

Gas Facilities and Rights-of-Way Pest Management Plan

**Reference: FEI 20/25
Confirmation # 799-0014-20/25**



Expires June 2025

Table of Contents

1.0	Introduction.....	1
1.1	<i>FortisBC Energy Background</i>	1
1.1	<i>Geographic Boundaries of the Plan Area [IPMR Section 58(1)(a)]</i>	2
1.2	<i>Pest Management Plans</i>	2
1.3	<i>Person Responsible for Managing Pests [IPMR Section 58(1)(b)(c)]</i>	2
1.4	<i>FortisBC Energy Facilities.....</i>	2
1.5	<i>FortisBC Energy Rights-of-Way</i>	3
2.0	Pest Management Using Integrated Pest Management Principles	4
2.1	<i>The Principles of Integrated Pest Management</i>	4
3.0	Facilities Integrated Pest Management.....	5
3.1	<i>Prevention [IPMR Section 58(2)(a)]</i>	5
3.1.1	<i>Surfacing Materials at Facilities</i>	5
3.1.2	<i>Maintaining Vegetation Free Perimeter Fences</i>	5
3.1.3	<i>Seeding Disturbed Areas.....</i>	6
3.2	<i>Facilities Pest Identification [IPMR Section 58(2)(b)(ii)]</i>	6
3.3	<i>Monitoring Pest Populations at Facilities [IPMR Section 58(2)(c)]</i>	7
3.3.1	<i>Monitoring Methods [IPMR Section 58(2)(c)(i)]</i>	7
3.3.2	<i>Monitoring Frequency [IPMR Section 58(2)(c)(ii)]</i>	7
3.3.3	<i>Data Collected During Monitoring [IPMR Section 58(2)(c)(iii)]</i>	8
3.4	<i>Injury Thresholds and Treatment Decisions [IPMR Section 58(2)(d)]</i>	8
3.4.1	<i>How Injury Thresholds are Chosen [IPMR Section 58(2)(d)(i)]</i>	8
3.4.2	<i>How Injury Thresholds are Applied [IPMR Section 58(2)(d)(ii)]</i>	9
3.4.3	<i>Specific Treatment Thresholds</i>	9
3.5	<i>Treatment Options & Selection Criteria [IPMR Section 58(2)(e)]</i>	11
3.5.1	<i>Facility Vegetation Background Information</i>	11
3.5.2	<i>Vegetation Management Database.....</i>	11
3.5.3	<i>Treatment Options Available.....</i>	12
3.5.4	<i>Physical Control Methods.....</i>	12
3.5.5	<i>Chemical (Herbicides) Selection [IPMR Section 58(2)(e)].....</i>	15
3.5.6	<i>Herbicide Identification and Application</i>	16
3.5.7	<i>Herbicide Application Equipment</i>	17
3.5.8	<i>Herbicide Application Methods/Techniques</i>	18
3.6	<i>Treatment Selection Criteria [IPMR Section 58(2)(e)(iv)]</i>	18
3.7	<i>Post Treatment Evaluations [IPMR Section 58(2)(c)]</i>	19
4.0	Rights-of-Way Integrated Pest Management	21
4.1	<i>Prevention [IPMR Section 58(2)(a)]</i>	21
4.2	<i>Pest Identification [IPMR Section 58(2)(b)(ii)]</i>	22
4.2.1	<i>Growth Stages of Plants</i>	22
4.2.2	<i>Vegetation Classification</i>	23

4.3	Monitoring Vegetation Populations [IPMR Section 58(2)(c)]	23
4.4	Injury Thresholds and Treatment Decisions [IPMR Section 58(2)(d)]	24
4.5	Treatment Options & Selection Criteria [IPMR Section 58(2)(e)]	24
4.5.2	Chemical (Herbicides) Selection [IPMR Section 58(2)(e)]	29
4.5.3	Herbicide Identification, Application Equipment and Methods	30
4.5.4	Herbicide Application Methods/Techniques	30
4.6	Post Treatment Evaluations [IPMR Section 58(2)(c)]	30
5.0	Environmental Protection Strategies and Procedures	32
5.1	Water Protection PFZs and NTZs	32
5.2	Environmental Feature Protection Strategies and Procedures	33
6.0	Operational Information	36
7.0	Reporting, Notification and Consultation	37
7.1	Reporting	37
7.1.1	Confirmation Holder Use Records	37
7.2	Annual Report for Confirmation Holders	37
7.3	Notifications	38
7.3.1	Notification of PMP Confirmation	38
7.3.2	Annual Notice of Intent to Treat	38
7.3.3	Requests to Amend the PMP	38
7.3.4	Notification of Contraventions	38
7.3.5	Posting of Treatment Notices	39
7.4	Consultations	39
7.4.1	Public Consultation Plan	39
7.4.2	Public Consultation Report	40
7.4.3	Indigenous Communities Consultation Plan	40
7.4.4	Indigenous Communities Consultation Report	41
Table 1	Vegetation Identification Information Available Online	7
Table 2	Treatment Options, Methods and Techniques for Facilities Vegetation Management	12
Table 3	Mechanical Treatment Methods	13
Table 4	Physical Treatment Methods	14
Table 5	Description and Rationale, Benefits and Limitations of Cultural Control Methods	15
Table 7	Herbicide Application Methods/Techniques	18
Table 8	Description of Preventative Methods of Vegetation Management	21
Table 9	The Four Stages of Development Typical of Most Plants	22
Table 10	Problem Vegetation and Their Characteristics	23
Table 11	Summary of the FEI Monitoring Program	23
Table 12	Physical Control Methods	27
Table 13	Cultural Control Methods	29
Table 14	Definitions of PFZ and NTZ as Stated in the IPMR	32
Table 15	Minimum Water Protection Measures for the Protection of Domestic and Agricultural Wells and Water Intakes, Bodies of Water, and Streams	32
Table 16	Strategies/Procedures for the Protection of Environmental Features	33

Appendix A: The FortisBC Gas Service Area

Appendix B: Physical Control Methods and Techniques

Appendix C: Properties / Specifications of Pesticides Proposed for Use Under this PMP

Appendix D: Operational Practices in Pesticide Use

Appendix E: Post Treatment Inspection Report

1.0 Introduction

1.1 FortisBC Energy Background

FortisBC Energy Inc. (FEI) is the largest distributor of natural gas in British Columbia, servicing over 1.1 million customers in over 135 communities across the province, including Vancouver Island and the Sunshine Coast. Natural gas, which comes from wells located in northeast British Columbia and Alberta, enters the FEI system through the Enbridge and TC Energy pipeline systems. Natural gas is then transported through a network of approximately 49,000 km of transmission and distribution pipelines. FEI pipelines are connected to regulator, compressor and valve stations across the province. These control gas flow and decrease the pressure of the natural gas to levels useable by its customers. FEI is responsible for the safe and efficient movement of natural gas from the point it enters its system until it reaches its customers through distribution pipes.

The company understands that the presence of pests can adversely impact infrastructure integrity that can threaten worker and public safety and can compromise system reliability. As part of the FEI Safety and Environmental Policy, the company is committed to the delivery of safe, reliable power in an environmentally responsible manner.

The British Columbia *Integrated Pest Management Act* requires that management of vegetation on specified industrial sites be approved under a single, comprehensive Pest Management Plan (PMP). The PMP ensures:

- Compliance with the provisions of the Integrated Pest Management Act and other applicable federal, provincial and regional laws and regulations;
- The responsible use of pesticides;
- The incorporation and use of integrated pest management; and,
- Public awareness of FEI's pest management programs.

The Company is cognizant that the presence of pests can adversely impact infrastructure integrity that can threaten worker and public safety and can compromise system reliability. In 2014 and 2015, FEI developed PMP's to deal with vegetation issues within its facilities and on its rights-of-way (ROW) including transmission and distribution pipeline corridors and access roads. FEI received authorization for these PMP's under Confirmation Number 799-0009-15/20 (ROW) and 799-0010-15/20 (facilities).

This PMP has been prepared to collectively replace PMP No. 799-0009-15/20 and 799-0010-15/20 that expires in June 2020. The PMP uses the principles of integrated pest management (IPM) and is designed to control and/or eradicate unwanted vegetation on FEI rights-of-way and at FEI facilities. Noxious weeds and invasive plants are controlled by local weed committees and are not included under this PMP.

1.1 Geographic Boundaries of the Plan Area [IPMR Section 58(1)(a)]

This PMP applies to all FEI facilities and transmission and distribution line ROWs throughout the FEI service area. Attached hereto and marked as Appendix 1 is a map describing the geographic boundaries of the area to which this plan applies.

1.2 Pest Management Plans

Under the British Columbia *Integrated Pest Management Act* a PMP is defined as a plan that describes:

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

According to the Act the term pest means a microorganism or chemical or other material that is used to prevent, destroy, repel, or mitigate a pest. The terms pesticide and herbicide are used interchangeably in this document and refer to chemicals used to treat pests.

FEI, its contractors and agents, will use this PMP when carrying out vegetation management activities at facilities and on transmission and distribution line ROWs throughout the FEI service area.

1.3 Person Responsible for Managing Pests [IPMR Section 58(1)(b)(c)]

Within FEI, the person responsible for managing pests and the principal contact for information relating to this PMP is:

Dean Lambert, R.P.F.
FEI Inc.
1975 Springfield Road
Kelowna, BC V1Y 7V7
Ph: 250-868-4562 x74562
Email: Dean.Lambert@fortisbc.com

1.4 FortisBC Energy Facilities

Natural gas transported through the FEI network of high-pressure transmission pipelines is controlled by several different types of stations, and is then distributed to urban, commercial and industrial centers through local distribution pipelines. These sites are collectively referred to as facilities in this PMP.

Station – is a facility, at a specific location, where there is an assembly of piping including some of, but not limited to, valves, fittings, filters, line heaters, regulators, measuring devices, etc. This equipment is used for the purpose of treating, measuring, and/or controlling the gas flow in terms of volume and pressure.

Compressor Station – is usually located within a transmission system (and occasionally within a distribution system), for the purpose of increasing the pressure within the system downstream of the station through the operation of one or more mechanical or hydraulic devices (i.e., compressors).

Valve Station – is an assembly of piping and valves used to control and direct the flow of natural gas through transmission pipelines.

Gate (Regulator) Station – is connected to a high-pressure transmission pipeline at a specific location, designed to regulate (lower) the pressure of the gas stream prior to it entering a distribution line for delivery to customers. A gate station is part of the distribution system.

Control Station – is located within a transmission system for the purpose of controlling the flow and/or pressure downstream of the station within the transmission system.

District Station – is connected to an intermediate pressure pipeline at a specific location for the purpose of regulating the pressure of the gas stream prior to it entering a distribution system or system operating at a lower pressure.

Odorant Station – is an assembly of piping, including tanks and in some cases pumps, whose sole purpose is to inject odorant to the gas stream within the distribution system.

Farm Tap – is an assembly of piping, including regulators and other components, that is connected to a pipeline that controls the pressure of the supply of the gas to individual end users in rural locations.

1.5 FortisBC Energy Rights-of-Way

Rights-of-way (ROW) addressed under this PMP include transmission corridors, distribution networks, access roads, and associated infrastructure that are used to house and operate the pipeline infrastructure.

The purpose of the ROW is to define an area around the pipeline in which FEI controls activities in order to ensure pipeline integrity, safety and reliability and safety of the public. Some pipelines are also located within road allowance.

Access roads provide vehicular and worker entry to ROWs for routine operations and maintenance, safety inspections and emergency response.

2.0 Pest Management Using Integrated Pest Management Principles

Operational, safety and aesthetic concerns govern the need to control pests within and around FEI facilities and ROW's. Some of these concerns are:

- Vegetation can become a fire hazard or serve as a fuel source for fires;
- Vegetation can impair visibility of the pipeline;
- Vegetation can impact pipeline integrity;
- Vegetation can restrict access to equipment for maintenance, repairs, safety inspections and emergency response;
- Vegetation growing adjacent to a facility can serve as a seed source;
- Vegetation can increase the risk of tripping and slipping;
- Vegetation can serve as shelter and food for structural insect pests, especially rodents; and
- To comply with provisions of the *BC Weed Control Act* that requires occupiers of land control noxious weeds and listed invasive plants.

Along ROW's problem vegetation is defined as vegetation that compromises the maintenance of sight lines and above ground pipeline identification and restricts access to pipelines for maintenance, pressure and leak testing. Taller growing species, especially those deciduous species such as alder, birch, maple and aspen, that have the ability to re-sprout from cut stumps following mechanical control methods, are the primary targets of the FEI's vegetation management program.

