

# **APPENDICES**

<b>APPENDIX A</b>	<b>SUPPLEMENTARY REQUIREMENTS</b>
<b>APPENDIX B</b>	<b>TELECOMMUNICATION TOWERS</b>
<b>APPENDIX C</b>	<b>CONFINED FEEDING OPERATIONS</b>
<b>APPENDIX D</b>	<b>SPECIFIED PENALTIES FOR OFFENCES</b>
<b>APPENDIX E</b>	<b>DARK SKY BYLAW</b>
<b>APPENDIX F</b>	<b>RIPARIAN SETBACK MATRIX MODEL</b>
<b>APPENDIX G</b>	<b>SCREENING STANDARDS</b>
<b>APPENDIX H</b>	<b>SPECIAL EVENTS BYLAW</b>
<b>APPENDIX I</b>	<b>RURAL APPROACH STANDARDS POLICY</b>
<b>APPENDIX J</b>	<b>COMMUNITY STANDARDS BYLAW</b>
<b>APPENDIX K</b>	<b>BYLAW 15/2019 THE RESPONSIBLE DOG OWNERSHIP BYLAW</b>

## **APPENDIX A**

### **SUPPLEMENTARY REQUIREMENTS**

#### **TECHINICAL STUDIES**

##### ***BIOPHYSICAL ASSESSMENT***

Prepared by a qualified professional biologist accredited by the Alberta

Society of Professional Biologists (ASPB), identifying rare plant and wildlife species/communities, as listed on the current Alberta Natural Heritage Information Center (ANHIC) and Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

The findings of this report shall assist in the preparation of the environmental management plan and/or concept plan.

##### ***ENGINEERING PLANS AND SPECIFICATIONS/CONSTRUCTION DRAWINGS.***

These are required in support of your application to establish the parameters for the construction of improvements associated with the proposed development. Engineering plans and specifications must be completed by qualified professional engineer accredited by APEGGA and include the following:

- Cover Sheet(s);
- Clearing and Grading Drawings;
- Roads, Lanes and Walkways Drawings;
- Traffic Control and Signage Drawing;
- Water Distribution Drawing (if applicable);
- Water Distribution Disinfection and Flushing Drawing (if applicable);
- Sanitary Sewer Drawing (if applicable);
- Storm Sewer Drawing - Major/Minor System;
- Storm Sewer Drawing – Minor System;
- Shallow Utilities Drawing;
- Building Grade Drawing;
- Landscape Drawing;
- Erosion Control and Sedimentation Drawing.

Upon completion, two sets of complete construction drawings are required to be submitted to the MD of Foothills for preliminary review and approval.

# **Municipal District of Foothills No. 31 - Land Use Bylaw**

---

Additional circulation of the shallow utilities plan is required to be circulated by the developer to appropriate utility companies for review and approval. Each utility company is required to submit an approval letter for inclusion within the development agreement via the developer.

Upon acceptance, a final set of construction drawings may be required for inclusion within the development and servicing agreement in support of the proposed development.

For additional details on drawing specifications, and requirements and development agreement procedures please refer to Section 2 of the “General Engineering Guidelines and Municipal Servicing Standards”.

## **ENVIRONMENTAL MANAGEMENT PLAN**

An Environmental Management Plan prepared by a qualified professional biologist accredited by the Alberta Society of Professional Biologists (ASPB), indicating the impact of the proposed development on the wildlife, wildlife corridors, vegetation, water and environmental features.

The environmental management plan shall outline protection measures in accordance with environmental guidelines and also address mitigation measures, including necessary setbacks distances from significant natural features to mitigate potential impacts born by the proposed development on the surrounding natural environment. The environmental management plan shall also identify breeding and spawning times for wildlife, and the timing of construction and reclamation activities shall be adjusted accordingly.

The findings of this report shall assist in the preparation of the concept plan where required.

### **Fire Protection Plan.**

A fire protection plan is required to ensure adequate improvements to support fire suppression in the case of an emergency within the proposed development area. The fire protection plan must be prepared and submitted to the local fire authority for review and approval with confirmation provided to the MD of Foothills.

Once approved, the owner is responsible for implementing those improvements as outlined within the approved fire protection plan as these will be included within the terms of the development agreement where appropriate. During a fire emergency, a copy of the approved fire safety plan must be available for the responding fire department's use. In general terms, the fire protection plan should include:

- Key contact information including site location and access arrangements;
- Utility services (including shut-off valves for water, gas and electric);
- Access issues to the property;
- Layout, drawing, and location of water supply within the subject property;
- Layout and location of fire suppression infrastructure;
- Incorporation of Fire Smart Principles.

# **Municipal District of Foothills No. 31 - Land Use Bylaw**

---

Where required, the findings of this report should be incorporated within the servicing study and/or engineering plans and specifications requested in support of the proposed development.

## **FLOOD RISK ASSESSMENT (FRA).**

A Flood Risk Assessment study, completed by a qualified professional accredited by the Association of Professional Engineers and Geoscientists of Alberta (APEGA), shall ascertain whether the development area is suitable for the proposed uses by

- a. determining the risk of flooding at the site now and in the future (a minimum 100-year flood event); and
- b. considering the consequences of the site being flooded and provide recommended mitigation measures and design standards to guide the construction of improvement within the subject lands.

Setback requirements shall also form part of the recommendations and shall be outlined both in writing and graphically through supportive mapping drawn to scale and related to local elevations.

Where required, the findings of this report should be incorporated within the servicing study and/or engineering plans and specifications requested in support of the proposed development.

## **GEOTECHNICAL REPORT**

A Geotechnical Report shall be prepared by qualified professional engineer accredited by APEGGA, identifying and assessing the subsurface soil and groundwater conditions liable to affect suitability of the lands to support the proposed development. The geotechnical assessment shall be in accordance with the "General Engineering Guidelines and Municipal Servicing Standards".

The report shall provide conclusions and recommendations to guide the design and construction of the proposed development and associated improvements including both Municipal infrastructure and/or private improvements proposed on the subject property inclusive of buildings, structures and/or private services.

Where required, the findings of this report shall be incorporated within the servicing study and/or engineering plans and specifications requested in Support of the proposed development.

## **GROUNDWATER SUPPLY EVALUATION (GSE).**

A Groundwater Supply Evaluation, completed by a qualified professional accredited by APEGGA, shall assess the potential for one or more aquifers to supply a sustainable volume of water to the proposed development, in addition to determining any possible interference with groundwater supply from existing wells in the area.

# **Municipal District of Foothills No. 31 - Land Use Bylaw**

---

The evaluation shall involve the completion of a single well within the proposed development area pumping over a Municipally legislated time period, followed by a period of recovery over the same time period. Please note that the groundwater supply evaluation must satisfy those requirements as noted under Section 23(3) (a) of the Province of Alberta Water Act.

Should the results of the groundwater supply evaluation indicate that insufficient groundwater supply exists to support the proposed development or impact on existing wells within the area would be profound; the study shall outline alternative means of water supply to the proposed development. This shall include the source of an alternative potable water supply to support the proposed development, and infrastructure to support the water distribution. All alternative means of water supply shall comply with all Federal, Provincial, and Municipal regulations.

Where required, the findings of this report should be incorporated within the servicing study and/or engineering plans and specifications requested in support of the proposed development.

Hazards Assessment & Management Plan.

The Hazards Assessment and Management plan shall identify any and all potential hazards in relation to the proposed development and how they shall be managed. Suggested hazards include but are not limited to fire, petro chemicals and processing chemicals.

## ***PRIVATE SEWAGE SYSTEM SUITABILITY ANALYSIS.***

The Private Sewage System Suitability Analysis report represents a specific geotechnical investigation of the proposed development area documenting prevailing soil conditions, a soil texture analysis and soil suitability assessment to support an on-site private sewage disposal system. This report must be completed by a qualified professional and in accordance with the Alberta Private Sewage Systems Standard of Practice 2009. Where required, the findings of this report should be incorporated within the servicing study and/or engineering plans and specifications requested in support of the proposed development.

## ***PUBLIC CONSULTATION PLAN***

In order to ascertain the opinions and concerns of surrounding landowners with regards to the proposed development concept, consultation with the public will need to be undertaken.

In support of a conceptual development or subdivision plan, the consultation should be with landowners and/or residents within a minimum of one half mile of the subject property, shall be fully documented in writing and shall include the following information:

- a. the names and contact information of all attendees;
- b. a synopsis of matters discussed;
- c. a summary of concerns raised;
- d. a formal response to all concerns raised.

# **Municipal District of Foothills No. 31 - Land Use Bylaw**

---

The time and place of the public meeting must be advertised in Western Wheel for two consecutive weeks prior to the meeting and written notification shall be given to Planning Department of the MD of Foothills.

Further, a mail out must be prepared in support of the open house which may be distributed by the MD of Foothills on behalf of the applicant in support of the public consultation.

The applicant shall bear all costs.

## ***RECLAMATION REPORT.***

The reclamation report shall outline the measures to be taken to return the development site to an equivalent land capability, as based on pre-disturbance site assessments of soil, landscape, and vegetation.

The plan shall also establish criteria and specifications to guide the design, installation and maintenance of vegetation planted as part of a re-vegetation strategy. Plant species should be chosen in consultation with landowners and reflect species present on adjacent lands.

## ***SERVICING STUDY.***

A Servicing Study report shall be prepared by a qualified professional engineer accredited by APEGGA, which establishes the technical engineering requirements to service the proposed development.

The report should compile and summarize relevant information with respect to site grading, proposed water supply and distribution, sanitary sewage collection and treatment, storm drainage system, shallow utilities and public roadways. The report should include discussion pertaining to existing site conditions, proposed site grading, summary of supportive modeling completed and identification of any unique site constraints and/or issues that may affect the servicing of the proposed development.

The details of individual supportive studies that may be required in addition to the servicing study (i.e. geotechnical, biophysical assessment, traffic, water modeling, sanitary sewer system modeling, storm water management, and erosion and sediment control) may be contained in separate reports but should be referenced and summarized in the servicing study.

## ***STORMWATER MANAGEMENT PLAN.***

The Storm water Management Plan shall address current and future drainage requirements in support of the proposed development while satisfying constraints imposed by topography, existing and proposed land uses, land ownership, and other local considerations.

# **Municipal District of Foothills No. 31 - Land Use Bylaw**

---

The plan shall be completed by a qualified professional engineer accredited by APEGGA, and shall identify and locate major drainage facilities, including major drainage channel improvements, the location of storm sewer improvements, open channel routes, retention/detention facilities, and land requirements for drainage purposes.

Where required, the findings of this report should be incorporated within the servicing study and/or engineering plans and specifications requested in support of the proposed development.

## **TRAFFIC IMPACT ASSESSMENT**

In order to evaluate the traffic impact of proposed developments, a traffic impact assessment is required. The traffic impact assessment must be prepared by a qualified professional engineer accredited by APEGGA, which assesses the potential effects of traffic generation caused by the proposed development on regional and local roadway systems.

The traffic impact assessment shall identify and define the study area, the planning horizon and analysis period, the existing traffic conditions, and the estimated traffic demand. Furthermore, a safety analysis, site access analysis, traffic collision analysis, and sight distance evaluation should be conducted. The assessment shall also identify mitigation measures and provide overall recommendations for addressing local and regional traffic impacts.

Where required, the findings of this report shall be incorporated within the servicing study and/or engineering plans and specifications requested in support of the proposed development.

## **PLANNING FRAMEWORK**

A land use amendment or redesignation may require preparation of an Area Structure Plan(ASP), Area Redevelopment Plan (ARP), or an Outline plan (OP) pursuant to the MDP 2010 Planning Framework prior to or concurrent with the submission of a Development application or application for amendment to the Land Use Bylaw.

The Approving Authority will use their discretion when accepting an application to determine when additional plan preparation may be required.

Preparation of such plans shall include a public consultation process, consistent to the scope and intensity of a proposed development to allow for review of the application with the area landowners and/or residents and explore any potential future impacts on adjacent lands, as well as to demonstrate how this individual application complies with any applicable ASP, ARP, OP and the MDP.

Such plans may be adopted by bylaw or resolution of Council prior to, or concurrent with the Development application or application for amendment to the Land Use Bylaw.

.

# **Municipal District of Foothills No. 31 - Land Use Bylaw**

---

## **AREA STRUCTURE PLAN (ASP)**

ASPs are intended to provide a higher level of planning detail for a smaller area than undertaken in the Municipal Development Plan, Growth Management Strategy, or Development Concept Plans. This is a statutory plan, and as such, all planning authorities must adhere to the ASP.

These plans provide policy direction on how a specific area of land will develop over time, and identify the fundamental layout of land uses on the landscape prior to the preparation and submission of the more detailed plans. This plan does not detail parcel layout, it offers a broader level of planning which requires significant public consultation and involvement. An ASP can be created by the MD or by a developer/landowner or their agents.

An ASP specifically outlines the following detail:

- Policy, goals and objectives of the plan and how it supports the plans in higher levels of the framework.
- Sequence of development for a proposed area.
- Specific or general land uses, populations and densities.
- Specific location of transportation routes, utilities, environmental conservation, public open space design, and housing and business types.
- Implementation strategy required to undertake the proposal.

## **AREA REDEVELOPMENT PLAN (ARP)**

ARP's are similar to ASP's, except that an ARP is used to facilitate the "redevelopment" of an area that is already developed. The ARP provides policy direction regarding the removal, reconstruction and/or preservation of an area and buildings.

## **OUTLINE PLANS**

Outline plans, also often referred to as concept plans, are conceptual schemes that provide a greater level of detail of the proposed development and its future impact on adjacent lands as compared to an ASP. They also demonstrate how an individual application complies with the MDP, other applicable statutory plans, and the overall municipal goals for development.

Outline plans are undertaken by the developer/landowner or their agents and can be done concurrently with an application for redesignation, land use amendment, or subdivision and may address the following topics:

- a. proposed phasing of the development;
- b. identification of servicing and access details for the development;
- c. outline of what the built environment will look like including:
  - a. lot configuration;
  - b. parcel sizes;
  - c. road widths and access locations;

# **Municipal District of Foothills No. 31 - Land Use Bylaw**

---

- d. all land uses;
- e. housing types and styles;
- f. architectural controls and other development restrictions;
- g. technical studies; and
- h. other detailed information to fully visualize the proposal;

Outline plans shall be prepared in accordance with approved Municipal policy, based on the scope and intensity of development proposed. They may require the provision of supportive reports and/or studies completed by a qualified professional including but not limited to those studies listed in this Appendix.

# **Foothills County - Land Use Bylaw**

---

## **APPENDIX B**

### **TELECOMMUNICATION TOWERS**

#### **POLICIES & PROCEDURE ON TELECOMMUNICATION TOWERS:**

*(Federally Regulated only, those that do not fall under federal jurisdiction must go through the necessary applications of the Foothills County).*

#### **VISION STATEMENT:**

The Foothills County (hereafter known as “the County”), by way of the policies listed, will take proactive steps to limit the number of towers within the County by encouraging carriers towards co-utilization. It is important to the Council of the County to have telecommunication towers placed in an area that will have the least amount of opposition to and visual impact upon nearby residents.

#### **POLICIES:**

##### **LOCATION**

New telecommunication towers should be encouraged to locate in the areas zoned as Agriculture District and Industrial District.

All equipment shelters and tower locations must meet the County’s setback distances to roads and property lines.

##### **CO-LOCATION**

All Carriers requesting a new telecommunication tower (freestanding antenna structure) will be required to identify any other such structure within a 5-mile radius of the proposed site location. Each request should also provide documentary evidence that co-location of the existing structures within that 5-mile radius is not a viable alternative to a second structure.

The co-location of additional carriers is preferred and supported by this County. Each new tower request should allow for co-utilization. Required are letters from all four currently registered telecommunication carriers (Rogers AT&T, Telus Mobility, Microcell Connexions and Bell Mobility) indicating that they can or cannot co-locate on this tower. Reasons for not co-locating will be required.

Future requests for towers within the vicinity of the proposed tower will not be supported by the County if that Carrier chooses not to co-locate when asked. Sufficient reasons and explanations will need to be submitted to support another tower in that area.

##### **PUBLIC CONSULTATION**

The carriers will be responsible for contacting area landowners within a one-mile area and for holding a public meeting prior to a submission to the County. The public consultation is intended to provide an opportunity for local community concerns to be addressed when a telecommunication tower is proposed. One staff member of the County and the Councillor for the area, or an alternative, will also attend this meeting.

**NOTE: SEE APPENDIX B1 FOR TEMPORARY ALTERNATE PUBLIC CONSULTATION PROCESS - COVID**

# **Foothills County - Land Use Bylaw**

---

The Freedom of Information and Protection of Privacy Act restricts the County from providing the Carriers with landowner information. Therefore, the County will be responsible for sending the mailout to those area residents within one mile, at the Carrier's cost. The fees for each mailout would depend on the number of people to be contacted for each area. With each mailout, the Carrier will be responsible to submit a letter which will give notification of the location of the tower, physical details of the tower, the time and location of the public meeting, and a contact name and phone number of someone employed by the Carrier who can answer questions regarding this proposal. The mailout should be sent 20 days prior to the public meeting and the Carriers should allow an extra 5 days to give the County reasonable time to get the notices out.

