



Integrated Vegetation Management Plan for Coastal GasLink

2025 to 2030



TC Energy

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Glossary of Acronyms

a.i.	Active ingredient
BC	British Columbia
BC EAO	BC Environmental Assessment Office
BCER	BC Energy Regulator
CFIA	Canadian Food Inspection Agency
Coastal GasLink	Coastal GasLink PipeLine Ltd.
EA	Environmental Assessment
EAC	Environmental Assessment Certificate
EDRR	Early Detection and Rapid Response
EMP	Environmental Management Plan
FLNRO	(Ministry of) Forests, Lands, and Natural Resource Operations
IPCPRRD	Invasive Plant Committee of the Peace River Regional District
IPM	Integrated pest management
IPMA	<i>Integrated Pest Management Act</i>
IPMR	<i>Integrated Pest Management Regulation</i>
IVM	Integrated vegetation management
IVMP	Integrated Vegetation Management Plan
LNG	Liquefied natural gas
LNG Canada	LNG Canada Development Inc.
LRMP	Land and Resource Management Plan
MoE	Ministry of Environment and Climate Change Strategy
NIT	Notice of Intent to Treat
NTZ	No-treatment zone
NWIPC	Northwest Invasive Plant Committee
OHSR	Occupational Health & Safety Regulation (WorkSafe BC)
PCM	Post-Construction Monitoring
PCPA	<i>Pest Control Products Act</i>
PCP	Pest Control Product (number)
PFZ	Pesticide-free zone
PMP	Pest Management Plan
PMRA	Pest Management Regulatory Agency
PPE	Personal protective equipment

PUN	Pesticide Use Notice
RMA	Riparian management area
RMZ	Riparian management zone
RoW	Right-of-way
RRZ	Riparian reserve zone
SDS	Safety Data Sheet
st/ha	Stems per hectare
TDGA	<i>Transportation of Dangerous Goods Act</i>
TOP	TC Energy operational procedure

Section 1 – Introduction

Coastal GasLink Pipeline Ltd. (Coastal GasLink or CGL), owned by TC Energy Corporation (TC Energy), operates a 667 km, 48-inch (1,219 mm) diameter natural gas pipeline. The pipeline runs from the community of Groundbirch, BC – about 40 km west of Dawson Creek, BC – to the LNG Canada Development Inc. (LNG Canada) liquefied natural gas (LNG) export facility near Kitimat, BC.

In addition to the pipeline and associated right-of-way, the Coastal GasLink system consists of:

- Meter stations
- Valve sites
- Access roads and ancillary sites
- One compressor station with the potential for up to eight additional compressor stations to be completed as part of Phase 2 of construction

The pipeline system has a capacity of about 2 to 3 billion cubic feet/day (bcf/d) (56 million to 85 cubic metres per day [mmcm/d]), with the potential for expansion up to about 5 bcf/d (142 mmcm/d). The expansion scenarios do not involve the construction of additional pipeline; only the number of compressor stations would change.

1.1 About This Integrated Vegetation Management Plan

The *British Columbia Integrated Pest Management Act and Regulation* (IPMA and IPMR) include provisions for pesticide uses under a Pest Management Plan (PMP), which is referred to as an Integrated Vegetation Management Plan or IVMP in this document.

The mandate and objectives for the Integrated Vegetation Management (IVM) program under this IVMP are to identify pests and set clear, distinct, and tangible thresholds that will help determine the level at which vegetation becomes a pest and identify strategies for control.

The broader definition of pest as outlined in the Integrated Pest Management Act (IPMA) might include many kinds of organisms. However, the focus of this IVMP is on IVM and targeted plant pests as defined in Section 2.2 of this plan, with support in Appendix 1, TC Energy Brush Control Figures.

A pest (referred to as plant pests) in the context of this IVMP is:

- A “Noxious Weed” as identified in the Weed Act, or identified as a priority “Invasive Plant” in local weed committee management plans (referred to in this IVMP as noxious weeds and invasive plants).
- Unwanted vegetation as identified in TC Energy Brush Control Procedures (TOPs) – referred to in this IVMP as undesirable trees and brush.

For the purposes of this plan, the term “undesirable trees and brush” applies only to Coastal GasLink operating facilities and infrastructure.

In addition, this plan aligns and complies with several pieces of federal legislation as listed in [Appendix 2](#).

Industry standards and best practices are followed to achieve desired pest management results within the objectives of IVM. The IVM elements in the IPMA and IPMR, Section 58, outlined in [Section 2](#), will be used as a guide to support an integrated approach to vegetation management while implementing this plan.

1.2 Review and Consultation

To be effective, this IVMP must operate in cooperation with many other individuals, agencies, and land managers since weed infestations occur across many different land uses and jurisdictions. Invasive weed management is most effective when the multi-jurisdictional coordination includes all adjacent landowners in order to achieve the effective prevention of weed spread and overall control.

Coastal GasLink strives to be a sustainable energy provider, both socially and environmentally. Forested and agricultural lands in which Coastal GasLink operates represent important environmental and social resources such as watersheds, wildlife habitat, agriculture, food and fiber production, and recreation to local communities. As such, Coastal GasLink’s vegetation management plans and efforts may be reviewed by governmental and public planning groups, including:

- Local Land Use Plan managers
- Invasive Plant Committee of the Peace River Regional District (IPCPRRD)
- Northwest Invasive Plant Committee (NWIPC)
- The Pest Management Regulatory Agency
- Regional District of Bulkley-Nechako
- Peace River Regional District
- Fraser Fort George Regional District
- Regional District of Kitimat-Stikine
- District of Kitimat

Prior to construction of the pipeline, environmental impact assessments were carried out in support of CGL’s application to the BC Environmental Assessment Office (BC EAO). Management plans for the project were developed in consultation with regulatory agencies and Indigenous groups. The BC EAO confirmed its approval of the project’s Environmental Management Plan (EMP Revision 5) and associated resource management and contingency plans, programs, and reports. On October 24, 2014, the BC EAO awarded CGL a conditional Environmental Assessment Certificate (EAC #E14-03) for the construction and operation of the pipeline system.

Specifically related to vegetation management, EAC #E14-03 contains a condition pertaining to methods of vegetation control in the asserted territories of Indigenous communities:

The Holder must use alternative methods of vegetation control, as specified in the Holder's Invasive Plant Management Plan, in the asserted territories of Indigenous groups that have requested that pesticides or herbicides not be used, and tracked in the *Working Group Issue-Response Tracking Table (including First Nations)* for the *Coastal GasLink Pipeline Project*, provided those alternative methods are consistent with the *Integrated Pest Management Act*.

During the development of the project's environmental impact assessment reports as well as the EMP, engagement work conducted by Coastal GasLink's Indigenous Relations staff provided opportunities for communities to share information and provide input into the planning of the project.

Coastal GasLink continues to consult with and engage Indigenous groups that are potentially affected by the CGL pipeline system in accordance with CGL's Aboriginal Consultation Plan, as well as regulatory requirements, including permit conditions. This consultation will include sharing information with Indigenous groups throughout construction and operational lifespan of the pipeline.

CGL invited Indigenous communities to comment and be involved in the finalization of the IVMP. In addition, prior to registering this plan with the Ministry of Environment and Climate Change Strategy (MoE), Coastal GasLink provided notice to Indigenous groups of its intent to file the IVMP.

1.3 Purpose and Scope

IPMR Section 27,28,58(1),59,61,62,64

Coastal GasLink intends to control vegetation in and around pipeline right-of-way (RoW), access roads, ancillary sites, and facilities using an IVM approach. CGL needs to manage and control vegetation for the following reasons.

- To meet the legal obligation of landowners and occupiers to control noxious weeds under the *BC Weed Control Act*
- To maintain clear site lines to facilitate aerial patrols of the pipeline and RoW, which are critical for inspecting for operational concerns, wildlife, and possible third-party impacts
- To maintain access in case of wildfire events as per legislation requirements
- To reduce the risk of wildfire within fenced, bare ground facilities
- To ensure and maintain the security of fenced facilities
- To establish equivalent land capability

The areas where potential treatments might occur are outlined below in [Section 1.4, Geographic Boundaries](#).

This IVMP will ensure compliance with provincial and federal legislation and TC Energy internal policies, including:

- Public consultation and Indigenous community engagement to ensure awareness of and input to CGL's vegetation management plan.

- Protection of public health and the environment.
- Compliance with the CGL's Environmental Assessment Certificate approval conditions, which include mitigation measures for valued resources as outlined within the CGL EMP. Notably, EAC condition #16 indicates that alternative methods of vegetation control will be used in the asserted territories of Indigenous communities that have requested that pesticides or herbicides not be used. These commitments are tracked in the CGL's Working Group Issue-Response Tracking.
- Conformance with Coastal GasLink's project applications and filings to the BC Energy Regulator (BCER) for construction, operation, and maintenance of the infrastructure identified in [Section 1.4](#).
- Inclusion of all integrated vegetation management principles and options into vegetation management programs

This plan will be in effect for a five-year period from the date the Confirmation of a Pesticide Use Notice is obtained (summer 2025).

The purpose of this IVMP is to provide a framework to manage the growth and spread of noxious weeds and invasive plants and to remove undesirable trees and brush for reasons of safety and fire control, as well as to ensure pipeline or facility site security. The plan outlines a suite of integrated pest management principles that involve the selection of treatments that most effectively target specific plant species and problem vegetation communities, while minimizing impacts to the environment.

1.4 Geographic Boundaries

This plan applies to the CGL pipeline RoW, and all related facilities, ancillary sites, and access roads. The CGL pipeline runs from the Dawson Creek area to the LNG Canada facility near Kitimat, BC.

The geographical areas covered by this IVMP overlap with Peace River Regional District, Fraser Fort George Regional District, Regional District of Bulkley-Nechako, Regional District of Kitimat-Stikine, and the District of Kitimat. Specifically, the areas are near the communities of Dawson Creek, Fort St. John, Groundbirch, Chetwynd, Prince George, Vanderhoof, Fraser Lake, Burns Lake, Houston, Smithers, Kitimat, and Terrace. See [Appendix 3](#) for general location maps for pipelines and facilities referred to within this IVMP.

1.5 Person Responsible for Managing Pests

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Section 2 – Integrated Vegetation Management Plan

2.1 Prevention and Planning

IPMR Section 58(2)(a)

As a first step in the IVM process, Coastal GasLink uses measures aimed at preventing the initial growth and spread of plant pests. These mitigation measures are incorporated during construction, operations, and maintenance and are contained within Coastal GasLink's EMP and TOPs. Some of these prevention measures may include:

- Minimizing the spread of invasive and noxious weeds. Examples in practice include:
 - All equipment arriving on site is clean and free of soil or vegetative debris
 - Minimizing construction area disturbance
 - Rapid site reclamation
 - Preventing use of weed-contaminated construction and reclamation material
 - Cutting, bagging, and disposing of seed heads in appropriate landfills (during weed control activities)
- Seed certificates of analysis will be obtained and all seed used will be Canada Certified No. 1, if available. Seed mixtures used will have a weed certificate.
- Seeding of forbs and grasses: Involves the planting of native grass mixes or plants in specific areas (such as erosion-prone areas) during and post-construction to return the land to equivalent land capability.
- Removal of topsoil and/or installing aggregate or geo-textile materials: Done during construction and after site disturbances in site-specific areas (usually facilities) where this treatment is deemed to be beneficial and suppression of all vegetation is required.

All seed mixes and rates have been developed with insight from BC regulatory agencies and the Working Group. All seed used will require seed certificates of analysis and will be Canada Certified No. 1 or better (Canadian Food Inspection Agency 2007).

Prevention requirements are also driven by the following provincial legislation and EAC conditions:

- The *BC Weed Control Act* imposes a duty on all land occupiers to control designated noxious weeds.
- The BC EAO, as per the EAC, requires development of an Invasive Plant Management Plan and implementation of a Post-Construction Monitoring (PCM) Program.
- As per a condition of EAC #E14-03, alternative methods of vegetation control must be used in the asserted territories of Indigenous communities that have requested that herbicides and pesticides not be used.
- The *BC Wildfire Act* requires that Coastal GasLink mitigate any potential fire hazards on their facility sites and rights-of-way.

2.2 Pest Identification

IPMR Section 58(2)(b)

Accurate identification of weeds and/or undesirable trees and brush on or adjacent to CGL's RoW and facilities enables the company to better understand the potential growth rate, spread, and other characteristics of these targeted plant pests, as well as predict locations of future infestations and decide if control is warranted or desirable. Plant pest identification also includes data collection as outlined in [Section 2.3.3](#). In addition, the scope of identifying undesirable trees and brush includes those plants on and around Coastal GasLink facilities and directly on RoWs (while staying within Coastal GasLink's legal boundaries).

The pests targeted under this IVMP can be divided into two groups as per [Section 1.1](#): weeds (noxious weeds and invasive plants) and undesirable trees and brush.

2.2.1 Noxious Weeds and Invasive Plants

Invasive plants and noxious weeds are non-native plants that have been introduced into a region or area of the province from an outside source. Due to a lack of predators from their natural environment that would otherwise help control their aggressive growth tendencies, these alien plants can be highly destructive to habitat and food production values, cultural values and can have significant economic and human health impacts. Noxious weeds are invasive plant species that are regulated under law and are identified [Parts 1 and 2 of Schedule A](#) of the *BC Weed Control Regulation* under the *Weed Control Act*. Left unchecked, they are difficult to control and can take over native or desirable vegetation.

According to a study commissioned by the Invasive Species Council of BC and published in 2021, the rate of alien species invasions and the number of established alien species have risen drastically over the past fifty years and are expected to continue to have significant and increasing impacts to species at risk throughout BC. Early detection and rapid response (EDRR) to localized infestations is critical to keeping them contained.

Targeted invasive plant and noxious weed infestations are identified during pre-construction biophysical studies, construction activities, post-construction monitoring (PCM), routine maintenance operations (see [Section 2.3](#)), and communications with local landowners, land managers, and local weed committees. A priority listing of these plants is derived from the experience of local land managers, the IPCPRD, the NWIPC, and profiles of locally targeted invasive plants.

2.2.2 Undesirable Trees and Brush

Undesirable trees and brush are nuisance vegetation requiring control due to:

- Safety concerns caused by reduction of visual site lines
- Access limitations
- Fire prevention
- Occupational health and safety (trip/fall issues)

This may include any vegetation in and around the project facilities and infrastructure elements along RoWs (e.g., fence lines or crossings that are within the project legal boundaries).

By clearly identifying and understanding the plant pests within its legal and statutory boundaries (along its RoW corridors, access roads, and around facilities), Coastal GasLink has a better appreciation of the types of control methods required. In some cases, plant pest species can be easily controlled by non-chemical methods, while others can only be effectively managed through a combination of non-chemical and chemical methods. Re-sprouting of certain deciduous tree species, for example, is best controlled by manual/mechanical cutting followed by the application of foliar herbicide to the re-sprouts one to two growing seasons after cutting. In addition, timing of control measures varies according to species and treatment type, which significantly impacts program planning and thus social, environmental, and economic concerns within the IVM process.

Undesirable trees and brush are identified primarily through regular maintenance activities, which include vegetation monitoring elements (see [Section 2.3](#) below), routine inspections (as stated in [Section 2.1](#)), aerial patrols, and communication with/from local landowners and land managers.

2.3 Pest Monitoring

IPMR Section 58(2)(c)

During construction and post-construction monitoring activities, RoW monitoring via ground patrols provides information on vegetation encroachment or infestation. When vegetation is identified as a problem, informal site plans are developed. In areas where herbicide is not applied, the *Weed Monitoring Form* ([Appendix 5](#)) is used to collect data. Where herbicide is the intended treatment method, the *Herbicide Application Log* ([Appendix 4](#)) is used in place of the *Weed Monitoring Form* (also see [Section 2.3.3](#) below).

During operations, periodic facility and RoW monitoring via aerial and ground visitation provides information on vegetation encroachment or infestation. When vegetation is identified as a problem, a digital record is created. The annual accumulation of these records, and other opportunistic observations by locals and CGL staff while on site, informs the development of informal site plans for an area. Specific actions and items are also recorded on the *Herbicide Application Log* or the *Weed Monitoring Form* ([Appendix 4](#) and [Section 2.3.3](#)).

CGL conducts regular follow-up monitoring and evaluations of its annual vegetation management activities. These evaluations, as part of ground and aerial visitation, include detailing selected plant pest communities and areas for management on a site-specific basis. Information gathered helps generate a more formalized vegetation management plan for a given geographic area. The visitations, which include opportunistic observations, verify the need for treatment and help confirm the best time, type, and scope of treatments.

2.3.1 Monitoring Methods

The pest monitoring methods to be conducted will consist of activities implemented during construction, post-construction monitoring, and operations of the pipeline and facilities.

During construction and post-construction monitoring activities of the pipeline RoW, facilities, ancillary sites, and access roads, routine ground or aerial inspections will be conducted throughout the growing season.

During operations, routine inspections of facilities and air patrol of RoW are the main pest monitoring method. Facilities have regular monthly inspections with formal vegetation inspections completed annually. Where aerial patrols identify vegetation problems on RoWs, a ground inspection is completed. Site plans for vegetation management within the previously identified geographic areas are developed following inspection protocols.

2.3.2 Frequency of Monitoring

During construction activities, ground-based monitoring is conducted throughout the growing season. Post-construction monitoring activities are initiated once construction and final cleanup is complete on the facilities and pipeline RoW, and are carried out for the first five years of operations. The frequency of inspections and monitoring depends on the following:

- Length of time that construction activities require the pipeline RoW, facilities, ancillary sites, and access roads to remain in either a disturbed or un-reclaimed state
- Re-vegetation and reclamation success
- Type of facility or pipeline RoW being managed

The frequency of inspections and monitoring during operations activities depends on the type of facility or pipeline RoW being managed. Aerial patrols of RoWs are required a minimum of once per year and ground patrols supplement these as problem sites are identified.

