



Integrated Vegetation Management Plan for Southeast BC

2024 – 2029



TC Energy

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Glossary of Acronyms

a.i.	Active ingredient
BCER	British Columbia Energy Regulator
CANUTEC	Canadian Transport Emergency Centre
CER	Canadian Energy Regulator
CKISS	Central Kootenay Invasive Species Society
ECC	BC Emergency Coordination Centre
EKISC	East Kootenay Invasive Species Council
EPP	TCE's Environmental Protection Plans
FLNR	(Ministry of) Forests, Lands, Natural Resource Operations and Rural Development
IPM	Integrated pest management
IPMA	Integrated Pest Management Act
IPMR	Integrated Pest Management Regulation
IVM	Integrated vegetation management
IVMP	Integrated Vegetation Management Plan
MoE	Ministry of Environment and Climate Change Strategy
NIT	Notice of Intent to Treat
NTZ	No-treatment zone
OGC	Oil and Gas Commission
OSHR	Occupational Health & Safety Regulation (WorkSafe BC)
PCP	Pest Control Product (number)
PCPA	Pest Control Products Act
PFZ	Pesticide-free zone
PMP	Pest Management Plan
PMRA	Pest Management Regulatory Agency
PPE	Personal protective equipment
RoW	Right-of-way
RPRC	Regional Pesticide Review Committee
SDS	Safety Data Sheet
st/ha	Stems per hectare
TDGA	Transportation of Dangerous Goods Act
TOP	TCE Operating Procedure
TC Energy	TC Energy - Foothills Pipe Lines (South BC) Ltd.

Section 1 – Introduction

TC Energy (TCE) is a leader in the responsible development and reliable operation of North American energy infrastructure.

Whether it's renewable energy, renewable natural gas, hydrogen, or other low carbon energy services, TCE uses its continental presence to offer customers flexible, cost-effective solutions to manage their energy and decarbonisation needs, helping them respond to the current energy transition environment.

TCE's network of gas pipelines transports the majority of western Canada's natural gas production to key Canadian and U.S. markets. It also has interests in solar, wind, and hydro electric power generation facilities in Canada and the United States.

In BC, TCE and its wholly owned subsidiary, Foothills Pipe Lines (South B.C.) Ltd., operates natural gas pipelines from the Alberta border at the Crowsnest Pass through the Kootenay Region of BC to Idaho.

1.1 About this Integrated Vegetation Management Plan

The *British Columbia Integrated Pest Management Act & Regulations* (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 objectives for the IVMP are to identify pests and set clear, distinct, and tangible thresholds that will assist in determining the level at which vegetation becomes a pest and identifying strategies for control.

The broader definition of pest as outlined in the IPMA might include many kinds of organisms. However, the focus of this IVMP is on Integrated Vegetation Management (IVM) and targeted plant pests as defined in [Section 2.2](#) of this plan, with support in [Appendix 1](#), *TCE 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 Control 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 TCE's *Brush Control Procedure TOP* (referred to in this IVMP as undesirable trees and brush).

In addition, this plan aligns and complies the federal legislation 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, outlined in [Section 2](#), will be used as a guide in support of an integrated approach to vegetation management while implementing this plan.

1.2 Purpose and Scope

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

TC Energy intends to control vegetation in and around pipeline right-of-ways (RoWs), access roads, and facilities using an IVM approach within the areas outlined below in Section 1.3. This IVMP will ensure compliance with provincial and federal legislation and TCE's internal procedures, including:

- Public consultation and Indigenous community engagement, to ensure awareness of and input to the IVMP
- Protection of public health and the environment
- Compliance with
 - Canadian Energy Regulator Act and the Onshore Pipeline Regulation
 - BC IPMA and IPMR
 - BC Wildfire Act
- Inclusion of IVM principles 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 2024).

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, emergency management, and fire control, as well as to ensure pipeline and 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 potential effects to the environment.

1.3 Geographic Boundaries

This plan applies to TCE's RoWs, access roads, and facilities within the southeast BC Foothills area. [Appendix 3](#) contains a map and points describing the geographic boundaries of the area to which the plan applies.

1.4 Persons Responsible for Managing Pests

Persons Responsible [IPMR Section 58(1)(b)(c)]

Within TCE, the person responsible for managing vegetation in and around RoWs, access roads, and facilities is:

Brad Agnew
Environmental Specialist, Rocky Mountain Region
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1.5 Review and Consultation

TC Energy safely delivers the energy the world needs in an economically, environmentally, and socially responsible manner. Rangelands and forests in which TC Energy operates represent important environmental and social resources such as watersheds, wildlife habitat, agriculture, food and fiber production, and recreation to local communities. As such, TCE vegetation management plans and efforts may be reviewed by governmental and public planning groups, including:

- Local Land Use Plan managers
- East Kootenay Invasive Species Council (EKISC)
- Pest Management Regulatory Agency (PRMA)

Prior to registering this plan with the Ministry of Environment and Climate Change Strategy (MoE), TC Energy conducted public consultation and engaged with Indigenous communities (First Nations and Métis Nations) near TCE RoWs and facilities in southeast BC. The goal was to provide information to those parties who may be impacted by vegetation management activities so their issues and concerns could be understood and addressed. Accommodations and annual notifications will be made if required.

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 to help achieve effective prevention of spread and overall control.

Section 2 – Integrated Vegetation Management Plan

2.1 Prevention and Planning

IPMR Section 58(2)(a)

As a first step in the IVM process, TCE 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 TCE's Environmental Protection Plans (EPP) and Operating Procedures (TOPs). Some of these prevention measures may include:

- Minimizing the spread of invasive and noxious weeds. Examples in practice include:
 - Minimizing construction area disturbance
 - Site reclamation
 - Awareness of local, municipal, or county restrictions that may apply for the movement of soil and gravel from outside or within that jurisdiction; and ensuring that the contractor follows the appropriate process for the facility site or RoW
 - Ensuring that any materials brought to the work site (e.g., gravel, soil, straw bales, seed, etc.) are free of weeds (which may require laboratory analysis or documented assurances by the contractor or supplier).
 - Cutting, bagging, and disposing of seed heads in appropriate landfills (during weed control activities)
 - Checking and cleaning undercarriages of vehicles when leaving or travelling through weed-infested sites
- 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 and adjacent site comparability.
- 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.

