Attachment 2
Environmental Protection Plan

TABLE 1

AMENDMENTS TO THE NORTHWEST MAINLINE EXPANSION ENVIRONMENTAL PROTECTION PLAN (EPP) BETWEEN THE AUGUST 2012 AND THE AS-FILED NATIONAL ENERGY BOARD (NEB) JULY 2012 EPP

Reference - Final EPP (July 2012 EPP)	Amendment/Action	Request from NEB	Rationale
Section 4.0, Section 5.0, Section 7.0, Section 8.4, Section 8.7	Inclusion of additional regulatory notification and permitting details.		Additional regulatory notifications required as a result of the Hydrostatic Test Program, post NEB filing and the oil and gas commission NEB Pipeline Provincial Authorizations Application Manual (August 2012)
Section 7.0, Section 7.0, Table 1	Revised the following 'Rare Plants / Rare Ecological Communities' measure to include hydrostatic test sites and access routes: Clearly mark identified rare plant locations before the start of right-of-way preparation and construction. This measure was also included in Section 7.0 in place of the measure outlined in Table 1.		Updated to ensure consistency with the vegetation survey for the Hydrostatic Test Program, post NEB filing. General mitigation measures removed from 'Resource-Specific Table', Section 7.0, to Section 10.0.
Section 7.0, Section 7.0, Table 1	Revised the following 'Rare Plants / Rare Ecological Communities' measure to include hydrostatic test sites and access routes: Preconstruction flagging/staking will be reviewed by the Environmental Inspector(s) and survey team to ensure the locations requiring mitigation are clearly marked. This measure was also included in Section 7.0 in place of the measure outlined in Table 1.		Updated to ensure consistency with the vegetation survey for the Hydrostatic Test Program, post NEB filing. General mitigation measures removed from 'Resource-Specific Table', Section 7.0, to Section 10.0.
Section 7.0, Table 1	Inclusion of beaver dam/lodge locations at the borrow sites for hydrostatic test sources for the Kyklo Creek Section.		Beaver dam/lodge found during surveys for the Hydrostatic Test Program, post NEB filing.
Section 7.0, Table 1	Inclusion of archaeology site 7238_Site_1 lithic scatter within the vicinity of the unnamed lake hydrostatic test source for the Kyklo Creek Section.		Archaeology site found during surveys for the Hydrostatic Test Program, post NEB filing.
Section 7.0, Table 1	Inclusion of rare plant locations identified along the hydrostatic test access routes, also as reported in the vegetation survey conducted for the hydrostat test water sources and access routes for the Project in summer 2012.		Additional rare plant locations identified during surveys for the Hydrostatic Test Program, post NEB filing.
Section 7.0, Table 1	Correction of itemization in table.		Edits to table organization have provided for greater clarity.
Section 10	Revised the following 'Post-Construction Monitoring' vegetation monitoring description to include hydrostatic test sites and access routes.		Updated to ensure consistency with the vegetation survey for the Hydrostatic Test Program, post NEB filing.

ENVIRONMENTAL ALIGNMENT SHEET CONCORDANCE TABLE

Amendment	Comments
Correction of site-specific evidence of TLU site (*e.g.*, trail corridor) location to KPK 20, preciously KPK 21.	Updated to accurately reflect TK recommendations regarding the trail curdier was previously noted at KPK 21 (Kyklo Creek Section environmental alignment sheet: 4634-03-ML-05-005).
Inclusion of a rare plant location identified along the hydrostatic test access routes, also as reported in the vegetation survey conducted for the hydrostat test water sources and access routes for the Project in summer 2012.	Updated to reflect issues and/or concerns from the 2012 biophysical reports conducted along the 2012 hydrostatic test water source and access routes. These include the rare plant locations identified along the Timberwolf Section at KPT 48.6 (Timberwolf Section environmental alignment sheet: 4619-03-ML-05-011).

Activity	Preparation Measures
Listed or Sensitive Species	8. If listed or sensitive species are identified during construction of the Project, implement the Plant Species and Ecological Communities of Concern Discovery Contingency Plan or the Wildlife Species of Concern Discovery Contingency Plan (Appendix E). 9. Report sightings of sensitive or species at risk to the Environmental Inspector(s). Specific protection measures may be implemented and the sighting will be recorded in daily reports and located on the environmental issues tracking list.
Traditional Land Use (TLU) Sites	10. If TLU sites are identified during the construction of the Project, implement the Contingency Plan for TLU Sites Discovery during construction (Appendix E).
Industry Guidelines and Regulations	11. Industry Guidelines, Regulations and Codes of Practice (COPs) have been considered in the creation of the EPP. These include: • DFO Operational Statements (OSs) (DFO 2008a,b,c,d,e,f,g,h,i,j,k,l); • Pipeline Associated Watercourse Crossings, 3rd Edition (Canadian Association of Petroleum Producers [CAPP] 2005); • *Code of Practice for Pipelines and Telecommunication Lines Crossing a Water Body* (Alberta Environment [AENV] 2000a); • *Code of Practice for the Temporary Diversion of Water for Hydrostatic Testing of Pipelines* (AENV 1999a); • *Code of Practice for the Release of Hydrostatic Test Water from Hydrostatic Testing of Petroleum Liquid and Gas Pipelines* (AENV 1999b); • *Code of Practice for Watercourse Crossings* (AENV 2000b); • Upstream Oil and Gas Approval Standards for the Enhanced Approval Process (EAP) (GOA 2010b); • Upstream Oil and Gas Operating Conditions for the EAP (GOA 2010c); and • Upstream Oil and Gas for the EAP (GOA 2010d). • BC Oil and Gas Waste Regulation; • BC *Water Act*; • *Forest Practices Code of BC Act*. Timber Harvesting and Silviculture Practices Regulations; • NEB Pipeline Provincial Authorizations Application Manual (BC Oil and Gas Commission); • *Forest Practices Act*; and • BC *Environmental Management Act*.
Environmental Inspector's Qualifications	12. The Environmental Inspector(s) hired for the Project will be required to have experience in pipeline planning, environmental inspection or both. The Environmental Inspector(s) will have an understanding of pipeline construction techniques and take a preventative approach. In addition, the Environmental Inspector(s) will be supported by appropriate Resource Specialists who have expertise in the particular issues associated with the Project and who will be available onsite or via consultation, as required.
Environmental Inspection Responsibilities	13. The Environmental Inspector(s) main responsibility is to ensure that environmental commitments, undertakings and conditions of authorizations are met and that work is completed in compliance with applicable environmental regulations and NGTL policies, procedures and specifications in the most efficient and effective way possible. Other responsibilities include:

5.0 NOTIFICATION OF CONCERNED PARTIES

Introduction

Notification of the construction schedule and timing of specific construction activities will facilitate awareness of upcoming activities and allow regulatory agencies and other stakeholders to plan as appropriate for construction activities in their area.

Objective

The objective of these mitigation measures is to ensure:

- interruptions to other land use activities are reduced during construction of the Project;
- affected stakeholders are aware of Project activities; and
- relevant regulatory agencies personnel are kept informed throughout construction.

Specific Measures

Contacts	Measures
Federal, Provincial and Municipal Agencies	1. Inform appropriate federal and provincial resource agencies and interested municipal officials of the Project developments, as warranted. 2. In Alberta, the disposition holder will notify AESRD within 48 hours of site entry. ~~2.~~3. In BC, ~~A~~a Notice of Construction Start ~~(NCS)~~ must be submitted prior to clearing land and/or equipment on location and 48 hours prior to construction. ~~3.~~4. Contact AESRD if there are circumstances that lead to delays with the construction schedule.
Aboriginal Communities	~~4.~~5. Provide Aboriginal communities with proposed construction schedule and pipeline loop maps.
Trappers and Guide Outfitters	~~5.~~6. Contact trappers and guide outfitters at least two weeks prior to construction.
General Public	~~6.~~7. Post signage, where appropriate, notifying the public of construction activities.