From the public meeting, the Carriers will be responsible to provide the County with a copy of the agenda and the minutes indicating the topics discussed, additional concerns raised with resolutions, and any outstanding issues that the Carriers and/or Landowners could not resolve. After the Public Consultation has been held, the Carrier, if it wishes to proceed, shall submit its formal proposal to the County.

## **DESIGN STANDARDS**

Where Canada Innovation, Science and Economic Development (ISED) or Industry Canada requires that a telecommunication tower be lighted, the following steps are encouraged to minimize visual impacts:

1. the lighting of equipment structures and any other facilities on site should be shielded from adjacent properties where possible without interfering with the requirements of Transport Canada;
2. all lighting should be a minimum number of low intensity white lights; and
3. the strobe interval should be the maximum allowable by Canada Innovation, Science and Economic Development and Industry Canada, and the strobe lights should only be used if absolutely necessary.

## **COUNTY FEES, CONSULTATION, AND DECISION**

The Carriers will submit, along with their formal proposal, the Telecommunications Towers application fee.

The Carriers will submit their formal proposal to the Development Officer of the County. The Development Officer will present the proposal to Council and will provide his/her position of support or non-support towards the formal proposal.

The County will provide its position to the Carriers within a 30-day period of receiving the proposal. This decision will also be forwarded to Industry Canada by the Development Officer.

## TEMPORARY ALTERNATE PUBLIC CONSULTATION REQUIREMENTS FOR TELECOMMUNICATION TOWERS

*Given the ongoing COVID 19 pandemic, the following alternate form of Public Consultation is deemed appropriate to fulfill the requirements of the Public Consultation portion of the Policies and Procedure under Appendix B Telecommunication Tower of the Land Use Bylaw, until otherwise directed by Council. (August 26, 2020, Council)*

### **Proponents will be responsible to:**

1. Mail a detailed notification package to landowners within the subject quarter section and for one mile surrounding.
2. Provide public access to online notification materials.
3. Draft materials, both mailed and online, are to be provided to County staff for review and acceptance. These materials must, at minimum, include:
  - a. Tower locations (including visual representation and site plan), specifications, and benefits.
  - b. Multiple forms of contact (i.e.: phone, mail, email); and options to contact the proponent, the assigned County contact, and the local office of Innovation, Science, and Economic Development Canada must be provided to the public.
  - c. ***The posting of adequate and informative signage placed in a highly visible area adjacent to the tower location. \*\****
  - d. Paid advertisement in the Western Wheel newspaper.
4. Where applicable, have consideration for Land-Use Authority and Public Consultation requirements as are included under Section 4.2 CPC-2-0-03 (Industry Canada).

### ***Timelines and Requirements:***

- A. The mailout of materials is at the proponent's cost and must follow the County's existing process and requirements for mailing services. As much information as possible shall be contained within the mailed notification, to accommodate any residents that may not have reliable service connections to appropriately respond to/view online materials.
- B. A 7-day time period for County staff to review all draft materials (written, online, and any signage) prior to the proponent's preparation of materials for mailing is required.
- C. The proponent is to allow 5 working days from the time of receipt of the notifications to give the County reasonable time to get the notices out.
- D. The proponent shall allow at least 30 days from the date of mailing for public comment.
- E. Record of all comments or concerns and any survey submissions, along with the proponent's response to the same, shall be forwarded to the assigned County contact as they are received.
- F. After the Public Consultation has been completed, the Proponent, if they wish to proceed, shall submit formal proposal to the County for Council's consideration.

## APPENDIX C

### **CONFINED FEEDING OPERATIONS**

#### **DEFINITION:**

“**Confined Feeding Operation (CFO)** is defined in the *Agricultural Operation Practices Act (AOPA)* as “an activity on land that is fenced or enclosed, or within buildings where livestock are confined for the purpose of growing, sustaining, finishing, or breeding by means other than grazing, but does not include seasonal feeding and bedding sites”. At the time of adoption of this policy, a CFO will require either registrations or approvals through the Natural Resources Conservation Board (NRCB). Readers are advised to contact the NRCB for up-to-date information.

The NRCB is the approving authority for CFO facilities. Additional facilities on the CFO site that are not included in the license, permit or approval, or other authorization granted by the NRCB and that will fall under the Municipal approval process are dealt with as outlined below. These are dealt with below.

#### **PROCEDURE FOR THE APPLICANT:**

- 1.0 The applicant must obtain the necessary license, permit, approval, or other authorization granted by the NRCB.
- 1.1 The applicant must then apply for a Development Permit for a “development incidental or ancillary to a CFO”, which is a permitted use in the Agricultural District. The applicant will be required to submit the following information with the Development Permit application:
  - Development Permit fees (please see the Development Officer for the amount);
  - Site plan indicating access locations to and from the lot, including roads and highways to be used;
  - A statement regarding the roads and highway to be used and dust control measure to be implemented;
  - A statement regarding the amount of traffic generated on a daily or monthly basis on those roads or hauling routes, whichever most accurately reflects the facts.
- 1.2 The Development Permit and supporting information is circulated by the Development Officer to the necessary referral agencies and internal departments (i.e., Public Works, Council, and Alberta Transportation).
- 1.3 The Development Officer makes an approved decision on the file and a letter is circulated to landowners within a half mile. The decision is based on a “permitted use” and, therefore, does not allow the right of appeal.
- 1.4 Upon the applicant’s completion of the conditions of approval, the file is closed.

# APPENDIX D

## Specified Penalties for Offences

*Table A – Specified Penalties For Offences*

Section	Description	Minimum Specified Penalty	Specified Penalty for Second Contravention (within twelve month period)	Specified Penalty for Third and Subsequent Contraventions (within twelve month period)
7.18.2(a)	Fail to comply with remedial order	\$2500.00	\$5000.00	\$7500.00
7.18.2(b)	Fail to comply with order to remedy	\$2500.00	\$5000.00	\$7500.00
7.18.2(c)	Fail to comply with stop order	\$2500.00	\$5000.00	\$7500.00
7.18.2(d)	Obstruct / interfere with Designated Officer Community Peace Officer / Bylaw Enforcement Officer in execution of their duties	\$2000.00	\$4000.00	\$6000.00
9.24.11(a)	Erect / place / affix / locate or allow any person to erect / place / affix / locate a sign that obstructs visibility at roadway intersections	\$2000.00	\$4000.00	\$6000.00
9.24.11(b)	Erect / place / affix / locate, or allow any person to erect / place / affix / locate a sign on private property without the consent of owner	\$750.00	\$1500.00	\$2250.00
9.24.11(c)	Erect / place / affix / locate, or allow any person to erect / place / affix / locate a sign not compliant with Dark Sky Bylaw	\$750.00	\$1500.00	\$2250.00
9.24.11(d)	Erect /place / affix / locate , or allow any person to erect / place / affix / locate an animated or illuminated sign without approval	\$750.00	\$1500.00	\$2250.00

9.24.11(e)	Erect / place / affix / locate, or allow any person to erect / place / affix / locate a temporary sign exceeding 14 days at location	\$750.00	\$1500.00	\$2250.00
9.24.11(f)	Erect place / affix / locate, or allow any person to erect / place / affix / locate a sign not complying with setback requirements	\$750.00	\$1500.00	\$2250.00
9.24.11(g)	Erect / place / affix / locate, or allow any person to erect / place / affix / locate a sign within 300 m from limit of controlled highway without permit	\$2000.00	\$4000.00	\$6000.00
9.24.11(h)	Erect place / affix / locate, or allow any person to erect / place / affix / locate a sign within 800 m. from centre point of intersection of a controlled highway / another highway / public roadway without permit	\$2000.00	\$4000.00	\$6000.00
9.24.11(i)	Erect / place / affix / locate, or allow any person to erect / place / affix / locate a sign requiring a development permit without such permit	\$2000.00	\$4000.00	\$6000.00
9.24.11(j)	Erect / place / affix / locate, or allow any person to erect / place / affix / locate any prohibited sign	\$2000.00	\$4000.00	\$6000.00
9.24.11(k)	Erect / place / affix / locate, or allow any person to erect / place / affix / locate a non-compliant sign	\$2000.00	\$4000.00	\$6000.00

**APPENDIX E**



Keeping the Night Skies Dark – 2011

## TABLE OF CONTENTS

1.0 Enactment	3
2.0 Preamble	3
3.0 Definitions	3
4.0 General Requirements	4
4.1 Shielding	
4.2 Lamp types	
4.3 Voluntary light curfews	
5.0 Street Lighting	5
6.0 Signage	5-6
7.0 Enhanced Preservation Areas	6-8
7.1 Observatories	
7.2 Curfews	
7.3 Signage	
7.4 Miscellaneous	
8.0 Prohibitions	9-10
8.1 Shielding	
8.2 Lamps	
8.3 Laser Light Sources	
8.4 Outdoor Advertising Signs	
8.5 Streetlights	
8.6 Searchlights	
8.7 Light Trespass	
8.8 Glare	
9.0 Exemptions	10-11
9.1 Temporary Exemptions	
9.2 Permanent Exemptions	
9.3 Grandfathering of Existing Luminaires	

10.0 Remedial Orders, Enforcement, Appeals	12
10.1 Remedial Orders and Enforcement	
10.2 Appeals	
11.0 Severability	12
Appendix	13-20
1. Technical Standards	
2. Examples of Permitted and Prohibited Luminaires	
3. Consolidated List of Definitions	
4. Temporary Exemption Application	

## 1.0 ENACTMENT

A bylaw to regulate light pollution.

The Council of the Municipal District<sup>1</sup> of Foothills No. 31 (herein referred to as: The MD) has passed, for three readings, Bylaw 27/2009, on April 16<sup>th</sup>, 2009, entitled the DARK SKY BYLAW. On June 15<sup>th</sup>, 2011, The MD passed for three readings an amendment to Bylaw 27/2009. The purpose and intent of Bylaw 27/2009 and subsequent amendments is to regulate the type of light source and fixture that is to be installed by any person<sup>2</sup> in the MD, thereby mitigating further light pollution, and reducing existing light pollution, that is shown (in certain instances) to adversely affect astronomical observation, plant and animal cycles, and the safety and health of those persons within the MD.

## 2.0 PREAMBLE

The DARK SKY BYLAW will be exclusive of the Municipal Development Plan (bylaw 139/98 and 30/04) and the Land Use Bylaw (1/99) of the MD and any amendments and rewritings of the abovementioned documents.

The DARK SKY BYLAW will bring into immediate effect the prohibition of inefficient<sup>3</sup> incandescent light bulbs for outdoor use, in accordance with the Government of Canada's decision to phase out the sale and use of ALL inefficient light bulbs by the year 2012 (Government of Canada 2008).

---

<sup>1</sup> **Municipal District:** the Municipal District of Foothills No. 31, a Municipal District duly established pursuant to the laws of the Province of Alberta, or the area within the legal boundaries of the Municipal District of Foothills No. 31.

<sup>2</sup> **Person(s):** includes a corporation, other legal entities and an individual having charge or control of a premises.

<sup>3</sup> **Efficiency:** relative to lighting, efficiency is calculated by how many lumens (a unit of light measurement) a light source can produce per watt of power input. The higher the lumens per watt, the more efficient the light source is.

### 3.0 DEFINITIONS

The definitions pertinent to this bylaw are embedded within the document to ensure ease of understanding for the reader. The embedded definitions are in footnotes at the end of each page, with a consolidation of definitions available in the appendix.

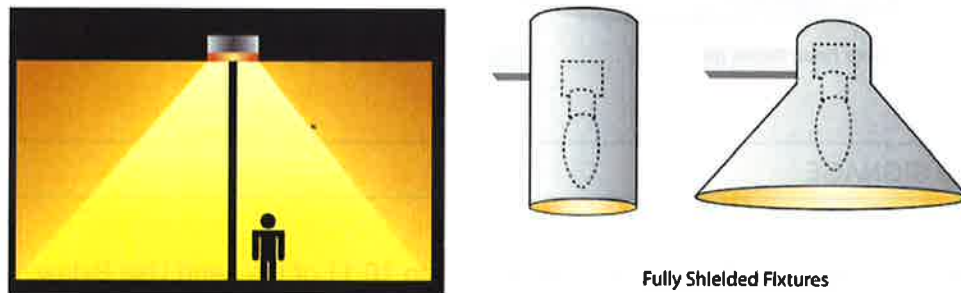
### 4.0 GENERAL REQUIREMENTS

All development approved after the passing of this bylaw is subject to the rules and regulations setout herein.

#### 4.1 Shielding

FULL CUT-OFF<sup>4</sup> fixtures<sup>5</sup> shall be installed for all exterior lighting and all fixtures shall be oriented as to direct ALL light below the horizon<sup>6</sup>. See Figure 1.

Figure 1



#### 4.2 Lamp<sup>7</sup> Types

Permitted lamps within the MD are restricted to specific types of High Intensity Discharge (HID) light sources. Please see the *Technical Standards* section of the appendix (page 14).

<sup>4</sup> **Full cut-off fixture:** A light fixture that does not allow any light dispersion above the horizontal plane, and whose lamp (bulb) is recessed fully within the housing of the fixture itself.

<sup>5</sup> **Fixture:** the assembly that houses the lamp(s) and can include all or some of the following parts; housings, mounting brackets, and pole sockets.

<sup>6</sup> **Horizon:** the apparent intersection where the earth meets the sky, also referred to as the *apparent* horizon.

<sup>7</sup> **Lamp:** the component of a luminaire (complete lighting system including lamp and fixture) that produces light, commonly referred to as a light bulb.

#### 4.3 Voluntary Light Curfews

ALL residential, commercial, industrial, recreational, and institutional users of exterior night time illumination are encouraged to extinguish luminaires when not required.

### 5.0 STREET LIGHTING

In addition to the MD street lighting policy, adopted April 19, 2001 (ADC-STN-1), ALL streetlights installed after the adoption of this bylaw shall be of the cut-off<sup>8</sup> flat lens fixture variety (see Figure 2). Furthermore, ALL streetlights shall be subject to the standards set out in the *Technical Standards* section of the appendix (page 14).

Figure 2



Flat lens cobra head fixture (permitted)



Drop lens cobra head fixture (prohibited)

### 6.0 SIGNAGE

ALL signage in the MD is regulated by Section 10.11 of the Land Use Bylaw. Further to the regulations set out in Section 10.11 of the Land Use Bylaw, ALL new signage in the MD requiring night-time illumination shall be illuminated only from the top of the sign, and only with full cut-off fixtures, oriented such that ALL light will be directed downward and below the horizon (see Figure 3).

ALL signage in the MD installed prior to the passing of this bylaw that is used for advertising/entertainment purposes that does NOT comply with the above regulation shall be required to extinguish artificial illumination by<sup>9</sup>:

- 11 pm between April 1<sup>st</sup> and September 30<sup>th</sup>

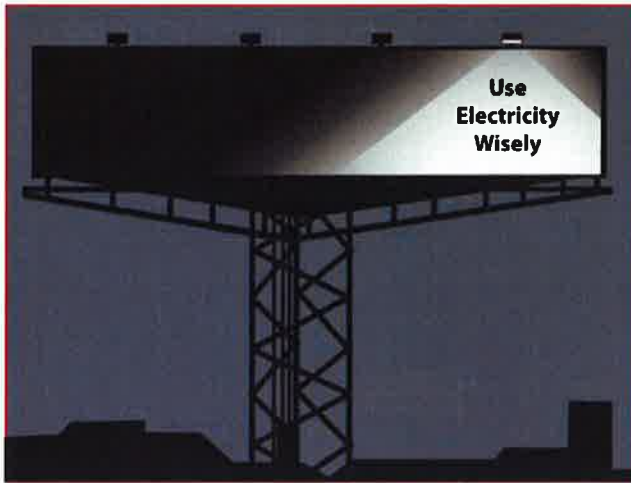
<sup>8</sup> **Cut-off fixture:** a fixture allowing no more than 2.5% of direct light emitted above the horizontal plane.

<sup>9</sup> Curfews are generally aligned with the Vernal (March 20-21) and Autumnal (September 22-23) Equinoxes.

- 9 pm between October 1<sup>st</sup> and March 31<sup>st</sup>

UNLESS approved business hours<sup>10</sup> surpass the prescribed curfew times.