Prevention requirements are also driven by the following provincial and federal legislation (see [Appendix 2](#)):

- The Canadian Energy Regulator (CER) requires pipeline managers to develop a weed management plan under Section 48 of the *Onshore Pipeline Regulation*.
- The BC *Wildfire Act* requires that TCE mitigate any potential fire hazards on their facility sites and RoWs.

2.2 Pest Identification

IPMR Section 58(2)(b)

The pests targeted under this IVMP can be divided into two groups: weeds (noxious weeds and invasive plants) and undesirable trees and brush as per [Section 1.1](#). Accurate identification of these targeted plant pests on or adjacent to TCE RoWs, access roads, and facilities enables the company to better understand their potential growth rate, spread, and other characteristics, as well as predict locations of future infestations and decide whether or not control is warranted.

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 TCE facilities and access roads and directly on RoWs (while staying within TCE legal boundaries).

2.2.1 Noxious Weeds and Invasive Plants

Noxious weeds and invasive plants 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 help keep them in check, and because of their aggressive growth tendencies, these plants can be highly destructive to habitat and food production values and difficult to control if left unchecked. Early and rapid response to localized infestations is critical to keep them contained.

Targeted invasive plant and noxious weed infestations are identified during construction activities, operations, and maintenance (see [Section 2.3](#)), and communications with local landowners and managers and local weed committees. Post construction and during operations and maintenance, a priority listing of these plants and their infestation sites is derived from the experience of local land managers, as well as the EKISC plan and profile of locally-targeted invasive plants, which is adjusted annually.

2.2.2 Undesirable Trees and Brush

Undesirable trees and brush are nuisance vegetation requiring control due to worker safety concerns and/or environmental concerns caused by reducing visual site lines, access limitations, fire prevention, and occupational health and safety (trip/fall issues). This may include any vegetation in and around TCE facilities and access roads and infrastructure elements along RoWs (e.g., fence lines, crossings within TCE 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), TCE 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 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 pre- and post-treatment vegetation monitoring elements, routine inspections as required by the CER (see Section 2.3 below), aerial patrols, and opportunistic observations with/from local landowners and land managers.

2.3 Pest Monitoring

IPMR Section 58(2)(c)

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 TCE 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 logs for a site (see [Appendix 4](#) and also Section 2.3.3 below).

TCE conducts regular follow-up monitoring and evaluations of its annual vegetation management activity. 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

Required routine inspections of facilities and aerial patrol of RoWs 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 a geographic area are developed after the inspections.

2.3.2 Frequency of Monitoring

The frequency of inspections and monitoring depends on the type of facility or pipeline RoW being managed. Aerial patrols of RoWs are required once a year and ground patrols supplement these as problem sites are identified. Some monitoring is done *ad hoc*, identified by landowners, opportunistic observations, or communication with 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 (this new site information will also include 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
 - 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 and evaluations of previous treatments 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.

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 facility sites must be clear of vegetation (to bare ground), including land within and 1m around TCE fence lines at compressors, meter stations, and valve sites. These selected sites must be free of all vegetation including dry skeletons.

These requirements are driven by TCE policies and operating procedures as influenced by CER requirements and the BC *Wildfire Act*.

2.4.1 Undesirable Trees and Brush

Targeting trees and brush but not creating bare ground areas will be done when the following encroaching conditions apply:

- Undesirable trees and brush are within 5m from the centreline on each side of the pipeline, including overhead canopy intrusions (see [Appendix 1, TCE 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 20m wide or full easement width, whichever is less; and 200m along the RoW in each direction from the

boundaries of block valves, side valves, and thermal electric generator sites, and 50m along the RoW in each direction from cathodic protection test leads.

2.4.2 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.

2.5 Treatment Options

IPMR Section 58(2)(e)

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

TCE's selection of treatment method factors in the IVM objectives, as per [Section 1.1](#) and requirements in the IPMA and IPMR. 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 is 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 mowers to cut areas of plant pests. They can be used in larger areas of RoWs. 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 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 plants pests that propagate through roots and rhizomes. ○ Repeated treatments are required. ○ Non-selective; impacts all vegetation cover.

Weed Whacking / Brushsaw

This method involves the use of gas-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. When used in conjunction with a follow-up foliar herbicide application on re-sprouts, this can be a very effective tool.

Weed Whacking / Brush Saw	
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 plant pests that propagate through roots and rhizomes. ○ Repeated treatments are required if herbicide follow-up cannot be done.

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. ○ Ineffective on extensive populations. ○ Labour-intensive and time-consuming. ○ Does not work well on plant pests that propagate through roots and rhizomes. ○ 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 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

These are 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.

Cultural Controls	
Benefits	Limitations
<ul style="list-style-type: none"> ○ Native vegetation is reintroduced to the site. ○ Easily applied to small areas where recent disturbance has occurred. 	<ul style="list-style-type: none"> ○ Not suitable on all sites due to soil and site conditions. ○ Can be difficult to obtain appropriate seed. ○ Logistically challenging on some sites.

2.5.3 Chemical Control Treatments

Basal Bark Streamline

Basal bark streamline treatment involves using the 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). ○ Time-consuming and expensive. ○ Public concerns over herbicide use. ○ High densities or large stems bring higher costs. ○ Safety/health issues due to flying debris and two-cycle motor exhaust fumes.

Foliar Treatments

With this treatment, herbicides are usually applied by backpack but wick and wipe-on applications are included here. Applications are typically selective and targeted, 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 leaf out and actively growing. Incidental collateral effects will occur with foliar applications of active ingredients that are also residual and active in the soil as post-emergent products.

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. ○ 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)

TCE uses 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 low population density dispersed sites, 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 species of weeds is best achieved with specific herbicide products.

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.

