – 49.0
Water Depth (m): Mean, Range	1.35, 1.00 – 2.00
Ordinary Highwater Mark (m): Mean, Range	See comments
Discharge (m³/s)	Negligible
Stream Gradient (%)	1.0
Embeddedness	Highly embedded

CHANNEL AND FLOW CONDITIONS CONTINUED		
Beaver Dams	None	
Native Channel Width (m)	n/a	
BANK CONDITIONS	LEFT BANK	RIGHT BANK
Bank Shape	Vertical	Vertical
Bank Texture	Fines	Fines
Mean Bank Height (m)	1.5	1.5
Grade of Approach Slopes (%)	<4	<4
Riparian Area Width (m)	20 – 30	20 – 30
Riparian Vegetation Type	Grasses and wetland	Grasses and wetland

SUBSTRATE	%
Organics	50
Fines (<2 mm)	46
Small Gravel (2-20 mm)	0
Large Gravel (21-65 mm)	2
Cobble (66-250 mm)	2
Boulder (>250 mm)	0

WATER QUALITY PARAMETERS	
Water Temperature (°C)	24.0
pH	8.6
Dissolved Oxygen (mg/L)	5.6
Conductivity (µS/cm)	960.0
Turbidity (visual)	Stained

HABITAT	No.	Length (m)	%	Velocity (m/s)
Pool 1 (depth >1.00 m)	--	--	--	--
Pool 2 (depth 0.5-1.00 m)	--	--	--	--
Pool 3 (depth <0.5 m)	--	--	--	--
Run 1 (>1.00 m)	1	200	100	Negligible
Run 2 (0.5-1.00 m)	--	--	--	--
Run 3 (<0.5 m)	--	--	--	--
Flat 1 (>1.00 m)	--	--	--	--
Flat 2 (0.5-1.00 m)	--	--	--	--
Flat 3 (<0.5 m)	--	--	--	--
Riffle	--	--	--	--
Other	--	--	--	--
Other	--	--	--	--
Other	--	--	--	--

COVER TYPES	%
Boulders	--
Undercut Banks	--
Overhanging Vegetation	--
Woody Debris	--
Depth	75
Instream Vegetation	25
Other	--
Other	--
Other	--
Other	--
TOTAL COVER	100
Stream Shading	0

FISH HABITAT POTENTIAL RATINGS				
Species	Spawning	Rearing	Overwintering	Migration
northern pike	Important	Important	Marginal	Important
walleye	Unsuitable	Marginal	Marginal	Important
white sucker	Unsuitable	Important	Marginal	Important
brassy minnow	Important	Important	Marginal	Important

FISH SPECIES PREVIOUSLY DOCUMENTED
Northern pike, white sucker, Johnny darter, Iowa darter, blackside darter, pearl dace, western blacknose dace, emerald shiner, bigmouth shiner, common shiner, fathead minnow, longnose dace, creek chub, trout-perch and brook stickleback previously documented in Oak Creek (AAR 2007b, Milani 2013).

FISH SPECIES PRESENT	No. Captured	No. Observed	Fork Length (mm): Mean, Range
Johnny darter	3	0	23, 20 – 25
northern pike	3	0	140, 130 – 150
white sucker	11	0	30, 21 – 40
cyprinid spp.	2	0	21, 20 – 22
--	--	--	--
--	--	--	--

FISH SAMPLING EFFORT		
Sampling Method	Seine Netting	Minnow Trapping
No. Of hauls/ No. of traps	5	6
Area (m²)/Time (hours)	50 m²	24 hours
No. Captured	16	3
CPUE	0.32	0.13

ADDITIONAL HABITAT COMMENTS
Abundant instream vegetation (approximately ¼ of channel). Wet flooded marsh along all stream margins in assessment area. Water level was above the ordinary highwater mark. Due to close proximity and habitat homogeneity, fish sampling was conducted at one location between the two proposed Oak Creek crossings. There is a small amount of large gravel and cobble at the proposed crossing, likely due to previous pipeline construction. Some depths and banks heights were estimated due to unsafe wading conditions.

Notes: CPUE is the number of fish captured per hour of minnow trapping and number of fish captured per m² of seining.
n/a: not applicable.



Plate 1 Photograph taken at right-of-way looking upstream.



Plate 2 Photograph taken at right-of-way looking downstream.



Plate 3 Photograph taken at right-of-way of left bank.



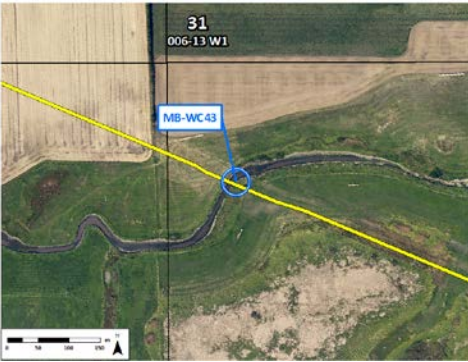
Plate 4 Photograph taken at right-of-way of right bank.



Plate 5 Aerial photograph taken of crossing view north (June 26, 2013).



Plate 6 Photograph taken of juvenile northern pike captured.



Map illustrating crossing and watercourse.

