

Trans Mountain Expansion Project
Amphibian Salvage Streams South Coast Area C

Region	Construction Spread	Geographic Area in South Coast Region	Relocation Area Land Status	Watercourse Crossing ID	Watercourse Name	Natural Stream or Channel/Ditch	Watercourse Classification	Zone	Easting	Northing	KP (SSEID005)	Adjacent Land Use	Pipeline Crossing Method	Date of Baseline Amphibian Survey	Amphibian Species Observed	Predicted or Identified Critical Habitat	Anticipated Start Date of Construction	Salvage Effort (Estimated Time)	Location and Description of Amphibian Relocation Site	Description on Use of Exclusion Fencing	Map Reference No.	Photo Reference No
South Coast	5	Area C - Abbotsford to Chilliwack	Private	BC-704	Unnamed	Natural Stream	S6	10	592626	5450144	1074.76	Agriculture	Isolation if water present	25-Jul-13	None Observed	None	01-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 1	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-705	Anderson Creek	Natural Stream	S2	10	592317	5449796	1075.23	Agriculture	Isolation with fish salvage and WQM if flowing	25-Jul-13	Coastal tailed frog tadpoles	Coastal giant salamander	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 1	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-706a1	Unnamed	Natural Stream	S4	10	591949	449380	1075.85	Urban with paved roads, residential properties with lawn.	Isolation with fish salvage and WQM if flowing	N/A	No survey completed	Coastal giant salamander	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 1	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-706b	Bridal Creek	Natural Stream	S3	10	591505	5448893	1076.51	Forested Anthropogenic within 200 m to the NE	Isolation with fish salvage and WQM	N/A	No survey completed	Coastal giant salamander	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 1	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private - Aboriginal: IR POPKUM 2	BC-706c	Unnamed	Natural Stream	S3	10	591507	5448652	1076.76	Western edge of Bridal Veil Falls Provincial Park.	Isolation with fish salvage and WQM	N/A	No survey completed	Coastal giant salamander	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 1	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown	BC-707a	Unnamed	Natural Stream	S6	10	591342	5448348	1077.13	Bridal Veil Falls Provincial Park. Mature intact forest.	Isolation if water present	N/A	No survey completed	Coastal giant salamander	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 1	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown	BC-707b	Unnamed	Natural Stream	S6	10	591240	5448287	1077.25	Just west of Bridal Veil Falls Provincial Park. Mature intact forest.	Isolation if water present	N/A	No survey completed	Coastal giant salamander	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 1	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown	BC-707c	Unnamed	Natural Stream	S6	10	590969	5448259	1077.52	Bridal Veil Falls Golf Course and roadways 100m to the west and Provincial park to the east.	Isolation if water present	N/A	No survey completed	Coastal giant salamander	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 1	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-707d	Unnamed Drainage	Natural Stream	NCD	10	588625	5447836	1080.03	Agriculture	Isolation if water present	N/A	No survey completed	OSF - Semmihault/Elk Population (Predicted Occupied Habitat) - Note, a separate permit application is being submitted for Oregon Scotted Frog	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 2	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-708	Nevin Creek	Natural Stream	S3	10	588122	5447510	1080.63	Adjacent to road, agriculture	Isolation with fish salvage and WQM	N/A	No survey completed	OSF - Semmihault/Elk Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Scotted Frog	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 2	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-709	Dunville Creek	Natural Stream	S3	10	587698	5447206	1081.16	agriculture and access roads	Trenchless (Bore)	25-Jul-13	Coastal tailed frog metamorphs	OSF - Semmihault/Elk Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Scotted Frog	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Trenchless - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-713 ^(SAP)	Elk Creek	Natural Stream	S3	10.00	584319	5445601	1084.92	Agricultural lands.	Trenchless (Bore)	23-Jul-13 16-Mar-15	None Observed	OSF - Semmihault/Elk Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Scotted Frog	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Trenchless - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-713a	Big Ditch Creek	Natural Stream	S2	10.00	583695	5445358	1085.60	agriculture and access roads. HWY 20 south.	Trenchless (Bore)	16-Mar-15	None Observed	OSF - Semmihault/Elk Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Scotted Frog	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Trenchless - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-714 ^(SAP)	Semmihault Creek	Natural Stream	S3	10.00	580008	5442933	1090.23	Agriculture.	Trenchless (Bore)	N/A	No survey completed	OSF - Semmihault/Elk Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Scotted Frog	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Trenchless - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-715 ^(SAP)	Chilliwack Creek	Natural Stream	S2	10.00	578954	5442264	1091.49	agriculture and paved road to the west.	Trenchless (Bore)	N/A	No survey completed	OSF - Semmihault/Elk Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Scotted Frog	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Trenchless - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)

Trans Mountain Expansion Project
Amphibian Salvage Streams South Coast Area C

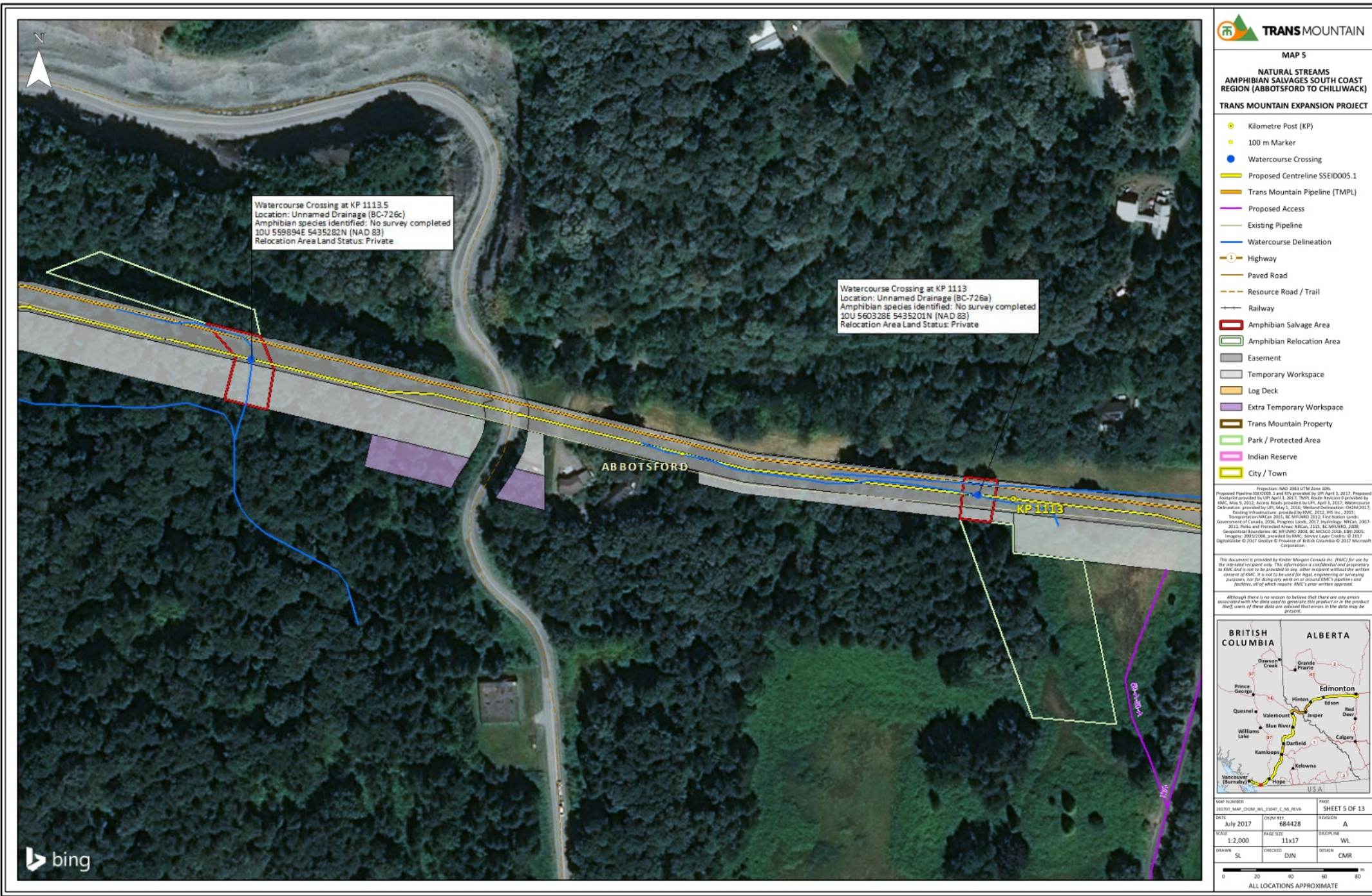
Region	Construction Spread	Geographic Area in South Coast Region	Relocation Area Land Status	Watercourse Crossing ID	Watercourse Name	Natural Stream or Channel/Ditch	Watercourse Classification	Zone	Easting	Northing	KP (SSEID005)	Adjacent Land Use	Pipeline Crossing Method	Date of Baseline Amphibian Survey	Amphibian Species Observed	Predicted or Identified Critical Habitat	Anticipated Start Date of Construction	Salvage Effort (Estimated Time)	Location and Description of Amphibian Relocation Site	Description on Use of Exclusion Fencing	Map Reference No.	Photo Reference No
South Coast	6	Area C - Abbotsford to Chilliwack	Crown	BC-716	Peach Creek	Natural Stream	S1B	10.00	571592	5439102	1100.18	Floodplain and tributary to Vedder River. Disturbed but has seemingly undergone some restoration efforts. Abundant invasive plant species. Roadway to the north.	Trenchless with WQM	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Trenchless - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown	BC-717	Chilliwack/Vedder River	Natural Stream	S1B	10.00	571514	5438913	1100.38	Disturbed but has seemingly undergone some restoration efforts. Abundant invasive plant species.	Trenchless with WQM	N/A	No survey completed	Coastal giant salamander	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Trenchless - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown	BC-718 ^(SAR)	Hopedale Slough	Natural Stream	S2	10.00	571471	5438805	1100.50	Hopedale Slough and floodplain of Vedder River. Disturbed but has seemingly undergone some restoration efforts. Abundant invasive plant species. Agriculture to the south.	Trenchless with WQM	N/A	No survey completed	Coastal giant salamander	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Trenchless - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-719	Browne Creek	Natural Stream	S2	10.00	571369	5438584	1100.74	Agriculture. Road 50m to the south.	Isolation with fish salvage and WQM if flowing	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 3	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-720	Street Creek	Natural Stream	S3	10.00	571163	5438096	1101.27	Agriculture	Isolation with fish salvage and WQM	23-May-13	Northern red-legged frog	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 3	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-720e	Stewart Slough	Natural Stream	S3	10.00	570284	5437035	1102.68	Agriculture and paved road directly south, roadside drainage.	Trenchless (Bore)	N/A	No survey completed	Coastal giant salamander	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Trenchless - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-721a	Stewart Creek Branch B - South	Natural Stream	S3	10.00	569707	5436534	1103.47	Agriculture and paved road directly west roadside drainage.	Trenchless (Bore)	N/A	No survey completed	Coastal giant salamander	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Trenchless - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-721b	Knox Creek	Natural Stream	S3	10.00	569552	5436524	1103.63	Agriculture	Isolation with fish salvage and WQM if flowing	N/A	No survey completed	Coastal giant salamander	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 4	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-722	Stewart Slough	Natural Stream	S2	10.00	569056	5436488	1104.13	Agriculture. Disturbed.	Isolation with fish salvage and WQM	N/A	No survey completed	Coastal giant salamander	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 4	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-722.1	Stewart Creek North Branch	Natural Stream	S3	10.00	568725	5436468	1104.46	Agriculture	Isolation with fish salvage if water present	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 4	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-726	Sumas River	Natural Stream	S1B	10	560565	5435169	1112.78	Agriculture, roads and trails to the east and west. Intact sections of riparian 100 m north of crossing.	Trenchless (Pipe Ramming) with WQM	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Trenchless - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-726a	Unnamed Drainage	Natural Stream	NCD	10	560328	5435201	1113.02	Forested	Isolation if water present	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 5	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-726c	Unnamed Drainage	Natural Stream	NCD	10	559894	5435282	1113.46	Forested, industrial properties and access roads to the north and east.	Isolation if water present	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 5	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-726e	Unnamed Drainage	Natural Stream	NCD	10	559500	5435335	1113.86	Forested, industrial properties and access roads to the north and east.	Isolation if water present	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 6	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-727	Neufeld Creek	Natural Stream	S6	10	559228	5435456	1114.16	Residential and industrial properties and access roads to the north and west. Parallels existing right of way to the northeast.	Isolation if water present	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 6	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-727a	Unnamed Drainage	Natural Stream	NCD	10	558899	5435678	1114.57	Industrial use paved roads surround the crossing.	Isolation if water present	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 6	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-728	Kilgard Creek	Natural Stream	S6	10	558870	5435697	1114.60	Industrial use paved roads surround the crossing.	Isolation if water present	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 6	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-728a	Unnamed Drainage	Natural Stream	NCD	10	558590	5435973	1115.00	Industrial use paved roads surround the crossing.	Isolation if water present	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 7	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)

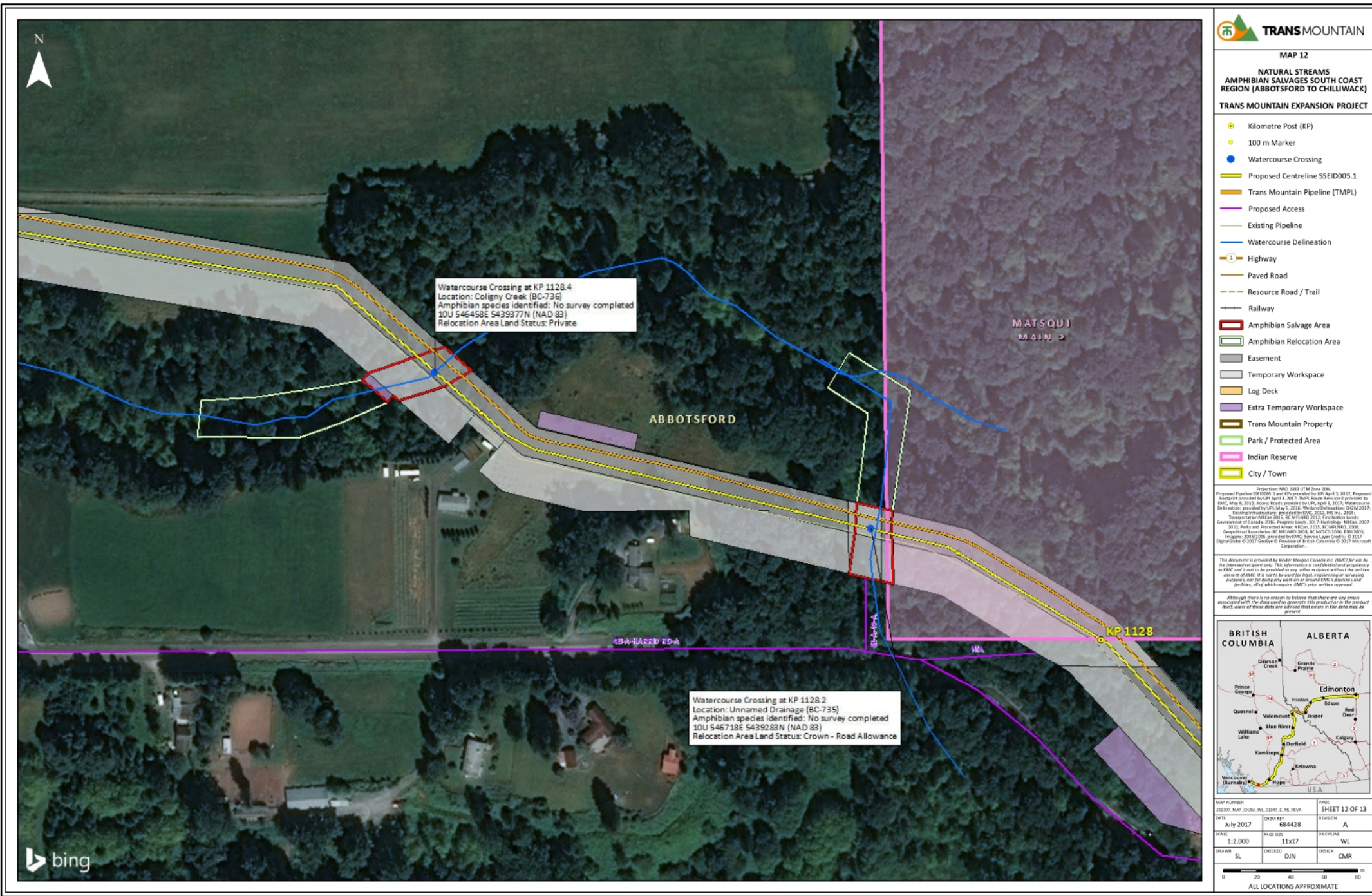
Trans Mountain Expansion Project
Amphibian Salvage Streams South Coast Area C

Region	Construction Spread	Geographic Area in South Coast Region	Relocation Area Land Status	Watercourse Crossing ID	Watercourse Name	Natural Stream or Channel/Ditch	Watercourse Classification	Zone	Easting	Northing	KP (SSEID005)	Adjacent Land Use	Pipeline Crossing Method	Date of Baseline Amphibian Survey	Amphibian Species Observed	Predicted or Identified Critical Habitat	Anticipated Start Date of Construction	Salvage Effort (Estimated Time)	Location and Description of Amphibian Relocation Site	Description on Use of Exclusion Fencing	Map Reference No.	Photo Reference No
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-728a1	Unnamed Drainage	Natural Stream	NCD-W	10	558553	5436023	1115.10	Industrial use paved roads surround the crossing.	Isolation if water present	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 7	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown - Road Allowance	BC-728b1	Unnamed Drainage	Natural Stream	NCD-W	10	558135	5436250	1115.60	Industrial use paved roads surround the crossing.	Isolation if water present	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 7	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-728d	Unnamed Drainage	Natural Stream	NCD	10	558086	5436098	1115.79	Adjacent existing right of way, but otherwise limited disturbance.	Isolation if water present	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 7	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-728e	Unnamed Drainage	Natural Stream	NCD	10	558046	5436106	1115.83	Adjacent existing right of way, but otherwise limited disturbance.	Isolation if water present	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 7	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-728f	Unnamed Drainage	Natural Stream	NCD	10	557856	5436145	1116.03	Adjacent existing right of way, but otherwise limited disturbance.	Isolation if water present	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 8	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-728g	Unnamed Drainage	Natural Stream	NCD	10	557678	5436180	1116.21	Adjacent existing right of way, but otherwise limited disturbance.	Isolation if water present	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 8	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-728h	Unnamed	Natural Stream	S3	10	557408	5436225	1116.48	Adjacent existing right of way, but otherwise limited disturbance.	Isolation with fish salvage and WQM if flowing	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 8	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-728i1	Unnamed Drainage	Natural Stream	NCD	10	557194	5436244	1116.70	Adjacent existing right of way, but otherwise limited disturbance.	Isolation if water present	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 8	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-728i2	Unnamed Drainage	Natural Stream	NCD	10	557062	5436241	1116.83	Adjacent existing right of way, but otherwise limited disturbance.	Isolation if water present	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 8	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-728j	Unnamed Drainage	Natural Stream	NCD	10	556840	5436087	1117.11	Adjacent existing right of way, but otherwise limited disturbance. Residential housing development 600m west	Isolation if water present	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 9	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-729	Unnamed	Natural Stream	S5	10	556757	5435953	1117.27	Adjacent existing right of way, but otherwise limited disturbance. Residential housing development 500m west	Isolation if water present	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 9	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-729a	Unnamed Drainage	Natural Stream	NCD	10	556721	5435911	1117.30	Adjacent existing right of way, but otherwise limited disturbance. Residential housing development 500m west	Isolation if water present	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 9	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-729b	Unnamed	Natural Stream	S6	10	555858	5435846	1118.24	Forested with a golf course to the north, south and east.	Isolation if water present	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 9	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-730	Unnamed	Natural Stream	S3	10	555485	5435979	1118.65	Adjacent existing right of way, but otherwise limited disturbance. Residential housing development 800m south and west	Isolation with fish salvage and WQM	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 9	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-730b	Nicholas Creek	Natural Stream	S3	10	554533	5436301	1119.68	urban setting with paved roads and residential houses	Install pipeline under existing culvert	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	trenchless (under existing culvert) - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-730c	Nicholas Creek	Natural Stream	S3	10	554345	5436321	1119.87	urban and agricultural setting with paved roads and residential houses to the east and industrial farmlands 10m to the west	Trenchless with WQM	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Trenchless - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-731	Clayburn Creek	Natural Stream	S2	10	553388	5436663	1120.91	Agriculture. Country road 10m to the west	Isolation with fish salvage and WQM	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 10	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-732	Clayburn Creek	Natural Stream	S2	10	552467	5437068	1121.93	Agriculture. Country road 10m to the west	Isolation with fish salvage and WQM	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 10	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)

Trans Mountain Expansion Project
Amphibian Salvage Streams South Coast Area C

Region	Construction Spread	Geographic Area in South Coast Region	Relocation Area Land Status	Watercourse Crossing ID	Watercourse Name	Natural Stream or Channel/Ditch	Watercourse Classification	Zone	Easting	Northing	KP (SSEID005)	Adjacent Land Use	Pipeline Crossing Method	Date of Baseline Amphibian Survey	Amphibian Species Observed	Predicted or Identified Critical Habitat	Anticipated Start Date of Construction	Salvage Effort (Estimated Time)	Location and Description of Amphibian Relocation Site	Description on Use of Exclusion Fencing	Map Reference No.	Photo Reference No
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-734	McLennan Creek	Natural Stream	S2	10	548387	5438569	1126.31	Agriculture and Rural housing.	Isolation with fish salvage and WQM	17-Mar-15	None Observed	OSF - McLennan Population Note, a separate permit application is being submitted for Oregon Spotted Frog	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 11	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown - Road Allowance	BC-735	Unnamed Drainage	Natural Stream	NCD	10	546718	5439283	1128.15	Forested agriculture and rural development to the north and south.	Isolation if water present	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 12	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-736	Coligny Creek	Natural Stream	S2	10	546458	5439377	1128.44	Forested riparian with agriculture and rural development to the north and south outside the riparian area	Isolation with fish salvage and WQM	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 12	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-738	Unnamed Drainage (Wetland)	Natural Stream	NCD-W	10	544044	5440142	1131.00	Agriculture and wetland	Refer to Wetland Survey and Mitigation Plan	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 13	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-739	Unnamed	Natural Stream	S5	10	543241	5440420	1131.85	Agriculture and rural developments.	Isolation if water present	N/A	No survey completed	None	06-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 13	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)







**FISH AND WILDLIFE MANAGEMENT BRANCH
ANIMAL CARE APPLICATION FORM**

PLEASE TYPE

(F11 key will tab you through to the next box requiring information)

For office use: Date Received: Project Number:

1. Project Title: Amphibian Salvage – Natural Streams – Trans Mountain Pipeline ULC Trans Mountain Pipeline Expansion Project (TMEP) – South Coast Region (Area C – Abbotsford to Chilliwack)

2. Starting Date: (Note, if multi-year include the process of this) August 15, 2017
Completion Date: December 31, 2020

3. Principal Investigator: Must be a Qualified Person as defined by the [Natural Resource Sector QP Guidance Document](#)

Name: Elke Wind
Position: Biologist
Department/Organization: E. Wind Consulting
Region/Institution: n/a
Phone: (250) 716-1119
Fax: () -
E-mail: s.22

Mailing Address: Suite A – 114 Fifth St
Nanaimo
BC
V9R 1N2

Experience related to the described species, methods and proposal (ensure that experience related to the taxa/activity concerned is emphasized):

E. Wind has worked with amphibians for over 17 years, and has extensive experience with species identification, handling, trapping, temporary holding, and disease protocols. This includes Coastal Tailed Frog. She assisted in the development of the *Best Management Practices for Amphibian and Reptile Salvages in British Columbia*. E. Wind conducted some of the baseline surveys for the TMEP Project for amphibians, including Coastal Tailed Frog.

4. Additional Investigators: copy and paste if you require more than two

Name: Claudio Bianchini
Position: Senior Biologist
Department/Organization: McTavish Resource & Mgmt Cons
Region/Institution:
Phone: (604) 219-9699
Fax:
E-mail: claudio@mctavishconsultants.ca

Mailing Address: 15300 Croyden Drive, #300
Surrey
BC
V3S 0Z5

Experience related to the described species, methods and proposal ensure that experience related to the taxa concerned is emphasized):

C. Bianchini has worked with amphibians and other wildlife for over 23 years, and has extensive experience with species identification, mapping, habitat impact assessments, handling, trapping,

temporary holding, and disease protocols. This includes Coastal tailed frog, Red legged frog, Western toad, and Giant salamander. C. Bianchini has conducted three years of baseline inventory as well as salvages during construction for Coastal Tailed Frog for the Lorenzetta Creek Hydroelectric Project (Laidlaw, BC). C. Bianchini has also conducted three years of baseline inventory for Coastal Tailed Frog and Pacific Giant Salamander for the proposed Frost Creek Hydroelectric Project (Cultus Lake, BC), and he has conducted amphibian salvage including Red legged frog and western toad for Valley Gravel Sales.

Name: <u>Cassidy Hedden</u>	Mailing Address: <u>15300 Croyden Drive, #300</u>
Position: <u>Environmental Technologist</u>	<u>Surrey</u>
Department/Organization: <u>McTavish Resource & Mgmt Cons</u>	<u>BC</u>
Region/Institution:	<u>V3S 0Z5</u>
Phone: <u>(604) 864-1635</u>	
Fax:	
E-mail: cassidy@mctavishconsultants.ca	

Experience related to the described species, methods and proposal ensure that experience related to the taxa/activity concerned is emphasized):
C Hedden has experience conducting stream classifications and wildlife assessments primarily for forestry, urban development and municipal infrastructure projects. She has conducted wildlife salvages in the Lower Mainland of BC. Recent projects include survey and salvage for Northern red-legged frog salvage for mining and private developments.

Other personnel working with protocol: (include experience)

5. Project Proposal (be concise and write in lay language. The information in all sections of this application should be complete so that it can be evaluated as a stand-alone document. The proposal must include all applicable information about animals and their handling and care relating to the project. Only maps can be included as additional material.

A. Background – Goals and Objectives:

Trans Mountain Pipeline ULC (Trans Mountain) submitted an Application to the National Energy Board (NEB) in December 2013 for the Trans Mountain Expansion Project (TMEP). A Certificate of Public Convenience and Necessity (CPCN OC-064) allowing the Project to proceed was issued by the Government of Canada on December 1, 2016. The Government of BC issued an Environmental Assessment Certificate on January 11, 2017.

The purpose of this Permit Application is to avoid incidental mortality of amphibians occurring in natural streams within the pipeline construction footprint from Abbotsford to Chilliwack. Natural "stream", as defined by MFLNRO for the purposes of this salvage application, includes the following habitat types:

- Stream 1 (shallow or clear / good visibility; 1st & 2nd Order)
- Stream 2 (deep, fast flowing or turbid / poor visibility; 3rd+ Order)

B. Key Expected Results and Management Implications:

Salvaged amphibians will be placed into buckets individually where possible, or in low density, with secure lids and containing channel water. To avoid predation within holding and transport buckets, invertebrates will be kept separate from all amphibians, and anuran tadpoles (i.e., frog and toad larva) will

For further information: www.frontcounterbc.ca

Last updated: Sept 14, 2015 Phone: 1-877-855-3222 (within North America) or ++1-778-372-0729 (outside of North America)

be kept separate from all other organisms captured (e.g., salamander larva and neotenic adults). Salvaged native amphibian species will be transported and released at least 50 m upstream of the construction work area into suitable aquatic or riparian habitat within the original channel watercourse. The relocation of individuals within the same watercourse as their capture site is expected to have limited spatial scope of impact or risk to populations or habitat.

6. CCAC Invasiveness Category: (see Appendix A)

A ____ B ____ C ☒ D ____

7. Species and Number of Animals Required: (include justification of animal numbers predicted to be captured/handled). If exact numbers are not known, please provide a reasonable order of magnitude based on your professional assessment of habitat, location, species etc. – for example, under 10, 100s or 1000s. For multi-species and multi-year projects, indicate expected numbers for each species and each year of the project.

Species (both standard common and Latin names preferred):

- Coastal tailed frog (*Ascaphus truei*)
- Coastal giant salamander (*Dicamptodon tenebrosus*)
- Northwestern salamander (*Ambystoma gracile*)
- Northern red-legged frog (*Rana aurora*)
- Rough-skinned newt (*Taricha granulosa*)

Number expected for 2017 to 2020 :

The number of amphibians that will be encountered, captured and moved is unknown.

Justification for numbers:

The number of amphibians that will be encountered in the Project work area is unknown.

8. Details of Capture, Handling, Sampling and Surgical Procedures and Final Disposition: (Be detailed and SPECIFIC. It is not sufficient to just refer to a particular protocol (e.g., RISC protocol).

Please refer to Appendix B – CCAC guidelines on: the care and use of wildlife (2003) and other documents such as AVMA Guidelines for Euthanasia of Animals (2013) for appropriate and humane techniques and guidelines for handling and care.

For wildlife salvage permits, please consult the [Salvage Permit Information Checklist](#) to ensure that all necessary information is included. Incomplete information will cause delays in the review process.

Standard capture and handling techniques will be used and holding time will be minimal. Best Management Practices for Amphibian and Reptile Salvages in British Columbia (BC MFLNRO 2016) were used to guide the development of these salvage protocols. Detailed information is provided below.

Capture Technique: Please give details of capture techniques used as well as reference to standards or reference researchers who have previously used the technique. If traps are to be used please specify the type of traps, how long the traps are to be set, modifications made for the target species and the interval they will be checked.

Depending on the stream Order and total area to be salvaged, it is estimated that the salvage for streams will begin approximately 3 to 7 days prior to the onset of clearing and in-stream construction activities. In both the aquatic and terrestrial salvage areas, the habitat will be simplified over numerous passes in order to locate amphibians while reducing overall cover availability and making the site less appealing to amphibians prior to the onset of construction.

For Stream 1 habitats, the salvage will take place immediately prior to stream water diversion required within the construction footprint. A salvage exclusion zone will be created within the instream project footprint, by installing a minimum of two semi-permeable barriers, one each at the upstream and downstream ends of the salvage zone. These barriers assist in capturing amphibians during the salvage, and they reduce the likelihood that amphibians will drift back down into the construction footprint. In larger, less clear stream systems, multiple barriers may be installed to intercept amphibians during the salvage. The temporary, semi-permeable barriers will be installed across the width of the stream channel, anchored down onto / buried within the substrate, and extending at least 10 cm above the water line. The salvage will start at the downstream end of the exclusion zone and move upstream, searching for amphibians under moveable cover objects, using hand sweeps along bank edges and within and along log jams, raking through gravel beds, and visually searching pools. A net will be held downstream of all moveable objects as they are lifted, scanned for tadpoles, and removed from the channel to simplify the habitat and reduce cover. This process will be repeated a minimum of 3 times, or until no tadpoles or other life stages are found within the simplified channel within the salvage zone. In addition to this, as the stream water is diverted the QP will be onsite to continually monitor for any amphibians that emerge as water levels are reduced. As well, any larger objects within the stream that could not be moved by hand during the salvage operation will be monitored by a QP for amphibians as they are removed. All in-stream temporary salvage exclusion barriers will be removed once pipeline construction in the area is completed to allow natural recolonization / dispersal back into the salvage area by amphibians.