Figure 3



Billboard illuminated from the top (permitted)



From the bottom (prohibited)

## 7.0 ENHANCED PRESERVATION AREAS

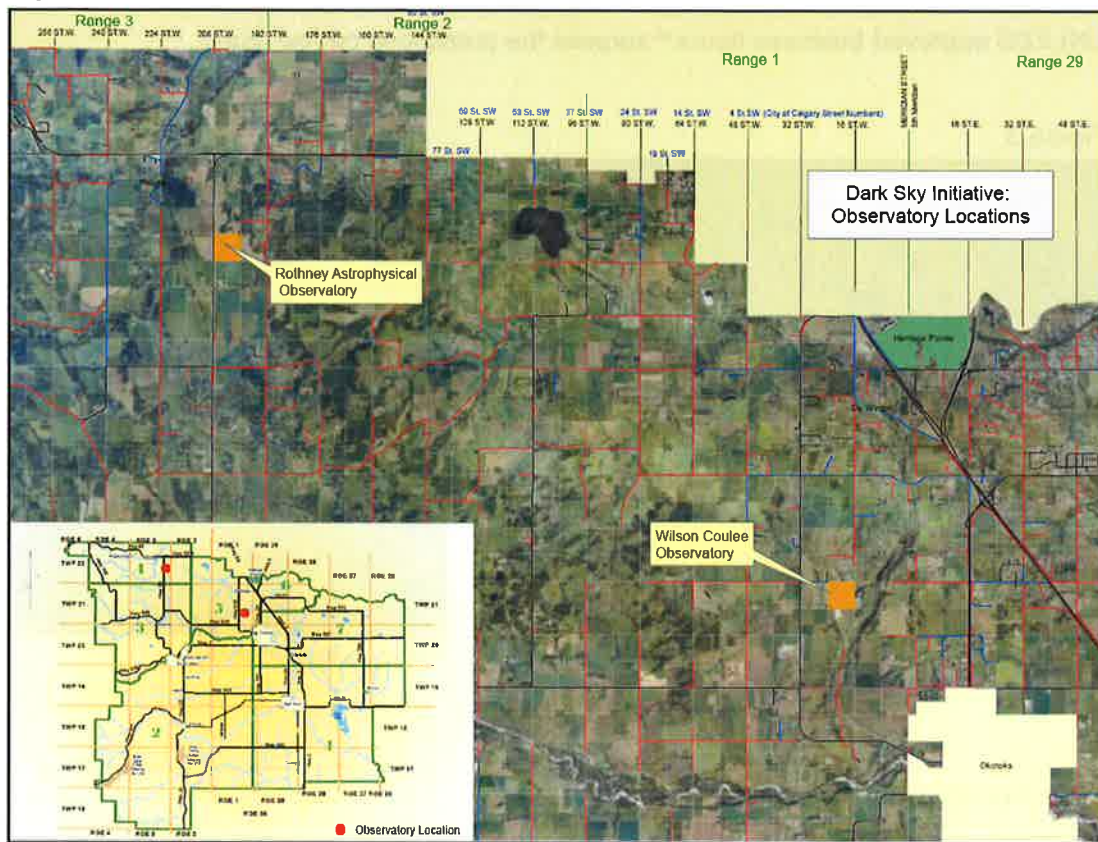
The following regulations will apply within the identified *Enhanced Preservation Areas* shown around the observatories in Figure 5.

### 7.1 Observatories

The University of Calgary's Rothney Astrophysical Observatory (RAO) and the Royal Astronomical Society of Canada's Wilson Coulee Observatory (WCO) are situated within the boundaries of the MD. See Figure 4.

<sup>10</sup> Business hours: those operating hours as outlined in the business's Development Permit.

Figure 4



Geographic location of the RAO and WCO

## 7.2 Curfews

ALL existing sources of exterior illumination, including but not limited to residential, commercial, industrial, recreational, institutional, and signage for the purposes of advertising/entertainment that do NOT comply with pertinent sections of this bylaw shall be turned off by<sup>11</sup>:

- i. 11 pm from April 1<sup>st</sup> to September 30<sup>th</sup>
- ii. 9 pm from October 1<sup>st</sup> to March 30<sup>th</sup>

When enforcing Section 7.2 of this bylaw, the municipality may take into account any practical considerations, including business hours of operation seasonal nighttime differences, and so on.

<sup>11</sup> Curfews are generally aligned with the Vernal (March 20-21) and Autumnal (September 22-23) Equinoxes.

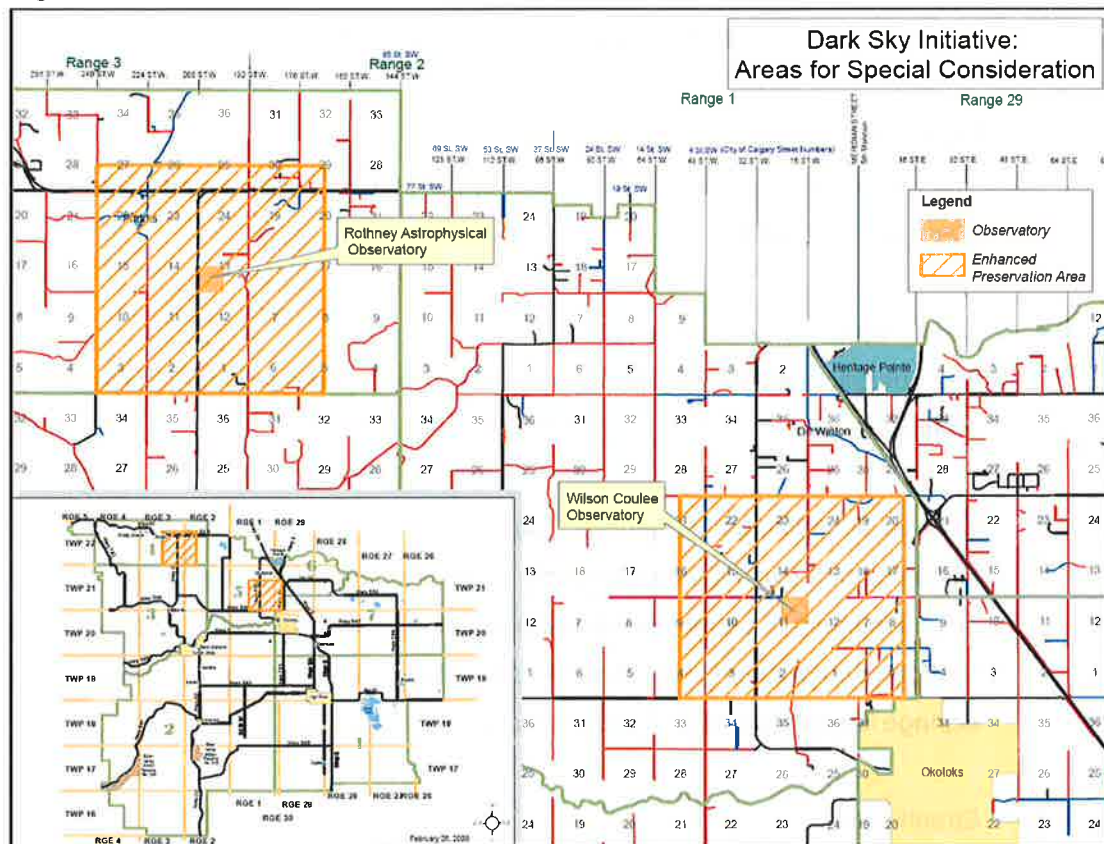
### 7.3 Signage

No new illumination for the purpose of advertising/entertainment shall be permitted within the specified radius of the observatories. See Figure 5.

### 7.4 Miscellaneous

ALL persons residing within the specified radius are encouraged to use the least powerful lamps possible for their outdoor lighting needs and take the steps necessary to make existing lighting compliant with this bylaw.

Figure 5



Enhanced Preservation Area surrounding both the RAO and WCO

## 8.0 PROHIBITIONS

### 8.1 Shielding

ALL luminaires that are not fully shielded and are not exempt as per Section 9 of this bylaw, are prohibited for use in the MD.

### 8.2 Lamps

To align with the Government of Canada's phasing out of all inefficient lamps by 2012, inefficient incandescent lamps are strictly prohibited for exterior use in the MD, effective immediately. Furthermore, the use of mercury vapor lamps is also prohibited for exterior applications in the MD.

### 8.3 Laser light sources

The use of laser light sources for outdoor advertising and/or entertainment purposes is prohibited.

### 8.4 Searchlights<sup>12</sup>

The operation of searchlights for advertising and/or entertainment purposes is prohibited.

### 8.5 Outdoor advertising/entertainment signs

Illumination of existing non-compliant outdoor signage after approved business hours is prohibited unless the luminaire is retrofitted to be fully shielded and oriented as to direct ALL light below the horizon. ALL new signage illumination MUST be compliant with this bylaw.

### 8.6 Streetlights

The use of drop lens cobra head light fixtures for street lighting purposes is prohibited. Only flat lens streetlight fixtures are permitted.

---

<sup>12</sup> **Searchlight:** A luminaire containing a light source and a reflector for throwing a high-intensity beam of generally parallel beams of light.

### 8.7 Light Trespass<sup>13</sup>

Effective immediately, no luminaire shall be oriented such that the light it emits trespasses beyond the property line on which the luminaire is situated, see Figure 6.

Figure 6



### 8.8 Glare<sup>14</sup>

No luminaire that produces glare due to its bulb type, power, and/or orientation, shall be permitted.

## 9.0 EXEMPTIONS

### 9.1 Temporary Exemptions

Temporary activities may be exempt from the regulations set out in this bylaw on a provisional basis. Those persons granted exemptions are required to extinguish lighting immediately after the use has ended, and furthermore, are encouraged to ensure that, if possible, the lighting fixtures used for temporary purposes are fully shielded, whether it is achieved through retro-fitting, or the acquisition of fully shielded light fixtures at the time the lighting is purchased. Any persons granted temporary exemptions that in the future become permanent shall be required to adhere to this bylaw. Please see Section 3 of the appendix for further information on temporary exemptions, including a copy of the Temporary Exemption Application.

<sup>13</sup> **Light Trespass:** the shining of light produced by a luminaire beyond the boundaries of the property on which it is located.

<sup>14</sup> **Glare:** light emitting from a luminaire with intensity great enough to reduce visibility and in extreme cases momentarily blind observers.

## 9.2 Permanent Exemptions

- i. Intermittent<sup>15</sup> activities including but not limited to the following areas are exempt from the regulations of this bylaw on a permanent basis and do not require the benefit of an approved Temporary Exemption Application.
  1. Agriculture
  2. Resource extraction
  3. Construction
  4. Filming
  5. Holiday lighting
- ii. Street lighting is partially exempt from Section 4.1 of this bylaw, requiring only cut-off fixtures and not full cut-off fixtures.
- iii. Street lighting is exempt from Section 7.2 of this bylaw on a permanent basis due to implications of safety on roadways.
- iv. Street lighting is partially exempt from Section 8.7 of this bylaw on a permanent basis due to the need for wide dispersion of street lighting for safety and efficiency purposes. Some trespass is permitted.
- v. Outdoor advertizing/entertainment signs within 500 metres of the right-of-way of Highway 2 (see Figure 7) may be internally illuminated by the use of neon lamps. Such signage must have opaque backgrounds only and any such lamps shall be fully enclosed in cabinets. Illumination of signage within this area must be extinguished outside of approved business hours. All aspects of this form of exempted signage are to the discretion of the Approving Authority.
- vi. Any activity or use that is regulated by a body superseding the authority and jurisdiction of the MD is exempt from this bylaw.

---

<sup>15</sup> **Intermittent:** activities lasting 20 consecutive working days (approximately one month) or less, upon which exterior lighting is required at approximately the same time each night.

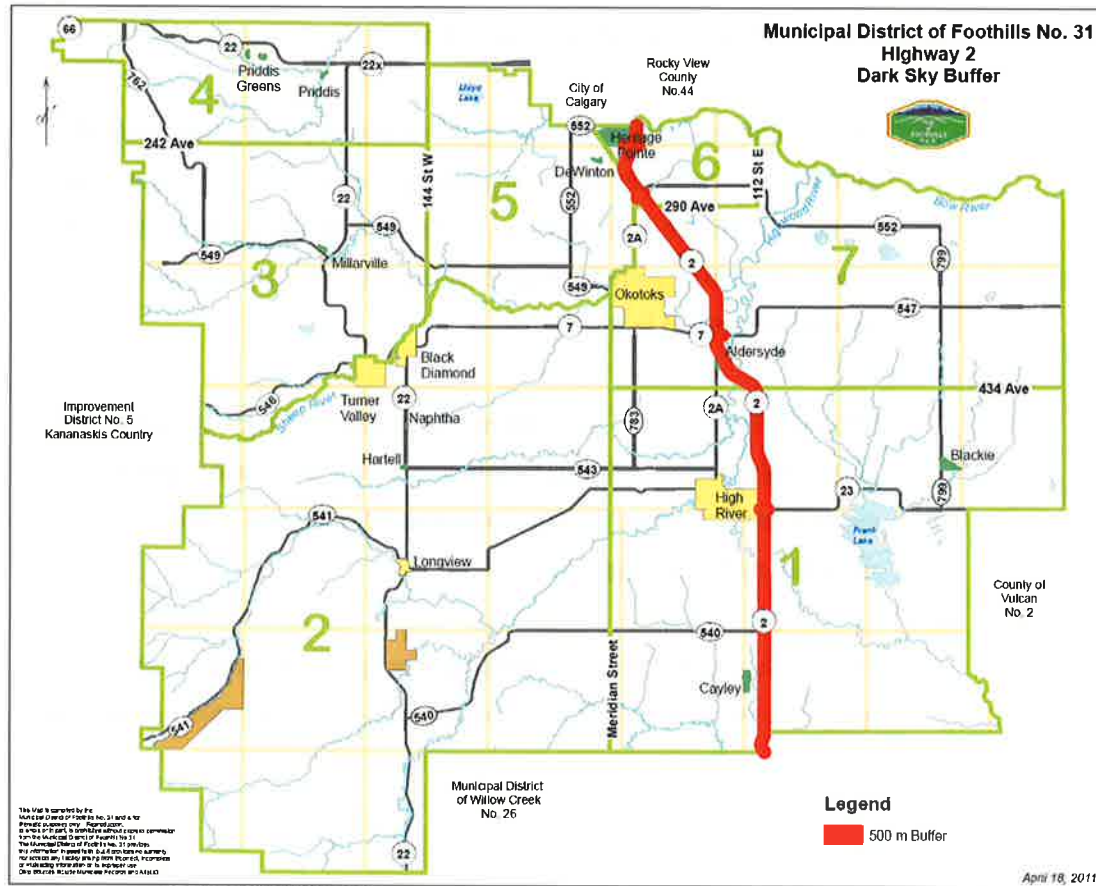
### 9.3 Grandfathering of Non-conforming Luminaires

- i. ALL luminaires and luminous signs lawfully in place prior to the date of the adoption of this bylaw shall be grandfathered. In the case that grandfathered luminaires are to be moved, repaired, or replaced for any reason, the luminaire shall then be required to meet the provisions set out in this bylaw.
- ii. Should grandfathered luminaires<sup>16</sup> currently in place cause glare and/or light trespass, the owner is to rectify the situation at their earliest convenience. Should the owner choose not to do so, a remedial order may be issued.
- iii. The MD is committed to developing a program that will assist homeowners with retrofitting their existing non-compliant luminaires.

---

<sup>16</sup>**Grandfathered Luminaires:** luminaires not conforming to this bylaw in operation prior to the date of the passing of this bylaw.

Figure 7



Lands within 500 metres of the Highway 2 right-of-way.

## 10.0 REMEDIAL ORDERS, ENFORCEMENT, APPEALS

### 10.1 Remedial Orders and Bylaw Enforcement

- i. Should any part of the Dark Sky Bylaw not be adhered to, the responsible person(s) will be provided with a notification of the infraction, accompanied by a time limit in which it must be corrected.
- ii. Should the responsible person(s) choose not to correct the infraction in the time provided and in a manner deemed appropriate by the MD, a remedial order may be issued.

## 10.2 Appeals

The Community Standards Appeal Board shall be the board responsible for hearing appeals of remedial orders issued to person(s) that have not adhered to the regulations of the Dark Sky Bylaw.

## 11.0 SEVERABILITY

Should any part, section, subsection, or portion of this bylaw be repealed or declared by a court of competent jurisdiction to be illegal, the same shall not affect the validity of the bylaw as a whole or in part thereof, except for that which was declared to be invalid.

# APPENDIX

1. Technical Standards
2. Examples of Permitted and Prohibited Luminaires
3. Consolidated List of Definitions
4. Temporary Exemption Application

### Preamble

Technical Standards are subject to change as lighting technology advances and therefore the following technical standards outlined below may be amended from time to time.