2.1 The Principles of Integrated Pest Management

In order to ensure effective vegetation management on all of its facilities and ROW corridors, FEI has adopted the principles of IPM as part of its vegetation management program. IPM means a process for managing pest populations that includes the following activities:

- **Planning (prevention)** and managing ecosystems to prevent organisms from becoming pests;
- **Identifying** pest problems and potential pest problems;
- **Monitoring** populations of pests and beneficial organisms; damage caused by pests and environmental conditions;
- **Using injury (treatment) thresholds** in making treatment decisions,
- **Suppressing (pest treatment options and method selection)** pest populations to tolerable levels using strategies based on consideration of physical, cultural, mechanical, behavioural and chemical controls in appropriate combinations and environmental and human health protection; and,
- **Evaluating** the effectiveness of pest management strategies.

3.0 Facilities Integrated Pest Management

3.1 Prevention [IPMR Section 58(2)(a)]

In order to meet their vegetation management objectives, FEI employs preventative measures aimed at reducing the initial growth and spread of unwanted vegetation. These measures are incorporated, where feasible, into station and building designs prior to construction, or may be implemented during regular operational and maintenance activities or during facility upgrades.

3.1.1 Surfacing Materials at Facilities

The proper selection and installation of surfacing materials at FEI facilities are important in minimizing growth of unwanted vegetation. The presence of organic material, such as soil fines, at facilities provides a growth medium for unwanted vegetation. Suitable surfacing material of a correct thickness and free of organic matter can reduce the establishment of organic vegetation. Gravel (crushed rock) and road mulch are the predominant surfacing materials within FEI facilities.

In order to reduce the need to undertake long-term vegetation control at facilities, the following measures are taken, where feasible, when installing and maintaining surface materials:

- Installing clean gravel of suitable thickness when upgrading stations. Thick gravel reduces the ability of vegetation to penetrate down to the underlying subsoil;
- Controlling vegetation prior to upgrading gravel areas;
- Installing landscape fabric (e.g. geotextile) under clean gravel to prevent roots from growing into the underlying subsoil;
- Upgrading areas of low gravel created by vehicular traffic, construction or maintenance activities;
- Utilizing mulches in landscaping around facilities to reduce the growth of vegetation; and,
- Removing and disposing of leaves, needles, cones, branches and other organic debris that have been deposited or blown into facilities from adjacent trees and shrubs during regular clean up.

3.1.2 Maintaining Vegetation Free Perimeter Fences

Vegetation growing adjacent to fences and access roads will be removed or controlled because:

- Large trees (especially deciduous) and shrubs can deposit organic debris into the stations, compromise station security by improving access over the fence, and create safety and fire hazards if they grow too close to equipment;
- Certain types of low growing vegetation can grow through/entwine chain link fencing and provide a seed source for new growth on station gravel. At most FEI facilities, vegetation has established immediately outside of station fences or concrete wall, where gravel is seldom present;

- Vegetation growing along access roads can be spread by vehicles and personnel to non-infested sites; and,
- Overgrown vegetation can impact site aesthetics, especially in urban areas.

3.1.3 Seeding Disturbed Areas

Soils disturbed during construction of new facilities, upgrading of facilities or other activities will be seeded and fertilized if other surfacing materials are not being installed. These areas (mainly outside the station fence) can provide optimum conditions for the establishment of unwanted vegetation. As these disturbed areas are also subject to erosion, planting of low-growing perennial vegetation, turf, or surfacing with crushed gravel underlain with landscape fabric will be undertaken where feasible.

3.2 Facilities Pest Identification [IPMR Section 58(2)(b)(ii)]

Unwanted vegetation growing within or adjacent to FEI facilities and along ROWs will be termed “weeds” within this PMP. Weeds are a term used to describe vegetation growing where it is not desired (i.e., interfering with human activity and/or causing safety issues), and is therefore considered to be a pest. The accurate identification of vegetation in, or adjacent to, FEI facilities is important for several reasons:

- Depending on their growth rates and characteristics and on their physical location within the facility, they may become problem vegetation;
- Control methods for problem vegetation may differ depending on the species. For example, certain deciduous tree species that are best controlled by manual cutting followed by the application of an herbicide to the freshly cut stump to inhibit re-sprouting; and
- Certain brush and shrubs, depending on their growth habits, may interfere with access to the facility for maintenance and inspections.

There are numerous publications that will assist in the identification of problem vegetation. The table below includes the web sites where information on the identification and management of tree, shrub and weed species (including noxious weeds and listed invasive plants) can be accessed:

Table 1 Vegetation Identification Information Available Online

BC Ministry of Forests, Lands and Natural Resources and Invasive Species Council of British Columbia	"Field Guide to Noxious Weeds and Other Selected Invasive Plants of British Columbia"	https://bcinvasives.ca/documents/Field_Guide_to_Noxious_Weeds_Final_WEB_09-25-2014.pdf
E-Flora BC	Electronic Atlas of the plants of BC	https://ibis.geog.ubc.ca/biodiversity/eflora/
BC Ministry Environmental Protection & Sustainability	Invasive Species management in BC	https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/invasive-species/pest-management/flnrord_southern_interior_pmp_4_02-0678-1924_2019_to_2024.pdf
Invasive Species Council of BC	List of invasive species in BC	https://www.bcinvasives.ca
Metro Vancouver	List of invasive species and practical solutions, best management practices	http://www.metrovancouver.org/services/regional-planning/conserving-connecting/invasive-species/Pages/default.aspx
Ministry of Forests, Lands & Natural Resource Operations (south Coast)	List of practical solutions, PMP	https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/invasive-species/pest-management/flnr_south_coastal_pmp_402-0677-1924_2019_to_2024_final_confirmed.pdf

3.3 Monitoring Pest Populations at Facilities [IPMR Section 58(2)(c)]

FEI staff and contractors monitor vegetation, including danger trees, on or adjacent to their facilities and their access roads on a regular basis. Monitoring of facilities provides a record of information about weed occurrence and density, and site conditions. Monitoring also includes recording information on changes to weed species composition, distribution, and density over time, as well as changes to adjacent plant communities that could invade the facility.

3.3.1 Monitoring Methods [IPMR Section 58(2)(c)(i)]

Monitoring is generally carried out on foot or by vehicle, depending on the terrain. Monitoring normally consists of a visual inspection, where emerging weed problems are brought to the attention of the appropriate FEI staff.

3.3.2 Monitoring Frequency [IPMR Section 58(2)(c)(ii)]

FEI staff and contractors regularly visits all facilities to conduct general safety and maintenance inspections. These are normally conducted on a monthly basis. During these inspections, incidental monitoring of vegetation presence is noted. Areas on the perimeter of facilities, including fence lines and access roads, are also inspected. Subsequent inspections will observe and document changes that have occurred since the previous inspection. Based on the results of the monitoring program, FEI employees or contractors will make decisions on the necessity of treatment (i.e., have the injury or treatments levels for vegetation been exceeded), and decide on the best treatment option(s) from those described in this document.

3.3.3 Data Collected During Monitoring [IPMR Section 58(2)(c)(iii)]

The following information is generally collected and recorded during the monitoring of each facility that is carried out by staff or contractors:

- Post-treatment inspection of previously undertaken vegetation management;
- Documentation of vegetation type, location, and area;
- The presence and location of dead, dying, and leaning trees (i.e. danger trees); and,
- Any changes that need to be made to the Facilities Vegetation Management Site Plan as a result of observations made during the monitoring.

3.4 Injury Thresholds and Treatment Decisions [IPMR Section 58(2)(d)]

Treatment of weeds/vegetation within FEI facilities is required when the vegetation reaches a certain level. This level is termed the treatment threshold, which is the level of surface weed cover, expressed as a percentage of the total area, that can be tolerated and still maintain the integrity, security, and safety within the site.

3.4.1 How Injury Thresholds are Chosen [IPMR Section 58(2)(d)(i)]

Any percentage vegetation/weed cover above the established treatment threshold requires a vegetation management action. Treatment thresholds will vary, since vegetation control is more critical for certain areas within each facility. The level of control required is determined by either the:

- Type of facility;
- Density of weed establishment; and/or,
- Specific weed problem species.

3.4.1.1 *Density of Weed (Vegetation) Establishment*

The operational injury (treatment) threshold is determined by the density of all vegetation species and dead organic matter present at the site in areas where tolerance for vegetation is low. This is specific to certain types of facilities and to certain defined areas within a facility. For example, areas under or adjacent to gas piping would have a lower injury threshold than gravel parking areas or access roads located outside a facility. A vegetation management action will be taken when the injury threshold for a particular facility or defined area within a facility has been exceeded.

3.4.1.2 *Specific Weed (Vegetation) Problem Species*

Only specific high-risk weed (vegetation) species will be managed in areas such as fenced compounds not in use, along access roads and outside fence perimeters. When present, these species will be selectively controlled in a manner that minimizes the disturbance to adjacent low risk vegetation.

3.4.2 How Injury Thresholds are Applied [IPMR Section 58(2)(d)(ii)]

Vegetation density and location (type of facility or specific location within a facility) are the primary injury thresholds that will be applied in making vegetation control decisions. This will also include the presence and location of hazard trees that may fall or grow into the facility. Vegetation control does not follow established management cycles, as the decision to initiate control measures is based on the above factors.

3.4.3 Specific Treatment Thresholds

Specific vegetation management treatment thresholds for the different types of FEI facilities covered by this PMP are detailed below:

3.4.3.1 Secured Stations (Compressor, Valve, Regulator)

Secured stations, which include compressor, valve and regulator stations, are enclosed behind industrial grade chain-link fencing or concrete walls. The fenced portion of all stations contains piping, while larger stations may have equipment buildings, offices, vehicle parking and vacant areas for future site expansion. Since vegetation within these areas pose a serious fire risk and can inhibit operations and maintenance, all vegetation will be controlled **(0% threshold)**.

Adjacent to Gas Piping

Areas under and adjacent to gas piping and buildings are normally surfaced with gravel or road mulch. Since vegetation within these areas pose a serious fire risk and can inhibit operations and maintenance, all vegetation will be controlled **(0% threshold)**.

Vehicle Parking

In these areas, vegetation must be controlled to ensure vehicle access and to prevent fire hazards. In these areas, all vegetation will be controlled **(0% threshold)**.

Vacant Expansion Areas

Low-growing herbaceous vegetation is allowed in these areas, provided that they do not increase the fire hazard, and are regularly maintained to minimize the seed sources that can disperse to other areas of the station. In several stations, vacant areas have been seeded to lawn and are regularly maintained. This effectively reduces the size of the gravel surface requiring vegetation maintenance. Tall growing tree and shrub species are not permitted within vacant expansion areas **(0% threshold)**, since they develop extensive root systems, deposit organic debris, and overhang station fences impeding site security.

Outside of Fences and on Access Roads

All tree and shrub species within 1 meter of station fences and access roads will be selectively controlled **(0% threshold)**. Low-growing herbaceous vegetation is allowed outside of the 1-meter perimeter of station fences, provided that they are regularly maintained and do not exceed a height that would facilitate unauthorized access to the station. The 1-meter strip is to allow

access around the outside perimeter and to prevent vegetation from growing against concrete walls or through chain link fencing.

3.4.3.2 *Unsecured Stations (Valve, Farm Tap)*

Unsecured stations include valve stations and farm taps with above ground piping not secured behind chain link fencing or concrete walls. Unsecured valve stations are small (approximately 9-16 square meters) and located in remote areas. Farm taps are located within remote areas and consist of vertical piping that taps into the main transmission pipeline.

Under Gas Piping

Growth of vegetation is not allowed in areas under gas piping in unsecured valve stations and farm taps, since the presence of vegetation poses a serious fire risk, inhibits operation and maintenance of the equipment, and impacts site identification. In these areas, all vegetation will be controlled **(0% injury threshold)**.

Adjacent Areas

Under this PMP, vegetation management is generally not conducted in areas adjacent to unsecured valve stations and farm taps. Vegetation growing adjacent to these areas would generally be maintained, if required, by private landowners or by FEI.

3.4.3.3 *Liquefied Natural Gas Plants*

The liquefied natural gas (LNG) plants are secured facilities containing large liquefied natural gas storage tanks, gravel equipment areas with gas piping, and offices. Gravel perimeters surround the storage tanks, security equipment, and lighting and camera poles.

Gravel Areas

Gravel areas must be kept vegetation free to reduce the fire hazard and to allow for safe operation and maintenance. In these areas, all vegetation will be controlled **(0% threshold)**.

Outside of Fences and on Access Roads

All tall growing tree and shrub species within 1 meter of plant fences and access roads will be selectively controlled **(0% threshold)**. Low-growing herbaceous vegetation is allowed within 1 meter of fences, provided that they are regularly maintained and do not exceed a height of 3 cm. This 1-meter strip is to allow access around the outside perimeter and to prevent vegetation from growing against concrete walls or through chain link fencing.

3.4.3.4 *Noxious Weeds and Invasive Plants*

There is no tolerance for noxious weeds or invasive plants within FEI facilities or within 1 meter of facility fences **(0% threshold)**. They will be prioritized at sites for treatment.