Some monitoring during construction, PCM, and operations activities is also conducted on an unscheduled and *ad hoc* basis, driven by landowner, community, or other local stakeholder complaints, or communication with provincial or local weed committees and land managers.

2.3.3 Data Collected

Data that may be collected during identification of vegetation pests include:

- Percentage cover and distribution information both at and adjacent to the site, along with species mix, composition, and any efficacy of past treatments as applicable
- Potential areas of concern with adjacent landowners, or areas of new ingress/infestation, such as new ground disturbance that will be habitat for noxious weeds and invasive plants or accumulating organic matter (including information on site type, location, and priority)

- Environmental data for potential treatment sites, including information on riparian areas, wildlife, erosion concerns, and water protection requirements and methods
- Previously identified resources and mitigation measures from the EMP
- Access concerns (e.g., road conditions, presence of invasive species along access roads, washouts, etc.)
- Potential treatment methods and timing

Monitoring is done visually (sometimes with photo documentation). Ground monitoring generates a pre-treatment assessment, which in turn will become part of the overall work plan for a geographic area (that will include numerous sites). If a herbicide treatment is prescribed, a *Herbicide Application Log* (see [Appendix 4](#)) is completed for the site. Where herbicide is not permitted for use, the *Weed Monitoring Form* ([Appendix 5](#)) is completed.

2.4 Treatment Thresholds

IPMR Section 58(2)(d)

Vegetation to be treated and prioritization of treatment is based on safety, security, access, and compliance with federal and provincial requirements.

All compressor stations, meter stations, and valve sites must be clear of vegetation to bare ground, including land within and 1 m around fence lines. These sites must be free of all vegetation including dry skeletons.

These requirements are driven by TC Energy policies and operation procedures (TOPs) as well as the conditions of the Environmental Assessment Certificate (EAC #E14-03) and the *BC Wildfire Act*.

2.4.1 Noxious Weeds and Invasive Plants

Noxious weed and invasive plant treatments will be completed to reduce pest populations to equivalent levels or below comparable adjacent lands with similar land use and land management.

2.4.2 Undesirable Trees and Brush

The targeting of trees and brush – but not creating bare ground areas – will be done when the following encroaching conditions apply:

- Undesirable trees and brush are within 5 m from the centreline on each side of the pipeline, including overhead canopy intrusions (see [Appendix 1, TC Energy Brush Control Figures](#)).
- Vegetation obscures the identity and presence of the pipeline for safety and operational requirements, or for conducting pipeline maintenance, safety inspections, emergency response, and leak/pressure surveys.
- Vegetation visually obstructs pipeline markers and signs.
- Vegetation is under and around exposed pipe.
- Vegetation impacts the integrity of the pipeline or pipeline bed (safety and operations).

Clearing of vegetation at helicopter landing sites will include a minimum 20 m width or full easement width, whichever is less, and 200 m along the RoW in each direction from the boundaries of block valves, side valves, and thermal electric generator sites, and 50 m along the RoW in each direction from cathodic protection test leads.

2.5 Treatment Options

IPMR Section 58(2)(e)

A variety of treatment options will be employed by Coastal GasLink to control plant pests. When selecting the most appropriate methods, consideration will be given to the type of vegetation, treatment timing, land use, and environmental, and social aspects.

A wide variety of undesirable plant pests may exist on any given site, so multiple techniques and variable timing may be required to best address these pests, including manual/mechanical, cultural, or chemical options. The benefits and limitations of each of these treatment options are considered when making treatment selection decisions as described in [Section 2.6](#).

A brief description of each of these options along with their benefits and limitations follows.

2.5.1 Manual/Mechanical Treatments

Mowing / Mulching

These methods involve the use of powered mobile rotary mowers to cut areas of plant pests. They can be used in larger areas of RoW. Typically, rotary pin and blade mowers will be used to remove deciduous brush and herbaceous undergrowth.

Mowing / Mulching	
Benefits	Limitations
<ul style="list-style-type: none"> ○ Can improve aesthetics on some sites ○ Fast and effective on large areas ○ Works well on plant pests that propagate through seed or annuals if timed correctly 	<ul style="list-style-type: none"> ○ Safety issues due to flying debris ○ Can create significant debris and potential fire and safety hazards on sites with extensive deciduous shrub, bush, and tree problems ○ Does not work well on perennials and plant pests that propagate through roots and rhizomes ○ Repeated treatments are required ○ Non-selective; impacts all vegetation cover ○ High risk activity during wildfire season – limited window of opportunity to complete

Weed Whacking

This method involves the use of rotary-powered hand mowers (brush saws and weed whackers). It is used selectively to control undesirable trees and brush (e.g., along fence lines) and noxious weeds and invasive plants in smaller dispersed populations.

Weed Whacking	
Benefits	Limitations
<ul style="list-style-type: none"> ○ Can improve aesthetics on some sites ○ Logistically easy to apply this technique to smaller dispersed sites ○ A method commonly used by local contractors ○ Works well on shrubs and plant pests that propagate through seed or annuals 	<ul style="list-style-type: none"> ○ Safety/health issues due to flying debris and two-cycle motor exhaust fumes ○ Can create significant debris and potential fire and safety hazards onsite ○ Does not work well on perennials and plant pests that propagate through roots and rhizomes ○ Repeated treatments are required if herbicide follow-up cannot be done ○ High-risk activity during wildfire season – limited window of opportunity to complete

Hand Pulling and Digging

These techniques are primarily used for managing individual plant pests and sporadic diffuse infestations of noxious weeds and invasive plants. Hand pulling is only effective if the infestations are of a manageable size (see [Figure 1, Treatment Decision-making Flowchart](#)). Some species are difficult to hand pull, especially if the plants are young (e.g., knapweed species), which makes this treatment ineffective.

Hand Pulling and Digging	
Benefits	Limitations
<ul style="list-style-type: none"> ○ Can be applied any time of year ○ Logistically easy to apply this technique to smaller dispersed sites ○ A method commonly used by local contractors ○ Works well on plant pests that propagate through seed or annuals ○ Works well in environmentally-sensitive areas 	<ul style="list-style-type: none"> ○ Safety/health issues due to fatigue and strain ○ Does not work well on plant pests that propagate through roots and rhizomes i.e., difficult to remove all fragments of roots and stolons that will cause regrowth ○ Repeated treatments are required

Discing and Ploughing

These methods may be used on agricultural lands or grassland areas when the objectives are to destroy underground root systems, deplete seed reserves in the soil, and prevent future seed production.

The techniques are most effective when they are timed to catch the first germination of vegetation or weeds; in autumn to kill winter annuals, biennials, and the suppressed perennials; or in autumn to stimulate the germination of new plants that will be susceptible to winter frost.

Discing and Ploughing	
Benefits	Limitations
<ul style="list-style-type: none"> ○ Can be used effectively on large areas for rehabilitation ○ Works well on plant pests that propagate through seed or annuals 	<ul style="list-style-type: none"> ○ Not suitable for non-agricultural areas or smaller sites ○ Does not work well on plant pests that propagate through roots and rhizomes ○ Follow-up treatment of some other type may be required ○ Disturbs soil, providing a seeding area for new infestations ○ Brings weed seed in the soil seed bank to the surface, which can stimulate new growth

2.5.2 Cultural Control Treatments

Cultural control treatments reduce the establishment, reproduction, dispersal, or survival of target vegetation. These can be preventive treatments that involve the planting of forbs and grasses to disturbed sites where invasive plants or noxious weeds can gain a foothold. Seeding may be applied post-construction or after a localized disturbance at a site to help promote competition and to choke out weeds and invasive plants with desirable, native vegetation.

Cultural Controls	
Benefits	Limitations
<ul style="list-style-type: none"> ○ Native vegetation is reintroduced to the site ○ Works well for small areas where recent disturbance has occurred ○ Works as an option in environmentally sensitive areas 	<ul style="list-style-type: none"> ○ Not suitable on all sites due to soil and site conditions ○ Can be difficult to obtain appropriate seed ○ Can be labour intensive and tedious work not popular with labour force

2.5.3 Biological Control Treatments

Biological control treatments involve introducing natural predators, parasites, or pathogens to the environment to control target vegetation. This may include the use of targeted grazing (such as goats or sheep) to reduce target vegetation or the intentional introduction of insects, mites, or fungal pathogens to control an unwanted vegetation pest. Insect pest introduction is done on a plant and site-specific basis and is provincially coordinated, usually involving the Invasive Species Council of BC (ISCBC). The import and release of biological control agents in Canada is regulated by the Canadian Food Inspection Agency (CFIA).

Biological Controls	
Benefits	Limitations
<ul style="list-style-type: none"> ○ Can work well in environmentally sensitive areas ○ Can be very selective; no danger of damage to non-target plant species ○ Can be self-sustaining, broad-scale control of target vegetation 	<ul style="list-style-type: none"> ○ Complex pest management strategy that requires a robust understanding of ecology; may be difficult to design and implement ○ Biocontrol agents may be difficult to obtain due to permitting requirements ○ Limited number of target weeds that can be controlled with insect agents (still in development) ○ Grazing does not work well on perennials and plant pests that propagate through roots and rhizomes ○ May impact or slow the establishment of desirable vegetation ○ Fencing requirements; grazers need to be kept in the area to be controlled

2.5.4 Chemical Control Treatments

Basal Bark Streamline

Basal bark streamline treatment involves using an herbicide (triclopyr) to penetrate the bark of deciduous and coniferous vegetation from the root collar upwards to a point determined by the size of the stem. Enough chemical and oil carrier is applied selectively to encircle the stem and effect a chemical girdling. Application is usually done in the spring, summer, or early fall with backpack or hand-held sprayers. The herbicide diffuses through the tree and roots.

Basal Bark Streamline	
Benefits	Limitations
<ul style="list-style-type: none"> ○ Highly selective with little or no off-target drift ○ Works well on undesirable trees and brush ○ Can be used at most times of the year ○ Cost-effective in areas with stem densities of less than 10,000 st/ha and stems less than 2.5cm at stump ○ Easily applicable to large or small infestations of undesirable trees and brush 	<ul style="list-style-type: none"> ○ Dead vegetation is unsightly ○ Public concerns over herbicide use ○ Does not translocate well and vegetation prone to suckering may show diminished efficacy over time ○ High densities or large stems bring higher costs and more herbicide usage

Cut Surface Treatments

With cut surface treatments, deciduous trees are cut down close to the ground and herbicide is applied at the stump using either an applicator attached to the saw or a spray

bottle. The herbicide is applied to prevent re-sprouting. Usually, the active ingredient glyphosate is used, but in some cases triclopyr may be substituted.

Cut Surface Treatments	
Benefits	Limitations
<ul style="list-style-type: none"> ○ Highly selective with little or no off-target drift ○ Works well on undesirable trees and shrubs prone to suckering if glyphosate is applied ○ Cost-effective in areas with high stem densities (in excess of 10,000 st/ha) where basal streamline is limited ○ Visually more beneficial than basal streamline as the stem is cut ○ Easily applicable to large or small infestations of undesirable trees and brush 	<ul style="list-style-type: none"> ○ Cut stumps and debris can be a hazard (fire and worker safety) ○ Safety/health issues due to flying debris and two-cycle motor exhaust fumes ○ Time-consuming and expensive ○ Public concerns over herbicide use ○ High densities or large stems bring higher costs

Foliar Treatments

With this treatment, herbicides are usually applied by backpack, but wick and wipe-on applications are also included here. Applications are typically selective and targeted treatments, but broadcast applications are sometimes used on large contiguous areas of plant pests. Efficacy for most active ingredients is best when plant pests are at full leafout and actively growing. Some off-target effects may occur with foliar applications but are limited to the selective nature of the treatment and the site attributes.

This technique has physical limitations. Applications must cease if winds reach speeds of 8km/hr, or in lighter winds if the potential for offsite drift becomes apparent. Spraying may also be suspended under certain high temperature and low humidity conditions where label recommendations of the manufacturer and provincial legislation dictate.

Foliar Treatments	
Benefits	Limitations
<ul style="list-style-type: none"> ○ Can be used very selectively ○ Work well on most types of vegetation including perennials ○ Works well to eradicate noxious weeds and invasive species that reproduce by their root system ○ Controls plants at the seedling or juvenile stage that may be difficult to distinguish or control through other methods ○ Cost-effective and efficient use of labour and chemical ○ Easily applicable to large or small infestations of plant pests ○ Application rates and dosage can be varied depending on target requirements 	<ul style="list-style-type: none"> ○ Physically demanding ○ Public concerns over herbicide use ○ Applications are weather and seasonally dependent

Soil and Bare Ground Applications

Herbicides are applied using backpack or motorized application equipment (similar to foliar) to bare ground areas where there is zero tolerance for any vegetation due to safety, security, and regulatory imperatives. On some sites, multiple treatments may be used or a mix of herbicides applied.

This technique has physical limitations. Applications must cease if winds reach speeds of 8km/hr, or in lighter winds if the potential for offsite drift becomes apparent. Spraying may also be suspended under certain high temperature and low humidity conditions where label recommendations of the manufacturer and provincial legislation dictate.

Soil and Bare Ground Applications	
Benefits	Limitations
<ul style="list-style-type: none"> ○ Works well on most types of vegetation ○ Application rates and dosage can be varied depending on target requirements ○ Cost-effective, with efficient use of labour and chemicals ○ Easily applicable to large or small infestations of undesirable trees and brush 	<ul style="list-style-type: none"> ○ Physically demanding ○ Public concerns over herbicide use ○ Applications are weather and seasonally dependent

2.6 Treatment Selection

IPMR Section 58(2)(e)(ii)

Coastal GasLink may use a variety of treatment methods (outlined in [Section 2.5](#) and [Section 5.2](#)) to meet control objectives. Each method has an application where it may be best suited. Treatment type and suitability depends on several factors that differ considerably from site to site. Some of these suitability considerations include:

Timing: This is a critical factor with all treatment types and especially when the use of herbicides is contemplated. Product selection is based on mode of action (e.g., residual post-emergent soil-applied products vs. foliar-applied systemic products). The timing of application and technique used is driven by the growth stage of the target plant pests (e.g., foliar applications must be made to actively growing plants, whereas residual pre- and post-emergent herbicides are applied to the soil before seeds germinate).

Density, height, area coverage (%): These important considerations drive which technique to employ. Spot (selective) applications can be used on sites with dispersed and low population density, while broadcast applications are needed on dense sites with higher density populations of plant pests (see [Figure 1, Treatment Decision-making Flowchart](#)).

Species: Control of some specific species of weeds is best achieved with specific herbicide products (e.g., invasive weeds that propagate through roots and rhizomes are impossible to eradicate through manual methods).

Safety, security, access: Access to some sites may be physically limited at certain times of the year. In addition, in areas where dead weeds present a fire hazard, treatments need to take place before the dry time of the year so weed skeletons can be removed.

Site characteristics and conditions: The presence or absence of riparian areas that may require pesticide-free zones (PFZs) and no-treatment zones (NTZs) is a critical factor in determining treatment type and whether herbicides can be used safely or not. In addition, soil types will influence which product can be applied. Topography and size of the site will determine which technique is best employed.

Adjacent land: The usage attributes of adjacent lands impact the priority of treatments and type of treatment when the consequences of no treatment are considered. For example, it may be critical to control invasive and noxious weeds next to agricultural land, especially if adjacent lands are used for certified seed production, or if lands have been certified organic and require additional buffers to maintain their status.

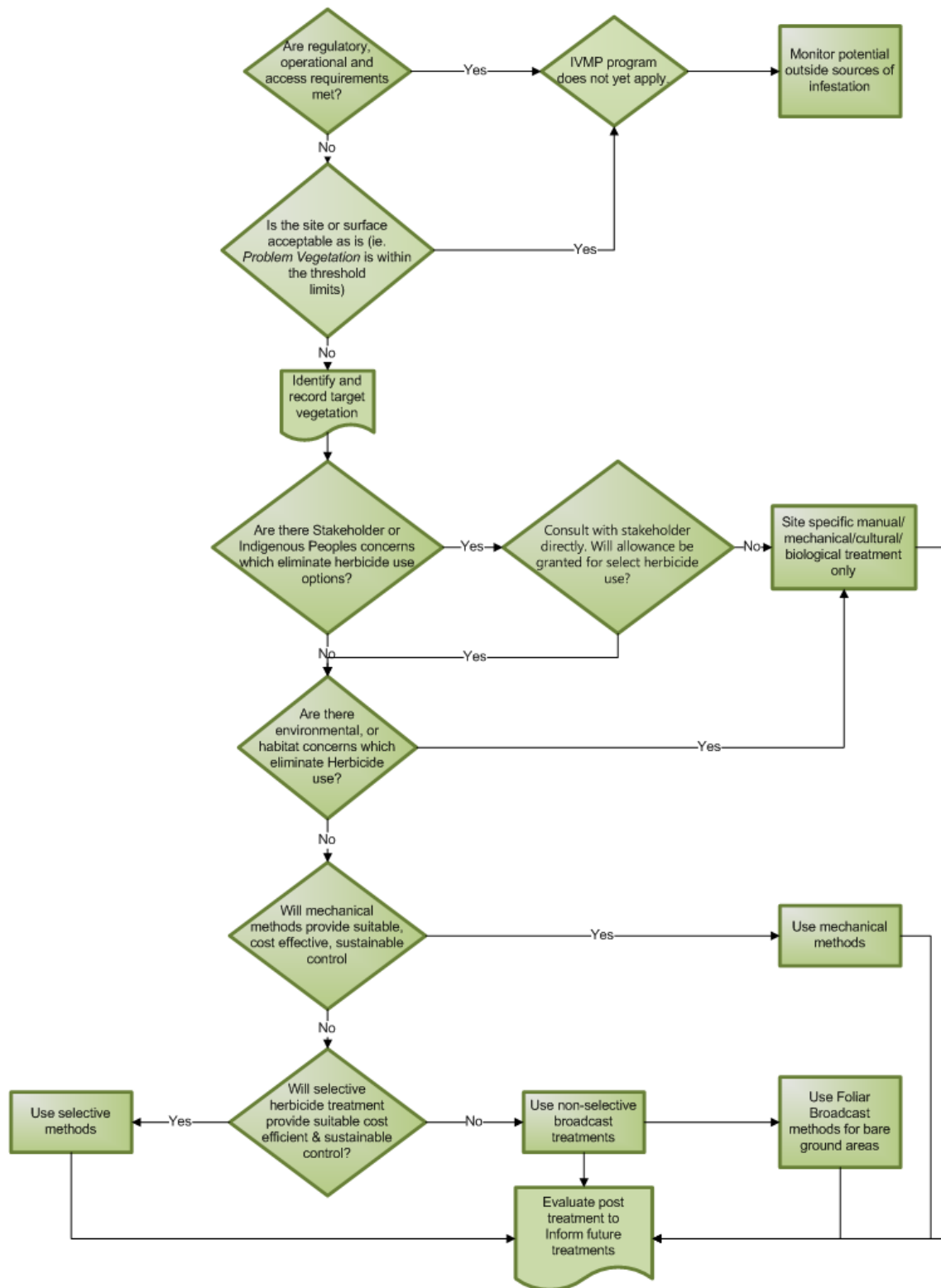
Stakeholder and Indigenous concerns: Issues brought forward associated with a site may limit the type of treatment applied according to the conditions of the EAC (#E14- 03), and as identified during engagement with stakeholders and Indigenous communities.