Line 3 Replacement Program



SELF-ASSESSMENT AND RISK MANAGEMENT DECISION FRAMEWORK FOR DFO REGULATORY REQUIREMENTS

DESCRIPTION OF AQUATIC ENVIRONMENT:

Federally/provincially listed species present:	No
Fish that are part of commercial, recreational or Aboriginal (CRA) fisheries present:	Yes
Fish that support a CRA fishery, or have downstream connectivity to a CRA fisheries present:	Yes
Banks and approach slope characteristics:	Vertical banks, low grade of approach slopes (<4%).
Riparian characteristics:	Functional Riparian Width (m) at Crossing (<i>i.e.</i> , contribution to fish habitat): L: 20 to 30 m, R: 20 to 30 m

CONSTRUCTION DETAILS:

Construction Schedule:	August to December 2017	
Pipeline Methods:	Isolate if water present/open cut if dry or frozen to bottom	
Contingency Methods:	n/a	
Vehicle Crossing Methods:	Snowfill/ice bridge/clear span bridge/existing	
Estimated Maximum Footprint*:	Right-of-Way Width: 45 m	Est. Instream Footprint: 45 m (ROW) x 17.2 m (bankfull) = 774 m ²
	Bankfull Width: 17.2 m	Est. Functional Riparian Footprint: 45 m (ROW) x 60 m (riparian) = 2,700 m ²
	Functional Riparian Width: L: 20 to 30 m, R: 20 to 30 m	Max Instream + Riparian Footprint: 774 m ² + 2,700 m ² = 3,474 m ²
Zone-of-influence (ZOI):	300 m	
No. Days of Instream Work:	2 to 15 days	

RISK ASSESSMENT RANKING:

Using the risk assessment evaluation criteria, what ranking did the proposed watercourse crossing receive?				Moderate			
Scale of Negative Effects Evaluation Criteria		Scale of Negative Effect	Sensitivity of Fish and Fish Habitat				
<ul style="list-style-type: none">Fish species present and fish habitat potential within zone of influenceInstream timing windowsPipeline and vehicle/equipment crossing methodOccurrence and duration of instream workFootprint sizeDisturbance to riparian vegetationChannel and fish passage restrictionsChanges to water quality and turbidity parametersChanges to timing, duration and frequency of flowRiparian and bank restoration measuresBeaver activity and associated removals	Extreme Project Unlikely to Proceed		High DFO Authorization	Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required	Low Meets DFO criteria: review not required	Not fish habitat	
	Extreme Project Unlikely to Proceed						
	High DFO Authorization						
	Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required			MB-WC43			
Low Meets DFO criteria: review not required							
Sensitivity to Fish and Fish Habitat Evaluation Criteria		None					
<ul style="list-style-type: none">Fish-bearing statusFish stream classificationFederally or provincially listed fish speciesFish species of management concernHabitat potential and/or availability for fish species and/or life stagesRiparian habitat valueWater quality parametersFreshwater mussel presence							

SELF-ASSESSMENT DECISION FRAMEWORK:

QUESTION	ANSWER
<i>If YES is answered to Questions 1 and 2 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 1 and 2, proceed to Questions 3 and 4.</i>	
1. Can all of the criteria outlined in DFO's Project Activities for the above pipeline/vehicle methods be met based on the qualified fish biologist's current knowledge?	YES
Provide rationale: <u>Dewatering/Pumping</u> : Temporary isolation dams and pumps with fish screen and a qualified fish biologist-lead fish salvage is recommended if water is present at the time of the isolation. Recommended the site be restored to pre-construction conditions. <u>Bridges</u> : Recommend no earth fill below the high watermark and no obstruction of potential fish passage by vehicle crossing.	
2. Can all applicable mitigation measures listed in DFO's <i>Measures to Avoid Causing Harm to Fish and Fish Habitat</i> be implemented to address the Pathways of Effects based on the qualified fish biologist's current knowledge?	YES (however, see below)
Provide rationale: Construction is to occur outside the restricted activity timing window. It is assumed the remaining mitigation measures for project planning, site selection, contaminant and spill management, erosion and sediment control, revegetation and stabilization, fish protection and operation of machinery can be met and are included in the Project's ESA and the EPP.	

<i>If YES is answered to Questions 3 and 4 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 3 and 4, proceed to Question 5.</i>	
3. Have fisheries management objectives, best management practices and/or plans been considered and applied where applicable?	YES
Provide rationale: Other standards and best management practices for working in and around water have been incorporated into the Project's EPP and will be implemented where applicable (<i>e.g.</i> , CAPP <i>et al.</i> 2005).	
4. Have additional mitigation measures to avoid causing harm to fish and fish habitat been recommended by a qualified fish biologist and will serious harm to fish be avoided and/or mitigated by the successful implementation of these additional measures?	YES
Provide rationale: Watercourse was rated as Important northern pike rearing and spawning habitat potential and juvenile northern pike were captured within the study reach. Maintaining a qualified fish biologist onsite is recommended to facilitate fish passage, if required, and conduct water quality monitoring and a fish/mussel salvage during construction.	

5. Is further review by NEB/DFO recommended by the qualified fish biologist?	NO
Provide rationale: With the successful implementation of additional recommendations made by a qualified fish biologist and construction timing (<i>i.e.</i> , outside the restricted activity timing window), it is expected no serious harm to fish will result.	

Notes:	1	Pending further direction from DFO regarding riparian habitat disturbance at pipeline-associated watercourse crossings, the mitigation measures and best management practices described in the Project's EPP and the guidance of existing provincial standards are assumed to be sufficient to avoid serious harm to fish, unless otherwise specified by a qualified fish biologist.
	2	Functional riparian width is interpreted as the terrestrial area/zone adjacent to a watercourse where vegetation and microclimate are hydrologically influenced by the presence of perennial or intermittent water from the stream or river.