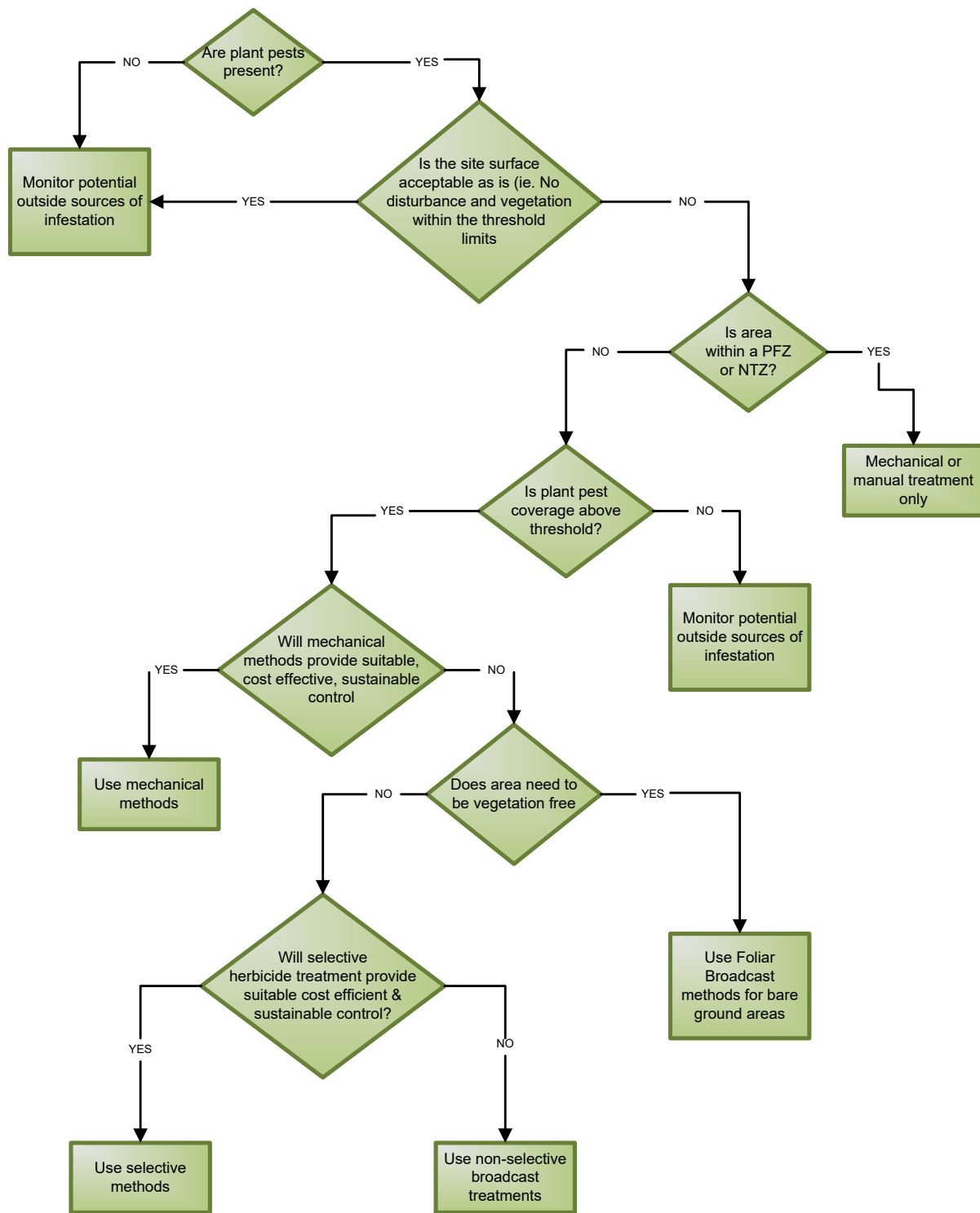
Stakeholder concerns: Issues brought forward associated with a particular site may limit the type of treatment applied.

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

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

The following simplified flowchart depicts the treatment selection process used when determining treatment type.

Figure 1: Treatment Decision-Making Flowchart



Note: Pesticide-free zones (PFZ) and no-treatment zones (NTZ) are defined in [Appendix 5](#).

2.7 Post-Treatment Evaluation

IPMR Section 58(2)(f)

Post-treatment evaluation is integral to continually improving and refining the vegetation management process. TCE uses post-treatment evaluation as a planning tool and predictor for future treatments (see [Section 2.3](#)).

Post-treatment evaluation will be conducted using visual assessments during onsite visitations. For facility sites, evaluation is typically completed within two weeks of treatment and 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* for the site (see [Appendix 4](#)). Some of the recorded observations include:

- IVMP compliance, including boundary and PFZ marking as required, offsite treatment, and protection of riparian areas, habitat, and any other valued identified components of the land base.
- Whether treatment objectives were met – efficacy and impacts to targets will be recorded as poor, fair, good, or excellent based on visual estimates
- Impacts to non-targets if any – will be recorded in the Weed Control Post-Treatment Recommendations section of the *Herbicide Application Log* (see [Appendix 4](#))
- 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* and will be included in vegetation management plans for the site in 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 IPMA, and *Transportation of Dangerous Goods Act* (TDGA) regulate the transportation and handling of some herbicides.

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

All TCE contractors will follow these procedures (as a minimum) 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 TCE will ensure that all herbicides are stored in accordance with the IPMA and IPMR 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 TCE.

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

- No herbicides will be stored on TCE 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, or supervised by, certified pesticide applicators in the appropriate category of certification.

TCE’s contractors will follow these procedures and precautions when mixing, loading, and applying herbicides:

- Mixing of herbicides will 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 Safety Data Sheets 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 15m of sensitive environmental features (riparian areas, streams, wetlands, lakes, no-treatment zones).
- There will be no mixing or loading of herbicides within 30m of any known 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 pick up 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.
- 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 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 TCE's contractors in accordance with the manufacturer's instructions as noted on the product label or provincial instructions, and the recommendations detailed in the *Canadian Pesticide Education Program Applicator Core Manual* (2011), Chapter 8, Section 3.

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 treatment 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 TCE's Release and Spill

Response Procedure. The following will be adhered to as minimum guidance for determining the adequacy of spill response plans as provided by contractors.

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

- A copy of the approved spill response plan will be at or near each work site.
- Spill response equipment must be present at any application, storage, mixing, and loading site.
- Each clean up and containment activity should be performed after reviewing the appropriate TOP (for example, Safety, Environmental, or Health Hygiene procedure.)
- 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 OSHR).
- Safety of personnel and human health protection will be the first priority in any spill response plan.
- The spilled material should be clearly identified and the source of the spill 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 TCE representative to determine if the spill is reportable and to obtain instructions for shipping and disposal of waste material.
- All spills will be recorded in the TCE Incident Management system, which generates actions from incidents.
- Refer to TCE's Release and Spill Response Procedure to determine if the spill is reportable and to whom.
- As a general guide, any spill of herbicide (a deleterious/toxic substance) is provincially and/or federally reportable if it:
 - Enters a water body
 - Is in excess of 5kg or 5L on land or while transporting

The emergency contact information in Table 1 can be used for assistance as required if a spill occurs and is determined to be reportable as per TCE's Release and Spill Response Procedure or as per the minimum amounts outlined in the above bullet notes.