Activity/Concern	Mitigation Measures
Caribou Protection (Timberwolf and Cranberry Sections)	22. Within Provincially identified caribou areas, implement the following measures. • Employ an "early in/ early out" approach by initiating activities as early as possible in the winter and working expeditiously to limit late winter activities. • Bi-weekly updates (*i.e.,* every second week) will be provided by NGTL to the appropriate AESRD representative(s). NGTL will consult and inform AESRD of its construction schedule if activity continues after mid-March. • NGTL will ensure pipeline construction will not be a barrier to caribou movement. For large diameter welded pipe, gaps are typically associated with terrain features (*i.e.*, slope changes), crossings (*i.e.*, watercourse, road, right-of-way) and bends. Efforts will be made to provide gaps at obvious, well used wildlife trails. Breaks in set-up and welded pipe shall be coincident with gaps in strippings, spoil, snow and rollback windrows.
Caribou Protection (Kyklo Creek Section)	23. The Kyklo Creek Section is located within 1.4 km of Snake-Sahtenah Caribou Range. The proposed measures identified in the Caribou Protection Plan (CPP) (Appendix K) will be implemented, where appropriate.
Caribou Protection (All Sections)	24. If caribou are encountered, stop vehicles/equipment and allow the caribou to move through the area undisturbed. Advise others working nearby of the presence of caribou in the area. 25. Follow additional mitigation measures within identified caribou areas in Alberta as described in the CPP (Appendix K). For the Kyklo Creek section, measures identified in the CPP will be implemented, where appropriate.
Grizzly Bear Protection	26. If an active grizzly bear den is discovered during supplemental surveys or Project construction activities, NGTL will consult with AESRD and BC MFLNRO to discuss what, if any, mitigation is required. Note that in Alberta, the recommended setback distance from an active grizzly bear den is 750 m from October 1 to April 30 (GOA 2011) and in BC, a 50 m setback is recommended (BC Oil and Gas Commission 2011).
Species with Special Conservation Status	27. In the event that a species with special conservation status is observed during construction, the appropriate regulatory agency (AESRD or BC MOE) will be contacted to determine if additional mitigation measures are warranted.
Rare Plants / Rare Ecological Communities	28. Clearly mark identified rare plant locations before the start of right-of-way preparation and construction, and hydrostatic test sites and access routes. 29. Preconstruction flagging/staking will be reviewed by the Environmental Inspector(s) and survey team to ensure the locations requiring mitigation are clearly marked, and hydrostatic test sites and access routes. 30. Review mitigation of rare plants / rare ecological communities with Contractor(s) personnel in advance of construction to ensure there is full understanding of the procedures involved. 31. Restrict the general application of herbicide near rare plants or rare ecological communities. Spot spraying, wicking, mowing or hand-picking are acceptable measures for weed control in these areas. 32. Follow mitigation identified in the Resource-Specific Mitigation Table (Table 1) and Environmental Alignment Sheets (Appendix M).

Activity/Concern	Mitigation Measures
Wetlands (cont'd)	50. Natural recovery is the preferred method of reclamation (*i.e.,* do not seed wetland areas). 51. In Alberta, construct the shallow open water wetland crossings as per COP notifications submitted to AESRD. 52. In BC, pipeline and vehicle wetland crossings on NEB-regulated projects require either approval from or notification to the BC MOE under Section 9 of the *Water Act* and Section 7 of the *Water Regulations*. Where delineated wetlands correspond to fish-bearing non-classified drainages, notification under Section 9 of the *Water Act* BC MOE for the pipeline crossing is required a minimum of 45 days prior to the start of construction and adherence to the applicable terms and conditions outlined in BC MOE (2010).
Historical and Palaeontological Resources	53. If historical or palaeontological features (*e.g.,* arrow heads, modified bone, pottery fragments, fossils) not previously identified are found on the right-of-way or facility site during construction follow conditions outlined in the Heritage Resource Discovery Contingency Plan (Appendix E). 54. Prohibit collection of Historical Resources by Project personnel.
TLU Sites	55. Previously identified TLU sites requiring mitigation are specified in the Resource-Specific Mitigation Table (Table 1). 56. If additional TLU sites are identified during the construction of the Project, implement the Contingency Plan for TLU Sites Discovery during construction (Appendix E).
Discontinuous Permafrost	57. If discontinuous permafrost is encountered during construction implement the Discontinuous Permafrost Contingency Plan (Appendix E). 58. Follow mitigation measures identified in the Resource-Specific Mitigation Table (Table 1) and Environmental Alignment Sheets (Appendix M).
Permafrost	59. Permafrost tends to be confined to poorly-drained organic bogs where the thick layers of peat provide insulating properties to protect the permafrost from thawing. In the unlikely event that isolated pockets of permafrost are identified throughout the Project during construction, the following mitigation measures will be implemented to the extent practical. • NGTL will inform the NEB Compliance Inspector with a report identifying and describing each permafrost location encountered. The report will include the depth, extent, terrain, vegetation and mitigation measures implemented. • Construction schedule will allow site preparation in frozen conditions only. • Snow and ice will be used to create a level surface to facilitate construction. Grubbing and grading over the area of permafrost will be avoided, if feasible. • Any strippings or subsoil will be placed on a snow layer in the permafrost area to prevent damage to the upper surface materials over the permafrost.

TABLE 1

RESOURCE-SPECIFIC MITIGATION TABLE

Location	Issues	Timing Windows and / or Regulatory Guidelines	Mitigation	Comments
WILDLIFE - GENERAL				
Nesting Areas	Migratory birds	Avoid construction activities during the migratory bird restricted activity period of May 1 to July 31	• In the event that the schedule changes and clearing or construction activities are planned during the migratory bird RAP, a migratory bird nest sweep is recommended. • Stick nests were observed along the Cranberry pipeline route (KPC 24.7) during the 2011 field work. Clearing will be scheduled to occur in winter at a time when the nest will be inactive.	• In the event of a discovery of wildlife species of concern or migratory bird nest, implement the appropriate mitigative measures outlined in the Wildlife Species of Concern Discovery Contingency Plan (Appendix E).
Bear Dens	Grizzly Bear Zone	A timing restriction of October 1 to April 30, and 750 m setback distance applies to active grizzly bear dens, as outlined in the Upstream Oil and Gas Best Management Guidelines for the EAP (GOA 2010d)	• If an active grizzly bear den is discovered during supplemental surveys or Project construction activities, NGTL will discuss the setback with AESRD or BC MFLNRO. In Alberta, the setback distance is 750 m with a timing restriction of October 1 to April 30 (GOA 2010d) with AESRD. Alternative measures may be implemented only with the approval of AESRD. In BC, the setback distance is 50 m (BC OGC 2011).	• If required, additional mitigation measures will be implemented.
Trumpeter Swan Breeding Lakes	Trumpeter Swans	Clearing and construction are scheduled to commence outside of the timing restriction for trumpeter swans: Alberta: April 1 to September 30 (GOA 2010b); BC: April 1 to July 31 critical period and August 1 to August 31 cautionary period (BC MOE 2010b).	• No trumpeter swan breeding lakes were observed during the fall 2011 field surveys. • Avoid direct aerial overflights over identified trumpeter swan breeding lakes or waterbodies between April 1 to September 30 (GOA 2010b).	• In the event a trumpeter swan breeding lake is identified, consult with the Environmental Inspection(s) staff, Wildlife Resource Specialists and the appropriate regulatory representatives as directed in the Wildlife Discovery/Encounter Contingency Plan (Appendix E).