Watercourse (Site #): Oak Creek (MB-WC44)
Legal Location: 4-32-6-13 WPM
UTM (Zone 14U): 485594E, 5485289N
SKP (as of June 2014): 1133.0

Survey Date: July 4, 2013
Habitat Survey Length (m): 200
Timing Window: April 1 to June 30
Field Crew: J. Evans, S. Courtney

CHANNEL AND FLOW CONDITIONS (No. of Transects: 5)	
Confinement	Unconfined
Channel Pattern	Sinuuous
Bankfull Width (m): Mean, Range	21.7, 18.0 – 30.0
Wetted Width (m): Mean, Range	23.5, 18.0 – 30.0
Water Depth (m): Mean, Range	1.01, 0.49 – 1.50
Ordinary Highwater Mark (m): Mean, Range	See comments
Discharge (m³/s)	Negligible
Stream Gradient (%)	1.0
Embeddedness	n/a

CHANNEL AND FLOW CONDITIONS CONTINUED		
Beaver Dams	None	
Native Channel Width (m)	n/a	
BANK CONDITIONS	LEFT BANK	RIGHT BANK
Bank Shape	Sloping	Sloping
Bank Texture	Fines	Fines
Mean Bank Height (m)	1.2	1.3
Grade of Approach Slopes (%)	<4	<4
Riparian Area Width (m)	10 – 20	10 – 20
Riparian Vegetation Type	Grasses and wetland	Grasses and wetland

SUBSTRATE	%
Organics	50
Fines (<2 mm)	50
Small Gravel (2-20 mm)	0
Large Gravel (21-65 mm)	0
Cobble (66-250 mm)	0
Boulder (>250 mm)	0

HABITAT	No.	Length (m)	%	Velocity (m/s)
Pool 1 (depth >1.00 m)	--	--	--	--
Pool 2 (depth 0.5-1.00 m)	--	--	--	--
Pool 3 (depth <0.5 m)	--	--	--	--
Run 1 (>1.00 m)	1	200	100	Negligible
Run 2 (0.5-1.00 m)	--	--	--	--
Run 3 (<0.5 m)	--	--	--	--
Flat 1 (>1.00 m)	--	--	--	--
Flat 2 (0.5-1.00 m)	--	--	--	--
Flat 3 (<0.5 m)	--	--	--	--
Riffle	--	--	--	--
Other	--	--	--	--
Other	--	--	--	--
Other	--	--	--	--

COVER TYPES	%
Boulders	--
Undercut Banks	--
Overhanging Vegetation	--
Woody Debris	--
Depth	75
Instream Vegetation	25
Other	--
Other	--
Other	--
Other	--
TOTAL COVER	100
Stream Shading	0

WATER QUALITY PARAMETERS	
Water Temperature (°C)	25.4
pH	8.6
Dissolved Oxygen (mg/L)	5.4
Conductivity (µS/cm)	988.0
Turbidity (visual)	Stained

FISH HABITAT POTENTIAL RATINGS				
Species	Spawning	Rearing	Overwintering	Migration
northern pike	Important	Important	Marginal	Important
walleye	Unsuitable	Marginal	Marginal	Important
white sucker	Unsuitable	Important	Marginal	Important
brassy minnow	Important	Important	Marginal	Important

FISH SPECIES PREVIOUSLY DOCUMENTED
Northern pike, white sucker, Johnny darter, Iowa darter, blackside darter, pearl dace, western blacknose dace, emerald shiner, bigmouth shiner, common shiner, fathead minnow, longnose dace, creek chub, trout-perch and brook stickleback \ previously documented in Oak Creek (AAR 2007b, Milani 2013).

FISH SPECIES PRESENT	No. Captured	No. Observed	Fork Length (mm): Mean, Range
Johnny darter	3	0	23, 20 – 25
northern pike	3	0	140, 130 – 150
white sucker	11	0	30, 21 – 40
cyprinid spp.	2	0	21, 20 – 22
--	--	--	--
--	--	--	--

FISH SAMPLING EFFORT		
Sampling Method	Seine Netting	Minnow Trapping
No. Of hauls/ No. of traps	5	6
Area (m²)/ Time (hours)	50 m²	24 hours
No. Captured	16	3
CPUE	0.32	0.13

ADDITIONAL HABITAT COMMENTS
Abundant instream vegetation (approximately ¼ of channel). Wet flooded marsh along all stream margins in assessment area. Water level was above the ordinary highwater mark. Side channel, likely anthropogenic, branches off from main channel approximately 80 m downstream. Due to close proximity and habitat homogeneity, fish sampling was conducted at one location between the two Oak Creek crossings. Some depths and banks heights were estimated due to unsafe wading conditions.

Notes: CPUE is the number of fish captured per hour of minnow trapping and number of fish captured per m² of seining.
n/a: not applicable.



Plate 1 Photograph taken at right-of-way looking upstream.



Plate 2 Photograph taken at right-of-way looking downstream.



Plate 3 Photograph taken at right-of-way of left bank.



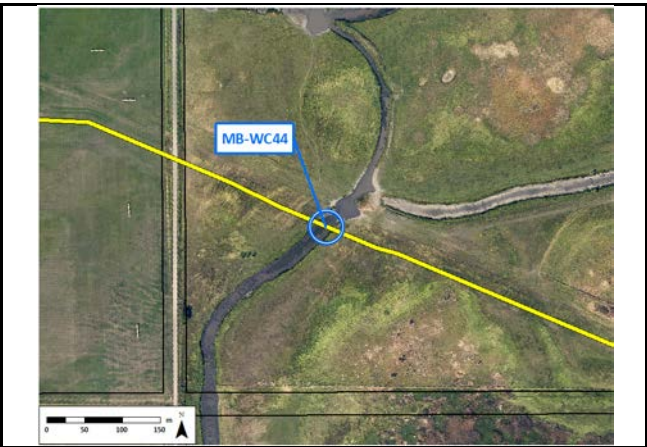
Plate 4 Photograph taken at right-of-way of right bank.



Plate 5 Aerial photograph of crossing view north (June 26, 2013). Side channel is visible to the left.