Table 1: Emergency Contact Numbers

Agency	Phone
BC Emergency Coordination Centre (ECC) – Ministry of Emergency Management and Climate Readiness	1-800-663-3456 (24 hours)
BC Poison Control Centre	1-800-567-8911
Canadian Transport Emergency Centre – CANUTEC (clean-up info)	1-613-996-6666 (collect)
Corteva AgriSciences Solution Center	1-800-667-3852
Bayer Crop Science Emergency and Crisis Communication line	1-800-334-7577

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 treatment
- Following the manufacturer's directions, and/or the FLNR *Herbicide Field Handbook* (Boateng 1998), and/or the *Canadian Pesticide Education Program Applicator Core Manual*
- 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, TCE supervisory personnel and contractors will review the treatment area and identify any environmentally-sensitive features. In addition, the engagement work conducted by TCE community 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. Components identified as part of initial and/or ongoing discussions will also be identified during these pre-treatment inspections. This input is in turn reflected in the final IVMP.

Prior to starting any herbicide treatments, all contractors and TCE supervisory personnel who will be involved will attend a pre-job information 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 value-added components and mitigation measures identified during treatment planning
- Accommodations and/or exclusions that TCE committed to during the consultation process for this IVMP
- Any internal TOPs that may apply

[Appendix 5](#) 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 the BC Ministry of Environment & Climate Change Strategy.

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

In addition, all PFZs will be measured and marked/flagged prior to herbicide use as per [Appendix 6](#) (*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 IPMA and IPMR specifically set 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 will follow the IPMR, Sections 71 and 73 to 77 (see [Appendix 6](#)).

In addition, and as required:

- 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, TCE ensures protection of water quality, fish, and fish habitat by following designed and approved water crossing techniques. TCE implements any specific conditions referenced in provincial water permits, codes of practice, or *Fisheries Act* authorizations, as well as any identified *Measures to Avoid Causing Harm to Fish and Fish Habitat* (Fisheries and Oceans Canada).

4.3 Protection of Domestic Water Intakes (and Agricultural Water Sources)

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

As per Section 71 of the IPMR, a 30m no-treatment zone will be maintained around any water supply intake or wells used for domestic or agricultural purposes, including water for livestock or for irrigation of crops.

This distance may be reduced if TCE is reasonably satisfied that the smaller NTZ will continue to ensure the integrity of the intake, and the rationale for this decision is documented.

4.4 Protection of Wildlife and Wildlife Habitat

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

Wildlife habitat features identified during the program planning phase and observed onsite become part of the approved vegetation management plan along with the *Herbicide Application Log* site reviews. Wildlife observations, including species at risk, will be reported to the TCE Regional Environmental Specialist. Any application of herbicides around these features will be consistent with the protection measures outlined in TCE's Operating Procedures (TOP).

Opportunistic observation of wildlife habitat features (e.g., beaver lodges, raptor nests) will be reported to TCE representatives and site-specific protection measures will be implemented.

Buffers (determined on a site-by-site basis using as a minimum the guidelines in [Appendix 6](#)) will be maintained around active/inhabited raptor and heron nests, mineral licks/wallows, and other essential wildlife habitat.

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

4.5 Protection of Food Intended for Human Consumption

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

Some of TCE's RoWs, access roads, 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 expended 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 and or bee keepers contact TCE, 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 as per the IPMR, Section 64(1), to notify individuals using any vegetation products from areas adjacent to 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 initial vegetation management plans developed as part of site inspections and on site visitations as per [Section 2.3](#) and recorded on the *Herbicide Application Log* (see [Appendix 4](#)).
- 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 by the application contractor to establish treatment boundaries, document the location of environmentally-sensitive areas, and 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)

Observation of species at risk that may be picked up by opportunistic observation or ground patrols will be reported to the TCE Regional Environmental Specialist, in accordance with the TCE's *Fish and Wildlife Protection Procedures*.

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

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, and temperature 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: Active Ingredients and Herbicides 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
Truvis	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.***

See [Appendix 7](#) for an expanded list of these active ingredients and a brief description of their properties.

5.2 Application Techniques

The benefits and limitations of each of these herbicide application techniques are considered when making overall vegetation management 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. ○ Because herbicide application is restricted to the cut surface of freshly cut stumps, there is very little herbicide drift, resulting in minimal impact to non-target plants, fish, wildlife, bodies of water, water sources, and food intended for human consumption. ○ It poses little risk of herbicide exposure to workers or the general public. ○ Selective removal of tall-growing deciduous trees generally helps promote 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"> ○ Because herbicide application is restricted to the basal areas of the bark, there is generally no herbicide drift, resulting in minimal impact to off-target species, fish, wildlife, bodies of water, water sources, and food intended for human consumption. ○ It poses little risk of herbicide exposure to workers or the general public. ○ Selective control of tall-growing deciduous trees helps promote 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 some of the contact herbicide 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. It can also be quite effective when used as a follow-up treatment to mechanical cutting to prevent deciduous vegetation re-sprouts.

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 7](#) 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 leaf out 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.

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)

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

The annual 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 consultation and engagement process, if an interested party informs TCE of any site-specific locations of high cultural, food production, recreation, or habitat value, and requests protection of these valued components, TCE personnel will revise the IVMP to include any commitments made.

Protection of such areas will 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, TCE will provide the annual NIT and maps of planned treatment areas to those who requested a copy during the consultation and engagement 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.