TABLE 1 Cont'd

Location	Issues	Timing Windows and / or Regulatory Guidelines	Mitigation	Comments
Key Wildlife and Biodiversity Zone	Wildlife Disturbance	A timing restriction of January 15 to April 30 applies to Key Wildlife and Biodiversity Zones~~.~~.	• Conduct work expeditiously to maintain a tight construction spread (*i.e.*, interval between front-end work activities such as clearing, grading and back-end activities such as clean-up) to reduce the duration of activities within the Key Wildlife and Biodiversity Zone. • Place line-of-sight measures along the pipeline loops to reduce long sight lines and to lessen predator mobility. Recommended locations include transition zones between upland forest and muskeg/black spruce forest, areas with level terrain that have long sight lines and where the pipeline loop intersects an existing road or other pipeline right-of-way. These locations will be selected by the Environmental Inspector(s) with guidance from a wildlife biologist where necessary. • Bi-weekly updates (*i.e.,* every second week) will be provided by NGTL to the appropriate AESRD representative(s) on construction progress within the Key Wildlife and Biodiversity Zone. NGTL will consult and inform AESRD of its construction schedule if activity continues after January 15. • Schedule pipeline construction to commence as soon as soil conditions allow. Complete construction within the Key Wildlife and Biodiversity Zone as early as practical within the winter construction season. • Obtain access to the right-of-way from existing access roads as indicated on maps provided to AESRD Public Lands and Forest. These maps will be posted at the construction camp and in construction offices.	• None
Caribou Area (Alberta)	Caribou Disturbance	An "early in/ early out" approach is recommended by AESRD. The Upstream Oil and Gas Approval Standards for the EAP (GOA 2010b) indicate new site preparation or construction should not be initiated between February 15 and July 15 unless approved by AESRD.	• Employ an "early in / early out" approach by initiating activities as early as possible in the winter and working expeditiously to limit late winter activities (GOA 2010b). • Bi-weekly updates (*i.e.*, every second week) will be provided by NGTL to the appropriate AESRD representative(s) • NGTL will consult and inform AESRD of its construction schedule if activity continues after mid-March. • NGTL will ensure pipeline construction will not be a barrier to caribou movement. For large diameter welded pipe, gaps are typically associated with terrain features (*i.e.*, slope changes), crossings (*i.e.*, watercourse, road, right-of-way) and bends. Efforts will be made to provide gaps at obvious, well used wildlife trails. Breaks in set-up and welded pipe shall be coincident with gaps in strippings, spoil, snow and rollback windrows. • If caribou are encountered, stop vehicles/equipment and allow the caribou to move through the area undisturbed. Advise others working nearby of the presence of caribou in the area.	• None.

TABLE 1 Cont'd

Location	Issues	Timing Windows and / or Regulatory Guidelines	Mitigation	Comments
Kyklo Section	Caribou Disturbance	An "early in/ early out" approach is recommended.	• The Kyklo Creek Section is located within 1.4 km of Snake-Sahtenah Caribou Range. The proposed measures identified in the Caribou Protection Plan (CPP) (Appendix K) will be implemented, where appropriate. • If caribou are encountered, stop vehicles/equipment and allow the caribou to move through the area undisturbed. Advise others working nearby of the presence of caribou in the area.	• None.
WILDLIFE – Site-Specific				
KPK 0.0 to 0.1, 2.9 to 3.0 KPT 1.6 to 1.8, 4.8 to 4.9, 5.8 to 5.9 KPC 5.8 to 6.7, 26.8 to 26.9, 27.9 to 28.0	Visual Screening / Line-of-Sight	N/A	• Place line-of-sight measures along the pipeline loops to reduce long sight lines and to lessen predator mobility. Recommended locations include transition zones between upland forest and muskeg/black spruce forest, areas with level terrain that have long sight lines and where the pipeline loop intersects an existing road or other pipeline right-of-way.	• Preliminary candidate locations for site-specific visual screening and access control measures are identified on the Environmental Alignment Sheets.
KPT 9.2, 9.4, 9.7 to 10.0, 12.9, 17.3, 24.9, 29.7, 30.6, 33.1, 34.9, 36.4 and 46.3 KPC 6.4 and 8.7 Kyklo Creek Borrow Sites (See Wildlife Review [TERA 2012b])	Beaver Dam/Lodge	N/A	• In the event that beaver dams or lodges will be disturbed, relevant permits for beaver dam removal will be obtained from the appropriate provincial regulatory agency. Comply with the DFO OS for Beaver Dam Removal, where applicable, as well as any Project approval conditions.	• Follow mitigation measures outlined in the Beaver Dam Removal Plans for Timberwolf and Cranberry sections. These Beaver Dam Removal Plans will be available prior to removal.
KPT 22.3	Mineral Lick	N/A	• Flag the mineral lick and ensure that all construction personnel are aware of its location. • Leave the mineral lick open for wildlife use. Do not cover the mineral lick with spoil, swamp mats, snow or other material. • To allow wildlife access to the mineral lick, ensure there is a gap in strung pipe within the area of the mineral lick. Welded pipe should not be on the ground for an extended period of time. Breaks in strung pipe shall be coincident with gaps in strippings, spoil, snow and rollback windrows. The locations of gaps in strung pipe will be determined in the field by the Environmental Inspector(s). • Conduct work expeditiously to maintain a tight construction spread (*i.e.*, interval between front-end work activities such as clearing, grading and back-end activities such as clean-up) to reduce the duration of the open trench and to reduce potential barriers to wildlife.	• None.

TABLE 1 Cont'd

Location	Issues	Timing Windows and / or Regulatory Guidelines	Mitigation	Comments
VEGETATION - General				
~~Hydrotest Sites and Access~~	~~Rare Plant Species and Rare Ecological Communities~~	~~Prior to construction~~	• ~~The locations of rare plant site-specific measures, if required, will be determined based on input from the supplemental rare plant species study for hydrotest sites and access and will be implemented in the field by the Environmental Inspector(s).~~	• ~~If previously unidentified rare plants or rare ecological communities are found on the right-of-way prior to or during construction, implement the Plant Species and Ecological Communities of Concern Discovery Contingency Plan (Appendix E).~~
~~Hydrotest Sites and Access~~	~~Rare Plant Species and Rare Ecological Communities~~	~~Prior to Construction~~	• ~~Clearly mark identified rare plant locations before the start of right-of-way preparation and construction.~~ • ~~Preconstruction flagging/staking will be reviewed by the Environmental Inspector(s) and survey team to ensure the locations requiring mitigation are clearly marked.~~	• ~~None.~~
VEGETATION – Mountain Pine Beetle				
Kyklo Creek Section	Mountian Pine Beetle	N/A	• Post-harvest woody debris will be mulched and scattered or piled and burned.	• None.
VEGETATION - White Adder's-Mouth Orchid				
KPK 4.7	Site-Specific Mitigation for 2011 Rare Plant Locations	N/A	• Flag the three rare plant sub-populations prior to commencement of construction activities. • Leave a gap in the spoil pile within 10 m of the population to protect the portion of the population located on the existing right-of-way. • Ramp or mat over the travel lane within 10 m of the population to protect the portion of the population located on the proposed construction right-of-way. • If any of the flagged sub-populations is determined to be on the trench line, hand transplant to a suitable receiving location off construction right-of-way during the growing season (*i.e.,* summer) prior to construction. A biologically suitable receiving location for this species was identified by the on-site biologist at the time of survey. UTM co-ordinates for the potential recipient site are provided at right. • Monitor the effectiveness of mitigation measures during Post-construction Monitoring (PCM).	• None.
KPK 5.0	Site-Specific Mitigation for 2011 Rare Plant Locations	N/A	• Flag the rare plants prior to commencement of construction activities. • Ramp or mat over the travel lane within 10 m of the population to protect any plants located on the proposed construction right-of-way. • If any of the flagged plants is determined to be on the trench line, hand transplant to a biologically suitable receiving location off construction right-of-way during the growing season (*i.e.,* summer) prior to construction. • Monitor the effectiveness of mitigation measures during PCM.	• None.