For Stream 2 habitats, the same process as above will be followed where possible, but the installation of exclusion barriers may not be possible in some systems until flow volume within the salvage area has been reduced (diverted) to some degree. For example, the stream and salvage will be broken down spatially and temporally, dewatering and salvaging systematically across / along the stream. In larger systems, where hand capture and nets are ineffective, seine nets and long handled dipnets in concert with electrofishing may be required to capture and move amphibians until water depth and volume are reduced to more manageable levels.

If a sump and pump are installed for dewatering / water diversion purposes, any deposited substrate during sump installation will be monitored for organisms emerging from the stock pile and salvaged as appropriate. As well, a filter cage will be secured around the pump intake to ensure amphibians are not sucked into it. At the onset of dewatering, the pump rate will be relatively low to allow amphibians to be salvaged. The QP will remain onsite to monitor the pump and water levels and capture and relocate individuals throughout the dewatering process. If needed, the pump will be turned off on occasion to allow for a rigorous capture effort and reduce stress to the aquatic organisms within the decreasing pool of water.

Within the adjacent riparian / upland habitat salvage area, surveys for amphibians will occur over a 3-day period prior to construction, searching visually under all cover objects, under / within vegetation, leafy debris, etc. As with the aquatic habitat, the area will be simplified to reduce cover and make the area less appealing to amphibians to reduce the probability of amphibians moving into the area prior to and during the initial construction phase. During construction, any larger objects within the riparian / upland habitat that could not be moved by hand during the salvage operation will be monitored by a QP for amphibians as they are removed.

Method of Handling:

Amphibians will be captured by hand (wearing nitrile gloves), or using a net, and placed into buckets with secure lids and containing stream water. Where possible, salvaged native amphibian species in stream habitats will be transported and released at least 50 m upstream of the work area into suitable aquatic or

riparian habitat within the original watercourse (BC MFLNRO 2016). Where upstream habitats are dry at the time of the salvage, downstream sites may be considered. Where no up or downstream habitat exists, amphibians will be released into the nearest suitable (similar) stream habitat where landowner permission has been acquired. Amphibians will be held in buckets no longer than 30 minutes prior to release, and buckets containing amphibians will be kept cool at all times (partially submerged, shaded). If non-native amphibian species are encountered (e.g., American Bullfrog and Green Frog) they will be euthanized on site following acceptable provincial protocols (e.g., immersion / overdose in MS-222) and, depending on the number captured, buried on site or disposed of at a local composting facility.

All equipment will be cleaned between stream sites following standard hygiene protocols established by the BC Ministry of Environment to avoid the spread of disease among individuals and populations (BC Ministry of Environment Standard Operating Procedures: Hygiene Protocols for Amphibian Fieldwork, 2008; Interim Hygiene Protocols for Amphibian Field Staff and Researchers).

Other Procedures: (Marking method, Sampling)

Animals will not be marked or tagged. No other procedures to list.

Chemical Restraint, Analgesics or other Pharmaceutical Agents used: (Drug names should be included with doses and volumes planned):

No chemicals, analgesics or other pharmaceutical agents will be used.

Contingency Plan: (What training, preparations and equipment are available in event of animal injury during capture or handling). A contingency plan is mandatory because accidents are not predictable. Describe what preplanning, resources and contacts are available in the event of accidental animal injury during capture and handling.

Injury is unlikely, but in the case that an amphibian is seriously injured during trapping or handling, it will be euthanized following directions outlined in provincial standards.

Method of Euthanasia and Disposal Technique: (All projects must be prepared to humanely euthanize animals with an appropriate technique). Euthanized animals should be submitted to a museum collection, unless damaged beyond usefulness for archival purposes or other logistical constraints. If not retained for archival purposes, animals should be disposed of appropriately to avoid environmental contamination or other unintended consequences. See [Canadian Council on Animal Care guidelines](#) or [AVMA Guidelines for the Euthanasia of Animals \(2013\)](#) for appropriate species specific methods.

In the case of accidental injury where euthanasia is required, euthanasia will follow a physical method causing rapid loss of brain function: decapitation followed by pithing. Prior to euthanasia, a deep level of anaesthesia will be achieved and confirmed using Orajel® (BC MFLNRO 2017).

Non-native amphibian species (e.g., American Bullfrog and Green Frog) will be euthanized on site following acceptable provincial protocols (e.g., immersion and overdose in MS-222) and, depending on the number captured, buried on site or disposed of at a local composting facility.

References:

British Columbia Ministry of Forests, Lands, and Natural Resource Operations. 2016. Best Management Practices for Amphibian and Reptile Salvages in British Columbia. Version 1.0., June 2, 2016. 57 pp.

British Columbia Ministry of Forests, Lands, and Natural Resource Operations. 2017. Bullfrog Euthanasia SOP. 1 pp.

British Columbia Ministry of Environment. 2008. Standard Operating Procedures: Hygiene Protocols for Amphibian Fieldwork: Interim Hygiene Protocols for Amphibian Field Staff and Researchers.

For further information: www.frontcounterbc.ca

Last updated: Sept 14, 2015 Phone: 1-877-855-3222 (within North America) or ++1-778-372-0729 (outside of North America)

9. Details of Potentially Controversial Procedures and Justification:
(Include any expected morbidity and methods used to avoid)

No controversial procedures are being considered.

10. Budget:
Funding sources applied for:

Are these peer reviewed? [NO](#)
Status: [APPROVED](#)

11. Region:

Identify the study area(s) in general and specific terms: (e.g. Region #, land status). Please attach maps if appropriate. For salvage permits, include maps indicating source and release sites.

South Coast Region (Area C – Abbotsford to Chilliwack). See attached maps.

12. Permit:

Please send the completed BC Animal Care Form Application Form to FrontCounter BC along with a General Permit Application and permit fees (if applicable). For further information on how to apply, please visit the FrontCounter BC website at <http://www.frontcounterbc.gov.bc.ca/guides/fish-wildlife/general-permit/overview/>

Approval of an Animal Care Application does not constitute approval of any application to handle wildlife. Applicants must also have a valid permit, issued under the *Wildlife Act*, before engaging in any such activity.

Principal Investigator's

Signature Date of Application

Please ensure you save this document to your desktop to upload with your General Wildlife Application.

Direct any comments about this form to FrontCounterBC@gov.bc.ca

Appendix A: Canadian Council on Animal Care: Categories of Invasiveness for Wildlife Studies

- A. Methods used on most invertebrates or on live isolates Possible examples: the use of tissue culture and tissues obtained at necropsy; the use of eggs, protozoa or other single-celled organisms; experiments involving containment, incision or other invasive procedures on metazoa.
- B. Methods used which cause little or no discomfort or stress Possible examples: observational studies in which the same individuals are not repeatedly observed so as to habituate or otherwise modify their behavior; census or other surveys which do not involve capture or marking individuals; non-invasive studies on animals that have been habituated to captivity; short periods of food and/or water deprivation equivalent to periods of abstinence in nature.
- C. Methods which cause minor stress or pain of short duration Possible examples: capture, using methods with little or no potential to cause injury and marking of animals for immediate release; long-term observational studies on free-ranging animals where the behaviour of individuals may be altered by repeated contact; brief restraint for blood or tissue sampling; short periods of restraint beyond that for simple observation or examination, but consistent with minimal distress; short periods of food and/or water deprivation which exceed periods of abstinence in nature; exposure to non-lethal levels of drugs or chemicals; low velocity darting and slow-injection darts with immobilization chemicals. Such procedures should not cause significant changes in the animal's appearance, in physiological parameters such as respiratory or cardiac rate, or fecal or urinary output, in social responses or *in ability to survive*.

Note: During or after Category C studies, animals must not show self-mutilation, anorexia, dehydration, hyperactivity, increased recumbency or dormancy, increased vocalization, aggressive-defensive behavior or demonstrate social withdrawal and self-isolation.

- D. Methods which cause moderate to severe distress or discomfort Possible examples: *capture, using methods that have the potential to cause injury (e.g. Leg snares, leg hold traps, high velocity darting and rapid-injection darts with immobilization chemicals, net gunning, etc.); maintenance of wild caught animals in captivity; translocation of wildlife to new habitats; major surgical procedures conducted under general anesthesia, with subsequent recovery; prolonged (several hours or more) periods of physical restraint; induction of behavioral stresses such as maternal deprivation, aggression, predator-prey interactions; procedures which cause severe, persistent or irreversible disruption of sensorimotor organization. Other examples in captive animals include induction of anatomical and physiological abnormalities that will result in pain or distress; the exposure of an animal to noxious stimuli from which escape is impossible; the production of radiation sickness; exposure to drugs or chemicals at levels that impair physiological systems. (NB. Experiments described in this paragraph would be Category E if performed on wildlife immediately prior to release.)*

Note: Procedures used in Category D studies should not cause prolonged or severe clinical distress as may be exhibited by a wide range of clinical signs, such as marked abnormalities in behavioral patterns or attitudes, the absence of grooming, dehydration, abnormal vocalization, prolonged anorexia, circulatory collapse, extreme lethargy or disinclination to move, and clinical signs of severe or advanced local or systemic infection, etc.

- E. Procedures which cause severe pain near, at, or above the pain tolerance threshold of unanesthetized conscious animals. This Category of Invasiveness is not necessarily confined to surgical procedures, but may include exposure to noxious stimuli or agents whose effects are unknown; exposure to drugs or chemicals at levels that (may) markedly impair physiological systems and which cause death, severe pain, or extreme distress; behavioral studies about which the effects of the degree of distress are not known; *environmental deprivation that has the potential to seriously jeopardize an animal's wellbeing*; use of muscle relaxants or paralytic drugs without anesthetics; burn or trauma infliction on unanesthetized animals; a euthanasia method not approved by the CCAC; any procedures (e.g., the injection of noxious agents or the induction of severe stress or shock) that will result in pain which approaches the pain tolerance threshold and cannot be relieved by analgesia (e.g., removal of teeth without analgesia, or when toxicity testing and experimentally-induced infectious disease studies have death as the endpoint), *capture methods with a high potential of causing severe injury that could result in severe chronic pain and/or death.*



Fish and Wildlife Application

Tracking Number: 100217339

Application Information

If approved, will the authorization be issued to an Individual or Company/Organization? Company/Organization
What is your relationship to the company/organization? Employee

APPLICANT COMPANY/ORGANIZATION CONTACT INFORMATION

Applicant is an Individual or an Organization to whom this authorization Permit/Licence will be issued, if approved.-

Name: TransMountain Pipeline ULC
Doing Business As:
Phone: 403-514-6462
Fax:
Email: margaret_mears@kindermorgan.com
BC Incorporation Number:
Extra Provincial Inc. No:
Society Number:
GST Registration Number:
Contact Name: Ellen Frisch, Manager Permitting
Mailing Address: 2700 300 5th Avenue
Calgary AB T2P 5J2

TECHNICAL INFORMATION

APPLICATIONS

You may submit one or more application(s) Click on the 'Add Application' for each application you would like to add. In order to submit multiple applications together they must be for one applicant and in the same region.

Type

General Wildlife Permit

GENERAL WILDLIFE PERMIT

Please provide the following general information about you and your application.

APPLICATION TYPE

Please provide the following details regarding your application.

What type of permit are you applying for: New Permit
Applicant Date of Birth (DD/MM/YYYY) Jun 16, 1959

PROPOSED ACTIVITY

Please provide the following details regarding your proposed activity.

Wildlife Species - Common Name: Coastal tailed frog, Coastal giant salamander, Northwestern salamander, Northern red-legged frog etc
Wildlife Species - Scientific Name: Ascaphus truei, Dicamptodon tenebrosus, Ambystoma gracile, Rana aurora, Taricha granulosa
Location of Activity: The TMEP route Abbotsford to Chilliwack, BC
Activity Start Date: Aug 15, 2017
Activity End Date: Dec 31, 2020

ACTIVITY DESCRIPTION

Provide a detailed description of the activity you require a permit for. Include methods and equipment to be used. If your activity involves the capture, transport, possession, release or export of live animals or viable eggs, you must also include a detailed safety plan that explains the measures you will take to ensure that public safety will be protected. (For example, how would you prevent escapes?) In your own words, also describe the purpose of this activity and any special circumstances the Ministry should be aware of.

Description:

Trans Mountain Pipeline ULC (Trans Mountain) submitted an Application to the National Energy Board (NEB) in December 2013 for the Trans Mountain Expansion Project (TMEP). A Certificate of Public Convenience and Necessity (CPCN OC-064) allowing the Project to proceed was issued by the Government of Canada on December 1, 2016. The Government of BC issued an Environmental Assessment Certificate on January 11, 2017.

The purpose of this Permit Application is to avoid incidental mortality of amphibians occurring in natural streams within the pipeline construction footprint from Abbotsford to Chilliwack. Natural "stream", as defined by MFLNRO for the purposes of this salvage application, includes the following habitat types:

- Stream1 (shallow or clear / good visibility; 1st & 2nd Order)
- Stream2 (deep, fast flowing or turbid / poor visibility; 3rd+ Order)

A salvage permit is requested to manually move amphibians that may be encountered within the work area for the Project. Trans Mountain will engage a Qualified Professional(s) (QP) with species experience as defined by the Natural Resource Sector QP Guidance Document to complete amphibian salvage activities. The permit will be for a QP to complete a search for all amphibians, with the emphasis on Coastal Tailed Frogs a Blue listed, stream-obligate species. The salvage will encompass the in-stream watercourse crossing area and 20 m of the adjacent riparian / terrestrial habitat within the pipeline construction footprint. The area of the in-stream salvage zone will vary by stream width at the crossing site (e.g., < 1.0 m to 10+m), and will encompass the pipeline construction footprint.

Depending on the stream Order and total area to be salvaged, it is estimated that the salvage for streams will begin approximately 3 to 7 days prior to the onset of clearing and in-stream construction activities. In both the aquatic and terrestrial salvage areas, the habitat will be simplified over numerous passes in order to locate amphibians while reducing overall cover availability and making the site less appealing to amphibians prior to the onset of construction.

Within the adjacent riparian / upland habitat salvage area, surveys for amphibians will occur over a 3-day period prior to construction, searching visually under all cover objects, under / within vegetation, leafy debris, etc. As with the aquatic habitat, the area will be simplified to reduce cover and make the area less appealing to amphibians to reduce the probability of amphibians moving into the area prior to and during the initial construction phase. During construction, any larger objects within the riparian / upland habitat that could not be moved by hand during the salvage operation will be monitored by a QP for amphibians as they are removed.

Amphibians will be captured by hand (wearing nitrile gloves), or

using a net, and placed into buckets with secure lids and containing stream water. Where possible, salvaged native amphibian species in stream habitats will be transported and released at least 50 m upstream of the work area into suitable aquatic or riparian habitat within the original watercourse (BC MFLNRO 2016).

All equipment will be cleaned between stream sites following standard hygiene protocols established by the BC Ministry of Environment to avoid the spread of disease among individuals and populations (BC Ministry of Environment Standard Operating Procedures: Hygiene Protocols for Amphibian Fieldwork, 2008: Interim Hygiene Protocols for Amphibian Field Staff and Researchers).

Additional Permit-Specific Information:

For further details, see attached Animal Care Form.

GENERAL WILDLIFE PERMIT - APPENDIX

Legislation

Below is a non-exhaustive list of provisions under the Wildlife Act and regulations that are relevant to this licence. It is the licence holder's responsibility to be aware of any provisions under the Act or regulations that may apply to this licence.

Failure to pay fine

85 (1) This section applies if a person

(a) fails to pay, within the time required by law, a fine imposed as a result of the person's conviction for an offence under this Act or the Firearm Act, and

(b) has been served with notice of this section.

(2) In the circumstances referred to in subsection (1),

(a) the person's right to apply for or obtain a licence, permit or limited entry hunting authorization under this Act is suspended immediately and automatically on the failure to pay the fine,

(b) all licences, permits and limited entry hunting authorizations issued to that person under this Act are cancelled immediately and automatically on the failure to pay the fine

(i) the person must not apply for employment as an assistant guide

(ii) the person must not guide as an assistant guide

(c) the person commits an offence if, before that fine is paid, the person

(i) applies for, or in any way obtains, a licence, permit or limited entry hunting authorization under this Act, or

(ii) does anything for which a licence, permit or limited entry hunting authorization under this Act is required.

(iii) applies for employment as an assistant guide

(iv) guides as an assistant guide

ATTACHED DOCUMENTS

Document Type	Description	Filename
Generic Document Upload	Amphibian Salvage Streams Map South Coast Area C	TMEP_SouthCoast_AreaC_Natur...
Generic Document Upload	Amphibian Salvage Streams South Coast Area C	TMEP_AmphibianSalvage_South...
Generic Document Upload	Wildlife Permit Application South Coast Area C	TMEP_AnimalCareForm_StreamA..

PRIVACY DECLARATION

☒ Check here to indicate that you have read and agree to the privacy declaration stated above.

IMPORTANT NOTICES

Please review the clauses and conditions associated with your application below.

DECLARATION

☒ I acknowledge that the information I have provided is true and that I fulfill the requirements for the applications.

OFFICE

Office to submit application to:

Surrey

APPLICANT SIGNATURE

Applicant Signature

Date

OFFICE USE ONLY

Office
Surrey

File Number

Project Number

Disposition ID

Client Number



PLEASE TYPE

(F11 key will tab you through to the next box requiring information)

For office use: Date Received: Project Number:

1. Project Title: Amphibian Salvage – Natural Streams – Trans Mountain Pipeline ULC Trans Mountain Pipeline Expansion Project (TMPEP) – South Coast Region (Area C – Abbotsford to Chilliwack)

2. Starting Date: (Note, if multi-year include the process of this) August 15, 2017
Completion Date: December 31, 2020

3. Principal Investigator: Must be a Qualified Person as defined by the [Natural Resource Sector QP Guidance Document](#)

Name: <u>Claudio Bianchini</u>	Mailing Address: <u>15300 Croyden Drive, #300</u>
Position: <u>Senior Biologist</u>	<u>Surrey</u>
Department/Organization: <u>McTavish Resource & Mgmt Cons</u>	<u>BC</u>
Region/Institution: <u>n/a</u>	<u>V3S 0Z5</u>
Phone: <u>(604) 219-9699</u>	
Fax:	
E-mail: <u>claudio@mctavishconsultants.ca</u>	

Experience related to the described species, methods and proposal ensure that experience related to the taxa concerned is emphasized):

C. Bianchini has worked with amphibians and other wildlife for over 23 years, and has extensive experience with species identification, mapping, habitat impact assessments, handling, trapping, temporary holding, and disease protocols. This includes Coastal Tailed Frog, Northern Red-legged Frog, Western Toad, and Pacific Giant Salamander. C. Bianchini has conducted three years of baseline inventory as well as salvages during construction for Coastal Tailed Frog for the Lorenzetta Creek Hydroelectric Project (Laidlaw, BC). C. Bianchini has also conducted three years of baseline inventory for Coastal Tailed Frog and Pacific Giant Salamander for the proposed Frost Creek Hydroelectric Project (Cultus Lake, BC), and he has conducted amphibian salvage including Northern Red-legged Frog and Western Toad for Valley Gravel Sales.

4. Additional Investigators: copy and paste if you require more than two

Name: <u>Cassidy Hedden</u>	Mailing Address: <u>15300 Croyden Drive, #300</u>
Position: <u>Environmental Technologist</u>	<u>Surrey</u>
Department/Organization: <u>McTavish Resource & Mgmt Cons</u>	<u>BC</u>
Region/Institution: <u>n/a</u>	<u>V3S 0Z5</u>
Phone: <u>(604) 864-1635</u>	
Fax:	
E-mail: <u>cassidy@mctavishconsultants.ca</u>	

Experience related to the described species, methods and proposal ensure that experience related to the taxa/activity concerned is emphasized):

C Hedden has experience conducting stream classifications and wildlife assessments primarily for forestry, urban development and municipal infrastructure projects. She has conducted wildlife salvages in the Lower Mainland of BC. Recent projects include survey and salvage for Northern Red-legged Frog salvage for mining and private developments.

Name: <u>Elke Wind</u>	Mailing Address: <u>Suite A – 114 Fifth St</u>
Position: <u>Biologist</u>	<u>Nanaimo</u>
Department/Organization: <u>E. Wind Consulting</u>	<u>BC</u>
Region/Institution: <u>n/a</u>	<u>V9R 1N2</u>
Phone: <u>(250) 716-1119</u>	
Fax: <u>() - - - - -</u>	
E-mail: <u>s.22</u>	

Experience related to the described species, methods and proposal (ensure that experience related to the taxa/activity concerned is emphasized):

E. Wind has worked with amphibians for over 17 years, and has extensive experience with species identification, handling, trapping, temporary holding, and disease protocols. This includes Coastal Tailed Frog. She assisted in the development of the *Best Management Practices for Amphibian and Reptile Salvages in British Columbia*. E. Wind conducted some of the baseline surveys for the TMEP Project for amphibians, including Coastal Tailed Frog.

Other personnel working with protocol: (include experience)

Information

5. Project Proposal (be concise and write in lay language. The information in all sections of this application should be complete so that it can be evaluated as a stand-alone document. The proposal must include all applicable information about animals and their handling and care relating to the project. Only maps can be included as additional material.

A. Background – Goals and Objectives:

Trans Mountain Pipeline ULC (Trans Mountain) submitted an Application to the National Energy Board (NEB) in December 2013 for the Trans Mountain Expansion Project (TMEP). A Certificate of Public Convenience and Necessity (CPCN OC-064) allowing the Project to proceed was issued by the Government of Canada on December 1, 2016. The Government of BC issued an Environmental Assessment Certificate on January 11, 2017.

The purpose of this Permit Application is to avoid incidental mortality of amphibians occurring in natural streams within the pipeline construction footprint from Abbotsford to Chilliwack. Natural "stream", as defined by MFLNRO for the purposes of this salvage application, includes the following habitat types:

- Stream 1 (shallow or clear / good visibility; 1st & 2nd Order)
- Stream 2 (deep, fast flowing or turbid / poor visibility; 3rd+ Order)

B. Key Expected Results and Management Implications:

Salvaged amphibians will be placed into buckets individually where possible, or in low density, with secure lids and containing channel water. To avoid predation within holding and transport buckets, invertebrates will be kept separate from all amphibians, and anuran tadpoles (i.e., frog and toad larva) will be kept separate from all other organisms captured (e.g., salamander larva and neotenic adults).

For further information: www.frontcounterbc.ca

Last updated: Sept 14, 2015 Phone: 1-877-855-3222 (within North America) or ++1-778-372-0729 (outside of North America)

Salvaged native amphibian species will be transported and released at least 50 m to 100 m upstream of the construction work area into suitable aquatic or riparian habitat within the original channel watercourse dependent of the species and surrounding land use. The relocation of individuals within the same watercourse as their capture site is expected to have limited spatial scope of impact or risk to populations or habitat.

6. CCAC Invasiveness Category: (see Appendix A)

A ____ B ____ C ✓ D ____

7. Species and Number of Animals Required: (include justification of animal numbers predicted to be captured/handled). If exact numbers are not known, please provide a reasonable order of magnitude based on your professional assessment of habitat, location, species etc. – for example, under 10, 100s or 1000s. For multi-species and multi-year projects, indicate expected numbers for each species and each year of the project.

Species (both standard common and Latin names preferred):

- Coastal tailed frog (*Ascaphus truei*)
- Coastal giant salamander (*Dicamptodon tenebrosus*)
- Northwestern salamander (*Ambystoma gracile*)
- Northern red-legged frog (*Rana aurora*)
- Rough-skinned newt (*Taricha granulosa*)

Number expected for 2017 to 2020:

The number of amphibians that will be encountered, captured and moved is variable and will range from 0 to 1000+ individuals. Seasonal timing of salvages and habitat quality will dictate the number of amphibians encountered. It is anticipated that most small channels and watercourses will have <20 amphibians salvaged, particularly in poor amphibian habitats during the winter months. Ponds and watercourses with suitable amphibian habitat, salvaged during the amphibian breeding season (spring/summer), may have 100 to 1000+ tadpoles/larva salvaged. Mountain streams with coastal tailed frog will likely have 100 to 700 tadpoles/20 m segment of watercourse dewatered.

Justification for numbers:

The number of amphibians expected to be encountered in the Project work area is based on past salvage experience in a variety of habitats throughout the Lower Mainland and Fraser Valley.

8. Details of Capture, Handling, Sampling and Surgical Procedures and Final Disposition: (Be detailed and SPECIFIC. It is not sufficient to just refer to a particular protocol (e.g., RISC protocol).

Please refer to Appendix B – CCAC guidelines on: the care and use of wildlife (2003) and other documents such as AVMA Guidelines for Euthanasia of Animals (2013) for appropriate and humane techniques and guidelines for handling and care.

For wildlife salvage permits, please consult the [Salvage Permit Information Checklist](#) to ensure that all necessary information is included. Incomplete information will cause delays in the review process.

Standard capture and handling techniques will be used and holding time will be minimal. Best Management Practices for Amphibian and Reptile Salvages in British Columbia (BC MFLNRO 2016) were used to guide the development of these salvage protocols. Detailed information is provided below.

For further information: www.frontcounterbc.ca

Last updated: Sept 14, 2015 Phone: 1-877-855-3222 (within North America) or ++1-778-372-0729 (outside of North America)

Capture Technique: Please give details of capture techniques used as well as reference to standards or reference researchers who have previously used the technique. If traps are to be used please specify the type of traps, how long the traps are to be set, modifications made for the target species and the interval they will be checked.

Depending on the stream Order and total area to be salvaged, it is estimated that the salvage for streams will begin approximately 3 to 7 days prior to the onset of clearing and in-stream construction activities. In both the aquatic and terrestrial salvage areas, the habitat will be simplified over numerous passes in order to locate amphibians while reducing overall cover availability and making the site less appealing to amphibians prior to the onset of construction.

For Stream 1 habitats, the salvage will take place immediately prior to stream water diversion required within the construction footprint. A salvage exclusion zone will be created within the instream project footprint, by installing a minimum of two semi-permeable barriers, one each at the upstream and downstream ends of the salvage zone. These barriers assist in capturing amphibians during the salvage, and they reduce the likelihood that amphibians will drift back down into the construction footprint. In larger, less clear stream systems, multiple barriers may be installed to intercept amphibians during the salvage. The temporary, semi-permeable barriers will be installed across the width of the stream channel, anchored down onto / buried within the substrate, and extending at least 10 cm above the water line. The salvage will start at the downstream end of the exclusion zone and move upstream, searching for amphibians under moveable cover objects, using hand sweeps along bank edges and within and along log jams, raking through gravel beds, and visually searching pools. A net will be held downstream of all moveable objects as they are lifted, scanned for tadpoles, and removed from the channel to simplify the habitat and reduce cover. This process will be repeated a minimum of 3 times, or until no tadpoles or other life stages are found within the simplified channel within the salvage zone. In addition to this, as the stream water is diverted the QP will be onsite to continually monitor for any amphibians that emerge as water levels are reduced. As well, any larger objects within the stream that could not be moved by hand during the salvage operation will be monitored by a QP for amphibians as they are removed. All in-stream temporary salvage exclusion barriers will be removed once pipeline construction in the area is completed to allow natural recolonization / dispersal back into the salvage area by amphibians.

For Stream 2 habitats, the same process as above will be followed where possible, but the installation of exclusion barriers may not be possible in some systems until flow volume within the salvage area has been reduced (diverted) to some degree. For example, the stream and salvage will be broken down spatially and temporally, dewatering and salvaging systematically across / along the stream. In larger systems, where hand capture and nets are ineffective, seine nets and long handled dipnets in concert with electrofishing may be required to capture and move amphibians until water depth and volume are reduced to more manageable levels.

If a sump and pump are installed for dewatering / water diversion purposes, any deposited substrate during sump installation will be monitored for organisms emerging from the stock pile and salvaged as appropriate. As well, a filter cage will be secured around the pump intake to ensure amphibians are not sucked into it. At the onset of dewatering, the pump rate will be relatively low to allow amphibians to be salvaged. The QP will remain onsite to monitor the pump and water levels and capture and relocate individuals throughout the dewatering process. If needed, the pump will be turned off on occasion to allow for a rigorous capture effort and reduce stress to the aquatic organisms within the decreasing pool of water.

Within the adjacent riparian / upland habitat salvage area, surveys for amphibians will occur over a 3-day period prior to construction, searching visually under all cover objects, under / within vegetation, leafy debris, etc. As with the aquatic habitat, the area will be simplified to reduce cover and make the area less appealing to amphibians to reduce the probability of amphibians moving into the area prior to and during the initial construction phase. During construction, any larger objects within the riparian / upland habitat that could not be moved by hand during the salvage operation will be monitored by a QP for amphibians as they are removed.

Method of Handling:

Amphibians will be captured by hand (wearing nitrile gloves), or using a net, and placed into buckets with secure lids and containing stream water. Where possible, salvaged native amphibian species in stream habitats will be transported and released at least 50 m upstream of the work area into suitable aquatic or riparian habitat within the original watercourse (BC MFLNRO 2016). Where upstream habitats are dry at the time of the salvage, downstream sites may be considered. Where no up or downstream habitat exists, amphibians will be released into the nearest suitable (similar) stream habitat where landowner permission has been acquired. Amphibians will be held in buckets no longer than 30 minutes prior to release, and buckets containing amphibians will be kept cool at all times (partially submerged, shaded). If non-native amphibian species are encountered (e.g., American Bullfrog and Green Frog) they will be euthanized on site following acceptable provincial protocols (e.g., immersion / overdose in MS-222) and, depending on the number captured, buried on site or disposed of at a local composting facility.

All equipment will be cleaned between stream sites following standard hygiene protocols established by the BC Ministry of Environment to avoid the spread of disease among individuals and populations (BC Ministry of Environment Standard Operating Procedures: Hygiene Protocols for Amphibian Fieldwork, 2008: Interim Hygiene Protocols for Amphibian Field Staff and Researchers).

Other Procedures: (Marking method, Sampling)

Animals will not be marked or tagged. No other procedures to list.

Chemical Restraint, Analgesics or other Pharmaceutical Agents used: (Drug names should be included with doses and volumes planned):

No chemicals, analgesics or other pharmaceutical agents will be used.

Contingency Plan: (What training, preparations and equipment are available in event of animal injury during capture or handling). A contingency plan is mandatory because accidents are not predictable. Describe what preplanning, resources and contacts are available in the event of accidental animal injury during capture and handling.

Injury is unlikely, but in the case that an amphibian is seriously injured during trapping or handling, it will be euthanized following directions outlined in provincial standards.

Method of Euthanasia and Disposal Technique: (All projects must be prepared to humanely euthanize animals with an appropriate technique). Euthanized animals should be submitted to a museum collection, unless damaged beyond usefulness for archival purposes or other logistical constraints. If not retained for archival purposes, animals should be disposed of appropriately to avoid environmental contamination or other unintended consequences. See [Canadian Council on Animal Care guidelines](#) or [AVMA Guidelines for the Euthanasia of Animals \(2013\)](#) for appropriate species specific methods.