3.5 Treatment Options & Selection Criteria [IPMR Section 58(2)(e)]

IPM involves the use of different techniques to control undesirable vegetation within and adjacent to facilities. The selection of a treatment option(s) will depend on the species of vegetation to be targeted, treatment timing, land use and environmental sensitivities of surrounding areas. These site conditions have been recorded in the following FEI documents:

- Facility Vegetation Background Information; and,
- Vegetation Management Database.

3.5.1 Facility Vegetation Background Information

This information has been prepared for select FEI facilities covered under this PMP. They are available to vegetation management contractors prior to treatment and include both the chemical and non-chemical treatment options that may be used at a particular facility.

The information collected typically includes some or all of the following:

- Facility location, size, and possible treatment area(s);
- Site security (fenced or not fenced);
- Existing vegetation concerns;
- Specific vegetation management recommendations/options;
- Distance from the facility perimeter to water bodies, water intakes and wells;
- Location and description of environmentally sensitive areas and suggested or required (i.e. by legislation) pesticide free zones (PFZ's) and no treatment zones (NTZ's) for their protection;
- Adjacent land uses (i.e., residential, agricultural, industrial, commercial);
- Prominent adjacent vegetation (i.e., grassland, forest, pasture, crop land, lawn, landscaping); and,
- Site conditions, including slope and aspect of site, drainage, water sources on site and climate.

3.5.2 Vegetation Management Database

This database is an archive of all records pertinent to vegetation management activities at facilities that are maintained by FEI. It is accessed when planning each vegetation management program and made available, and contains the following information:

- Details of previous treatment evaluations;
- Planning schedules for all chemical and non-chemical treatments including budget information;
- Daily Operations Records of herbicide use (current and historical);
- Contractor information, including invoice summaries; and,
- Annual Reports of Pesticide Use (for submission to the BC Ministry of Environment).

3.5.3 Treatment Options Available

Since a wide variety of vegetation types regularly grow at FEI facilities, a single treatment option is generally not suitable for all species. An integrated approach combining chemical, non-chemical treatment and biological control options is generally most effective when tailored to the vegetation concerns and conditions at each facility. Various non-chemical, chemical, and biological control vegetation control methods may be used at FEI facilities. The information in the following section will describe:

- The pesticide, non-pesticide control treatment methods of controlling vegetation that may be used;
- The rationale/selection criteria for treatment method(s) selection;
- The benefits and limitations of each treatment method; and,
- A description of how a decision to use a treatment method will be made.

The treatment options/methods/techniques that FEI may use for vegetation management at their facilities are outlined in the following table:

Table 2 Treatment Options, Methods and Techniques for Facilities Vegetation Management

Physical (Non-Chemical)	Mechanical (Non-Chemical)	Cultural (Non-Chemical)	Chemical (Herbicide)
Girdling Pruning Hand pulling Geotextile fabric	Mowing Tree & stump removal Weed trimming Selective slashing	Grass seeding Natural controls	Cut surface Basal Bark Foliar Wick/wipe-on

3.5.4 Physical Control Methods

Physical control methods may include girdling, hand pulling, pruning, and the use of geotextile fabrics. Mechanical methods may include mowing, selective slashing, weed trimming, and tree and stump removal. Tables 3 and 4 provide a description and rationale, and the benefits and limitations of these mechanical and physical control methods, respectively. Appendix B provides additional information on physical control methods.

Table 3 Mechanical Treatment Methods

Description and Rationale	Benefits and Limitations
<p>Mowing is the cutting of problem vegetation, primarily grasses or other low-growing herbaceous species. Vegetation will be mowed using commercial lawnmowers, garden tractors or industrial mowers.</p>	<p>Mowing is useful for maintaining vacant or undeveloped areas within a facility. Vacant areas are those that have no equipment storage or have been designated for future expansion. The surface of the vacant areas may be covered with grass or other low-growing herbaceous vegetation that is maintained only by mowing. Mowing helps control vegetation before it goes to seed. It will reduce the seed source available for dispersal to other areas of low vegetation tolerance within the facility. Vegetation should be mowed prior to weeds developing seed heads in order to reduce the seed source available for dispersal.</p>
<p>Tree and Stump Removal may be required adjacent to facilities to improve site safety and security. Tree and stump removal from adjacent properties.</p>	<p>Tree cutting and stump removal can be used to control individual tree species. Because it selectively removes individual trees, the growth and retention of low-growing vegetation are promoted, and site stability is maintained. Stump and tree removal is sometimes required following tree cutting if the stump is unsafe or may cause a hazard to the pipeline if it is left in place. cleanup is completed, there can be negative aesthetics.</p>
<p>Weed Trimming at the ground surface is commonly used for removing herbaceous vegetation growing on gravel areas, within cracks in asphalt or concrete, within landscaped areas and along fence lines and access roads. A common two-step procedure within gravel areas is combining weed trimming with a follow-up herbicide application.</p>	<p>Weed trimming helps to remove seed heads when done early in the season and is convenient and economical. The use of weed trimmers is generally more suitable than mowers for use in areas that are rocky, have stumps, on slopes, where low-growing compatible species predominate, or are not accessible to lawnmowers or tractors.</p>
<p>Selective Slashing is manual treatment for managing woody trees and shrub species that are encroaching on fence lines or equipment. It involves the use of chainsaws, brush saws, or other hand tools to selectively remove individual stems. For deciduous vegetation, selective slashing can be followed by the application of herbicides to the cut surface to inhibit re-sprouting.</p>	<p>Selective slashing is species specific, and enables desirable vegetation to be left, creates little soil disturbance, and has little effect on biodiversity.</p>

Table 4 Physical Treatment Methods

Description and Rationale	Benefits and Limitations
<p>Girdling involves cutting a strip of bark (and tissue) down to the sapwood from around the entire tree trunk with an axe or other hand tool. The above ground parts continue to grow, but the roots starve, and the tree slowly dies. The dead tree is cut down or slowly left to die, which may take 2 to 3 years.</p>	<p>This technique is effective in killing the tree roots, but above ground parts remain. The technique, which is very labour intensive, is useful in areas adjacent to water bodies or other environmentally sensitive areas where herbicide application is not permitted. Girdling also allows for the selective management of individual stems and species, which can be removed on a tree-by-tree basis. The disadvantage to girdling is that it has the potential to create a standing dead leave tree (or snag) which presents an ongoing safety concern. For this reason, the use of girdling will be limited. Topping is preferred when it is safe to do so.</p>
<p>Pruning is the selective removal of plant parts using proper arboricultural techniques. It is useful for the removal of limbs and branches from large native trees and domestic shrubs growing on perimeter fencing. Tree pruning can be used where tree removal may not be appropriate. In residential areas, pruning is often a more acceptable method of controlling problem vegetation than other manual or mechanical techniques.</p>	<p>Proper pruning on perimeter fences may influence the direction of branch growth and may eliminate the need to remove problem trees that are interfering with site security and access. Unlike other manual/mechanical control methods, pruning does not adversely affect wildlife habit, biodiversity or aesthetics. Because pruning may have to be repeated at regular intervals, it is more costly and labour intensive than other manual/mechanical methods.</p>
<p>Hand Pulling is a physical control method only for certain established weeds than can be easily uprooted such as young tree seedlings and clumps of grass where the roots can be fully removed. It is effective if the number of weeds to be pulled is small and the site is a manageable size. When hand pulling is used to manage weeds, the exposed soil should be immediately covered with gravel.</p>	<p>In areas where there has been little or no vegetation management undertaken for an extended period of time, hand pulling can be effective in reducing a large volume of vegetation to a manageable level. Other control methods can then be used to complete the vegetation management work. Excessive hand pulling of weeds tends to increase the amount of organic matter, which can encourage weed establishment.</p>
<p>Geotextile is a porous, polypropylene fabric that is generally placed below mulches, crushed rock or gravel. It is commonly used in landscaped. It works as a physical barrier – preventing growth of unwanted vegetation through the fabric.</p>	<p>The initial placement of geotextile fabric can be labour intensive. The use of geotextile fabric has the potential to reduce the need for other control methods for vegetation management.</p>

3.5.4.1 *Cultural Control Methods*

Cultural control methods may include grass seeding and the use of natural controls. Table 5 provides a description and rationale, and the benefits and limitations of these cultural control methods.

Table 5 Description and Rationale, Benefits and Limitations of Cultural Control Methods

<p>Natural Controls promote the establishment of local, low-growing competitive vegetation to provide long-term control of woody vegetation and herbaceous broadleaf and grass species. This use of plant competition will be promoted outside of fence lines and along access roads.</p>	<p>The use of natural controls will generally result in physical controls and chemical controls only being applied to targeted vegetation in these areas. Disturbances to the surrounding low-growing vegetation will be minimized, allowing the competitive plants to out-compete the undesirable species. The only limitation on the use of natural controls is the initial cost of establishing the low-growing competitive vegetation.</p>
<p>Grass Seeding is a cultural control that involves the establishment of local, low-growing competitive vegetation (i.e. grass) to minimize the need for long-term control of woody vegetation, noxious weeds and invasive plants, or grass seeding large areas of bare soil. It can be used on undeveloped sites or disturbed areas adjacent to the facility.</p>	<p>The advantages of using grass seeding are that it prevents erosion and inhibits weed establishment and growth.</p>

3.5.5 Chemical (Herbicides) Selection [IPMR Section 58(2)(e)]

Chemical control involves the use of herbicides to inhibit growth of problem vegetation within or adjacent to FortisBC transmission and distribution ROWs. Selection of the herbicide and method of treatment is determined by:

- Soil residual activity
- Mode of action
- Selectivity
- Environmental characteristics
- Health and safety characteristics

Soil Residual Activity

An herbicide with residual properties tends to be retained in the soil for a certain period of time. Herbicide active ingredients are generally classified by their degree of soil residual activity—low, moderate, or high. The most common herbicides used by FortisBC have low to moderate soil residual activity.

Mode of Action

An herbicide's mode of action refers to how it affects the plant. Uptake of herbicides is by plant roots, stems, and foliage.

Selectivity

Herbicides that control all vegetation are termed non-selective, while those that are effective in controlling certain types of vegetation are termed selective.

Environmental Characteristics

The following properties are considered when making an herbicide selection:

- Volatility
- Adsorption to soil particles
- Toxicity to non-target organisms
- Selectivity
- Residual activity

Health and Safety Characteristics

All herbicides used by FortisBC have low to moderate toxicity. Applicators are well trained and protected by personal safety equipment such as goggles, gloves, coveralls, and chemical-resistant boots based on the label recommendations. To minimize exposure, FortisBC selects herbicides with the lowest level of toxicity and rates that proved acceptable levels of weed control.

3.5.5.1 *The Need for Herbicide Use*

Although a main objective of this PMP is to minimize the use of herbicides for the control of problem vegetation where viable alternatives exist, herbicides are an important tool in vegetation management. This is especially true in areas where non-chemical methods cannot be employed because of safety issues.

The non-chemical control options described in this document remain important parts of the FEI IVM program, yet in some instances these methods can be impractical, dangerous for the workers, incompatible with environmental protection values, labour intensive and expensive.

In certain areas, mechanical methods cannot be used for vegetation control. Steep terrain may limit access by mowers and can be dangerous for a chain saw operator. Dense brush can create both a visibility and a physical hazard to workers and can result in increased injuries due to slipping and tripping while operating power equipment. Mechanical methods are non-selective and can also lead to soil erosion by removing a high percentage of the vegetative ground cover. They can also damage compatible plant species such as low growing shrubs and grasses. Biodiversity is reduced when non-selective mechanical methods are used to remove most of the vegetation from a site. From an economic viewpoint, mechanical methods have been shown to cost, on the average, four times more per hectare than control of the same vegetation using herbicides.

3.5.6 Herbicide Identification and Application

The herbicide active ingredients proposed for use under this PMP are 2-4-D, Aminocyclopyrachlor, Aminopyralid, Chlorsulfuron, Dicamba, Flumioxazin, Glyphosate,

Imazapyr, Metsulfuron-methyl, Indaziflam, Pyroxasulfone, Salfufenacil, Triclopyr, Clopyralid, MCPA, Picloram, Diflunfenzopyr. More details on these herbicides are provided in Appendix C.

3.5.7 Herbicide Application Equipment

The application equipment proposed for use in applying herbicides under this PMP include:

Backpack Sprayer

A backpack is a portable, manually operated, pressurized container with a positive shut-off system and a nozzle for applying herbicides. It operates under low pressure, thus minimizing the possibility of drift. It is particularly useful for spraying small areas or individual trees and plants. Within this PMP, backpack sprayers may be used for the foliar or soil application of all the active ingredients for vegetation management at facilities, for the application of the active ingredients to cut surfaces (i.e. stumps) following physical controls, and for the control of noxious weeds and invasive plants.

Wick/Wipe on Applicator

Wick/wipe on application may be used to selectively apply herbicides containing the active ingredient glyphosate by wiping it directly onto plants. Only small amounts of product are applied, so the need for pumps, control devices and spray tanks is eliminated. Wick/wipe on applications are ideal for vegetation management in areas where no spray drift can be tolerated. Wick/wipe on applications of product may be used for vegetation management at facilities, for the application to cut surfaces (i.e. stumps) following physical controls, and for the control of weeds.