Economics of treatment type: Cost of treatment is a factor in the decision-making process, especially on sites where control of all vegetation is critical.

Coastal GasLink staff and contractors use good professional judgement and experience to ensure that the most suitable, efficacious, environmentally compatible, and cost-effective method or combination of methods is chosen.

The following simplified flowchart depicts the treatment decisions to be made when determining treatment type.

Figure 1: Treatment Decision-Making Flowchart



2.7 Post-treatment Evaluation

IPMR Section 58(2)(f)

Post-treatment evaluation is integral to continually improving and refining the vegetation management process. Coastal GasLink uses post-treatment evaluation as a planning tool and predictor for future treatments.

Post-treatment evaluation will be conducted using visual assessments during onsite visitations. For facility sites, evaluation is completed within a year of treatment as a minimum. For RoW areas and remote locations, evaluations will be completed within a year of treatment. During these assessments, evaluators will record results on the *Herbicide Application Log* (see [Appendix 4](#)) or the *Weed Monitoring Form* for the site (see [Appendix 5](#)). Some of the observations to be recorded include:

- IVMP compliance, including boundary and PFZ marking as required, offsite treatment, and protection of riparian areas, habitat, and any other valued components of the land
- Whether treatment objectives were met, with efficacy and impacts to targets rated as poor, fair, good, or excellent based on visual estimates
- Impacts to non-targets, if any (record in the Post-Treatment Recommendations section of the *Herbicide Application Log*)
- Suitability of treatment selected and recommendations for changes, including evidence of cumulative effects and resistance
- Recommendations for follow-up treatments

Contractor personnel may be engaged in conducting post-treatment evaluations. Sites requiring additional follow-up evaluation or treatment are noted in the *Herbicide Application Log* or *Weed Monitoring Form* and will be included in vegetation management plans for the site in the future, as required. These observations will be used to improve future vegetation management programs.

Section 3 – Operational Requirements

3.1 Herbicide Transport

IPMR Section 58(3)(a)(i)

Provincial and federal legislation, the *Integrated Pest Management Act* (IPMA), and the *Transportation of Dangerous Goods Act* (TDGA) regulate the transportation and handling of some herbicides.

Contractors working for Coastal GasLink will be responsible for the transportation, storage, mixing, loading, applying, and handling of all herbicides and herbicide containers

All Coastal GasLink contractors will follow these procedures while transporting herbicides for application under this IVMP:

- Quantities of herbicides to be transported will be minimized.
- Herbicide concentrate will only be carried in a lockable compartment that is secured from unauthorized removal.
- Herbicide concentrate will only be transported in original labelled containers or in an appropriate undamaged, sealed container with trade name, active ingredient concentration, and pesticide registration number clearly written and affixed to the container.
- Herbicide concentrate will always be carried separately from food and drinking water, safety gear, and people.
- Vehicles transporting herbicides will be equipped with a first aid kit, fire extinguisher, spill contingency plan, and spill kit. Vehicle operators will be trained to implement these tools.
- Appropriate documents, including but not limited to, product labels and Safety Data Sheets (SDS) will be carried in each vehicle during herbicide transport and use. Appropriate placards will be affixed to the vehicle as required (see TDGA).

3.2 Herbicide Storage

IPMR Section 58(3)(a)(ii)

Contractors engaged by Coastal GasLink will ensure that all herbicides will be stored in accordance with the *Integrated Pest Management Act and Regulation* and WorkSafe BC's [*Standard Practices for Pesticide Applicators*](#). Some contractors may store herbicides for extended periods of time in vehicles when performing herbicide treatments for Coastal GasLink.

For all storage units, fixed or mobile, the following conditions will apply:

- No herbicides will be stored on Coastal GasLink property.
- The storage area will be ventilated to the outside atmosphere.
- Storage containers and or the storage area will be locked when left unattended.
- Access to storage areas will be restricted to authorized personnel.

- Storage containers and storage areas will be marked accordingly with placards that say in clearly visible block letters: “WARNING – CHEMICAL STORAGE – AUTHORIZED PERSONS ONLY.”
- The person responsible for the storage area will notify the appropriate fire department of the presence of herbicides on the premises.

3.3 Herbicide Mixing, Loading, and Applying

IPMR Section 58(3)(a)(iii)

All mixing, loading, and application of herbicides will be carried out by certified pesticide applicators in the appropriate category of certification.

The following procedures and precautions will be observed by Coastal GasLink contractors when mixing, loading, and applying herbicides:

3.3.1 Mixing and Loading Precautions

- Mixing of herbicides must always be conducted in a safe manner.
- Spill kits, spill response plans (including emergency contact numbers), and first aid supplies will be present on or near the treatment site.
- Personal washing facilities (with eye wash station) will be available at or near the mixing/loading areas.
- Personal protective equipment (PPE) will be worn and precautions implemented to prevent unprotected human exposure to pesticides.
- A copy of this IVMP, product labels, and SDS will be available at or near the treatment site. Label requirements along with IVMP recommendations will be followed.
- There will be no mixing or loading of herbicides within 10 m of sensitive environmental features (riparian areas, streams, wetlands, lakes, NTZs).
- There will be no mixing or loading of herbicides within 30 m of any wells or water intakes.
- Precautions will be implemented to ensure that domestic water sources, agricultural water sources, and soil used for agricultural crop production are protected for their intended use.
- To prevent contamination of watercourses, the containers and suction hoses used for herbicides will not be used to collect water from natural sources such as streams or ponds. The intake of water for mixing will be protected from backflow into the natural source by an “air gap” or “reservoir” between the source and the mixing tank.

3.3.2 Application Precautions

- Application equipment must be calibrated at the beginning of each project and after any changes are made to equipment of chemical mixtures and concentrations.
- Equipment must be in good working condition with no leaks.
- Whenever possible, mixing stations will be located within the treatment areas.

- All applications will be carried out by a certified applicator or under the supervision of a certified applicator. A ratio of 4:1 – applicators to certified applicator, will not be exceeded.
- All non-certified applicators will complete the BC MoE online training for Assistant Applicators.
- Applicators will review and confirm all boundaries and restrictions to treatment prior to application. PFZs and NTZs will be marked before commencing treatment.
- Signage will be posted prior to treatment.

3.4 Unused Herbicides

IPMR Section 58(3)(a)(iv)

Whenever practical, rinsate (herbicide waste from rinsing containers) will be used onsite as part of the carrier for additional applications. Any other rinsate produced (i.e., not used in applications) during application will be disposed of onsite where practical, and in a manner consistent with the requirements of the *Environmental Management Act* and the *Hazardous Waste Regulation*, as appropriate.

Leftover herbicide mix will be stored according to procedures identified in [Section 3.2](#).

3.5 Herbicide Container Disposal

IPMR Section 58(3)(a)(iv)

Empty containers will be disposed of by Coastal GasLink contractors in accordance with the manufacturer's instructions as noted on the product label or provincial instructions, and the recommendations detailed in the BC Ministry of Environment's *Handbook for Pesticide Applicators and Dispensers* (2005), the *Canadian Pesticide Education Program Applicator Core Manual*, and the Chemical and Waste Management Plan (Appendix D.1 of the EMP).

As a minimum, empty herbicide containers will be:

- Returned to the herbicide distributor as part of their recycling program; or
- Triple rinsed or pressure rinsed, then altered so they cannot be reused, and disposed of in a permitted sanitary landfill or other approved disposal site

3.6 Herbicide Spill Plan and Procedures

IPMR Section 58(3)(a)(v)

Spill response equipment will be at or near all storage mixing and application sites, and will include at least the following:

- Personal protective equipment, as per label recommendations and WorkSafe BC's *Occupational Health & Safety Regulation* (OHSR)
- Absorbent material such as sawdust, sand, activated charcoal, vermiculite, dry coarse clay, clay litter, or commercial absorbent

- Neutralizing material such as lime, chlorine bleach, or washing soda
- Broom, shovel, and waste container with lid

Contractors working under this IVMP who have their own spill response plan must ensure that it meets or exceeds the following basic procedures as outlined in the TC Energy Release and Spill Response Procedure and Coastal GasLink's Spill Contingency Plan (Appendix C.1 of the EMP). A copy of the approved spill response plan will be at or near each work site.

Personnel will follow these procedures (at a minimum) when working with herbicides and responding to herbicide spills:

- Spill response equipment and plan must be present at any application, storage, mixing, and loading site.
- Personnel must be familiar with and trained with respect to the response plan, equipment being used, and how to stop/contain spills.
- Appropriate PPE will be worn by all personnel when responding to spills (see label recommendations and WorkSafe BC's OHSR).
- Safety of personnel and human health protection will be first and foremost in any spill response plan.
- The spilled material should be clearly identified and the source of the spill should be stopped.
- The spilled material should be stopped from spreading by creating a dam or ridge to surround it.
- The project supervisor will ensure operations cease until the spill is contained and the source is repaired.
- Absorbent material will be spread over the spill, if applicable, to absorb any liquid and assist in mitigating any spread.
- The absorbent material will be collected in garbage bags or containers with the contents clearly marked.
- The person responsible for the project will contact an approved representative of Coastal GasLink to determine if the spill is reportable (using the TC Energy Release and Spill Response Procedure) and to determine instructions for shipping and disposal of waste material.
- All spills will be recorded in the TC Energy's Enablon system which generates actions from incidents.
- As a general guide, any spill of herbicide (a deleterious substance) into a water body is reportable.
- As a general guide, any spill of herbicide product in excess of 5 kg or 5 L on land or while transporting is reportable.

The following emergency contact information (Table 1) can be used for assistance if a spill occurs and is determined to be reportable as per the TC Energy Release and Spill Response Procedure, or as per the minimum amounts outlined above.

Table 1: Emergency Contact Numbers for Spills

Agency	Phone
Ministry of Emergency Management and Climate Readiness	1-800-663-3456 (24 hours)
BC Drug and Poison Information Centre	1-800-567-8911
Canada Transport Emergency Centre – CANUTEC (clean-up info)	1-613-996-6666 (collect)

3.7 Equipment Maintenance and Calibration

IPMR Section 58(3)(b)(v)

Application contractors will calibrate equipment used for foliar applications. Equipment should be calibrated:

- Prior to starting a project
- Following the manufacturer's directions and/or the FLNRO [Herbicide Field Handbook](#) (Boateng 2002); and/or the [Canadian Pesticide Education Program Applicator Core Manual](#), and [BC Industrial Vegetation Supplement](#).
- After maintenance/repair or after changes to equipment (e.g., nozzle changes)
- After changes in formulation or herbicide concentrations
- After changes in application personnel

All application equipment will be suitable to the project, compatible with project objectives, and in good repair. Records will be kept by contractors for each piece of calibrated equipment or person for a minimum of two years.

Section 4 – Environmental Protection

In planning herbicide treatments, Coastal GasLink supervisory personnel and contractors will review the treatment area and identify any environmentally-sensitive features and Valued Components and determine appropriate mitigation measures.

In support of the application to the BC EAO, Coastal GasLink consulted with Indigenous communities that may be affected by, or have an interest in, the project prior to construction. These efforts provided opportunities for Indigenous groups to share information and provide input into the planning of the pipeline project. Outcomes from this engagement informed the identification of Valued Components that were the subject of biophysical and traditional ecological knowledge field programs, as well as traditional land use studies in which a number of Indigenous groups chose to participate and contribute.

Data from these programs and studies were assessed by expert consultants (including professional biologists, botanists, and specialists in traditional land use) and integrated into the Environmental Assessment Application to the EAO. The assessment determined the significance of potential effects of the proposed pipeline's construction and operation, including vegetation management activities on traditional land use, vegetation, wildlife, and other ecosystem components.

The expert consultants identified mitigation measures to reduce or eliminate these potential effects of construction and operational activities in the EMP. The resources and mitigation measures are reflected in the EMP and mapped on CGL's internal mapping software.

In addition to pre-construction survey information, the engagement work conducted by CGL and indigenous relations personnel in support of this IVMP provided opportunities for the public and Indigenous communities to share information and provide input into the planning of the projects. The input is in turn reflected in the final IVMP. Components identified as part of the initial or ongoing discussions will also be identified during the pre-treatment inspections.

Prior to starting any herbicide treatments, all involved contractors and Coastal GasLink supervisory personnel will attend a pre-job/tailgate meeting. Items to cover in the discussion will include but are not limited to:

- Treatment area boundaries and any areas requiring PFZs and NTZs
- Any Valued Components and mitigation measures identified during treatment planning
- Accommodations and/or exclusions that CGL committed to during the consultation process for this IVMP
- Any resources and mitigation measures identified in the EMP
- Any additional TOPs that may apply

[Appendix 6](#) contains definitions of terms taken from applicable legislation, many of them related to environmental terms as used in the following paragraphs.

4.1 Protection of Community Watersheds

IPMR Section 58(3)(b)(i)

Community watersheds will be identified and located by accessing the [Water Stewardship Division](#) and the [Community Watersheds website](#) of BC MoE.

A minimum 30 m NTZ will be applied to protect licensed water intakes within the community watersheds, except where special circumstances apply as outlined in the IPMR Section 74(1)(2) and 77(1)(2).

In addition, all PFZs/NTZs will be measured and marked/flagged prior to herbicide use as per [Appendix 7](#) (*Minimum Water Protection Measures*, with distances and exceptions).

4.2 Protection of Fisheries Resources and Riparian Areas

IPMR Section 58(3)(b)(ii)

Prior to implementing any treatment options or control measures, the following will be confirmed:

- Location of bodies of water
- Classification of bodies of water as fish-bearing or non-fish-bearing
- Establishment of any required PFZ or NTZ

The *Integrated Pest Management Act and Regulation* specifically sets the standard for protecting fisheries resources and riparian areas regarding the use of herbicides. Herbicide treatments along bodies of water, dry streams, and classified wetlands requiring identification and layout will follow requirements found in the IPMR Sections 71 and 73 to 77 (see [Appendix 7](#)). In addition:

- All measurements will be taken on the horizontal plane.
- All PFZs will be measured from the high-water mark and will have buffers to maintain PFZ integrity.
- Buffer widths will depend on application method, terrain, and complexity of the treatment area.

Working around wetlands, watercourses, and waterbodies is a higher risk activity that requires considerable pre-planning and proper execution. During and post-construction, CGL ensures protection of water quality, fish, and fish habitat by following designed and approved water crossing techniques. CGL implements any specific conditions referenced in provincial water permits, codes of practices, or *Fisheries Act* authorizations, as well as any identified [Measures to Protect Fish and Fish Habitat](#) (Fisheries and Oceans Canada).

4.3 Protection of Wildlife and Wildlife Habitat

IPMR Section 58(3)(b)(ii)

Wildlife habitat features identified through the program planning phase outlined above and observed onsite become part of vegetation management plans along with the *Herbicide Application Log* site reviews. Wildlife observations, including species at risk, will be reported to

Coastal GasLink environmental personnel. Any application of herbicides around these features will be consistent with the protection measures outlined in the EMP, PCM plans developed for the site, and/or TC Energy operational procedures (TOPs).

Opportunistic observations of wildlife habitat features (e.g., beaver lodges, raptor nests, etc.) will be reported to Coastal GasLink environmental personnel and site-specific protection measures will be implemented.

In general, the following precautions will apply:

- Treatments of all types will seek to minimize soil erosion potential from vegetation management activities.
- Buffers (determined on a site-by-site basis using as a minimum the buffers included in the EMP and the guidelines in [Appendix 7](#)) will be maintained around active/inhabited raptor and heron nests, mineral licks/wallows, and other essential wildlife habitat and Valued Components.

See [Section 4.7](#) for information on federally and provincially listed species at risk.

4.4 Protection of Domestic and Agricultural Water Intakes and Wells

IPMR Section 58(3)(b)(i)

As per Section 71 of the *Integrated Pest Management Regulation*, a 30 m NTZ will be maintained around any water supply intake or wells used for domestic or agricultural purposes, including water for livestock or for crop irrigation.

As per the IPMR, this distance may be reduced if Coastal GasLink is reasonably satisfied that the smaller NTZ will continue to ensure the integrity of the intake, and the rationale for this decision is documented.