### Section 4, sub-section 4.2: Lamp Types

Permitted lamps within the MD are restricted to specific types of High Intensity Discharge (HID), and other light sources, including but not limited to:

1. High Pressure Sodium (HPS) *HID*
2. Low Pressure Sodium (LPS) *HID*
3. Light Emitting Diode (LED)
4. Quartz Halogen
5. Fluorescent (including but not limited to compact fluorescent)
6. Metal Halide *HID*
7. Neon (ONLY in the area identified in Figure 7 of the Bylaw)

### Section 5: Street Lighting

ALL streetlights shall use LPS, HPS, LED, or metal halide lamps in streetlight design. The following lamp wattages are permitted for the corresponding application, in accordance with the Illuminating Engineering Society of North America (IESNA)<sup>17</sup> recommendations.

1. 70 w for residential
2. 100 w for intersections
3. 100 – 200 w for major thoroughfares
4. 200 w for pole spacing ratio of greater than 5:1
5. Pole spacing ratio not to exceed IESNA luminance and uniformity standards
6. Pole spacing ratio assumes values 3:1 to 10:1 based on usage

<sup>17</sup> IESNA: is the international body that acts as the standards committee for responsible outdoor lighting, the Illuminating Engineering Society of North America.

## 2 Examples of Permitted and Prohibited Luminaires



Permitted wallpack Luminaire



Prohibited wallpack luminaire



Permitted pole-mounted luminaire



Prohibited pole-mounted luminaire



Prohibited decorative luminaire  
(Unshielded, exposed lamp)



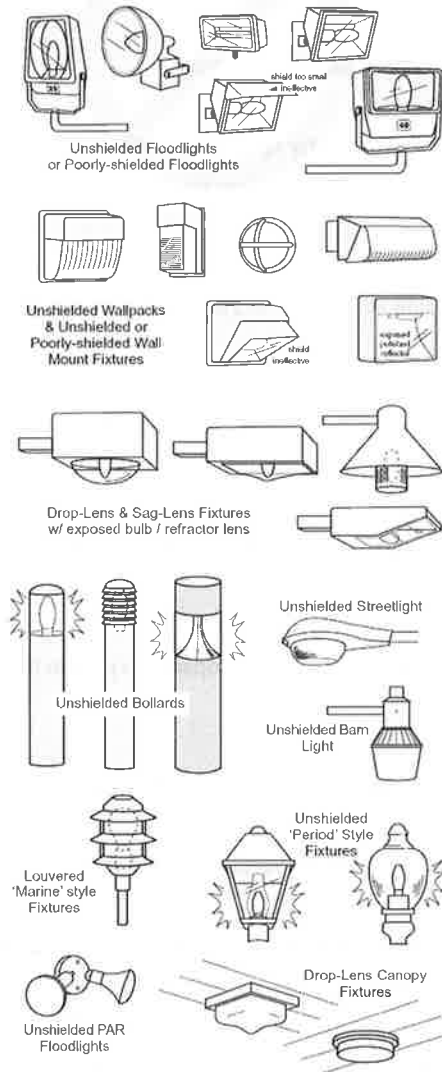
Prohibited decorative luminaire  
(Unshielded, exposed lamp)

# Better Lights for Better Nights

Help eliminate light pollution. Select the best fixture for your application using this guide. Use the lowest wattage bulb appropriate for the task and turn off the light when it's not being used.

## Unacceptable / Discouraged

Fixtures that produce glare and light trespass



## Acceptable

Fixtures that shield the light source to minimize glare and light trespass and to facilitate better vision at night



Rendered for the Town of East Hampton, NY by Bob Crelin 6/205

presented by the

**Dark Sky Society**

[www.darksksociety.org](http://www.darksksociety.org)

Illustrations by Bob Crelin, used with permission. You may freely copy and distribute this document.

**Business hours:** those operating hours as outlined in the business's Development Permit.

**Color Rendition:** the visible wavelengths at which the lamp operates, sometimes making light appear as though it has a color to it, such as yellow or blue.

**Cut-off fixture:** a fixture allowing no more than 2.5% of all light emitted above the horizontal plane.

**Efficacy:** measured in lumens per watt, the ability of a lamp to produce illumination.

**Efficiency:** relative to lighting, efficiency is calculated by how many lumens (a unit of light measurement) a light source can produce per watt of power input. The higher the lumens per watt, the more efficient the light source is.

**Fixture:** the assembly that houses the lamp(s) and can include all or some of the following parts; housings, mounting brackets, and pole sockets.

**Full cut-off fixture:** A light fixture that does not allow any light dispersion above the horizontal plane, and whose lamp (bulb) is recessed fully within the housing of the fixture itself.

**Glare:** light emitting from a luminaire with intensity great enough to reduce visibility and in extreme cases momentarily blind onlookers.

**Grandfathered Luminaires:** luminaires not conforming to this bylaw that were in operation prior to the passing of this bylaw.

**Horizon:** the apparent intersection where the earth meets the sky, also referred to as the *apparent* horizon.

**IESNA:** is the international body that acts as the standards committee for responsible outdoor lighting.

**Intermittent:** activities lasting 20 consecutive working days (approximately one month) or less, upon which exterior lighting is required at approximately the same time each night.

**Lamp:** the component of a luminaire (complete lighting system including lamp and fixture) that produces light, commonly referred to as a light bulb.

**Light Trespass:** the shining of light produced by a luminaire beyond the boundaries of the property on which it is located.

**Lumen:** a unit of luminous flux equal to the light emitted in a unit solid angle by a uniform point source. In most instances the greater the number of lumens per watt of energy, the more efficient the lamp will be.



**Lumen Maintenance:** also referred to as lumen depreciation, is the loss in the ability of a luminaire to produce light over its lifespan.

**Municipal District:** the Municipal District of Foothills No. 31, a Municipal District duly established pursuant to the laws of the Province of Alberta, or the area within the legal boundaries of the Municipal District of Foothills No. 31.

**Opaque:** impenetrable to any light source, including but not limited to artificial light sources.

**Person:** includes a corporation, other legal entities and an individual having charge or control of a premises.

**Searchlight:** A luminaire containing a light source and a reflector for throwing a high-intensity beam of generally parallel beams of light.

	<b>Dark Sky Bylaw: Temporary Exemption Application</b>										
<p><b>CONTACT INFORMATION (LANDOWNER)</b></p> <p>NAME(S): _____</p> <p>ADDRESS: _____</p> <p>TELEPHONE: _____</p> <p>FAX: _____</p> <p>EMAIL: _____</p>	<p><b>CONTACT INFORMATION (OTHER)</b></p> <p>NAME(S): _____</p> <p>ADDRESS: _____</p> <p>TELEPHONE: _____</p> <p>FAX: _____</p> <p>EMAIL: _____</p>										
<p><b>PROPERTY LOCATION AND LEGAL DESCRIPTION</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">PLAN: _____</td> <td style="width: 33%;">BLOCK: _____</td> <td style="width: 33%;">LOT: _____</td> </tr> <tr> <td>QUARTER: _____</td> <td>TOWNSHIP: _____</td> <td>RANGE: _____</td> </tr> <tr> <td></td> <td></td> <td>MERIDIAN: _____</td> </tr> </table>			PLAN: _____	BLOCK: _____	LOT: _____	QUARTER: _____	TOWNSHIP: _____	RANGE: _____			MERIDIAN: _____
PLAN: _____	BLOCK: _____	LOT: _____									
QUARTER: _____	TOWNSHIP: _____	RANGE: _____									
		MERIDIAN: _____									
<p><b>DESCRIPTION OF ACTIVITY REQUIRING EXEMPTION</b></p> <p>START DATE: _____</p> <p>END DATE: _____</p> <p>DURATION (NIGHTLY): _____</p> <p>NATURE OF ACTIVITY: _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>											
<p><b>LIGHTING PLAN REQUIREMENTS</b></p> <p>BULB TYPE: _____</p> <p>WATTAGE: _____</p> <p>SHIELDING: NONE <input type="checkbox"/> PARTIAL <input type="checkbox"/> FULL <input type="checkbox"/></p> <p>LOCATION OF LUMINAIRES (SHOW ON PROPERTY SKETCH AND ATTACH)</p> <p>WILL LIGHT TRESPASS ONTO ADJACENT PROPERTIES: YES <input type="checkbox"/> NO <input type="checkbox"/></p>											
<p>_____  <b>LANDOWNER SIGNATURE (AUTHORIZING ACTIVITY TO TAKE PLACE)</b>      <b>DATE</b></p> <p>_____  <b>SIGNATURE OF PERSON(S) ACTING ON BEHALF OF LANDOWNER</b>      <b>DATE</b></p>											

**THIS SIDE FOR OFFICE USE ONLY**

**DECISION:**

**APPROVED** ☐ **APPROVED WITH CONDITIONS** ☐ **REFUSED** ☐

**CONDITIONS (IF APPROVED WITH SUCH)**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

**REASONS FOR REFUSAL (IF REFUSED):**

---

---

---

---

**SIGNATURE:**

**DATE:**

**Please Note: Temporary Exemption Applications are required only for activities requiring structure based lighting. See below for examples.**

**Examples of activities requiring Temporary Exemption Applications**

- Celebrations (weddings, birthdays, festivals, etc)
- Non-permanent sporting events
- Concerts

**Examples of activities not requiring Temporary Exemption Applications**

- Resource extraction equipment operation
- Agricultural equipment operations
- Protective services

## **APPENDIX F**

### **The Riparian Setback Matrix Model**



**Prepared for:**  
Municipal District of Foothills  
Box 5605  
High River, Alberta, Canada  
T1V 1M7

**Prepared by:**  
Aquality Environmental Consulting Ltd.  
#705, 10240 – 124 Street N.W.  
Edmonton, Alberta  
T5N 3W6

**Writers:**  
Joshua Haag, B.Sc.  
Melissa Logan, B.Sc., P.Biol.  
Jay White, M.Sc., P.Biol.

**Model Developers:**  
Melissa Logan B.Sc., P.Biol  
Michelle Gray B.Sc., B.I.T.  
Judy Stewart, LLB

March 31, 2010

Mr. Spencer Croil  
P.O. Box 5605  
309 MacLeod Trail  
High River, AB  
T1V 1M7

Dear Mr. Croil,

**Re: The Riparian Setback Matrix Model**

AQUALITY is pleased to present you with the Riparian Setback Matrix Model, which has been adapted for use within the MD of Foothills. With this tool in hand, the MD of Foothills will be better prepared to manage riparian areas and protect water quality for the future enjoyment of all residents and visitors to the area. The Model will also complement any future policies or bylaws that the MD adopts in order to further protect environmentally sensitive and significant areas.

In this document you will find an introduction to the importance of riparian areas, how we developed the Matrix, the Matrix Model, how to use it, and further considerations. References that support the science of the model are provided. We have also included a companion document, the Developer's Guide for distribution to those who wish to develop in areas adjacent to watercourses within the MD.

We would like to thank you for the opportunity to work with you on this project. If you have any questions or concerns regarding the RSMM, please feel free to call the undersigned at (780) 757-5530.

Yours truly,

AQUALITY ENVIRONMENTAL CONSULTING LTD.

Per: \_\_\_\_\_  
Jay S. White, M.Sc., P.Biol.  
Principal

## Table of Contents

<b>Table of Tables .....</b>	<b>4</b>
<b>Table of Figures .....</b>	<b>4</b>
<b>Acknowledgments .....</b>	<b>5</b>
<b>1 Introduction .....</b>	<b>6</b>
1.1 Purpose .....	6
1.2 Environmental Reserves .....	6
1.3 Environmental Reserve Easements and Conservation Easements.....	9
1.4 Development Setbacks for Buildings .....	9
1.5 Riparian Areas .....	10
1.6 Environmental Legislation.....	11
<b>2 Development of the Riparian Setback Matrix Model .....</b>	<b>14</b>
<b>3 The Riparian Setback Matrix Model.....</b>	<b>14</b>
3.1 Riparian Setback Matrix Model - Setback Determinations.....	14
3.2 How to use the Riparian Setback Matrix Model .....	17
3.3 Slope and Bank Height .....	19
3.4 Groundwater Influence.....	20
3.5 Vegetation Type .....	21
3.6 Soil Texture and Type.....	22
<b>4 Professional Requirement for Site Assessments .....</b>	<b>24</b>
<b>5 Summary and Conclusions .....</b>	<b>25</b>
5.1 Remote Sensing and the RSMM .....	25
5.2 Other Considerations .....	26
<b>6 References .....</b>	<b>27</b>
6.1 Riparian Setback Matrix Model References by Category .....	27
6.2 References .....	28
<b>7 Appendix A – Vegetation Definitions .....</b>	<b>32</b>
<b>8 Appendix B - Example Worksheet.....</b>	<b>33</b>

## Table of Tables

Table 1. Legislation and policy involving riparian land management. ....	12
Table 2. The Riparian Setback Matrix Model (RSMM) for waterbodies in the Municipal District of Foothills. Parameters or measurements that may lead to intervention or modification of the prescribed setbacks by municipal administrators are highlighted in yellow; parameters or measurements requiring special surveys or other technical considerations are highlighted in red. ....	15
Table 3. Recommended Riparian Setbacks for Nitrogen, Phosphorus and Sediment Control. ....	16

## Table of Figures

Figure 1. Illustration of bed and bank which is Public Land and owned by the Province and the Environmental Reserve land that is owned by the Municipality. ....	8
Figure 2. Federal and Provincial legislation that can be used to protect riparian habitats. ....	13
Figure 3. Potential pathways for nutrient and pollutant input from sloping lands to surface water(A) surface runoff, (B) subsurface flow, and (C) groundwater (Taken from Li <i>et al</i> 2006). ....	21
Figure 4. Nitrogen removal effectiveness in riparian buffers by buffer vegetation type and water flow path. The center vertical line of the box and whisker plot marks the median of the sample. The length of each box shows the range within which the central 50% of the values fall. Taken from Mayer <i>et al</i> (2005). We do not use wetland or forested wetland cover type in our model. ....	22

## **Acknowledgments**

We would like to acknowledge Gerry Haekel, Judy Stewart, Barry Kolenosky, Krystle Fedoretz, the Bow River Basin Council and Urban Systems for their contributions towards the development of this Riparian Setback Matrix Model. We would also like to acknowledge the Alberta Conservation Association for providing funding for the development of this model.

## **1 Introduction**

### **1.1 Purpose**

Facing immense development pressures, the need to protect and restore the riparian areas in the Municipal District of Foothills has become increasingly apparent. The Riparian Setback Matrix Model is a tool that was developed in 2007 by Aquality for Lac La Biche County (formerly Lakeland County) and has subsequently been incorporated in their municipal bylaws. Aquality has modified the model to meet the development needs and conservation objectives of the MD of Foothills. The Riparian Setback Matrix Model creates unique, defensible Environmental Reserve setbacks based on slope, height of bank, groundwater table level, soil type and texture, and vegetation/ground cover. These development setbacks will help to protect riparian lands<sup>1</sup> and maintain the ecological goods and services that healthy and functional riparian areas provide for future generations' benefit.

The purpose of this document is to help municipalities and developers determine the appropriate area of an Environmental Reserve (ER) to maintain healthy and functional riparian areas free from pollution<sup>2</sup> while providing public access that will not impede natural functions. In addition, the Riparian Setback Matrix Model can be used to determine appropriate development setbacks and land uses for all private lands located adjacent to environmentally sensitive and or significant lands within a municipality.