Handgun (Power Hose and Nozzle)

A handgun (power hose and nozzle) is a hand-held spray gun and hose attached to a portable tank filled with herbicide solution, usually with a power-driven pump to provide pressure to the herbicide solution in the hose. Handguns are generally used within facilities where large areas of vegetation have to be controlled but may also be used for the control of noxious weeds and invasive plants. Within this PMP, handguns may be used for the foliar or soil application of all the active ingredients for vegetation management at facilities, and for the control of weeds. Tanks are typically mounted on vehicles or ATVs.

Squirt Bottle

A hand-held, non-pressurized container used to apply the herbicide active ingredients to the cut surface of deciduous stumps to inhibit re-sprouting following physical control methods.

Injection Tools

An automatic lance or battery-powered drill used to inject the herbicide active ingredients into individual deciduous stems to inhibit re-sprouting following physical control methods.

3.5.8 Herbicide Application Methods/Techniques

The herbicide application methods/techniques proposed for use under this PMP include foliar, soil, wick/wipe-on, and cut surface applications. A description, rationale for use, and the benefits and limitations of each of these application methods/techniques, is shown in Table 7.

Table 7 Herbicide Application Methods/Techniques

Description & Rationale	Benefits/Limitations
Foliar applications involve use of a manually operated pressurized backpack sprayer or a handgun and can be used to apply all of the active ingredients. This method/technique is most effective when the target vegetation is actively growing.	Foliar applications can be carried out at any time of the year, provided the target plants are actively growing. 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 that are growing among them.
Soil applications involve the use of manually operated pressurized backpack sprayer or a handgun and can be used to apply the active ingredient diuron for total vegetation control within facilities.	Non-selective, residual herbicides can be used for vegetation control within most facilities where long-term control of all vegetation is the objective. They are effective in preventing seed germination of some broadleaf vegetation, annual and perennial grasses when applied to the soil. Care must be exercised in their use within facilities if used in areas subject to heavy rainfall or snow, as the herbicides may be washed or move off-site.
Wick-Wipe-on applications involve the use of a wick soaked with the active ingredient that is wiped or dragged over the foliage of the target vegetation. The wick applicators are available in various materials and in many sizes. This technique will generally be used where cut stumps have re-sprouted, or for treating small patches of vegetation within facilities in areas where no drift can be tolerated.	This application technique virtually eliminates drift, and is useful for the safe and effective treatment of individual plants or stems located in areas of desirable vegetation. This technique is labour intensive, however, and is only practical to use for small treatment areas or for a small number of individual plants.
Cut Surface applications will be used in conjunction with manual treatments for controlling deciduous vegetation. With this method/technique, 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.	This method/technique is preferable in areas where standing dead trees do not meet treatment objectives. Because herbicide application is restricted to the cut surface of freshly cut stumps, there is generally no herbicide drift, resulting in minimal impact to fish, wildlife, and bodies of water, water sources, and food intended for human consumption. Cut surface applications pose little risk of herbicide exposure to workers or the general public. If treatment is not undertaken immediately following physical control, this technique may not be successful.

3.6 Treatment Selection Criteria [IPMR Section 58(2)(e)(iv)]

Integrated vegetation management involves a decision-making process that looks at the various treatment options that are available. This decision-making process ensures that the most

suitable, effective, environmentally compatible and cost-effective method or combination of methods is selected for a particular facility. In making these decisions, FEI personnel will generally use the following assessment criteria to justify and evaluate the method(s) chosen:

- Urgency of the required treatment;
- Species of problem vegetation (conifer/deciduous);
- Location of the problem vegetation (under piping, perimeter fences);
- Accessibility to the problem vegetation (terrain, slope, remote areas);
- Safety issues (the public, FEI staff and contractors);
- Risk of fire (fuel loading on the ground);
- Objectives of the vegetation management (reduce fire hazard, access, site security);
- Consequences of not taking action;
- Stem density of problem vegetation;
- Height of problem vegetation;
- Effect on adjacent property owners and land uses;
- Indigenous and public concerns;
- Short and long-term impacts of the method(s) being considered;
- Expected efficacy of the method(s) being considered;
- Benefits and limitations of each method;
- Cost effectiveness of each method;
- Environmental considerations (proximity to water sources, bodies of water, food growing or planted for human consumption, riparian areas, wildlife and fish habitat); and,
- For herbicide treatments, the choice of herbicide, application methods/ techniques and application equipment.

If a site is recommended for herbicide application to manage the weeds, at the conclusion of the treatment, the contractor will record on the plan the following information:

- Date and time of treatment;
- The active ingredient(s) applied, application rate, total area treated in square meters;
- The locations at which herbicide was applied; and
- Vegetation treated.

3.7 Post Treatment Evaluations [IPMR Section 58(2)(c)]

All applications of herbicides for facilities vegetation management under this PMP will be undertaken by contracts issued to qualified companies in possession of a valid BC Pest Control Service Licence. All herbicide applications will be made by certified pesticide applicators in the appropriate category of certification or supervised by certified pesticide applicators in the appropriate category of certification.

During their regular operations and maintenance site visits, FEI staff will monitor the effectiveness of vegetation management treatments undertaken by each contractor.

Work will be inspected to determine:

- Compliance with the commitments made in this PMP;
- Compliance with the *Integrated Pest Management Act and Regulations*;
- That site objectives have been achieved;
- The success of the treatment methods employed;
- If pesticide free zones, no treatment zones and buffer zones were maintained;
- If any negative environmental impacts have occurred; and,
- If corrective action is required.

Inspections will be undertaken on the ground and will generally be based on visual evaluations. Evaluations may include both qualitative and quantitative determinations of mortality to the targeted problem vegetation, as well documentation of any non-target mortality that is evident. Effectiveness of the treatments will be determined.

4.0 Rights-of-Way Integrated Pest Management

4.1 Prevention [IPMR Section 58(2)(a)]

Preventative measures, such as regular vegetation management cycles, hazard tree identification and shared planning, are aimed at stopping the initial growth and spread of unwanted vegetation and are an integral part of an IPM program.

Under its prevention program, FEI conducts regular patrols. Information such as hazard tree identification, vegetation management requirements, clearances and anticipated cycle times is gathered during these patrols. From this information FEI is able to establish regular vegetation management cycles.

Using the results of inspection information and available information on average growth rates for the various species of trees in each area, a plan is designed so that each area is managed on an appropriate and regular cycle (e.g., every 3 to 5 years). Where feasible preventative measures are incorporated into corridor designs prior to construction or may be implemented during infrastructure upgrades. In some instances, these measures may reduce the need for future maintenance requirements of pesticide and non-pesticide control methods. Descriptions of the preventative methods of vegetation management that will be used under this PMP are shown in Table 8.

Table 8 Description of Preventative Methods of Vegetation Management

Prevention Methodology	Description
Vegetation Management Cycles	<ul style="list-style-type: none"> • Designed to ensure public safety and system reliability are maintained. • Cycle times normally 5 years. • In wet areas where the vegetation is fast growing, such as the west coast, interior rain forest, a cycle may be reduced to 3 years. • Several FEI transmission corridors traverse different biogeoclimatic zones; therefore, the vegetation management cycle may not be consistent throughout the length of line.
Hazard Tree Identification	<ul style="list-style-type: none"> • Criteria include dead, dying or infirm trees due to physical conditions (wind shock, snow loading, lightening, weakened root structure, etc.) or forest health issues (fir bark beetle, mountain pine beetle, birch worm, spruce bud worm, root rot, etc.).
Seeding with desirable species	<ul style="list-style-type: none"> • Seeding and fertilizing areas that have been disturbed during ROW construction or maintenance so as to reduce the potential of problem vegetation getting established.
Proper ROW Clearing Width During Construction	<ul style="list-style-type: none"> • During initial ROW planning and construction FEI will remove all problem vegetation for the majority of the width of the ROW to prevent crowing and vegetation on the clearing edges from inhibiting pipeline patrols.
Encourage other uses for ROW	<ul style="list-style-type: none"> • Encouraging alternative, compatible uses for the ROW such as agricultural crops, flowerbeds, vegetable gardens, low shrubbery, livestock grazing, golf courses and other types of uses approved by FEI.

4.2 Pest Identification [IPMR Section 58(2)(b)(ii)]

Unwanted vegetation has the potential to adversely impact FEI's ROWs and infrastructure and to threaten the safety of employees and the public. Vegetation includes all plant life, including grasses, sedges, forbs, vines, ferns, brush and trees. Trees are further divided into hardwoods (deciduous) and conifers. FEI is primarily concerned with the control of brush, shrubs and trees.

Accurate identification of unwanted vegetation on or adjacent to FEI ROWs enable the company to better understand growth rates and characteristics, predict locations and whether or not control is warranted or desirable. By understanding the pests along its ROW corridors, FEI has a better appreciation of the types of control methods needed/available, and the appropriateness of application. In some cases, pest species may be easily controlled by non-chemical methods, yet others may only be effectively managed through a combination of non-chemical and chemical methods. Re-sprouting of certain deciduous tree species, for example, are best controlled by manual cutting followed by the application of a pesticide (i.e. herbicide) to the freshly cut stump.

4.2.1 Growth Stages of Plants

Table 9 describes the four stages of development typical of most plants:

Table 9 The Four Stages of Development Typical of Most Plants

Plant Development Stage	Characteristics	Effectiveness of Chemical Treatment
Seedling	<ul style="list-style-type: none"> Seed leaves and the first true leaves may be present Plants are small and easily controlled by both chemical and non-chemical methods 	<ul style="list-style-type: none"> Good. Less waxy coating allows better penetration of leaf surface. Younger plants have small roots systems near the soil surface. Small size of the plants requires less herbicide Less likelihood of unsightly patches of dead weeds or brush.
Vegetative	<ul style="list-style-type: none"> Rapid growth of stems, foliage and roots. Rapid uptake of water and nutrients, Greater movement of water and nutrients throughout the plant 	<ul style="list-style-type: none"> Very effective
Reproductive	<ul style="list-style-type: none"> Flowering and seed production stage Uptake of water and nutrients is reduced Plant growth is limited. Water and nutrients directed to the reproductive parts, including flowers, fruit and seeds. Movement of plant food to the roots is reduced 	<ul style="list-style-type: none"> Herbicide use is less effective As plants become larger, the leaves are more difficult to penetrate, and their roots are deeper and have more stored food.

Plant Development Stage	Characteristics	Effectiveness of Chemical Treatment
Senescent (Mature)	<ul style="list-style-type: none"> • Little plant growth • Movement of water, nutrients and any chemical treatment is very slow. 	<ul style="list-style-type: none"> • Ineffective

4.2.2 Vegetation Classification

ROW vegetation can be grouped into several broad categories according to their growth form. Categories include grasses, sedges, broadleaves (forbs), ferns, vines and woody plants (brush, trees, shrubs). Woody plants and vines are the only problem vegetation on ROWs and are described in the Table 10 below:

Table 10 Problem Vegetation and Their Characteristics

Problem Vegetation	Characteristics
Woody Plants: Brush, Trees & Shrubs	<ul style="list-style-type: none"> • Perennials that reproduce by seed or from sprouting roots. • Brush and shrubs have several stems that grow to 3 meters in height. • Trees divided into hardwoods (deciduous) and conifers usually have a single stem and grow greater than 3 meters in height. • For conifers: mechanical, non-chemical methods are the preferred control due to ability to re-sprout from cut areas. • For deciduous trees: a combination of mechanical methods followed by the selective application of herbicides to eliminate re-sprouting is acceptable.

4.3 Monitoring Vegetation Populations [IPMR Section 58(2)(c)]

FEI staff and contractors monitor vegetation, including hazard trees, on or adjacent to their transmission ROWs and roads on a regular basis. Because distribution lines are generally located on road allowances in residential, commercial and industrial areas that traditionally have had few instances of problem vegetation, they are generally monitored less frequently. Table 11 provides a summary of the FEI monitoring program that is completed on a regular basis:

Table 11 Summary of the FEI Monitoring Program

Patrols/Monitoring	Purpose of Patrol	Data Collection	Frequency
Unauthorized Activity Patrol (driving or aerial)	<ul style="list-style-type: none"> • Detect and prevent unauthorized activity; • Ensure safety and the integrity of the pipeline are maintained; • Ensure that sight lines are unobstructed. 	GPS, physical location, photos	Weekly, monthly or yearly depending on the density of the population of the area through which the pipeline passes

Patrols/Monitoring	Purpose of Patrol	Data Collection	Frequency
Leak Survey Patrol	To detect gas leaks along the pipeline system	GPS, physical location, photos	Yearly to once every 5 years depending on the density of the population of the area through which the pipeline passes
Hazard Assessment Database	Geotechnical and Hydrotechnical Terrain features and hazards such as eroded or erosion prone areas, bare ground areas, patches of dead vegetation (possibly indicative of a system leak), and the presence of large rocks and stumps	GPS, topography, geomorphology of water features, photos	Regularly - ranging from yearly on sensitive site to every 5 years on stable terrain.
Public/ Internal Reports		Site specific	

4.4 Injury Thresholds and Treatment Decisions [IPMR Section 58(2)(d)]

An injury threshold (also called an action threshold) is the point at which control becomes necessary, due to:

- Vegetation restricting above ground pipeline identification; OR
- Vegetation restricting the maintenance of sight lines (location of pipeline markers and warning signs); OR,
- Vegetation restricting pipeline access for maintenance, emergency response, leak testing, coating surveys, or pipeline patrols.