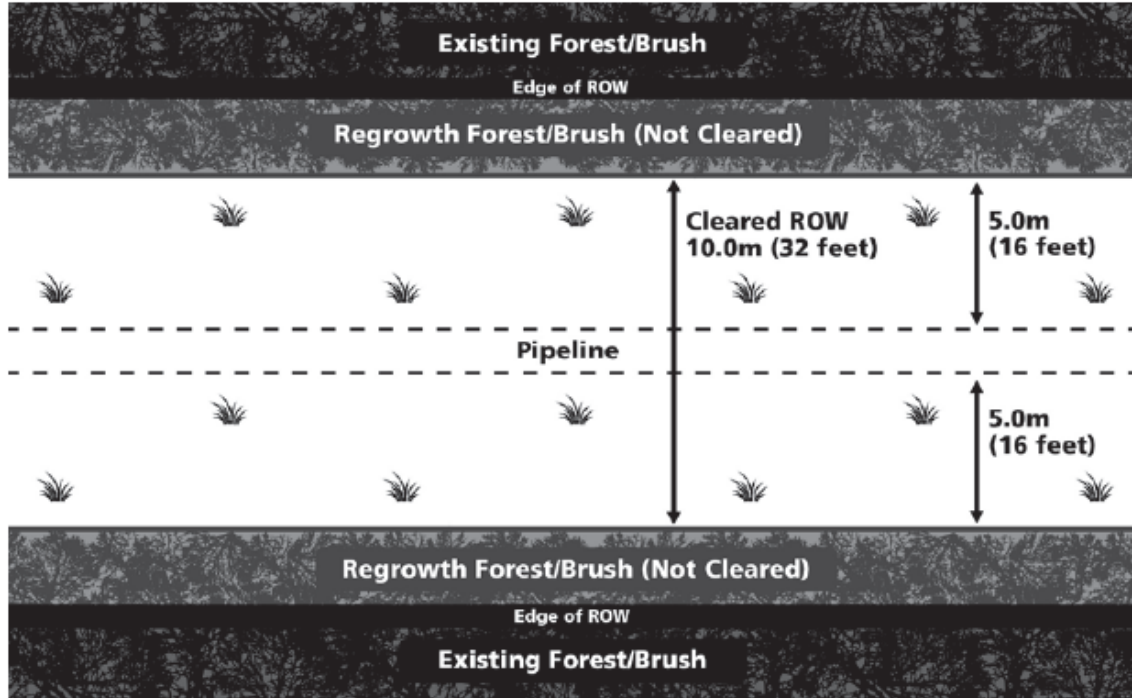
For additions or modifications to the NIT that result in an increase of total area greater than 10%, a revised NIT will be submitted to the administrator at least 21 days prior to starting work on those additions or modifications.

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

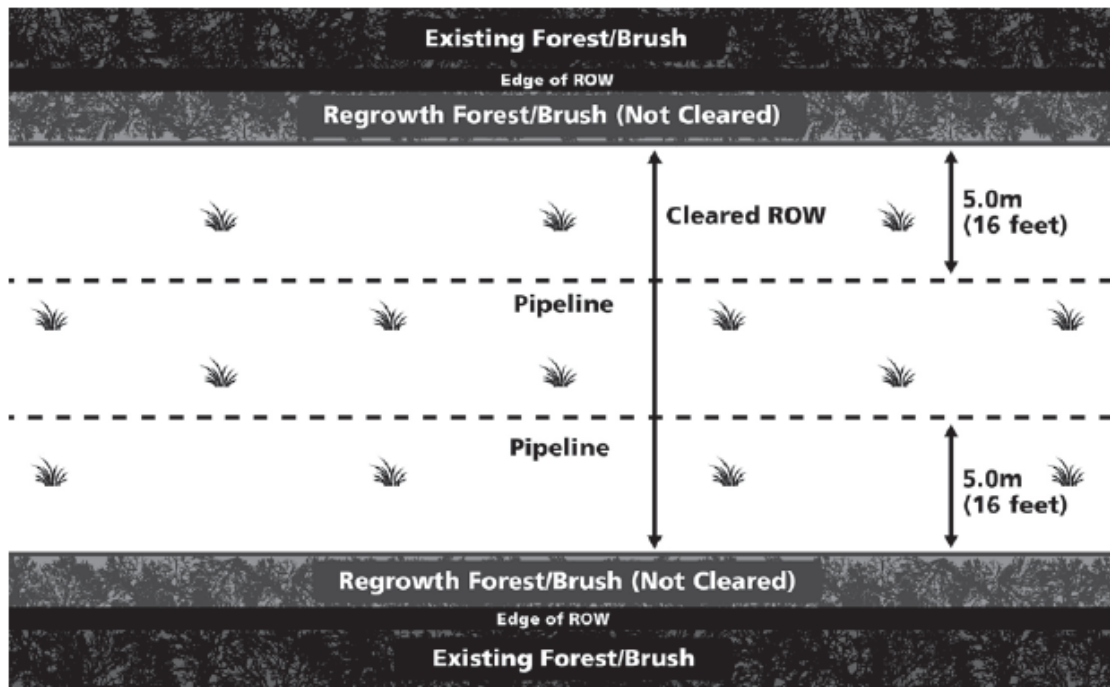
Appendix 1 – TCE Brush Control Figures

The following figures are from TCE's *Brush Control Procedure* TOP.

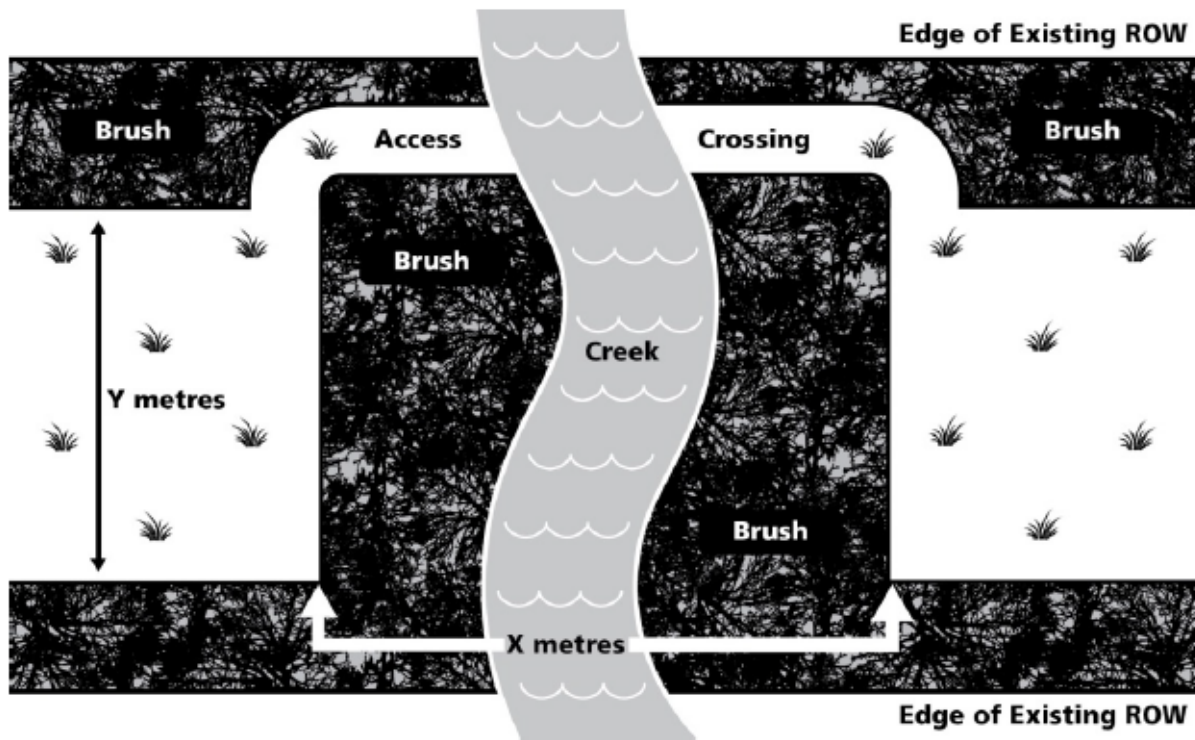
TOP Figure 1: Brush Control Clearing Guideline for Single Pipeline RoW