### **1.2 Environmental Reserves**

During subdivision of a parcel of land, under conditions prescribed in the *Municipal Government Act* (MGA), a municipality may acquire "reserve lands". Reserve lands include "environmental reserves" which are essentially "undevelopable" lands that must be left in their natural state or used as a public park, and "municipal reserves", "school reserves", or "municipal and school reserves", which are dedications of up to 10% of the remaining "developable" lands in the parcel after the removal of environmental reserves and any lands required for roads and public utility lots. If insufficient land is available, the developer may provide a monetary payment equivalent to the market value of up to 10% of the developable lands (cash in lieu). Dedicated reserves become property of the municipality in which

---

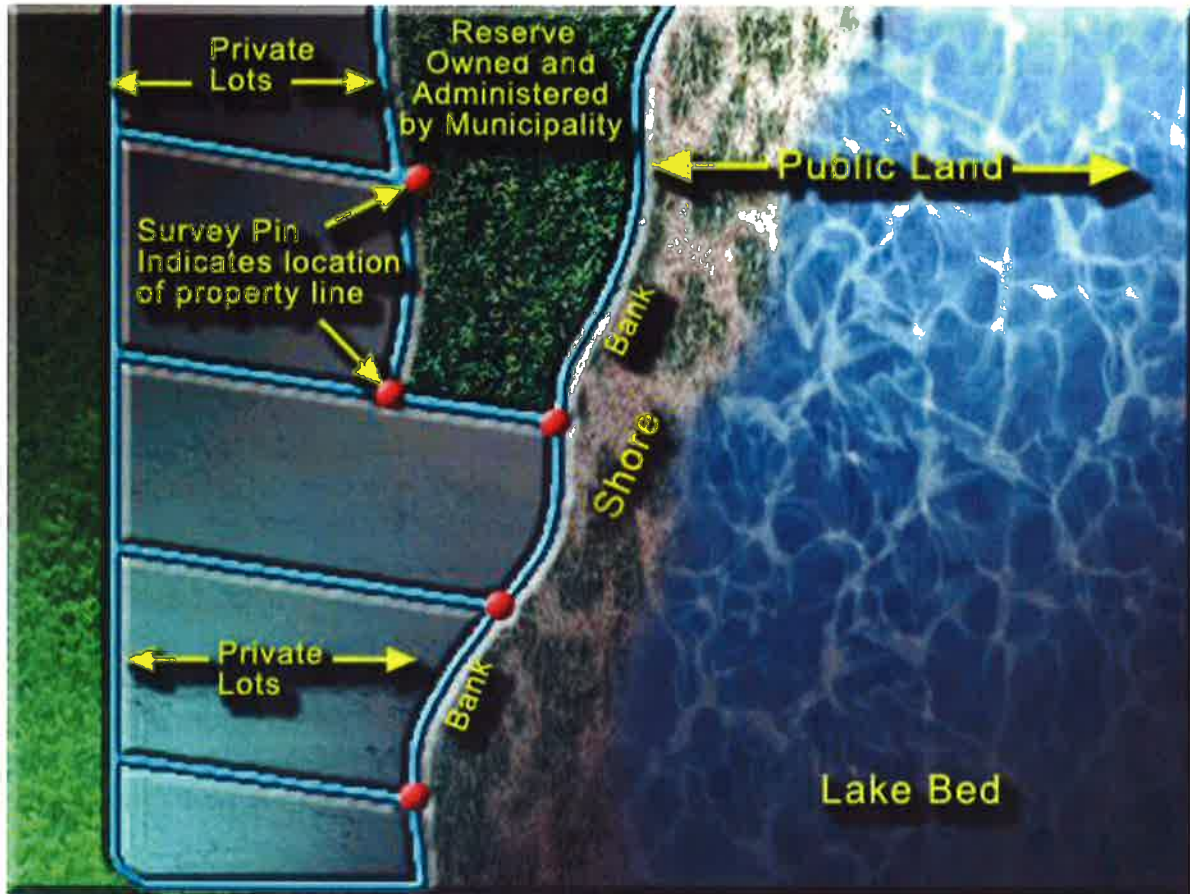
<sup>1</sup> "Riparian land" means the lands adjacent to a watercourse where the vegetation and soils show evidence of being influenced by the presence of water. Riparian areas are the green zone around a watercourse. They are the vital transitional zone between surface water and the drier uplands and play a vital role in the healthy functioning of both.

<sup>2</sup> "Pollution" means any non-point source impacts on the environment from substances such as sediments, nutrients, pesticides, bacteria, parasites or toxic chemicals that reach a watercourse by surface or subsurface flow through adjacent land, and the unauthorized release of any "deleterious substance" as defined in the *Fisheries Act* (Canada), or the unauthorized release of any substance whether non-point or otherwise that may cause an adverse effect under provisions of the *Environmental Protection and Enhancement Act*.

they are located. A municipality is not required to compensate the landowner for any lands taken as "reserve" during the subdivision process.

As stated in the MGA, a municipal council may require the dedication of ER if the lands proposed for subdivision consist of: a) a swamp, gully, ravine, coulee or natural drainage course, b) land that is subject to flooding, or land that is unstable, or c) a strip of land, not less than six metres in width, abutting the bed and shore of any lake, river, stream or other body of water (Figure 1). If the lands adjacent to the minimum required 6 meter strip are also subject to subsidence, flooding, contain swamps and natural drainage courses, the required dedication of ER may result in a much wider strip than 6 meters. The strips of land abutting a lake are taken for two purposes: to prevent pollution, or to provide public access to and beside the bed and shore (Stewart, 2006).

ER is dedicated to protect provincially owned beds and shores and water resources from "pollution". Therefore, the definition of "pollution" that a municipality adopts in its Land Use Bylaw must specify what constitutes "pollution" in their community. For prairie lakes already high in nutrients such as phosphorus and nitrogen, added nutrients may impair water quality causing noxious algal blooms, taste and odour problems, anoxic conditions and even fish kills. Phosphorus has been identified in several recent studies as causing water quality problems across the Province (Hamilton 1985, Mitchell 1998, Mitchell 2000, Mitchell 2001, Schindler et al. 2004, White and Prather, 2004). Nutrients, therefore, can be defined by the MD of Foothills as pollution and steps will be taken to protect aquatic systems from additional nutrients making their way into watercourses via point and non-point source discharges. One of the most effective ways to protect aquatic ecosystems and prevent pollution is to ensure that riparian areas are intact, healthy and functional.



**Figure 1.** Illustration of lake bed and bank which is public land and owned by the Province and the Environmental Reserve land that is owned by the Municipality.

Sometimes, residents think that their property rights allow them to use adjacent ER parcels for exclusive, private purposes. They landscape, cut down trees, mow vegetation along streams, and plant gardens outside their lot lines with invasive species of flowers, shrubberies and trees. ER shore lands are often fenced or barricaded or restricted against the natural flow of people and floodwaters even when ER strips lie between their property and the bed and shore of a river or lake. Environmental Reserves are sometimes littered with lawn clippings, leaves, tree branches stumps and other debris, while ravines and river valleys are littered with garbage wastes that are non-biodegradable and do not readily decompose in the natural environment.

People compete with wildlife for ER adjacent to rivers and lakes which act as wildlife corridors or migratory bird habitat, and provide shade, shelter, food and water for flora and fauna. Some citizens consider ER private playgrounds to walk dogs, cycle, and ride all terrain vehicles. These activities create *ad hoc* pathway systems, adversely affecting the natural ground cover and vegetation, pollution, erosion of escarpments and ravines, and sedimentation of adjacent watercourses and bodies of water. When conflicts arise among ER users with different values, complaints are made directly to the municipality about erosion, fencing, litter, illegal dumping, off-leash dogs and pet wastes. As the owner of ER, a

municipality has the responsibility to control access and use to ensure that these sensitive landscapes are sustained for current and future generations. This can be done through a Reserve Bylaw or policy sanctioned by the municipality.

ER can also be required to provide public access to the beds and shores and the water, creating an inherent conflict between users who value ER for equally important, but competing functions. Riparian development setbacks should have as few channels and walking paths as possible. Channels and walking paths will increase the amount of surface runoff that reaches surface waters and decrease the effectiveness of the setback. Surface runoff from adjacent lands, depending on the land use, may contain sediment, nutrients, pesticides, bacteria, parasites, toxic chemicals and other pollutants. Functional and intact riparian areas remove these pollutants and prevent them from entering a waterbody, but paths through these areas decrease their effectiveness. The role of ER and riparian land protection is particularly important around waterbodies that serve as a drinking water source for communities.

Community access points to provincial beds and shores can minimize cumulative detrimental effects. Communal beach, dock and swimming areas are recommended as alternatives to allowing multiple points of access. Communal access in areas with the least environmental sensitivity, with the lowest quality riparian or wildlife habitat (i.e. non-fish spawning habitat) or land that is already disturbed will help protect intact, sensitive and healthy habitat. Developers and regulators should work together to identify areas that are more suited for public access such as boat launch or dock that will minimize habitat loss or environmental damage.

### ***1.3 Environmental Reserve Easements and Conservation Easements***

It is important to recognize that since 1994 when the current MGA was enacted, a municipality may enter into an agreement with an owner of a parcel of land that is subject to a proposed subdivision to create an "environmental reserve easement" for the lands that would otherwise be dedicated as ER for "protection and enhancement of the environment". An ER easement is registered under the *Land Titles Act* and is a covenant on the land ensuring that lands are left in their natural state, and the easement is enforced by the municipality.

Under the *Environmental Protection and Enhancement Act*, landowners can voluntarily enter into a legal agreement called a conservation easement to preserve habitat while retaining title to the property. The landowner relinquishes certain ownership rights in order to protect the landscape's natural character. Qualified easement holders include land trusts, municipalities or conservation groups such as Ducks Unlimited Canada or the Nature Conservancy of Canada.

### ***1.4 Development Setbacks for Buildings***

A municipality is responsible for the planning and development of private lands within its geographical boundaries. Through provisions in the Land Use Bylaw (LUB), a municipal council can control the development of "buildings" on land that is subject to flooding or subsidence, or that is low lying, marshy or unstable; or, land that is adjacent to or within a specific distance of the bed and shore of any lake, river, stream or other body of water ("environmentally significant lands"). What constitutes a "building"

is defined in the MGA to include all structures except highways and bridges. Controlling development of buildings within prescribed development setback areas can be done through policy statements and land use bylaw provisions. The opportunity to create appropriate development setbacks and land uses in riparian areas is underutilized by municipal governments. The Riparian Setback Matrix Model presented here will assist the MD of Foothills to create a defensible “natural environmental reserve” land use designation with associated permitted and discretionary land uses. The natural riparian function of each landscape that a municipality wishes to preserve will determine the extent of the development setback required. The Riparian Setback Matrix Model will assist municipalities to adopt appropriate development setback policy and enact appropriate Land Use Bylaw provisions inclusive of Area Structure Plans or Watershed Management Plans, integration of policies and directives.

### ***1.5 Riparian Areas***

Vegetation in riparian areas is different from that of uplands. Riparian areas stay green longer and produce more biomass than uplands, partly due to soil types but mostly due to an elevated water table. The types and abundance of vegetation can help to identify riparian areas. The vegetation is different and tends to attract livestock, wildlife and humans. Riparian areas are highly productive and can be reliable producers of forage, shelter, fish, wildlife and water. These areas are especially useful when drought or flooding occurs by attenuating flood waters and reducing erosion (Alberta Riparian Habitat Management Society, 2006).

Riparian zones act as buffers that function to protect water quality. Contaminants are absorbed onto sediments, taken up by vegetation and transformed by soil microbes into less harmful forms (Klapproth and Johnson 2000). They have long been proven effective in reducing nutrients, sediments and other anthropogenic pollutants that enter surface waters via overland and subsurface flow (Klapproth and Johnson 2000; Lee and Smyth 2003; Mayer et al 2006).

In addition to protecting surface waters, riparian areas are valuable wildlife and plant habitat. They provide nesting sites for several bird species, habitat for reptiles and amphibians and safe corridors for several species of mammals such as deer and moose (Wenger 1999). Although riparian areas make up only a small fraction of our landscape, they are disproportionately important to fish and wildlife, recreation, agriculture, and society in general. As much as 80% of Alberta's wildlife relies in whole or in part on riparian areas to survive (Alberta Riparian Management Society, 2006). The health and functioning of riparian areas can be influenced by human activities including road construction, resource extraction, agriculture, urban or rural development, and recreation. Unfortunately, most riparian lands are privately owned and therefore difficult to protect unless a municipality enacts development setbacks in riparian lands from a body of water such as a river or lake.

Defining a riparian area (riparian buffer strip) that is far enough from a receiving water body to effectively protect the water and the aquatic ecosystem has been the subject of much debate. A “one size fits all” approach has traditionally been used by provincial regulators and is still being used today. However, it is becoming increasingly apparent that water bodies require a unique set of guidelines to define appropriate riparian buffer widths and development setbacks. It is essential that municipalities establish appropriate land uses adjacent to bodies of water, including wetlands, to avoid or minimize

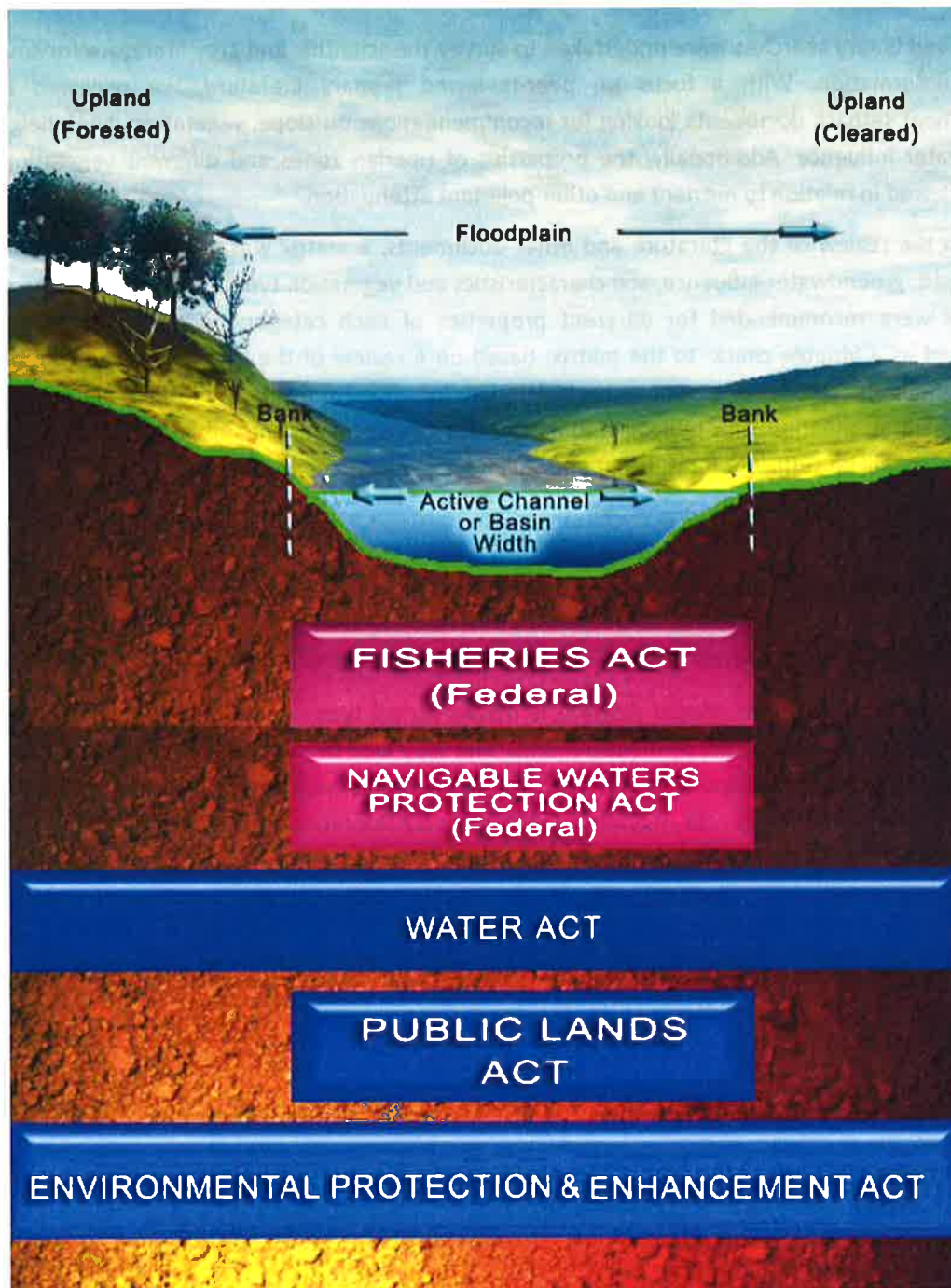
development impacts of our valuable water resources, as provided in the provincial *Land Use Policies*. The importance of establishing and protecting a properly-sized buffer strip is extremely important for source water protection.

### **1.6 Environmental Legislation**

The MGA and *Environmental Protection and Enhancement Act* are not the only pieces of legislation that protect environmental reserves and riparian buffers. There are at least twelve municipal, Provincial and Federal bylaws and acts that serve to protect these sensitive areas (Table 1), some with very broad powers of application (Figure 2). Several Provincial policies and strategies are also in place to protect the aquatic environment including the *Strategy for the Protection of the Aquatic Environment*, *Water for Life Strategy* and others that are consistent with *Alberta's Commitment to Sustainable Resource and Environmental Management* and *Strategy for the Protection of the Aquatic Environment*. The new *Framework for Watershed Management Planning* should provide municipalities with a suite of mechanisms to work with partner stakeholders, landowners and other jurisdictions to ensure that water resources are protected for future generations. Our common challenge will be to understand and implement these various pieces of legislation for the benefit of environmental protection within long term development integration.