4.5 Protection of Food Intended for Human Consumption

IPMR Section 58(3)(b)(iii)

Some of Coastal Gaslink's RoW and facilities may be located near environmentally-sensitive areas such as lawns, gardens, and berry-picking areas. Other sensitive areas include agricultural lands with crops or domestic animals. Food for human consumption can be found within some of these sensitive areas, which can also be adjacent to problem vegetation that is targeted for control and management. To protect these areas, the following strategies will be implemented:

- Non-chemical methods of vegetation management will be considered where all treatment objectives can still be achieved.
- Before treatment occurs, all reasonable efforts will be made to identify areas containing food plants for human consumption (including berries and medicinal plants). If herbicides are required for control, NTZs will be maintained around these areas during application.

- Where possible, herbicide treatments will be conducted at times that minimize impacts on food plants.
- Where organic growers contact Coastal GasLink, practical measures using buffers and NTZs will be included in vegetation management plans to ensure the integrity of the grower's operations.
- Signs will be posted at all access points to treatment sites to meet regulatory requirements (IPMR Section 64(1)). Signs help ensure that individuals who may be using vegetation in the area are notified of adjacent herbicide applications.

4.6 Identification and Marking of Treatment Boundaries

IPMR Section 58(3)(b)(iv)

The following procedures will be implemented to ensure that treatment area boundaries have been identified and clearly marked prior to herbicide applications:

- Specific information on treatment area boundaries and the location of known environmentally-sensitive features will be included in annual vegetation management plans developed as part of site inspections and on-site visitations as per [Section 2.3.3](#), and recorded on a *Herbicide Application Log (Appendix 4)* or *Weed Monitoring Form (Appendix 5)*.
- Contractors will be provided with the above information during the pre-job information meeting (see beginning of [Section 4](#)). The previous season's treatments will be reviewed to confirm any boundary changes/adjustments or changes to wildlife habitat features.
- A pre-treatment inspection will be conducted to establish treatment boundaries, to document the location of environmentally sensitive areas, and to confirm that no members of the public or grazing wildlife or livestock are in or near the treatment areas.
- Marking/flagging of all PFZs and NTZs will be completed by the application contractor prior to treatment.
- Marking/flagging will be left for at least 14 days after herbicide application.

4.7 Protection of Vulnerable Species and Habitat

IPMR Section 58(3)(b)(ii)

In the Environmental Assessment that supported Coastal GasLink's EAC application to the BC EAO, professional biologists identified and assessed potential impacts that the proposed pipeline project would have on species of concern, including federally and provincially listed species. They identified mitigation measures to reduce or eliminate the potential adverse effects; these mitigation measures are identified in the EMP.

Observation of species at risk that may be picked up by opportunistic observation or ground patrols will be reported to CGL environment personnel, in accordance with the TC Energy Fish and Wildlife Protection Procedure.

Where necessary, site-specific protection measures will be implemented based on proximity to potential pest management areas and discussions with appropriate regulators. Where vulnerable

species or habitat is identified, consideration of alternative methods of vegetation control will be explored to maintain the integrity of the species or habitat in question.

4.8 Weather Monitoring Procedures

IPMR Section 58(3)(b)(vi)

Measurements will be made to record weather conditions prior to, periodically during, and at the end of herbicide applications. Wind speed and direction, precipitation, temperature, and sky conditions will be recorded for foliar and soil herbicide applications. Temperature, precipitation, frost, and dew conditions will be recorded for wick/wipe-on applications, cut surface stump, and basal bark applications.

Persons applying herbicides will check each product label prior to usage and will adhere to directions for applying herbicides and information on weather conditions and limitations. Herbicide application will be stopped if:

- The maximum or minimum temperature stated on the herbicide label is exceeded.
- The wind speed or direction will cause the foliar or soil application of herbicide to drift significantly from the target.
- Ground wind velocity exceeds 8km/hr for broadcast foliar applications.
- Precipitation will lead to excessive runoff and leaching.
- There is ice or frost on the foliage.

Section 5 – Herbicides and Application Techniques

IPMR Section 58(3)(c)

5.1 Potential Herbicides Used

Table 2: Herbicide Product Names and Active Ingredients to be Used Under this IVMP

Trade Name(s)*	Active Ingredient	PCP No.
2,4-D Amine 600 (Ester 700)	2,4-D	14726 (27820)
Arsenal Powerline	Imazapyr	30203
Banvel VM	Dicamba	29249
Clearview	Aminopyralid / Metsulfuron methyl	29752
Esplanade SC	Indaziflam	31333
Garlon XRT	Triclopyr	28945
Gateway Adjuvant	Paraffinic Oil / Alkoxylated Alcohol	31470
Hasten NT Ultra	Methyl and ethyl oleate (esterified vegetable oil)	31760
Lontrel 360	Clopyralid	23545
MCPA Ester 600 (Amine 600)	MCPA	27803 (28384)
Milestone (Milestone NXT)	Aminopyralid (Florpyrauxifen)	28517 (34728)
Navius VM	Aminocyclopyrachlor Metsulfuron methyl	31382
OcTTain XL	Fluroxypyr / 2,4D	30077
Overdrive	Diflufenzopyr (present as sodium salt) - 20% a.e. and Dicamba (present as sodium salt) - 50% a.e.	30065
Payload	Flumioxazin 51.1%	29232
Roundup	Glyphosate	13644
Roundup Transorb HC	Glyphosate	28198
Sightline	Aminopyralid / Metsulfuron-Methyl-Fluroxypyr	30409 / 30795
Simplicity	Pyroxsulam	31916
Sylgard 309	Siloxylated Polyether 806%	23078
Tordon 101	Picloram and 2,4-D	9007
Tordon 22K	Picloram	9005
Truvist	Clorosulfuron / aminocyclopyraclor	30920
Xiameter OFX-0309 Fluid	Siloxylated Polyether	23078

*Note: These trade name products are meant as examples only and may be substituted with alternate products containing the same active Ingredients as listed here.

An expanded list of these active ingredients and a brief description of their properties are included in [Appendix 8](#).

5.2 Application Techniques

The benefits and limitations of each of these application techniques are considered when making treatment selection decisions, as described in [Section 2.6](#).

5.2.1 Cut Surface Applications

This technique will be used in conjunction with manual treatments for controlling undesirable trees and brush. The problem vegetation is cut as low to the ground as possible and herbicide is applied to the cut surface of the stump to limit re-sprouting. The active ingredients glyphosate and triclopyr may be applied using this technique.

Cut Surface Applications	
Benefits	Limitations
<ul style="list-style-type: none"> ○ Preferable in highly visible areas or in areas where standing dead trees (left by other treatment types such as foliar and basal) do not meet treatment aesthetic objectives ○ Very little herbicide drift occurs because herbicide application is restricted to the cut surface of freshly cut stumps resulting in minimal impact to valued components ○ It poses little risk of herbicide exposure to workers or the general public ○ Selective removal of tall-growing deciduous trees generally helps promote the growth of low-growing forage plants for wildlife habitat ○ Most useful for control of undesirable trees and brush located on perimeter fences or access roads and riparian areas 	<ul style="list-style-type: none"> ○ Not very effective in controlling some deciduous vegetation that re-sprouts through root suckering ○ To be successful, stump treatment needs to occur immediately following manual/mechanical cutting

5.2.2 Basal Bark Applications

This technique involves applying the active ingredient triclopyr to the bark of deciduous stems where it diffuses throughout the plant through translocation. Some of the herbicide also travels to the roots to help prevent re-sprouting. Trees may take up to three years to be killed with basal bark application of triclopyr.

Basal bark applications are generally applied to deciduous vegetation where the stems are between 1cm and 5cm in diameter, and where the stem density is less than 10,000 stems per hectare. Although most effective in the late summer, basal bark applications can be made throughout the year, except when the bark is wet.

Basal Bark Applications	
Benefits	Limitations
<ul style="list-style-type: none"> ○ Very little herbicide drift occurs because herbicide application is restricted to the basal areas of the bark resulting in minimal impact to valued components. ○ It poses little risk of herbicide exposure to workers or the public ○ Selective control of the tall-growing deciduous trees helps promote the growth of low-growing forage plants for wildlife 	<ul style="list-style-type: none"> ○ Not effective in wet weather ○ Translocation to roots is limited and some suckering may occur ○ In dense stands, the cost of chemical can be prohibitive

5.2.3 Foliar Applications

With this technique, a manually-operated pressurized backpack sprayer, wipe-on or wick apparatus, or vehicle-mounted spray apparatus with handguns or boom-mounted nozzles may be used to apply most of the active ingredients in [Table 2](#) (depending on formulation and as per manufacturer’s recommendations). This technique is most effective when the target vegetation is actively growing.

Typically, foliar-applied herbicides work by translocation. This mode of action results in the herbicides being transported through the plant affecting the roots and shoots. Some foliar-applied herbicides can remain active in the soil for a period of time and can also be taken up by the roots of new plants as they develop (see [Appendix 8](#) for more details on the properties of the active ingredients listed in this IVMP).

Foliar Applications	
Benefits	Limitations
<ul style="list-style-type: none"> ○ Can be carried out at any time of the growing season 	<ul style="list-style-type: none"> ○ As foliar applications are susceptible to drift, caution must be exercised around desirable plants and environmentally-sensitive areas ○ If non-selective herbicides are being applied, they will control both the target vegetation and desirable plants growing among them ○ Some foliar applications are seasonally influenced and require full leafout and restrictive weather conditions for drying

5.2.4 Soil and Bare Ground Applications

With this technique, a manually-operated pressurized backpack sprayer or vehicle-mounted spray apparatus with handguns or boom-mounted nozzles may be used to apply the active ingredients for total vegetation control within facilities and up to 1 m outside the fence line.

Soil Applications	
Benefits	Limitations
<ul style="list-style-type: none"> ○ Non-selective residual herbicides can be used for vegetation control within most facilities where long-term control of all species is the objective ○ Annual treatment provides good long-term control 	<ul style="list-style-type: none"> ○ Due to the residual nature of most herbicides used with this technique, care should be taken to monitor the offsite movement of the product ○ If used in areas subject to heavy rainfall, offsite movement is possible through soil leaching

5.3 Notice of Intent to Treat

IPM Reg. Sec.42 (1)(2)(3)

Coastal GasLink will complete and submit a Notice of Intent to Treat (NIT) at least 21 days prior to treatment in a calendar year.

The NIT will include:

- The name and business location of the confirmation holder
- A description of the proposed treatment areas (the Work Plan, including the pesticide and the method of application) for each calendar year
- A map that identifies each treatment location
- Total area of all proposed treatments for the calendar year

5.3.1 Protecting Site-Specific Locations

During the IVMP information-sharing, consultation, or engagement process, if an interested party informs Coastal GasLink of any site-specific locations of high cultural, food production, recreation, or habitat value, and requests protection of these Valued Components, Coastal GasLink personnel will revise the IVMP to include any commitments made.

Protection of such areas will follow EMP requirements and be accomplished through implementation of PFZs, treatment selection adjustments, or treatment scheduling changes, and will be done on a site-specific basis where specific concerns have been identified. In addition, Coastal GasLink will provide the annual NIT and maps to those who requested a copy during the information-sharing process.

5.3.2 Modifications to the Notice of Intent to Treat

IPM Reg. Sec.42 (4)(5)

For additions or modifications to the NIT that result in an increase of total area equal to or less than 10%, a written notice will be submitted to the administrator at least two days prior to starting treatment on the added or modified areas.

For additions or modifications to the NIT that result in an increase of total area greater than 10%, a revised NIT will be submitted to the administrator at least 21 days prior to starting work on those additions or modifications causing the excess increase (greater than 10%).

These changes will also be passed along to those parties who have requested annual NIT copies as per [Section 5.3.1](#).