TABLE 1 Cont'd

Location	Issues	Timing Windows and / or Regulatory Guidelines	Mitigation	Comments
KPK 5.2	Site-Specific Mitigation for 2011 Rare Plant Locations	N/A	• Flag the eastern and western extent of the rare plant population located on the proposed construction right-of-way prior to commencement of construction activities. • Ramp or mat over the travel lane for the extent of the population to protect the portion of the population located on the proposed construction right-of-way. • If any of the flagged sub-populations is determined to be on the trench line, hand transplant a portion of the population to a suitable receiving location off construction right-of-way during the growing season (*i.e.*, summer) prior to construction. • Monitor the effectiveness of mitigation measures during PCM.	• None.
KPK 5.6	Site-Specific Mitigation for 2011 Rare Plant Locations	N/A	• Flag the rare plant population prior to commencement of construction activities. • Leave a gap in the spoil pile within 10 m of the population. • Monitor the effectiveness of mitigation measures during PCM.	• None.
VEGETATION – Purple Stemmed Aster				
KPK 5.5	Site-Specific Mitigation for 2011 Rare Plant Locations	N/A	• Flag the rare plant population prior to commencement of construction activities. • Store spoil on top of frozen ground or snow layer within 10 m of the population. • Ramp or mat over the travel lane within 10 m of the population. • If stripping and/or grading are required in the vicinity of the population, salvage strippings from within 10 m of the population and store separately. • Maintain sufficient separation between strippings and spoil piles to ensure that piles do not mix, thereby preventing dilution of propagules. Identify strippings in this area by labeled stakes or flags. Redistribute salvaged strippings over the construction right-of-way at the location from which they were stripped. • Monitor the effectiveness of mitigation measures during PCM.	• None.

TABLE 1 Cont'd

Location	Issues	Timing Windows and / or Regulatory Guidelines	Mitigation	Comments
VEGETATION – Slender Mannagrass				
KPK 5.5, 23.0	Site-Specific Mitigation for 2011 Rare Plant Locations	N/A	• Flag the rare plant population prior to commencement of construction activities. • Ramp or mat over the travel lane within 10 m of the population. • If stripping and/or grading are required in the vicinity of the population, salvage strippings from within 10 m of the population and store separately. • Maintain sufficient separation between strippings and spoil piles to ensure that piles do not mix, thereby preventing dilution of propagules. Identify strippings in this area by labeled stakes or flags. Redistribute salvaged strippings over the construction right-of-way at the location from which they were stripped. • Monitor the effectiveness of mitigation measures during PCM.	• None.
KPK 23 to 23.05	Site-Specific Mitigation for 2009 Rare Plant Locations	N/A	• If grading is not warranted, it is recommended that disturbance of the root zone and soil seed bank be reduced by using a stump mulcher or alternate equipment that reduces disturbance of root zone and soil seed bank rather than grubbing except along the trench line. • For any plants that are determined to be located on spoil side, store spoil on top of frozen ground or snow layer. • For any plants that are determined to be on the work side, ramp over the travel lane with snow. • If grading is warranted, salvage the organic layer (*i.e.*, the leaf litter layer) and the upper strippings to an approximate depth of 15 cm. Identify strippings in this area by labeled stakes or flags. Redistribute salvaged strippings over the construction right-of-way at the location from which it was stripped.	• None.
VEGETATION – Bog Adder's Mouth Orchid				
KPK 17.1, 25.3	Site-Specific Mitigation for 2011 Rare Plant Locations	N/A	• Flag the rare plants prior to commencement of construction activities. • Leave a gap in the spoil pile within 10 m of the population to protect any plants located on the existing right-of-way. • Ramp or mat over the travel lane within 10 m of the population to protect any plants located on the proposed construction right-of-way. • If any of the flagged plants is determined to be on the trench line, hand transplant to a biologically suitable receiving location off construction right-of-way during the growing season (*i.e.*, summer) prior to construction. • Monitor the effectiveness of mitigation measures during PCM.	• None.
VEGETATION – Saxifrage species				
KPK 25.1, 25.2, 28.1, 28.9	Site-Specific Mitigation for 2011 Rare Plant Locations	N/A	• In areas where stripping and/or grading are required, restore site to preconstruction contours following construction.	• None.
VEGETATION – Orange Touch-Me-Not				

TABLE 1 Cont'd

Location	Issues	Timing Windows and / or Regulatory Guidelines	Mitigation	Comments
KPK 28.2	Site-Specific Mitigation for 2011 Rare Plant Locations	N/A	• Ensure vehicle and equipment traffic related to construction is restricted to the proposed construction right-of-way in the vicinity of the population.	• None.
VEGETATION – White Birch/ Scouler's Willow Community				
KPT 12.0, 30.9, 41.5	Site-Specific Mitigation for 2011 Rare Plant Locations	N/A	• Grubbing will be restricted to the trench unless grading is required. • In areas where stripping and/or grading are required, restore site to preconstruction contours following construction.	• None.
VEGETATION – Scalloped Moonwort				
KPC 1.5	Site-Specific Mitigation for 2011 Rare Plant Locations	N/A	• Use construction matting or an appropriate alternative (at the discretion of the Environmental Inspector(s)) within an approximately 5 m^2 area of the rare plant population in order to prevent disturbance of the soil during construction and clean-up. • Stake or flag the location of the construction matting to facilitate safe and appropriate clean-up and reclamation. • Monitor the effectiveness of mitigation measures during PCM.	• None.
KPC 8.5	Site-Specific Mitigation for 2011 Rare Plant Locations	N/A	• Fence off south boundary of the proposed construction right-of-way within an approximately 10 m^2 area of the rare plant population. • Leave a gap in the spoil pile around the 10 m^2 fenced area to protect the population. • Monitor the effectiveness of mitigation measures during PCM.	• None.

TABLE 1 Cont'd

Location	Issues	Timing Windows and / or Regulatory Guidelines	Mitigation	Comments
VEGETATION – Lance-Leaved Grape Fern, Leather Grape Fern, Northwestern Grape Fern				
KPC 8.5	Site-Specific Mitigation for 2011 Rare Plant Locations	N/A	• Fence off south boundary of the proposed construction right-of-way within an approximately 10 m^2 area of the rare plant population. • Leave a gap in the spoil pile around the 10 m^2 fenced area to protect the population. • Monitor the effectiveness of mitigation measures during PCM.	• None.
VEGETATION – Golden Saxifrage				
KPC 20.5	Site-Specific Mitigation for 2011 Rare Plant Locations	N/A	• Restore site to preconstruction contours following construction.	• None.
VEGETATION - Western Jacob's Ladder				
Hydrostatic Test Sites and Access (Table 3 [TERA 2012b])	Rare Plant Species and Rare Ecological Communities	N/A	• Where grading is required for the proposed hydrostatic test access route, strip and store salvaged topsoil according to Section 8.3 of this EPP. • Where grading is required for construction of the proposed hydrostatic test access route, restore landscape contours and replace salvaged topsoil to approximate preconstruction conditions.	• None.
VEGETATION - Slender-Leaved Sundew				
Hydrostatic Test Sites and Access (KPT 48.6 and See Table 3 [TERA ~~2012a~~2012b])	Rare Plant Species and Rare Ecological Communities	N/A	• In the event that hydrostatic testing is anticipated to be postponed until nonfrozen conditions, consider rerouting the proposed hydrostatic test access route to avoid the open fen habitat by realigning the proposed hydrostatic test access route approximately 100 m south for a distance of approximately 200 m from the intersection with the proposed Timberwolf Section pipeline right-of-way. • Construct a temporary travel surface over the occurrence using snow and ice. • Ensure that local hydrology and landscape contours are maintained.	• None.
WATER CROSSINGS – See Table 2A, B and C for specific water crossing mitigation measures				
WETLANDS - General				
Class and distribution of wetlands crossed by the pipeline sections are identified in the 2011 Wetland Assessment (Tables 2 to 4) TERA 2011a and Wetland Evaluation 2012b).–	Wetlands traversed by pipeline route	N/A	• Refer to Table 11 of the 2011Wetland Assessment for general mitigation measures (TERA 2011a)and the 2012 Wetland Evaluation for hydrostatic test sites and access routes (TERA 2012b). .	• None.
TRADITIONAL LAND USE				
Approximately 1 km west of the pipeline crossing at Kyklo Creek	A trail corridor that runs roughly parallel and within 1 km of the right-of-way	N/A	• Leave sufficiently sized gaps in snow piles, spoil piles, and strung pipe to allow for movement across the right-of-way. • Ensure that during trenching activities, locations are maintained that allow for the safe crossing of the right-of-way. • Post adequate signage indicating crossing locations.	• If additional TLU sites are identified during the construction of the Project, implement the Contingency Plan for TLU Sites Discovery during construction (Appendix E).