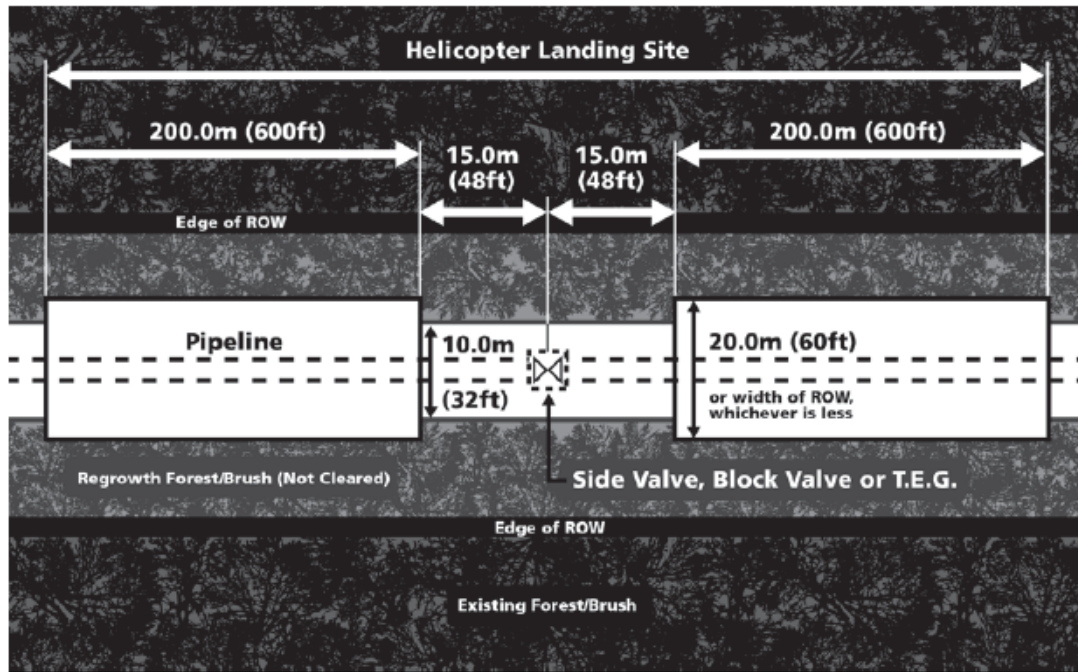
TOP Figure 2: Brush Control Clearing Guideline for Multiple Pipeline RoW



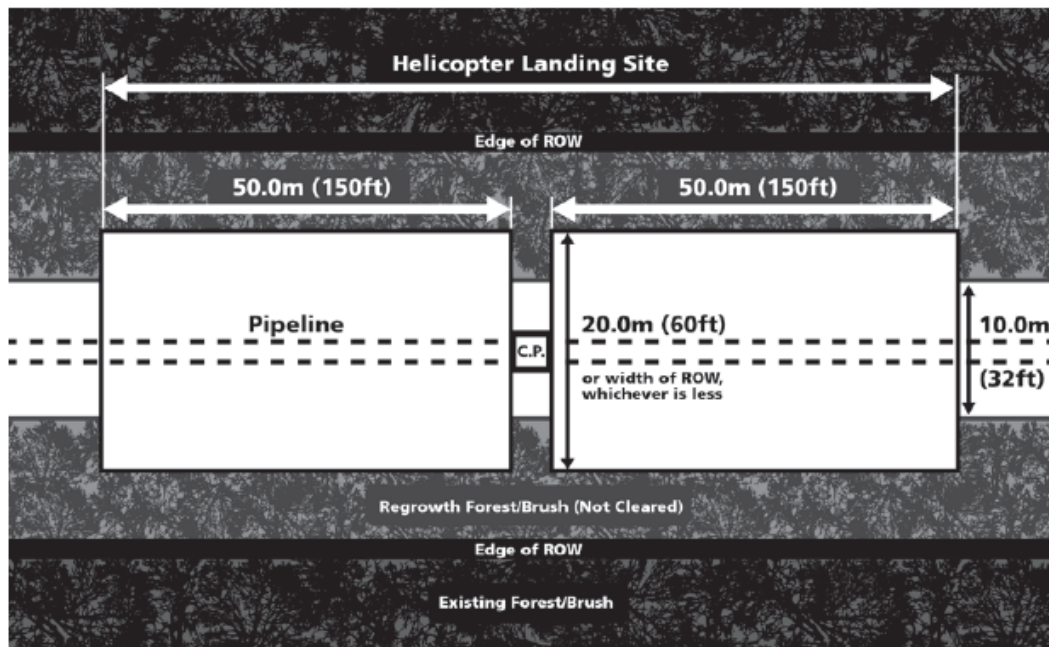
TOP Figure 3: Vegetation Buffers at Creek / River Crossings



TOP Figure 4: Helicopter Landing Site and Pad Layout at Block and Side Valves, and Thermal Electric Generator Sites



TOP Figure 5: Helicopter Landing Site and Pad Layout at Cathodic Protection Sites



Appendix 2 – Legislation and Other Resources

This information is provided for the reader's interest. More detailed information about this legislation can be sourced on line.

Federal and provincial legislation that contain sections pertinent to TCE 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 (PCPA) 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 (TDGA) provides information regarding the storage and transportation of pesticides (and other dangerous goods).