Vegetation height, density and location are the primary injury thresholds that will be applied in making vegetation control decisions. This will also include the presence and location of hazard trees that may fall or grow into the pipeline ROW. Vegetation control does not necessarily follow established management cycles, as the decision to initiate control measures is based on the above factors.

4.5 Treatment Options & Selection Criteria [IPMR Section 58(2)(e)]

IPM involves the use of different techniques to control undesirable vegetation on FEI transmission and distribution ROWs. The selection of a particular technique will depend on:

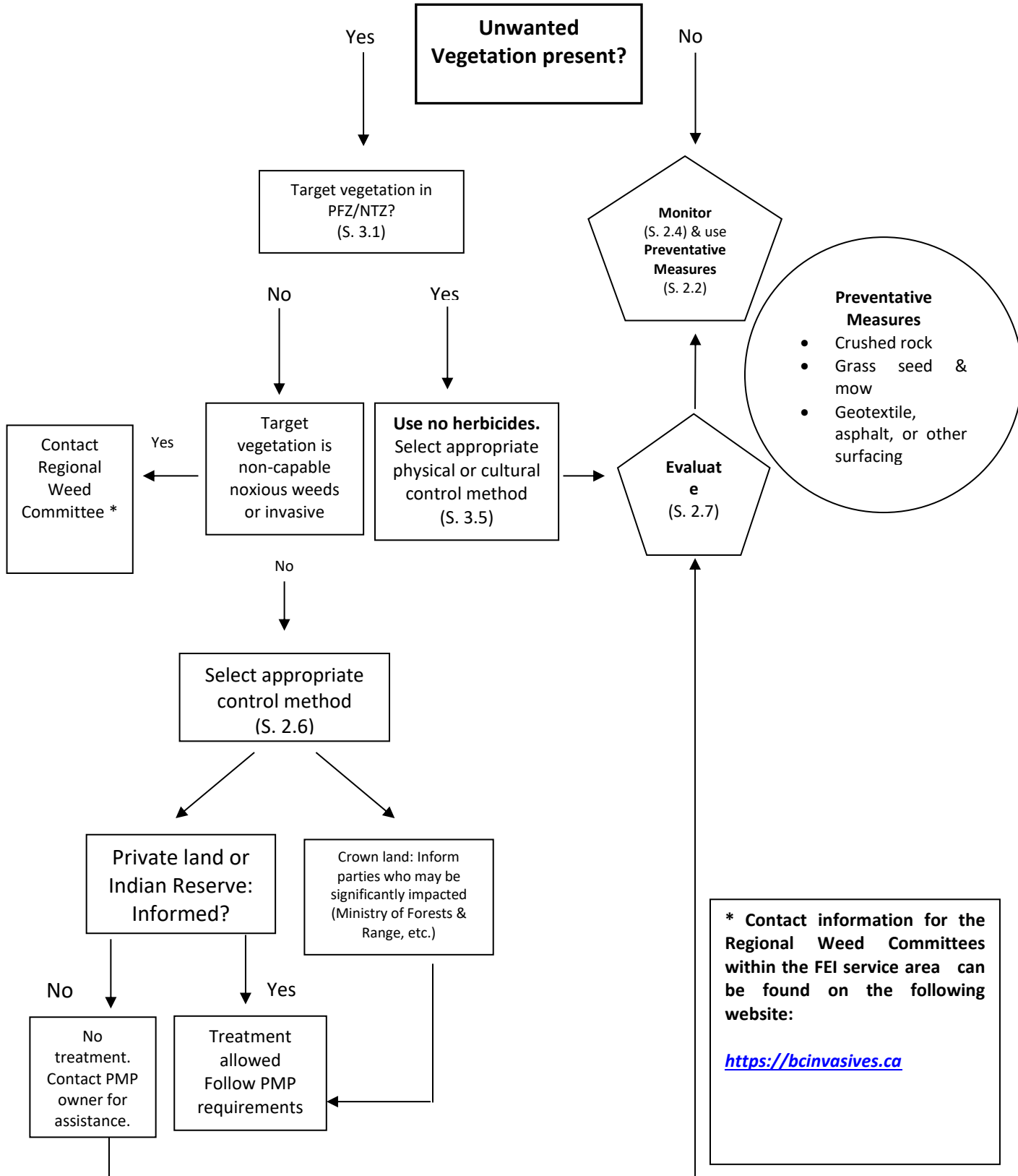
- How required clearance along the ROW can be achieved;
- Land use (including public verses private and adjacent land uses);
- Proximity of water sources, bodies of water and other environmentally sensitive features;
- The possibility of adverse impacts to wildlife, fish, surrounding land, workers and adjacent residents;
- Safety, security and economic impacts;

- Existing soil types, weed species present, objectives of control, and how these relate to the suitability of the particular method(s) being considered;
- Site accessibility; and,
- The consequences of no treatment.

General site conditions and environmental sensitivities are assessed during regular inspections or during patrols, and again immediately prior to control measures being implemented.

A Treatment Decision Tree, such as is shown below, can be used to determine the most appropriate IPM technique to employ for problem vegetation.

The IPM techniques proposed for use under this PMP on or adjacent to FEI transmission and distribution ROWs include physical controls, cultural controls, biological controls, and chemical controls (herbicides). Physical controls will be primarily considered in the selection process to manage problem vegetation. Herbicides will be combined with physical treatments where physical treatments alone are not providing effective vegetation management. The targeted purpose for each herbicide approved under this PMP is discussed in detail later in this section. During all use of herbicides, disturbance to low growing vegetation will be minimized when controlling woody vegetation by selective applications.

Treatment Decision Tree


4.5.1.1 *Physical Control Methods*

Physical controls may include slashing, mowing, pruning and burning. Table 12 provides a description and rationale, and the benefits and limitations of each of these physical treatment methods. Appendix B includes more information on physical control methods.

Table 12 Physical Control Methods

Description & Rationale	Benefits/Limitations
<p>Selective Slashing is the primary physical method to remove problem vegetation and involves the use of chain saws or other appropriate tools to selectively cut problem vegetation to ground level. For conifer trees, re-sprouting will not occur if all green branches are removed. For deciduous trees, herbicide may be applied to the cut stump area to prevent re-sprouting.</p>	<p>Species specific and enables desirable vegetation to be left on the ROW.</p> <p>Useful for deciduous vegetation control, as it allows the follow-up selective application of herbicides to cut surfaces to inhibit re-sprouting.</p> <p>Can be done without decreasing slope stability, increasing erosion potential or causing damage to the streambed of bodies of water and riparian areas</p> <p>Generally, not suitable or economical for areas with high stem densities (> 5,000 to 10,000 coniferous stems per hectare or > 10,000 to 20,000 deciduous stems per hectare), or where the problem vegetation is greater than 4 meters in height.</p> <p>It may also be dangerous for workers if the vegetation is dense or is located in areas of steep terrain.</p>
<p>Mowing is the use of mechanized mowers such as tractor-mounted mowers, grade all or hydro axes to remove all ROW vegetation to ground level.</p>	<p>Less expensive than other physical methods, as problem vegetation can be removed faster.</p> <p>Generally, not suitable for use in areas that are rocky, have stumps, or that are on slopes or boggy areas, due to restricted access and/or worker safety considerations.</p> <p>Not suitable for use in riparian areas or in areas where low-growing compatible species predominate.</p> <p>Often promotes the re-sprouting of deciduous vegetation, resulting in the need for future treatments or herbicide applications. Because mowing uses wheel or track-mounted equipment, there can be widespread soil disturbance (track marks and rutting) that can lead to the establishment of noxious weeds and invasive plants.</p> <p>Although less labour intensive and therefore less expensive it is not selective and both desirable and undesirable species are removed.</p> <p>Mowing mulches, the brush using high speed, flail type action, which can spread debris across the ROW. This may also open up the opportunities for undesirable species to sprout from seed if soil is disturbed.</p>
<p>Pruning is the reduction of tree growth through the use of proper arboricultural</p>	<p>Can be used in riparian areas to protect wildlife habitat where tree removal may not be appropriate or allowed.</p>

Description & Rationale	Benefits/Limitations
<p>practices. The priority is to remove side limbs of selected trees to enable line of sight between pipeline markers or remove large branches that obscure ground to sky visibility.</p>	<p>May also be used where the main stem of the problem tree is not on the ROW, but the branches are encroaching.</p> <p>In residential areas, pruning is often a more acceptable method of controlling problem vegetation than other physical control methods.</p> <p>Proper pruning on ROW perimeters may influence the direction of branch growth and may eliminate the need to remove problem trees.</p> <p>Does not adversely affect wildlife habit, biodiversity or aesthetics.</p> <p>Because pruning may have to be repeated at regular intervals, it is costlier and more labour intensive than other physical control methods.</p> <p>Knowledge and experience of proper arboricultural techniques are needed for successful pruning. Improper pruning can cause tree damage and can result in unsightly, unhealthy and hazardous trees that may require further remedial action.</p>
<p>Grooming is the grubbing, rough grading and seeding of the ROW using heavy equipment such as bulldozers and backhoes. All groomed sites must be re-seeded afterwards with grass or other low-growing species to prevent the growth of problem vegetation, noxious weeds or invasive plants. Grooming is sometimes employed as both a control method, and to prepare a ROW for alternative uses such as grazing or other agricultural uses.</p>	<p>The main benefit of grooming is the replacement of problem vegetation with a compatible ROW use that will result in reduced future maintenance requirements and costs.</p> <p>The soil conditions needed to establish viable agricultural uses following grooming are only present in certain locations. Unless re-seeding is done immediately after grooming, the resulting exposure of bare soil can lead to erosion, and the establishment of noxious weeds and invasive plants. Grooming does not remove re-sprouting species or root-suckering species and may require follow-up herbicide applications.</p>
<p>Burning is a recognized physical control for problem vegetation. Unless undertaken in accordance with regulatory requirements, FEI will generally not utilize burning as a physical control method.</p>	

4.5.1.2 Cultural Control Methods

Cultural controls involve encouraging the planting and maintaining of low growing shrubs and/or compatible species by private landowners adjacent to the ROW, encouraging the establishment of certain types of agroforestry on the ROW, and investigating the feasibility of using tree growth regulators/inhibitors if and when they become registered for use in Canada. Table 13 provides a description and rationale, and the benefits and limitations of each of these cultural treatment methods.

Table 13 Cultural Control Methods

Description & Rationale	Benefits/Limitations
Planting Low Growing Vegetation (i.e. <30 cm tall) will be promoted where practical and feasible.	Landowners can be educated on the benefits of planting and maintaining of low growing vegetation for safety; system reliability; reduced requirement for treatment of undesirable vegetation.
Encouraging Agroforestry ventures on ROWs will be encouraged, provided that they do not grow or can come into contact with transmission and distribution lines.	FEI will consider commercial agroforestry ventures as long as they do not adversely impact the Company's business. Currently, the following types of agroforestry ventures are located on FEI ROWs: <ul style="list-style-type: none"> • Commercial vineyards; and, • Native grasses and seed production.
Tree Growth Regulators/Inhibitors will be investigated for possible use on both ROWs and on adjacent private land.	No products are yet registered in Canada that would allow for tree growth regulators/inhibitors on utility corridors. Once available, FEI will include these products into its PMP toolkit where practical and feasible.

4.5.2 Chemical (Herbicides) Selection [IPMR Section 58(2)(e)]

Refer to section 3.5.4 for further information regarding herbicide selection rationale.

4.5.2.1 *The Need for Herbicide Use*

Herbicides may be required on FEI ROWs to target specific types of vegetation problems. Herbicides will generally be used to selectively control deciduous vegetation and re-sprouting, to control individual stems or trees, or for the spot treatment of problem vegetation following physical controls. Although a main objective of this PMP is to minimize the use of herbicides for vegetation management where viable alternatives exist, herbicides are an important tool in ROW vegetation management.