Plate 6 Photograph taken approximately 100 m upstream of the right-of-way looking upstream.



Map illustrating crossing and watercourse.

Line 3 Replacement Program



SELF-ASSESSMENT AND RISK MANAGEMENT DECISION FRAMEWORK FOR DFO REGULATORY REQUIREMENTS

DESCRIPTION OF AQUATIC ENVIRONMENT:

Federally/provincially listed species present:	No
Fish that are part of commercial, recreational or Aboriginal (CRA) fisheries present:	Yes
Fish that support a CRA fishery, or have downstream connectivity to a CRA fisheries present:	Yes
Banks and approach slope characteristics:	Sloping banks, low grade (<4%).Wet flooded marsh along all stream margins in assessment area.
Riparian characteristics:	Functional Riparian Width (m) at Crossing (<i>i.e.</i> , contribution to fish habitat): L: 10 to 20 m, R: 10 to 20 m

CONSTRUCTION DETAILS:

Construction Schedule:	August to December 2017	
Pipeline Methods:	Isolate if water present/open cut if dry or frozen to bottom	
Contingency Methods:	n/a	
Vehicle Crossing Methods:	Snowfill/ice bridge/clear span bridge/existing	
Estimated Maximum Footprint:	Right-of-Way Width: 45 m	Est. Instream Footprint: 45 m (ROW) x 21.7 m (bankfull) = 976.5 m ²
	Bankfull Width: 21.7 m	Est. Functional Riparian Footprint: 45 m (ROW) x 40 m (riparian) = 1,800 m ²
	Functional Riparian Width: L: 10 to 20 m, R: 10 to 20 m	Max Instream + Riparian Footprint: 976.5 m ² + 1,800 m ² = 2,776.5 m ²
Zone-of-influence (ZOI):	300 m	
No. Days of Instream Work:	2 to 15 days	

RISK ASSESSMENT RANKING:

Using the risk assessment evaluation criteria, what ranking did the proposed watercourse crossing receive?	Moderate
--	----------

Scale of Negative Effects Evaluation Criteria		Sensitivity of Fish and Fish Habitat				
<ul style="list-style-type: none">Fish species present and fish habitat potential within zone of influenceInstream timing windowsPipeline and vehicle/equipment crossing methodOccurrence and duration of instream workFootprint sizeDisturbance to riparian vegetationChannel and fish passage restrictionsChanges to water quality and turbidity parametersChanges to timing, duration and frequency of flowRiparian and bank restoration measuresBeaver activity and associated removals	Scale of Negative Effect	Extreme Project Unlikely to Proceed	High DFO Authorization	Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required	Low Meets DFO criteria: review not required	Not fish habitat
	Extreme Project Unlikely to Proceed					
	High DFO Authorization					
	Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required			MB-WC44		
	Low Meets DFO criteria: review not required					
None						
Sensitivity to Fish and Fish Habitat Evaluation Criteria						
<ul style="list-style-type: none">Fish-bearing statusFish stream classificationFederally or provincially listed fish speciesFish species of management concernHabitat potential and/or availability for fish species and/or life stagesRiparian habitat valueWater quality parametersFreshwater mussel presence						

SELF-ASSESSMENT DECISION FRAMEWORK:

QUESTION	ANSWER
<i>If YES is answered to Questions 1 and 2 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 1 and 2, proceed to Questions 3 and 4.</i>	
1. Can all of the criteria outlined in DFO's Project Activities for the above pipeline/vehicle methods be met based on the qualified fish biologist's current knowledge?	YES
Provide rationale: <u>Dewatering/Pumping:</u> Temporary isolation dams and pumps with fish screen and a qualified fish biologist-lead fish salvage is recommended if water is present at the time of the isolation. Recommended the site be restored to pre-construction conditions. <u>Bridges:</u> Recommend no earth fill below the high watermark and no obstruction of potential fish passage by vehicle crossing.	
2. Can all applicable mitigation measures listed in DFO's <i>Measures to Avoid Causing Harm to Fish and Fish Habitat</i> be implemented to address the Pathways of Effects based on the qualified fish biologist's current knowledge?	YES (however, see below)
Provide rationale: Construction is to occur outside the restricted activity timing window. It is assumed the remaining mitigation measures for project planning, site selection, contaminant and spill management, erosion and sediment control, revegetation and stabilization, fish protection and operation of machinery can be met and are included in the Project's ESA and the EPP.	

<i>If YES is answered to Questions 3 and 4 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 3 and 4, proceed to Question 5.</i>	
3. Have fisheries management objectives, best management practices and/or plans been considered and applied where applicable?	YES
Provide rationale: Other standards and best management practices for working in and around water have been incorporated into the Project's EPP and will be implemented where applicable (<i>e.g.</i> , CAPP <i>et al.</i> 2005).	
4. Have additional mitigation measures to avoid causing harm to fish and fish habitat been recommended by a qualified fish biologist and will serious harm to fish be avoided and/or mitigated by the successful implementation of these additional measures?	YES
Provide rationale: Watercourse was rated as Important northern pike rearing and spawning habitat potential and juvenile northern pike were captured within the study reach. Maintaining a qualified fish biologist onsite is recommended to facilitate fish passage, if required, and conduct water quality monitoring and a fish/mussel salvage during construction.	

5. Is further review by NEB/DFO recommended by the qualified fish biologist?	NO
Provide rationale: With the successful implementation of additional recommendations made by a qualified fish biologist and construction timing (<i>i.e.</i> , outside the restricted activity timing window), it is expected no serious harm to fish will result.	