**Table 1. Legislation and policy involving riparian land management.**

Legislation/policy	Description
Federal <i>Fisheries Act</i> - Fisheries and Oceans Canada (FOC)	Regulates and enforces on harmful alteration, disruption and destruction of fish habitat in Section 35.
Provincial <i>Water Act</i> - Alberta Environment (AENV)	Governs the diversion, allocation and use of water. Regulates and enforces actions that affect water and water use management, the aquatic environment, fish habitat protection practices, in-stream construction practices, storm water management.
Provincial <i>Environmental Protection and Enhancement Act (EPEA)</i> - AENV	Management of contaminated sites, storage tanks, landfill management practices, hazardous waste management practices and enforcement.
Provincial <i>Alberta Land Stewardship Act (ASRD)</i>	This legislation supports implementation of the Land-use Framework. It creates the seven land-use regions, establishes the Land-use Secretariat and gives authority for regional plans, creation of Regional Advisory Councils and addresses the cumulative effects of human and other activity.
Provincial <i>Agricultural Operations Practices Act (AOPA)</i> - Natural Resources Conservation Board (NRCB)	Regulates and enforces on confined feedlot operation and environment standards for livestock operations.
<i>Historical Resources Act</i> - Culture and Community Spirit	Concerns any work of humans that is primarily of value for its prehistoric, historic, cultural or scientific significance, and is or was buried or partially buried in land or submerged beneath the surface of any watercourse or permanent body of water.
Provincial <i>Municipal Government Act (MGA)</i> - Municipal Affairs	Provides municipalities with authorities to regulate water on municipal lands, management of private land to control non-point sources, and authority to ensure that land use practices are compatible with the protection of aquatic environment.
Provincial <i>Public Lands Act - Sustainable Resource Development (ASRD)</i>	Regulates and enforces on activities that affect Crown-owned beds and shores of water bodies and some Crown-owned uplands that may affect nearby water bodies.
Provincial <i>Safety Codes Act</i> - Municipal Affairs	Regulates and enforces septic system management practices, including installation of septic field and other subsurface disposal systems.
<i>Regional Health Authorities Act</i> - Alberta Health	RHA have the mandate to promote and protect the health of the population in the region and may respond to concerns that may adversely affect surface and groundwater.
<i>Wildlife Act</i> - ASRD	Regulates and enforces on protection of wetland-dependent and wetland-associated wildlife, and endangered species (including plants).
<i>Provincial Parks Act &amp; Wilderness Areas, Ecological Reserve and Natural Areas Act</i> - ASRD and Community Development	Both Acts can be used to minimize the harmful effects of land use activities on water quality and aquatic resources in and adjacent to parks and other protected areas.



**Figure 2.** Federal and Provincial legislation that can be used to protect riparian habitats.

## **2 Development of the Riparian Setback Matrix Model**

Internet and library searches were undertaken to survey the scientific and grey literature for sources of riparian information. With a focus on peer-reviewed primary literature, we reviewed riparian development setback documents looking for recommendations on slope, vegetation, bank height, and groundwater influence. Additionally, the properties of riparian zones and different vegetation types were reviewed in relation to nutrient and other pollutant attenuation.

Based on the review of the literature and other documents, a matrix was designed to include slope, bank height, groundwater influence, soil characteristics and vegetation type. For each category, setback distances were recommended for different properties of each category. Additionally, a table was established as a 'double check' to the matrix. Based on a review of the literature, the table presents recommended riparian development setback distances for effective nutrient (nitrogen and phosphorus) and sediment attenuation. This table acts to ensure that the development setback distance determined by the matrix will be sufficient for nutrient and sediment removal.

## **3 The Riparian Setback Matrix Model**

### ***3.1 Riparian Setback Matrix Model - Setback Determinations***

The Riparian Setback Matrix Model (RSMM) is meant for all types of waterbodies in the Municipal District of Foothills. Parameters or measurements that may lead to intervention or modification of the prescribed setbacks by municipal administrators are highlighted in yellow; parameters or measurements requiring special surveys or other technical considerations are highlighted in red.

**Table 2. Riparian Setback Matrix Model for the Municipal District of Foothills #31.**

Waterbody Name:

Waterbody Location:

Waterbody Type (circle one): Lake/Pond

River/Stream

Wetland

STEP 1	Slope Category (%)	Slope (%)	Distance Adjustment
	0 - 4.9		10 m
	5 - 9.9		10 m + 1 m per % of slope over 5%
	10 - 14.9		Same as above†
	≥ 15		Requires a geotechnical survey††

**SLOPE SETBACK**

STEP 2	Height of Bank	Bank Height (m)	Distance Adjustment
	< 5 m	_____	10 m
	5 to 30 m	_____	2x height of bank
	≥ 30 m	_____	60 m
	<b>BANK HEIGHT SETBACK</b>	_____	

STEP 3	Groundwater Influence	Select one:	Distance Adjustment
	Distance to water table	_____	
	0 - 9.9 m	_____	30 m
	10 - 19.9 m	_____	15 m
	≥ 20 m	_____	10 m
	<b>GROUNDWATER SETBACK</b>	_____	

STEP 4	Vegetative Cover Type	% Cover	Distance Adjustment (m / % cover type)
	Forested	_____	0.15
	Shrub	_____	0.25
	Grass and Herbaceous Plants	_____	0.30
	Bare Ground	_____	0.50
	Impermeable surfaces	_____	0.60†††
	<b>VEGETATION SETBACK</b>	_____	

STEP 5	Soil Texture/Type	Select one:	Distance Adjustment (multiplier)
	Peat (minimum 50% organic matter in soil)	_____	1.0
	Sand, Sandy Loam, or Loamy Sand	_____	1.0
	Loam, Silty Loam, or Silt	_____	1.1
	Clay Loam, Sandy Clay Loam, Silty Clay Loam, Sandy Clay, Silty Clay, or Clay	_____	1.25

Rock and gravel (more than 50% rock and gravel) \_\_\_\_\_ 1.25

**SOIL SETBACK MULTIPLIER** \_\_\_\_\_

STEP 6	Overall Setback Calculation
	Determine maximum setback from Steps 1-4 above _____
	Multiply baseline setback by soil texture multiplier _____
	<b>TOTAL CALCULATED SETBACK:</b> _____

† - Sites with slopes of 10 – 14.9% may require a geotechnical survey, decided on a site by site basis at the discretion of the administration.

†† - Sites with slopes of >15% require a geotechnical survey in all circumstances, to be carried out by a qualified professional (see *Professional Requirements for Site Assessments*).

††† - for survey points with impermeable surfaces (concrete, asphalt, etc.) as a component of the ground cover, the established setback distance is subject to special approval by municipal administrators. It is recommended that the setbacks be long enough that the impermeable surfaces make up at maximum 5% of the setback distance. For instance, if 2 m of the survey site are covered by impermeable surfaces, then the recommended setback at that site would become  $2 \text{ m} \div 0.05 = 40 \text{ m}$ .

†††† - Soil texture serves as a modifier of the distances calculated from the previous steps, and are not included in the most-sensitive-parameter approach of the preceding calculations. A multiplier of 1.0 means that the soil texture does not change the setback determined previously, while multipliers greater than one increase the setback proportionally. For instance, a setback of 36 m calculated for a site based on vegetation, slope, bank height, and groundwater depth would remain at 36 m if on a sandy loam ( $36 \text{ m} \times 1.0 = 36 \text{ m}$ ), while on a silty clay it would increase to 45 m ( $36 \text{ m} \times 1.25 = 45 \text{ m}$ ).

**Table 3. Recommended Riparian Setbacks for Nitrogen, Phosphorus and Sediment Control.**

Parameter	Riparian Vegetation	Recommended Setback (m)	Notes
Nitrogen	Grass	50+	-Will remove ~90% of nitrate from surface and subsurface runoff.
	Grass/Shrub or Forest	30+	
	Forest	30+	
Phosphorus	Grass	20+	-Will reduce soluble phosphorous by ~90%. -See recommendations for sediment for the removal of total phosphorus (most phosphorus enters a buffer attached to the sediments).
	Grass/Shrub or Forest	20+	
	Forested	20+	
Sediment	Grass	30+	-Will remove ~90% of sand and silt particles. -100m is required for the effective removal of clay particles. - For long term retention of sediments the setback should be 30 – 100m.
	Grass/Shrub or Forest	30+	
	Forested	25+	

### **3.2 How to use the Riparian Setback Matrix Model**

The amount of Environmental Reserve to be taken will be determined by using the Riparian Setback Matrix Model. Environmental Reserve will be determined at several sites along the water's edge, and as such the area dedicated as ER will vary throughout the site; some areas will require more Environmental Reserve and others will require much less. The dedicated Environmental Reserve will vary throughout the parcel of land depending on slope of the land, height of any banks present, groundwater influence, soil type and vegetative cover.

The amount of property bordering the water's edge will also affect how Environmental Reserve is determined. To start using the Riparian Setback Matrix, setback points will need to be established. The number of points used to determine Environmental Reserve will vary based on the area to be developed.

#### **1. Establish the number and location of setback points required.**

##### **1.1. Whereas the location of the point will be:**

1.1.1. At the point where vegetation (living or dead) characteristic of an aquatic environment end changes to that of upland vegetation. This vegetation includes but is not limited to; Sedges, Bulrushes, Cattails and Willows.

1.1.2. If no vegetation exists, the setback point will be determined from the current edge of water.

##### **1.1.3. Whereas the length of land bordering the water body, stream or wetland is:**

1.1.3.1. **Greater than 200 meters** – The outside setback point will be no more than 100 meters from the property line along the water body, stream or wetland. The subsequent setback points will be equally spaced no more than 200 meters apart.

1.1.3.2. **200 meters to 50 meters** – Two (2) setback points will be required equal distance apart and equal distance from each property line.

1.1.3.3. **Less than 50 meters** – One (1) setback point will be required at the discretion of the Municipal District of Foothills. Please contact the MD of Foothills administration to determine the location of this setback point.

#### **2. Slope of the land must be determined by a legal land surveyor at each of the setback points. From each setback point, determine the slope of the land perpendicular to the water body, stream or wetland. The setback distance for slope is calculated as follows:**

2.1. If the slope is <5%, the setback distance requirement is 10 m.

2.2. If the slope is 5-9.9%, the setback distance will be 10 m + 1 m for every 1 % increase in slope after the minimum.

- 2.3. If the slope is **10-15%**, consult with MD of Foothills administration to determine if a geotechnical survey will be required.
- 2.4. If the slope is **≥ 15 %**, then a geological survey is required. The total setback required for this site will be determined by a registered professional. The determined setback must take into account the slope, height of bank, groundwater influence, soil type and vegetative cover. Setback requirements will be subject to the approval of the subdivision authority.
- 2.5. Record slope, under measured slope in Step 1 and enter the calculated distance adjustment in the TOTAL Box in Step 1.
- 2.6. If the determined setback is greater than or equal to 75 m, skip to step 6; otherwise, continue to step 3.
  
3. **Height of Bank** must be determined by a legal land surveyor at each of the setback points. From each setback point, determine the height of bank perpendicular to the water body, stream or wetland. NOTE: Height of bank will be determined at the same time as slope by the surveyor.
  - 3.1. Put a check mark next to the appropriate bank height in Step 2.
  - 3.2. Identify and enter the required distance adjustment in the TOTAL Box in Step 2.
  - 3.3. If the required distance adjustment is 75 m you can stop here. The required distance adjustment for this site is 75 m. The Environmental Reserve allocation will be determined horizontally, perpendicular to the water body, stream or wetland from the setback point.
  - 3.4. If the determined setback is greater than or equal to 75 m, skip to step 6; otherwise, continue to step 4.
  
4. Determine the **depth to the water table** for the site. This information can be obtained from a geotechnical report, or from local well data by a qualified hydrogeologist.
  - 4.1. Put a check mark next to the appropriate groundwater depth in Step 3.
  - 4.2. Identify and enter the required distance adjustment in the TOTAL Box in Step 3.
  - 4.3. If the determined setback is greater than or equal to 75 m, skip to step 6; otherwise, continue to step 5.
  
5. Determine the **vegetation cover of each type** for the site.
  - 5.1. From each setback point, determine the vegetation type perpendicular to the water body, stream or wetland, by creating a 1 m x 10 m plot.
  - 5.2. Determine the percent of the plot that is grass, shrub, forested, impermeable and cleared.
  - 5.3. Multiply the percentage of each vegetation cover class by the respective distance adjustment for each type.
  - 5.4. Put the required adjusted distance beside the respective vegetation cover.
  - 5.5. Add up the setback requirements from all vegetation cover types to obtain the total vegetation cover setback.

- 5.6. Continue to step 6.
6. **Determine the baseline setback** based on slope, bank height, groundwater depth, and vegetation cover.
  - 6.1. If any of the setbacks calculated from steps 2 – 5 are equal to 75 m, the baseline setback for that point is 75 m.
  - 6.2. Otherwise, the baseline setback is the maximum of the setbacks determined in steps 2 – 5.
7. Determine the **soil type and texture** for the site.
  - 7.1. The soil type and texture with respect to proportions of sand, silt, clay, organic material (peat), rocks and gravel should be determined by a qualified professional.
  - 7.2. Based on the percentages of each soil particle fraction, determine the soil texture category that the soil at the site falls into, and use this texture/type to determine the setback soil multiplier.
8. Multiply the distance obtained in step 6 by the soil multiplier determined in step 7. This is the final setback for the site.
9. **To establish Environmental Reserve**, determine setback distances from each setback point. Connect setback points. Setback to the property line will be done perpendicularly from the nearest determined setback point. (See diagram on Page 9 for clarification).

See the attached **Riparian Setback Matrix Model SAMPLE** for more clarification (Appendix B).

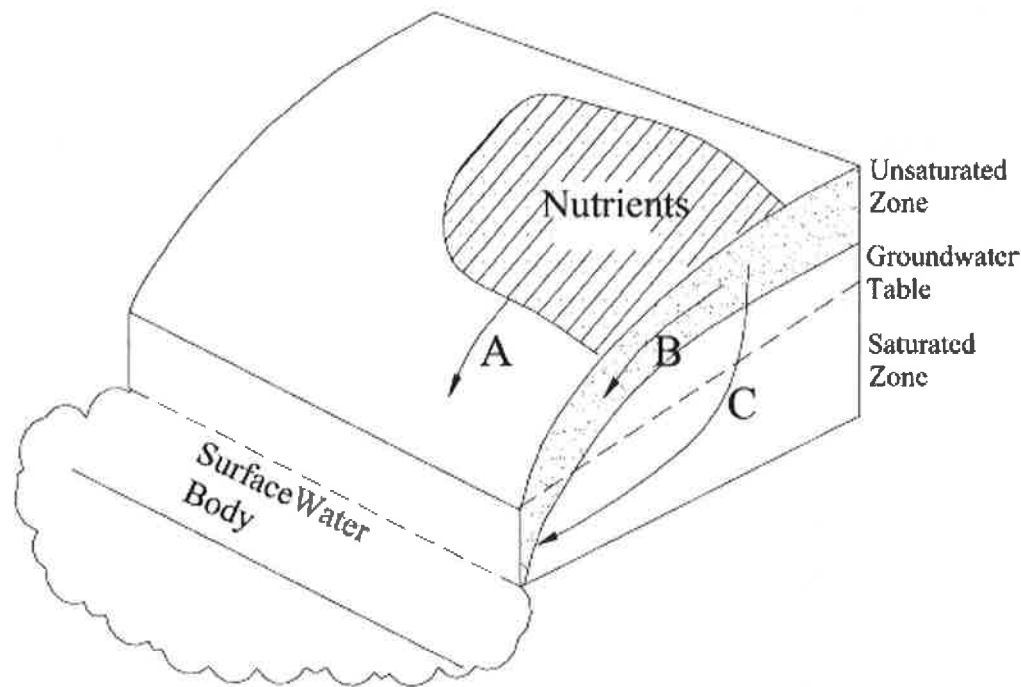
### ***3.3 Slope and Bank Height***

Slope and bank height are important factors in determining an appropriate riparian setback width. Steeper slopes are more susceptible to erosion and can increase the velocity of overland flow (runoff) and reduce buffer contact time (Wenger 1999; Li et al 2006). Dillaha et al (1988, 1989) found that as buffer slope increased from 11 % to 16%, sediment removal efficiency declined by 7-38%. Li et al (2006) also found that as slope gradient increases, that loss of nutrients also increases. Fox and Brown (1999) found that flow velocities increased with increased slope, with the rate of increase following an approximately linear relationship over the range of slopes considered by this model. The Connecticut Association of Wetland Scientists (2004) suggested a minimum buffer width of 25 feet with a width increase of 3 feet (~1m) for every degree of slope. Others have suggested that there be minimum buffer of 30 m with an increase of 0.61 m for every 1 % increase in slope (Wenger 1999; Sasson 2003). The City of Calgary (2006) recommends that the development setback distance should increase by 1.5 m for every 1% increase in slope after 5%. Based on these and other documents, the minimum setback for slope was established at 10 m, with a linear increase in the setback distance of 1 m for every degree in slope over 5%.

Bank height was addressed in the Draft Watershed Management Plan for the Nose Creek Watershed (Palliser, 2005), modified slightly here to extend the upper limit of the bank height setback to 75 m. It was suggested that where there is  $\geq 15\%$  slope, an additional setback from the top of the bank should be added to the riparian development setback. This would provide a stable slope allowance (Palliser, 2005). These recommendations were adopted into our matrix model by requiring that there be a geotechnical survey conducted when the slope is  $\geq 15\%$ . Slopes between 10 and 15% may require a similar survey, to be determined at the discretion of the administration on a case by case basis in order to adequately protect especially sensitive areas. The slope and height of bank should be determined by a legal land surveyor in order for the model to be legally defensible.