In the case of accidental injury where euthanasia is required, euthanasia will follow a physical method causing rapid loss of brain function: decapitation followed by pithing. Prior to euthanasia, a deep level of anaesthesia will be achieved and confirmed using Orajel® (BC MFLNRO 2017).

If encountered, invasive bullfrogs and green frogs will be humanely euthanized. Euthanasia will follow a physical method causing rapid loss of brain function: decapitation followed by pithing. Prior to euthanasia, a deep level of anaesthesia will be achieved and confirmed using Orajel® (BC MFLNRO 2017). Depending on the number captured, any euthanized non-native amphibians will be buried on site or disposed of at a local composting facility.

References:

For further information: www.frontcounterbc.ca

Last updated: Sept 14, 2015 Phone: 1-877-855-3222 (within North America) or ++1-778-372-0729 (outside of North America)

British Columbia Ministry of Forests, Lands, and Natural Resource Operations. 2016. Best Management Practices for Amphibian and Reptile Salvages in British Columbia. Version 1.0., June 2, 2016. 57 pp.

British Columbia Ministry of Forests, Lands, and Natural Resource Operations. 2017. Bullfrog Euthanasia SOP. 1 pp.

British Columbia Ministry of Environment. 2008. Standard Operating Procedures: Hygiene Protocols for Amphibian Fieldwork: Interim Hygiene Protocols for Amphibian Field Staff and Researchers.

9. Details of Potentially Controversial Procedures and Justification:
(Include any expected morbidity and methods used to avoid)

No controversial procedures are being considered.

10. Budget:
Funding sources applied for:

Are these peer reviewed? [NO](#)

Status: [APPROVED](#)

11. Region:

Identify the study area(s) in general and specific terms: (e.g. Region #, land status). Please attach maps if appropriate. For salvage permits, include maps indicating source and release sites.

South Coast Region (Area C – Abbotsford to Chilliwack). See attached maps.

12. Permit:

Please send the completed BC Animal Care Form Application Form to FrontCounter BC along with a General Permit Application and permit fees (if applicable). For further information on how to apply, please visit the FrontCounter BC website at <http://www.frontcounterbc.gov.bc.ca/guides/fish-wildlife/general-permit/overview/>

Approval of an Animal Care Application does not constitute approval of any application to handle wildlife. Applicants must also have a valid permit, issued under the *Wildlife Act*, before engaging in any such activity.



Principal Investigator's

August 2, 2017

Signature Date of Application

Please ensure you save this document to your desktop to upload with your General Wildlife Application.

Direct any comments about this form to FrontCounterBC@gov.bc.ca

For further information: www.frontcounterbc.ca

Last updated: Sept 14, 2015 Phone: 1-877-855-3222 (within North America) or ++1-778-372-0729 (outside of North America)

Appendix A: Canadian Council on Animal Care: Categories of Invasiveness for Wildlife Studies

- A. Methods used on most invertebrates or on live isolates Possible examples: the use of tissue culture and tissues obtained at necropsy; the use of eggs, protozoa or other single-celled organisms; experiments involving containment, incision or other invasive procedures on metazoa.
- B. Methods used which cause little or no discomfort or stress Possible examples: observational studies in which the same individuals are not repeatedly observed so as to habituate or otherwise modify their behavior; census or other surveys which do not involve capture or marking individuals; non-invasive studies on animals that have been habituated to captivity; short periods of food and/or water deprivation equivalent to periods of abstinence in nature.
- C. Methods which cause minor stress or pain of short duration Possible examples: capture, using methods with little or no potential to cause injury and marking of animals for immediate release; long-term observational studies on free-ranging animals where the behaviour of individuals may be altered by repeated contact; brief restraint for blood or tissue sampling; short periods of restraint beyond that for simple observation or examination, but consistent with minimal distress; short periods of food and/or water deprivation which exceed periods of abstinence in nature; exposure to non-lethal levels of drugs or chemicals; low velocity darting and slow-injection darts with immobilization chemicals. Such procedures should not cause significant changes in the animal's appearance, in physiological parameters such as respiratory or cardiac rate, or fecal or urinary output, in social responses or *in ability to survive*.

Note: During or after Category C studies, animals must not show self-mutilation, anorexia, dehydration, hyperactivity, increased recumbency or dormancy, increased vocalization, aggressive-defensive behavior or demonstrate social withdrawal and self-isolation.

- D. Methods which cause moderate to severe distress or discomfort Possible examples: *capture, using methods that have the potential to cause injury (e.g. Leg snares, leg hold traps, high velocity darting and rapid-injection darts with immobilization chemicals, net gunning, etc.); maintenance of wild caught animals in captivity; translocation of wildlife to new habitats; major surgical procedures conducted under general anesthesia, with subsequent recovery; prolonged (several hours or more) periods of physical restraint; induction of behavioral stresses such as maternal deprivation, aggression, predator-prey interactions; procedures which cause severe, persistent or irreversible disruption of sensorimotor organization. Other examples in captive animals include induction of anatomical and physiological abnormalities that will result in pain or distress; the exposure of an animal to noxious stimuli from which escape is impossible; the production of radiation sickness; exposure to drugs or chemicals at levels that impair physiological systems. (NB. Experiments described in this paragraph would be Category E if performed on wildlife immediately prior to release.)*

Note: Procedures used in Category D studies should not cause prolonged or severe clinical distress as may be exhibited by a wide range of clinical signs, such as marked abnormalities in behavioral patterns or attitudes, the absence of grooming, dehydration, abnormal vocalization, prolonged anorexia, circulatory collapse, extreme lethargy or disinclination to move, and clinical signs of severe or advanced local or systemic infection, etc.

- E. Procedures which cause severe pain near, at, or above the pain tolerance threshold of unanesthetized conscious animals. This Category of Invasiveness is not necessarily confined to surgical procedures, but may include exposure to noxious stimuli or agents whose effects are unknown; exposure to drugs or chemicals at levels that (may) markedly impair physiological systems and which cause death, severe pain, or extreme distress; behavioral studies about which the effects of the degree of distress are not known; *environmental deprivation that has the potential to seriously jeopardize an animal's wellbeing*; use of muscle relaxants or paralytic drugs without anesthetics; burn or trauma infliction on unanesthetized animals; a euthanasia method not approved by the CCAC; any procedures (e.g., the injection of noxious agents or the induction of severe stress or shock) that will result in pain which approaches the pain tolerance threshold and cannot be relieved by analgesia (e.g., removal of teeth without analgesia, or when toxicity testing and experimentally-induced infectious disease studies have death as the endpoint), *capture methods with a high potential of causing severe injury that could result in severe chronic pain and/or death.*

Trans Mountain Expansion Project
Amphibian Salvage Streams South Coast Area C 100217339

Region	Construction Spread	Geographic Area in South Coast Region	Relocation Area Land Status	Watercourse Crossing ID	Watercourse Name	Natural Stream or Channel/Ditch	Natural Stream or Channel/Ditch Type	Watercourse Classification	Zone	Eastings	Northings	KP (SSEDD05)	Adjacent Land Use	Pipeline Crossing Method	Date of Baseline Amphibian Survey	Amphibian Species Observed	Predicted or Identified Critical Habitat	Anticipated Start Date of Construction	Salvage Effort (Estimated Time)	Location and Description of Amphibian Relocation Site	Description on Use of Exclusion Fencing	Map Reference	Photo Reference No
South Coast	5	Area C - Abbotsford to Chilliwack	Private	BC-704	Unnamed	Natural Stream	Stream 1	S6	10	592626	540144	1074.76	Agriculture	Isolation if water present	25-Jul-13	None Observed	None	1-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 1	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-705	Anderson Creek	Natural Stream	Stream 1	S2	10	592317	5449796	1075.23	Agriculture	Isolation with fish salvage and WQM if flowing	25-Jul-13	Coastal tailed frog tadpoles	Coastal giant salamander	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 1	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-706a1	Unnamed	Natural Stream	Stream 1	S4	10	591949	449380	1075.65	Urban with paved roads, residential properties with lawn.	Isolation with fish salvage and WQM if flowing	N/A	No survey completed	Coastal giant salamander	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 1	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-706b	Bridal Creek	Natural Stream	Stream 1	S3	10	591505	544893	1076.51	Forested Anthropogenic within 200 m to the NE	Isolation with fish salvage and WQM	N/A	No survey completed	Coastal giant salamander	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 1	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private - Aboriginal IR POPKUM 2	BC-706c	Unnamed	Natural Stream	Stream 1	S3	10	591507	5448652	1076.76	Western edge of Bridal Veil Falls Provincial Park.	Isolation with fish salvage and WQM	N/A	No survey completed	Coastal giant salamander	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 1	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown	BC-707a	Unnamed	Natural Stream	Stream 1	S6	10	591342	5446348	1077.13	Bridal Veil Falls Provincial Park. Mature intact forest.	Isolation if water present	N/A	No survey completed	Coastal giant salamander	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 1	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown	BC-707b	Unnamed	Natural Stream	Stream 1	S6	10	591240	5446287	1077.25	Just west of Bridal Veil Falls Provincial Park. Mature intact forest.	Isolation if water present	N/A	No survey completed	Coastal giant salamander	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 1	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown	BC-707c	Unnamed	Natural Stream	Stream 1	S6	10	590969	5448259	1077.52	Bridal Veil Falls Golf Course and roadways 100m to the west and Provincial park to the east.	Isolation if water present	N/A	No survey completed	Coastal giant salamander	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 1	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-707d	Unnamed Drainage	Natural Stream	Stream 1	NCD	10	588625	5447836	1080.03	Agriculture	Isolation if water present	N/A	No survey completed	OSF - Semmihaut/Eik Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 2	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-708	Nevin Creek	Natural Stream	Stream 1	S3	10	588122	5447510	1080.63	Adjacent to road, agriculture	Isolation with fish salvage and WQM	N/A	No survey completed	OSF - Semmihaut/Eik Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 2	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-709	Dunville Creek	Natural Stream	Stream 1	S3	10	587698	5447206	1081.16	agriculture and access roads	Trenchless (Bore)	25-Jul-13	Coastal tailed frog metamorphs	OSF - Semmihaut/Eik Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of stream. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact)	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Trenchless - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)

Trans Mountain Expansion Project
Amphibian Salvage Streams South Coast Area C 100217339

Region	Construction Spread	Geographic Area in South Coast Region	Relocation Area Land Status	Watercourse Crossing ID	Watercourse Name	Natural Stream or Channel/Ditch	Natural Stream or Channel/Ditch Type	Watercourse Classification	Zone	Easting	Northing	KP (SSE005)	Adjacent Land Use	Pipeline Crossing Method	Date of Baseline Amphibian Survey	Amphibian Species Observed	Predicted or Identified Critical Habitat	Anticipated Start Date of Construction	Salvage Effort (Estimated Time)	Location and Description of Amphibian Relocation Site	Description on Use of Exclusion Fencing	Map Reference No.	Photo Reference No.
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-713 ⁽¹⁰⁰⁾	Elk Creek	Natural Stream	Stream 1	S3	10.00	584319	5445001	1084.92	Agricultural lands.	Trenchless (Bore)	23-Jul-13 16-Mar-15	None Observed	OSF - Semmihaut/Elk Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of stream. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact)	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Trenchless - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-713a	Big Ditch Creek	Natural Stream	Stream 1	S2	10.00	583695	5445358	1085.60	agriculture and access roads, HWY 20 south.	Trenchless (Bore)	16-Mar-15	None Observed	OSF - Semmihaut/Elk Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of stream. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact)	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Trenchless - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-714 ⁽¹⁰⁰⁾	Semmihaut Creek	Natural Stream	Stream 1	S3	10.00	580008	5442933	1090.23	Agriculture.	Trenchless (Bore)	N/A	No survey completed	OSF - Semmihaut/Elk Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of stream. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact)	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Trenchless - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-715 ⁽¹⁰⁰⁾	Chilliwack Creek	Natural Stream	Stream 1	S2	10.00	578954	5442684	1091.49	agriculture and paved road to the west.	Trenchless (Bore)	N/A	No survey completed	OSF - Semmihaut/Elk Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of stream. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact)	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Trenchless - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown	BC-716	Peach Creek	Natural Stream	Stream 1	S1B	10.00	571592	5439102	1100.18	Floodplain and tributary to Yeader River. Disturbed but has seemingly undergone some restoration efforts. Abundant invasive plant species. Roadway to the north.	Trenchless with WQM	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of stream. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact)	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Trenchless - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown	BC-717	Chilliwack/Yeader River	Natural Stream	Stream 2	S1B	10.00	571514	5438913	1100.38	Disturbed but has seemingly undergone some restoration efforts. Abundant invasive plant species.	Trenchless with WQM	N/A	No survey completed	Coastal giant salamander	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of stream. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact)	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Trenchless - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)

Trans Mountain Expansion Project
Amphibian Salvage Streams South Coast Area C 100217339

Region	Construction Spread	Geographic Area in South Coast Region	Relocation Area Land Status	Watercourse Crossing ID	Watercourse Name	Natural Stream or Channel/Ditch	Natural Stream or Channel/Ditch Type	Watercourse Classification	Zone	Easting	Northing	KP (SSE0005)	Adjacent Land Use	Pipeline Crossing Method	Date of Baseline Amphibian Survey	Amphibian Species Observed	Predicted or Identified Critical Habitat	Anticipated Start Date of Construction	Salvage Effort (Estimated Time)	Location and Description of Amphibian Relocation Site	Description on Use of Exclusion Fencing	Map Reference No.	Photo Reference No.
South Coast	6	Area C - Abbotsford to Chilliwack	Crown	BC-718 ⁽¹⁰⁰⁾	Hopedale Slough	Natural Stream	Stream 1	S2	10.00	571471	5438805	1100.50	Hopedale Slough and floodplain of Vedder River. Disturbed but has seemingly undergone some restoration efforts. Abundant invasive plant species. Agriculture to the south.	Trenchless with WQM	N/A	No survey completed	Coastal giant salamander	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of stream. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact)	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Trenchless - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-719	Browne Creek	Natural Stream	Stream 1	S2	10.00	571369	5438594	1100.74	Agriculture. Road 50m to the south.	Isolation with fish salvage and WQM if flowing	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 3	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-720	Street Creek	Natural Stream	Stream 1	S3	10.00	571163	5438596	1101.27	Agriculture	Isolation with fish salvage and WQM	23-May-13	Northern red-legged frog	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 3	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-720a	Stewart Slough	Natural Stream	Stream 1	S3	10.00	570284	5437035	1102.68	Agriculture and paved road directly south, roadside drainage.	Trenchless (Bore)	N/A	No survey completed	Coastal giant salamander	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of stream. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact)	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Trenchless - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-721a	Stewart Creek Branch B - South	Natural Stream	Stream 1	S3	10.00	569707	5436534	1103.47	Agriculture and paved road directly west, roadside drainage.	Trenchless (Bore)	N/A	No survey completed	Coastal giant salamander	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of stream. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact)	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Trenchless - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-721b	Knox Creek	Natural Stream	Stream 1	S3	10.00	569552	5436524	1103.63	Agriculture	Isolation with fish salvage and WQM if flowing	N/A	No survey completed	Coastal giant salamander	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 4	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-722	Stewart Slough	Natural Stream	Stream 1	S2	10.00	569556	5436488	1104.13	Agriculture. Disturbed.	Isolation with fish salvage and WQM	N/A	No survey completed	Coastal giant salamander	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 4	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-722.1	Stewart Creek - North Branch	Natural Stream	Stream 1	S3	10.00	568725	5436468	1104.46	Agriculture	Isolation with fish salvage if water present	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 4	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-726	Sumas River	Natural Stream	Stream 2	S1B	10	560565	5435169	1112.78	Agriculture, roads and trails to the east and west. Intact sections of riparian 100 m north of crossing.	Trenchless (Pipe Ramming) with WQM	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of stream. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact)	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Trenchless - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)

Trans Mountain Expansion Project
Amphibian Salvage Streams South Coast Area C 100217339

Region	Construction Spread	Geographic Area in South Coast Region	Relocation Area Land Status	Watercourse Crossing ID	Watercourse Name	Natural Stream or Channel/Ditch	Natural Stream or Channel/Ditch Type	Watercourse Classification	Zone	Easting	Northing	KP (SSEDD05)	Adjacent Land Use	Pipeline Crossing Method	Date of Baseline Amphibian Survey	Amphibian Species Observed	Predicted or Identified Critical Habitat	Anticipated Start Date of Construction	Salvage Effort (Estimated Time)	Location and Description of Amphibian Relocation Site	Description on Use of Exclusion Fencing	Map Reference	Photo Reference No
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-725a	Unnamed Drainage	Natural Stream	Stream 1	NCD	10	560328	5435201	1113.02	Forested	Isolation if water present	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 5	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-725c	Unnamed Drainage	Natural Stream	Stream 1	NCD	10	558994	5435282	1113.46	Forested, industrial properties and access roads to the north and east.	Isolation if water present	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 5	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-725e	Unnamed Drainage	Natural Stream	Stream 1	NCD	10	559500	5435335	1113.88	Forested, industrial properties and access roads to the north and east.	Isolation if water present	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 6	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-727	Neufeld Creek	Natural Stream	Stream 1	S6	10	559228	5435456	1114.16	Residential and industrial properties and access roads to the north and west. Parallels existing right of way to the northeast.	Isolation if water present	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 6	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-727a	Unnamed Drainage	Natural Stream	Stream 1	NCD	10	558899	5435678	1114.57	Industrial use paved roads surround the crossing.	Isolation if water present	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 6	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-728	Kilgard Creek	Natural Stream	Stream 1	S6	10	558870	5435997	1114.60	Industrial use paved roads surround the crossing.	Isolation if water present	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 6	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-728a	Unnamed Drainage	Natural Stream	Stream 1	NCD	10	558990	5435973	1115.00	Industrial use paved roads surround the crossing.	Isolation if water present	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 7	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-728a1	Unnamed Drainage	Natural Stream	Stream 1	NCD-W	10	558553	5436023	1115.10	Industrial use paved roads surround the crossing.	Isolation if water present	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 7	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown - Road Allowance	BC-728b1	Unnamed Drainage	Natural Stream	Stream 1	NCD-W	10	558135	5436250	1115.60	Industrial use paved roads surround the crossing.	Isolation if water present	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 7	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-728d	Unnamed Drainage	Natural Stream	Stream 1	NCD	10	558086	5436098	1115.79	Adjacent existing right of way, but otherwise limited disturbance.	Isolation if water present	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 7	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-728e	Unnamed Drainage	Natural Stream	Stream 1	NCD	10	558046	5436106	1115.83	Adjacent existing right of way, but otherwise limited disturbance.	Isolation if water present	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 7	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-728f	Unnamed Drainage	Natural Stream	Stream 1	NCD	10	557856	5436145	1116.03	Adjacent existing right of way, but otherwise limited disturbance.	Isolation if water present	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 8	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-728g	Unnamed Drainage	Natural Stream	Stream 1	NCD	10	557678	5436180	1116.21	Adjacent existing right of way, but otherwise limited disturbance.	Isolation if water present	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 8	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)

Trans Mountain Expansion Project
Amphibian Salvage Streams South Coast Area C 100217339

Region	Construction Spread	Geographic Area in South Coast Region	Relocation Area Land Status	Watercourse Crossing ID	Watercourse Name	Natural Stream or Channel/Ditch	Natural Stream or Channel/Ditch Type	Watercourse Classification	Zone	Easting	Northing	KP (SSEDD05)	Adjacent Land Use	Pipeline Crossing Method	Date of Baseline Amphibian Survey	Amphibian Species Observed	Predicted or Identified Critical Habitat	Anticipated Start Date of Construction	Salvage Effort (Estimated Time)	Location and Description of Amphibian Relocation Site	Description on Use of Exclusion Fencing	Map Reference	Photo Reference No
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-728h	Unnamed	Natural Stream	Stream 1	S3	10	557408	5436225	1116.48	Adjacent existing right of way, but otherwise limited disturbance.	Isolation with fish salvage and WQM if flowing	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 8	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-728i	Unnamed Drainage	Natural Stream	Stream 1	NCD	10	557194	5436244	1116.70	Adjacent existing right of way, but otherwise limited disturbance.	Isolation if water present	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 8	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-728j	Unnamed Drainage	Natural Stream	Stream 1	NCD	10	557062	5436241	1116.83	Adjacent existing right of way, but otherwise limited disturbance.	Isolation if water present	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 8	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-728k	Unnamed Drainage	Natural Stream	Stream 1	NCD	10	556840	5436087	1117.11	Adjacent existing right of way, but otherwise limited disturbance. Residential housing development 600m west	Isolation if water present	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 9	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-729	Unnamed	Natural Stream	Stream 1	S5	10	556757	5435953	1117.27	Adjacent existing right of way, but otherwise limited disturbance. Residential housing development 500m west	Isolation if water present	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 9	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-729a	Unnamed Drainage	Natural Stream	Stream 1	NCD	10	556721	5435911	1117.30	Adjacent existing right of way, but otherwise limited disturbance. Residential housing development 500m west	Isolation if water present	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 9	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-729b	Unnamed	Natural Stream	Stream 1	S6	10	556958	5435846	1116.24	Forested with a golf course to the north, south and east.	Isolation if water present	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 9	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-730	Unnamed	Natural Stream	Stream 1	S3	10	555485	5435979	1116.65	Adjacent existing right of way, but otherwise limited disturbance. Residential housing development 800m south and west.	Isolation with fish salvage and WQM	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 9	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-730b	Nicholas Creek	Natural Stream	Stream 1	S3	10	554533	5436301	1119.68	urban setting with paved roads and residential houses	Install pipeline under existing culvert	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	trenchless (under existing culvert) - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-730c	Nicholas Creek	Natural Stream	Stream 1	S3	10	554345	5436321	1119.87	urban and agricultural setting with paved roads and residential houses to the east and industrial farmlands 10m to the west	Trenchless with WQM	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of stream. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact)	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Trenchless - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-731	Olayburn Creek	Natural Stream	Stream 1	S2	10	553388	5436663	1120.91	Agriculture. Country road 10m to the west	Isolation with fish salvage and WQM	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 10	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-732	Olayburn Creek	Natural Stream	Stream 1	S2	10	552467	5437068	1121.93	Agriculture. Country road 10m to the west	Isolation with fish salvage and WQM	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 10	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)

Trans Mountain Expansion Project
Amphibian Salvage Streams South Coast Area C 100217339

Region	Construction Spread	Geographic Area in South Coast Region	Relocation Area Land Status	Watercourse Crossing ID	Watercourse Name	Natural Stream or Channel/Ditch	Natural Stream or Channel/Ditch Type	Watercourse Classification	Zone	Easting	Northing	KP (SSE005)	Adjacent Land Use	Pipeline Crossing Method	Date of Baseline Amphibian Survey	Amphibian Species Observed	Predicted or Identified Critical Habitat	Anticipated Start Date of Construction	Salvage Effort (Estimated Time)	Location and Description of Amphibian Relocation Site	Description on Use of Exclusion Fencing	Map Reference No.	Photo Reference No.
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-734	McLennan Creek	Natural Stream	Stream 1	S2	10	548387	5438569	1126.31	Agriculture and Rural housing.	Isolation with fish salvage and WQM	17-Mar-15	None Observed	OSF - McLennan Population Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 11	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown - Road Allowance	BC-735	Unnamed Drainage	Natural Stream	Stream 1	NCD	10	546718	5439283	1128.15	Forested agriculture and rural development to the north and south.	Isolation if water present	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 12	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-736	Culigny Creek	Natural Stream	Stream 1	S2	10	546458	5439377	1128.44	Forested riparian with agriculture and rural development to the north and south outside the riparian area.	Isolation with fish salvage and WQM	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 12	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-738	Unnamed Drainage (Wetland)	Natural Stream	Stream 1	NCD-W	10	544044	5440142	1131.00	Agriculture and wetland	Refer to Wetland Survey and Mitigation Plan	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 13	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-739	Unnamed	Natural Stream	Stream 1	S5	10	543241	5440420	1131.85	Agriculture and rural developments.	Isolation if water present	N/A	No survey completed	None	6-Sep-17	Salvages will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 13	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)

RE: Amphibian Salvage Applications Query - TM Response

From: Walker, Julie <Julie_Walker@transmountain.com>
To: Hewison, Melinda FLNR:EX <Melinda.Hewison@gov.bc.ca>
Cc: Fitton, Susan FLNR:EX <Susan.Fitton@gov.bc.ca>, Frisch, Ellen <Ellen_Frisch@transmountain.com>, ROC <ROC@kindermorgan.com>
Sent: August 18, 2017 3:59:36 PM PDT
Attachments: TMEP_AnimalCareForm_ChannelAmph_AreaC Aug-2017.pdf,
TMEP_AnimalCareForm_StreamAmph_AreaC Aug-2017.pdf,
TMEP_SCoast_AnimalCare_PondAmph_AreaC Aug-2017.pdf,
TMEP_SCoast_Wetlands_AreaC_100217347 Aug 2017.pdf,
TMEP_AmphibianSalvage_SouthCoast_AreaC_NaturalStreams_100217339 Aug 2017.pdf,
TMEP_AmphibianSalvage_SouthCoast_AreaC_Channels_100217333 Aug 2017.pdf

Melinda,

This submission includes the South Coast Area C applications updated ACA forms and Spreadsheets.

- South Coast Area C
 - Channels # **100217333**
 - Natural Stream # **100217339**
 - Ponds # **100217347**

If you have any questions please let me know,

Julie

From: Walker, Julie
Sent: Friday, August 18, 2017 3:58 PM
To: 'Hewison, Melinda FLNR:EX'
Cc: 'Fitton, Susan FLNR:EX'; Frisch, Ellen; ROC
Subject: RE: Amphibian Salvage Applications Query - TM Response

Melinda

This submission includes the South Coast Area A applications.
If you have any questions please let me know,

Julie

From: Walker, Julie
Sent: Friday, August 18, 2017 3:48 PM
To: 'Hewison, Melinda FLNR:EX'
Cc: 'Fitton, Susan FLNR:EX'; Frisch, Ellen; ROC
Subject: Amphibian Salvage Applications Query - TM Response

Melinda

Please find attached updated ACA forms and spreadsheets to address the attached Query Aug 4, 2017.

I have had all of our Amphibian Salvage applications addressed for this.
I will provide them to you in a few email submissions.

This submission includes:

- Omineca pond-dwelling #**100205331**

◦ Note: no spreadsheet associated with this permit

- Omineca pond-dwelling # **100217353**
- Thompson-Okanagan pond-dwelling # **100205320**
- Thompson-Okanagan pond-dwelling # **100217810**

If you have any questions please let me know,

Thank you,

Julie

Julie Walker

Permitting Specialist

TransMountain Expansion Project

C | 587-582-4560 **P** | 403-514-6590 **E** | mailto:julie_walker@transmountain.com

www.transmountain.com



**FISH AND WILDLIFE MANAGEMENT BRANCH
ANIMAL CARE APPLICATION FORM**

PLEASE TYPE

(F11 key will tab you through to the next box requiring information)

For office use: Date Received: Project Number:

1. Project Title: Amphibian Salvage – Channels – Trans Mountain Pipeline ULC Trans Mountain Pipeline Expansion Project (TMEP) – South Coast Region (Area C – Abbotsford to Chilliwack)

2. Starting Date: (Note, if multi-year include the process of this) August 15, 2017
Completion Date: December 31, 2020

3. Principal Investigator: Must be a Qualified Person as defined by the [Natural Resource Sector QP Guidance Document](#)

Name: <u>Claudio Bianchini</u>	Mailing Address: <u>15300 Croyden Drive, #300</u>
Position: <u>Senior Biologist</u>	<u>Surrey</u>
Department/Organization: <u>McTavish Resource & Mgmt Cons</u>	<u>BC</u>
Region/Institution: <u>n/a</u>	<u>V3S 0Z5</u>
Phone: <u>(604) 219-9699</u>	
Fax:	
E-mail: <u>claudio@mctavishconsultants.ca</u>	

Experience related to the described species, methods and proposal ensure that experience related to the taxa concerned is emphasized):

C. Bianchini has worked with amphibians and other wildlife for over 23 years, and has extensive experience with species identification, mapping, habitat impact assessments, handling, trapping, temporary holding, and disease protocols. This includes Coastal Tailed Frog, Northern Red-legged Frog, Western Toad, and Pacific Giant Salamander. C. Bianchini has conducted three years of baseline inventory as well as salvages during construction for Coastal Tailed Frog for the Lorenzetta Creek Hydroelectric Project (Laidlaw, BC). C. Bianchini has also conducted three years of baseline inventory for Coastal Tailed Frog and Pacific Giant Salamander for the proposed Frost Creek Hydroelectric Project (Cultus Lake, BC), and he has conducted amphibian salvage including Northern Red-legged Frog and Western Toad for Valley Gravel Sales.

4. Additional Investigators: copy and paste if you require more than two

Name: <u>Cassidy Hedden</u>	Mailing Address: <u>15300 Croyden Drive, #300</u>
Position: <u>Environmental Technologist</u>	<u>Surrey</u>
Department/Organization: <u>McTavish Resource & Mgmt Cons</u>	<u>BC</u>
Region/Institution: <u>n/a</u>	<u>V3S 0Z5</u>
Phone: <u>(604) 864-1635</u>	
Fax:	
E-mail: <u>cassidy@mctavishconsultants.ca</u>	

Experience related to the described species, methods and proposal ensure that experience related to the taxa/activity concerned is emphasized):

C Hedden has experience conducting stream classifications and wildlife assessments primarily for forestry, urban development and municipal infrastructure projects. She has conducted wildlife salvages in the Lower Mainland of BC. Recent projects include survey and salvage for Northern Red-legged Frog salvage for mining and private developments.

Name: <u>Elke Wind</u>	Mailing Address: <u>Suite A – 114 Fifth St</u>
Position: <u>Biologist</u>	<u>Nanaimo</u>
Department/Organization: <u>E. Wind Consulting</u>	<u>BC</u>
Region/Institution: <u>n/a</u>	<u>V9R 1N2</u>
Phone: <u>(250) 716-1119</u>	
Fax: <u>() -</u>	
E-mail: <u>s.22</u>	

Experience related to the described species, methods and proposal (ensure that experience related to the taxa/activity concerned is emphasized):

E. Wind has worked with amphibians for over 17 years, and has extensive experience with species identification, handling, trapping, temporary holding, and disease protocols. This includes Coastal Tailed Frog. She assisted in the development of the *Best Management Practices for Amphibian and Reptile Salvages in British Columbia*. E. Wind conducted some of the baseline surveys for the TMEP Project for amphibians, including Coastal Tailed Frog.

Other personnel working with protocol: (include experience)

Information

5. Project Proposal (be concise and write in lay language. The information in all sections of this application should be complete so that it can be evaluated as a stand-alone document. The proposal must include all applicable information about animals and their handling and care relating to the project. Only maps can be included as additional material.

A. Background – Goals and Objectives:

Trans Mountain Pipeline ULC (Trans Mountain) submitted an application with the National Energy Board (NEB) in December 2013 for the Trans Mountain Expansion Project (TMEP). A Certificate of Public Convenience and Necessity (CPCN OC-064) allowing the Project to proceed was issued by the Government of Canada on December 1, 2016. The Government of BC issued an Environmental Assessment Certificate on January 11, 2017.