Notes:	1	Pending further direction from DFO regarding riparian habitat disturbance at pipeline-associated watercourse crossings, the mitigation measures and best management practices described in the Project's EPP and the guidance of existing provincial standards are assumed to be sufficient to avoid serious harm to fish, unless otherwise specified by a qualified fish biologist.
	2	Functional riparian width is interpreted as the terrestrial area/zone adjacent to a watercourse where vegetation and microclimate are hydrologically influenced by the presence of perennial or intermittent water from the stream or river.

Watercourse (Site #): Cypress River (MB-WC48)
Legal Location: 15-18-6-12 WPM
UTM (Zone 14U): 494639E, 5481485N
SKP (as of June 2014): 1143.5

Survey Date: September 4, 2013
Habitat Survey Length (m): 200
Timing Window: April 1 to June 30
Field Crew: E. Fulcher, L. Olsen

CHANNEL AND FLOW CONDITIONS (No. of Transects: 5)	
Confinement	Frequently confined
Channel Pattern	Straight
Bankfull Width (m): Mean, Range	8.9, 5.9 – 13.1
Wetted Width (m): Mean, Range	2.0, 1.4 – 2.5
Water Depth (m): Mean, Range	0.12, 0.33 – 0.05
Ordinary Highwater Mark (m): Mean, Range	0.15, 0 - 30
Discharge (m³/s)	0.06
Stream Gradient (%)	1.5
Embeddedness	Moderately embedded

CHANNEL AND FLOW CONDITIONS CONTINUED		
Beaver Dams	None	
Native Channel Width (m)	n/a	
BANK CONDITIONS	LEFT BANK	RIGHT BANK
Bank Shape	Vertical	Vertical
Bank Texture	Fines and large gravel	Fines and boulder
Mean Bank Height (m)	1.6	3.0
Grade of Approach Slopes (%)	4 - 14	<4
Riparian Area Width (m)	5 - 10	5 - 10
Riparian Vegetation Type	Grasses	Grasses

SUBSTRATE	%
Organics	0
Fines (<2 mm)	32
Small Gravel (2-20 mm)	31
Large Gravel (21-65 mm)	26
Cobble (66-250 mm)	11
Boulder (>250 mm)	0

HABITAT	No.	Length (m)	%	Velocity (m/s)
Pool 1 (depth >1.00 m)	--	-	-	-
Pool 2 (depth 0.5-1.00 m)	1	12	6	n/r
Pool 3 (depth <0.5 m)	1	2	1	n/r
Run 1 (>1.00 m)	--	--	--	--
Run 2 (0.5-1.00 m)	--	--	--	--
Run 3 (<0.5 m)	2	28	14	n/r
Flat 1 (>1.00 m)	--	--	--	--
Flat 2 (0.5-1.00 m)	--	--	--	--
Flat 3 (<0.5 m)	4	130	65	n/r
Riffle	2	28	14	n/r
Other	--	--	--	--
Other	--	--	--	--
Other	--	--	--	--

COVER TYPES	%
Boulders	1.1
Undercut Banks	1.5
Overhanging Vegetation	0
Woody Debris	0.4
Depth	0
Instream Vegetation	3.4
Other	0
Other	0
Other	0
Other	0
TOTAL COVER	6.4
Stream Shading	0

FISH HABITAT POTENTIAL RATINGS				
Species	Spawning	Rearing	Overwintering	Migration
northern pike	Unsuitable	Marginal	Unsuitable	Important
walleye	Unsuitable	Unsuitable	Unsuitable	Important
white sucker	Important	Important	Marginal	Important
brassy minnow	Important	Important	Important	Important

FISH SPECIES PREVIOUSLY DOCUMENTED
Northern pike, rock bass, black bullhead, stonecat, white sucker, silver redbhorse, common shiner, river shiner, bigmouth shiner, sand shiner, emerald shiner, fathead minnow, western blacknose dace, longnose dace, finescale dace, creek chub, brook stickleback, Johnny darter, blackside darter, river darter and central mudminnow previously documented in the Cypress River (Milani 2013, McCulloch and Franzin 1996, RL&L 1998c).

FISH SPECIES PRESENT	No. Captured	No. Observed	Fork Length (mm): Mean, Range
silver redbhorse	1	0	55
white sucker	17	0	140, 80 - 165
creek chub	22	0	70, 20 - 208
brassy minnow	18	0	40, 25 - 78
western blacknose dace	39	0	49, 30 - 64
pearl dace	3	0	50, 25 - 75
longnose dace	3	0	80
emerald shiner	3	0	45, 40 - 50
sand shiner	9	0	74, 70 - 78
common shiner	7	0	50, 25 - 75

FISH SAMPLING EFFORT	
Sampling Method	Backpack electrofishing
No. of seconds	962
Distance (m)	200
No. Captured	122
CPUE	12.69

ADDITIONAL HABITAT COMMENTS
No land access in July 2013. Bank armoring present on right bank within right-of-way. Overhead pipeline crossing present at 50 m downstream. Flood signs are present, showing evidence of high flows. Banks are unstable at some locations within the study area. Limited overwintering habitat potential for large-bodied fish species due to depth. There were five fatmucket mussels captured and observed both upstream and downstream of the right-of-way.

Notes: CPUE is the number of fish captured per 100 seconds of electrofishing effort.
n/a: not applicable, n/r: not recorded



Plate 1 Photograph taken at right-of-way looking upstream.



Plate 2 Photograph taken at right-of-way looking downstream.



Plate 3 Photograph taken at right-of-way of left bank.



Plate 4 Photograph taken at right-of-way of right bank.



Plate 5 Aerial photograph of crossing view north showing existing aerial pipeline crossing (June 26, 2013).



Plate 6 Photograph taken of fatmucket mussel captured.



Map illustrating crossing and watercourse.