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

Canadian Energy Regulator Onshore Pipeline Regulation, under the *Canadian Energy Regulator Act*. Companies are responsible for meeting the requirements of the OPR to manage safety, security, and environmental protection throughout the entire lifecycle of their facilities, from design through to construction, operation, and abandonment.

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 Regulations (IPMA / IPMR) prohibit 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 5](#) 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.

Oil and Gas Activities Act outlines the rules pertaining to pipelines in British Columbia.

Regulatory and Review Agencies

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

BC Oil and Gas Commission (OGC)

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

British Columbia Energy Regulator (BCER)

BCER's main job is to protect the environment during exploration, development, and operations including up to restoration, of all oil and gas and geothermal activities in the province.

Regional Pesticide Review Committee (RPRC)

The Regional Pesticide Review Committee (RPRC) is comprised of representatives from the BC ministries of Agriculture, Health, Forests, and Environment, as well as Environment Canada and Health Canada (via the PMRA, see below).

Pest Management Regulatory Agency (PMRA)

The 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 contained in pest control products, such as formulants, adjuvants, and contaminants, which can also pose risks to human and environmental health.

Appendix 3 – Southeast BC Projects Location Map and GPS Locations

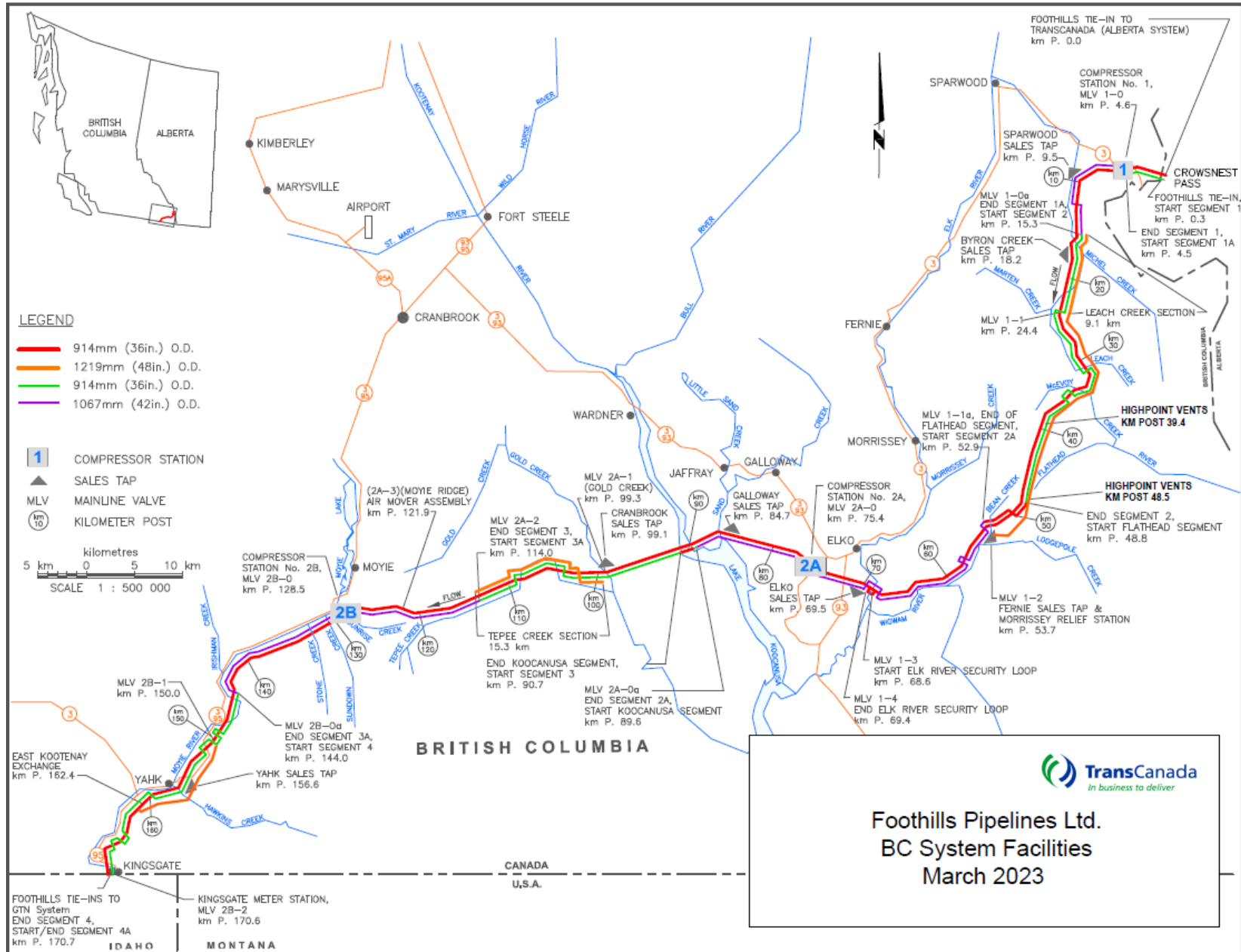



Table 3: GPS Locations for BC Facilities

BC Facility Location	Latitude	Longitude
Km Post .4 XR-1 Valve Yard	49:38:36.527 (dms) 49.643480 (dec) Scale House Rd / Phillips Pass	-114:39:38.036 (dms) 5900 feet -114.660566 (dec)
Km Post 4.6 Crowsnest Compressor Stn 1	49:38:56.381(dms) 49.648995 (dec) Highway 3	-114:42:49.305 (dms) 5000 feet -114.713696 (dec)
Km Post 9.5 Sparwood Sales / Tap	49:38:34.764 (dms) 49.642990 (dec) Corbin Rd / McGillvary Mine Rd	-114:46:38.898 (dms) 4800 feet -114.777472 (dec)
Km Post 15.3 Valve Yard	49:35:38.471 (dms) 49.594020 (dec) Corbin Rd / South Loop Rd	-114:47:14.425 (dms) 4850 feet -114.787340 (dec)
Km Post 18.2 Byron Tap on Pipeline	49:34:13.549 (dms) 49.570430 (dec) Corbin Rd / Coal Leach Rd	-114:47:40.298 (dms) 5100 feet -114.794527 (dec)
Byron Creek Sales (measurement building)	49:34:14.302 (dms) 49.570639 (dec) Corbin Rd / Leach Creek Rd	-114:47:16.365 (dms) 5100 feet -114.787879 (dec)
Km Post 24.4 Valve Yard	49:31:2.593 (dms) 49.517387 (dec) Corbin Rd / Leach Creek Rd	-114:48:47.372 (dms) 5300 feet -114.813159 (dec)
Km Post 39.4 Wranglers Cabin	49:25:5.083 (dms) (Highpoint vents) 49.418079 (dec) Morrissey Rd / McEvoy Rd / Wranglers Cabin Rd	-114:50:30.143 (dms) 6411 feet -114.841706 (dec)
Km Post 48.5 Flathead Ridge (Highpoint vents)	49:20:19.065 (dms) 49.338629 (dec) Morrissey Rd / Lodge Pole Rd / Shoe Fly Rd	-114:52:30.016 (dms) 6564 feet -114.875004 (dec)
Km Post 52.9 Valve Yard	49:19:8.243 (dms) 49.318956 (dec) Morrissey Rd / Lodge Pole Rd / Bean creek Rd	-114:55:27.368 (dms) 4450 feet -114.924269 (dec)
Fernie Sales and Km Post 53.7 MLV 1-2	49:18:50.667 (dms) 49.314074 (dec) Morrissey Rd / Lodge Pole Rd	-114:55:48.151 (dms) 4300 feet -114.930042 (dec)
Km Post 68.6 Elk River Security Loop (East Side)	49:15:36.454 (dms) 49.260126 (dec) River Rd / Mt Broadwood Access Rd (gated)	-115:5:24.87 (dms) -115.090242 (dec)
Km Post 69.4 Elk River Security Loop (West Side)	49:15:50.568 (dms) 49.264047 (dec) River Rd / Pipeline	-115:5:48.661 (dms) 3700 feet -115.096850 (dec)
Km Post 69.5 Elko Sales Tap	49:15:52.268 (dms) 49.264519 (dec) River Rd / Pipeline	-115:5:52.464 (dms) 3700 feet -115.097907 (dec)
Km Post 75.4 Elko Compressor Stn 2A	49:16:57.243 (dms) 49.282568 (dec) Highway 3/93 - Kikomun Rd	-115:10:21.26 (dms) 3350 feet -115.172572 (dec)

BC Facility Location	Latitude	Longitude
Km Post 84.7 Galloway Sales Tap	49:18:51.601 (dms) 49.314334 (dec) Jaffray/Baynes Lake Rd	-115:17:18.29 (dms) 3100 feet -115.288414 (dec)