Appendix 1 – TC Energy Brush Control Figures

Figure 2: Brush Control Clearing on Single Pipeline RoW

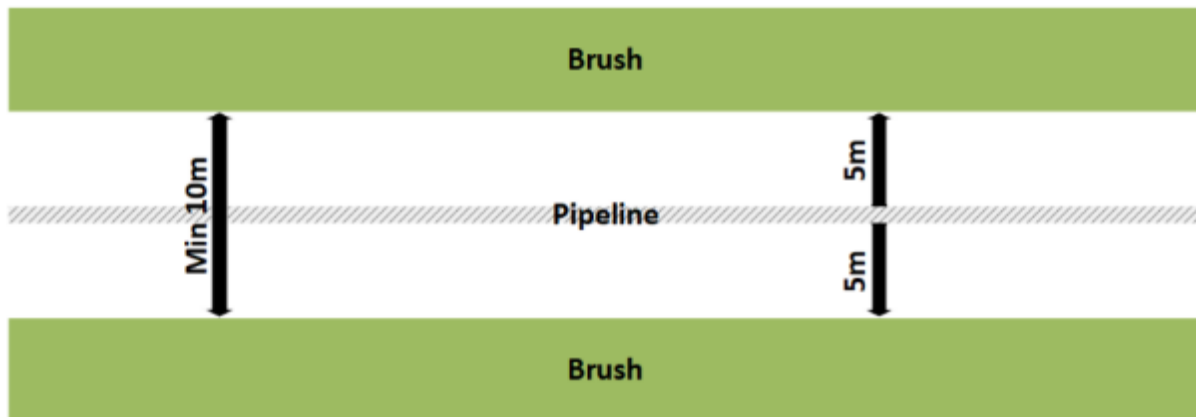


Figure 3: Brush Control Clearing on Multiple Pipeline RoW

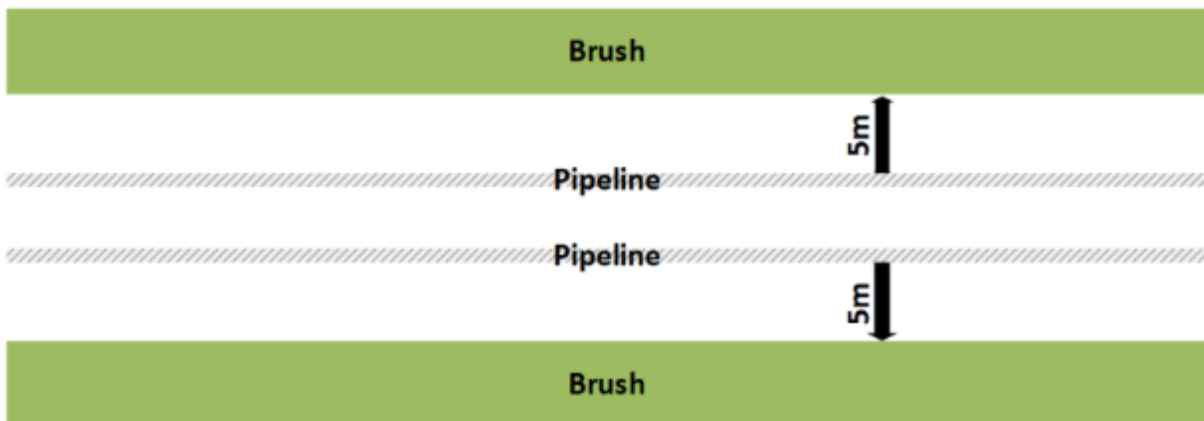


Figure 4: Vegetation Buffers at Water Crossing

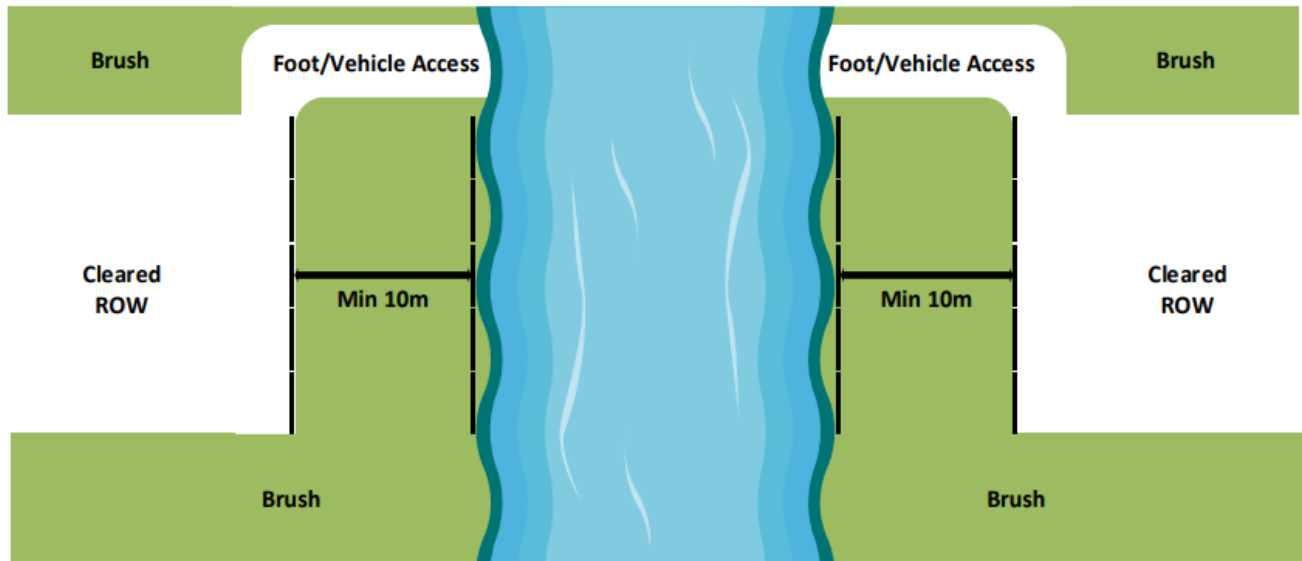


Figure 5: Helicopter Landing Site for RoW Facility

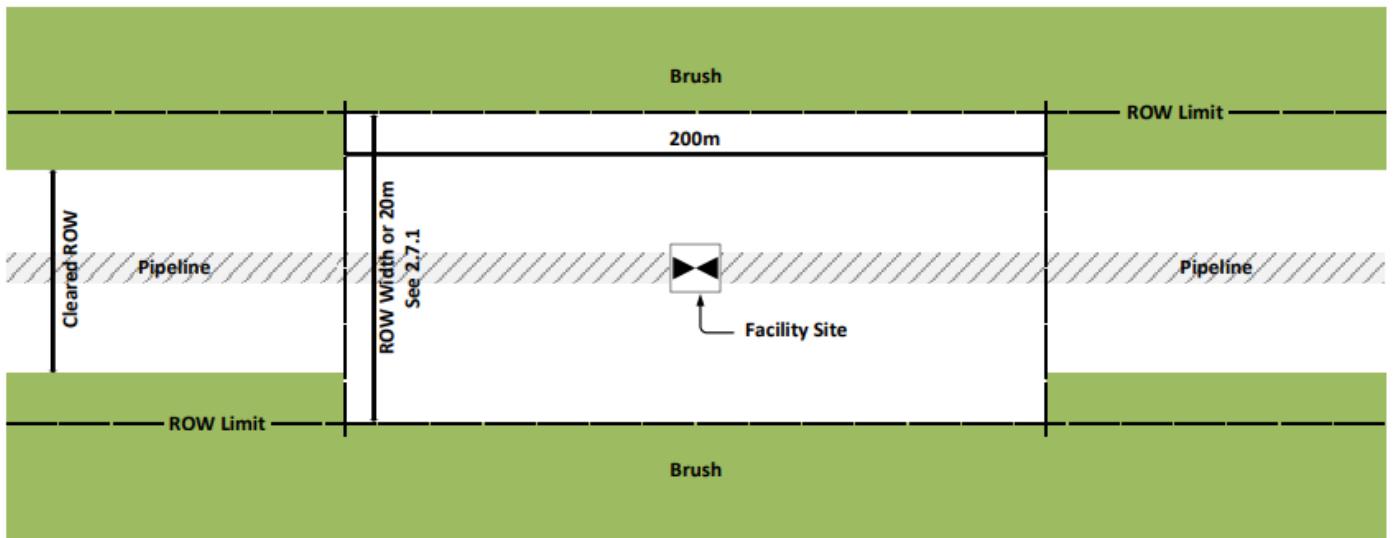
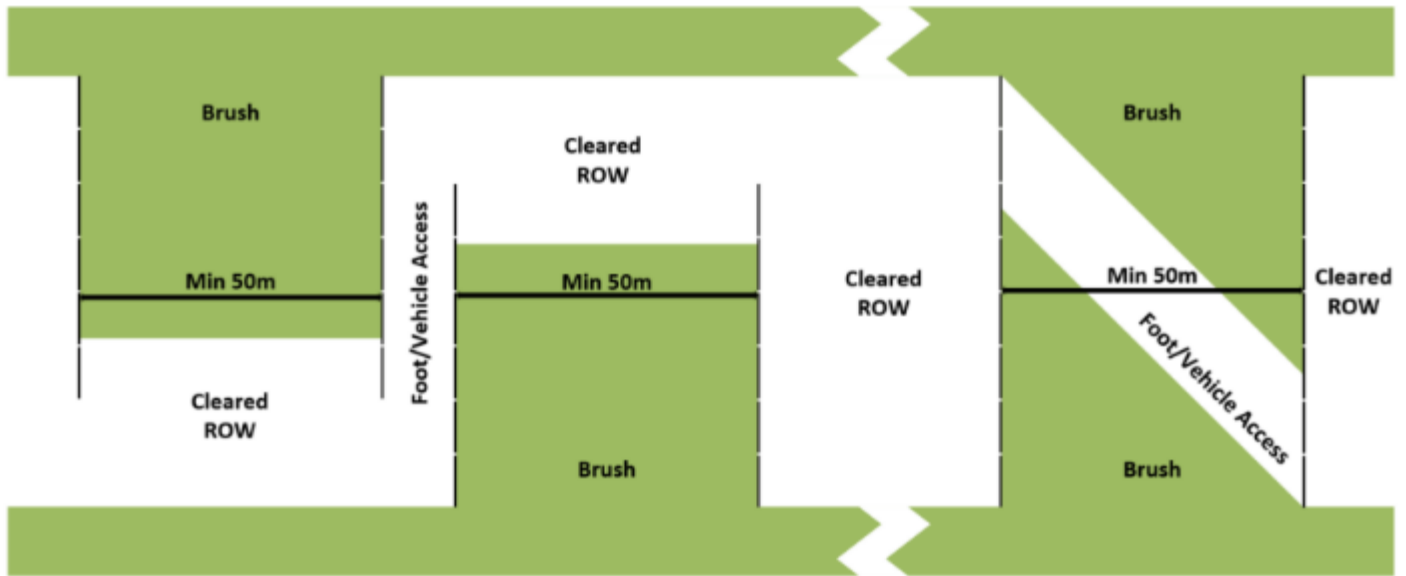


Figure 6: RoW Sight Blocks



Appendix 2 – Legislation and Other Resources

This information is provided for the reader's interest.

Federal and provincial legislation that contain sections pertinent to TCE CGL's vegetation management operations include (but are not limited to) the following:

Federal Legislation

Fisheries Act establishes criteria for the protection of fisheries and fish habitat from pesticides.

Food and Drugs Act describes restrictions on pesticide use on livestock forage and where humans will consume livestock.

Migratory Birds Convention Act describes the requirements to protect migratory birds from pesticides.

Pest Control Products Act summarizes the registration and availability of pesticides and prohibits application under unsafe conditions.

Pesticide Residue Compensation Act details possible compensation for farmers whose crops have been seized by the Health Protection Branch.

Species at Risk Act works to (a) prevent wildlife species (plants and animals) from becoming extirpated or extinct; (b) provide for the recovery of species at risk, and; (c) encourage the management of species to prevent them becoming at risk in the future.

Transportation of Dangerous Goods Act provides information regarding the storage and transportation of pesticides (and other dangerous goods).

Waste Management Act outlines procedures for the disposal of pesticide wastes.

Provincial Legislation

Environmental Management Act prohibits the introduction of wastes into the environment without a permit or approval of compliance. The legislation regulates activities such as transportation and storage of wastes, disposal of unused petroleum or herbicide products, empty petroleum or herbicide containers, and herbicide-contaminated rinse water.

Integrated Pest Management Act and Regulation prohibits the application of pesticides, including herbicides, on Crown land except under an authorization of a Pesticide License or a confirmation of a Pest Management Plan from the PMP holder. The legislation regulates the use, handling, storage, disposal, and sale of pesticides. The MoE administers the act and supporting regulations from regional offices within the province. Pest Management Plans are developed by the proponent and must be kept on file for any audits that MoE may deem necessary under the

IPMA. Refer to the Definitions in [Appendix 6](#) for more information on key elements of the legislation.

Water Sustainability Act outlines the rights to the use of water in streams within British Columbia. This includes the altering or improving of streams or channels.

Weed Control Act outlines the obligation to control designated noxious weeds by the land occupier.

Wildlife Act establishes criteria for the protection of wildlife and wildlife habitat.

Workers Compensation Act enforces the WorkSafe BC *Occupational Health and Safety Regulation* when carrying out herbicide applications and other vegetation management activities.

Regulatory and Review Agencies

Vegetation management work undertaken by Coastal GasLink under this IVMP may be reviewed by several higher-level planning authorities or agencies.

BC Energy Regulator (BCER)

The BC Energy Regulator regulates many aspects of the oil and gas industry, as a representative of the Crown. The BCER has legislated authority under the *Forest Act*, *Heritage Conservation Act*, *Land Act*, *Waste Management Act*, and the *Water Sustainability Act*.

6534 Airport Rd., Fort St. John, BC, V1J 4M6 Main Reception: (250) 261-5700

To report incidents call: 1-800-663-3456 (24 hours a day) FAX: (250) 261-5728

Environmental Assessment Office and the Environmental Assessment Act

The Environmental Assessment process ensures that any potential environmental, economic, social, cultural, and health effects that may occur during the lifetime of a major project are thoroughly assessed. Environmental Assessments are managed by the Environmental Assessment Office, a neutral regulatory agency within the provincial government that works with and seeks input from scientific professionals, Indigenous groups, proponents, the public, local governments, and federal and provincial agencies to ensure that no adverse effects are missed.

The Environmental Assessment Office follows a clearly defined process in the [Environmental Assessment Act](#) to conduct the assessment of a major project, and then produces a detailed Assessment Report. That report is then given to provincial Ministers to make a decision on if the project should proceed.

Pest Management Regulatory Agency (PMRA)

The Pest Management Regulatory Agency (PMRA) was established in April 1995 in response to the recommendations of the Pesticide Registration Review Team. The review

team was charged with studying and making recommendations to improve the federal pesticide regulatory system. The federal legislative authority for the regulation of pesticides in Canada is the *Pest Control Products Act* (PCPA). With the transfer of administration of the PCPA from the Minister of Agriculture and Agri-Food Canada to the Minister of Health, the PMRA was established in Health Canada to consolidate the resources and responsibilities for pest management regulation. The PMRA now administers the PCPA for the federal Minister of Health.

The PCPA regulates the use of substances that claim to have a pest control use, including all products designed to manage, destroy, attract, or repel pests that are used, sold, or imported into Canada. These products include chemicals, devices, and even organisms, and are referred to collectively as pest control products, or simply “pesticides.”

The PCPA also regulates other substances that are contained in pest control products, such as formulants, adjuvants, and contaminants, which can also pose risks to human and environmental health.

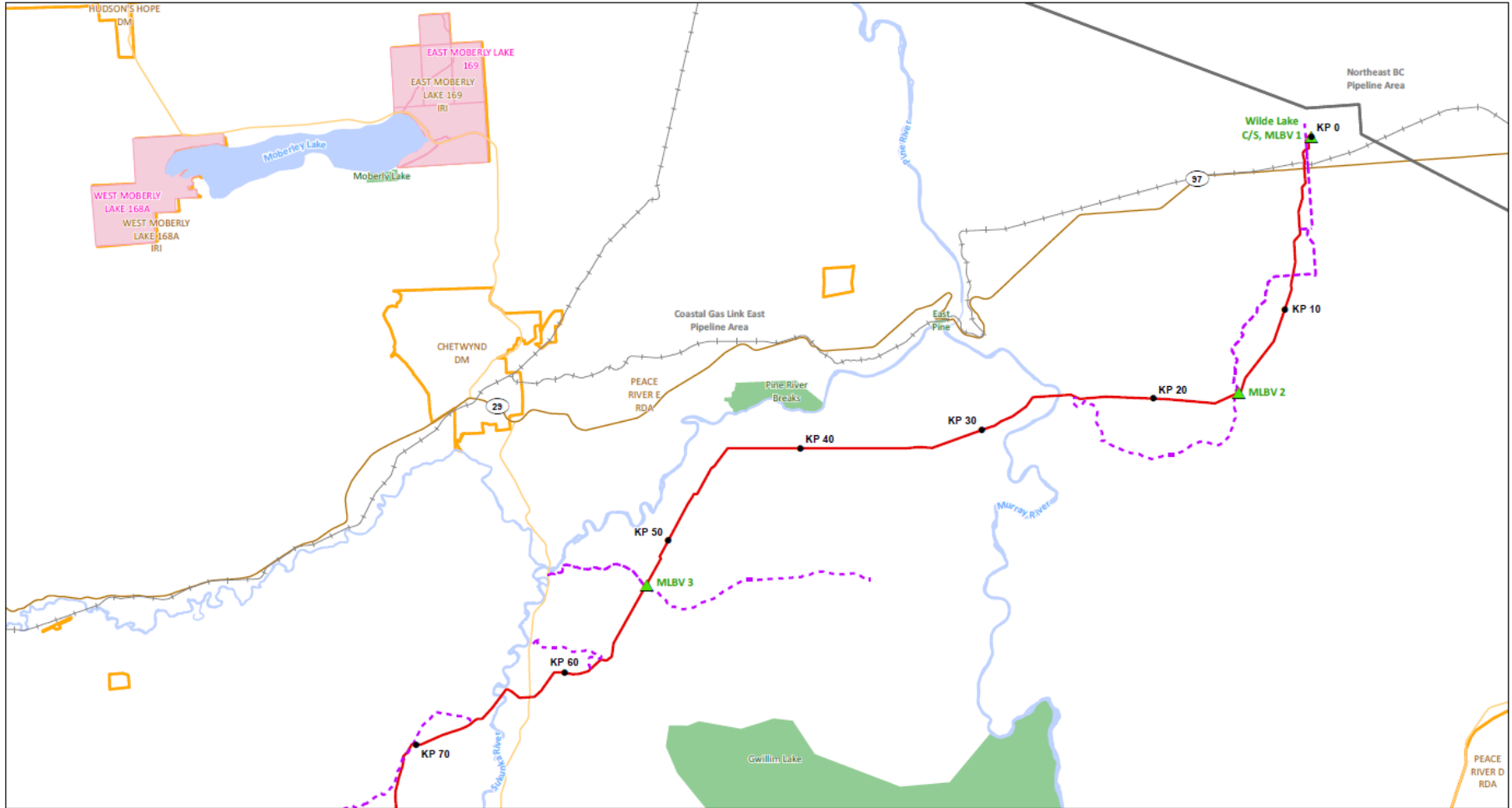
2720 Riverside Drive Ottawa, Ontario
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1-800-267-6315 within Canada
<http://www.pmra-arla.gc.ca/english/index-e.html>

Land Resource Management Plans

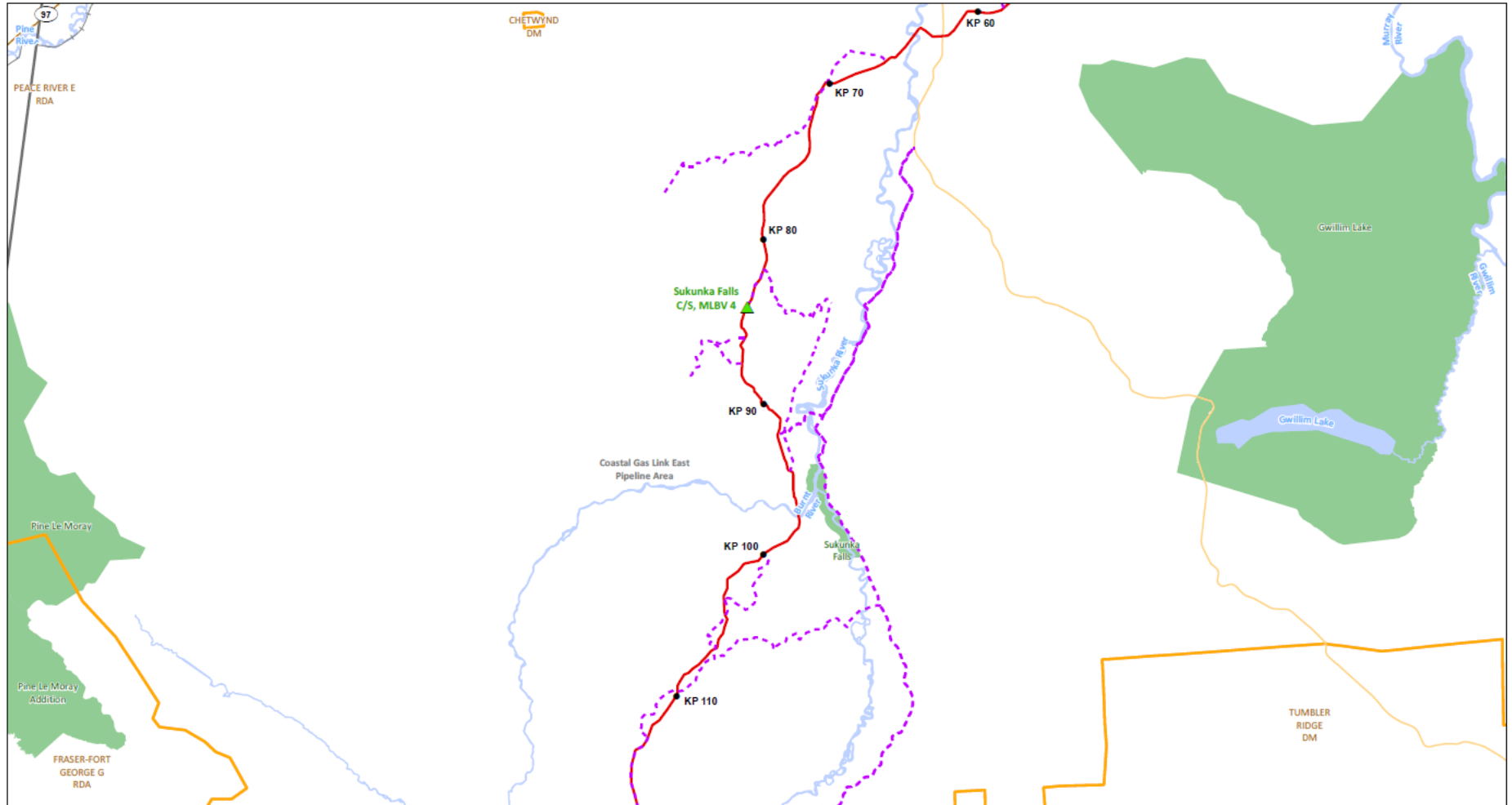
The following six provincial Land and Resource Management Plans (LRMP) are within the boundaries of this IVMP. The LRMP specify objectives for resource management direction, including agriculture and fish and wildlife.