Line 3 Replacement Program



SELF-ASSESSMENT AND RISK MANAGEMENT DECISION FRAMEWORK FOR DFO REGULATORY REQUIREMENTS

DESCRIPTION OF AQUATIC ENVIRONMENT:

Federally/provincially listed species present:	No
Fish that are part of commercial, recreational or Aboriginal (CRA) fisheries present:	No
Fish that support a CRA fishery, or have downstream connectivity to a CRA fisheries present:	Yes
Banks and approach slope characteristics:	Left bank vertical with moderate grade of approach slopes (4-14%), right bank vertical with low grade of approach slopes (<4%).
Riparian characteristics:	Functional Riparian Width (m) at Crossing (<i>i.e.</i> , contribution to fish habitat): L: 5 to 10 m, R: 5 to 10 m

CONSTRUCTION DETAILS:

Construction Schedule:	August to December 2017	
Pipeline Methods:	Isolate if water present/open cut if dry or frozen to bottom	
Contingency Methods:	n/a	
Vehicle Crossing Methods:	Snowfill/ice bridge/clear span bridge/existing	
Estimated Maximum Footprint*:	Right-of-Way Width: 45 m	Est. Instream Footprint: 45 m (ROW) x 8.9 m (bankfull) = 400.5 m²
	Bankfull Width: 8.9 m	Est. Functional Riparian Footprint: 45 m (ROW) x 20 m (riparian) = 900 m²
	Functional Riparian Width: L: 5 to 10 m, R: 5 to 10 m	Max Instream + Riparian Footprint: 400.5 m² + 900 m² = 1,300.5 m²
Zone-of-influence (ZOI):	200 m	
No. Days of Instream Work:	2 to 15 days	

RISK ASSESSMENT RANKING:

Using the risk assessment evaluation criteria, what ranking did the proposed watercourse crossing receive?				Moderate			
Scale of Negative Effects Evaluation Criteria		Scale of Negative Effect	Sensitivity of Fish and Fish Habitat				
<ul style="list-style-type: none">Fish species present and fish habitat potential within zone of influenceInstream timing windowsPipeline and vehicle/equipment crossing methodOccurrence and duration of instream workFootprint sizeDisturbance to riparian vegetationChannel and fish passage restrictionsChanges to water quality and turbidity parametersChanges to timing, duration and frequency of flowRiparian and bank restoration measuresBeaver activity and associated removals			Extreme Project Unlikely to Proceed	High DFO Authorization	Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required	Low Meets DFO criteria: review not required	Not fish habitat
		Extreme Project Unlikely to Proceed					
		High DFO Authorization					
		Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required			MB-WC48		
		Low Meets DFO criteria: review not required					
		None					
Sensitivity to Fish and Fish Habitat Evaluation Criteria							
<ul style="list-style-type: none">Fish-bearing statusFish stream classificationFederally or provincially listed fish speciesFish species of management concernHabitat potential and/or availability for fish species and/or life stagesRiparian habitat valueWater quality parametersFreshwater mussel presence							

SELF-ASSESSMENT DECISION FRAMEWORK:

QUESTION	ANSWER
<i>If YES is answered to Questions 1 and 2 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 1 and 2, proceed to Questions 3 and 4.</i>	
1. Can all of the criteria outlined in DFO's Project Activities for the above pipeline/vehicle methods be met based on the qualified fish biologist's current knowledge?	YES
Provide rationale: <u>Dewatering/Pumping</u> : Temporary isolation dams and pumps with fish screen and a qualified fish biologist-lead fish salvage is recommended if water is present at the time of the isolation. Recommended the site be restored to pre-construction conditions. <u>Bridges</u> : Recommend no earth fill below the high watermark and no obstruction of potential fish passage by vehicle crossing.	
2. Can all applicable mitigation measures listed in DFO's <i>Measures to Avoid Causing Harm to Fish and Fish Habitat</i> be implemented to address the Pathways of Effects based on the qualified fish biologist's current knowledge?	YES (however, see below)
Provide rationale: Construction is to occur outside the restricted activity timing window. It is assumed the remaining mitigation measures for project planning, site selection, contaminant and spill management, erosion and sediment control, revegetation and stabilization, fish protection and operation of machinery can be met and are included in the Project's ESA and the EPP.	

<i>If YES is answered to Questions 3 and 4 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 3 and 4, proceed to Question 5.</i>	
3. Have fisheries management objectives, best management practices and/or plans been considered and applied where applicable?	YES
Provide rationale: Other standards and best management practices for working in and around water have been incorporated into the Project's EPP and will be implemented where applicable (<i>e.g.</i> , CAPP <i>et al.</i> 2005).	
4. Have additional mitigation measures to avoid causing harm to fish and fish habitat been recommended by a qualified fish biologist and will serious harm to fish be avoided and/or mitigated by the successful implementation of these additional measures?	YES
Provide rationale: Watercourse contains high species diversity (10 species captured) and is documented to contain northern pike and rock bass. Maintaining a qualified fish biologist onsite is recommended to facilitate fish passage, if required, and conduct water quality monitoring and a fish/mussel salvage during construction. It is also recommended to revegetate using live staking, particularly on the depositional (left) bank, to facilitate re growth as previous flood-related revegetation issues were noted with earlier pipeline crossings.	

5. Is further review by NEB/DFO recommended by the qualified fish biologist?	NO
Provide rationale: With the successful implementation of additional recommendations made by a qualified fish biologist and construction timing (<i>i.e.</i> , outside restricted activity timing window), it is expected no serious harm to fish will result.	