The purpose of this Permit Application is to avoid incidental mortality of amphibians occurring in channelized watercourses within the pipeline construction footprint from Abbotsford to Chilliwack. Channelized watercourses (e.g., road ditch, irrigation canal) as defined by MFLNRO for the purposes of this salvage application, include the following habitat types:

- Channel 1: narrow width; can easily stand in the watercourse to salvage; < 2 m wide.
- Channel 2: deep or wide; need a boat or alternative access

All salvage staff will adhere to strict safety procedures during the dewatering and salvage operations, especially in deep water environments where soft substrates occur (e.g., wear chest waders and life jackets, and use long, sturdy rope and structures such as pallets topped with a slip-free surface to stand on).

B. Key Expected Results and Management Implications:

For further information: www.frontcounterbc.ca

Last updated: Sept 14, 2015 Phone: 1-877-855-3222 (within North America) or ++1-778-372-0729 (outside of North America)

Salvaged amphibians will be placed into buckets individually where possible, or in low density, with secure lids and containing channel water. To avoid predation within holding and transport buckets, invertebrates will be kept separate from all amphibians, and anuran tadpoles (i.e., frog and toad larva) will be kept separate from all other organisms captured (e.g., salamander larva and neotenic adults). Salvaged native amphibian species will be transported and released at least 50 m to 100 m upstream of the construction work area into suitable aquatic or riparian habitat within the original channel dependent of the species and surrounding land use. The relocation of individuals within the same watercourse as their capture site is expected to have limited spatial scope of impact or risk to populations or habitat.

6. CCAC Invasiveness Category: (see Appendix A)

A ____ B ____ C ✓ D ____

7. Species and Number of Animals Required: (include justification of animal numbers predicted to be captured/handled). If exact numbers are not known, please provide a reasonable order of magnitude based on your professional assessment of habitat, location, species etc. – for example, under 10, 100s or 1000s. For multi-species and multi-year projects, indicate expected numbers for each species and each year of the project.

Species (both standard common and Latin names preferred):

- Northwestern salamander (*Ambystoma gracile*)
- Northern red-legged frog (*Rana aurora*)
- Rough-skinned newt (*Taricha granulosa*)

Number expected for 2017 to 2020:

The number of amphibians that will be encountered, captured and moved is variable and will range from 0 to 1000+ individuals. Seasonal timing of salvages and habitat quality will dictate the number of amphibians encountered. It is anticipated that most small channels and watercourses will have <20 amphibians salvaged, particularly in poor amphibian habitats during the winter months. Ponds and watercourses with suitable amphibian habitat, salvaged during the amphibian breeding season (spring/summer), may have 100 to 1000+ tadpoles/larva salvaged. Mountain streams with coastal tailed frog will likely have 100 to 700 tadpoles/20 m segment of watercourse dewatered.

Justification for numbers:

The number of amphibians expected to be encountered in the Project work area is based on past salvage experience in a variety of habitats throughout the Lower Mainland and Fraser Valley.

8. Details of Capture, Handling, Sampling and Surgical Procedures and Final Disposition: (Be detailed and SPECIFIC. It is not sufficient to just refer to a particular protocol (e.g., RISC protocol).

Please refer to Appendix B – CCAC guidelines on: the care and use of wildlife (2003) and other documents such as AVMA Guidelines for Euthanasia of Animals (2013) for appropriate and humane techniques and guidelines for handling and care.

For wildlife salvage permits, please consult the [Salvage Permit Information Checklist](#) to ensure that all necessary information is included. Incomplete information will cause delays in the review process.

Standard capture and handling techniques will be used and holding time will be minimal. Best Management Practices for Amphibian and Reptile Salvages in British Columbia (BC MFLNRO 2016) were used to guide the development of these salvage protocols. Detailed information is provided below.

Capture Technique: Please give details of capture techniques used as well as reference to standards or reference researchers who have previously used the technique. If traps are to be used please specify the type of traps, how long the traps are to be set, modifications made for the target species and the interval they will be checked.

Depending on the total area to be salvaged, the specific site conditions, species and life stages expected to occur at the time of the salvage, it is estimated that the salvage will begin 3 days to a 1 week prior to the onset of clearing and channel construction activities. For Channel 1 habitats (narrow), a salvage exclusion zone will be created within the channel Project Footprint, by installing a minimum of two semi-permeable barriers, one each at the upstream and downstream ends of the salvage zone. These barriers assist in capturing amphibians during the salvage, and they reduce the likelihood that amphibians will move back down into the construction footprint. The temporary, semi-permeable barriers will be installed across the width of the stream channel, anchored down onto / buried within the substrate, and extending at least 10 cm above the water line. The salvage will start at the downstream end of the exclusion zone and move upstream, searching for amphibians under moveable cover objects, along bank edges, and visually searching and dip-netting pools. Collapsible floating mesh funnel/minnow traps will be set overnight throughout the channel, one approximately every 5m², to capture more cryptic and nocturnal species and life stages (e.g., Northwestern Salamander). This process will be repeated a minimum of 3 times for 3 days, or until no tadpoles or other life stages are found within the simplified channel within the salvage zone. In addition to this, as the channel water is diverted the QP will be onsite to continually monitor for any amphibians that emerge as water levels are reduced. Lastly, any larger objects within the channel that could not be moved by hand during the salvage operation will be monitored by a QP for amphibians as they are removed. All temporary salvage exclusion barriers will be removed once pipeline construction in the area is completed to allow natural recolonization / dispersal back into the channel by amphibians.

For Channel 2 habitats (deep and wide), the above salvage approach will be followed where possible but other techniques will be added, such as the use of a boat to set traps, etc. and seine netting, depending on the depth of the water. Where possible, salvages will be broken down into smaller spatial and temporal stages to make the process more manageable and minimize stress for amphibians within the salvage zone.

Every effort will be made to avoid salvage and dewatering during the amphibian egg phase. However, if the timing of salvage at a channel crossing site coincides with the egg phase, a repeated visual search for eggs will take place first and all egg masses will be hand collected before any dip-netting or seine netting occurs to avoid dislodging eggs from attachment sites.

If a sump and pump are installed for dewatering / water diversion purposes, any deposited substrate during sump installation will be monitored for organisms emerging from the site and salvaged as appropriate. As well, a filter cage will be secured around the pump intake to ensure amphibians are not sucked into it. At the onset of dewatering, the pump rate will be relatively low to allow amphibians to be salvaged. The QP will remain onsite to monitor the pump and water levels and dipnet individuals throughout the dewatering process. If needed, the pump will be turned off on occasion to allow for rigorous dip-netting and reduce stress to the aquatic organisms within the decreasing pool of water. Sufficient salvage staff will be on hand to dipnet during this process to accommodate for the potential for large numbers of amphibians that may emerge. Large, clean buckets containing fresh water from nearby unaffected areas (i.e., from release sites with cold, clear water) will be available within reaching distance to each person conducting the salvage and fresh water will be replenished in the buckets frequently. Where relocation is not within the same channel system (i.e., upstream), efforts will be made to avoid or minimize water being transferred from the source channel to the release channel to reduce the probability of transmission of disease, parasites and introduced species.

Within the adjacent riparian / upland habitat salvage area, surveys for amphibians will occur over a 3-day period prior to construction, searching visually under all cover objects, under / within vegetation, leafy debris, etc. As with the aquatic habitat, the area will be simplified to reduce cover and make the area less appealing to amphibians to reduce the probability of amphibians moving into the area prior to and during the initial construction phase. During construction, any larger objects within the riparian / upland habitat that could not be moved by hand during the salvage operation will be monitored by a QP for amphibians as they are removed.

Method of Handling:

Amphibians will be captured by hand, or using a small net, and placed into buckets with secure lids and containing channel water. Salvaged amphibians will be placed into buckets individually where possible, or in low density, with secure lids and containing channel water. To avoid predation within holding and transport buckets, invertebrates will be kept separate from all amphibians, and anuran tadpoles (i.e., frog and toad larva) will be kept separate from all other organisms captured (e.g., salamander larva and neotenic adults). Salvaged native amphibian species will be transported and released at least 50 m upstream of the construction work area into suitable aquatic or riparian habitat within the original channel watercourse (BC MFLNRO 2016). Where upstream habitats are dry at the time of the salvage, downstream sites may be considered. Where no up or downstream habitat exists, amphibians will be released into the nearest suitable (similar) channel habitat where landowner permission has been granted. Amphibians will be held in buckets no longer than 30 minutes prior to release, and buckets containing amphibians will be kept cool at all times.

Amphibians will be released into similar habitat to their point of capture (e.g., terrestrial or aquatic), at cover objects (e.g., downed wood, leaf litter, instream rocks). All animal care protocols will be adhered to (e.g., gloves worn, animals kept separate, etc.). All equipment will be cleaned regularly following standard hygiene protocols established by the BC Ministry of Environment to avoid the spread of disease among individuals (BC Ministry of Environment Standard Operating Procedures: Hygiene Protocols for Amphibian Fieldwork, 2008: Interim Hygiene Protocols for Amphibian Field Staff and Researchers).

Other Procedures: (Marking method, Sampling)

Animals will not be marked or tagged. No other procedures to list.

Chemical Restraint, Analgesics or other Pharmaceutical Agents used: (Drug names should be included with doses and volumes planned):

No chemicals, analgesics or other pharmaceutical agents will be used.

Contingency Plan: (What training, preparations and equipment are available in event of animal injury during capture or handling). A contingency plan is mandatory because accidents are not predictable. Describe what preplanning, resources and contacts are available in the event of accidental animal injury during capture and handling.

Injury is unlikely, but in the case that an amphibian is seriously injured during trapping or handling, it will be euthanized following directions outlined in provincial standards.

Method of Euthanasia and Disposal Technique: (All projects must be prepared to humanely euthanize animals with an appropriate technique). Euthanized animals should be submitted to a museum collection, unless damaged beyond usefulness for archival purposes or other logistical constraints. If not retained for archival purposes, animals should be disposed of appropriately to avoid environmental contamination or other unintended consequences. See [Canadian Council on Animal Care guidelines](#) or [AVMA Guidelines for the Euthanasia of Animals \(2013\)](#) for appropriate species specific methods.

In the case of accidental injury where euthanasia is required, euthanasia will follow a physical method causing rapid loss of brain function: decapitation followed by pithing. Prior to euthanasia, a deep level of anaesthesia will be achieved and confirmed using Orajel® (BC MFLNRO 2017).

If encountered, invasive bullfrogs and green frogs will be humanely euthanized. Euthanasia will follow a physical method causing rapid loss of brain function: decapitation followed by pithing. Prior to euthanasia, a deep level of anaesthesia will be achieved and confirmed using Orajel® (BC MFLNRO 2017). Depending on the number captured, any euthanized non-native amphibians will be buried on site or disposed of at a local composting facility.

References:

British Columbia Ministry of Forests, Lands, and Natural Resource Operations. 2016. Best Management Practices for Amphibian and Reptile Salvages in British Columbia. Version 1.0., June 2, 2016. 57 pp.

British Columbia Ministry of Forests, Lands, and Natural Resource Operations. 2017. Bullfrog Euthanasia SOP. 1 pp.

British Columbia Ministry of Environment. 2008. Standard Operating Procedures: Hygiene Protocols for Amphibian Fieldwork: Interim Hygiene Protocols for Amphibian Field Staff and Researchers.

9. Details of Potentially Controversial Procedures and Justification: (Include any expected morbidity and methods used to avoid)

No controversial procedures are being considered.

10. Budget: Funding sources applied for:

Are these peer reviewed? [NO](#)

Status: [APPROVED](#)

11. Region:

Identify the study area(s) in general and specific terms: (e.g. Region #, land status). Please attach maps if appropriate. For salvage permits, include maps indicating source and release sites.

South Coast Region (Area C – Abbotsford to Chilliwack). See attached maps and spreadsheet (note, channels that are crossed with a trenchless method will not be directly impacted by the Project and are not included on the maps).

12. Permit:

Please send the completed BC Animal Care Form Application Form to FrontCounter BC along with a General Permit Application and permit fees (if applicable). For further information on how to apply, please visit the FrontCounter BC website at <http://www.frontcounterbc.gov.bc.ca/guides/fish-wildlife/general-permit/overview/>

Approval of an Animal Care Application does not constitute approval of any application to handle wildlife. Applicants must also have a valid permit, issued under the *Wildlife Act*, before engaging in any such activity.

For further information: www.frontcounterbc.ca

Last updated: Sept 14, 2015 Phone: 1-877-855-3222 (within North America) or ++1-778-372-0729 (outside of North America)



Principal Investigator's

August 2, 2017
Signature Date of Application

Please ensure you save this document to your desktop to upload with your General Wildlife Application.

Direct any comments about this form to FrontCounterBC@gov.bc.ca

Appendix A: Canadian Council on Animal Care: Categories of Invasiveness for Wildlife Studies

- A. Methods used on most invertebrates or on live isolates Possible examples: the use of tissue culture and tissues obtained at necropsy; the use of eggs, protozoa or other single-celled organisms; experiments involving containment, incision or other invasive procedures on metazoa.
- B. Methods used which cause little or no discomfort or stress Possible examples: observational studies in which the same individuals are not repeatedly observed so as to habituate or otherwise modify their behavior; census or other surveys which do not involve capture or marking individuals; non-invasive studies on animals that have been habituated to captivity; short periods of food and/or water deprivation equivalent to periods of abstinence in nature.
- C. Methods which cause minor stress or pain of short duration Possible examples: capture, using methods with little or no potential to cause injury and marking of animals for immediate release; long-term observational studies on free-ranging animals where the behaviour of individuals may be altered by repeated contact; brief restraint for blood or tissue sampling; short periods of restraint beyond that for simple observation or examination, but consistent with minimal distress; short periods of food and/or water deprivation which exceed periods of abstinence in nature; exposure to non-lethal levels of drugs or chemicals; low velocity darting and slow-injection darts with immobilization chemicals. Such procedures should not cause significant changes in the animal's appearance, in physiological parameters such as respiratory or cardiac rate, or fecal or urinary output, in social responses or *in ability to survive*.

Note: During or after Category C studies, animals must not show self-mutilation, anorexia, dehydration, hyperactivity, increased recumbency or dormancy, increased vocalization, aggressive-defensive behavior or demonstrate social withdrawal and self-isolation.

- D. Methods which cause moderate to severe distress or discomfort Possible examples: *capture, using methods that have the potential to cause injury (e.g. Leg snares, leg hold traps, high velocity darting and rapid-injection darts with immobilization chemicals, net gunning, etc.); maintenance of wild caught animals in captivity; translocation of wildlife to new habitats; major surgical procedures conducted under general anesthesia, with subsequent recovery; prolonged (several hours or more) periods of physical restraint; induction of behavioral stresses such as maternal deprivation, aggression, predator-prey interactions; procedures which cause severe, persistent or irreversible disruption of sensorimotor organization. Other examples in captive animals include induction of anatomical and physiological abnormalities that will result in pain or distress; the exposure of an animal to noxious stimuli from which escape is impossible; the production of radiation sickness; exposure to drugs or chemicals at levels that impair physiological systems. (NB. Experiments described in this paragraph would be Category E if performed on wildlife immediately prior to release.)*

Note: Procedures used in Category D studies should not cause prolonged or severe clinical distress as may be exhibited by a wide range of clinical signs, such as marked abnormalities in behavioral patterns or attitudes, the absence of grooming, dehydration, abnormal vocalization, prolonged anorexia, circulatory collapse, extreme lethargy or disinclination to move, and clinical signs of severe or advanced local or systemic infection, etc.

- E. Procedures which cause severe pain near, at, or above the pain tolerance threshold of unanesthetized conscious animals. This Category of Invasiveness is not necessarily confined to surgical procedures, but may include exposure to noxious stimuli or agents whose effects are unknown; exposure to drugs or chemicals at levels that (may) markedly impair physiological systems and which cause death, severe pain, or extreme distress; behavioral studies about which the effects of the degree of distress are not known; *environmental deprivation that has the potential to seriously jeopardize an animal's wellbeing*; use of muscle relaxants or paralytic drugs without anesthetics; burn or trauma infliction on unanesthetized animals; a euthanasia method not approved by the CCAC; any procedures (e.g., the injection of noxious agents or the induction of severe stress or shock) that will result in pain which approaches the pain tolerance threshold and cannot be relieved by analgesia (e.g., removal of teeth without analgesia, or when toxicity testing and experimentally-induced infectious disease studies have death as the endpoint), *capture methods with a high potential of causing severe injury that could result in severe chronic pain and/or death.*



**FISH AND WILDLIFE MANAGEMENT BRANCH
ANIMAL CARE APPLICATION FORM**

PLEASE TYPE

(F11 key will tab you through to the next box requiring information)

For office use: Date Received: Project Number:

1. Project Title: Pond Dwelling Amphibian Salvage for the Trans Mountain Pipeline ULC Trans Mountain Pipeline Expansion Project (TMEP) – South Coast Region (Area C – Abbotsford to Chilliwack)

2. Starting Date: (Note, if multi-year include the process of this) August 15, 2017

Completion Date: December 31, 2020

3. Principal Investigator: Must be a Qualified Person as defined by the [Natural Resource Sector QP Guidance Document](#)

Name: Claudio Bianchini

Position: Senior Biologist

Department/Organization: McTavish Resource & Mgmt Cons

Region/Institution: n/a

Phone: (604) 219-9699

Fax:

E-mail: claudio@mctavishconsultants.ca

Mailing Address: 15300 Croyden Drive, #300

Surrey

BC

V3S 0Z5

Experience related to the described species, methods and proposal ensure that experience related to the taxa concerned is emphasized):

C. Bianchini has worked with amphibians and other wildlife for over 23 years, and has extensive experience with species identification, mapping, habitat impact assessments, handling, trapping, temporary holding, and disease protocols. This includes Coastal Tailed Frog, Northern Red-legged Frog, Western Toad, and Pacific Giant Salamander. C. Bianchini has conducted three years of baseline inventory as well as salvages during construction for Coastal Tailed Frog for the Lorenzetta Creek Hydroelectric Project (Laidlaw, BC). C. Bianchini has also conducted three years of baseline inventory for Coastal Tailed Frog and Pacific Giant Salamander for the proposed Frost Creek Hydroelectric Project (Cultus Lake, BC), and he has conducted amphibian salvage including Northern Red-legged Frog and Western Toad for Valley Gravel Sales.

4. Additional Investigators: copy and paste if you require more than two

Name: Cassidy Hedden

Position: Environmental Technologist

Department/Organization: McTavish Resource & Mgmt Cons

Region/Institution: n/a

Phone: (604) 864-1635

Fax:

E-mail: cassidy@mctavishconsultants.ca

Mailing Address: 15300 Croyden Drive, #300

Surrey

BC

V3S 0Z5

Experience related to the described species, methods and proposal ensure that experience related to the taxa/activity concerned is emphasized):

C Hedden has experience conducting stream classifications and wildlife assessments primarily for forestry, urban development and municipal infrastructure projects. She has conducted wildlife salvages in the Lower Mainland of BC. Recent projects include survey and salvage for Northern Red-legged Frog salvage for mining and private developments.

Name: <u>Elke Wind</u>	Mailing Address: <u>Suite A – 114 Fifth St</u>
Position: <u>Biologist</u>	<u>Nanaimo</u>
Department/Organization: <u>E. Wind Consulting</u>	<u>BC</u>
Region/Institution: <u>n/a</u>	<u>V9R 1N2</u>
Phone: <u>(250) 716-1119</u>	
Fax: <u>() -</u>	
E-mail: <u>s.22</u>	

Experience related to the described species, methods and proposal (ensure that experience related to the taxa/activity concerned is emphasized):

E. Wind has worked with amphibians for over 17 years, and has extensive experience with species identification, handling, trapping, temporary holding, and disease protocols. She assisted in the development of the *Best Management Practices for Amphibian and Reptile Salvages in British Columbia*. E. Wind conducted some of the baseline surveys for the TMEP Project for amphibians.

Other personnel working with protocol: (include experience)

Information

5. Project Proposal (be concise and write in lay language. The information in all sections of this application should be complete so that it can be evaluated as a stand-alone document. The proposal must include all applicable information about animals and their handling and care relating to the project. Only maps can be included as additional material.

A. Background – Goals and Objectives:

Trans Mountain Pipeline ULC (Trans Mountain) submitted an application with the National Energy Board (NEB) in December 2013 for the Trans Mountain Expansion Project (TMEP). A Certificate of Public Convenience and Necessity (CPCN OC-064) allowing the Project to proceed was issued by the Government of Canada on December 1, 2016. The Government of BC issued an Environmental Assessment Certificate on January 11, 2017.

The purpose of this Permit Application is to avoid incidental mortality of amphibians within the pipeline construction footprint from Abbotsford to Chilliwack. Trans Mountain will engage a Qualified Professional(s) with species experience as defined by the Natural Resource Sector QP Guidance Document to complete amphibian salvage activities. The Qualified Professional(s) will complete a search for amphibians prior to the onset of clearing and construction activities. Systematic searches will be conducted of the identified wetlands as well as immediately adjacent terrestrial habitat within the pipeline construction footprint within 150 m of the identified wetlands (where suitable habitat is present), looking under moveable cover objects. All amphibians encountered prior to the onset of clearing, and incidentally encountered on the Project Footprint during construction will be moved out of the work zone and out of harm's way to nearby pre-identified suitable habitat (within ~150 m of the Project area depending on terrain and land access permission).

B. Key Expected Results and Management Implications:

For further information: www.frontcounterbc.ca

Last updated: Sept 14, 2015 Phone: 1-877-855-3222 (within North America) or ++1-778-372-0729 (outside of North America)

Amphibians encountered on the pipeline construction footprint will be captured by hand (or using a net) and immediately transported outside the work zone (within ~150 m of the capture site depending on terrain and land access permission). The release sites will be within the same general habitat (within wetland of capture site but outside the work zone) or within suitable habitat in close proximity to the salvage site (*i.e.*, within daily/seasonal movement distances). The relocation of individuals within close proximity to their capture site is expected to have limited spatial scope of impact or risk to amphibian species, populations or their habitat.

6. CCAC Invasiveness Category: (see Appendix A)

A ____ B ____ C ✓ D ____

7. Species and Number of Animals Required: (include justification of animal numbers predicted to be captured/handled). If exact numbers are not known, please provide a reasonable order of magnitude based on your professional assessment of habitat, location, species etc. – for example, under 10, 100s or 1000s. For multi-species and multi-year projects, indicate expected numbers for each species and each year of the project.

Species (both standard common and Latin names preferred):

- Western toad (*Anaxyrus boreas*)
- Red-legged frog (*Rana aurora*)
- Northern Pacific treefrog (*Pseudacris regilla*)
- Northwestern salamander (*Ambystoma gracile*)
- Red-backed salamander (*Plethodon vehiculum*)
- Rough-skinned newt (*Taricha granulosa*)
- Long-toed salamander (*Ambystoma macrodactylum*)
- Columbia spotted frog (*Rana luteiventris*)

Number expected for 2017 to 2020:

The number of amphibians that will be encountered, captured and moved is variable and will range from 0 to 1000+ individuals. Seasonal timing of salvages and habitat quality will dictate the number of amphibians encountered. It is anticipated that most small ponds and wetlands with poor quality amphibian habitats will have <20 amphibians salvaged, particularly during the winter months. Ponds and watercourses with suitable amphibian habitat, salvaged during the amphibian breeding season (spring/summer), may have 100 to 1000+ tadpoles/larva salvaged.

Justification for numbers:

The number of amphibians expected to be encountered in the Project work area is based on past salvage experience in a variety of habitats throughout the Lower Mainland and Fraser Valley.

8. Details of Capture, Handling, Sampling and Surgical Procedures and Final Disposition: (Be detailed and SPECIFIC. It is not sufficient to just refer to a particular protocol (e.g., RISC protocol).

Please refer to Appendix B – CCAC guidelines on: the care and use of wildlife (2003) and other documents such as AVMA Guidelines for Euthanasia of Animals (2013) for appropriate and humane techniques and guidelines for handling and care.

For wildlife salvage permits, please consult the [Salvage Permit Information Checklist](#) to ensure that all necessary information is included. Incomplete information will cause delays in the review process.

Standard capture and handling techniques will be used and holding time will be minimal. Best Management Practices for Amphibian and Reptile Salvages in British Columbia (BC MFLNRO 2016) were used to guide the development of these salvage protocols. Detailed information provided below.

Capture Technique: Please give details of capture techniques used as well as reference to standards or reference researchers who have previously used the technique. If traps are to be used please specify the type of traps, how long the traps are to be set, modifications made for the target species and the interval they will be checked.

The permit will be for a Qualified Professional(s) that will be onsite and will complete a search for amphibians prior to the onset of clearing activities. The Qualified Professional(s) will conduct systematic searches of the area for amphibians before clearing is set to begin. Depending on wetland size and condition, amphibian salvage will begin up to 7 days before clearing and construction activities with a minimum of 3 days of search effort. Searches will include looking under moveable cover objects. All amphibians encountered prior to the onset of clearing and incidentally during construction activities will be moved out of the work zone and out of harm's way. Capture methods suitable to the season and life stage encountered will be used (BC MFLNRO 2016). Adult and juvenile amphibians will be captured by hand, or using a small net, and placed into a bucket or container for immediate transport out of the work zone and into adjacent suitable habitat (BC MFLNRO 2016). Egg masses and tadpoles will be scooped using a small net, and placed into a bucket with fresh water from the site of capture for immediate transport out of the work zone and into adjacent suitable habitat (BC MFLNRO 2016). In locations where highly-aquatic species are present, unbaited floating aquatic funnel/minnow traps may be used if necessary to ensure that all individuals are captured prior to clearing and construction activities. All equipment will be cleaned regularly following standard hygiene protocols established by the BC Ministry of Environment to avoid the spread of disease among individuals (BC Ministry of Environment 2008).

Fencing will be used to exclude the salvage area, preventing amphibians from entering the work area during and following salvage activities. Placement of fencing will be determined on a site by site basis depending on the location of the wetland relative to the Project footprint, the terrain, and the site conditions. The fencing will be removed upon completion of Project activities.

Method of Handling:

Amphibians will be placed into a bucket for immediate transport out of the work zone. Adult and juvenile amphibians will be placed in individual clean, well ventilated container. Egg masses or tadpoles will be scooped into a bucket with a ventilated lid containing fresh water from the capture site. All animal care protocols will be adhered to (*e.g.*, gloves worn, animals kept separate, etc.). Amphibians will be kept at an appropriate temperature between salvage and release sites. Amphibians will be released at the release location immediately, where feasible (*e.g.*, release within the same wetland). Where release sites are selected away from the wetland of capture, amphibians will be released within 60 minutes of capture. Extra care will be taken to relocate sensitive life stages (*e.g.*, tadpoles) in an expeditious manner.

All equipment will be cleaned between sites following standard hygiene protocols established by the BC Ministry of Environment to avoid the spread of disease among individuals and populations (BC Ministry of Environment Standard Operating Procedures: Hygiene Protocols for Amphibian Fieldwork, 2008: Interim Hygiene Protocols for Amphibian Field Staff and Researchers).

Other Procedures: (Marking method, Sampling)

Animals will not be marked or tagged. No other procedures to list.

Chemical Restraint, Analgesics or other Pharmaceutical Agents used: (Drug names should be included with doses and volumes planned):

No chemicals, analgesics or other pharmaceuticals will be used.

Contingency Plan: (What training, preparations and equipment are available in event of animal injury during capture or handling). A contingency plan is mandatory because accidents are not predictable. Describe what preplanning, resources and contacts are available in the event of accidental animal injury during capture and handling.

Injury is unlikely but in the case that an amphibian is seriously injured during trapping or handling, it will be euthanized following directions outlined in provincial standards.

Method of Euthanasia and Disposal Technique: (All projects must be prepared to humanely euthanize animals with an appropriate technique). Euthanized animals should be submitted to a museum collection, unless damaged beyond usefulness for archival purposes or other logistical constraints. If not retained for archival purposes, animals should be disposed of appropriately to avoid environmental contamination or other unintended consequences. See [Canadian Council on Animal Care guidelines](#) or [AVMA Guidelines for the Euthanasia of Animals \(2013\)](#) for appropriate species specific methods.

In the case of accidental injury where euthanasia is required, euthanasia will follow a physical method causing rapid loss of brain function: decapitation followed by pithing. Prior to euthanasia, a deep level of anaesthesia will be achieved and confirmed using Orjel® (BC MFLNRO 2017).

If encountered, invasive bullfrogs and green frogs will be humanely euthanized. Euthanasia will follow a physical method causing rapid loss of brain function: decapitation followed by pithing. Prior to euthanasia, a deep level of anaesthesia will be achieved and confirmed using Orjel® (BC MFLNRO 2017). Depending on the number captured, any euthanized non-native amphibians will be buried on site or disposed of at a local composting facility.

References:

British Columbia Ministry of Forests, Lands, and Natural Resource Operations. 2016. Best Management Practices for Amphibian and Reptile Salvages in British Columbia. Version 1.0., June 2, 2016. 57 pp.

British Columbia Ministry of Forests, Lands, and Natural Resource Operations. 2017. Bullfrog Euthanasia SOP. 1pp.

British Columbia Ministry of Environment. 2008. Standard Operating Procedures: Hygiene Protocols for Amphibian Fieldwork: Interim Hygiene Protocols for Amphibian Field Staff and Researchers.

9. Details of Potentially Controversial Procedures and Justification: (Include any expected morbidity and methods used to avoid)

No controversial procedures are being considered.

10. Budget:

Funding sources applied for:

Are these peer reviewed? **NO**

Status: **APPROVED**

For further information: www.frontcounterbc.ca

Last updated: Sept 14, 2015 Phone: 1-877-855-3222 (within North America) or ++1-778-372-0729 (outside of North America)

11. Region:

Identify the study area(s) in general and specific terms: (e.g. Region #, land status). Please attach maps if appropriate. For salvage permits, include maps indicating source and release sites.

South Coast Region (Area C – Abbotsford to Chilliwack). See attached spreadsheet and maps.

12. Permit:

Please send the completed BC Animal Care Form Application Form to FrontCounter BC along with a General Permit Application and permit fees (if applicable). For further information on how to apply, please visit the FrontCounter BC website at <http://www.frontcounterbc.gov.bc.ca/guides/fish-wildlife/general-permit/overview/>

Approval of an Animal Care Application does not constitute approval of any application to handle wildlife. Applicants must also have a valid permit, issued under the *Wildlife Act*, before engaging in any such activity.



Principal Investigator's**August 2, 2017**

Signature Date of Application

Please ensure you save this document to your desktop to upload with your General Wildlife Application.

Direct any comments about this form to FrontCounterBC@gov.bc.ca

Appendix A: Canadian Council on Animal Care: Categories of Invasiveness for Wildlife Studies

- A. Methods used on most invertebrates or on live isolates Possible examples: the use of tissue culture and tissues obtained at necropsy; the use of eggs, protozoa or other single-celled organisms; experiments involving containment, incision or other invasive procedures on metazoa.
- B. Methods used which cause little or no discomfort or stress Possible examples: observational studies in which the same individuals are not repeatedly observed so as to habituate or otherwise modify their behavior; census or other surveys which do not involve capture or marking individuals; non-invasive studies on animals that have been habituated to captivity; short periods of food and/or water deprivation equivalent to periods of abstinence in nature.
- C. Methods which cause minor stress or pain of short duration Possible examples: capture, using methods with little or no potential to cause injury and marking of animals for immediate release; long-term observational studies on free-ranging animals where the behaviour of individuals may be altered by repeated contact; brief restraint for blood or tissue sampling; short periods of restraint beyond that for simple observation or examination, but consistent with minimal distress; short periods of food and/or water deprivation which exceed periods of abstinence in nature; exposure to non-lethal levels of drugs or chemicals; low velocity darting and slow-injection darts with immobilization chemicals. Such procedures should not cause significant changes in the animal's appearance, in physiological parameters such as respiratory or cardiac rate, or fecal or urinary output, in social responses or *in ability to survive*.