- Dawson Creek Land and Resource Management Plan
- Prince George Land and Resource Management Plan
- Vanderhoof Land and Resource Management Plan
- Lakes Land and Resource Management Plan
- Morice Land and Resource Management Plan
- Kalum Land and Resource Management Plan

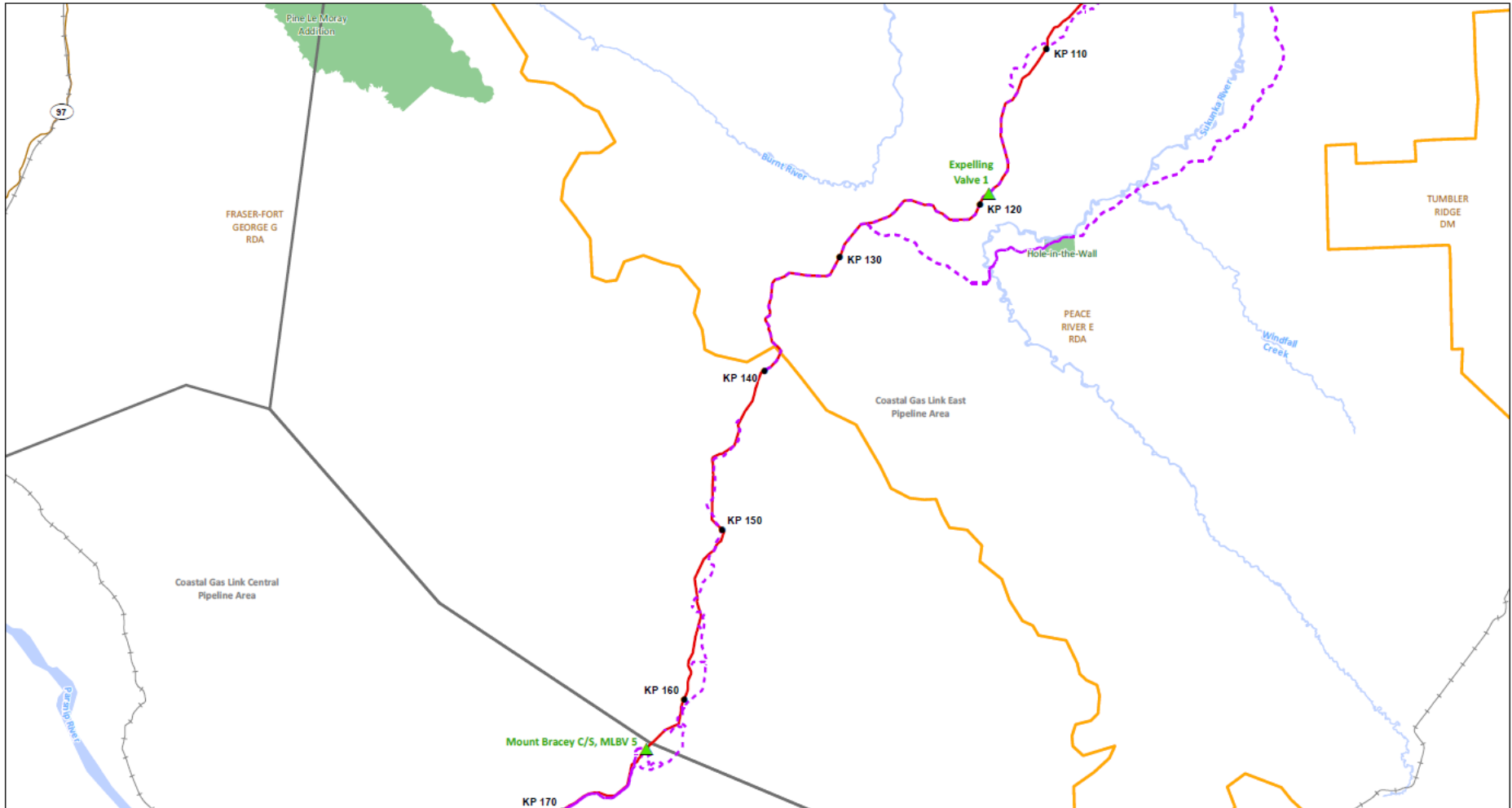
Appendix 3 – Location Maps for Pipeline RoW, Access Roads, and Facilities



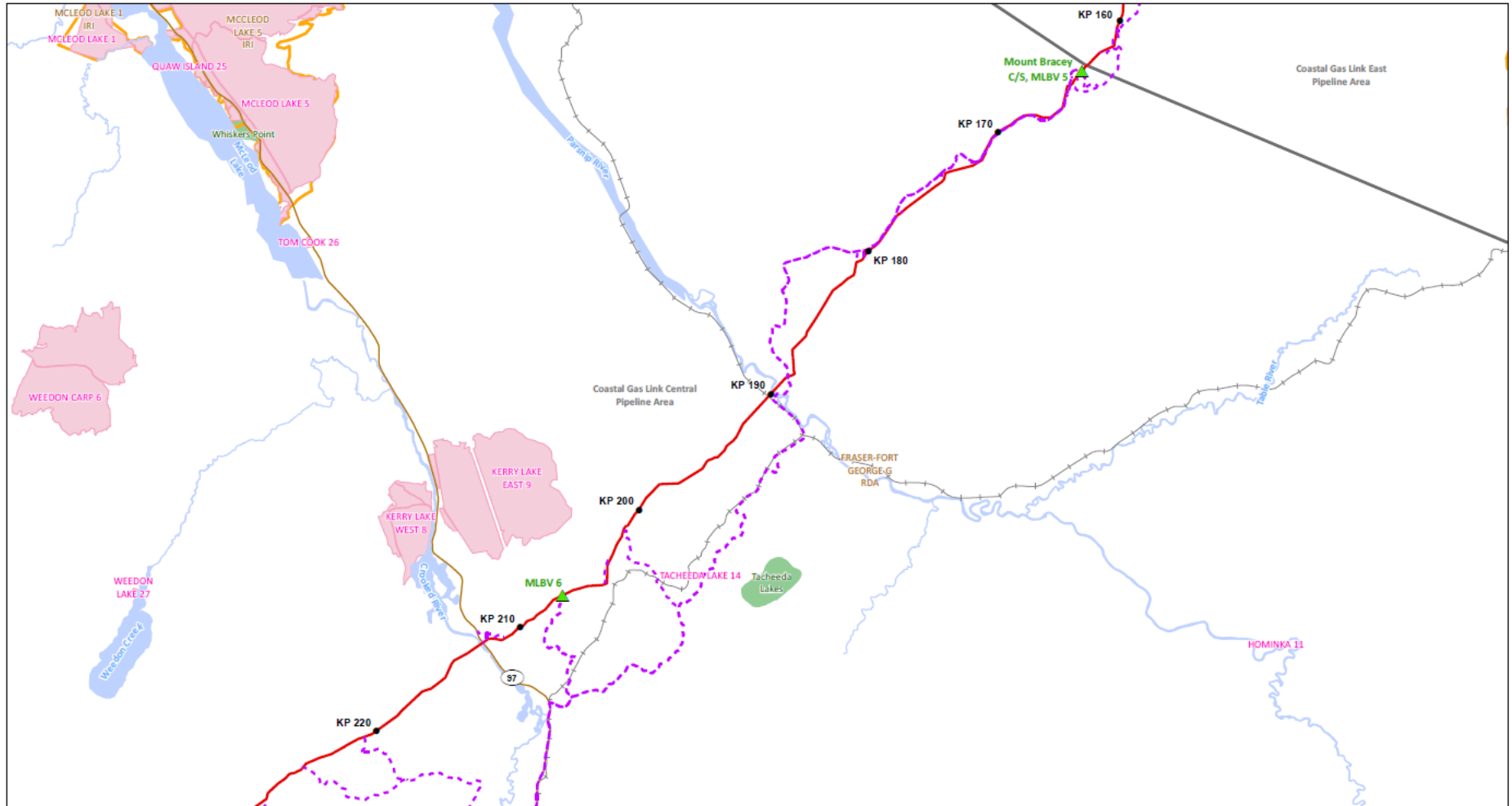
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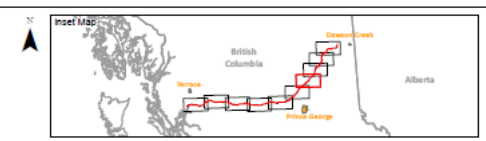