Notes:	1	Pending further direction from DFO regarding riparian habitat disturbance at pipeline-associated watercourse crossings, the mitigation measures and best management practices described in the Project's EPP and the guidance of existing provincial standards are assumed to be sufficient to avoid serious harm to fish, unless otherwise specified by a qualified fish biologist.
	2	Functional riparian width is interpreted as the terrestrial area/zone adjacent to a watercourse where vegetation and microclimate are hydrologically influenced by the presence of perennial or intermittent water from the stream or river.

Watercourse (Site#): Thornhill Coulee (MBR-WC3)
Legal Location: 6-29-3-5 WPM
UTM (Zone 14U): 565023E, 5454946N
SKP (as of June 2014): 1223.5

Survey Date: October 13, 2013
Habitat Survey Length (m): 200
Restricted Activity Timing Window: April 1 to June 30
Field Crew: B. Stitt, L. Snook

CHANNEL AND FLOW CONDITIONS (No. of Transects: 5)	
Confinement	Occasionally confined
Channel Pattern	Regular meanders
Bankfull Width (m): Mean, Range	1.8,1.2-2.6
Wetted Width (m): Mean, Range	0.9,0.2-1.3
Water Depth (m): Mean, Range	0.09,0.03-0.21
Ordinary Highwater Mark (m): Mean, Range	0.6,0.5-0.8
Discharge (m³/s)	Negligible
Stream Gradient (%)	0.5%
Embeddedness	Highly embedded

CHANNEL AND FLOW CONDITIONS CONTINUED		
Beaver Dams	None	
Native Channel Width (m)	n/a	
BANK CONDITIONS	LEFT BANK	RIGHT BANK
Bank Shape	Vertical	Vertical
Bank Texture	Organic/fines	Organic/fines
Mean Bank Height (m)	2.3,1.3-3.2	2.0,2.2-1.7
Grade of Approach Slopes (%)	<4	<4
Riparian Area Width (m)	0 - 5	0 - 5
Riparian Vegetation Type	Grass	Grass

SUBSTRATE	%
Organics	0
Fines (<2 mm)	100
Small Gravel (2-20 mm)	0
Large Gravel (21-65 mm)	0
Cobble (66-250 mm)	0
Boulder (>250 mm)	0

WATER QUALITY PARAMETERS	
Water Temperature (°C)	6.1
pH	7.3
Dissolved Oxygen (mg/L)	8.8
Conductivity (µS/cm)	1921.0
Turbidity (visual)	Moderately turbid

HABITAT	No.	Length (m)	%	Velocity (m/s)
Pool 1 (depth >1.00 m)	-	-	-	-
Pool 2 (depth 0.5-1.00 m)	-	-	-	-
Pool 3 (depth <0.5 m)	-	-	-	-
Run 1 (>1.00 m)	-	-	-	-
Run 2 (0.5-1.00 m)	-	-	-	-
Run 3 (<0.5 m)	-	-	-	-
Flat 1 (>1.00 m)	-	-	-	-
Flat 2 (0.5-1.00 m)	-	-	-	-
Flat 3 (<0.5 m)	-	-	-	-
Riffle	-	-	-	-
No defined channel	-	-	-	-
Other (LWB)	-	-	-	-
Other	-	-	-	-

COVER TYPES	%
Boulders	-
Undercut Banks	-
Overhanging Vegetation	-
Woody Debris	-
Depth	-
Instream Vegetation	-
Other	-
Other	-
Other	-
Other	-
Other	-
TOTAL COVER (m²)	See comments
Stream Shading	0 %

FISH HABITAT POTENTIAL RATINGS				
Species	Spawning	Rearing	Overwintering	Migration
northern pike	Unsuitable	Unsuitable	Unsuitable	Unsuitable
walleye	Unsuitable	Unsuitable	Unsuitable	Unsuitable
white sucker	Unsuitable	Unsuitable	Unsuitable	Unsuitable
black bullhead	Unsuitable	Unsuitable	Unsuitable	Unsuitable

FISH SPECIES PREVIOUSLY DOCUMENTED
Brook stickleback, fathead minnow and central mudminnow have been previously documented (AAR 2007b, Milani 2013).

FISH SPECIES PRESENT	No. Captured	No. Observed	Fork Length (mm): Mean, Range
Fathead minnow	69	-	23,15-32
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

FISH SAMPLING EFFORT	
Sampling Method	Backpack Electrofishing
No. of seconds/hours	210
Distance (m)/No. of traps	100 m
No. Captured	69
CPUE	32.86

ADDITIONAL HABITAT COMMENTS
Defined channel with limited depth and no flow detected. Cattle sign is evident. Limited cover for fish, expect high flows in the spring.

Notes: Catch per unit effort (CPUE) is the number of fish captured per hour of minnow trapping, per m² of seine netting and per 100 seconds of electrofishing.
n/a: not applicable.



Plate 1 Photograph taken at right-of-way looking upstream.



Plate 2 Photograph taken at right-of-way looking downstream.



Plate 3 Photograph taken at right-of-way of left bank.



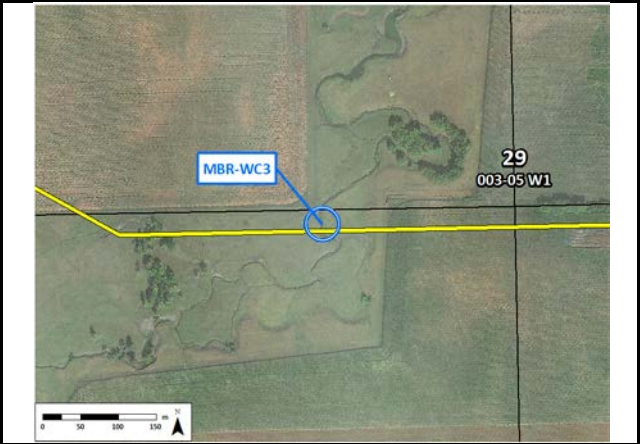
Plate 4 Photograph taken at right-of-way of right bank.