Km Post 89.6 Valve Yard	49:18:21.094 (dms) 49.305859 (dec) West side of Lake Kooconusa	-115:20:45.045 (dms) 2900 feet -115.345846 (dec)
Km Post 99.1 Cranbrook Sales Tap	49:16:49.555 (dms) 49.280432 (dec) Gold Creek Road	-115:28:8.9 (dms) 4100 feet -115.469139 (dec)
Km Post 99.3 Valve Yard	49:16:48.269 (dms) 49.280075 (dec) Gold Creek Road	-115:28:18.951 (dms) 4100 feet -115.471931 (dec)
Km Post 114 Valve Yard	49:15:32.357 (dms) 49.258988 (dec) Gold Creek Rd / Tepee Creek Rd	-115:39:37.123 (dms) 4700 feet -115.660312 (dec)
Km Post 121.9 Moyie Mtn High Point Vent	49:14:50.802 (dms) 49.247445 (dec) Sunrise Rd / Moyie Mtn Rd	-115:45:40.865 (dms) 7200 feet -115.761351 (dec)
Km Post 128.5 Moyie Compressor Stn 2B	49:14:44.677 (dms) 49.245744 (dec) Highway 3/95 - Sunrise Rd	-115:50:49.79 (dms) 3800 feet -115.847164 (dec)
Km Post 144 Valve Yard	49:10:26.757 (dms) 49.174099 (dec) Ryan Station Rd / Palmer Ranch	-116:0:4.935 (dms) 3600 feet -116.001371 (dec)
Km Post 150 Valve yard	49:7:42.094 (dms) 49.128359 (dec) Highway 3/95 / Rest Area turnout	-116:2:3.731 (dms) 3400 feet -116.034370 (dec)
Km Post 156.6 Yahk Sales Tap	49:4:54.065 (dms) 49.081685 (dec) Highway 3/95 – Meadow Cr Rd	-116:4:56.198 (dms) 3400 feet -116.082277 (dec)
Km Post 162.4 East Kootenay Sales Tap Valve Yard	49:3:34.941 (dms) 49.059706 (dec) Highway 95 / Barnhardt Rd	-116:8:56.002 (dms) 3400 feet -116.148889 (dec)
East Kootenay Meter Station building	49:3:59.193 (dms) 49.066442 (dec) Highway 95	-116:9:4.673 (dms) 3300 feet -116.151298 (dec)
Km Post 170.6 Kingsgate Meter Station	49:0:4.664 (dms) 49.001296 (dec) Highway 95 / Boundary Rd	-116:11:10.33 (dms) 3250 feet -116.186203 (dec)

Appendix 4 – TCE Herbicide Application Log



 TRANSCANADA OPERATING PROCEDURE (FORM)				 <i>In business to deliver</i>
Title: Herbicide Application Log Canada				
Revision: 00	Effective Date: 2016/04/08	Status: Issued	Driver: Regulatory	Page 1 of 7

Document Owner: Joanne Widmer

Instructions:

1. This form is to be completed in conjunction with the TOP entitled [Invasive Vegetation Weed Control Management Canada](#) (EDMS No. 005518537).
2. Save this form using the following naming convention
 - a. 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).
 - b. Attach completed form to SAP Work Order (Refer to IPSECA (Identify Plan Schedule Execute Close Analyze) Work Management Quick Reference Guide Page 88.
3. 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).
4. 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 <i>(TransCanada work order No.)</i>	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"/>	Fire 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	

 TRANSCANADA OPERATING PROCEDURE (FORM)					
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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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Photographs of Treatment Area










 TRANSCANADA OPERATING PROCEDURE (FORM)					
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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 Campion	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 – Shepherd’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 – Legislative Definitions

This information is provided for the reader's interest.

These definitions are taken directly from the following legislation. 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.

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 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 6 – 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 (below).
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(2)	Glyphosate applications for noxious weed and invasive plant management	Targeted application of glyphosate to noxious weeds and invasive plants if selective application is used between 1m and 10m above the high-water mark	1m PFZ	
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 7 – Active Ingredients and Herbicides

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 nonherbicidal 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 pyridinoxy 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 Scentless 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. Triclopyr 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.