Note: During or after Category C studies, animals must not show self-mutilation, anorexia, dehydration, hyperactivity, increased recumbency or dormancy, increased vocalization, aggressive-defensive behavior or demonstrate social withdrawal and self-isolation.

- D. Methods which cause moderate to severe distress or discomfort Possible examples: *capture, using methods that have the potential to cause injury (e.g. Leg snares, leg hold traps, high velocity darting and rapid-injection darts with immobilization chemicals, net gunning, etc.); maintenance of wild caught animals in captivity; translocation of wildlife to new habitats; major surgical procedures conducted under general anesthesia, with subsequent recovery; prolonged (several hours or more) periods of physical restraint; induction of behavioral stresses such as maternal deprivation, aggression, predator-prey interactions; procedures which cause severe, persistent or irreversible disruption of sensorimotor organization. Other examples in captive animals include induction of anatomical and physiological abnormalities that will result in pain or distress; the exposure of an animal to noxious stimuli from which escape is impossible; the production of radiation sickness; exposure to drugs or chemicals at levels that impair physiological systems. (NB. Experiments described in this paragraph would be Category E if performed on wildlife immediately prior to release.)*

Note: Procedures used in Category D studies should not cause prolonged or severe clinical distress as may be exhibited by a wide range of clinical signs, such as marked abnormalities in behavioral patterns or attitudes, the absence of grooming, dehydration, abnormal vocalization, prolonged anorexia, circulatory collapse, extreme lethargy or disinclination to move, and clinical signs of severe or advanced local or systemic infection, etc.

- E. Procedures which cause severe pain near, at, or above the pain tolerance threshold of unanesthetized conscious animals. This Category of Invasiveness is not necessarily confined to surgical procedures, but may include exposure to noxious stimuli or agents whose effects are unknown; exposure to drugs or chemicals at levels that (may) markedly impair physiological systems and which cause death, severe pain, or extreme distress; behavioral studies about which the effects of the degree of distress are not known; *environmental deprivation that has the potential to seriously jeopardize an animal's wellbeing*; use of muscle relaxants or paralytic drugs without anesthetics; burn or trauma infliction on unanesthetized animals; a euthanasia method not approved by the CCAC; any procedures (e.g., the injection of noxious agents or the induction of severe stress or shock) that will result in pain which approaches the pain tolerance threshold and cannot be relieved by analgesia (e.g., removal of teeth without analgesia, or when toxicity testing and experimentally-induced infectious disease studies have death as the endpoint), *capture methods with a high potential of causing severe injury that could result in severe chronic pain and/or death.*

Trans Mountain Expansion Project
Amphibian Salvage Wetlands South Coast Area C 100217347

Region	Construction Spread	Geographic Area in South Coast Region	Landowner Approval if Relocation Site on Private Land (Y/N)	Wetland ID	Wetland Class or Description	Zone	Easting	Northing	Project KP	Location of Wetland Relative to Pipeline Construction Footprint	Construction Right-of-Way Components Crossed	Date of Baseline Survey	Amphibian Species Observed	Predicted or Identified Critical Habitat for Amphibians	Anticipated Start Date of Construction	Salvage Effort (Estimated Time)	Location and Description of Amphibian Relocation Site	Description on Use of Exclusion Fencing	Map Reference No.	Photo Reference No.
South Coast	6	Abbotsford to Chilliwack	Crown	Hope-Abbo_WC1046point5	Flat Swamp (shrubby swamp) (Wt53)	10	592040E	5449465N	1075.7	On Footprint	Extra Temporary Workspace; Permanent Easement; Temporary Workspace	N/A	No survey completed	Coastal giant salamander proposed critical habitat	6-Sep-17	Amphibian salvage will begin up to 7 days before clearing and construction activities start.	Amphibians encountered within the work area will be moved to the west or east outside of the area of impact and within the swamp or adjacent suitable terrestrial habitat.	Fencing will be located to the west and east of the Project Footprint, isolating the remainder of the swamp from construction activities and to prevent amphibians from moving back into the work area.	Map 1	
South Coast	6	Abbotsford to Chilliwack	Private	Hope-Abbo_WN1065point39	Artificial Pond	10	576010E	5440984N	1094.7	On Footprint	Temporary Workspace; Permanent Easement	N/A	No survey completed	None	6-Sep-17	Amphibian salvage will begin up to 7 days before clearing and construction activities start.	Amphibians encountered within the work area will be moved to the south outside of the area of impact and within the pond or suitable adjacent terrestrial habitat.	Fencing will be located to the south of the Project Footprint, isolating the remainder of the pond from construction activities and to prevent amphibians from moving back into the work area.	Map 2	
South Coast	6	Abbotsford to Chilliwack	Crown	Hope-Abbo_WC1070point4	Open Water Component9	10	571580E	5439069N	1100.2	On Footprint	Permanent Easement	N/A	No survey completed	Coastal giant salamander proposed critical habitat	6-Sep-17	Amphibian salvage will begin up to 7 days before clearing and construction activities start.	The wetland complex is along a trenchless segment and will not be directly impacted by construction activities. Amphibians encountered within the HDD exit work area will be moved to adjacent suitable habitat to the south of the work area. In the event the trenchless crossing method fails and the proposed contingency method (i.e., isolation with fish salvage and water quality monitoring) is required, amphibians encountered within the work area will be moved to the east outside of the area of impact and within the wetland complex or adjacent suitable terrestrial habitat.	Fencing will be located to the south of the HDD exit work area to prevent amphibians dispersing back into the work area. In the event an isolation crossing method is required, exclusion fencing to the west and east of the Project Footprint, isolating the remainder of the wetland complex from construction activities and to prevent amphibians from moving back into the work area.	Map 3	
South Coast	6	Abbotsford to Chilliwack	Crown	Hope-Abbo_WC1070point4	Riparian Marsh (emergent marsh) 10	10	571552E	5439992N	1100.3	On Footprint	Permanent Easement	N/A	No survey completed	Coastal giant salamander proposed critical habitat	6-Sep-17	Amphibian salvage will begin up to 7 days before clearing and construction activities start.	The wetland complex is along a trenchless segment and will not be directly impacted by construction activities. Amphibians encountered within the HDD exit work area will be moved to adjacent suitable habitat to the south of the work area. In the event the trenchless crossing method fails and the proposed contingency method (i.e., isolation with fish salvage and water quality monitoring) is required, amphibians encountered within the work area will be moved to the east outside of the area of impact and within the wetland complex or adjacent suitable terrestrial habitat.	Fencing will be located to the south of the HDD exit work area to prevent amphibians dispersing back into the work area. In the event an isolation crossing method is required, exclusion fencing to the west and east of the Project Footprint, isolating the remainder of the wetland complex from construction activities and to prevent amphibians from moving back into the work area.	Map 3	
South Coast	6	Abbotsford to Chilliwack	Crown	N/A	Emergent marsh	10	571505E	5439819N	1100.5	On Footprint	Permanent Easement (trenchless)	22/05/2013	Bullfrog or green frog (adults); green frog (adults and tadpoles); northern red-legged frog (adults and tadpoles); northwestern salamander (eggs)	None	6-Sep-17	Amphibian salvage will begin up to 7 days before clearing and construction activities start.	The emergent marsh is along a trenchless segment and will not be directly impacted by construction activities. Amphibians encountered within the HDD exit work area will be moved to adjacent suitable habitat to the north of the work area. In the event the trenchless crossing method fails and the proposed contingency method (i.e., isolation with fish salvage and water quality monitoring) is required, amphibians encountered within the work area will be relocated upstream of Hopedale Slough (BC-718) or adjacent suitable terrestrial habitat outside of the area of impact.	Fencing will be located to the west, north and east of the HDD exit work area to prevent amphibians dispersing back into the work area. In the event an isolation crossing method is required, exclusion fencing upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but will prevent amphibians from moving back into the work area.	Map 4	
South Coast	6	Abbotsford to Chilliwack	Mixed	Hope-Abbo_WC1071point3	Basin Marsh (wet meadow) (Wm01)	10	571416E	5439620N	1100.7	On Footprint	Temporary Workspace; Permanent Easement	22/05/2013	Green frog (adults); northern red-legged frog (tadpole); northwestern salamander (eggs)	None	6-Sep-17	Amphibian salvage will begin up to 7 days before clearing and construction activities start.	Amphibians encountered within the work area will be moved to the east outside of the area of impact and within the marsh or suitable adjacent terrestrial habitat.	Fencing will be located to the west and east of the Project Footprint, isolating the remainder of the wetland from construction activities and to prevent amphibians from moving back into the work area.	Map 5	
South Coast	6	Abbotsford to Chilliwack	Private	N/A	Artificial open water pond	10	569733E	5436576N	1103.4	26 m north of Footprint	None	24/05/2013	Northern red-legged frog (tadpoles); northwestern salamander (eggs)	Coastal giant salamander proposed critical habitat	6-Sep-17	Amphibian salvage will begin up to 7 days before clearing and construction activities start.	The open water pond will not be directly impacted by construction activities. Amphibians encountered within the work area will be moved to the north outside of the area of impact within suitable terrestrial habitat in the vicinity of the pond.	Fencing will be located to the north of the Project Footprint to prevent amphibians from moving back into the work area.	Map 6	
South Coast	6	Abbotsford to Chilliwack	Private	N/A	Artificial open water pond	10	568229E	5436388N	1104.9	10 m south of Footprint	None	23/05/2013	Northwestern salamander (eggs)	none	6-Sep-17	Amphibian salvage will begin up to 7 days before clearing and construction activities start.	The open water pond will not be directly impacted by construction activities. Amphibians encountered within the work area will be moved to the south outside of the area of impact within suitable terrestrial habitat in the vicinity of the pond.	Fencing will be located to the south of the Project Footprint to prevent amphibians from moving back into the work area.	Map 7	
South Coast	6	Abbotsford to Chilliwack	Private	N/A	Ditch and ponded water	10	557863E	5436154N	1116.0	On Footprint	Temporary Workspace; Permanent Easement	17/06/2014	unidentified salamander (tadpoles)	None	6-Sep-17	Amphibian salvage will begin up to 7 days before clearing and construction activities start.	Amphibians encountered within the work area will be moved to the north outside the area of impact and within the ditch and ponded water or adjacent terrestrial habitat.	Fencing will be located to the north of the Project Footprint, isolating the remainder of the ditch and ponded water from construction activities and to prevent amphibians from moving back into the work area.	Map 8	
South Coast	6	Abbotsford to Chilliwack	Private	Hope-Abbo_W1086point1	Slope Swamp (shrubby swamp) (Wt53)	10	557599E	5436175N	1116.3	On Footprint	Temporary Workspace; Permanent Easement	N/A	No survey completed	None	6-Sep-17	Amphibian salvage will begin up to 7 days before clearing and construction activities start.	Amphibians encountered within the work area will be moved to the south outside of the area of impact and within the swamp or adjacent suitable terrestrial habitat.	Fencing will be located to the south of the Project Footprint, isolating the remainder of the swamp from construction activities and to prevent amphibians from moving back into the work area.	Map 9	

Trans Mountain Expansion Project
Amphibian Salvage Wetlands South Coast Area C 100217347

Region	Construction Spread	Geographic Area in South Coast Region	Landowner Approval if Relocation Site on Private Land (Y/N)	Wetland ID	Wetland Class or Description	Zone	Easting	Northing	Project KP	Location of Wetland Relative to Pipeline Construction Footprint	Construction Right-of-Way Components Crossed	Date of Baseline Survey	Amphibian Species Observed	Predicted or Identified Critical Habitat for Amphibians	Anticipated Start Date of Construction	Salvage Effort (Estimated Time)	Location and Description of Amphibian Relocation Site	Description on Use of Exclusion Fencing	Map Reference No.	Photo Reference No.
South Coast	6	Abbotsford to Chilliwack	Private	Abbo-Burn_NW1088	Basin Open Water (open water pond)	10	5435899N	5435899N	1118.2	40 m north of Footprint	None	25/05/2013	Green frog (adult); northern pacific treefrog (tadpoles); northwestern salamander (eggs); unidentified ambystoma species	None	6-Sep-17	Amphibian salvage will begin up to 7 days before clearing and construction activities start.	The open water pond will not be directly impacted by construction activities. Amphibians encountered within the work area will be moved to the north outside of the area of impact within suitable terrestrial habitat in the vicinity of the pond.	Fencing will be located to the north of the Project Footprint to prevent amphibians from moving back into the work area.	Map 10	
South Coast	6	Abbotsford to Chilliwack	Private	Abbo-Burn_NW1088point5	Artificial Pond	10	555380E	5435931N	1118.7	On Footprint	Drag Section	25/05/2013	bullfrog (adults); northern pacific treefrog (eggs, tadpoles, calling adults); northern red-legged frog (eggs); northwestern salamander (eggs); rough-skinned newt (limb development); unidentified ambystoma species (limb development)	None	6-Sep-17	Amphibian salvage will begin up to 7 days before clearing and construction activities start.	Multiple artificial ponds occur and some will not be directly impacted by construction activities. Amphibians encountered within the work area will be moved to the south outside of the area of impact and within the ponds located off the Footprint or within suitable adjacent terrestrial habitat.	Fencing will be located to the south of the Project Footprint to prevent amphibians from moving back into the work area.	Map 11	
South Coast	6	Abbotsford to Chilliwack	Private	Abbo-Burn_W1089point4	Basin Open Water (open water pond)	10	554547E	5436261N	1119.7	20 m south of Footprint	None	25/05/2013	Northern pacific treefrog (eggs and tadpoles); northern red-legged frog (tadpoles); northwestern salamander (eggs); unidentified ambystoma species (limb development)	None	6-Sep-17	Amphibian salvage will begin up to 7 days before clearing and construction activities start.	The open water pond will not be directly impacted by construction activities. Amphibians encountered within the work area will be moved to the south outside of the area of impact within suitable terrestrial habitat in the vicinity of the pond.	Fencing will be located to the south of the Project Footprint to prevent amphibians from moving back into the work area.	Map 12	
South Coast	6	Abbotsford to Chilliwack	Private	Abbo-Burn_W1099point4	Basin Marsh (seasonal emergent marsh) (reed canary)	10	549021E	5438328N	1125.6	On Footprint	Temporary Workspace; Permanent Easement	N/A	No survey completed	None	6-Sep-17	Amphibian salvage will begin up to 7 days before clearing and construction activities start.	Amphibians encountered within the work area will be moved to the north outside of the area of impact and within the marsh or suitable adjacent terrestrial habitat.	Fencing will be located to the north and south of the Project Footprint, isolating the remainder of the marsh from construction activities and to prevent amphibians from moving back into the work area.	Map 13	
South Coast	6	Abbotsford to Chilliwack	Private	N/A	Trailside Ditch	10	546150E	5439480N	1128.8	On Footprint	Temporary Workspace; Permanent Easement	17/06/2014	Columbia spotted frog	None	6-Sep-17	Amphibian salvage will begin up to 7 days before clearing and construction activities start.	Amphibians encountered within the work area will be moved to the north outside of the area of impact and within the trailside ditch or adjacent suitable terrestrial habitat.	Fencing will be located to the north of the Project Footprint, isolating the remainder of the trailside ditch from construction activities and to prevent amphibians from moving back into the work area.	Map 14	
South Coast	6	Abbotsford to Chilliwack	Private	Abbo-Burn_W1100point93	Basin Marsh (emergent marsh) (Wm06)	10	544048E	5440127N	1131.0	On Footprint	Temporary Workspace; Permanent Easement	27/05/2013	Bullfrog (adults); green frog (adults); northern pacific treefrog (tadpoles and calling adults); northern red-legged frog (tadpoles); unidentified ambystoma species (limb development)	None	6-Sep-17	Amphibian salvage will begin up to 7 days before clearing and construction activities start.	Amphibians encountered within the work area will be moved to the north outside of the area of impact and within the marsh or suitable adjacent terrestrial habitat.	Fencing will be located to the north of the Project Footprint isolating the remainder of the emergent marsh from the construction activities and to prevent amphibians from moving back into the work area.	Map 15	
South Coast	6	Abbotsford to Chilliwack	Private	Abbo-Burn_W1100point91	Basin Marsh (emergent marsh)	10	543982E	5440142N	1131.1	On Footprint	Temporary Workspace	N/A	No survey completed	None	6-Sep-17	Amphibian salvage will begin up to 7 days before clearing and construction activities start.	Amphibians encountered within the work area will be moved to the south outside of the area of impact and within the marsh or suitable adjacent terrestrial habitat.	Fencing will be located to the south of the Project Footprint, isolating the remainder of the marsh from construction activities and to prevent amphibians from moving back into the work area.	Map 15	
South Coast	6	Abbotsford to Chilliwack	Private	Abbo-Burn_W1101point89	Basin Open Water (open water pond)	10	543014E	5440647N	1132.1	115 m north of Footprint	None	26/05/2013	Bullfrog (adults and tadpoles); green frog (adults and tadpoles); northern pacific treefrog (tadpoles and eggs); northern red-legged frog (tadpoles); northwestern salamander (eggs); roughskin newt (limb development); unidentified ambystoma species (limb development)	None	6-Sep-17	Amphibian salvage will begin up to 7 days before clearing and construction activities start.	The open water pond will not be directly impacted by construction activities. Amphibians encountered within the work area will be moved to the north outside of the area of impact within suitable terrestrial habitat in the vicinity of the pond.	Fencing will be located to the north of the Project Footprint to prevent amphibians from moving back into the work area.	Map 16	
South Coast	6	Abbotsford to Chilliwack	Private	Abbo-Burn_W1102point2	Basin Open Water (open water pond)	10	542752E	5440524N	1132.3	30 m south of Footprint	None	26/05/2013	Bullfrog or green frog (adults and tadpoles); northern pacific treefrog (tadpoles); northern red-legged frog (tadpoles); northwestern salamander (eggs); roughskin newt (limb development)	None	6-Sep-17	Amphibian salvage will begin up to 7 days before clearing and construction activities start.	The open water pond will not be directly impacted by construction activities. Amphibians encountered within the work area will be moved to the south outside of the area of impact within suitable terrestrial habitat in the vicinity of the pond.	Fencing will be located to the south of the Project Footprint to prevent amphibians from moving back into the work area.	Map 16	
South Coast	6	Abbotsford to Chilliwack	Private	Abbo-Burn_W1102point3	Basin Open Water (open water pond)	10	542654E	5440530N	1132.4	50 m south of Footprint	None	26/05/2013	Bullfrog (adults and tadpoles); green frog (adults and tadpoles); roughskin newt (limb development)	None	6-Sep-17	Amphibian salvage will begin up to 7 days before clearing and construction activities start.	The open water pond will not be directly impacted by construction activities. Amphibians encountered within the work area will be moved to the south outside of the area of impact within suitable terrestrial habitat in the vicinity of the pond.	Fencing will be located to the south of the Project Footprint to prevent amphibians from moving back into the work area.	Map 16	

Trans Mountain Expansion Project
Amphibian Salvage Channels South Coast Area C 100217333

Region	Construction Spread	Geographic Area in South Coast Region	Relocation Area Land Status	Watercourse Crossing ID	Watercourse Name	Natural Stream or Channel/Ditch	Natural Stream or Channel/Ditch Type	Watercourse Classification	Zone	Easting	Northing	KP (SSEID005)	Adjacent Land Use	Pipeline Crossing Method	Date of Baseline Amphibian Survey	Amphibian Species Observed	Predicted or Identified Critical Habitat	Anticipated Start Date of Construction	Salvage Effort (Estimated Time)	Location and Description of Amphibian Relocation Site	Description on Use of Exclusion Fencing	Map Reference No.	Photo Reference No.
South Coast	6	Area C - Abbotsford to Chilliwack	Crown	BC-706a2	Unnamed Drainage (Roadside Ditch)	Channel/Ditch	Channel 1	NCD	10	591920	5449330	1075.85	Forested, agriculture to the E	Isolation if water present	N/A	No survey completed	Coastal giant salamander	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 1	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-708a	Unnamed Channel (Irrigation Ditch)	Channel/Ditch	Channel 1	S3	10	587781	5447264	1081.05	Agriculture	Isolation with fish salvage if water present	N/A	No survey completed	OSF - Semmihault/Eik Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 2	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-710	Unnamed Channel	Channel/Ditch	Channel 1	S3	10	587287	5446972	1081.63	agriculture and access roads	Isolation with fish salvage if flowing	23-Jul-13	None Observed	OSF - Semmihault/Eik Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 2	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-710a	Unnamed Channel (Rogers Ditch)	Channel/Ditch	Channel 1	S3	10	586963	5446779	1082.01	agriculture and access roads	Isolation with fish salvage and NCD if flowing	23-Jul-13	Northwestern salamander	OSF - Semmihault/Eik Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 2	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-710b	Unnamed Channel (Roadside Ditch)	Channel/Ditch	Channel 1	S3	10	586886	5446733	1082.10	agriculture and access roads	Trenchless (Bore)	N/A	No survey completed	OSF - Semmihault/Eik Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-710b1	Unnamed Drainage (Irrigation Ditch)	Channel/Ditch	Channel 1	NCD	10	586492	5446588	1082.52	Agriculture	Isolation if water present	N/A	No survey completed	OSF - Semmihault/Eik Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 2	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-710c	Unnamed Drainage (Irrigation Ditch)	Channel/Ditch	Channel 1	NCD	10	586445	5446571	1082.57	Agriculture	Isolation if water present	N/A	No survey completed	OSF - Semmihault/Eik Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 2	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-711	Unnamed Channel	Channel/Ditch	Channel 1	S6	10.00	585515	5446236	1083.56	agriculture and access roads	Isolation if water present	N/A	No survey completed	OSF - Semmihault/Eik Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 3	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-711a	Unnamed Channel (Roadside Ditch)	Channel/Ditch	Channel 1	S6	10.00	585294	5446062	1083.84	agriculture and paved roads	Trenchless (Bore)	N/A	No survey completed	OSF - Semmihault/Eik Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-712	Unnamed Channel (Brown Ditch)	Channel/Ditch	Channel 1	S3	10.00	585289	5446057	1083.85	agriculture and paved roads	Trenchless (Bore)	16-Mar-15	None Observed	OSF - Semmihault/Eik Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-712a	Unnamed Channel (Irrigation Ditch)	Channel/Ditch	Channel 1	S3	10.00	585124	5445966	1084.04	agricultural lands	Isolation with fish salvage if water present	16-Mar-15	None Observed	OSF - Semmihault/Eik Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 3	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)

Trans Mountain Expansion Project
Amphibian Salvage Channels South Coast Area C 100217333

Region	Construction Spread	Geographic Area in South Coast Region	Relocation Area Land Status	Watercourse Crossing ID	Watercourse Name	Natural Stream or Channel/Ditch	Natural Stream or Channel/Ditch Type	Watercourse Classification	Zone	Easting	Northing	KP (SSEID005)	Adjacent Land Use	Pipeline Crossing Method	Date of Baseline Amphibian Survey	Amphibian Species Observed	Predicted or Identified Critical Habitat	Anticipated Start Date of Construction	Salvage Effort (Estimated Time)	Location and Description of Amphibian Relocation Site	Description on Use of Exclusion Fencing	Map Reference No.	Photo Reference No.
South Coast	6	Area C - Abbotsford to Chilliwack	Private	N/A	Unnamed	Channel/Ditch	Channel 1	N/A	10	584777	5445906	1084.41	agriculture and access roads	N/A	16-Mar-15	None Observed	OSF - Semmihault/Ek Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 3	none
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-712b	Unnamed Channel (Irrigation Ditch)	Channel/Ditch	Channel 1	S3	10.00	584491	5445679	1084.73	agriculture and access roads	Isolation with fish salvage if water present	16-Mar-15	Northwestern salamander, Northern red-legged frog	OSF - Semmihault/Ek Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 3	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-713b	Unnamed Channel (Roadside Canal)	Channel/Ditch	Channel 1	S3	10.00	583548	5445256	1085.79	agriculture and access roads, HWY 50 m north	Isolation with fish salvage and WQM if flowing	N/A	No survey completed	OSF - Semmihault/Ek Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 3	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-713d	Unnamed Channel (Roadside Ditch)	Channel/Ditch	Channel 1	S3	10.00	582089	5444476	1087.44	agriculture paved roads west and south	Trenchless (Bore)	N/A	No survey completed	OSF - Semmihault/Ek Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-713e	Unnamed Channel (Roadside Ditch)	Channel/Ditch	Channel 1	S3	10.00	582055	5444431	1087.54	agriculture and paved roads east and north	Trenchless (Bore)	N/A	No survey completed	OSF - Semmihault/Ek Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-713j	Unnamed Channel (Irrigation Ditch)	Channel/Ditch	Channel 1	S3	10.00	580676	5443587	1089.15	Agriculture	Isolation with fish salvage if water present	N/A	No survey completed	OSF - Semmihault/Ek Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 4	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-714a ^(PRA)	Unnamed Channel (Irrigation Ditch)	Channel/Ditch	Channel 1	S3	10.00	579991	5442920	1090.25	Agriculture.	Trenchless (Bore)	N/A	No survey completed	OSF - Semmihault/Ek Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-714b	Unnamed Channel (Roadside Ditch)	Channel/Ditch	Channel 1	S3	10.00	579832	5442807	1090.45	agriculture and paved road north	Trenchless (Bore)	N/A	No survey completed	OSF - Semmihault/Ek Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-715a ^(PRA)	Unnamed Channel (Roadside Canal)	Channel/Ditch	Channel 1	S3	10.00	578898	5442240	1091.55	agriculture and paved road east.	Trenchless (Bore)	N/A	No survey completed	OSF - Semmihault/Ek Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-715b	Unnamed Channel (Irrigation Ditch)	Channel/Ditch	Channel 1	S3	10.00	578204	5442025	1092.28	Agriculture	Isolation with fish salvage if water present	N/A	No survey completed	OSF - Semmihault/Ek Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 5	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)

Trans Mountain Expansion Project
Amphibian Salvage Channels South Coast Area C 100217333

Region	Construction Spread	Geographic Area in South Coast Region	Relocation Area Land Status	Watercourse Crossing ID	Watercourse Name	Natural Stream or Channel/Ditch	Natural Stream or Channel/Ditch Type	Watercourse Classification	Zone	Easting	Northing	KP (SSEID005)	Adjacent Land Use	Pipeline Crossing Method	Date of Baseline Amphibian Survey	Amphibian Species Observed	Predicted or Identified Critical Habitat	Anticipated Start Date of Construction	Salvage Effort (Estimated Time)	Location and Description of Amphibian Relocation Site	Description on Use of Exclusion Fencing	Map Reference No.	Photo Reference No.
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-715c	Unnamed Channel (Irrigation Ditch)	Channel/Ditch	Channel 1	S3	10.00	578037	5441983	1092.45	Agriculture	Isolation with fish salvage if water present	N/A	No survey completed	OSF - Semmihaut/Eik Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 5	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-715d	Unnamed Channel (Irrigation Ditch)	Channel/Ditch	Channel 1	S3	10.00	577771	5441924	1092.72	Agriculture	Isolation with fish salvage if water present	N/A	No survey completed	OSF - Semmihaut/Eik Population (Predicted Occupied Habitat) Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 5	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown - Road Allowance	BC-720a	Unnamed Channel (Roadside Ditch)	Channel/Ditch	Channel 1	S6	10.00	571070	5437846	1101.54	Urban and paved road directly south.	Trenchless (Bore)	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-720b	Unnamed Channel (Irrigation Ditch)	Channel/Ditch	Channel 1	S3	10.00	570847	5437546	1101.92	Urban and access road east and west.	Isolation with fish salvage if water present	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 6	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown - Road Allowance	BC-720c	Unnamed Channel (Roadside Ditch)	Channel/Ditch	Channel 1	S3	10.00	570709	5437427	1102.11	Agriculture and paved road directly adjacent to the west.	Trenchless (Bore)	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-720d	Unnamed Channel (Irrigation Canal)	Channel/Ditch	Channel 1	S3	10.00	570503	5437240	1102.38	Agriculture, industry and access road directly adjacent to the west.	Isolation with fish salvage and WQM	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 6	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-720f	Unnamed Drainage (Railway Ditch)	Channel/Ditch	Channel 1	NCD	10	570120	5436901	1102.90	Agriculture and railway directly east, railway ditch.	Trenchless (Bore)	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-721	Unnamed Channel (Irrigation Canal)	Channel/Ditch	Channel 1	S4	10.00	569695	5436771	1103.09	Agriculture	Isolation with fish salvage and WQM if flowing	23-Jul-13	None Observed	Coastal giant salamander	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 6	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-721.1	Unnamed Channel (Irrigation Canal)	Channel/Ditch	Channel 1	S3	10	569699	5436657	1103.23	Agriculture	Isolation with fish salvage and WQM if flowing	N/A	No survey completed	Coastal giant salamander	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 6	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-722.2	Unnamed Channel (Roadside Ditch)	Channel/Ditch	Channel 1	S6	10.00	568097	5436372	1105.09	Agriculture, urban, and paved road directly west - roadside drainage.	Trenchless (Bore)	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)

Trans Mountain Expansion Project
Amphibian Salvage Channels South Coast Area C 100217333

Region	Construction Spread	Geographic Area in South Coast Region	Relocation Area Land Status	Watercourse Crossing ID	Watercourse Name	Natural Stream or Channel/Ditch	Natural Stream or Channel/Ditch Type	Watercourse Classification	Zone	Easting	Northing	KP (SSEID005)	Adjacent Land Use	Pipeline Crossing Method	Date of Baseline Amphibian Survey	Amphibian Species Observed	Predicted or Identified Critical Habitat	Anticipated Start Date of Construction	Salvage Effort (Estimated Time)	Location and Description of Amphibian Relocation Site	Description on Use of Exclusion Fencing	Map Reference No.	Photo Reference No.
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-722.3	Unnamed Drainage (Roadside Ditch)	Channel/Ditch	Channel 1	NVC	10	567151	5436153	1106.08	Adjacent to road, Agriculture to the east, disturbed land to the west.	Trenchless (Bore)	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-722a	Unnamed Channel (Irrigation Canal)	Channel/Ditch	Channel 1	S3	10	568624	5436053	1106.61	Agriculture	Isolation with fish salvage if water present	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 7	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown - Road Allowance	BC-722a1	Unnamed Channel (Roadside Canal)	Channel/Ditch	Channel 1	S3	10	568696	5435954	1107.15	Agriculture, urban, and paved road directly west - roadside drainage.	Trenchless (Bore)	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown - Road Allowance	BC-722a2	Unnamed Channel (Roadside Canal)	Channel/Ditch	Channel 1	S3	10	568679	5435951	1107.17	Agriculture, urban, and paved road directly east - roadside drainage.	Trenchless (Bore)	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-722b	Unnamed Channel (Irrigation Canal)	Channel/Ditch	Channel 1	S3	10	565558	5435847	1107.70	Agriculture	Isolation with fish salvage if water present	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 8	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown - Road Allowance	BC-723	Unnamed Channel (Roadside Canal)	Channel/Ditch	Channel 1	S3	10	565041	5435747	1108.23	Agriculture and paved road directly adjacent to the west	Trenchless (Bore)	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown - Road Allowance	BC-724	Unnamed Channel (Roadside Canal)	Channel/Ditch	Channel 1	S3	10	565016	5435742	1108.25	Agriculture and paved road directly adjacent to the east	Trenchless (Bore)	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-725	Sumas Lake Canal	Channel/Ditch	Channel 2	S1B	10	564463	5435623	1108.82	Agriculture and access trail along the east and west banks	Isolation with fish salvage and WQM during low flow	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 8	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-725.1	Unnamed Channel (Irrigation Canal)	Channel/Ditch	Channel 1	S3	10	563916	5435529	1109.38	Agriculture and paved road directly adjacent to the west	Trenchless (Bore)	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)