TABLE 1 Cont'd

Location	Issues	Timing Windows and / or Regulatory Guidelines	Mitigation	Comments
All Three Sections of Pipeline	Traplines	N/A	• contact trappers prior to construction activities, including right-of-way clearing, general construction, and clean-up activities; • provide construction activity schedules to trappers to enable them to select alternate areas of activity; and • compensate trappers for trapping-related losses in accordance with NGTL's Trapper Compensation and Engagement Program.	• In accordance with NGTL's Trapper Compensation and Engagement Program.
KPT 22.3	Mineral Lick	N/A	• Flag the mineral lick and ensure that all construction personnel are aware of its location. • Leave the mineral lick open for wildlife use. Do not cover the mineral lick with spoil, swamp mats, snow or other material. • To allow wildlife access to the mineral lick, ensure there is a gap in strung pipe within the area of the mineral lick. Welded pipe should not be on the ground for an extended period of time. Breaks in strung pipe shall be coincident with gaps in strippings, spoil, snow and rollback windrows. The locations of gaps in strung pipe will be determined in the field by the Environmental Inspector(s). • Conduct work expeditiously to maintain a tight construction spread (*i.e.*, interval between front-end work activities such as clearing, grading and back-end activities such as clean-up) to reduce the duration of the open trench and to reduce potential barriers to wildlife.	• If additional mineral lick sites are identified during the construction of the Project, implement the Contingency Plan for TLU Sites Discovery during construction (Appendix E).
KPC 22.2	Abandoned Cabin and Campsite	N/A	• Current alignment of the Cranberry Section will avoid this habitation site and, in addition, signs will be posted to notify site users of construction activities in the vicinity and alert workers of these features to ensure the habitation site will not be affected by the pipeline loop.	• If additional TLU sites are identified during the construction of the Project, implement the Contingency Plan for TLU Sites Discovery during construction (Appendix E).
HISTORICAL RESOURCES				
Hydrostatic test Sites and Access (see Historical Resources Evaluation [2012b])	Lithic Scatter (7238_Site_1)	N/A	• Apply for a Section 12 Historical Clearances Act (HCA) Site Alteration Permit in advance of any land-altering activities with the boundaries of the site noted in the Historical Resouces Evaluation for hydrostatic test sites and access routes (TERA 2012b) noted in the Historical Resouces Evaluation for hydrostatic test sites and access routes (TERA 2012b)	• None.
DISCONTINUOUS PERMAFROST				
KPK 10.575 to KPK 10.675 KPK 17.600 to KPK 17.675 KPK 26.7 to KPK 26.875	Site-specific mitigation for discontinuous permafrost locations	N/A	• If discontinuous permafrost is encountered during construction implement the Discontinuous Permafrost Contingency Plan (Appendix E).	• If additional permafrost areas occur, NGTL will determine whether specific design measures are required and if so, will ensure that the appropriate measures are implemented.

Note: All locations are approximate. See Environmental Alignment sheets for additional details.

Specific Measures

Activity/Concern	Mitigation Measures
Watercourse Crossing Methods	1. Refer to Tables 2A, 2B and 2C for the method of vehicle and pipeline crossings on all watercourses.
Permits and Approvals	2. NGTL will obtain applicable permits and/or authorizations prior to the commencement of the crossings (Appendix C). Follow DFO Letter of Advice or *Fisheries Act* s35(2) authorization conditions and Transport Canada Approval conditions.
Notification	3. Ensure notification of DFO 14 days prior to commencement of work in waterbody in accordance with the applicable DFO OSs (Appendices 8G and 8H). OSs that could apply to the Project includes Clear Span Bridges, High Pressure Directional Drilling (should a horizontal directional drill [HDD] be required), Isolated or Dry Open-cut Stream Crossings (if construction occurs outside the RAP at watercourses that are less 5 m wide at the crossing) and Ice Bridges and Snowfills. Refer to Appendices 8G and 8H for copies of the OSs that are applicable to the Project. 4. In Alberta, ensure notifications are completed in accordance with the AENV *Code of Practice for Pipelines and Telecommunication Lines Crossing a Water Body and Watercourse Crossings* and *Code of Practice for Watercourse Crossings* (AENV 2000a,b). 5. Where delineated wetlands correspond to fish-bearing non-classified drainages, approval from or notification to the BC Oil and Gas Commission (OGC) under Section 9 of the *Water Act* and Section 7 of the Water Regulations are required. Notification under Section 9 of the *Water Act* is required a minimum of 45 days prior to the start of construction and adherence to the applicable regulatory terms and conditions must be followed. 6. In BC, ensure Section 9 notifications are completed in accordance with the BC *Water Act* and *Water Regulations*.
Signage	7. Post signs before clearing (including name, number and KP) for watercourses. Signs will be posted 100 m from the watercourse or at the top of the valley slope, whichever is greater, to alert the Contractor(s) of the upcoming watercourse.
	8. As directed by the Transport Canada Navigable Waters approval, instream temporary works shall be marked with yellow flashing lights from dusk until dawn and during period of restricted visibility. 9. As directed by under the Transport Canada Navigable Waters approval, warning signs shall: • be placed and maintained during all periods of construction and instream activity; • be legible at a minimum distance of 50 m; • be placed 50 m upstream and downstream of the crossings that are navigable (*i.e.*, Kyklo Creek, Hay River, Little Buffalo River and the unnamed tributary to the Chinchaga River) until completion of the project; and display black letters on a yellow background
RAPs – Windows of Least Risk	10. Refer to Tables 2A, 2B and 2C for the RAPs and instream work windows of least risk associated with the watercourse crossings traversed by the Project.