Coastal GasLink Integrated Vegetation Management Plan

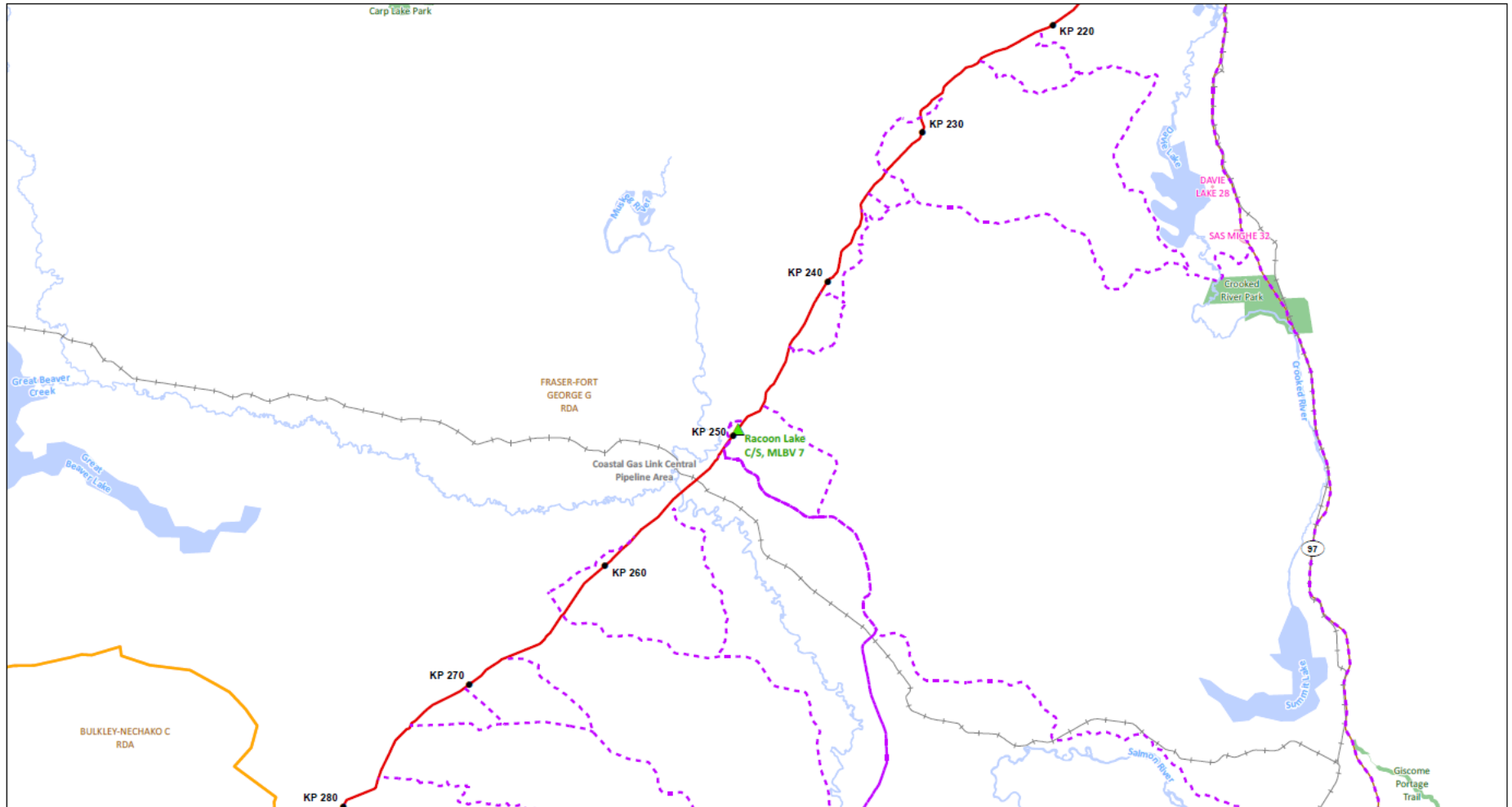
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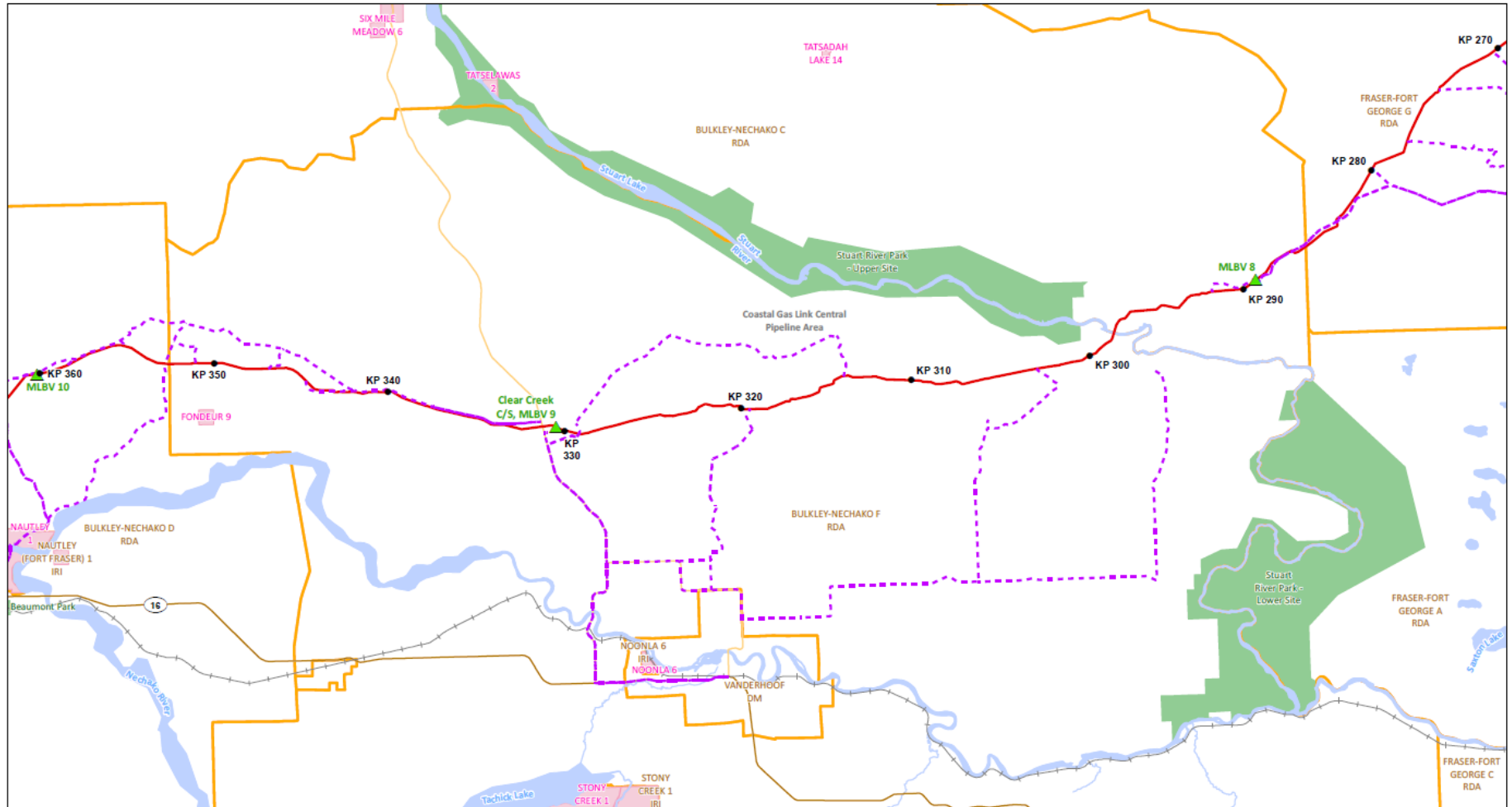
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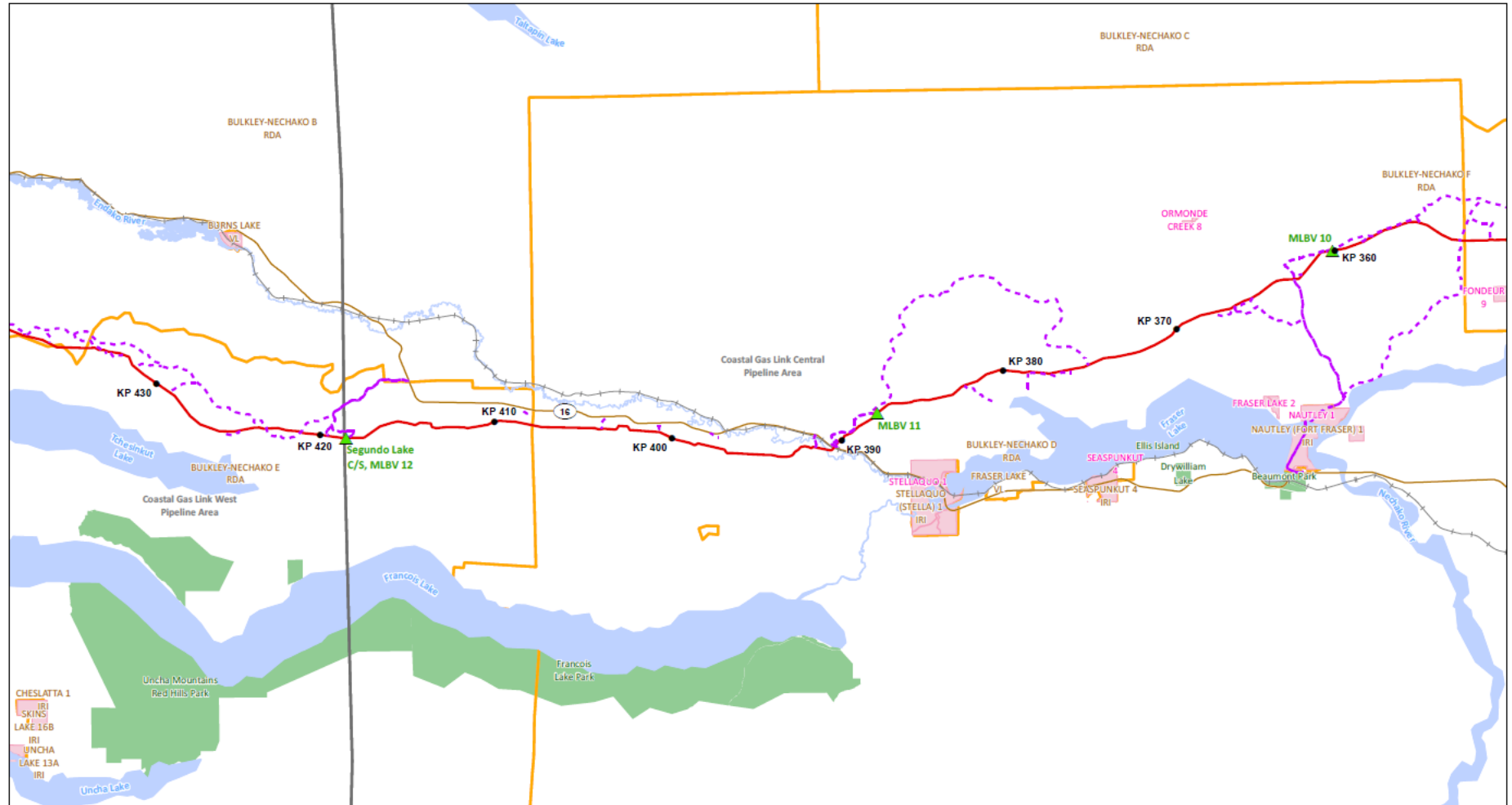
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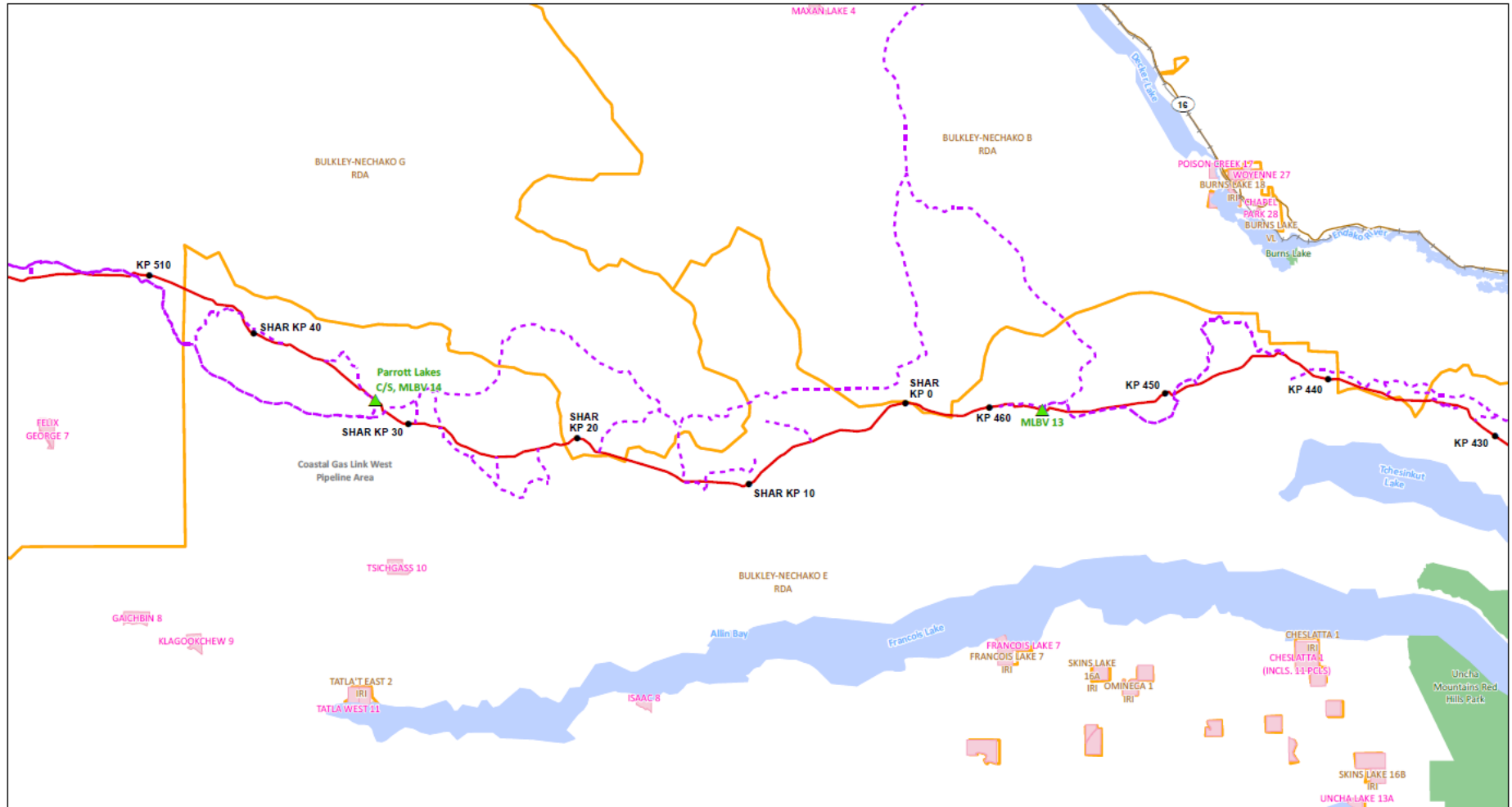
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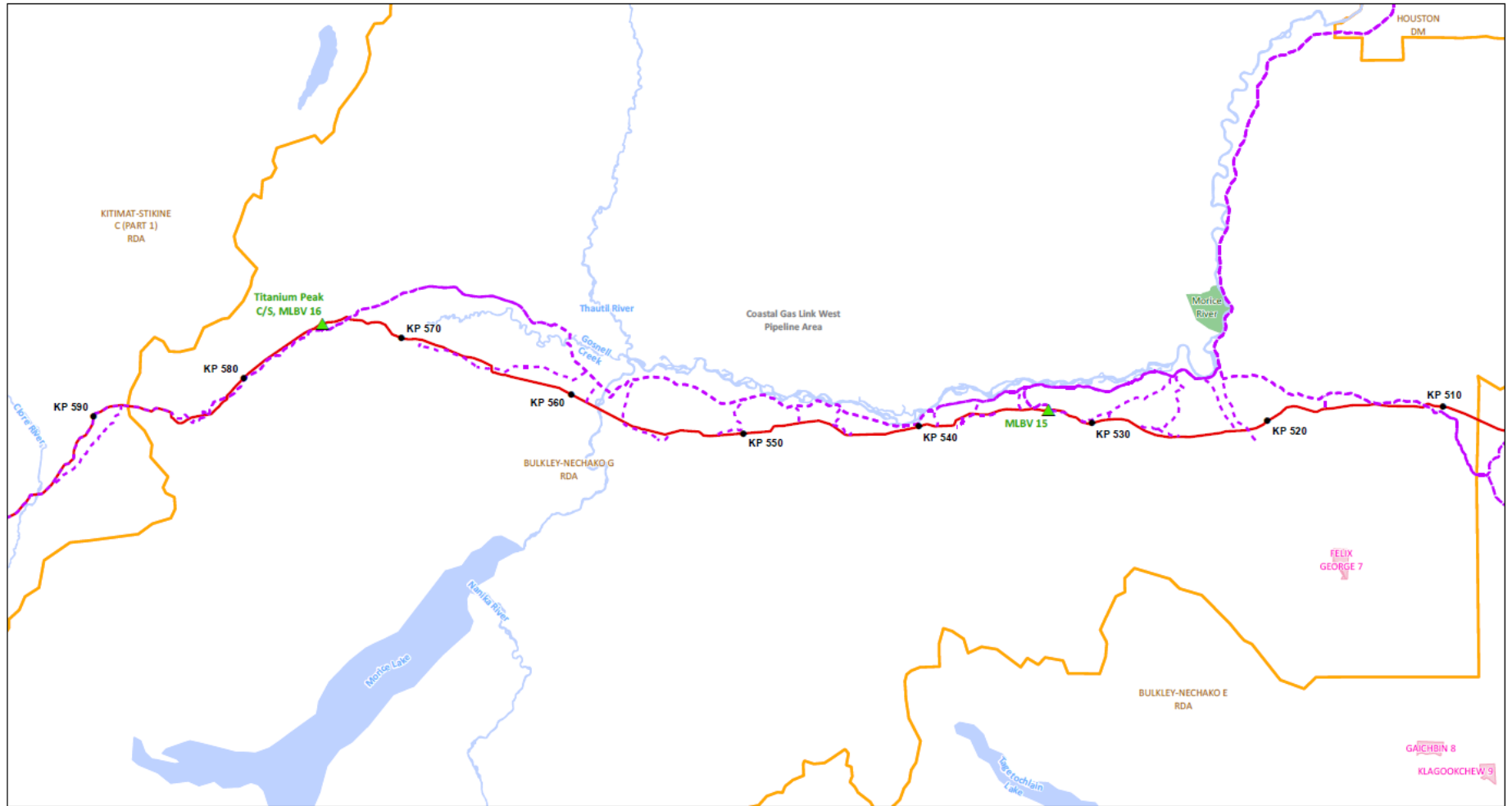
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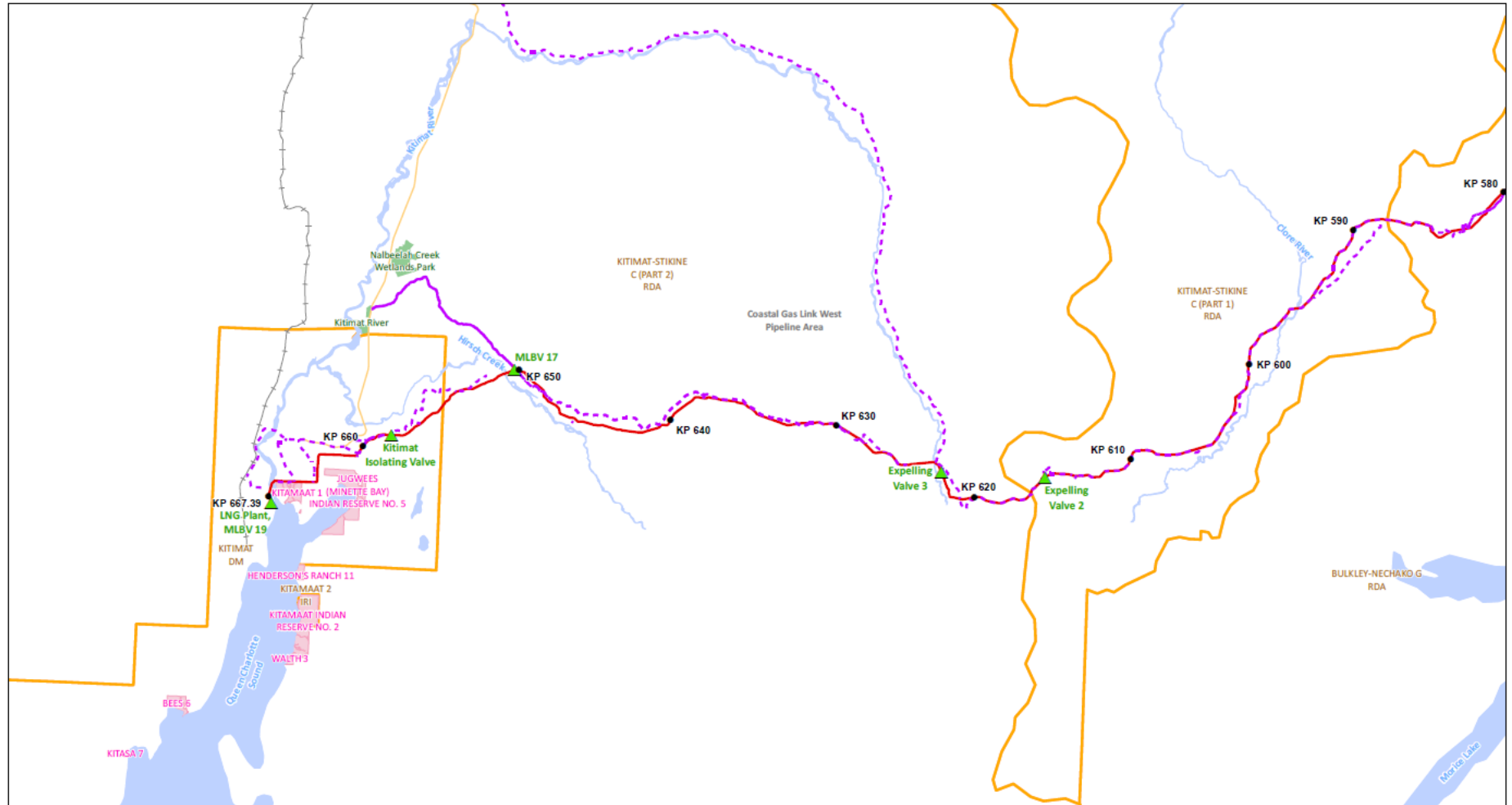
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Appendix 4 – Herbicide Application Log

 TRANSCANADA OPERATING PROCEDURE (FORM)				 In business to deliver
Title: Herbicide Application Log Canada				
Revision: 00	Published Date: 2018/04/01	Status: Published	Driver: Regulatory	Page 1 of 4


Document Owner: Darion Byerley

Instructions:

- This form is to be completed in conjunction with the TOP entitled Invasive Vegetation Weed Control Management Canada (EDMS No. 005518537).
- Save this form using the following naming convention
 - Forms associated with Procedures: 'Procedure Title Facility (ID or Name) Work Order No yyyy_mm_dd'.docx (e.g. Herbicide Application Log (ID or Name) Work Order No yyyy_mm_dd'.docx).
 - Attach completed form to SAP Work Order (Refer to IPSECA (Identify Plan Schedule Execute Close Analyze) Work Management Quick Reference Guide Page 88.
- Submit this form to the Regional TransCanada Environmental or HSE Coordinator for input into the Vegetation Management Database. Records to be retained in accordance with an EN-02 document (environmental record).
- For information on filing and the onsite/offsite retention requirements, please refer to the 'TransCanada Facility Filing Structure Reference' compliance list (EDMS No. 003794696).

Treatment Location (Facility ID/ ROW location)	Region	Work Order Number (TransCanada work order No.)	Contractor performing work	Date of Herbicide Application (YYYY-MM-DD)
Location (GPS – Lat/Long; LSD, Chainage) – for ROW, enter start and end coordinates.				
Type of Site (e.g. compressor or pump station, meter station, valve site, right-of-way, energy facility)				
Permit Number (If permit is required for herbicide application. If not, N/A)				
Environmental Pre-Treatment Inspection – to be completed prior to herbicide application (same date or earlier)				
Name and organization of person completing pre-treatment inspection		Date of Environmental Pre-treatment Inspection		
Are there any landscaped areas within facility site that contain restricted or prohibited weeds?		<input type="checkbox"/> Yes	<input type="checkbox"/> No	If yes, describe proposed treatment:
Are there steep slopes which require targeted vegetation control? Note: goal is to minimize erosion of slopes, and ensure herbicide stays where applied.		<input type="checkbox"/> Yes	<input type="checkbox"/> No	If yes, describe proposed treatment:
Is the undesirable vegetation located in or near an area exhibiting erosion, or with high erosion potential? (Note: Ensure herbicide stays where applied)		<input type="checkbox"/> Yes	<input type="checkbox"/> No	If yes, describe proposed treatment:

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Are there any water courses, riparian areas, wetlands (even if seasonally wet and currently dry), or waterbodies within 30 m of treatment location?	Type (ditch, creek, lake, etc.)	Proximity (m)	Direction from treatment area	Topography Sloped Toward Water?			
Is there potential wildlife habitat on or adjacent to the site (e.g., natural woodlots, grasslands, wetland features)? Describe.							
Adjacent Land Use (Within 300m of site) & Direction							
Additional Information - Any info not already recorded that will assist planning of future site activities, including (but not limited to) - landowner information, access, adjacent land users, conditions, travel to site, etc. Include the expiry date of any condition and any TransCanada associated sites (M/S, C/S, V/S) you can see from the site. Include a site diagram.							
Agricultural	<input type="checkbox"/>						
Industrial	<input type="checkbox"/>						
Grazing/Pasture	<input type="checkbox"/>						
Forested	<input type="checkbox"/>						
Park/ Protected Area	<input type="checkbox"/>						
Undisturbed	<input type="checkbox"/>						
Potential Berry Picking	<input type="checkbox"/>						
Residential	<input type="checkbox"/>						
Purpose of Herbicide Application (mark with an x):							
<input type="checkbox"/>	Existing Site	<input type="checkbox"/>	Complaint – (Enter SAP Notification No.)	<input type="checkbox"/>	Prevent Spread of vegetation	<input type="checkbox"/>	Maintain sight lines
<input type="checkbox"/>	New Site	<input type="checkbox"/>	 Field Prevention	<input type="checkbox"/>	Brush Control (Integrated Vegetation Management)	<input type="checkbox"/>	Other (specify):
Notification Type (if required)		E.g. phone call, mail-out, radio, newspaper, other		Date of Notification		YYYY-MM-DD	
Date Signage Posted		YYYY-MM-DD		Date Signage Removed		YYYY-MM-DD	

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Herbicide Application Details – to be completed at the time of herbicide application												
Site Dimensions (m)			Total Site Area (m ²)			Soil Type (Clay, gravel, loam, muskeg, sand, topsoil, other)			Meteorological Conditions			
									Temp (°C)	Precipitation (Is it currently raining? Is rain forecast/imminent?)	Approx. wind speed (km/hr)	Wind Direction (from)
Vegetation Survey			Area Sprayed (m ²)	Product Name (trade name)	PCP Number (from label)	Application Method (boom, handgun, backpack, other)	Application Rate (L or kg/ha)		Total Volume or Solution Mix (L or kg)	Total Volume of Product Used (L or kg)		
Target Species ¹	Density (Class) ²	Adjacent Species					Herbicide	Carrier				
Weed Control Post-Treatment Recommendations (recommended follow-up actions)									Applicator's Name (please print)			
									Applicators License Number			


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Site Diagram (Facility Site Boundary, location of treatment area relative to boundary and distances to sensitive environmental features.)