Trans Mountain Expansion Project
Amphibian Salvage Channels South Coast Area C 100217333

Region	Construction Spread	Geographic Area in South Coast Region	Relocation Area Land Status	Watercourse Crossing ID	Watercourse Name	Natural Stream or Channel/Ditch	Natural Stream or Channel/Ditch Type	Watercourse Classification	Zone	Easting	Northing	KP (SSEID005)	Adjacent Land Use	Pipeline Crossing Method	Date of Baseline Amphibian Survey	Amphibian Species Observed	Predicted or Identified Critical Habitat	Anticipated Start Date of Construction	Salvage Effort (Estimated Time)	Location and Description of Amphibian Relocation Site	Description on Use of Exclusion Fencing	Map Reference No.	Photo Reference No
South Coast	6	Area C - Abbotsford to Chilliwack	Crown - Road Allowance	BC-725.2	Unnamed Channel (Roadside Canal)	Channel/Ditch	Channel 1	S3	10	563899	543525	1109.39	Agriculture and paved road directly adjacent to the east	Trenchless (Bore)	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-725a	Unnamed Channel (Irrigation Canal)	Channel/Ditch	Channel 1	S3	10	563383	5435428	1109.92	Agriculture and access trail along the east and west banks	Isolation with fish salvage if water present	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 9	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown - Road Allowance	BC-725b	Unnamed Channel (Roadside Canal)	Channel/Ditch	Channel 1	S3	10	562854	5435324	1110.46	Agriculture and paved road directly adjacent to the east - roadside	Trenchless (Bore)	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-725c	Unnamed Channel (Irrigation Canal)	Channel/Ditch	Channel 1	S3	10	562282	5435213	1111.04	Agriculture	Isolation with fish salvage if water present	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 9	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-725d	Unnamed Channel (Irrigation Canal)	Channel/Ditch	Channel 1	S3	10	561907	5435110	1111.43	Agriculture and access trails along the east and west banks	Isolation with fish salvage if water present	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 9	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-725e	Unnamed Channel (Irrigation Ditch)	Channel/Ditch	Channel 1	S6	10	560648	5435162	1112.70	Agriculture, paved road 50m to the west and residential home 20m to the south.	Isolation if water present	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 10	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown - Road Allowance	BC-728c1	Unnamed Drainage (Roadside Ditch)	Channel/Ditch	Channel 1	NCD	10	558182	5436251	1115.56	Industrial use paved roads surround the crossing.	Trenchless (Bore)	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-728d1	Unnamed Drainage (Roadside Ditch)	Channel/Ditch	Channel 1	NCD	10	558135	5436250	1115.61	Industrial use paved roads surround the crossing.	Trenchless (Bore)	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown - Road Allowance	BC-7283	Unnamed Drainage (Roadside Ditch)	Channel/Ditch	Channel 1	NCD	10	556968	5436211	1116.93	Adjacent existing highway. Forested to E	Trenchless (Bore)	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown - Road Allowance	BC-730d	Unnamed Channel (Roadside Ditch)	Channel/Ditch	Channel 1	S4	10	553965	5436366	1120.26	Agriculture and paved road directly to the east - roadside	Trenchless	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)

Trans Mountain Expansion Project
Amphibian Salvage Channels South Coast Area C 100217333

Region	Construction Spread	Geographic Area in South Coast Region	Relocation Area Land Status	Watercourse Crossing ID	Watercourse Name	Natural Stream or Channel/Ditch	Natural Stream or Channel/Ditch Type	Watercourse Classification	Zone	Easting	Northing	KP (SSEID005)	Adjacent Land Use	Pipeline Crossing Method	Date of Baseline Amphibian Survey	Amphibian Species Observed	Predicted or Identified Critical Habitat	Anticipated Start Date of Construction	Salvage Effort (Estimated Time)	Location and Description of Amphibian Relocation Site	Description on Use of Exclusion Fencing	Map Reference No.	Photo Reference No.
South Coast	6	Area C - Abbotsford to Chilliwack	Crown - Road Allowance	BC-731a	Unnamed Channel (Roadside Ditch)	Channel/Ditch	Channel 1	S6	10	553125	5436810	1121.21	Agriculture and paved road directly to the north - roadside.	Trenchless (Bore)	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown - Road Allowance	BC-731b	Unnamed Channel (Roadside Canal)	Channel/Ditch	Channel 1	S3	10	553099	5436825	1121.24	Agriculture and paved road directly to the south - roadside.	Trenchless (Bore)	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-732a	Unnamed Channel (Irrigation Canal)	Channel/Ditch	Channel 1	S3	10	552344	5437096	1122.05	Agriculture and country road directly to the west - roadside.	Isolation with fish salvage and WQIM if flowing	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 11	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-732a1	Unnamed Channel (Roadside Canal)	Channel/Ditch	Channel 1	S3	10	552047	5437203	1122.37	Agriculture and paved road directly to the east - roadside.	Trenchless (Bore)	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-732b	Unnamed Channel (Irrigation Canal)	Channel/Ditch	Channel 1	S3	10	551529	5437405	1122.92	Agriculture and access trail directly to the east	Isolation with fish salvage if water present	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 11	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown - Road Allowance	BC-732c	Unnamed Channel (Roadside Ditch)	Channel/Ditch	Channel 1	S3	10	551041	5437604	1123.45	Agriculture and paved road directly to the north and the west - roadside.	Trenchless (Bore)	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-733	Unnamed Channel (Tributary to Gifford Slough)	Channel/Ditch	Channel 1	S3	10	550723	5437729	1123.79	Agriculture.	Isolation with fish salvage if water present	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 11	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown - Road Allowance	BC-733.1	Unnamed Channel (Roadside Ditch)	Channel/Ditch	Channel 1	S3	10	549919	5438056	1124.66	Rural farmland, agriculture, road located directly to the west - roadside drainage.	Trenchless (Bore)	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown - Road Allowance	BC-733a	Unnamed Drainage (Roadside Ditch)	Channel/Ditch	Channel 1	NCD	10	549601	5438063	1124.68	Rural farmland, agriculture, road located directly to the west - roadside drainage.	Trenchless (Bore)	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)

Trans Mountain Expansion Project
Amphibian Salvage Channels South Coast Area C 100217333

Region	Construction Spread	Geographic Area in South Coast Region	Relocation Area Land Status	Watercourse Crossing ID	Watercourse Name	Natural Stream or Channel/Ditch	Natural Stream or Channel/Ditch Type	Watercourse Classification	Zone	Easting	Northing	KP (SSEID005)	Adjacent Land Use	Pipeline Crossing Method	Date of Baseline Amphibian Survey	Amphibian Species Observed	Predicted or Identified Critical Habitat	Anticipated Start Date of Construction	Salvage Effort (Estimated Time)	Location and Description of Amphibian Relocation Site	Description on Use of Exclusion Fencing	Map Reference No.	Photo Reference No.
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-733b	Unnamed Channel (Railway Ditch)	Channel/Ditch	Channel 1	S3	10	548610	5438158	1125.10	Agriculture. Railroad tracks located directly to the east.	Trenchless (Bore)	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown - Road Allowance	BC-733d	Unnamed Drainage (Roadside Ditch)	Channel/Ditch	Channel 1	S6	10	548764	5438418	1125.91	Rural farmland, agriculture, road located directly to the south - roadside drainage.	Trenchless (Bore)	17-Mar-15	Northwestern salamander; Northern red-legged frog	OSF - McLennan Population Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-734b	Unnamed Drainage (Roadside Ditch)	Channel/Ditch	Channel 1	NCD	10	547102	5439010	1127.67	Agriculture and paved road located directly to the east - roadside drainage	Trenchless (Bore)	17-Mar-15	Northwestern salamander; Northern red-legged frog	OSF - McLennan Population Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Crown - Road Allowance	BC-734c	Unnamed Channel (Roadside Ditch)	Channel/Ditch	Channel 1	S3	10	547089	5439014	1127.68	Agriculture and paved road located directly to the east - roadside drainage	Trenchless (Bore)	17-Mar-15	Northwestern salamander; Northern red-legged frog	OSF - McLennan Population Note, a separate permit application is being submitted for Oregon Spotted Frog	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Trenchless crossing of watercourse. A salvage of amphibians from aquatic environment is not expected to be required. Amphibians incidentally encountered in terrestrial environment may be moved to suitable terrestrial habitat upstream of the crossing (at least 50 m to 100 m from the area of impact).	Exclusion fencing may be installed around the Project workspace to prevent amphibians (terrestrial) from entering the workspace associated with the entry/exit point of the trenchless crossing	Trenchless crossing - not mapped	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)
South Coast	6	Area C - Abbotsford to Chilliwack	Private	BC-738a	Unnamed Channel	Channel/Ditch	Channel 1	S6	10	543591	5440304	1131.48	Agriculture and dirt access road located directly to the south.	Isolation if water present	N/A	No survey completed	None	6-Sep-17	Salvage will begin 3-7 days prior to the onset of clearing/construction	Amphibians will be relocated upstream (at least 50 m to 100 m beyond the upstream fencing) within the same watercourse.	Exclusion fencing at both upstream and downstream of the crossing will be used to isolate the salvage area. Fencing will allow water flow but prevent the movement of amphibians.	Map 12	Refer to the Watercourse Crossing Inventory Atlas (part of NEB Condition 43)

FW: Trans Mountain South Coast Wildlife Permit ACA Amendments - Changes to Principal and Additional Investigators

From: Galand, Lise FLNR:EX <Lise.Galand@gov.bc.ca>
To: Morgan, Kendra FLNR:EX <Kendra.Morgan@gov.bc.ca>
Cc: Yacyshe, Tom D FLNR:EX <Tom.Yacyshe@gov.bc.ca>
Sent: April 30, 2020 9:32:35 AM PDT
Attachments: TransMountain ACA_100204465_TPS3537.pdf, TransMountain ACA_100217163_TPS3550.pdf, TransMountain ACA_100217298_TPS3551.pdf, TransMountain ACA_100217326_TPS3545.pdf, image001.jpg, TransMountain ACA_100217320_TPS3546.pdf, TransMountain ACA_100217291_TPS3549.pdf, TransMountain ACA_100204920_TPS3543.pdf, TransMountain ACA_100210499_TPS3552.pdf, TransMountain ACA_100204714_TPS3542.pdf, TransMountain ACA_100217339_TPS3538.pdf, TransMountain ACA_100218268_TPS3536.pdf, TransMountain ACA_100300841_TPS3544.pdf, TransMountain ACA_100217342_TPS3540.pdf, TransMountain ACA_100217328_TPS3547.pdf, TransMountain ACA_100217333_TPS3539.pdf

Hi Kendra,

Please see attached ACAs with updated personnel (i.e., principal and additional investigators) from Transmountain, do you need any more info to process these? Is it just a matter of double checking them and replacing the existing ACA in the folder? Let me know if you need any help with these or if you have any questions or concerns.

Cheers,
Lise

From: Yacyshe, Tom D FLNR:EX <Tom.Yacyshe@gov.bc.ca>
Sent: April 30, 2020 8:50 AM
To: Galand, Lise FLNR:EX <Lise.Galand@gov.bc.ca>
Subject: FW: Trans Mountain South Coast Wildlife Permit ACA Amendments - Changes to Principal and Additional Investigators
Importance: High

Hi Lise
The updated aca's for Trans Mountain permits was forwarded to the inbox this week, do you need any more info to process these?
The PRRO recommendations are still forthcoming
Thanks

Tom Yacyshe
FLNRORD Surrey

From: Cassidy Hedden <cassidy@mctavishconsultants.ca>
Sent: April 28, 2020 8:48 PM
To: FLNR SC Fish and Aquatic Wildlife FLNR:EX <SCFishandAquaticWildlife@gov.bc.ca>
Cc: Pountney, Bronwyn <Bronwyn.Pountney@transmountain.com>; Yacyshe, Tom D FLNR:EX <Tom.Yacyshe@gov.bc.ca>; Bonnington, Calum <Calum.Bonnington@transmountain.com>; Matt McTavish <matt@mctavishconsultants.ca>
Subject: Trans Mountain South Coast Wildlife Permit ACA Amendments - Changes to Principal and Additional Investigators
Importance: High

Good evening,

Please find attached amended ACA forms with updated personnel (i.e., principal and additional investigators) for the South Coast wildlife permits associated with the Trans Mountain Expansion Project.

Please note we have also amended the dates on the ACAs due to project delays and actual dates in which salvage activities are scheduled to be carried out. All other aspects of the ACAs remain unchanged including the attachments in the previously approved forms. If you would like Trans Mountain to resend these attachments please let us know and we will compile them.

If you have any questions or comments, feel free to contact myself or Matthew McTavish.

Best regards,

Cassidy Hedden B.Sc., R.P.Bio., P. Biol.

Environment Technical Lead

McTavish Resource & Management Consultants Ltd.

Unit 203, 19292 60 Avenue, Surrey BC V3S 3M2 Canada

W: www.mctavishconsultants.ca | M: 236.688.1780 | E: cassidy@mctavishconsultants.ca



CONFIDENTIALITY NOTICE: This message and any attached documents are for the use of the intended recipient only and may contain information that is confidential or privileged. If you have received this message in error, please notify the sender immediately by return email and delete the message from your system.



PLEASE TYPE

(F11 key will tab you through to the next box requiring information)

For office use: Date Received:

Project Number:

1. Project Title: Snake Salvage for the Trans Mountain Pipeline ULC Trans Mountain Pipeline Expansion Project (TMEP) – South Coast Region

2. Starting Date: (Note, if multi-year include the process of this) June 15, 2020
Completion Date: December 31, 2023

3. Principal Investigator: Must be a Qualified Person as defined by the [Natural Resource Sector QP Guidance Document](#)

Name: Claudio Bianchini (R.P.Bio)

Mailing Address:

Unit 203-19292 60 Avenue

Position: Senior Wildlife Biologist

Surrey BC

Department/Organization: McTavish Resource & Management Consultants Ltd.

V3S 3M2

Region/Institution: N/A

Phone: (604) 219-9699

Fax: N/A

E-mail: claudio@mctavishconsultants.ca

Experience related to the described species, methods and proposal (ensure that experience related to the taxa/activity concerned is emphasized):

Mr. Bianchini has worked with reptiles and other wildlife for over 25 years, and has extensive experience with species identification, mapping, habitat impact assessments, handling, trapping, temporary holding, and disease protocols.

The following table provides a list of projects, target salvage species and the number of individuals salvaged pertaining to projects involving amphibian salvage and handling.

Client: Kinder Morgan Canada	
Project: Pipeline Integrity Program	
Project Description: Salvage of a hibernaculum identified during removal of large angular rock associated with a pipeline integrity project in Abbotsford, BC.	2015
Target Salvage Species: Common Garter Snake (<i>Thamnophis sirtalis</i>)	
Number of Individuals Salvaged: One hibernaculum	

Client: Gateway Program Project: Port Mann/ Highway 1 Project-Fraser Heights Connector Project Description: Reptile (snake) salvage effort associated with the construction of the above-mentioned project. Works were conducted under Gabauer & Associates. Target Salvage Species: Northern Rubber Boa (<i>Charina bottae</i>) Number of Individuals Salvaged: 0	2009-2015
---	-----------

4. Additional Investigators: copy and paste if you require more than two

Name: Jessica Harvey (M.Sc., R.P.Bio) Mailing Address: 6526 Water Street
 Position: Senior Wildlife Biologist Sooke, BC
 Department/Organization: Corvidae Environmental Consulting Inc. V9Z 0X1
 Region/Institution: N/A
 Phone: (403) 200-8236
 Fax: N/A
 E-mail: Jessicah@corvid.pro

Jessica Harvey has been working as a biologist for 12 years. She specializes in wildlife ecology, herpetology, and environmental impact assessments. Jessica has led several large wildlife habitat modelling and cumulative effects analysis projects using Geographic Information Systems, including the Trans Mountain Expansion Pipeline Project, West Coast Gas Connector Transmission Project, and Multiple Species At Risk (MULTISAR) Habitat Mapping for Alberta Conservation Association. She has designed, executed and managed large field-based research and industrial wildlife survey programs throughout British Columbia and Alberta, including snake and turtle surveys.

The following lists select relevant reptile survey and salvage projects Jessica has participated in over the last 10 years:

Client: Trans Mountain Pipeline ULC Project: Trans Mountain Expansion Project Project Description: Reptile Salvage associated with the Burnaby Terminal Facility Upgrades and Expansion. Salvage effort included sweeps of aquatic and riparian habitat during clearing and construction activities. Salvage efforts followed the provincial Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2016). Target Salvage Species: Common gartersnake (<i>Thamnophis sirtalis</i>), northwestern gartersnake (<i>Thamnophis ordinoides</i>), terrestrial gartersnake (<i>Thamnophis elegans</i>) Number of Individuals Salvaged: 5	2019
--	------

<p>Client: Windley Construction Ltd</p> <p>Project: MOTI Leigh Rd to Westshore Parkway Expansion</p> <p>Project Description: Reptile Salvage associated with MOTI Highway widening project. Salvage effort included sweeps of terrestrial habitat before and during clearing and construction activities. Salvage efforts followed the provincial Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2016).</p> <p>Target Salvage Species: Common gartersnake (<i>Thamnophis sirtalis</i>), northwestern gartersnake (<i>Thamnophis ordinoides</i>), terrestrial gartersnake (<i>Thamnophis elegans</i>), sharp-tailed snake (<i>Contia tenuis</i>), northern alligator lizard (<i>Elgaria coerulea</i>)</p> <p>Number of Individuals Salvaged: 0</p>	2019-2020
<p>Client: Langdon-Weir Construction</p> <p>Project: 804 Latoria</p> <p>Project Description: Reptile surveys associated with subdivision project. Salvage effort will include sweeps of terrestrial habitat before and during clearing and construction activities. Salvage efforts followed the provincial Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2016).</p> <p>Target Species: Common gartersnake (<i>Thamnophis sirtalis</i>), northwestern gartersnake (<i>Thamnophis ordinoides</i>), terrestrial gartersnake (<i>Thamnophis elegans</i>), sharp-tailed snake (<i>Contia tenuis</i>), northern alligator lizard (<i>Elgaria coerulea</i>)</p> <p>Number of Individuals Salvaged: none found so far, project ongoing</p>	2019-2020
<p>Client: Trans Mountain Pipeline ULC</p> <p>Project: Trans Mountain Expansion Project</p> <p>Project Description: Reptile surveys for pipeline application to NEB. Survey protocols followed BC RISC standards.</p> <p>Target Species: Northern Pacific rattlesnake (<i>Crotalus oreganus oreganus</i>), Great basin gophersnake (<i>Pituophis catenifer deserticola</i>), Yellow-bellied racer (<i>Coluber constrictor</i>), Rubber boa (<i>Charina bottae</i>), Common gartersnake (<i>Thamnophis sirtalis</i>)</p> <p>Number of Individuals Salvaged: n/a</p>	2012-2017
<p>Client: Enbridge</p> <p>Project: Line 3</p> <p>Project Description: Hibernacula identification, restoration and monitoring during construction of the pipeline right-of-way.</p> <p>Target Species: Prairie rattlesnake (<i>Crotalus viridis</i>)</p> <p>Number of Individuals Salvaged: n/a – den size ~ 50 animals</p>	2013-2015

Client: Thompson River's University/ Grasslands Conservation Council Project: Master's Thesis Research Project Description: Northern Pacific rattlesnake surveys and radiotelemetry study to assess long-distance migrations and habitat use. Target Species: Northern Pacific rattlesnake (<i>Crotalus oregonus oregonus</i>) Number of Individuals Salvaged: n/a Study sample size: 35 animals Number handled for inventory: 200+ animals for measurements and sex	2010-2012
---	-----------

Other personnel working with protocol: (include experience)

5. Project Proposal (be concise and write in lay language. The information in all sections of this application should be complete so that it can be evaluated as a stand-alone document. The proposal must include all applicable information about animals and their handling and care relating to the project. Only maps can be included as additional material.

A. Background – Goals and Objectives:

Trans Mountain Pipeline ULC (Trans Mountain) submitted an Application to the National Energy Board (NEB) in December 2013 for the proposed Trans Mountain Expansion Project (TMEP). A Certificate of Public Convenience and Necessity (CPCN OC-064) allowing the Project to proceed was issued by the Government of Canada on December 1, 2016. The Government of BC issued an Environmental Assessment Certificate on January 11, 2017. CH2M has been retained by Trans Mountain to conduct snake salvage during Project activities.

A salvage permit is required to manually move any snakes that may be encountered within the pipeline trench, work area and nearby travel routes for the Project. Trans Mountain will engage a Qualified Professional(s) with species experience as defined by the Natural Resource Sector QP Guidance Document to complete snake salvage activities along the length of the pipeline where snakes may be encountered.

B. Key Expected Results and Management Implications:

The purpose of this Permit application is to avoid incidental mortality of snakes within the pipeline construction right-of-way and along travel routes.

6. CCAC Invasiveness Category: (see Appendix A)

A ___ B ___ C ☒ D ___

7. Species and Number of Animals Required: (include justification of animal numbers predicted to be captured/handled). If exact numbers are not known, please provide a reasonable order of magnitude based on your professional assessment of habitat, location, species etc. – for example, under 10, 100s or 1000s. For multi-species and multi-year projects, indicate expected numbers for each species and each year of the project.

For further information: www.frontcounterbc.ca

Last updated: Sept 14, 2015 Phone: 1-877-855-3222 (within North America) or ++1-778-372-0729 (outside of North America)

Species (both standard common and Latin names preferred):

Snakes with potential to occur within the Project Footprint in the South Coast Region are provided below:

- common gartersnake (*Thamnophis sirtalis*)
- terrestrial gartersnake (*Thamnophis elegans*)
- rubber boa (*Charina bottae*)

Number expected for 2020 to 2023 :

Number of snakes that will be encountered, salvaged and relocated is unknown.

Justification for numbers:

The number of snakes that will be encountered in the Project work area is unknown.

8. Details of Capture, Handling, Sampling and Surgical Procedures and Final Disposition:
(Be detailed and SPECIFIC. It is not sufficient to just refer to a particular protocol (e.g., RISC protocol).

Please refer to Appendix B – CCAC guidelines on: the care and use of wildlife (2003) and other documents such as AVMA Guidelines for Euthanasia of Animals (2013) for appropriate and humane techniques and guidelines for handling and care.

For wildlife salvage permits, please consult the [Salvage Permit Information Checklist](#) to ensure that all necessary information is included. Incomplete information will cause delays in the review process.

Capture Technique: Please give details of capture techniques used as well as reference to standards or reference researchers who have previously used the technique. If traps are to be used please specify the type of traps, how long the traps are to be set, modifications made for the target species and the interval they will be checked.

The salvage protocol was designed using guidance from the Best Management Practices for Amphibian and Reptile Salvages in British Columbia (BC Ministry of Forests, Lands, and Natural Resource Operations, 2016.). Methods to capture and handle snakes were developed from the Inventory Methods for Snakes. Standards for Components of British Columbia's Biodiversity No.38. Version 2.0 (BC Ministry of Environment, Lands and Parks, 1998a).

Snakes will be gently captured by hand or using a snake hook or tongs. Snakes will be lifted or directed into a suitable carrying container or sack. Suitable containers include: large thick cotton sacks that can be tied or sealed at the open end, or plastic or rubbermaid boxes without sharp edges that have pre-drilled, small (< 1cm) ventilation holes to allow fresh air flow.

All equipment (e.g., containers, hooks, and snake tongs) used during salvage will be cleaned when soiled, in between holding individual animals, and at the end of each day.

Method of Handling:

Handling methods of snakes will be adopted from the Live Animal Capture and Handling Guidelines for Wild Mammals, Birds, Amphibians & Reptiles – Standards for Components of British Columbia's Biodiversity No. 3 (BC Ministry of Environment, Lands and Parks 1998b).

- All field staff will wear gloves when handling any animals and that field staff will ensure that sunscreen, insect repellent, etc. will not come in contact with any animals.
- Handlers will avoid the use of excessive force when restraining the animal to avoid injury; hooks, tongs or containers may be used to capture larger animals and avoid injury.

For further information: www.frontcounterbc.ca

Last updated: Sept 14, 2015 Phone: 1-877-855-3222 (within North America) or ++1-778-372-0729 (outside of North America)

- The length of time individuals are handled will be limited to reduce stress and the likelihood of injury.

Capture and handling techniques will minimize the amount of handling time required, and reduce or eliminate the contact between handler and animal. Personnel will be familiar with standard emergency procedures that are to be initiated in the event of an accidental bite or contact.

Snakes will be held for a maximum of 1 hour in the container before release. Containers with snakes will be stored in a safe, quiet location and will be clearly marked "Live animals – Do Not Open or Disturb". Containers will also be labeled with snake species and capture location. All containers will be placed in cool, shady areas for the duration of occupancy in order to keep the animals from overheating.

Other Procedures: (Marking method, Sampling)

Captured animals will not be marked.

Release Sites: Relocation sites will be determined through desktop review and consultation with MFLNRO, and confirmed in the field prior to the commencement of salvage activities. Snakes will be translocated to safe relocation sites a maximum of 500 m from their capture site. Relocation sites will be selected to include suitable habitat features (rocks, large cover objects) on the same side of the pipeline trench or snake fence as the animal was captured. Snakes will be released at cover objects (e.g., rocks, coarse woody debris).

Chemical Restraint, Analgesics or other Pharmaceutical Agents used: (Drug names should be included with doses and volumes planned):

No chemical restraints, analgesics or other Pharmaceutical Agents will be utilized.

Contingency Plan: (What training, preparations and equipment are available in event of animal injury during capture or handling). A contingency plan is mandatory because accidents are not predictable. Describe what preplanning, resources and contacts are available in the event of accidental animal injury during capture and handling.

Field staff conducting the snake salvage will include a Qualified Professional with experience handling snakes, including venomous snakes. Length of time that individuals are handled will be limited in order to reduce stress and likelihood of injury/mortality. Animals will be held in suitable containers, and will be kept out of the direct sunlight.

Method of Euthanasia and Disposal Technique: (All projects must be prepared to humanely euthanize animals with an appropriate technique). Euthanized animals should be submitted to a museum collection, unless damaged beyond usefulness for archival purposes or other logistical constraints. If not retained for archival purposes, animals should be disposed of appropriately to avoid environmental contamination or other unintended consequences. See [Canadian Council on Animal Care guidelines](#) or [AVMA Guidelines for the Euthanasia of Animals \(2013\)](#) for appropriate species specific methods.

If a snake in distress is found, consultation with local wildlife officers or veterinarians will take place before field euthanasia is performed. Injured animals will be transported to a nearby wildlife rescue centre, in consultation with local wildlife officers. Field staff will not carry anesthetic chemicals in the field. In the case of accidental severe injury where euthanasia is required, euthanasia will follow a physical method to result in rapid loss of brain function: decapitation followed by pithing.

References:

British Columbia Ministry of Environment, Lands and Parks. 1998a. Inventory Methods for Snakes. Standards for Components of British Columbia's Biodiversity No. 38. Version 2.0. Resources Inventory Branch. Victoria, BC. 50 pp.

British Columbia Ministry of Forests, Lands and Natural Resource Operations. 2016. Best Management Practices for Amphibian and Reptile Salvages in British Columbia. Version 1.0. Surrey, BC. 57 pp.

British Columbia Ministry of Environment, Lands and Parks. 1998b. Live Animal Capture and Handling Guidelines for Wild Mammals, Birds, Amphibians & Reptiles – Standards for Components of British Columbia's Biodiversity No. 3. Resource Inventory Branch. Victoria, BC.

9. Details of Potentially Controversial Procedures and Justification:
(Include any expected morbidity and methods used to avoid)

No controversial procedures will be used.

10. Budget:
Funding sources applied for:

Are these peer reviewed? [NO](#)

Status: [APPROVED](#)

11. Region:

Identify the study area(s) in general and specific terms: (e.g. Region #, land status). Please attach maps if appropriate. For salvage permits, include maps indicating source and release sites.

Snake salvage will occur along the Trans Mountain Expansion Pipeline route where snakes are encountered during clearing and construction activities. This permit is specific to the TMEP route in the South Coast Region. A map of the TMEP route is provided.

12. Permit:

Please send the completed BC Animal Care Form Application Form to FrontCounter BC along with a General Permit Application and permit fees (if applicable). For further information on how to apply, please visit the FrontCounter BC website at <http://www.frontcounterbc.gov.bc.ca/guides/fish-wildlife/general-permit/overview/>

Approval of an Animal Care Application does not constitute approval of any application to handle wildlife. Applicants must also have a valid permit, issued under the *Wildlife Act*, before engaging in any such activity.



April 28, 2020

Principal Investigator's

Signature Date of Application

Please ensure you save this document to your desktop to upload with your General Wildlife Application.

Direct any comments about this form to FrontCounterBC@gov.bc.ca

Appendix A: Canadian Council on Animal Care: Categories of Invasiveness for Wildlife Studies

A. Methods used on most invertebrates or on live isolates

Possible examples: the use of tissue culture and tissues obtained at necropsy; the use of eggs, protozoa or other single-celled organisms; experiments involving containment, incision or other invasive procedures on metazoa.

B. Methods used which cause little or no discomfort or stress

Possible examples: observational studies in which the same individuals are not repeatedly observed so as to habituate or otherwise modify their behavior; census or other surveys which do not involve capture or marking individuals; non-invasive studies on animals that have been habituated to captivity; short periods of food and/or water deprivation equivalent to periods of abstinence in nature.

C. Methods which cause minor stress or pain of short duration

Possible examples: capture, using methods with little or no potential to cause injury and marking of animals for immediate release; long-term observational studies on free-ranging animals where the behaviour of individuals may be altered by repeated contact; brief restraint for blood or tissue sampling; short periods of restraint beyond that for simple observation or examination, but consistent with minimal distress; short periods of food and/or water deprivation which exceed periods of abstinence in nature; exposure to non-lethal levels of drugs or chemicals; low velocity darting and slow-injection darts with immobilization chemicals. Such procedures should not cause significant changes in the animal's appearance, in physiological parameters such as respiratory or cardiac rate, or fecal or urinary output, in social responses or *in ability to survive*.

Note: During or after Category C studies, animals must not show self-mutilation, anorexia, dehydration, hyperactivity, increased recumbency or dormancy, increased vocalization, aggressive-defensive behavior or demonstrate social withdrawal and self-isolation.