Activity/Concern	Mitigation Measures
Hay River Trenchless Crossing (cont'd)	69. Ensure that water from dewatering entry and exit sites with a high sediment load is not discharged or allowed to flow into any waterbody. Remove the sediment load (*e.g.*, filtered or discharged into a vegetated area) before discharge water is allowed to enter any watercourse. 70. Develop an emergency response plan that will be implemented in the event of sediment releases or spills of deleterious substances during the construction of the trenchless crossings. 71. Where warranted, develop a monitoring plan with input from a QAES/Qualified Environmental Professional that combines water quality monitoring with other monitoring methods (*e.g.,* frac-walks, monitoring for loss of drilling fluids and/or annular pressure monitoring, total suspended solids and/or turbidity if trenchless methods are used) to help ensure if a drilling loss does occur that it is detected as quickly as possible so that the Emergency Frac-Out Response Plan can also be implemented as quickly as possible. 72. Cease work immediately and refer to the Directional Drilling Procedures and Instream Drilling Mud Release Contingency Plan (Appendix E) in the event that sediment-laden water or other deleterious substances enter a watercourse. 73. The Environmental Inspector(s) will notify the emergency contacts including the appropriate regulatory authorities (*e.g.,* AESRD, BC MOE, Environment Canada and DFO) if sediment-laden water or other deleterious substances enter the watercourse.
Contingency Plans	74. Follow the Construction and Sediment Control Plan developed for the contingency crossing method on the Hay River if implemented. This is included in the DFO Supplemental Filing (TERA 2012a), available at the construction office. 75. Postpone watercourse crossing construction if excessive flows or flood conditions exist or are anticipated, and construction methods cannot be modified to cope with the increased flow, follow the Flood and Excessive Flow Contingency Plan (Appendix E).
Backfill Trench	76. Place only clean coarse material (gravel or rock) or native material removed from the trench in the trenched area as the final 0.5 m of backfill. Where there is not sufficient native material or where salvage of the native granular material is not practical to complete backfilling, clean course non-native granular material (gravel or rock) can be used to cap the trench. Any imported material must be obtained from above the average high water level of any watercourse.
Reclamation	77. Upon completion of the crossing, stabilize disturbed areas until such time that permanent reclamation activities are complete. Implement permanent reclamation measures to re-establish riparian vegetation and fish habitat should be implemented immediately following completion of construction at the crossing location (Refer to Appendix D, Dwgs. STDS-03-ML-05-604, STDS-03-ML-05-606 and STDS-03-ML-05-608). 78. The bed and banks of each watercourse should be returned as close as possible to their original preconstruction contours. 79. Follow the site-specific reclamation plans developed for Kyklo Creek, the Hay River contingency crossing and the unnamed tributary to Chinchaga River. These reclamation plans will be available at the construction office of the Project.

8.7 Pressure Testing

Introduction

Hydrostatic testing uses a considerable amount of water for long sections of pipeline. Water is typically withdrawn from nearby lakes, watercourses, or municipal sources in accordance with applicable permits for withdrawal of water.

Objective

The objectives of these mitigation measures are to:

- ensure contingency pressure testing activities are conducted in accordance with all approval conditions, and permits; and
- reduce effects to watercourses and wetlands.

Specific Measures

Activity/Concern	Contingency Mitigation Measures
Permits and Approvals	1. Conduct hydrostatic testing activities in accordance with the NEB Onshore Pipeline Regulations, provincial regulations, Transport Canada's *Minor Works for Water Intakes* as well as the latest version of CSA Z662 and *BC Oil and Gas Waste Regulation* Section 7(2)(e). 2. In Alberta, submit notification to AENV under both the *Code of Practice for the Temporary Diversion of Water for Hydrostatic Testing of Pipelines* and the *Code of Practice for the Release of Hydrostatic Test Water from Hydrostatic Testing of Petroleum Liquid and Gas Pipelines*. If withdrawal amounts exceed 30,000 m^3, obtain a separate water diversion license. 3. In Alberta, if the volume of water to be released is greater than 1,000 m^3, obtain a registration number from AENV for the release of the hydrostatic test water under the *Code of Practice for the Release of Hydrostatic Test Water from Hydrostatic Testing of Petroleum Liquid and Gas Pipelines.* 4. In BC, obtain *Water Act* Section 8 Approval from the BC ~~Oil and Gas Commission (OGC) MOE Water Stewardship Division~~ for the short-term use of water. 5. NGTL must authorize the Contractor's preferred water withdrawal sources for testing purposes (*i.e.,* must have sufficient quantity and quality of water) as well as the Contractor's test plan, including discharge locations. 6. Abide by applicable provincial or federal approval conditions.
Scheduling	7. Abide by instream RAPs, instream work windows and applicable provincial or federal approved conditions.
Traffic	8. Implement the Traffic Control Management Plan (Appendix F of the EPP) for specific mitigation measures.
Air Quality	9. Minimize unnecessary idling of Project equipment, to the extent practical. 10. Use well-maintained equipment during hydrostatic test activities to minimize emissions. 11. Utilize multi-passenger vehicles for the transport of crews to and from the job sites, to the extent practical, to minimize emissions and potential for wildlife/vehicle collisions.
Noise	12. The contractor will ensure noise abatement equipment (*e.g.,* mufflers) on machinery is in good working order.

there are any significant adverse effects to disturbance of natural drainage patterns. The trench and areas of potential terrain instability will be monitored during regular aerial pipeline patrol during spring break-up after construction and for at least two years following construction. Mitigative measures will be implemented as soon as feasible after an issue is identified during the aerial pipeline patrol and the Environmental Issues List will be used to monitor the success of mitigation measures taken to address the issues identified.

10.1.2 Vegetation Monitoring

The pipeline rights-of-way and hydrostatic test sites and access routes will be visually inspected by personnel with experience completing PCM during the first growing season following construction and the implementation of post-construction reclamation measures for vegetation issues, such as weed infestations or poor vegetation establishment. The timing of vegetation monitoring will be in the late summer/early fall when vegetation is mature enough for accurate identification and evaluation. Particular attention will be given to areas of terrain instability that may be prone to erosion. If warranted, detailed vegetation assessments will be completed at sites where reclamation problems are identified. The above process will be continued during the second growing season after construction.

The second year of monitoring will focus on ensuring vegetation on the reclaimed rights-of-way is comparable to that of conditions off right-of-way. The rights-of-way will be visually inspected for vegetation issues such as weed infestations and poor vegetation establishment. Where the natural regeneration of vegetation along the rights-of-way is the preferred option for revegetation, the establishment of a vegetative cover compatible with the surrounding vegetation and land use will be evaluated.

10.1.3 Wetland Post-Construction Monitoring

NGTL has a PCMP in place to document the return of wetland function following temporary disturbance and, if warranted, provide recommendations for additional remedial measures to assist in the return of full functionality to wetland habitat. This plan provides a general description of the data collection requirements (both baseline and PCM) in order to gather sufficient information to identify alterations to and recovery of wetland function and for measuring the effectiveness of NGTL's wetland management.

The general PCM study design is to revisit disturbed wetlands in the years following construction in order to document the progress of functionality returning to the wetland system. Wetland function conditions documented during baseline (*i.e.*, preconstruction) assessments and wetland function conditions that are observed either adjacent to or in close proximity to the right-of-way, will be directly compared to wetland function conditions observed along the reclaimed (*i.e.*, post-construction) right-of-way. The results of this comparison will be used to measure the effectiveness and efficiency of mitigation and remedial measures and provide support to the determination of loss or "no net loss" of wetland function.

Based on the findings during the PCM, additional recommendations for remedial measures will be provided, if warranted, to promote the successful return of wetland function within the lifetime of the PCMP. The duration of the PCMP will be for five years following construction. Wetland assessments will be completed once per year and will ideally take place at or near the height of the growing season during the first and second complete growing seasons following construction and the implementation of post-construction reclamation measures. If a wetland is determined not to have full functionality before the completion of the five year PCMP, NGTL will continue to monitor those specific wetlands once per year up to year five and if at the end of five years of monitoring the wetland has still not reached full functionality, NGTL will consult with Environment Canada regarding the appropriate next steps.

Wetlands will be generally and specifically assessed along the rights-of-way. Generally, where alterations to the site are documented, they will be supported with remedial measure recommendations (*e.g.*, ponding is observed on work side and spoil side of right-of-way indicating that an elevated trench crown exists; recommend that breaks in the trench crown be created to ensure proper throughflow of surface waters). Specifically, random plots will be documented both on and off right-of-way and at various zones within the right-of-way (*i.e.*, work, trench, spoil sides) in order provide enough detail to the data to successfully see changes over the life of the PCMP.

During a PCM assessment, the following information will be collected.

Harper, W.L., J.P. Elliott, I. Hatter, and H. Schwantje. 2000. Management Plan for Wood Bison in British Columbia. B.C. Minist. Environ., Lands and Parks, Victoria, BC. 43 pp.

Meidinger, D. and J. Pojar. 1991. Ecosystems of British Columbia. Special Report Series 6, February 1991. Research Branch and Forest Sciences Section. BC Ministry of Forests. Victoria, BC. Website: http://www.for.gov.bc.ca/hfd/pubs/Docs/Srs/Srs06.htm. Accessed: April 2011.