Although mowing, pruning and selective slashing remain important parts of FEI's ROW maintenance program, in some instances these methods can be impractical, dangerous for the workers, incompatible with environmental protection values, labour intensive and expensive. In certain areas, mechanical methods cannot be used for vegetation control. Steep terrain may limit access by mowers and can be dangerous for a chain saw operator. Exceedingly dense brush can create both a visibility and a physical hazard to workers and can result in an increased incidence of injuries due to slipping and tripping while operating power equipment. Mechanical methods are non-selective and can also lead to soil erosion by removing a high percentage of the vegetative ground cover. They can also damage compatible plant species such as low growing shrubs and grasses. Biodiversity is reduced when non-selective mechanical methods are used to remove most of the vegetation from a site.

Herbicide use has not been shown to impair applicator health provided that personal protective measures and equipment, as indicated on product labels, are adhered to. Herbicide use is often the only practical and safe method of controlling vegetation where ROW traverse rugged,

mountainous terrain, or areas inaccessible to motorized equipment. From an economic viewpoint, mechanical methods have been shown to cost, on the average, four times more per hectare than control of the same vegetation using herbicides.

Appendix 3 provides details on the properties/use patterns, timing of application. Where and how they will be applied, and the equipment used for application, for the herbicide active ingredients proposed for use under this PMP.

4.5.3 Herbicide Identification, Application Equipment and Methods

Refer to section 3.5.5 for a list of herbicides proposed for use under this PMP.

4.5.3.1 *Herbicide Application Equipment*

Refer to Section 3.5.6 for herbicide application equipment proposed for use under this PMP.

4.5.4 Herbicide Application Methods/Techniques

Refer to Sections 3.5.7 for application methods proposed under this PMP.

4.6 Post Treatment Evaluations [IPMR Section 58(2)(c)]

All herbicide applications on FEI transmission and distribution ROWs under this PMP will be undertaken by contracts issued to qualified companies in possession of a valid BC Pest Control Service License. All herbicide applications will be made by certified pesticide applicators in the appropriate category of certification or supervised by certified pesticide applicators in the appropriate category of certification.

During their regular operations and maintenance site visits, FEI staff will monitor the effectiveness of vegetation management treatments undertaken by each contractor.

FEI will ensure independent evaluations of contractor's work through inspections of sites treated with herbicides. The timing and procedure for evaluating specific treatment programs will be dependent on the treatment used. Inspections will be undertaken on the ground and will generally be based on visual evaluations. Evaluations may include both qualitative and quantitative determinations of mortality to the targeted problem vegetation, as well documentation of any non-target mortality that is evident. Effectiveness of the treatments will be determined.

Work will be inspected to determine:

- Compliance with the commitments made in this PMP;
- Compliance with the *Integrated Pest Management Act and Regulations*; i.e. type of treatment performed, date & time of audit,
- That site objectives have been achieved; i.e. Were goals & objectives of program met?

- The success of the treatment methods employed; i.e. Treatment efficacy,
- If pesticide free zones, no treatment zones and buffer zones were maintained;
- If any negative environmental impacts have occurred; i.e. Any non-target damages?
- If corrective action is required.

A ROW Post Treatment Monitoring Form is shown in Appendix E.

5.0 Environmental Protection Strategies and Procedures

All pest management activities undertaken under this PMP (both chemical and non-chemical) incorporate measures designed to protect the natural environment including:

- Strategies to protect community watersheds;
- Strategies to protect domestic and agricultural water sources;
- Strategies to protect fish and wildlife, riparian areas, bodies of water and wildlife habitat;
- Strategies to prevent herbicide contamination of food intended for human consumption;
- Pre-treatment inspection procedures for identifying treatment area boundaries;
- Procedures for monitoring weather conditions and strategies for modifying herbicide application methods for different weather conditions; and,
- Procedures for pre-treatment inspections to ensure protection of human health and the environment during treatment period.

In this PMP, all pesticide free zones (PFZ) and no treatment zones (NTZ) will comply with the standards contained in Division 7 of the IPMR.

5.1 Water Protection PFZs and NTZs

According to the *Integrated Pest Management Regulation (IPMR)*:

Table 14 Definitions of PFZ and NTZ as Stated in the IPMR

Pesticide Free Zone (PFZ)	means an area of land that <ul style="list-style-type: none"> a. must not be treated with pesticide, and b. must be protected from pesticide moving into it
No Treatment Zone (NTZ)	means an area of land that must not be treated with pesticide

The following table lists the minimum no-treatment zones (NTZs) and pesticide-free zones (PFZs) that are followed to protect domestic and agricultural water sources, such as water intakes and wells.

Table 15 Minimum Water Protection Measures for the Protection of Domestic and Agricultural Wells and Water Intakes, Bodies of Water, and Streams

All Pesticides	Required Distance
Domestic and agricultural wells and water intakes	30-meter NTZ
Any water body or stream using any pesticide except glyphosate, subject to label restrictions	10-meter PFZ
Glyphosate Applications	Required Distance
A water body or stream that is fish bearing and not within an industrial site (as defined by <i>Integrated Pest Management Regulation</i>)	5-meter PFZ

A water body or stream that is fish bearing and within an industrial site (as defined by <i>Integrated Pest Management Regulation</i>)	2-meter PFZ
A permanent water body that is not fish bearing at any time of the year	2-meter PFZ
Up to high water mark of a temporary free-standing body of water that is not fish-bearing and does not drain directly into fish-bearing water, at any time of year	0-meter PFZ
Dry streams that are not fish bearing at any time of the year and do not drain directly into fish bearing water, at any time of the year	0-meter PFZ

**Any waterbody where fish bearing status is unconfirmed, and there are not obvious barriers to fish passage, will be assumed to be fish bearing.

5.2 Environmental Feature Protection Strategies and Procedures

Table 16 Strategies/Procedures for the Protection of Environmental Features

Environmental Feature	FEI PMP Protection Strategy/Procedure
Community Watersheds – defined under the <i>BC Forest Range Practices Act</i>	<ul style="list-style-type: none"> • Locations of community watersheds are verified by accessing information from the Ministry of Environment or local governments • Pesticides will not be stored within a community watershed for more than 24 hours prior to their use, and removed from the community watershed within 7 days of their use, unless they are stored in a permanent structure • NTZs are maintained around all lakes and other water bodies consistent with those listed in Section 5.1 • A 100-meter NTZ will be maintained upslope from all licensed water intakes within the community watershed, except when failure to treat weeds could compromise public or worker safety. In those cases, NTZs are consistent with those listed in Table 19 • Pesticide use will be discontinued if pesticide residues or pesticide breakdown products are detected at a community watershed water intake, and further use will not be undertaken until the BC Ministry of Health Services (Medical Health Officer) has been satisfied that all required measures have been implemented to preserve water quality Prior to the use of pesticides, community watershed maps will be consulted to determine if pesticide treatments are within a community watershed or are within 100 meters upslope of any water intake, or 30 meters downslope of any water intake. These are available on the provincial interactive mapping site “BC Water Resources Atlas” (http://maps.gov.bc.ca/ess/hm/wrbc/)
Domestic and Agricultural Water Sources, including water intakes and wells	<ul style="list-style-type: none"> • Domestic and agricultural water sources, including water intakes and wells, will be protected by adhering to the PFZs and NTZs listed in Table 17

Environmental Feature	FEI PMP Protection Strategy/Procedure
	<ul style="list-style-type: none"> A visual survey will be done to determine if there are wells present not identified by accessing information from the Ministry of Environment or local governments
Groundwater Sources, Surface Water Intakes	<ul style="list-style-type: none"> Efforts will be made to identify groundwater sources (watersheds, wells, surface water intakes) in advance of treatment by using the best available information from the Ministry of Environment and from local governments Visual surveys will be conducted in areas adjacent to proposed treatment sites to determine the presence of domestic or agricultural surface water
Riparian Areas, Wildlife, Wildlife Habitat, and Species at Risk	<ul style="list-style-type: none"> A minimum 15-meter NTZ will be maintained around riparian areas when cleaning or fueling application equipment and refilling pesticide dispensing equipment Prior to control measures being implemented, the boundaries of any required PFZ or NTZ shall be established and marked Appropriate precautions shall be taken when applying pesticides in critical wildlife habitat areas
Protection of Food Intended for Human Consumption	<ul style="list-style-type: none"> Where possible, areas containing food plants for human consumption shall be located, NTZs of appropriate width established around these areas for their protection, and treatment notices posted at public access points to proposed treatment areas advising of treatments. In addition, all pesticide use under this PMP will be undertaken in a manner that minimizes the possibility of any negative impact on these environmentally sensitive areas. Appropriate precautions that may be taken during weed control operations to avoid contaminating these areas include providing increased buffer zones during herbicide applications or using alternative, non-chemical methods of control where possible. In the vicinity of certified organic farms, it is the responsibility of the grower to maintain a 25 ft buffer zone between their organic crops and power poles as recommended by the Certified Organic Associations of British Columbia (Production Operation Policies and Management Standards)
Monitoring Weather Conditions	<p>Weather conditions will be monitored prior to and periodically during pesticide applications. Wind speed and direction, precipitation, temperature and sky conditions (clear, overcast, cloudy, partly cloudy) will be recorded for foliar herbicide applications using backpacks or handguns. Temperature, precipitation, frost and dew conditions will be recorded for stem, bark, wick/wipe-on and stump applications.</p> <p>Pesticide applications will be shut down if:</p> <ul style="list-style-type: none"> The maximum temperature stated on the herbicide label is exceeded

Environmental Feature	FEI PMP Protection Strategy/Procedure
	<ul style="list-style-type: none"> • The wind speed and/or direction cause the application of herbicide to drift and/or miss the weeds • It begins to rain, increasing the chances of excessive runoff and leaching
Procedures for Pre-Treatment Inspections and Identifying Treatment Area Boundaries	<ul style="list-style-type: none"> • A pre-treatment inspection shall be completed prior to pesticide use to protect environmentally sensitive areas and to establish treatment area boundaries. During this inspection, the location of environmentally sensitive areas shall be located and mapped. • A pre-treatment meeting/discussion shall be held and crew members shall be instructed in the flagging/marketing requirements (which may include the use of Riparian Zone and PFZ flagging tape), as well as the methodology and procedures for herbicide application and handling and the posting of treatment notices by the contractor at locations that meet regulatory requirements
Private & Public Property	<ul style="list-style-type: none"> • In areas such as on or adjacent to parks, schools, daycare centers, lawns, landscaped areas, flowerbeds, or domestic animals on agricultural lands, all pesticide use will be undertaken in a manner that minimizes the possibility of any negative impact on these sensitive areas. • Treatment notices will be posted at locations that meet regulatory requirements

6.0 Operational Information

Appendix D provides details on the operational information/practices that are required to be included in a PMP, including:

- Qualifications and responsibilities of persons applying herbicides;
- Procedures for safely transporting herbicides *[IPMR Section 58(3)(a)(i)]*;
- Procedures for safely storing herbicides *[IPMR Section 58(3)(a)(ii)]*;
- Procedures for safely mixing, loading and applying herbicides *[IPMR Sections 58(3)(a)(ii) and (iii)]*;
- Procedures for the safe disposal of empty herbicide containers and unused herbicides *[IPMR Section 58(3)(a)(iv)]*;
- Procedures for responding to herbicide spills *[IPMR Section 58(3)(a)(v)]*; and,
- Identification of each pesticide that will be used under the plan, the manner of its application, and the type of equipment required for each manner of application *[IPMR Section 58(3)(c)]*.

7.0 Reporting, Notification and Consultation

7.1 Reporting

Accurate record keeping allow FEI and the Administrator, *Integrated Pest Management Act*, to monitor the quantity of pesticides used, and to ensure compliance with the *Integrated Pest Management Act and Regulation*, the commitments made in this PMP, and the contents of the Pesticide Use Notice. FEI will ensure that each of the required records described below are maintained.

7.1.1 Confirmation Holder Use Records

Each contracting firm that applies pesticides for FEI must maintain daily records of herbicide use.

Section 37(1) of the *Integrated Pest Management Regulation (IPMR)* describes the requirements for these records. The following records must be kept for each treatment location and day of use:

- The date and time of the pesticide use;
- The name of the pest targeted by the use or the purpose of the pesticide use;
- The trade name of each pesticide used and its registration number under the federal Act;
- For each pesticide used, the method and rate of application and the total quantity used;
- The prevailing meteorological conditions including temperature, precipitation and velocity and direction of the wind, these conditions should be measured at the beginning of each day before starting treatment, re-measured if obvious changes in environmental conditions occur throughout the day, and re-measured at the end of any treatment day; and,
- A record for each piece of the holder's pesticide application equipment that requires calibration showing when the equipment was calibrated and the data upon which its calibration was based.

7.2 Annual Report for Confirmation Holders

In accordance with Section 39 of the IPMR, FEI will provide to the Regional Administrator, *Integrated Pest Management Act*, the following information for a calendar year by January 31 in the next calendar year for operations conducted under this PMP during the calendar year:

- The name and address of the confirmation holder, and their confirmation number;
- Trade name and active ingredient of the pesticide(s) applied, including their PCP numbers;
- Total area treated; and,
- Quantity of each active ingredient applied (kg).