### **3.4 Groundwater Influence**

Groundwater and subsurface flows can also contribute nutrients and pollutants to surface waters (Figure 4), and groundwater itself can become compromised when polluted runoff infiltrates through the soil. For the protection of the surface and groundwater, it is recommended that shallower water tables have larger development setback distances. Devito *et al* (2000) found that a lake located in a regional recharge or local discharge area received proportionally greater phosphorus inputs from surface and near-surface flows, and were therefore more susceptible to disturbances in the watershed. It was also found that in deeper water tables with primarily subsurface flows, phosphorus is more readily absorbed to the soil and taken up by plant roots. However, in shallower water tables where soil is often waterlogged, overland flow is more common and there was little phosphorus removal (Devito *et al*, 2000). There is very little reference in the literature to groundwater influence when determining effective riparian setback distances. Therefore, this category of the model was developed with the knowledge that deeper groundwater has generally had a longer residence time in the soils (Li *et al*, 2006) and allows for more water to absorb to soil particles (Devito *et al*, 2000). Water that has longer contact with soil has more time for physical, chemical and biological breakdown of pollutants. Shallower water tables are more likely influenced by the immediate surroundings and the water will have had a shorter residence time; additionally, it is more likely to discharge into the surface waters of concern.



**Figure 3.** Potential pathways for nutrient and pollutant input from sloping lands to surface water: (A) surface runoff, (B) subsurface flow, and (C) groundwater (Taken from Li *et al* 2006).

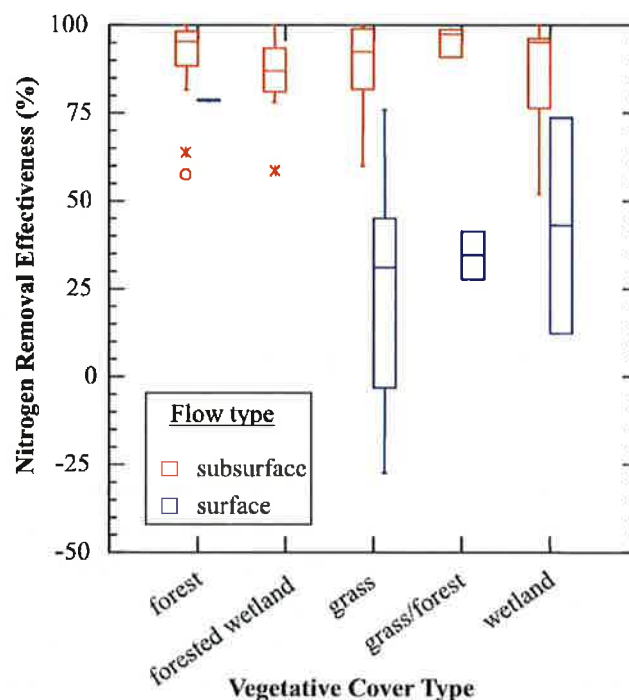
### 3.5 Vegetation Type

Vegetation slows the velocity of overland water flow and allows increased infiltration and sediment deposition (Connecticut Association of Wetland Scientists 2004). Once in the soil, chemical, biological and physical processes remove pollutants through filtering and absorption (Connecticut Association of Wetland Scientists 2004). Plants and microflora also remove nutrients and pollutants through absorption (Connecticut Association of Wetland Scientists 2004). In an extensive review of the literature, Mayer *et al* (2005) found that grassed buffers were the least effective at removing nitrogen from surface and subsurface flows, whereas forested buffers were the most effective (Figure 3). Wenger (1999) reported that both grass and forested buffers were effective for sediment and nutrient removal, but that shrub or forested buffers were more effective for bank stabilization and decreasing erosion. Gilliam (1997) reported that forested buffers were more effective than grass for sediment and nutrient removal, and that a combination of grass and forest was the most effective buffer. The presence of emergent vegetation enhanced the effectiveness of the riparian setback. Based on these and other documents, we designed the matrix so that grass buffers would have the largest distance adjustment.

The matrix was designed with vegetation of different types having additive effects. The aim of the model is to remove a specified percentage of pollutants from runoff. Since each vegetation cover type is capable of removing pollutants at a different rate, the use of an additive model with different weights

for each vegetation class will ensure the removal of a consistent percentage of pollutants regardless of cover type at a given location.

Although certainly not as effective as vegetation cover at slowing and removing pollutants from surface runoff, bare ground does still allow infiltration into the shallow groundwater, where such pollutants may adsorb onto soil particles or eventually be removed by plant growth. However, impermeable surfaces such as asphalt and concrete pavement confer no such advantage. When impermeable surfaces are present within the vegetation plot, it is recommended that the determination of the setback distance be subject to approval by MD of Foothills administration. In such cases, we recommend that the setback distance for vegetation be extended so that at most, 5% of the length of the setback is covered by impermeable surfaces, to maintain as best as possible the protection provided by the vegetated buffer.



**Figure 4.** Nitrogen removal effectiveness in riparian buffers by buffer vegetation type and water flow path. The center vertical line of the box and whisker plot marks the median of the sample. The length of each box shows the range within which the central 50% of the values fall. Taken from Mayer *et al* (2005). We do not use wetland or forested wetland cover type in our model.

### 3.6 Soil Texture and Type

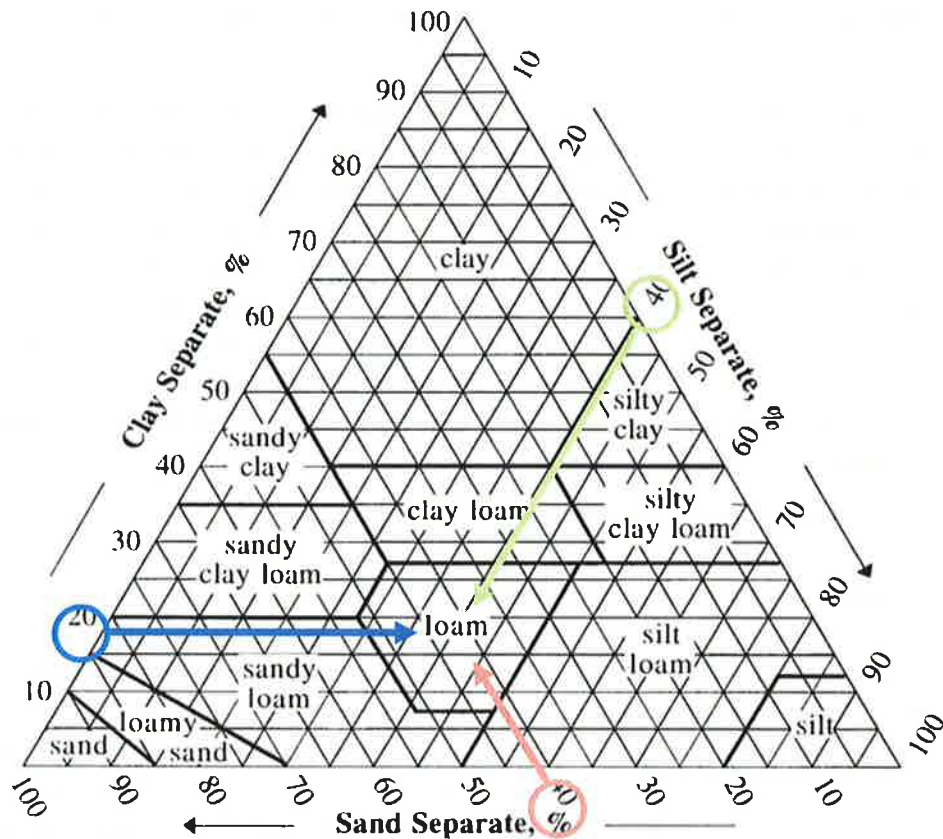
The type and texture of soil present at a site may have a strong influence on the ability of a riparian habit to remove pollutants from surface runoff. Soil type is determined by the “parent” material, i.e. the original substrate that the soil developed on (e.g. bedrock of various types, glacial till, ancient river or

lakebeds), while texture is determined by the relative proportions of sand, silt, and clay that are present in the soil.

Two important aspects of soils that are determined by texture may have the potential to strongly influence pollutant loadings into adjacent waterbodies: erodibility and hydraulic conductivity. Low erodibility can be beneficial because it reduces loadings of solids and other potential pollutants into waterbodies; high hydraulic conductivity can be beneficial because it allows rapid infiltration of surface water into shallow groundwater. Soils that are high in clay content tend to be less erodible than those dominated by sand or silt (White, 2006), because the chemical and physical bonds between the particles are stronger and are more resistant to the physical action of water. However, a tradeoff exists, because soils with higher sand and silt contents have generally higher hydraulic conductivities (United States Department of Agriculture, 2008), meaning that they are better at allowing surface water to infiltrate into shallow groundwater.

This implies that high clay soils might be preferred near waterbodies (or at least allow for shorter setback distances). However, if otherwise healthy riparian areas are left undisturbed by human activities, vegetation will establish rapidly and reduce rates of erosion across all soil types (Morgan and Rickson, 1995). For longer-term protection of waterbodies, hydraulic conductivity will be the more important component to consider. Since the effectiveness of groundwater infiltration depends upon the slowing of surface runoff by reduced slope and the presence of established vegetation, soil texture and type are included in the model as a parameter that modifies the original setback, akin to a “soil texture tax.” For soils textures with high hydraulic conductivity, there is no tax imposed, but soil textures that do not permit easy groundwater infiltration (e.g. clay-dominated soils) are heavily “taxed” to allow increased infiltration time and distance.

While the determination of soil texture excludes the fraction of soil comprising rocks, gravel, and organic matter, these factors can have important influences on hydraulic conductivity, erodibility, and the ability of a soil to support plant life. Naturally formed peat deposits can be highly beneficial in riparian zones, due to their high capacity for absorbing water and nutrients and supporting plants (Cohen, 1997). Rocks and gravel, on the other hand, tend to have a negative influence on pollutant removal, because they may act as an impediment to vegetation establishment (McBride and Strahan, 1984) and can form natural “pavements” that allow surface water to rapidly run over them (Huggenberger et al., 2002), without allowing sufficient contact time with soil particles or plant roots for the removal of sediments and nutrient pollutants.



**Figure 5.** Soil texture as determined by the relative proportions of sand, silt, and clay present in the soil sample. The texture of a given soil (with known sand, silt, and clay contents, is determined by moving directly to right from the appropriate percentage on the clay (left) axis, down and left from the appropriate percentage on the silt (right) axis, and up and left from the appropriate percentage on the sand (bottom) axis. The determination of the texture for a soil with 20% clay, 40% sand, and 20% silt (a loam soil) is shown by the coloured lines on the figure.

#### 4 Professional Requirement for Site Assessments

Although every effort has been made to make the Riparian Setback Matrix Model accessible to as wide an audience as possible, the determination of setbacks should not be undertaken without enlisting the assistance of a professional(s) with qualifications appropriate for the conditions and complexity of the site.

Condition	Professional Requirements for setback determination
Low slope, obvious transition from aquatic to upland vegetation, groundwater table known from nearby wells	Professional biologist
Complex vegetation communities with no obvious transition from aquatic to upland vegetation	QAES/QWAES

Moderate slopes (5-15%)	Legal land surveyor
Steep slopes (>15%)	Geotechnical professional (Geological engineer, hydrogeologist)
Extensive river meander or presence of floodplain	QAES/QWAES + Geotechnical professional
Unknown water table depth	Hydrogeologist

---

## 5 Summary and Conclusions

Riparian setbacks are useful in reducing the amount of pollutants that reach surface waters. However, they are not perfect, and in storms and floods their effectiveness will be reduced. Therefore, every step possible should be taken to reduce pollutants at their source, and sources should be restricted from floodplains whenever possible, regardless of development setback distance (Wenger 1999). Certain land uses, such as storage of toxic chemicals should never occur adjacent to ER lands or within riparian development setbacks. The cumulative effects of urbanization adjacent to bodies of water and in riparian areas requires careful monitoring and adaption to ensure seemingly innocuous development activities are not polluting our waters. Determining appropriate land uses in environmentally sensitive lands is an important policy consideration for Municipalities that want to ensure long term community and environmental sustainability.

This Riparian Setback Matrix Model was designed using information and recommendations from several pieces of literature and other academic and government documents. There is continuous research on this subject, and new recommendations are continuously being made so future revisions may be required. There are several other categories that may additionally be considered, especially with soils. These include vegetation density and percent cover and for soils, soil type and texture, organic content, pH, and conductivity. However, we feel that this model will be an effective method for determining an effective riparian development setback. As the RSMM is used and more information comes available, adjustments can be made to suit different requirements and needs, depending upon municipal suitability and environmental integrity.

### 5.1 Remote Sensing and the RSMM

The determination of riparian setbacks as formulated in the above model is based on on-the-ground surveys of potential development or subdivision sites. As such, determining setbacks for large numbers of parcels or over large areas may require a large temporal and financial commitment. However, if sufficiently high resolution remote sensing or other spatial data are available, it may be possible to extend the RSMM to a GIS platform where setbacks could be determined as a desktop exercise, possibly in a semi-automated fashion. However, the resolution for the required data would need to be very high, so unless they are already available or required for other purposes, it may not be fiscally worthwhile to do so. At minimum, the required data would include digital elevation models with 1-2 m lateral and 0.5 m or less vertical resolution for slope and bank determination, 1:5,000 or 1:10,000 aerial photos for

vegetation cover determination, and 1:20,000 scale soil texture and groundwater depth maps. The cost associated with purchasing or producing such data currently are high, so unless they are required or would be highly useful for other purposes, it would likely not be fiscally worthwhile to obtain them.

## **5.2 Other Considerations**

The riparian development setback should have as few disturbances such as channels and walking paths as possible. Channels and walking paths will increase the amount of runoff that reaches surface waters and decrease the effectiveness of the development setback. Community pathway systems should be developed using permeable construction materials with naturescaping around the edges. Community access points to provincial beds and shores and communal beach development are recommended to minimize cumulative detrimental effects instead of allowing many access points or private beach development on reserve lands.

We believe that the Riparian Setback Matrix Model will be of great value to the MD of Foothills and other municipalities across Alberta that are serious about protecting their Environmental Reserve lands and sensitive riparian lands. The model is scientifically-based, legally defensible and will allow municipalities to take adequate Environmental Reserve to prevent the most common forms of pollution in Alberta, instead of guessing, using a pre-determined arbitrary setback or simply requesting the 6 m minimum. Identifying and protecting Environmental Reserve supports two of the main goals of Alberta's *Water For Life* strategy of ensuring safe, secure drinking water supplies and healthy aquatic ecosystems. Municipalities that adopt this approach will benefit from source water protection within their jurisdiction and will ultimately save thousands of dollars on long term water treatment costs.