Mitchell, J.A., and C.C. Gates. 2002. Status of the Wood Bison (Bison bison athabascae) in Alberta. Alberta Sustainable Resource Development, Fish and Wildlife Division, and Alberta Conservation Association, Wildlife Status Report. No. 38. Edmonton, Alberta. 32 pp.

Natural Regions Committee. 2006. Natural Regions and Subregions of Alberta. Compiled by D.J. Downing and W.W. Pettapiece. Government of Alberta. Pub. No. T/852.

Pettapiece, W.W. 1986. Physiographic subdivisions of Alberta. Agriculture Canada. 1:1,500,000 map.

TERA Environmental Consultants. 2011. Environmental and Socio-economic Assessment for the NOVA Gas Transmission Ltd. Northwest Mainline Expansion. April 2011. Prepared for NOVA Gas Transmission Ltd.

TERA Environmental Consultants. 2012a. Construction and Sediment Control Plan for the Hay River Partial Isolation Contingency Crossing along the NOVA Gas Transmission Ltd. Northwest Mainline Expansion (Timberwolf Section). March 2012. Prepared for NOVA Gas Transmission Ltd.

TERA Environmental Consultants. 2012b.Overview of the Hydrostatic Test Program for the NOVA Gas Transmission Ltd. Northwest Mainline Expansion. August 2012 . Prepared for NOVA Gas Transmission Ltd.

Valentine, K.W.G., P.N. Sprout, T.E. Baker and L.M. Lavkulich. 1978. The Soil Landscapes of British Columbia. 197 pp.

11.2 GIS Data and Mapping

Alberta Tourism, Parks and Recreation - Parks Division. 2011. Protected Areas (digital file). Edmonton, Alberta. Available: hhttp://albertaparks.ca/albertaparksca/library/downloadable-data-sets.aspx. Acquired: November 2011. Last Update Check: May 2012.

AltaLIS. 2012. Alberta Municipal Boundaries (digital file). Calgary, Alberta. Available: http://www.altalis.com. Acquired: May 2012. Last Update Check: May 2012.

BC Forests, Lands and Natural Resource Operations. 2007. Tantalis Regional Districts (digital file). Victoria, BC. Available:https://apps.gov.bc.ca/pub/dwds/home.so. Acquired: March 2011. Last Update Check: May 2012.

BC Forests, Lands and Natural Resource Operations. 2008. Tantalis Parks, Ecological Reserves and Protected Areas (digital file). Victoria, BC. Available:https://apps.gov.bc.ca/pub/dwds/home.so. Acquired: November 2011. Last Update Check: February 2012.

IHS Inc. 2004. IHS Hydro Line Data (digital file). Calgary, Alberta. Available: http://energy.ihs.com/Solutions/Regions/Canada/. Acquired: June 2011. Last Update Check: October 2011.

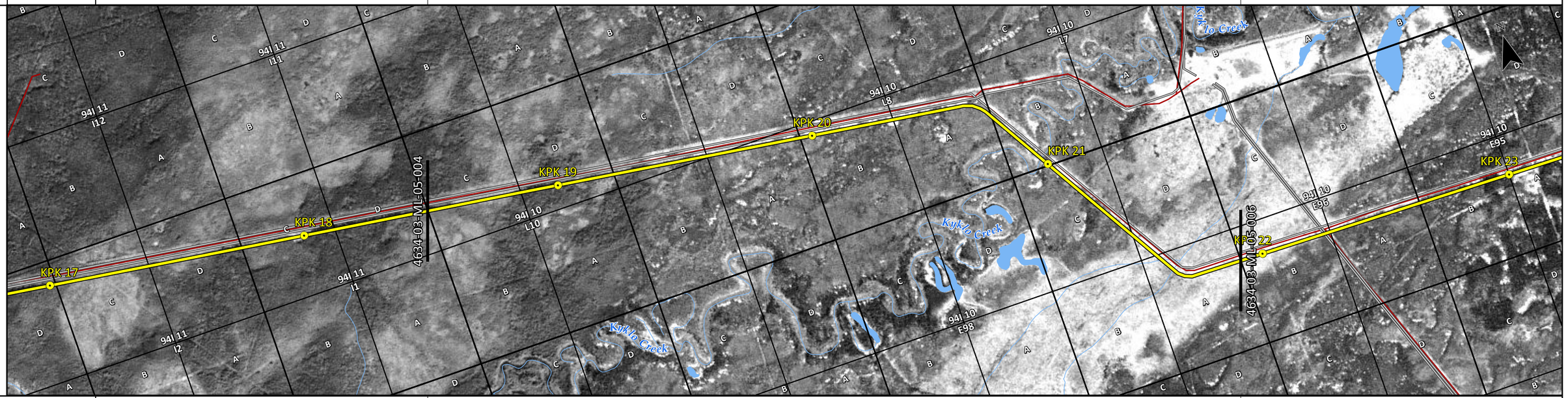
IHS Inc. 2012. IHS Road Segments (digital file). Calgary, Alberta. Available: http://energy.ihs.com/Solutions/Regions/Canada/. Acquired: April 2012. Update Interval: Monthly.

Midwest Surveys Inc. 2011. Pipeline Routing (digital files). Calgary, Alberta. Acquired: September 2011.

ENVIRONMENTAL SETTINGS

PHYSIOGRAPHY		FORT NELSON LOWLAND SUBREGION OF THE GREAT PLAINS PHYSIOGRAPHIC REGION	
WETLANDS		TREED BOG; MIXEDWOOD TREED SWAMP; TREED BOG; MIXEDWOOD TREED SWAMP; TREED BOG; MIXEDWOOD TREED SWAMP; MIXEDWOOD TREED SWAMP; SHRUBBY SWAMP; MIXEDWOOD TREED SWAMP; EMERGENT MARSH	
DRAINAGES			
WATERCOURSE CROSSINGS		KYKLO CREEK	
FISH AND FISH HABITAT		SEE INDEX SHEETS - TABLE 1	
VEGETATION		FORT NELSON LOWLAND SUBREGION OF THE GREAT PLAINS PHYSIOGRAPHIC REGION	
WILDLIFE AND WILDLIFE HABITAT			
HERITAGE AND TRADITIONAL LAND USE		NO SITES IDENTIFIED - SEE NOTES 5 AND 22	TRAIL CORIDOOR 1KM FROM ROW; NO SITES IDENTIFIED - SEE NOTES 5 AND 22
TRANSCANADA DRAWING #		4634-03-ML-02-005	

11" X 17" MOSAIC SCALE 1:15,000
DATE OF PHOTOGRAPHY: 2009



MUNICIPAL AUTHORITY		BC CROWN - NORTHERN ROCKIES REGIONAL MUNICIPALITY	
RIGHT-OF-WAY WIDTH / TEMPORARY WORK SPACE (TWS)		32 m / TWS TO BE DETERMINED	
LAND USE		FORESTED	
OWNERSHIP		CROWN	
ENVIRONMENTAL PROTECTION — STRIPPING SALVAGE		STRIP AREAS TO BE GRADED TO 15 cm (APPROX.) - SEE NOTE 6	
ENVIRONMENTAL PROTECTION — TIMBER SALVAGE — MERCHANTABLE		SALVAGE TIMBER AS DIRECTED IN THE TIMBER SALVAGE PLAN	
ENVIRONMENTAL PROTECTION — TIMBER SALVAGE — ROLLBACK			
ENVIRONMENTAL PROTECTION — ENVIRONMENTAL ISSUES		TREED BOG; MIXEDWOOD TREED SWAMP; TREED BOG; MIXEDWOOD TREED SWAMP; TREED BOG; MIXEDWOOD TREED SWAMP; MIXEDWOOD TREED SWAMP; SHRUBBY SWAMP; MIXEDWOOD TREED SWAMP; EMERGENT MARSH; KYKLO CREEK	
ENVIRONMENTAL PROTECTION — ENVIRONMENTAL PROTECTION MEASURES		SEE NOTE 9 AND NOTE 11; SEE NOTE 9 AND NOTE 11; SEE NOTE 9 AND NOTE 11; SEE NOTE 9 AND NOTE 11; SEE NOTE 9 AND NOTE 11; SEE NOTE 9 AND NOTE 11; SEE NOTE 9 AND NOTE 11; SEE NOTE 9 AND NOTE 11; SEE NOTE 9 AND NOTE 11; SEE NOTES 7, 8, 17, 18, 19, AND 20; SEE NOTE 11	
ENVIRONMENTAL PROTECTION — REVEGETATION			