7.3 Notifications

FEI commits to providing the following notifications with respect to this PMP:

7.3.1 Notification of PMP Confirmation

FEI will, within 7 days of the plan confirmation date, make available, for the term of the confirmation, a copy of the confirmation and the PMP with relevant maps at their local offices to allow inspection by the public.

7.3.2 Annual Notice of Intent to Treat

As per section 42 of the IPMR, for the purpose of an annual Notice of Intent to treat, FEI will prepare and retain a map showing the treatment locations for the applicable calendar year, which indicate the following for each treatment location:

- The proposed treatment areas; and
- The geographic features that require a pesticide-free zone or a no-treatment zone.

FEI will forward, in writing, to the B.C. Ministry of Environment, at least 21 days prior to treatment in each year during which the PMP is in effect, an Annual Notice of Intent to Treat (NIT) for the following year. This NIT will identify:

- Name and business location of confirmation holder;
- Proposed treatment areas;
- Proposed treatments;
- Pesticides proposed for use and their method of application; and,
- The total area proposed for treatment.

7.3.3 Requests to Amend the PMP

FEI will forward, in writing, to the Ministry of Environment, amendments requested for the PMP. Amendment requests to add new application techniques or similar changes will not require further public advertising or consultation with Indigenous communities, provided that the amendment request is within land owned or controlled by FEI. Amendments to add new active ingredients will require further public advertising and/or consultation with Indigenous communities.

7.3.4 Notification of Contraventions

Section 72(1)(d) of the IPMR requires that a confirmation holder give written notice to the administrator on a contravention of the *Integrated Pest Management Act* or regulation that involves the release of a pesticide into the environment. FEI commits to abiding by this requirement.

In addition, FEI has implemented contractor guidelines to ensure compliance. Failure of the contractor to observe the following requirements may be cause for contractor dismissal:

- Violation of the requirements of the *IPMA* or the IPMR;

- Mixing of chemicals in inappropriate locations such as near environmentally sensitive zones;
- Failure to use adequate personal protective equipment when required by the product label;
- Application of treatment chemicals within prohibited zones;
- Improper cleanup or reporting of spills;
- Application of pesticides by uncertified personnel without appropriate supervision;
- Improper disposal of unused chemicals or containers;
- Improper equipment calibration;
- Application of pesticides under inappropriate or unsafe conditions;
- Failure to properly complete and submit daily operating logs or records; or,
- Handling, storing, mixing, transporting, or applying pesticides in a manner that violates product labels.

7.3.5 Posting of Treatment Notices

Prior to treatment, notification signs will be posted on land being treated with herbicides. The applicator is responsible for posting notification signs according to regulatory requirements.

Signs will be clearly visible and legible from each approach to the treatment area used by public/employees/contractors to access the treatment area or at locations where due diligence would seem to require them. Signs may not be removed for at least 14 days after the herbicides have been applied.

For each treatment location, the applicator will maintain a record of where notices were posted.

7.4 Consultations

7.4.1 Public Consultation Plan

Prior to submitting a Pesticide Use Notice to the Ministry of Environment for PMP confirmation, FEI will carry out a consultation process with the public and individuals adjacent to FEI property potentially significantly affected by the PMP.

The objectives of conducting consultations when this PMP is at the draft stage are:

- To increase public awareness of the PMP process and of the principles of Integrated Pest Management which are embodied in the PMP;
- To ensure that the public have an opportunity to identify concerns, and for FEI to address those concerns, before the PMP is finalized and submitted and a Pesticide Use Notice submitted for confirmation;
- To ensure a transparent and accountable review process for the PMP;
- To educate the public on the need to manage problem vegetation, noxious weeds and invasive plants; and,

- To explain how the planning process that is described in the PMP recognizes the need to protect human health and the environment.

The public will be consulted of the PMP development via notices in local community newspapers throughout the FEI service area. As per the *Integrated Pest Management Regulation*, at least 45 days before submitting a Pesticide Use Notice, the first of 2 notices, at least 40 cm² in size, will be published within a 2-week period in newspapers circulated in the various communities (or nearest communities).

Communities or individuals adjacent to FEI property potentially significantly affected by the PMP will be directly forwarded written notice of the development of this PMP, prior to submitting a Pesticide Use Notice as per Section 61(2) of the Regulation.

During the public consultation process, the draft PMP will be accessible to the public in various locations, as stated in the public notifications.

7.4.2 Public Consultation Report

FEI will prepare a Public Consultation Report that contains:

- A summary of public consultations, including the names and addresses of those who provided input, the nature of their concerns and/or recommendations, and the FEI response to the input from the public; and,
- A list of newspapers in which notification of the pending PMP submission appeared, along with the publication dates and a photocopy or tear sheet of a representative advertisement.

7.4.3 Indigenous Communities Consultation Plan

In addition to the objectives for public consultation outlined in Section 5.3.1, FEI will consult with Indigenous communities to avoid infringement on indigenous rights, treaty rights, or cultural values during the vegetation management program. Consultation is also undertaken to request authorization to undertake pesticide applications on federal reserve lands.

FEI not only has an obligation to consult with Indigenous communities, it must also attempt to address their concerns and accommodate their cultural interests. Consultation processes must take into account the BC Treaty negotiation process, and current litigation actions by Indigenous communities respecting indigenous land use or sovereignty. Both of these major issues can have an impact on the FEI vegetation management program.

In light of the above sensitivities and special concerns, FEI is committed to establishing and maintaining positive relationships with Indigenous communities through meaningful and respectful consultation.

In conducting consultation with Indigenous communities, FEI will refer to the procedures outlined in the August 2011 publication entitled “*Draft Guidelines for IPM Proponents Conducting Consultations with First Nations*”, published by the BC Ministry of Environment, Integrated Pest Management Program and/or any additional publications that have been recently introduced by the Ministry of Environment & Climate Change Strategy.

The FEI Indigenous consultation plan is outlined below:

- Develop a draft pest management plan (this document) that incorporates all related government policies, procedures, standards and information into a single, comprehensive planning document that incorporates the principles of IPM as the basis for decision making options;
- Deliver an introductory letter including information regarding the PMP and program, and make the PMP available to Indigenous communities, inviting their input into the development of the plan and provide them a copy of the PMP draft and maps if they request to review them, and if desired meet with them in person;
- Provide the Ministry of Environment a summary of consultation with Indigenous communities, including the names and addresses of those that provided input, the nature of their concerns and/or recommendations, and the FortisBC response to the input from the Indigenous communities; and,
- Submit a Pesticide Use Notice to the Ministry of Environment confirmation of the PMP

7.4.4 Indigenous Communities Consultation Report

In order to facilitate Ministry consideration of the adequacy of consultation with Indigenous Communities and of the FEI response to any issues raised, FEI will prepare a report that describes the consultation process and outcomes. This report will be submitted to the Administrator, *Integrated Pest Management Act*, in conjunction with the submission of the Pesticide Use Notice application.

Appendix A (The FortisBC Gas Service Area)



Appendix B Physical Control Methods and Techniques

Pre-Mow Slashing

Pre-mow slashing (also called brushing) is the removal (cutting to ground) of all vegetation that is growing within a corridor or fenced compound. It is particularly appropriate for rural ROW. Brushing can be accomplished with a variety of specialized mechanized equipment.

Pre-mow slashing involves the use of mechanized equipment to cut down all problem vegetation on a ROW in preparation for mowing. In preparation for mowing, pre-mow slashing must achieve the following:

Vegetation must be removed to maintain clearance standards;

- All fence lines, telecommunication pedestals, signs, stumps greater than 15 cm in diameter, and any other obstructions must be removed for a minimum distance of 1 meter on all sides;
- Stumps will be cut flat and no taller than 5 cm from the ground;
- Steep slopes, ditch banks and other areas inaccessible to mowing will be slashed, and the debris piled for disposal;
- All slash will be placed in areas accessible to the mower, and not within 1 meter of hazardous obstacles such as rocks and stumps greater than 15 cm in diameter, or in hazardous areas such as steep ditch bottoms; and,
- Debris will not be piled in environmentally sensitive areas such as in runoff areas, creek beds, or other areas prone to spring flooding.

Mowing

Mowing is the use of mechanized mowers such as tractor-mounted mowers, grade all or hydro axes, to remove all vegetation from a ROW. With mowing, all vegetation is cut to the ground, leaving a level ROW. This technique facilitates the subsequent application of herbicide to deciduous vegetation to control re-sprouting. Well-timed and properly performed mowing can inhibit the re-growth of deciduous vegetation for several years. Mowing is less labour intensive, less expensive and is less hazardous to workers than hand slashing.

Mowing is not selective. Desirable species of vegetation are cut as well as the undesirable species. Because mowing mulches the brush using high speed, flail type action, this can spread debris and leave the ROW unsightly. Mowing may also open up the seedbed, allowing undesirable species to sprout from seed. Mowing is also limited by terrain.

Mowing is seasonably effective. Mowing after the spring flush of growth through late summer will inhibit growth better than mowing done at other times of the year. This is particularly important in areas where the problem vegetation is deciduous, and follow-up selective herbicide treatment is not possible. Mowing must be done to cut stubs as close to the ground as possible, which may necessitate the expense of mowing an area several times to reduce the stumps to ground level.

For maximum effectiveness, mowing should be followed in 2 to 3 years by the selective use of herbicides by spot treatment, or wipe-on application to individual stems, to control re-sprouting. An alternative to herbicide use would be to plough and reseed or replant with desirable, low-growing vegetation that will inhibit the growth of undesirable vegetation. This may not be practical or economical for large areas but may be useful on private property adjacent to a ROW where grass, crops, native shrubs and bushes, and landscape trees and shrubs can be planted and maintained by the private landowner.

Hand Slashing

Hand slashing involves the use of chain saws, brush cutters, or other hand-held equipment to remove undesirable vegetation. Hand slashing can be species-specific, enabling desirable vegetation to be left. The remaining desirable vegetation will inhibit the growth of tall growing species and give the area a more landscaped look.

Hand slashing is compatible with the species-specific spot application of herbicides used to control re-sprouting of deciduous vegetation, single stem treatments or small patches of problem vegetation. The major disadvantage of hand slashing is that re-growth is not inhibited as well as it is by mowing. For maximum effectiveness, hand slashing, like mowing, should be followed by the selective use of herbicides.

PRUNING

Collar Cuts

When removing a lateral branch from a stem or limb, or when reducing an upright to a lateral, the final cut must be made at the correct place in order to minimize danger to the tree and prevent re-sprouting. These cut lines are indicated by the branch collar and by the branch bark ridge. Proper cuts will minimize decay and promote closure of the cut. When removing a branch, cuts will be made as close as possible to the branch collar, taking care not to remove or injure the collar. Injury to the collar destroys a major defense system of the tree and also leads to excessive sprouting. When cutting a stem, cuts will be made close to, and on an angle with, the branch bark ridge. The remaining branch will be at least one third the diameter of the trunk. Stubs will not be left, as they are entry points for rot-causing fungi. Pruning cuts will not be painted, as this does not stop rot. There is no set angle for a correct cut. The size and shape of the collar will determine the position and angle of the cut. Cuts will always be made where branches meet other branches or the trunk. Making cuts between nodes (internodal) leads to excessive sprouting and to the development of cracks and rots, which are the major causes of branch and trunk failure. When branches are properly pruned, rings of living tissue will form around the cut after one growing season. Incomplete rings of tissue indicate improper cuts and may lead to decay.

Directional Pruning

Directional pruning is the practice of removing appropriate limbs or laterals to encourage the tree or limb to grow in a desired direction. The use of proper cuts is essential to make this practice

successful. Proper cuts will minimize re-sprouting and encourage directional growth, while improper cuts will encourage re-sprouting and defeat directional growth.

Side Pruning

Side pruning is a type of crown raising. All branches are removed from one side of the tree in order to achieve clearance. This technique is only appropriate where removal is not practical or possible.

Crown Thinning

Crown thinning is the reduction of canopy mass without significant reduction to the size of the tree or its profile. The use of this technique will allow for reduced wind resistance, less snow loading, less branch breakage, and reduced chance of blow down. The entry of sunlight into the inner crown will generally improve the health and stability of the tree. Using proper cuts, the crown is thinned by removing every second or third branch. This technique is appropriate for large trees with thick upper canopies such as cedars. When under pruning has been employed with large trees, additional protection may be achieved by thinning the balance of the crown.

Crown Cleaning

Crown cleaning involves the removal of deadwood, damaged or diseased limbs. Inappropriate interior branches are generally removed at the same time. Falling deadwood is frequently a cause of outages. Crown cleaning is generally done on larger, mature trees. The use of crown cleaning not only improves tree health, but substantially reduces its potential hazard.

Shearing

Shearing is the cutting back of all terminal buds to a common distance to create a hedge effect. This practice may be used on evergreens where removal is not possible. The creation of a hedge will only be allowed if the customer has agreed to maintain it on an annual basis in the future. Shearing may also be an acceptable option in cases where large mature coniferous trees have previously been sheared, re-growth is not vigorous, and clearances are more than is required for cycle maintenance.