Plate 5 Aerial photograph taken of crossing view west (June 26, 2013).



Plate 6 Photograph taken approximately 50 m downstream of the right-of-way looking downstream.



Map illustrating crossing and watercourse.

Line 3 Replacement Program



SELF-ASSESSMENT AND RISK MANAGEMENT DECISION FRAMEWORK FOR DFO REGULATORY REQUIREMENTS

DESCRIPTION OF AQUATIC ENVIRONMENT:

Federally/provincially listed species present:	No
Fish that are part of commercial, recreational or Aboriginal (CRA) fisheries present:	No
Fish that support a CRA fishery, or have downstream connectivity to a CRA fisheries present:	Yes
Banks and approach slope characteristics:	Vertical banks, low grade (<4%).
Riparian characteristics:	Functional Riparian Width (m) at Crossing (<i>i.e.</i> , contribution to fish habitat): 0 to 5 m

CONSTRUCTION DETAILS:

Construction Schedule:	August to December 2017	
Pipeline Methods:	Isolate if water present/open cut if dry or frozen to bottom	
Contingency Methods:	n/a	
Vehicle Crossing Methods:	Snowfill/ice bridge/clear span bridge/existing	
Estimated Maximum Footprint*:	Right-of-Way Width: 45 m	Est. Instream Footprint: 45 m (ROW) x 1.8 m (bankfull) = 81 m ²
	Bankfull Width: 1.8 m	Est. Functional Riparian Footprint: 45 m (ROW) x 10 m (riparian) = 450 m ²
	Functional Riparian Width: L: 0 to 5 m, R: 0 to 5 m	Max Instream + Riparian Footprint: 81 m ² + 450 m ² = 531 m ²
Zone-of-influence (ZOI):	100 m	
No. Days of Instream Work:	2 to 15 days	

RISK ASSESSMENT RANKING:

Using the risk assessment evaluation criteria, what ranking did the proposed watercourse crossing receive?	Low
--	-----

Scale of Negative Effects Evaluation Criteria		Sensitivity of Fish and Fish Habitat				
<ul style="list-style-type: none">Fish species present and fish habitat potential within zone of influenceInstream timing windowsPipeline and vehicle/equipment crossing methodOccurrence and duration of instream workFootprint sizeDisturbance to riparian vegetationChannel and fish passage restrictionsChanges to water quality and turbidity parametersChanges to timing, duration and frequency of flowRiparian and bank restoration measuresBeaver activity and associated removals	Scale of Negative Effect	Extreme Project Unlikely to Proceed	High DFO Authorization	Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required	Low Meets DFO criteria: review not required	Not fish habitat
	Extreme Project Unlikely to Proceed					
	High DFO Authorization					
	Moderate Additional Mitigation and/or NEB/DFO Request for Review May be Required				MBR-WC3	
	Low Meets DFO criteria: review not required					
None						
Sensitivity to Fish and Fish Habitat Evaluation Criteria						
<ul style="list-style-type: none">Fish-bearing statusFish stream classificationFederally or provincially listed fish speciesFish species of management concernHabitat potential and/or availability for fish species and/or life stagesRiparian habitat valueWater quality parametersFreshwater mussel presence						

SELF-ASSESSMENT DECISION FRAMEWORK:

QUESTION	ANSWER
<i>If YES is answered to Questions 1 and 2 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 1 and 2, proceed to Questions 3 and 4.</i>	
1. Can all of the criteria outlined in DFO's Project Activities for the above pipeline/vehicle methods be met based on the qualified fish biologist's current knowledge?	YES
Provide rationale: <u>Dewatering/Pumping:</u> Temporary isolation dams and pumps with fish screen and a qualified fish biologist-lead fish salvage is recommended if water is present at the time of the isolation. Recommended the site be restored to pre-construction conditions. <u>Bridges:</u> Recommend no earth fill below the high watermark and no obstruction of potential fish passage by vehicle crossing.	
2. Can all applicable mitigation measures listed in DFO's <i>Measures to Avoid Causing Harm to Fish and Fish Habitat</i> be implemented to address the Pathways of Effects based on the qualified fish biologist's current knowledge?	YES
Provide rationale: Construction is to occur outside the restricted activity timing window. It is assumed the remaining mitigation measures for project planning, site selection, contaminant and spill management, erosion and sediment control, revegetation and stabilization, fish protection and operation of machinery can be met and are included in the Project's ESA and the EPP.	

If YES is answered to Questions 3 and 4 below, NEB/DFO review is not required for the proposed activities at the proposed watercourse crossing. If NO is answered for one or more of Questions 3 and 4, proceed to Question 5.

3. Have fisheries management objectives, best management practices and/or plans been considered and applied where applicable?	NA
Provide rationale:	
4. Have additional mitigation measures to avoid causing harm to fish and fish habitat been recommended by a qualified fish biologist and will serious harm to fish be avoided and/or mitigated by the successful implementation of these additional measures?	NA
Provide rationale:	

5. Is further review by NEB/DFO recommended by the qualified fish biologist?	No
Provide rationale:	

- Notes:
- 1

Pending further direction from DFO regarding riparian habitat disturbance at pipeline-associated watercourse crossings, the mitigation measures and best management practices described in the Project's EPP and the guidance of existing provincial standards are assumed to be sufficient to avoid serious harm to fish, unless otherwise specified by a qualified fish biologist.
- 2

Functional riparian width is interpreted as the terrestrial area/zone adjacent to a watercourse where vegetation and microclimate are hydrologically influenced by the presence of perennial or intermittent water from the stream or river.