D. Methods which cause moderate to severe distress or discomfort

Possible examples: *capture, using methods that have the potential to cause injury (e.g. Leg snares, leg hold traps, high velocity darting and rapid-injection darts with immobilization chemicals, net gunning, etc.); maintenance of wild caught animals in captivity; translocation of wildlife to new habitats; major surgical procedures conducted under general anesthesia, with subsequent recovery; prolonged (several hours or more) periods of physical restraint; induction of behavioral stresses such as maternal deprivation, aggression, predator-prey interactions; procedures which cause severe, persistent or irreversible disruption of sensorimotor organization.*

Other examples *in captive animals* include induction of anatomical and physiological abnormalities that will result in pain or distress; the exposure of an animal to noxious stimuli from which escape is impossible; the production of radiation sickness; exposure to drugs or chemicals at levels that impair physiological systems. (NB. *Experiments described in this paragraph would be Category E if performed on wildlife immediately prior to release.*)

Note: Procedures used in Category D studies should not cause prolonged or severe clinical distress as may be exhibited by a wide range of clinical signs, such as marked abnormalities in behavioral patterns or attitudes, the absence of grooming, dehydration, abnormal vocalization, prolonged anorexia, circulatory collapse, extreme lethargy or disinclination to move, and clinical signs of severe or advanced local or systemic infection, etc.

E. Procedures which cause severe pain near, at, or above the pain tolerance threshold of unanesthetized conscious animals.

This Category of Invasiveness is not necessarily confined to surgical procedures, but may include exposure to noxious stimuli or agents whose effects are unknown; exposure to drugs or chemicals at levels that (may) markedly impair physiological systems and which cause death, severe pain, or extreme distress; behavioral studies about which the effects of the degree of distress are not known; *environmental deprivation that has the potential to seriously jeopardize an animal's wellbeing*; use of muscle relaxants or paralytic drugs without anesthetics; burn or trauma infliction on unanesthetized animals; a euthanasia method not approved by the CCAC; any procedures (e.g., the injection of noxious agents or the induction of severe stress or shock) that will result in pain which approaches the pain tolerance threshold and cannot be relieved by analgesia (e.g., removal of teeth without analgesia, or when toxicity testing and experimentally-induced infectious disease studies have death

as the endpoint), *capture methods with a high potential of causing severe injury that could result in severe chronic pain and/or death.*

Appendix B:**Canadian Council on Animal Care guidelines on: the care and use of wildlife (2003)**

http://www.ccac.ca/en/_standards/guidelines

<https://www.ccac.ca/Documents/Standards/Guidelines/Wildlife.pdf>



**FISH AND WILDLIFE MANAGEMENT BRANCH
ANIMAL CARE APPLICATION FORM**

PLEASE TYPE

(F11 key will tab you through to the next box requiring information)

For office use: Date Received:

Project Number:

1. Project Title: Amphibian Salvage – Channels – Trans Mountain Pipeline ULC Trans Mountain Pipeline Expansion Project (TMEP) – South Coast Region (Area C – Abbotsford to Chilliwack)

2. Starting Date: (Note, if multi-year include the process of this) June 15, 2020

Completion Date: December 31, 2023

3. Principal Investigator: Must be a Qualified Person as defined by the [Natural Resource Sector QP Guidance Document](#)

Name: Claudio Bianchini (R.P.Bio)

Position: Senior Wildlife Biologist

Department/Organization: McTavish Resource & Management Consultants Ltd.

Region/Institution: N/A

Phone: (604) 219 - 9699

Fax: N/A

E-mail: claudio@mctavishconsultants.ca

Mailing Address:

Unit 203-19292 60 Avenue

Surrey BC

V3S 3M2

Experience related to the described species, methods and proposal (ensure that experience related to the taxa/activity concerned is emphasized):

Mr. Bianchini has worked with amphibians and other wildlife for over 25 years, and has extensive experience with species identification, mapping, habitat impact assessments, handling, trapping, temporary holding, and disease protocols. This includes Coastal Tailed Frog, Northern Red-legged Frog, Western Toad, and Coastal Giant Salamander. He has conducted three years of baseline inventory and post construction sampling as well as salvages during construction for Coastal Tailed Frog for the Lorenzetta Creek Hydroelectric Project (Laidlaw, BC). Claudio has also conducted three years of baseline inventory for Coastal Tailed Frog and Pacific Giant Salamander for the proposed Frost Creek Hydroelectric Project (Cultus Lake, BC), as well as conducted amphibian salvage including Northern Red-legged Frog and Western Toad for various projects in the Lower Mainland.

The following table provides a list of projects, target salvage species and the number of individuals salvaged pertaining to projects involving amphibian salvage and handling.

<p>Client: Trans Mountain Pipeline ULC</p> <p>Project: Trans Mountain Expansion Project</p> <p>Project Description: Amphibian Salvage associated with the Burnaby Terminal Facility Upgrades and Expansion. Salvage effort included sweeps of aquatic and riparian habitat during clearing and construction activities. Salvage efforts followed the provincial Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2016).</p> <p>Target Salvage Species: Northern Pacific Tree Frog (<i>Pseudacris regilla</i>) and Northern Red-Legged Frog (<i>Rana aurora</i>)</p> <p>Number of Individuals Salvaged: 191 (9 Red-legged Frogs, 27 Long-toed Salamanders & 155 Pacific Tree Frogs)</p>	2019
<p>Client: Trans Mountain Pipeline ULC</p> <p>Project: Trans Mountain Expansion Project</p> <p>Project Description: Visual assessment of habitat with potential to support the species identified within the project footprint as part of the baseline survey for species at risk in the Lower Mainland and Fraser Valley. Visual assessment included collection of baseline habitat characteristics and biophysical attributes, assessment of critical habitat suitability, and visual surveys for the species.</p> <p>Target Salvage Species: Oregon Spotted Frog (<i>Rana pretiosa</i>) and Coastal Giant Salamander (<i>Dicamptodon tenebrosus</i>)</p> <p>Number of Individuals Salvaged: 0 (numerous egg masses identified visually)</p>	2018-2019
<p>Client: Zella Holdings Ltd.</p> <p>Project: Lorenzetta Creek IPP</p> <p>Project Description: Post-construction Inventory for Coastal Tailed Frog. Assessment and inventory methods followed the provincial RISC standards. ¹</p> <p>¹ RISC. 2000. <i>Inventory Methods for Tailed Frog and Pacific Giant Salamander Standards for Components of British Columbia's Biodiversity No. 39</i> Prepared by Ministry of Environment, Lands and Parks Resources Inventory Branch for the Terrestrial Ecosystems Task Force Resources Inventory Committee, March 13, 2000. Version 2 <http://srmwww.gov.bc.ca/risc/pubs/tebiodiv/index.htm></p> <p>Target Salvage Species: Coastal Tailed Frog (<i>Ascaphus truei</i>)</p> <p>Number of Individuals Salvaged: 1176 (2017=440, 2018=342 & 2019=392)</p>	2017 - 2019

<p>Client: BC Hydro/Chartwell Consultants Ltd.</p> <p>Project: Furry Creek Clear Span Bridge Upgrade/Maintenance</p> <p>Project Description: Provided oversight and acted as the Principal Investigator. Salvage effort included two instream areas along the margins of Furry Creek and followed provincial Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2016) and provincial RISC standards (referenced in the above project).</p> <p>Target Salvage Species: Coastal Tailed Frog</p> <p>Number of Individuals Salvaged: 0</p>	2018
<p>Client: Valley Gravel Sales Ltd.</p> <p>Project: Makara Property – Gravel Quarry Operation</p> <p>Project Description: Conducted an amphibian salvage associated with gravel quarry operations. Salvage effort followed provincial Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2016)</p> <p>Target Salvage Species: Northern Red-Legged Frog and Western Toad (<i>Anaxyrus boreas</i>)</p> <p>Number of Individuals Salvaged: 0</p>	2016
<p>Client: Zella Holdings Ltd.</p> <p>Project: Lorenzetta Creek IPP</p> <p>Project Description: Coastal Tailed Frog salvage. Salvage effort included the instream area associated with an IPP intake and followed provincial Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2016) and provincial RISC standards (referenced in the above projects).</p> <p>Target Salvage Species: Coastal Tailed Frog</p> <p>Number of Individuals Salvaged: 627 Tadpoles</p>	2015
<p>Client: Zella Holdings Ltd.</p> <p>Project: Lorenzetta Creek IPP</p> <p>Project Description: Pre-construction Inventory for Coastal Tailed Frog. Assessment and inventory methods followed the provincial RISC standards. ¹</p> <p>¹ RISC. 2000. <i>Inventory Methods for Tailed Frog and Pacific Giant Salamander Standards for Components of British Columbia's Biodiversity No. 39 Prepared by Ministry of Environment, Lands and Parks Resources Inventory Branch for the Terrestrial Ecosystems Task Force Resources Inventory Committee, March 13, 2000. Version 2</i> <http://srmwww.gov.bc.ca/risc/pubs/tebiodiv/index.htm></p> <p>Target Salvage Species: Coastal Tailed Frog</p> <p>Number of Individuals Salvaged: 464 (2012=42, 2013=28, 2014=394)</p>	2012 - 2014

<p>Client: Zella Holdings Ltd.</p> <p>Project: Frosst Creek IPP</p> <p>Project Description: Coastal Tailed Frog and Pacific Giant Salamander baseline inventory. Assessment and inventory methods followed the provincial RISC standards.¹</p> <p>¹ RISC. 2000. <i>Inventory Methods for Tailed Frog and Pacific Giant Salamander Standards for Components of British Columbia's Biodiversity No. 39</i> Prepared by Ministry of Environment, Lands and Parks Resources Inventory Branch for the Terrestrial Ecosystems Task Force Resources Inventory Committee, March 13, 2000. Version 2 <http://srmwww.gov.bc.ca/risc/pubs/tebiodiv/index.htm></p> <p>Target Salvage Species: Coastal Tailed Frog</p> <p>Number of Individuals Salvaged: Coastal Tailed Frog: 384 (2012=7, 2013=30 & 2014=347); Pacific Giant Salamander: 12 (2012=1, 2013=3 & 2014=8)</p>	2012 - 2014
<p>Client: Valley Gravel Sales Ltd.</p> <p>Project: 37271 Ward Rd – Gravel Quarry Operation</p> <p>Project Description: Provided oversight and acted as the Principal Investigator for an amphibian salvage associated with the infilling of a wetland as part of a gravel quarry expansion. Salvage effort followed provincial Draft Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2014)</p> <p>Target Salvage Species: Northern Red-Legged Frog and Western Toad</p> <p>Number of Individuals Salvaged: Eight (8) Northern Red-Legged Frog and two (2) Northwestern Salamander (<i>Ambystoma gracile</i>)</p>	2015
<p>Client: Valley Gravel Sales Ltd./090602 BC Ltd.</p> <p>Project: Lot KW Gravel</p> <p>Project Description: Conducted an amphibian salvage associated with gravel quarry operations. Salvage effort followed provincial Draft Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2014)</p> <p>Target Salvage Species: Northern Red-Legged Frog and Western Toad</p> <p>Number of Individuals Salvaged: 0</p>	2014
<p>Client: Gateway Program</p> <p>Project: Port Mann/Highway 1 Project – Fraser Heights Connector</p> <p>Project Description: Amphibian Salvage following provincial best management practices.</p> <p>Target Salvage Species: Northern Red-Legged Frog and Western Toad</p> <p>Number of Individuals Salvaged: >20 (data with Gebauer & Assoc.)</p>	2009 - 2015

Client: BC Ministry of Transportation and Infrastructure (MOTI) Project: Highway 1 Truck Climbing Lane Project Description: Amphibian Salvage following provincial best management practices. Target Salvage Species: Northern Red-Legged Frog and Western Toad Number of Individuals Salvaged: 0	2013 - 2014
Client: Gary Toor and District of Mission Project: Gaudin Creek Realignment Project Description: Amphibian salvage following provincial best management practices. Target Salvage Species: Northern Red-Legged Frog Number of Individuals Salvaged: 48 amphibians total; twelve (12) Northern Red-legged Frogs, eighteen (18) Northwestern Salamanders, and seven (7) Green Frogs.	2008

4. Additional Investigators: **copy and paste if you require more than two**

Name: Cassidy Hedden (B.Sc., R.P.Bio., P.Biol) Mailing Address: Unit 203-19292 60 Avenue
 Position: Environment, Technical Lead Surrey BC
 Department/Organization: McTavish Resource & Management Consultants Ltd. V3S 3M2
 Region/Institution: N/A
 Phone: (236) 688-1780
 Fax: N/A
 E-mail: cassidy@mctavishconsultants.ca

Experience related to the described species, methods and proposal (ensure that experience related to the taxa/activity concerned is emphasized):

Ms. Hedden is a Project Biologist with McTavish Resource & Management Consultants Ltd. and has over five years of experience in environmental consulting, specializing in freshwater aquatic ecosystems. Since 2015 she has provided professional services to government, industry and private sector clients. These services have included wildlife salvages and terrestrial and aquatic habitat assessment for the following amphibian species: Northern Red-legged Frog (*Rana aurora*), Western Toad (*Anaxyrus boreas*), Northern Pacific Treefrog (*Pseudacris regilla*), Oregon Spotted Frog (*Rana pretiosa*), and Coastal Tailed Frog (*Ascaphus truei*).

The following table provides a list of projects, target salvage species and the number of individuals salvaged pertaining to projects involving amphibian salvage and handling.

<p>Client: Trans Mountain Pipeline ULC</p> <p>Project: Trans Mountain Expansion Project</p> <p>Project Description: Visual assessment of habitat with potential to support the species identified within the project footprint as part of the baseline survey for species at risk in the Lower Mainland and Fraser Valley. Visual assessment included collection of baseline habitat characteristics and features, assessment of critical habitat suitability and documentation of biophysical attributes, and visual surveys for the species.</p> <p>Target Salvage Species: Oregon Spotted Frog (<i>Rana pretiosa</i>) and Coastal Giant Salamander (<i>Dicamptodon tenebrosus</i>)</p> <p>Number of Individuals Salvaged: 0, numerous amphibian egg masses visually assessed and identified to species</p>	2018-2019
<p>Client: BC Hydro/Chartwell Consultants Ltd.</p> <p>Project: Furry Creek Clear Span Bridge Upgrade/Maintenance</p> <p>Project Description: Salvage effort included two instream areas along the margins of Furry Creek and followed provincial Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2016) and provincial RISC standards.¹</p> <p>¹ RISC. 2000. <i>Inventory Methods for Tailed Frog and Pacific Giant Salamander Standards for Components of British Columbia's Biodiversity No. 39</i> Prepared by Ministry of Environment, Lands and Parks Resources Inventory Branch for the Terrestrial Ecosystems Task Force Resources Inventory Committee, March 13, 2000. Version 2 <http://srmwww.gov.bc.ca/risc/pubs/tebiodiv/index.htm></p> <p>Target Salvage Species: Coastal Tailed Frog</p> <p>Number of Individuals Salvaged: 0</p>	2018
<p>Client: Bird Construction</p> <p>Project: 14292 Green Timbers Way, Surrey (RCMP Forensic Building Upgrades)</p> <p>Project Description: Northern Red-legged Frog salvage associated with culvert and drainage works required for a temporary laydown area. Salvage efforts followed the provincial Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2016).</p> <p>Target Salvage Species: Northern Red-Legged Frog</p> <p>Number of Individuals Salvaged: > 50 egg masses</p>	2017
<p>Client: Zella Holdings Ltd.</p> <p>Project: Lorenzetta Creek IPP</p> <p>Project Description: Coastal Tailed Frog salvage. Salvage effort included the instream area associated with an IPP intake and followed provincial Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2016) and provincial RISC standards (referenced in the above project).</p> <p>Target Salvage Species: Coastal Tailed Frog</p> <p>Number of Individuals Salvaged: 627 Tadpoles</p>	2015

<p>Client: Abbotsford Concrete Products</p> <p>Project: Facility upgrades</p> <p>Project Description: Salvage associated with infilling of an artificial pond feature for facility upgrades. Salvage efforts followed the provincial Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2016).</p> <p>Target Salvage Species: Northern Red-legged Frog and Western Toad</p> <p>Number of Individuals Salvaged: 2 Green Frog (<i>Lithobates clamitans</i>)</p>	2016
<p>Client: Valley Gravel Sales Ltd.</p> <p>Project: 37271 Ward Rd – Gravel Quarry Operation</p> <p>Project Description: Provided oversight and acted as the Principal Investigator for an amphibian salvage associated with the infilling of a wetland as part of a gravel quarry expansion. Salvage effort followed provincial Draft Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2014)</p> <p>Target Salvage Species: Northern Red-Legged Frog and Western Toad</p> <p>Number of Individuals Salvaged: Eight (8) Northern Red-Legged Frog and two (2) Northwestern Salamander (<i>Ambystoma gracile</i>)</p>	2015
<p>Client: Vancouver Island University</p> <p>Project: Natural Resource Extension Program</p> <p>Project Description: Installed and monitored pit traps to survey amphibian species presence at a wetland site in Nanaimo, BC as part of an education program focused on land monitoring skills which included wildlife surveys and habitat assessment.</p> <p>Target Salvage Species: All species</p> <p>Number of Individuals Salvaged: One Ensatina (<i>Ensatina eschscholtzii</i>),</p>	2014

Name: Oliver Busby (R.P.Bio)
 Position: Senior Wildlife Biologist
 Department/Organization: EBB Environmental Consulting Inc
 Region/Institution: N/A
 Phone: (604) 943 - 3209
 Fax: (604) 948-3273
 E-mail: busby@ebbconsulting.ca

Mailing Address: PO Box 18180 1251C
 56th Street
 Delta BC
 V4L 2M4

Experience related to the described species, methods and proposal (ensure that experience related to the taxa/activity concerned is emphasized):

Mr. Busby has worked with amphibians throughout the Lower Mainland for the last 25 years. As part of these works Mr. Busby has extensive knowledge working with amphibians, including habitat identification, habitat suitability assessments, and salvage/handling.

The following table provides a list of projects, target salvage species and the number of individuals salvaged pertaining to projects involving amphibian salvage and handling.

Client: Enbridge Inc. Project: Chilliwack Mainline Replacement Project Description: Conducted salvages and sweeps ahead of construction works and performing three years post construction monitoring to determine re-establishment of the area. Target Salvage Species: Oregon Spotted Frog Number of Individuals Salvaged: 6 frogs and multiple egg masses	2017-on going
Client: Canadian National Railway Co. Project: Cox Pit Habitat Assessment Project Description: Conducted detailed assessment of wildlife to be impacted as a result of anticipated construction works. Formulated salvage plan to ensure works minimized impacts to amphibians within impacted wetlands. Target Salvage Species: Red-legged Frog and Oregon Spotted Frog Number of Individuals Salvaged: 0	2017 - 2018
Client: Ministry of Transportation & Infrastructure Project: Strong Pit Habitat and Wildlife Assessment Project Description: Conducted detailed assessment of habitat and wildlife to determine impacts to wildlife including Oregon Spotted Frogs. Target Salvage Species: Red-listed species specifically Organ Spotted Frog and Pacific Water Shrew Number of Individuals Salvaged: 0	2013

<p>Client: Public Works Canada/Department of National Defence</p> <p>Project: Canadian Forces base Aldergrove</p> <p>Project Description: Assisted with assessment of habitat for Oregon Spotted frogs and assessed management options for bullfrog eradication and water level management.</p> <p>Target Salvage: None</p> <p>Number of Individuals Salvaged: 0</p>	2011
---	------

Name: Geoff Smart (R.P.Bio)
 Position: Wildlife Biologist
 Department/Organization: EBB Environmental Consulting Inc
 Region/Institution: N/A
 Phone: (604) 943 - 3209
 Fax: N/A
 E-mail: gsmart@ebbconsulting.ca

Mailing Address:

PO Box 18180 1251C
 56th Street
 Delta BC
 V4L 2M4

Experience related to the described species, methods and proposal ensure that experience related to the taxa concerned is emphasized):

Mr. Smart is a Project Biologist with EBB Environmental Consultants and has over 12 years of experience in environmental consulting. Mr. Smart has provided professional services to government, industry and private sector clients. These services have included wildlife salvages and terrestrial and aquatic habitat assessments.

The following table provides a list of projects, target salvage species and the number of individuals salvaged pertaining to projects involving amphibian salvage and handling.

<p>Client: Canadian National Railway Co.</p> <p>Project Cox Pit Habitat Assessment</p> <p>Project Description: Conducted detailed assessment of wildlife to be impacted as a result of anticipated construction works. Formulated salvage plan to ensure works minimized impacts to amphibians within impacted wetlands.</p> <p>Target Salvage Species: Red-legged Frog and Oregon Spotted Frog</p> <p>Number of Individuals Salvaged: 0</p>	2018
<p>Client: Enbridge Inc.</p> <p>Project: Chilliwack Mainline Replacement</p> <p>Project Description: Conducted salvages and sweeps of ahead of construction works and performing three years post construction monitoring to determine re-establishment of the area.</p> <p>Target Salvage Species: Oregon Spotted Frog</p> <p>Number of Individuals Salvaged: 6 frogs and multiple egg masses</p>	2017

as the endpoint), *capture methods with a high potential of causing severe injury that could result in severe chronic pain and/or death.*

Appendix B:

Canadian Council on Animal Care guidelines on: the care and use of wildlife (2003)

http://www.ccac.ca/en/_standards/guidelines

<https://www.ccac.ca/Documents/Standards/Guidelines/Wildlife.pdf>



**FISH AND WILDLIFE MANAGEMENT BRANCH
ANIMAL CARE APPLICATION FORM**

PLEASE TYPE

(F11 key will tab you through to the next box requiring information)

For office use: Date Received:

Project Number:

1. Project Title: Pond Dwelling Amphibian Salvage for the Trans Mountain Pipeline ULC Trans Mountain Pipeline Expansion Project (TMEP) – South Coast Region (Area B – Fraser River to Abbotsford)

2. Starting Date: (Note, if multi-year include the process of this) June 15, 2020
Completion Date: December 31, 2023

3. Principal Investigator: Must be a Qualified Person as defined by the [Natural Resource Sector QP Guidance Document](#)

Name: Claudio Bianchini (R.P.Bio)

Position: Senior Wildlife Biologist

Department/Organization: McTavish Resource & Management Consultants Ltd.

Region/Institution: N/A

Phone: (604) 219 - 9699

Fax: N/A

E-mail: claudio@mctavishconsultants.ca

Mailing Address:

Unit 203-19292 60 Avenue

Surrey BC

V3S 3M2

Experience related to the described species, methods and proposal (ensure that experience related to the taxa/activity concerned is emphasized):

Mr. Bianchini has worked with amphibians and other wildlife for over 25 years, and has extensive experience with species identification, mapping, habitat impact assessments, handling, trapping, temporary holding, and disease protocols. This includes Coastal Tailed Frog, Northern Red-legged Frog, Western Toad, and Coastal Giant Salamander. He has conducted three years of baseline inventory and post construction sampling as well as salvages during construction for Coastal Tailed Frog for the Lorenzetta Creek Hydroelectric Project (Laidlaw, BC). Claudio has also conducted three years of baseline inventory for Coastal Tailed Frog and Pacific Giant Salamander for the proposed Frost Creek Hydroelectric Project (Cultus Lake, BC), as well as conducted amphibian salvage including Northern Red-legged Frog and Western Toad for various projects in the Lower Mainland.

The following table provides a list of projects, target salvage species and the number of individuals salvaged pertaining to projects involving amphibian salvage and handling.

<p>Client: Trans Mountain Pipeline ULC</p> <p>Project: Trans Mountain Expansion Project</p> <p>Project Description: Amphibian Salvage associated with the Burnaby Terminal Facility Upgrades and Expansion. Salvage effort included sweeps of aquatic and riparian habitat during clearing and construction activities. Salvage efforts followed the provincial Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2016).</p> <p>Target Salvage Species: Northern Pacific Tree Frog (<i>Pseudacris regilla</i>) and Northern Red-Legged Frog (<i>Rana aurora</i>)</p> <p>Number of Individuals Salvaged: 191 (9 Red-legged Frogs, 27 Long-toed Salamanders & 155 Pacific Tree Frogs)</p>	2019
<p>Client: Trans Mountain Pipeline ULC</p> <p>Project: Trans Mountain Expansion Project</p> <p>Project Description: Visual assessment of habitat with potential to support the species identified within the project footprint as part of the baseline survey for species at risk in the Lower Mainland and Fraser Valley. Visual assessment included collection of baseline habitat characteristics and biophysical attributes, assessment of critical habitat suitability, and visual surveys for the species.</p> <p>Target Salvage Species: Oregon Spotted Frog (<i>Rana pretiosa</i>) and Coastal Giant Salamander (<i>Dicamptodon tenebrosus</i>)</p> <p>Number of Individuals Salvaged: 0 (numerous egg masses identified visually)</p>	2018-2019
<p>Client: Zella Holdings Ltd.</p> <p>Project: Lorenzetta Creek IPP</p> <p>Project Description: Post-construction Inventory for Coastal Tailed Frog. Assessment and inventory methods followed the provincial RISC standards. ¹</p> <p>¹ RISC. 2000. <i>Inventory Methods for Tailed Frog and Pacific Giant Salamander Standards for Components of British Columbia's Biodiversity No. 39</i> Prepared by Ministry of Environment, Lands and Parks Resources Inventory Branch for the Terrestrial Ecosystems Task Force Resources Inventory Committee, March 13, 2000. Version 2 <http://srmwww.gov.bc.ca/risc/pubs/tebiodiv/index.htm></p> <p>Target Salvage Species: Coastal Tailed Frog (<i>Ascaphus truei</i>)</p> <p>Number of Individuals Salvaged: 1176 (2017=440, 2018=342 & 2019=392)</p>	2017 - 2019

<p>Client: BC Hydro/Chartwell Consultants Ltd.</p> <p>Project: Furry Creek Clear Span Bridge Upgrade/Maintenance</p> <p>Project Description: Provided oversight and acted as the Principal Investigator. Salvage effort included two instream areas along the margins of Furry Creek and followed provincial Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2016) and provincial RISC standards (referenced in the above project).</p> <p>Target Salvage Species: Coastal Tailed Frog</p> <p>Number of Individuals Salvaged: 0</p>	2018
<p>Client: Valley Gravel Sales Ltd.</p> <p>Project: Makara Property – Gravel Quarry Operation</p> <p>Project Description: Conducted an amphibian salvage associated with gravel quarry operations. Salvage effort followed provincial Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2016)</p> <p>Target Salvage Species: Northern Red-Legged Frog and Western Toad (<i>Anaxyrus boreas</i>)</p> <p>Number of Individuals Salvaged: 0</p>	2016
<p>Client: Zella Holdings Ltd.</p> <p>Project: Lorenzetta Creek IPP</p> <p>Project Description: Coastal Tailed Frog salvage. Salvage effort included the instream area associated with an IPP intake and followed provincial Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2016) and provincial RISC standards (referenced in the above projects).</p> <p>Target Salvage Species: Coastal Tailed Frog</p> <p>Number of Individuals Salvaged: 627 Tadpoles</p>	2015
<p>Client: Zella Holdings Ltd.</p> <p>Project: Lorenzetta Creek IPP</p> <p>Project Description: Pre-construction Inventory for Coastal Tailed Frog. Assessment and inventory methods followed the provincial RISC standards. ¹</p> <p>¹ RISC. 2000. <i>Inventory Methods for Tailed Frog and Pacific Giant Salamander Standards for Components of British Columbia's Biodiversity No. 39 Prepared by Ministry of Environment, Lands and Parks Resources Inventory Branch for the Terrestrial Ecosystems Task Force Resources Inventory Committee, March 13, 2000. Version 2</i> <http://srmwww.gov.bc.ca/risc/pubs/tebiodiv/index.htm></p> <p>Target Salvage Species: Coastal Tailed Frog</p> <p>Number of Individuals Salvaged: 464 (2012=42, 2013=28, 2014=394)</p>	2012 - 2014

<p>Client: Zella Holdings Ltd.</p> <p>Project: Frosst Creek IPP</p> <p>Project Description: Coastal Tailed Frog and Pacific Giant Salamander baseline inventory. Assessment and inventory methods followed the provincial RISC standards.¹</p> <p>¹ RISC. 2000. <i>Inventory Methods for Tailed Frog and Pacific Giant Salamander Standards for Components of British Columbia's Biodiversity No. 39 Prepared by Ministry of Environment, Lands and Parks Resources Inventory Branch for the Terrestrial Ecosystems Task Force Resources Inventory Committee, March 13, 2000. Version 2</i> <http://srmwww.gov.bc.ca/risc/pubs/tebiodiv/index.htm></p> <p>Target Salvage Species: Coastal Tailed Frog</p> <p>Number of Individuals Salvaged: Coastal Tailed Frog: 384 (2012=7, 2013=30 & 2014=347); Pacific Giant Salamander: 12 (2012=1, 2013=3 & 2014=8)</p>	2012 - 2014
<p>Client: Valley Gravel Sales Ltd.</p> <p>Project: 37271 Ward Rd – Gravel Quarry Operation</p> <p>Project Description: Provided oversight and acted as the Principal Investigator for an amphibian salvage associated with the infilling of a wetland as part of a gravel quarry expansion. Salvage effort followed provincial Draft Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2014)</p> <p>Target Salvage Species: Northern Red-Legged Frog and Western Toad</p> <p>Number of Individuals Salvaged: Eight (8) Northern Red-Legged Frog and two (2) Northwestern Salamander (<i>Ambystoma gracile</i>)</p>	2015
<p>Client: Valley Gravel Sales Ltd./090602 BC Ltd.</p> <p>Project: Lot KW Gravel</p> <p>Project Description: Conducted an amphibian salvage associated with gravel quarry operations. Salvage effort followed provincial Draft Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2014)</p> <p>Target Salvage Species: Northern Red-Legged Frog and Western Toad</p> <p>Number of Individuals Salvaged: 0</p>	2014
<p>Client: Gateway Program</p> <p>Project: Port Mann/Highway 1 Project – Fraser Heights Connector</p> <p>Project Description: Amphibian Salvage following provincial best management practices.</p> <p>Target Salvage Species: Northern Red-Legged Frog and Western Toad</p> <p>Number of Individuals Salvaged: >20 (data with Gebauer & Assoc.)</p>	2009 - 2015

Client: BC Ministry of Transportation and Infrastructure (MOTI) Project: Highway 1 Truck Climbing Lane Project Description: Amphibian Salvage following provincial best management practices. Target Salvage Species: Northern Red-Legged Frog and Western Toad Number of Individuals Salvaged: 0	2013 - 2014
Client: Gary Toor and District of Mission Project: Gaudin Creek Realignment Project Description: Amphibian salvage following provincial best management practices. Target Salvage Species: Northern Red-Legged Frog Number of Individuals Salvaged: 48 amphibians total; twelve (12) Northern Red-legged Frogs, eighteen (18) Northwestern Salamanders, and seven (7) Green Frogs.	2008

4. Additional Investigators: **copy and paste if you require more than two**

Name: Cassidy Hedden (B.Sc., R.P.Bio., P.Biol) Mailing Address: Unit 203-19292 60 Avenue
 Position: Environment, Technical Lead Surrey BC
 Department/Organization: McTavish Resource & Management Consultants Ltd. V3S 3M2
 Region/Institution: N/A
 Phone: (236) 688-1780
 Fax: N/A
 E-mail: cassidy@mctavishconsultants.ca

Experience related to the described species, methods and proposal (ensure that experience related to the taxa/activity concerned is emphasized):

Ms. Hedden is a Project Biologist with McTavish Resource & Management Consultants Ltd. and has over five years of experience in environmental consulting, specializing in freshwater aquatic ecosystems. Since 2015 she has provided professional services to government, industry and private sector clients. These services have included wildlife salvages and terrestrial and aquatic habitat assessment for the following amphibian species: Northern Red-legged Frog (*Rana aurora*), Western Toad (*Anaxyrus boreas*), Northern Pacific Treefrog (*Pseudacris regilla*), Oregon Spotted Frog (*Rana pretiosa*), and Coastal Tailed Frog (*Ascaphus truei*).