Appendix C Properties / Specifications of Pesticides Proposed for Use Under This PMP

Active Ingredient	Common Name	Application*	Soil Residual Activity**	Selectivity***
2-4-D	2,4-D Amine	Foliage Post-emergent	Low	Selective
Aminocyclopyrachlor	Navius / Truvist	Foliage; Post-emergent	Moderate	selective
Aminopyralid	Clearview / Milestone	Foliage; Post-emergent	Low	Selective
Chlorsulfuron	Telar XP / Truvist	Foliage; Pre & Post-emergent	Moderate	Non-Selective
Dicamba	Banvel II	Foliage; Post-emergent	Low	Selective
Flumioxazin	Torpedo / Payload	Soil; Pre-emergent	Moderate	Non-selective
Glyphosate	Vantage XRT / VP 480	Foliage and cut surface; Post-emergent	Low	Non-selective
Triclopyr	Garlon XRT	Foliage, Basal	Low	Selective
Imazapyr	Arsenal Powerline	Foliage & Cut Stump Pre and post- emergent	Moderate	Non-selective
Indaziflam	Esplanade	Soil; Pre-emergent	Moderate	Non-Selective
Metsulfuron-methyl	Clearview Navius VM	Foliage; Post-emergent	Moderate	Selective
Pyroxasulfone	Torpedo	Foliage and soil; Pre and post- emergent	Moderate	Non-selective
Salflufenacil	Detail / Heat	Foliage and soil;	Moderate	Non-Selective
Diflufenzopyr	Overdrive	Post-emergent	Moderate	Selective
MCPA Amine	MCPA	Foliage Post-emergent		Selective
Picloram	Tordon 22K	Foliage; Post-emergent	High	Selective
Clopyralid	Lontrel 360	Foliage Post-emergent	Moderate	Selective

* Post emergent refers to treatments made after the vegetation has emerged through soil surfaces and pre emergent refers to treatments before the vegetation has emerged through the soil surface. ** LOW generally refers to residual soil activity of up to 40 days, MODERATE for residual soil activity of up to one year and HIGH for residual soil activity of greater than one year. *** Herbicides that control all vegetation are termed non-selective, while those that control certain types of vegetation (e.g., only grasses or only broadleaf) are termed selective. **NOTE:** For Right of Way treatments triclopyr is predominantly the herbicide that is likely to be used based on past practice by FortisBC.

Appendix D Operational Practices in Pesticide Use

This appendix provides details on the operational practices, including contractor responsibilities, on the handling and transport of herbicides used for vegetation management on FEI transmission and distribution ROWs.

Qualifications for Persons Applying Pesticides

The majority of pesticide use on FEI transmission and distribution ROWs is carried out by outside contractors.

The transportation, storage, handling, application and disposal of pesticides are governed by federal and provincial legislation. All outside contractors and FEI personnel working with pesticides will follow safe handling practices including workplace requirements for Workplace Hazardous Materials Information System (WHMIS) labeling and worker education. The required practices for contractors and their workers are detailed in:

- Worker's Compensation Board of British Columbia (1998) *Occupational Health and Safety Regulation – BC Regulation 296/97 as amended by BC Regulation 185/99 – Sections 6.70 to 6.109*;
- B.C Ministry of Environment, Lands and Parks (1995) *Handbook for Pesticide Applicators and Dispensers*; and,
- Worker's Compensation Board of British Columbia (1990) *Standard Practices for Pesticide Applicators*.

Any individual or company (i.e., a contractor) that provides a service to FEI by applying commercial or industrial pesticides for vegetation management on FEI transmission and distribution ROWs must have a valid B.C Pest Control Service Licence, and each supervising applicator must have a valid B.C. Pesticide Applicator Certificate in the Industrial Vegetation and Noxious Weed Category.

Under the B.C. *Pesticide Control Act Regulation*, a certified pesticide applicator can supervise up to 4 uncertified assistants, provided the assistants are within continuous auditory or visual range at all times while applying pesticides. Individuals must carry proof of their applicator certification with them when applying pesticides for inspection purposes.

Transportation of Pesticides

The transportation of pesticides will comply with all current legislation, federal and provincial, governing their transport. In addition, the following procedures will be followed while pesticides are being transported for application under this PMP:

- Limited amounts of pesticides will be carried in any one vehicle. The quantity will be no more than what is necessary for each project;

- Pesticides will be carried in a secure lockable compartment;
- Pesticides will be transported in original labeled containers;
- Pesticides will be transported separately from food and drinking water, safety gear and people;
- Spill containment and clean up equipment will be transported separately from pesticides, but in close proximity to them, on each vehicle during transport and use;
- Appropriate documents such as Pest Control Service Operations Records, material safety data sheets (MSDS), this PMP and the PMP approval document, will be available during transport and use of pesticides;
- All documents and placards will be carried in, or placed on, transport vehicles if required under the *Transportation of Dangerous Goods Act* or the *BC Pesticide Control Act*; and,
- All pesticide containers will be inspected for defects prior to transporting and will be secured against spillage or unauthorized removal.

Spill Treatment Equipment

Spill treatment equipment will be ready and available at storage (including mobile storage), mixing and loading sites, and will include the following:

- Personal protective equipment, as recommended on the respective pesticide labels;
- Absorbent material such as sawdust, sand, activated charcoal, vermiculite, dry coarse clay, kitty litter or commercial absorbent;
- Neutralizing material such as lime, chlorine bleach or washing soda; and,
- Long handled broom, shovel, and waste-receiving container with lid.

Spill Response Planning

A copy of an approved spill response plan will be available at each work site. All personnel working on a project involving pesticides must be familiar with its contents. If contractors that work under this PMP have their own spill response plan, it must meet or exceed the contents of this plan.

The following procedures must be followed if a spill occurs:

- All personnel will be protected from pesticide contamination by wearing appropriate protective clothing and safety gear;
- Any person exposed to a pesticide will be moved away from the place of the spill and kept warm. First aid will be administered, if required;
- The source of the spill will be stopped;
- The spilled material will be stopped from spreading by creating a dam or ridge;
- 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 up any liquid;

- The absorbent material will be collected into garbage bags or containers, with the contents clearly marked;
- Contaminated soil or other material will be removed from the spill site and placed in garbage bags or containers;
- Where the pesticide involved in the spill results or may result in its release into the environment, the person responsible for the product will immediately report it to Emergency Management BC by telephoning 1-800-663- 3456 or, where that is impractical, to the local police or nearest detachment of the R.C.M.P; and,
- An approved representative of the PMP holder will be notified of the details related to the spill as soon as is practical by the project supervisor.

Pesticide Storage

No vegetation management pesticides will be stored by FEI or by contractors at facilities owned or operated by FEI. All pesticides will be supplied by the contractor, who must follow, as a minimum, the storage requirements described below.

Pesticides stored on FEI property will be in accordance with the *Pesticide Control Act and Regulation* and the Worker's Compensation Board document “*Standard Practices for Pesticide Applicators*”.

In summary, the storage area must:

- Be ventilated to the outside atmosphere;
- Be locked when left unattended;
- Be entered only by persons who are authorized to do so; and,
- Have a placard affixed and maintained on the outside of each door leading into the facility in which the pesticides are stored bearing, in block letters that are clearly visible, the words “WARNING – CHEMICAL - STORAGE -AUTHORIZED PERSONS ONLY “.

In addition, the person responsible for the storage area shall notify the appropriate fire department of the presence of the pesticide on the premises.

FEI has no direct control of the pesticide storage practices of its contractors while not under contract to them. These companies are still governed by the provisions of the BC Pesticide *Control Act and Regulation* with respect to storage by a Pest Control Service Licensee.

Some contractors may store pesticides for extended periods of time in vehicles when performing a number of pesticide treatments for FEI. The vehicle is considered to be a mobile storage unit. Persons responsible for the pesticide storage will ensure that all pesticides are stored in a locked canopy or similar arrangement, separate from the driver and personal protective gear.

Mixing and Loading Pesticides

All mixing and use of pesticides will be carried out by certified pesticide applicators in the appropriate category of certification, or by individuals directly supervised by a certified pesticide applicator in the appropriate category of certification.

Mixing of pesticides must always be conducted in a safe manner. Safety spill kits, spill response plans and first aid supplies will be present on site. Eye wash station(s) and protection clothing as recommended on the respective product labels shall be available on site. Product labels and MSDSs will be available on site to ensure that quantities of pesticides being mixed and used are consistent with label rates.

There will be no mixing or loading of pesticides within 10 meters of sensitive environmental features.

Pesticide Application Procedures/Conditions

FEI will ensure that the following conditions are adhered to for all application of pesticides under this PMP:

- Pesticide applicators will be provided with current labels and Material Safety Data Sheets for the pesticide products they will be using;
- Applicators will inspect each site and plan application procedures before treatment begins.;
- All pesticides will be applied using only trained and certified personnel who have the required application equipment and protective equipment;
- All pesticide will be applied at the lowest possible application rate that will do the job, and will not exceed the lesser of the pesticide label rate or the rate specified in this PMP;
- Pesticides will only be applied when there is clear evidence of a current or impending pest problem;
- Where possible, pesticides will be applied when target species are at their most susceptible stage;
- Pesticide products and application methods will be selected to maximize the degree of selectivity for the target pest and to minimize the degree of toxicity to non-target organisms, pesticide drift, bystander and worker exposure, and persistence in the environment;
- Pesticide use will be restricted to periods that minimize human exposure and adverse impacts to the environment. Due consideration will be given to the proximity of bystanders, workers, adjacent open windows, high foot-traffic areas and other local sensitive pesticide features. Where possible, pesticides will be applied during periods of low staff or public presence, in the early morning or evening, or on weekends if necessary;

- Unless other required by product labels, outdoor pesticide applications are restricted to conditions where wind speeds do not exceed 8 km/hr.; and,
- For outdoor pesticide use, applications will only occur during suitable weather conditions.

Protective Equipment

Protective clothing and equipment required during pesticide mixing, loading, application and disposal will conform with Workers' Compensation Board Occupational Health and Safety Regulations. Equipment such as protective clothing, headgear, eye and face protection, gloves, footwear and respiratory protection equipment must be used where required.

Bystander and Worker Protection/Pesticide Treatment Signs

All of the conditions listed above under pesticide mixing, loading and application are designed, in part, to protect bystanders and workers from exposure to pesticides. Section 8 of this PMP (the next section), will describe the notification requirements that will be adhered to with respect to pesticide use. These conditions relate directly to bystander and worker protection.

At all sites scheduled for pesticide treatment, workers will be advised, either verbally or in writing, of the dates and locations of pesticide treatments, as well as advice or precautions to follow, as appropriate, to minimize their exposure.

Before pesticides are applied, signs will be posted at the treatment site on the day of application. The signs will remain posted for a minimum of 14 days after application. The signs will be visible from both within and outside each treatment area.

Notices will also be posted at all major entry points to sites that receive pesticide treatment. The notices will contain the following information:

- A description of the area to be treated;
- Date and start time of the proposed application;
- Pesticide product name(s) and active ingredient(s); and,
- Precautions, including any applicable re-entry times or conditions, needed for persons to minimize exposure to the pesticide(s) or residues.

Equipment Maintenance and Calibration

All pesticide application equipment used in FEI property safe, clean, in good repair, and compatible and appropriate for the pesticide being used.

As a minimum, all pesticide application equipment will be calibrated once per year prior to use, and at regular intervals throughout the season of use. The frequency of calibration will be dictated by factors such as the formulation of pesticides used (e.g., abrasive formulations will

result in greater nozzle wear and will require more frequent calibrations), when changing pesticide products, and when nozzle output begins to vary.

Disposal of Pesticide Containers and Residual Pesticides

Disposal of empty containers shall to according to the manufacturer's instructions as noted on the product label or provincial instructions and recommendations that are detailed in the BC Ministry of Environment, Lands and Parks document “*Handbook for Pesticide Applicators and Dispensers*” (1995). As a minimum, empty pesticide container shall:

- Be triple rinsed or pressure rinsed;
- Be made so they cannot be reused by crushing, puncturing or damaging them; and,
- Be disposed of in a permitted sanitary landfill or other approval disposal site.

Appendix E Post-Treatment Inspection Report

Post-Treatment Inspection Report		V.2. Dec.2019
Site Name:		
Site Location (address or UTM coordinates):		
Date of Herbicide Treatment(s):		
Licensee Undertaking Herbicide Treatments:		
Service License #:		
Applicator(s):		
Herbicide(s) and Application Rate:		
Target Pest(s):		
Treatment Efficacy:		
Environmental Features Requiring Protection and Measures Taken: (i.e., permanent and seasonal water bodies, community watersheds, residential areas, habitat or riparian areas, catch basins, potable and non-potable water intakes)		
Domestic Water Intakes and Wells: YES NO (if yes, describe location and distance from ROW)		
Comments/ Recommendations:		