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Photographs of Treatment Area



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1. Vegetation Survey: Target Species: Species for Which Herbicide is Applied

AN – Aspen	FH – Field Horsetail	PS – Perennial Sowthistle
AS – Annual Sowthistle	FW – Flixweed	PV – Poverty Weed
BB – Bluebur	GB – Goatsbeard	PW – Pineapple Weed
BC – Bladder Champion	GF – Goosefoot	QG – Quackgrass
BD – Burdock	GR – Grass	RP – Russian Pigweed
BG – Barnyard Grass	HB – Hawksbeard	RR – Redroot Pigweed
BL – Broadleaf Weeds	HC – Hoary Cress	RT – Russian Thistle
BM – Black Medic	HN – Hemp Nettle	SB – Storksbill
BP – Broadleaf Plantain	KO – Kochia	SC – Scentless Chamomile
BT – Bull Thistle	KW – Knapweed	SK – Stinkweed
BW – Blueweed	LQ – Lambs Quarters	SP – Shepheard’s Purse
CC – Cow Cockle	LS – Leafy Spurge	SR – Sweet Clover
CG – Common Groundsel	MW – Milkweed	SS – Sheep Sorrel
CL – Cattail	MS - Mosses	SW – Smartweed
CT – Canada Thistle	MV – Milk Vetch	TB – Tall Buttercup
CW – Chickweed	NC – Night Flowering Catchfly	TF – Toadflax
CV – Cleavers	NT – Nodding Thistle	TS – Tansy
DB – Downy Brome	OD – Oxeye Daisy	WB – Wild Buckwheat
DK – Dock	PB – Poplar Balsam	WM – Wild Mustard
DL – Dandelion	PG – Pasture Sage	WO – Wild Oats
FB – Foxtail Barley	PI – Poison Ivy	WP – Wild Parsnip
FD – Field Bindweed	PL – Plantain	

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2. Vegetation Survey: Density Distribution Codes (Source: Luttmerding *et al.* 1990)

Class	Density Distribution	Sample
1	Rare individual, a single occurrence	
2	A few sporadically occurring individuals	
3	A single patch or clump of a species	
4	Several sporadically occurring individuals	
5	A few patches or clumps of a species	
6	Several well spaced patches or clumps	
7	Continuous uniform occurrence of well spaced individuals	
8	Continuous occurrence of a species with a few gaps in the distribution	
9	Continuous dense occurrence of a species	

Appendix 5 – Weed Monitoring Form

Coastal GasLink Invasive Plant Monitoring Form
Page 1 – Site Assessment

Date: _____ Daily: _____ Page: _____ Name: _____

Location: _____ Type: ROW Land Use: _____ Photos: _____

PRECONSTRUCTION INVASIVE PLANT SURVEY

Species Observed (Corresponds to site sketch)	Location	Growth Stage (S / J / M)	Height (cm)	Density Code (1-13)	Designation (R / Nox / Nus)	Plant Category (1 - 4)
1.	On site					
	Adjacent ¹					
2.	On site					
	Adjacent ¹					
3.	On site					
	Adjacent ¹					
4.	On site					
	Adjacent ¹					
5.	On site					
	Adjacent ¹					
6.	On site					
	Adjacent ¹					
7.	On site					
	Adjacent ¹					
8.	On site					
	Adjacent ¹					
9.	On site					
	Adjacent ¹					
10.	On site					
	Adjacent ¹					

Sketch of Site – Show Distribution of Invasive Plants

Additional Comments

¹Adjacent: the area within 20 m of the Project footprint

A. – PRECONSTRUCTION INVASIVE PLANT CONTROL – ROW, Facility Site or Access Road

- If prohibited or Noxious weeds are present, recommend control method for immediate suppression
- If agronomic invasives are present, recommend either:
 1. No treatment, if not invasive where found, or
 2. Control method (see Treatment Options, below), or
 3. Topsoil management during construction (See EPP), or
 4. Both 2 & 3

B. POST CONSTRUCTION MONITORING – ROW, Facility Site or Access Road

- Course of Action Key:
1. Are prohibited or Noxious weeds present?
 2. If Yes, are weeds more abundant on site than off?
 3. If Yes, determine Treatment Priority

Treatment Threshold				Plant Category	Treatment Priority
Plant Category	Site Risk Level				
	High	Mod	Low		
1	P1	P1	P1	1 - Extremely Invasive, dominant	P1 - As soon as possible, immediate suppression treatment
2	P2	P3	P4	2 - Very Invasive, dense patches	P2 - As soon as conditions are optimal for treatment
3	P2	P3	P4	3 - Somewhat Invasive, not dominant	P3 - When conditions are optimal, treat once P2 sites treated
4	P3	P4	P5	4 - Aggressive, relatively easy to control (For plant rating, see table 2-1, WMP)	P4 - Assess again next year and treat to prevent spread P5 - Assess again next year, treat once P4 sites treated

Site Risk Level – Purpose/Intent of Treatment (See also Table 2-4, WMP)

High - To stop the spread of invasive plants currently threatening non-infested or highly susceptible sites (cultivated, hay and pasture lands)

Moderate - To stop the enlargement of sites in less susceptible areas

Low - To stop the enlargement/contain sites on and adjacent to industrial lands

Environmental Protection

Water source/waterbody within 30 m	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Comments	
Waterbody/Riparian area within 30 m	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Comments	
Site requiring protection	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Comments	
Environmental features within 10 m (e.g. wildlife habitat)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Comments	
Native/rare plants present	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Comments	
Accessibility (circle)	POOR		Comments	

Other: _____

Treatment Options

Control Method (circle)

Rationale/Comments: _____

Treatment Decision

Recommendations reviewed by: _____

Approved course of action: _____

Rationale for approved course of action: _____

Appendix 6 – Legislative Definitions

This information is provided for the reader's interest.

Definitions used in this document are taken directly from the following legislation and associated guides. Refer to these Acts and Regulations for further information:

- [*Integrated Pest Management Act \(IPMA\)*](#)
- [*Integrated Pest Management Regulation \(IPMR\)*](#)

Integrated Pest Management (IPMA)

A process for managing pest populations that includes the following elements:

- a) planning and managing ecosystems to prevent organisms from becoming pests;
- b) identifying pest problems and potential pest problems;
- c) monitoring populations of pests and beneficial organisms, damage caused by pests and environmental conditions;
- d) using injury thresholds in making treatment decisions;
- e) suppressing pest populations to acceptable levels using strategies based on considerations of:
 - i. biological, physical, cultural, mechanical, behavioural and chemical controls in appropriate combinations
 - ii. environmental and human health protection; and
- f) evaluating the effectiveness of pest management treatments.

Note: **Integrated Vegetation Management** is the integrated pest management (IPM) process specifically for the control of vegetation.

No-treatment zone (IPMR)

An area of land that must not be treated with pesticide.

Pest (IPMA)

An injurious, noxious or troublesome living organism, but does not include a virus, bacteria, fungus or internal parasite that exists on or in humans or animals. [Note: For TCE CGL secured facilities, this means undesired vegetation, mostly weeds.]

Pest Management Plan (IPMA)

A plan that describes:

- a) a program for managing pest populations or reducing damage caused by pests, based on integrated pest management, and
- b) the methods of handling, preparing, mixing, applying and otherwise using pesticides within the program.

Pesticide-free Zone (IPMR)

An area of land that (a) must not be treated with pesticide, and (b) must be protected from pesticide moving onto it.

Treatment Area (IPMR)

In relation to a pesticide use, means the area of land to which pesticide is applied or is intended to be applied.

Appendix 7 – Minimum Water Protection Measures

Reg. Section	Uses	Permitted Application	NTZ / PFZ	Exception
71(3)	All pesticide applications	Around a water supply intake or well used for domestic or agricultural purposes	30m NTZ	NTZ may be reduced if reasonably satisfied that a smaller NTZ will ensure no pesticide enters the well, water supply, or intake.
73	All pesticide applications except bacterial pesticides	Along or around bodies of water, dry streams, and classified wetlands	10m PFZ measured from the high-water mark NTZ (buffer) sufficient to maintain PFZ integrity	See exceptions relating to Sections 75 and 77 (regarding glyphosate applications, noxious weed treatment) set out in this table.
75(3)	Glyphosate applications	Along or around a body of water or classified wetland that is not fish-bearing at any time of the year	2m PFZ	Selective application methods must be used between 2m and 10m above the high-water mark.
75(4)	Glyphosate applications	Along or around a temporary, free-standing body of water that is not a classified wetland nor a wildlife habitat feature, not fish-bearing at any time of year, and does not drain into a fish-bearing body of water within 100m	0m PFZ	No glyphosate can be applied below the high-water mark.
75(5)	Glyphosate applications	Along and around a temporary, free-standing body of water that is not a wildlife feature, not fish-bearing, does not drain directly into a fish-bearing body of water within 100m, and is either smaller than 25m ² or not a wetland	Over spray	
75(6)	Glyphosate applications	Dry stream that is not a wildlife habitat feature, not fish-bearing when wet, and does not drain directly into a fish-bearing body of water within 100m	Over spray	
77(1)	Noxious weed and invasive plant management	For non-foliar and non-aerial applications, no herbicide application more than 1.5m from a targeted plant	1.5m from a targeted weed or plant	Reasonable efforts must be made to protect any biological weed control organisms in the area.

Appendix 8 – Active Ingredients and Herbicides

Note that some products have more than one active ingredient, so while this list covers all active ingredients that may be used by Coastal GasLink, it does not match exactly the product list in [Table 2](#).

2,4-D and Picloram

Several product and mix formulations that may be used contain one or both herbicides. These herbicides are selectively used on Oxeye Daisy and Blueweed as well as other broadleaf weeds. Picloram will not be applied during extremely rainy periods, when soils have been heavily saturated, or to ground that slopes to desirable plants. These herbicides control a broad spectrum of broadleaf species and deciduous brush.

Aminocyclopyrachlor

Products containing aminocyclopyrachlor are good for use in non-crop situations. These products are absorbed by both the roots and shoots and translocated throughout the plant in the xylem and phloem. This ingredient is especially effective on young, actively growing weeds.

Chlorsulfuron

Chlorsulfuron is useful for the control of hard to manage annual and perennial broadleaf vegetation by both foliar and root uptake. It may be used to spot treat horsetail, as well as other established species not controlled by other herbicides. Chlorsulfuron will not be used as a soil-applied residual herbicide. It is effective at very low application rates. It will not be applied near desirable plants or in areas where their roots may extend, or in locations where it may be moved or washed into contact with the roots. It will not be applied during extremely rainy periods, when soils have been heavily saturated, or to ground that slopes to desirable plants.

Clopyralid and Aminopyralid

These products are used for spot treatment on hard to control broadleaf weeds like Canada Thistle and Knapweed. Both products are short-term broadleaf residual herbicides. Some formulations combine these herbicides with other active ingredients.

Dicamba

Dicamba is used for the spot treatment of young, actively-growing broadleaf vegetation and brush species. Dicamba will control many broadleaf herbaceous species that cannot be effectively treated using physical controls or glyphosate applications. Dicamba can be safely mixed with other herbicides to broaden the number of target species controlled. Because it is a selective herbicide, it is useful in areas where grasses will be retained. Dicamba will not be applied during extremely rainy periods, when soils have been heavily saturated, or to ground that slopes to desirable plants.

Diflufenzopyr

Diflufenzopyr represents a new active ingredient for the Canadian vegetation management market and acts as an “auxin transport inhibitor.” Auxins are natural hormones the plant produces that affect growth when they are present in the new meristems. Diflufenzopyr traps auxins in these meristems and concentrates their effects.

Flumioxazin

Flumioxazin is used in the non-selective control of vegetation as a preemergent application. This residual chemical stays active in the soil for approximately one growing season and can help

prevent new growth, as well as stopping any current growth on the application area when mixed with glyphosate products.

Florpyrauxifen

Florpyrauxifen-benzyl is a new synthetic auxin that kills susceptible plants by causing disruption of growth processes. It provides excellent broad-spectrum (grass, broadleaf, and sedges) weed control in rice and aquatic environments at very low rates. Used in herbicides such as Rinskor, it rapidly degrades in the environment to nonherbicide residues and has a favorable human health and environmental safety profile. Applications of this product include its use for postemergence weed control in freshwater aquatic sites, including foliar application to emergent aquatic vegetation or direct application to water body use sites. Generally, florpyrauxifen-benzyl is classified as a reduced risk herbicide.

Fluroxypyr

Fluroxypyr is a pyridinooxy acid herbicide used to control annual and perennial broadleaf weeds and woody brush. Fluroxypyr induces auxin-type responses in susceptible annual and perennial broadleaf weeds (auxin is a type of plant growth hormone). Under this IVMP, this product will be used for selective treatments on invasive plants and noxious weeds to assist with the reduction of herbicide resistance. It is particularly effective on Group 2 and 9 resistant Kochia.

Glyphosate

Glyphosate is used to control a very large number of herbaceous broadleaf and grass species and woody vegetation. It is most effective for spot application on annuals and perennials. It is only effective for treating vegetation that has germinated, emerged above the soil, and is actively growing at the time of spraying. It is most useful in areas where low soil residual properties are desired because of the close proximity of wells, water bodies, and other environmentally-sensitive features. It can be applied to cut vegetation or young seedlings that emerge following trimming or hand pulling to further reduce onsite organic matter, or where physical control methods are not effectively controlling vegetation. It is deactivated quickly in the soil, where it moves very little from the point of application. For this reason, it is the herbicide of choice for vegetation control adjacent to sensitive environmental features.

Glyphosate can also be used for selectively treating deciduous tree species growing outside of facility fences, perimeter areas, or along access roads, particularly against those species that re-sprout following cutting. Specifically, glyphosate can be applied to cut stumps immediately after tree or shrub removal, including alder, willow, cottonwood, and poplar.

Imazapyr

Imazapyr is used to control broadleaf vegetation, annual and perennial grass species, and woody vegetation (especially maple). It works by preventing germination of seeds. It is readily absorbed through foliage and roots and moves rapidly throughout the plant, where it breaks down tissue. It is particularly useful in controlling vegetation that has not been effectively managed using a combination of physical controls and glyphosate application. Treated plants stop growing soon after spray application.

Indaziflam

Indaziflam is a pre-emergent and post-emergent weed killer with a broad spectrum of action against annual grasses and broadleaf plants. It is effective against a very wide range of weeds and offers excellent long-term results with very small doses. Indaziflam's primary mode of action

is inhibition of seedling emergence and root development, by inhibiting cellulose biosynthesis (CB Inhibitor). In areas of glyphosate resistance, indaziflam is a potential alternative.

MCPA (2-methyl-4-chlorophenoxyacetic acid)

MCPA is mainly used for control of Horsetail and Tall Buttercup. It leaves no active residue in the soil.

Methyl and Ethel Oleate

Methyl and Ethel Oleate (esterified vegetable oil) is the primary ingredient found in Hasten NT. The product is used as an adjuvant for chemicals that do not have surfactants/adjuvants in their makeup. These are to help increase the effectiveness upon contact with targeted species. Adjuvants generally help the chemicals stay on the selected vegetation and help the chemicals enter the vegetation by helping them “stick” longer on the plant surface.

Metsulfuron methyl

Metsulfuron methyl provides excellent control of Scentsless Chamomile at very low use rates with low residual effects. Treated plants stop growing soon after spray application.

Parafinic Oil – Alkoxylated Alcohol

This product is a non-ionic, paraffinic oil blend surfactant developed for use within the industrial vegetation management sector. Adding it to the tank mix increases the speed and uptake of a variety of active ingredients in a wide variety of environmental conditions.

Pyroxsulam

Pyroxsulam is a sulfonamide-based herbicide (marketed by DOW Agro Sciences LLC) used to control established annual grass and broadleaf weeds (i.e., Group 1 resistant Wild Oats under this IVMP). It is absorbed by the foliage and roots of plants, and treated weeds will stop growing almost immediately. Pyroxsulam is a systemic herbicide, meaning it disrupts the internal growth processes of established weeds, resulting in weed death 2 to 4 weeks following application. It is effective at very low application rates.

Siloxylated Polyether

Siloxylated Polyether is a silicone surfactant designed to enhance the efficacy of water soluble post-emergent herbicides. Spray solutions that are tank-mixed with this ingredient will completely wet the leaf surface and have been shown to increase the amount and speed of uptake of water-soluble herbicides. This results in more consistent weed control. Enhanced herbicidal efficacy has been most evident on broadleaf and woody brush weed species and has been shown to be less effective for enhancing performance on perennial grass weed species.

Triclopyr

Triclopyr is effective in controlling established perennial vegetation and brush species. It may also be used to selectively control deciduous trees that are encroaching on perimeter fences or alongside access roads and on RoWs. On undesirable trees and brush, it is applied as a basal bark and foliar treatment. It is particularly effective when used in basal applications at controlling trees that commonly re-sprout following cutting. Triclopyr is absorbed by both leaves and stems and readily moves throughout the plant. For control of birch and aspen, it is more effective than glyphosate.