The following table provides a list of projects, target salvage species and the number of individuals salvaged pertaining to projects involving amphibian salvage and handling.

<p>Client: Trans Mountain Pipeline ULC</p> <p>Project: Trans Mountain Expansion Project</p> <p>Project Description: Visual assessment of habitat with potential to support the species identified within the project footprint as part of the baseline survey for species at risk in the Lower Mainland and Fraser Valley. Visual assessment included collection of baseline habitat characteristics and features, assessment of critical habitat suitability and documentation of biophysical attributes, and visual surveys for the species.</p> <p>Target Salvage Species: Oregon Spotted Frog (<i>Rana pretiosa</i>) and Coastal Giant Salamander (<i>Dicamptodon tenebrosus</i>)</p> <p>Number of Individuals Salvaged: 0, numerous amphibian egg masses visually assessed and identified to species</p>	2018-2019
<p>Client: BC Hydro/Chartwell Consultants Ltd.</p> <p>Project: Furry Creek Clear Span Bridge Upgrade/Maintenance</p> <p>Project Description: Salvage effort included two instream areas along the margins of Furry Creek and followed provincial Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2016) and provincial RISC standards.¹</p> <p>¹ RISC. 2000. <i>Inventory Methods for Tailed Frog and Pacific Giant Salamander Standards for Components of British Columbia's Biodiversity No. 39 Prepared by Ministry of Environment, Lands and Parks Resources Inventory Branch for the Terrestrial Ecosystems Task Force Resources Inventory Committee, March 13, 2000. Version 2</i> <http://srmwww.gov.bc.ca/risc/pubs/tebiodiv/index.htm></p> <p>Target Salvage Species: Coastal Tailed Frog</p> <p>Number of Individuals Salvaged: 0</p>	2018
<p>Client: Bird Construction</p> <p>Project: 14292 Green Timbers Way, Surrey (RCMP Forensic Building Upgrades)</p> <p>Project Description: Northern Red-legged Frog salvage associated with culvert and drainage works required for a temporary laydown area. Salvage efforts followed the provincial Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2016).</p> <p>Target Salvage Species: Northern Red-Legged Frog</p> <p>Number of Individuals Salvaged: > 50 egg masses</p>	2017
<p>Client: Zella Holdings Ltd.</p> <p>Project: Lorenzetta Creek IPP</p> <p>Project Description: Coastal Tailed Frog salvage. Salvage effort included the instream area associated with an IPP intake and followed provincial Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2016) and provincial RISC standards (referenced in the above project).</p> <p>Target Salvage Species: Coastal Tailed Frog</p> <p>Number of Individuals Salvaged: 627 Tadpoles</p>	2015

<p>Client: Abbotsford Concrete Products</p> <p>Project: Facility upgrades</p> <p>Project Description: Salvage associated with infilling of an artificial pond feature for facility upgrades. Salvage efforts followed the provincial Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2016).</p> <p>Target Salvage Species: Northern Red-legged Frog and Western Toad</p> <p>Number of Individuals Salvaged: 2 Green Frog (<i>Lithobates clamitans</i>)</p>	2016
<p>Client: Valley Gravel Sales Ltd.</p> <p>Project: 37271 Ward Rd – Gravel Quarry Operation</p> <p>Project Description: Provided oversight and acted as the Principal Investigator for an amphibian salvage associated with the infilling of a wetland as part of a gravel quarry expansion. Salvage effort followed provincial Draft Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2014)</p> <p>Target Salvage Species: Northern Red-Legged Frog and Western Toad</p> <p>Number of Individuals Salvaged: Eight (8) Northern Red-Legged Frog and two (2) Northwestern Salamander (<i>Ambystoma gracile</i>)</p>	2015
<p>Client: Vancouver Island University</p> <p>Project: Natural Resource Extension Program</p> <p>Project Description: Installed and monitored pit traps to survey amphibian species presence at a wetland site in Nanaimo, BC as part of an education program focused on land monitoring skills which included wildlife surveys and habitat assessment.</p> <p>Target Salvage Species: All species</p> <p>Number of Individuals Salvaged: One Ensatina (<i>Ensatina eschscholtzii</i>),</p>	2014

Name: Oliver Busby (R.P.Bio)
 Position: Senior Wildlife Biologist
 Department/Organization: EBB Environmental Consulting Inc
 Region/Institution: N/A
 Phone: (604) 943 - 3209
 Fax: (604) 948-3273
 E-mail: busby@ebbconsulting.ca

Mailing Address: PO Box 18180 1251C
 56th Street
 Delta BC
 V4L 2M4

Experience related to the described species, methods and proposal (ensure that experience related to the taxa/activity concerned is emphasized):

Mr. Busby has worked with amphibians throughout the Lower Mainland for the last 25 years. As part of these works Mr. Busby has extensive knowledge working with amphibians, including habitat identification, habitat suitability assessments, and salvage/handling.

The following table provides a list of projects, target salvage species and the number of individuals salvaged pertaining to projects involving amphibian salvage and handling.

Client: Enbridge Inc. Project: Chilliwack Mainline Replacement Project Description: Conducted salvages and sweeps of ahead of construction works and performing three years post construction monitoring to determine re-establishment of the area. Target Salvage Species: Oregon Spotted Frog Number of Individuals Salvaged: 6 frogs and multiple egg masses	2017-on going
Client: Canadian National Railway Co. Project: Cox Pit Habitat Assessment Project Description: Conducted detailed assessment of wildlife to be impacted as a result of anticipated construction works. Formulated salvage plan to ensure works minimized impacts to amphibians within impacted wetlands. Target Salvage Species: Red-legged Frog and Oregon Spotted Frog Number of Individuals Salvaged: 0	2017 - 2018
Client: Ministry of Transportation & Infrastructure Project: Strong Pit Habitat and Wildlife Assessment Project Description: Conducted detailed assessment of habitat and wildlife to determine impacts to wildlife including Oregon Spotted Frogs. Target Salvage Species: Red-listed species specifically Organ Spotted Frog and Pacific Water Shrew Number of Individuals Salvaged: 0	2013

<p>Client: Public Works Canada/Department of National Defence</p> <p>Project: Canadian Forces base Aldergrove</p> <p>Project Description: Assisted with assessment of habitat for Oregon Spotted frogs and assessed management options for bullfrog eradication and water level management.</p> <p>Target Salvage: None</p> <p>Number of Individuals Salvaged: 0</p>	2011
---	------

Name: Geoff Smart (R.P.Bio)
 Position: Wildlife Biologist
 Department/Organization: EBB Environmental Consulting Inc
 Region/Institution: N/A
 Phone: (604) 943 - 3209
 Fax: N/A
 E-mail: gsmart@ebbconsulting.ca

Mailing Address:

PO Box 18180 1251C
 56th Street
 Delta BC
 V4L 2M4

Experience related to the described species, methods and proposal ensure that experience related to the taxa concerned is emphasized):

Mr. Smart is a Project Biologist with EBB Environmental Consultants and has over 12 years of experience in environmental consulting. Mr. Smart has provided professional services to government, industry and private sector clients. These services have included wildlife salvages and terrestrial and aquatic habitat assessments.

The following table provides a list of projects, target salvage species and the number of individuals salvaged pertaining to projects involving amphibian salvage and handling.

<p>Client: Canadian National Railway Co.</p> <p>Project Cox Pit Habitat Assessment</p> <p>Project Description: Conducted detailed assessment of wildlife to be impacted as a result of anticipated construction works. Formulated salvage plan to ensure works minimized impacts to amphibians within impacted wetlands.</p> <p>Target Salvage Species: Red-legged Frog and Oregon Spotted Frog</p> <p>Number of Individuals Salvaged: 0</p>	2018
<p>Client: Enbridge Inc.</p> <p>Project: Chilliwack Mainline Replacement</p> <p>Project Description: Conducted salvages and sweeps of ahead of construction works and performing three years post construction monitoring to determine re-establishment of the area.</p> <p>Target Salvage Species: Oregon Spotted Frog</p> <p>Number of Individuals Salvaged: 6 frogs and multiple egg masses</p>	2017

Name: Daniel Kelly
 Position: Environmental Technician
 Department/Organization: McTavish Resource & Management Consultants Ltd.
 Region/Institution: N/A
 Phone: (604) 302-4075
 Fax: N/A
 E-mail: daniel@mctavishconsultants.ca

Mailing Address: Unit 203-19292 60 Avenue
 Surrey BC
 V3S 3M2

Experience related to the described species, methods and proposal ensure that experience related to the taxa concerned is emphasized):

Daniel is a graduate of BCIT and holds an Environmental Technician Certificate from Vancouver Island University. Daniel has worked in the environmental industry since 1999, and has accumulated experience in soil and water sampling, fish isolation, water quality sampling, environmental monitoring, wildlife and bird surveys, wildlife salvages, vegetation assessments, soils and stream assessments. He has supervised fish and wildlife salvage crews and coordinated site restoration and environmental monitoring on large transmission line projects.

The following table provides a list of recent projects, target salvage species and the number of individuals salvaged pertaining to projects involving amphibian salvage and handling.

<p>Client: Trans Mountain Pipeline ULC</p> <p>Project: Trans Mountain Expansion Project</p> <p>Project Description: Amphibian Salvage associated with the Burnaby Terminal Facility Upgrades and Expansion. Salvage effort included sweeps of aquatic and riparian habitat during clearing and construction activities. Salvage efforts followed the provincial Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2016).</p> <p>Target Salvage Species: Northern Pacific Tree Frog (<i>Pseudacris regilla</i>) and Northern Red-Legged Frog (<i>Rana aurora</i>)</p> <p>Number of Individuals Salvaged: 191 (9 Red-legged Frogs, 27 Long-toed Salamanders & 155 Pacific Tree Frogs)</p>	2019
--	------

Name: Taisha Mitchell (P.Ag, BIT) Mailing Address: Unit 203-19292 60 Avenue
Position: Project Biologist Surrey BC
Department/Organization: McTavish Resource & Management Consultants Ltd. V3S 3M2
Region/Institution: N/A
Phone: (604) 364-1332
Fax: N/A
E-mail: taisha@mctavishconsultants.ca

Experience related to the described species, methods and proposal ensure that experience related to the taxa concerned is emphasized):

Ms. Mitchell is a Project Biologist with McTavish Resource & Management Consultants Ltd has over three years of consulting experience providing environmental monitoring services for various oil and gas and development projects across British Columbia. Taisha has undertaken wildlife and vegetation assessments, wildlife salvages, aquatic assessment, and agricultural capability assessment; and has managed multiple project components including wildlife and vegetation assessment.

The following table provides a list of recent projects, target salvage species and the number of individuals salvaged pertaining to projects involving amphibian salvage and handling.

<p>Client: Trans Mountain Pipeline ULC</p> <p>Project: Trans Mountain Expansion Project</p> <p>Project Description: Amphibian Salvage associated with the Burnaby Terminal Facility Upgrades and Expansion. Salvage effort included sweeps of aquatic and riparian habitat during clearing and construction activities. Salvage efforts followed the provincial Best Management Practices for Amphibian and Reptile Salvages in BC (MFLNRO, 2016).</p> <p>Target Salvage Species: Northern Pacific Tree Frog (<i>Pseudacris regilla</i>) and Northern Red-Legged Frog (<i>Rana aurora</i>)</p> <p>Number of Individuals Salvaged: 191 (9 Red-legged Frogs, 27 Long-toed Salamanders & 155 Pacific Tree Frogs)</p>	2019
--	------

Name: Jillian Wheatley (B.Sc. Dipl.Tech.) Mailing Address: Unit 203-19292 60 Avenue
 Position: Environmental Technician Surrey BC
 Department/Organization: McTavish Resource & Management Consultants Ltd. V3S 3M2
 Region/Institution: N/A
 Phone: (604) 803-7656
 Fax: N/A
 E-mail: jillian@mctavishconsultants.ca

Experience related to the described species, methods and proposal ensure that experience related to the taxa concerned is emphasized):

Ms. Wheatley and has over two years of experience working with fish and wildlife in the public and private sectors. In her current role, Ms. Wheatley performs pre-construction bird nest activity surveys and monitoring and fish and wildlife salvages and prepares associated reports.

Ms. Wheatley has a Bachelor of Science degree in Ecological Restoration and a Diploma of Technology in Forest and Natural Areas Management from the British Columbia Institute of Technology (BCIT). Through her education and employment, she has gained experience with amphibian trapping and handling.

The following table provides a list of projects, target salvage species and the number of individuals salvaged pertaining to small mammal trapping and handling.

<p>Client: South Coast Conservation Land Management Program</p> <p>Project: Restoring and reconnecting floodplain forest in the Heart of the Fraser</p> <p>Project Description: Amphibian presence/ not detected surveys were performed in Bert Brink Wildlife Management Area as a component of a biophysical inventory. Soft-sided amphibian traps were used within a stormwater channel and stormwater pond, and handling methods followed the provincial best management practices (MOE 2009).</p> <p>As the surveys were a component of a biophysical inventory, salvage was not included. A component of the amphibian sampling was to determine what native frogs and amphibians were interacting with the site. Further to aquatic sampling, artificial cover boards were established following best management practices (Fernandes 2002). Only Green Frog (<i>Lithobates clamitans</i>) were detected during terrestrial and aquatic sampling efforts.</p> <p><i>Fernandes, R. 2002. Simplified steps for salamander monitoring. The clean water team guidance compendium for watershed monitoring and assessment wildlife research center, state water resources control board, division of water quality, Sacramento CA.</i></p> <p><i>[MOE 2009] Ministry of Environment. 2009. Inventory methods for pond-breeding amphibians and painted turtle. Standards for components of British Columbia's biodiversity No.37. Province of British Columbia, Resources Inventory Committee, Vancouver BC.</i></p> <p>Target Salvage Species: N/A</p> <p>Number of Individuals Salvaged: N/A</p>	<p>2018</p>
--	-------------

Name: Terita Deare (B.Sc., Dipl.Tech., BIT)
 Position: Environmental Technician
 Department/Organization: Pinchin Ltd.
 Region/Institution: N/A
 Phone: (604) 425-1924
 Fax: N/A
 E-mail: tdeare@Pinchin.com

Mailing Address:

Suite 201, 34143 Marshall Road
 Abbotsford BC
 V2S 1L8

Experience related to the described species, methods and proposal ensure that experience related to the taxa concerned is emphasized):

Ms. Terita is an Environmental Technologist with Pinchin Ltd. (subconsultant to McTavish Resource & Management Consultants Ltd.) and has over two years of experience working with fish and wildlife. In her current role, Ms. Terita performs pre-construction fish and wildlife salvages, bird nest activity surveys and monitoring and prepares environmental assessments for development, including invasive plant management and environmental mitigation planning.

Ms. Terita has a Bachelor of Science degree in Ecological Restoration and Fish, Wildlife and Recreation Diploma from the British Columbia Institute of Technology (BCIT). Through her education and work experience, Ms. Terita has gained experience with small mammal trapping and handling.

The following table provides a list of projects, target salvage species and the number of individuals salvaged pertaining to small mammal trapping and handling.

<p>Client: Metro Vancouver Regional Parks, Ducks Unlimited Canada</p> <p>Project: Wetland Restoration Project in Derby Reach Regional Park</p> <p>Project Description: Baseline inventory of amphibian species utilizing the wetland by prescribing restoration efforts in order to preserve local threatened amphibian populations. Wetland sweeps, egg mass surveys and overnight minnow trapping were conducted to capture amphibians and then released after identifying. Trapping efforts followed the RISC Standards for Pond-breeding Amphibians and Painted Turtle (1998).</p> <p>Target Salvage Species: Northern Red-legged Frog (<i>Rana aurora</i>), Oregon Spotted Frog (<i>Rana pretiosa</i>), and Western Toad (<i>Anaxyrus boreas</i>)</p> <p>Number of Individuals Captured: 25 Northwestern Salamanders (<i>Ambystoma gracile</i>), 2 Pacific Treefrogs (<i>Pseudacris regilla</i>), 3 Long-toed Salamanders (<i>Ambystoma macrodactylum</i>), 1 Western Toad</p>	2019
<p>Client: BCIT</p> <p>Project: Coastal Tailed Frog Surveys in Golden Ears Provincial Park</p> <p>Project Description: Conducting stream sweeps in a creek for educational purposes following the RISC Standards for Tailed Frog and Pacific Giant Salamander (2000).</p> <p>Target Salvage Species: Coastal tailed frog (<i>Ascaphus truei</i>)</p> <p>Number of Individuals Captured: 6 (1 adult and 10 tadpoles)</p>	2016
<p>Client: BCIT Forest Society</p> <p>Project: Amphibian Inventory within Woodlot 007</p>	2015

Project Description: Conducting linear amphibian sweeps in the forests for educational purposes.

Target Salvage Species: All species

Number of Individuals Captured: 5 Ensatinas (*Ensatina eschscholtzii*), 1 Pacific Treefrog, & 6 Northwestern Salamanders

Other personnel working with protocol: (include experience)

5. Project Proposal (be concise and write in lay language. The information in all sections of this application should be complete so that it can be evaluated as a stand-alone document. The proposal must include all applicable information about animals and their handling and care relating to the project. Only maps can be included as additional material.

A. Background – Goals and Objectives:

Trans Mountain Pipeline ULC (Trans Mountain) submitted an application with the National Energy Board (NEB) in December 2013 for the Trans Mountain Expansion Project (TMEP). A Certificate of Public Convenience and Necessity (CPCN OC-064) allowing the Project to proceed was issued by the Government of Canada on December 1, 2016. The Government of BC issued an Environmental Assessment Certificate on January 11, 2017.

The purpose of this Permit Application is to avoid incidental mortality of amphibians within the pipeline construction footprint from the Fraser River to Abbotsford. Trans Mountain will engage a Qualified Professional(s) with species experience as defined by the Natural Resource Sector QP Guidance Document to complete amphibian salvage activities. The Qualified Professional(s) will complete a search for amphibians prior to the onset of clearing and construction activities. Systematic searches will be conducted of the identified wetlands as well as immediately adjacent terrestrial habitat within the pipeline construction footprint within 150 m of the identified wetlands (where suitable habitat is present), looking under moveable cover objects. All amphibians encountered prior to the onset of clearing, and incidentally encountered on the Project Footprint during construction will be moved out of the work zone and out of harm's way to nearby pre-identified suitable habitat (within ~150 m of the Project area depending on terrain and land access permission).

B. Key Expected Results and Management Implications:

Amphibians encountered on the pipeline construction footprint will be captured by hand (or using a net) and immediately transported outside the work zone (within ~150 m of the capture site depending on terrain and land access permission). The release sites will be within the same general habitat (within wetland of capture site but outside the work zone) or within suitable habitat in close proximity to the salvage site (i.e., within daily/seasonal movement distances). The relocation of individuals within close proximity to their capture site is expected to have limited spatial scope of impact or risk to amphibian species, populations or their habitat.

6. CCAC Invasiveness Category: (see Appendix A)

A ____ B ____ C ☒ D ____

For further information: www.frontcounterbc.ca

Last updated: Sept 14, 2015 Phone: 1-877-855-3222 (within North America) or ++1-778-372-0729 (outside of North America)

7. Species and Number of Animals Required: (include justification of animal numbers predicted to be captured/handled). If exact numbers are not known, please provide a reasonable order of magnitude based on your professional assessment of habitat, location, species etc. – for example, under 10, 100s or 1000s. For multi-species and multi-year projects, indicate expected numbers for each species and each year of the project.

Species (both standard common and Latin names preferred):

Western toad (*Anaxyrus boreas*)
 Red-legged frog (*Rana aurora*)
 Northern Pacific treefrog (*Pseudacris regilla*)
 Northwestern salamander (*Ambystoma gracile*)
 Red-backed salamander (*Plethodon vehiculum*)
 Rough-skinned newt (*Taricha granulosa*)
 Long-toed salamander (*Ambystoma macrodactylum*)
 Columbia spotted frog (*Rana luteiventris*)

Number expected for 2020 to 2023 :

The number of amphibians that will be encountered, captured and moved is unknown.

Justification for numbers:

The number of amphibians that will be encountered in the Project work area is unknown.

8. Details of Capture, Handling, Sampling and Surgical Procedures and Final Disposition: (Be detailed and SPECIFIC. It is not sufficient to just refer to a particular protocol (e.g., RISC protocol).

Please refer to Appendix B – CCAC guidelines on: the care and use of wildlife (2003) and other documents such as AVMA Guidelines for Euthanasia of Animals (2013) for appropriate and humane techniques and guidelines for handling and care.

For wildlife salvage permits, please consult the [Salvage Permit Information Checklist](#) to ensure that all necessary information is included. Incomplete information will cause delays in the review process.

Standard capture and handling techniques will be used and holding time will be minimal. Best Management Practices for Amphibian and Reptile Salvages in British Columbia (BC MFLNRO 2016) were used to guide the development of these salvage protocols. Detailed information is provided below.

Capture Technique: Please give details of capture techniques used as well as reference to standards or reference researchers who have previously used the technique. If traps are to be used please specify the type of traps, how long the traps are to be set, modifications made for the target species and the interval they will be checked.

The permit will be for a Qualified Professional(s) that will be onsite and will complete a search for amphibians prior to the onset of clearing activities. The Qualified Professional(s) will conduct systematic searches of the area for amphibians before clearing is set to begin. Depending on wetland size and condition, amphibian salvage will begin up to 7 days before clearing and construction activities. Searches will include looking under moveable cover objects. All amphibians encountered prior to the onset of clearing and incidentally during construction activities will be moved out of the work zone and out of harm's way. Capture methods suitable to the season and life stage encountered will be used (BC MFLNRO 2016). Adult and juvenile amphibians will be captured by hand, or using a small net, and placed into a bucket or container for immediate transport out of the work zone and into adjacent suitable habitat (BC MFLNRO 2016). Egg masses and tadpoles will be scooped using a small net, and placed into a bucket with fresh water from the site of capture for immediate transport out of the work zone and into adjacent suitable habitat (BC MFLNRO 2016). In locations where highly-aquatic species are present,

For further information: www.frontcounterbc.ca

Last updated: Sept 14, 2015 Phone: 1-877-855-3222 (within North America) or ++1-778-372-0729 (outside of North America)

unbaited aquatic funnel traps may be used if necessary to ensure that all individuals are captured prior to clearing and construction activities. All equipment will be cleaned regularly following standard hygiene protocols established by the BC Ministry of Environment to avoid the spread of disease among individuals (BC Ministry of Environment 2008).

Fencing will be used to exclude the salvage area, preventing amphibians from entering the work area during and following salvage activities. Placement of fencing will be determined on a site by site basis depending on the location of the wetland relative to the Project footprint, the terrain, and the site conditions. The fencing will be removed upon completion of Project activities.

Method of Handling:

Amphibians will be placed into a bucket for immediate transport out of the work zone. Adult and juvenile amphibians will be placed in individual clean, well ventilated container. Egg masses or tadpoles will be scooped into a bucket with a ventilated lid containing fresh water from the capture site. All animal care protocols will be adhered to (e.g., gloves worn, animals kept separate, etc.). Amphibians will be kept at an appropriate temperature between salvage and release sites. Amphibians will be released at the release location immediately, where feasible (e.g., release within the same wetland). Where release sites are selected away from the wetland of capture, amphibians will be released within 4 hours of capture. Extra care will be taken to relocate sensitive life stages (e.g., tadpoles) in an expeditious manner. All equipment will be cleaned regularly following standard hygiene protocols established by the BC Ministry of Environment to avoid the spread of disease among individuals.

Other Procedures: (Marking method, Sampling)

Animals will not be marked or tagged. No other procedures to list.

Chemical Restraint, Analgesics or other Pharmaceutical Agents used: (Drug names should be included with doses and volumes planned):

No chemicals, analgesics or other pharmaceuticals will be used.

Contingency Plan: (What training, preparations and equipment are available in event of animal injury during capture or handling). A contingency plan is mandatory because accidents are not predictable. Describe what preplanning, resources and contacts are available in the event of accidental animal injury during capture and handling.

Injury is unlikely but in the case that an amphibians is seriously injured during trapping or handling, it will be euthanized following directions outlined in provincial standards.

Method of Euthanasia and Disposal Technique: (All projects must be prepared to humanely euthanize animals with an appropriate technique). Euthanized animals should be submitted to a museum collection, unless damaged beyond usefulness for archival purposes or other logistical constraints. If not retained for archival purposes, animals should be disposed of appropriately to avoid environmental contamination or other unintended consequences. See [Canadian Council on Animal Care guidelines](#) or [AVMA Guidelines for the Euthanasia of Animals \(2013\)](#) for appropriate species specific methods.

In the case of accidental injury where euthanasia is required, euthanasia will follow a physical method causing rapid loss of brain function: decapitation followed by pithing. Prior to euthanasia, a deep level of anaesthesia will be achieved and confirmed using Orajel® (BC MFLNRO 2017).

British Columbia Ministry of Forests, Lands, and Natural Resource Operations. 2016. Best Management Practices for Amphibian and Reptile Salvages in British Columbia. Version 1.0., June 2, 2016. 57 pp.

British Columbia Ministry of Forests, Lands, and Natural Resource Operations. 2017. Bullfrog Euthanasia SOP. 1pp.

British Columbia Ministry of Environment. 2008. Standard Operating Procedures: Hygiene Protocols for Amphibian Fieldwork: Interim Hygiene Protocols for Amphibian Field Staff and Researchers.

9. Details of Potentially Controversial Procedures and Justification:
(Include any expected morbidity and methods used to avoid)

No controversial procedures are being considered.

10. Budget:
Funding sources applied for:

Are these peer reviewed? NO

Status: APPROVED

11. Region:

Identify the study area(s) in general and specific terms: (e.g. Region #, land status). Please attach maps if appropriate. For salvage permits, include maps indicating source and release sites.

South Coast Region (Area B – Fraser River to Abbotsford). See attached spreadsheet and maps.

12. Permit:

Please send the completed BC Animal Care Form Application Form to FrontCounter BC along with a General Permit Application and permit fees (if applicable). For further information on how to apply, please visit the FrontCounter BC website at <http://www.frontcounterbc.gov.bc.ca/guides/fish-wildlife/general-permit/overview/>

Approval of an Animal Care Application does not constitute approval of any application to handle wildlife. Applicants must also have a valid permit, issued under the *Wildlife Act*, before engaging in any such activity.



April 28, 2020

Principal Investigator's

Signature Date of Application

Please ensure you save this document to your desktop to upload with your General Wildlife Application.

For further information: www.frontcounterbc.ca

Last updated: Sept 14, 2015 Phone: 1-877-855-3222 (within North America) or ++1-778-372-0729 (outside of North America)

Direct any comments about this form to FrontCounterBC@gov.bc.ca

Appendix A: Canadian Council on Animal Care: Categories of Invasiveness for Wildlife Studies

A. Methods used on most invertebrates or on live isolates

Possible examples: the use of tissue culture and tissues obtained at necropsy; the use of eggs, protozoa or other single-celled organisms; experiments involving containment, incision or other invasive procedures on metazoa.

B. Methods used which cause little or no discomfort or stress

Possible examples: observational studies in which the same individuals are not repeatedly observed so as to habituate or otherwise modify their behavior; census or other surveys which do not involve capture or marking individuals; non-invasive studies on animals that have been habituated to captivity; short periods of food and/or water deprivation equivalent to periods of abstinence in nature.

C. Methods which cause minor stress or pain of short duration

Possible examples: capture, using methods with little or no potential to cause injury and marking of animals for immediate release; long-term observational studies on free-ranging animals where the behaviour of individuals may be altered by repeated contact; brief restraint for blood or tissue sampling; short periods of restraint beyond that for simple observation or examination, but consistent with minimal distress; short periods of food and/or water deprivation which exceed periods of abstinence in nature; exposure to non-lethal levels of drugs or chemicals; low velocity darting and slow-injection darts with immobilization chemicals. Such procedures should not cause significant changes in the animal's appearance, in physiological parameters such as respiratory or cardiac rate, or fecal or urinary output, in social responses or *in ability to survive*.

Note: During or after Category C studies, animals must not show self-mutilation, anorexia, dehydration, hyperactivity, increased recumbency or dormancy, increased vocalization, aggressive-defensive behavior or demonstrate social withdrawal and self-isolation.

D. Methods which cause moderate to severe distress or discomfort

Possible examples: *capture, using methods that have the potential to cause injury (e.g. Leg snares, leg hold traps, high velocity darting and rapid-injection darts with immobilization chemicals, net gunning, etc.); maintenance of wild caught animals in captivity; translocation of wildlife to new habitats; major surgical procedures conducted under general anesthesia, with subsequent recovery; prolonged (several hours or more) periods of physical restraint; induction of behavioral stresses such as maternal deprivation, aggression, predator-prey interactions; procedures which cause severe, persistent or irreversible disruption of sensorimotor organization.*

Other examples *in captive animals* include induction of anatomical and physiological abnormalities that will result in pain or distress; the exposure of an animal to noxious stimuli from which escape is impossible; the production of radiation sickness; exposure to drugs or chemicals at levels that impair physiological systems. (NB. *Experiments described in this paragraph would be Category E if performed on wildlife immediately prior to release.*)

Note: Procedures used in Category D studies should not cause prolonged or severe clinical distress as may be exhibited by a wide range of clinical signs, such as marked abnormalities in behavioral patterns or attitudes, the absence of grooming, dehydration, abnormal vocalization, prolonged anorexia, circulatory collapse, extreme lethargy or disinclination to move, and clinical signs of severe or advanced local or systemic infection, etc.

E. Procedures which cause severe pain near, at, or above the pain tolerance threshold of unanesthetized conscious animals.

This Category of Invasiveness is not necessarily confined to surgical procedures, but may include exposure to noxious stimuli or agents whose effects are unknown; exposure to drugs or chemicals at levels that (may) markedly impair physiological systems and which cause death, severe pain, or extreme distress; behavioral studies about which the effects of the degree of distress are not known; *environmental deprivation that has the potential to seriously jeopardize an animal's wellbeing*; use of muscle relaxants or paralytic drugs without anesthetics; burn or trauma infliction on unanesthetized animals; a euthanasia method not approved by the CCAC; any procedures (e.g., the injection of noxious agents or the induction of severe stress or shock) that will result in pain which approaches the pain tolerance threshold and cannot be relieved by analgesia (e.g., removal of teeth without analgesia, or when toxicity testing and experimentally-induced infectious disease studies have death

as the endpoint), *capture methods with a high potential of causing severe injury that could result in severe chronic pain and/or death.*

Appendix B:**Canadian Council on Animal Care guidelines on: the care and use of wildlife (2003)**

http://www.ccac.ca/en/_standards/guidelines

<https://www.ccac.ca/Documents/Standards/Guidelines/Wildlife.pdf>