ENVIRONMENTAL NOTES

SEE INDEX SHEET

Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

LEGEND

- Kilometre Post
- Pipeline
- Existing Pipeline
- Highway
- Local Road
- Watercourse

SOURCES

UTM Zone 10N
2010 SPOT5 © 2012 CNES, Licensed by BlackBridge Geomatics Corp, www.blackbridge.com;
Pipeline Current to 04 April 2011;
Hydrography: IHS Inc. 2004;
Existing Pipelines & Roads: IHS Inc. 2012.

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REVISIONS

REV.	DATE	DESCRIPTION	DRAWN BY
0	April 2011	NEB Submission	JS
1	July 2012	NEB Submission	LT
2	August 2012	NEB Submission	LT

NOVA GAS TRANSMISSION LIMITED
HORN RIVER MAINLINE
(KYKLO CREEK SECTION)
ENVIRONMENTAL ALIGNMENT SHEETS

DRAWN	TERA	DATE	Aug 2012	REV.	2
SCALE	1:15,000	TERA REF.	7238	SHEET	4634-03-ML-05-005

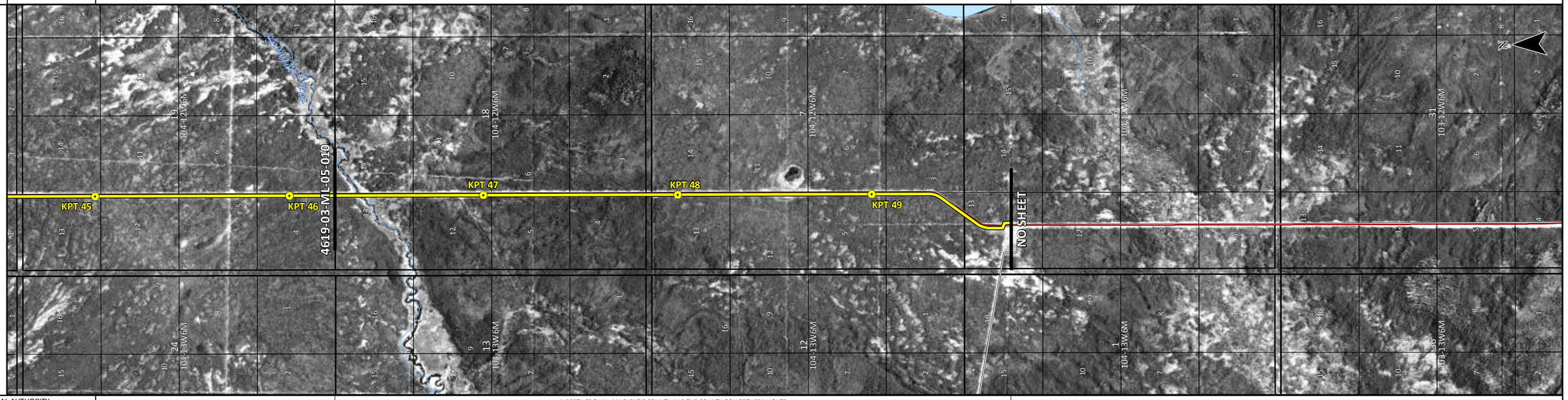
km 0 0.25 0.5

(All Locations Approximate)

ENVIRONMENTAL SETTINGS

PHYSIOGRAPHY	CHINCHAGA PLAIN DISTRICT WITHIN THE CLEAR HILLS UPLANDS DIVISION OF THE NORTHERN ALBERTA UPLANDS PHYSIOGRAPHIC REGION
WETLANDS	TREED BOG; TREED FEN; TREED FEN; SHRUBBY FEN; TREED BOG
DRAINAGES AND BEAVER DAM COMPLEXES (BDC)	SNOWFALL CREEK (BDC)
WATERCOURSE CROSSINGS	
FISH AND FISH HABITAT	SEE INDEX SHEETS - TABLE 1
VEGETATION	LOWER BOREAL HIGHLANDS SUBREGION OF THE BOREAL FOREST NATURAL REGION; RARE PLANT
WILDLIFE AND WILDLIFE HABITAT	CHINCHAGA CARIBOU RANGE; BEAVER DAM COMPLEX; GRIZZLY BEAR SECONDARY ZONE
HERITAGE AND TRADITIONAL LAND USE	NO SITES IDENTIFIED - SEE NOTE 5 AND 25
TRANSCANADA DRAWING #	4619-03-ML-02-011

11" X 17" MOSAIC SCALE 1:20,000
DATE OF PHOTOGRAPHY: 2010



MUNICIPAL AUTHORITY	ALBERTA CROWN - MACKENZIE COUNTY AND THE COUNTY OF NORTHERN LIGHTS
RIGHT-OF-WAY WIDTH / TEMPORARY WORK SPACE (TWS)	32 m / TWS TO BE DETERMINED
LAND USE	FORESTED
OWNERSHIP	CROWN

ENVIRONMENTAL PROTECTION

STRIPPING SALVAGE	STRIP AREAS TO BE GRADED TO 15 cm (APPROX.) - SEE NOTE 6
TIMBER SALVAGE – MERCHANTABLE	SALVAGE TIMBER AS DIRECTED IN THE TIMBER SALVAGE PLAN
TIMBER SALVAGE – ROLLBACK	
ENVIRONMENTAL ISSUES	TREED BOG; TREED FEN; TREED FEN; SNOWFALL CREEK (BDC); SHRUBBY FEN; TREED BOG; RARE PLANT; BEAVER DAM COMPLEX; CHINCHAGA CARIBOU RANGE; SEE NOTE 9 AND NOTE 11
ENVIRONMENTAL PROTECTION MEASURES	SEE NOTES 7, 8, 16, 22, 23, AND 24; SEE NOTE 9 AND NOTE 11; SEE NOTE 7, 8, 16, 23, 24 AND 25; SEE NOTE 11; SEE NOTE 12, 19, 20 AND 21; SEE NOTE 9 AND NOTE 11; SEE NOTE 11
REVEGETATION	

ENVIRONMENTAL NOTES

SEE INDEX SHEET

Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

LEGEND

- Kilometre Post
- Pipeline
- Existing Pipeline
- Highway
- Local Road
- Watercourse

SOURCES

UTM Zone 11N
2010 SPOT5 © 2012 CNES,
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www.blackbridge.com;
Pipeline Current to 01 April 2011;
Hydrography: IHS Inc. 2004;
Existing Pipelines & Roads: IHS Inc. 2012.

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REVISIONS

REV.	DATE	DESCRIPTION	DRAWN BY
0	April 2011	NEB Submission	JS
1	July 2012	NEB Submission	LT
2	August 2012	NEB Submission	LT

NOVA GAS TRANSMISSION LIMITED
NORTHWEST MAINLINE LOOP
(TIMBERWOLF SECTION)
ENVIRONMENTAL ALIGNMENT SHEETS

DRAWN	TERA	DATE	August 2012
SCALE	1:20,000	TERA REF.	7212
REV.	2	SHEET	4619-03-ML-05-011

0 0.25 0.5 km

(All Locations Approximate)