## 6 References

### 6.1 *Riparian Setback Matrix Model References by Category*

Parameter	References
<u>Vegetative Cover Type</u>	Mayer et al, 2005 Conneticut Association of Wetland Scientists, 2004 Chargin River Watershed Partners Inc., 2001 Wenger, 1999 Gilliam et al 1997 Klapproth, 2000
<u>Slope</u>	Conneticut Association of Wetland Scientists, 2004 Calgary City Council, 2006 City of North Royalton, 2005 Fox and Brown, 1999 Sasson, 2003 Wenger, 1999
<u>Height of Bank</u>	Palliser Environmental Services Ltd., 2005
<u>Soil Texture and Type</u>	United States Department of Agriculture, 2008 White, 2006 Morgan and Rickson, 1995 Cohen, 1997 McBride and Strahan, 1984 Huggenberger et al., 2002
<u>Groundwater Influence</u>	Li et al, 2006 Devito et al, 2000

## 6.2 References

- Alberta Riparian Management Society. Cows and Fish Website. <http://www.cowsandfish.org/> [accessed 25 January 2007].
- Atwill, E.R., Hou, L., Karle, B.M., Harter, T., Tate, K.W., and Dahlgren, R.A. 2002. Transport of *Cryptosporidium parvum* Oocysts through vegetated buffer strips and estimates filtration efficiency. *Applies and Environmental Microbiology* 68: 5517 – 5527.
- Bechtold, J.S. and Naiman, R.J. 2006. Soil texture and nitrogen mineralization potential across a riparian toposequence in a semi-arid savanna. *Soil Biology & Biochemistry* 38: 1325–1333.
- Cappiella, K., Schueler, T. 2002. Crafting a lake protection ordinance. [http://yosemite.epa.gov/R10/WATER.NSF/840a5de5d0a8d1418825650f00715a27/159859e0c556f1c988256b7f007525b9/\\$FILE/Crafting%20a%20Lake%20Protection%20Ordinance.pdf](http://yosemite.epa.gov/R10/WATER.NSF/840a5de5d0a8d1418825650f00715a27/159859e0c556f1c988256b7f007525b9/$FILE/Crafting%20a%20Lake%20Protection%20Ordinance.pdf) [accessed 25 January 2007].
- Chargin River Watershed Partners Inc. 2001. Why Riparian Setbacks? <http://www.3vct.org/lid/resources/Why%20Riparian%20Setbacks.pdf> [accessed 31 January 2007].
- City of Calgary. 2006. Environmental Reserve Setback Guidelines Discussion Draft. [http://www.calgary.ca/docgallery/bu/water\\_services/water\\_quality/environmental\\_reserve\\_setback\\_guideline.pdf](http://www.calgary.ca/docgallery/bu/water_services/water_quality/environmental_reserve_setback_guideline.pdf) [accessed 30 January 2007].
- City of North Royalton. 2005. Chapter 1492: Controlling riparian setbacks and wetland setbacks, Exhibit A. <http://www.northroyalton.org/Council/Legislation/2005%20Ordinances/05-172%20Exhibit%20A.pdf> [accessed 25 January 2007].
- Cohen, R. 1997. Fact Sheets: Functions and Values of Riparian Areas. Massachusetts Department of Fisheries, Wildlife and Environmental Law Enforcement.
- Connecticut Association of Wetland Scientists. 2004. Vegetative buffers for water quality protection: An introduction and guidance document, Draft Version 1.0. <http://www.ctwetlands.org/Draft%20Buffer%20Paper%20Version%201.0.doc> [accessed 11 Jan 2007].
- Devito, K.J., Creed, I.F., Rothwell, R.L. and Prepas, E.E. 2000. Landscape controls on phosphorus loading to boreal lakes: implications for the potential impacts of forest harvesting. *Can. J. Fish. Aquat. Sci.* 57: 1977 – 1984.
- Fox D.M. and R.B. Brown. 1999. The relationship of soil loss by interrill erosion to slope gradient. *Catena* 38:211–222.
- Gilliam, J.W., D.L. Osmond, and R.O.Evans. 1997. Selected Agricultural Best Management Practices to Control Nitrogen in the Neuse River Basin. North Carolina Agricultural Research Service Technical Bulletin 311, North Carolina State University, Raleigh, NC

- Government of Alberta. 2006. Standard Sustainable Resource Development Recommendations to Municipal Subdivision Referrals Including Recommended Minimum Environmental Reserve Widths DRAFT. Sustainable Resource Development.
- Hamilton Conservation Authority. 2005. Planning & Regulation, Policies and Guidelines. [http://www.conservationhamilton.ca/Asset/iu\\_files/Planning-Regs-and-Policies.pdf](http://www.conservationhamilton.ca/Asset/iu_files/Planning-Regs-and-Policies.pdf) [accessed 25 January 2007].
- Hamilton, H.R. 1985. Impact assessment of sewage discharges to Field Lake, Alberta. HydroQual Consultants report. 33 pp.
- Huggenberger, P., E. Hoehn, R. Beschta, and W. Woessner. 2002. Abiotic aspects of channels and floodplains in riparian ecology. *Freshwater Biology* 40(3):407-425.
- Klapproth, J.C. and Johnson, J.E. 2000. Understanding the Science Behind Riparian Forest Buffers: Effects on Water Quality. Virginia Cooperative Extension. <http://www.ext.vt.edu/pubs/forestry/420-151/420-151.html> [accessed 11 Jan 2007]
- Lee, P. and C. Smyth. 2003. Riparian forest management: paradigms for ecological management and practices in Alberta. Report produced by the Alberta Research Council (Vegreville, Alberta) and the Alberta Conservation Association (Edmonton, Alberta) for the Northern Watershed Project Stakeholder Committee. Northern Watershed Project Final Report No.1. 117 pp.
- Li, Y., Wang, C., Hongliang, T. 2006. Research advances in nutrient runoff on sloping land in watersheds. *Aquatic Ecosystem Health & Management* 9: 27–32.
- Mayer PM, Reynolds, SK Jr., Confield, TJ. 2005. Riparian Buffer Width, Vegetative Cover, and Nitrogen Removal Effectiveness: A Review of Current Science and Regulations. U.S. Environmental Protection Agency, Office of Research and Development, National Risk Management Research Laboratory. <http://www.epa.gov/ada/download/reports/600R05118/600R05118.pdf> [accessed 11 Jan 2007]
- McBride, J.R. and J. Strahan. 1984. Establishment and survival of woody riparian species on gravel bars of an intermittent stream. *American Midland Naturalist* 112(2):235-245.
- Mills, B. 2005. An assessment of the health and integrity of riparian management zones of Moose Lake and Lac La Biche, Alberta. Data Report (D-2005-001) produced by Alberta Conservation Association, St. Paul, Alberta, Canada. 18 pp.
- Mitchell, P. 1998. The impact of aerated sewage lagoon effluent on water quality in Field Lake. Alberta Environmental Protection report. 21 pp.
- Mitchell, P. 2000. Effect of Field Lake outflow on water quality in Red Deer Brook. Alberta Environmental Protection report. 22 pp.
- Mitchell, P. 2001. Lac la Biche: water quality and phosphorus sources. Patricia Mitchell Environmental Consulting report. 18 pp.

- Morgan, R.P.C. and R.J. Rickson. 1995. *Slope stabilization and erosion control: a bioengineering approach*. Chapman and Hall, London, United Kingdom.
- NC State University. 2002. Riparian buffers and controlled drainage to control agricultural and nonpoint source pollution. [http://www.soil.ncsu.edu/lockers/Osmond\\_D/web/RiparianBuffers.pdf](http://www.soil.ncsu.edu/lockers/Osmond_D/web/RiparianBuffers.pdf) [accessed 11 Jan 2007]
- Palliser Environmental Services Ltd. 2005. Draft Watershed Management Plan for the Nose Creek Watershed. Nose Creek Watershed Partnership. <http://www.airdrie.com/Content/environment/nosecreek/images/Draft%20WMP%20-%20November%207.pdf> [accessed 30 January 2007].
- Province of British Columbia. 2004. Flood Hazard Area Land Use Management Guidelines. Ministry of Water, Land and Air Protection. [http://www.env.gov.bc.ca/wsd/public\\_safety/flood/pdfs\\_word/guidelines.pdf](http://www.env.gov.bc.ca/wsd/public_safety/flood/pdfs_word/guidelines.pdf) [accessed 30 January 2007].
- Province of Ontario. 2001. Understanding Natural Hazards. Queen's Printer [http://www.mnr.gov.on.ca/MNR/pubs/nat\\_haz1.pdf](http://www.mnr.gov.on.ca/MNR/pubs/nat_haz1.pdf) [accessed 30 January 2007].
- Polyakov V, Fares A, and Ryder MH. 2005. Precision riparian buffers for the control of nonpoint source pollutant loading into surface water: A review. *Environ. Rev.* 13: 129-144.
- Riparian Land Conservation & Management Project: Phase I Final Report. 2007. Riparian Land Conservation and Management Project, Riparian Multi-stakeholder Committee Report, 76 pp, unpublished paper.
- Ritter, M.E. 2006. The Physical Environment: an Introduction to Physical Geography. [http://www.uwsp.edu/geo/faculty/ritter/geog101/textbook/title\\_page.html](http://www.uwsp.edu/geo/faculty/ritter/geog101/textbook/title_page.html) [accessed 30 January 2007].
- Polyakov V, Fares A, and Ryder MH. 2005. Precision riparian buffers for the control of nonpoint source pollutant loading into surface water: A review. *Environ. Rev.* 13: 129-144.
- Sasson, A. 2003. Points to include in determining riparian buffer requirements for Big Darby Environmentally Sensitive Development Area. <http://utilities.ci.columbus.oh.us/project/docs/031120%20Points%20to%20include%20in%20determining%20riparian%20buffer%20requirements%20for%20the%20Big%20Darby%20ESDA.doc> [accessed 25 January 2007].
- Schindler, D.W., R. Freed, A. Wolfe, S. Neufeld and R. Vinebrooke. 2004. Water Quality in Lac la Biche: A Preliminary Assessment of Past and Present Conditions. Unpublished report submitted to the Lac la Biche Watershed Steering Committee. 27 pages.
- Stewart, J. 2006. Ownership and Conservation of Wetlands and Riparian Lands in Alberta's Municipalities. (Unpublished paper).
- Stewart, J. 2007. Sharing governance of a modern commons: Managing access and use of urban municipal environmental reserves. (Unpublished paper).

- Sutton, D. 2004. Agricultural Region of Alberta Soil Inventory Database (AGRASID) Version 3.0. Government of Alberta, Department of Agriculture and Food. [http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/sag5173](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/sag5173) [accessed 25 January 2007].
- Town of Cochrane. 2005. Land use Bylaw 01/2004. [http://www.town.cochrane.ab.ca/municipal/cochrane/cochrane-website.nsf/AllDoc/0EBC6A8CAA5CD3388725700E00636D1E/\\$File/LUB%20with%20maps-first%20reading-mar-05.pdf](http://www.town.cochrane.ab.ca/municipal/cochrane/cochrane-website.nsf/AllDoc/0EBC6A8CAA5CD3388725700E00636D1E/$File/LUB%20with%20maps-first%20reading-mar-05.pdf) [accessed 30 January 2007].
- Ulén, B., Carlsson, C., Lidberg, B. 2004. Recent trends and patterns of nutrient concentrations in small agricultural streams in Sweden. *Environmental Monitoring and Assessment* 98: 307–322.
- United States Department of Agriculture. 2008. Saturated Hydraulic Conductivity in Relation to Soil Texture. Soil Survey Guides and References, Natural Resources Conservation Service. Accessed online at <http://www.usda.gov>
- Urban Systems. 2006. Lakeland County Municipal Development Plan. Draft July 2006. Urban Systems Planners, Edmonton, Alberta.
- Valastin, P. 1999. Caring for Shoreline Properties: Changing the way we look at owning lakefront property in Alberta. Report published by the Alberta Conservation Association (Edmonton, AB) and Fisheries and Wildlife Management Division, Natural Resources Service, Alberta Environmental Protection (St. Paul, AB). 32pp.
- Vermont DEC River Management Program. Defining River Corridors Fact Sheet 2. [http://www.anr.state.vt.us/dec/waterq/rivers/docs/rv\\_definingrcfactsheet.pdf](http://www.anr.state.vt.us/dec/waterq/rivers/docs/rv_definingrcfactsheet.pdf) [accessed 30 January 2007].
- Welsch, David J. 1992. Riparian Forest Buffers: Function and Design for Protection and Enhancement of Water Resources. NA-PR-07-91. Radnor, PA: USFS Forest Service, Northeastern Area.
- Wenger S. 1999. A Review of the scientific literature on riparian buffer width, extent and vegetation. Institute of Ecology, University of Georgia, Athens, Georgia. [http://64.233.167.104/search?q=cache:8ZQTRzNpLZQJ:outreach.ecology.uga.edu/tools/buffers/lit\\_review.pdf+riparian+buffer+width+and+phosphorus+removal&hl=](http://64.233.167.104/search?q=cache:8ZQTRzNpLZQJ:outreach.ecology.uga.edu/tools/buffers/lit_review.pdf+riparian+buffer+width+and+phosphorus+removal&hl=) [accessed 11 Jan 2007]
- White, J.S. and C.M. Prather. 2004. State of the Lac la Biche Watershed 2004: Summary of Current Information. Report prepared by AQUALITY Environmental Consulting Ltd., Edmonton, August 2004. 43 p.
- White, R.E. 2006. *Principles and Practice of Soil Science: The Soil as a Natural Resource*, 4th ed. Wiley-Blackwell, Malden, Massachusetts.

## 7 Appendix A – Vegetation Definitions

**Grass & Herbaceous Plants:** Any grass or non-woody vegetation (including grasses, forbs, rushes, sedges).

**Shrub:** Shrubs will be defined as woody plants differing from a tree by its low stature (>2m) and by generally producing several basal shoots instead of a single trunk. Tree seedlings (saplings) <2m will also be considered as shrubs.

**Forested:** A tree or group of trees with an average height of 2 m and an associated understory.

**Cleared:** An area where the soil is exposed. There may be sporadically occurring plants present.

**Aquatic Vegetation:** Plants that grow in water or in saturated soils (i.e. bulrushes, sedges, cattails, rushes, willows).

**Upland Vegetation:** Plants that grow away from the water in drier soils (i.e. aspen, birch, white spruce and pine trees; shrubs such as rose, mountain ash, juniper and Saskatoon; grasses such as fescue, common grass, wild rye and wheat grass).

## **8 Appendix B - Example Worksheet**

EXAMPLE SHEET WHEN MODEL IS FINALIZED

# Developer's Guide to the Riparian Setback Matrix Model for The Municipal District of Foothills #31



**Prepared for:**

Municipal District of Foothills  
Box 5605  
High River, Alberta, Canada  
T1V 1M7

**Prepared by:**

Aquality Environmental Consulting Ltd.  
#705, 10240 – 124 Street N.W.  
Edmonton, Alberta  
T5N 3W6

**Writers:**

Joshua Haag, B.Sc.  
Melissa Logan, B.Sc., P.Biol.  
Jay White, M.Sc., P.Biol.

**Developers of the Original Model:**

Melissa Logan B.Sc., P.Biol  
Michelle Gray B.Sc., B.I.T.  
Judy Stewart, LLB

The following document is a companion document to the Municipal District of Foothills' *Riparian Setback Matrix Model* and has been prepared to give an overview of the model for those working in the development industry. The Riparian Setback Matrix Model is used by the MD of Foothills to establish unique environmental reserve setbacks to lakes, streams, brooks, creeks, wetlands and intermittent water drainage courses during the development process under authority of Part 17 of the *Municipal Government Act* to sustain watershed and/or watercourses in balance with developmental pressure.

For more details, you can request a copy of the *Riparian Setback Matrix Model* from the Municipal District of Foothills office or online at <http://www.mdfoothills.com/>.

## Introduction

As the rate of development increases, so does the pressure placed on water bodies and sources of drinking water. In order to help mitigate the impacts of development, the Riparian Setback Matrix Model was created. The model will aid in the protection of shorelines, water quality and riparian areas<sup>1</sup>, while allowing for development to occur in a sustainable manner.

The purpose of this document is to help developers understand the need for Environmental Reserve protection to maintain healthy and functional riparian areas free from pollution<sup>2</sup>, while providing public access that will not impede natural functions. The Riparian Setback Matrix Model will be used by the Municipal District of Foothills to determine appropriate Environmental Reserve setbacks for all private lands located adjacent to environmentally sensitive and or significant water bodies, inclusive of lakes, streams, brooks, creeks or intermittent water inflows within the Municipal District.

### ***What is the Riparian Setback Matrix Model***

The Riparian Setback Matrix Model is a scientifically-based, legally defensible model that allows municipalities to take adequate precautions to prevent the most common forms of water pollution, instead of establishing arbitrary setbacks. Municipalities that adopt this approach will protect source water (drinking water sources) within their jurisdiction and will ultimately save thousands of dollars on long term water treatment costs as well as other benefits. This policy and procedure is in direct alignment with the Municipal Government Act (Section 663 and 664).

To obtain the required information (slope, height of bank, groundwater influence, soil type and texture, and vegetation data) required for the Riparian Setback Matrix Model, applicants will need to retain the services of a qualified professional, registered in the province of Alberta (i.e. surveyor, biologist, engineer, hydrologist, hydrogeologist or a combination thereof) to undertake an assessment of the proposed development. Please see the section entitled “Professional Requirements for Site Assessments” for a guide to the types of professional affiliation that are required for different site conditions based on a cursory initial assessment.

---

<sup>1</sup> “Riparian land” means the lands adjacent to a watercourse where the vegetation and soils show evidence of being influenced by the presence of water. Riparian areas are the green zone around a watercourse. They are the vital transitional zone between surface water and the drier uplands and play a vital role in the healthy functioning of both.

<sup>2</sup> “Pollution” means any non-point source impacts on the environment from substances such as sediments, nutrients, pesticides, bacteria, parasites or toxic chemicals that reach a watercourse by surface or subsurface flow through adjacent land, and the unauthorized release of any “deleterious substance” as defined in the *Fisheries Act* (Canada), or the unauthorized release of any substance whether non-point or otherwise that may cause an adverse effect under provisions of the *Environmental Protection and Enhancement Act*.

***What is an Environmental Reserve?***

An Environmental Reserve is a buffer of natural land that lies between developed/developable land and environmentally sensitive areas such as lakes, rivers, streams, creeks, and wetlands. During subdivision of a parcel of land, under conditions prescribed in the *Municipal Government Act* (MGA), a municipality may acquire "reserve lands". Environmental Reserve is "undevelopable" land that must be left in its natural state or used as a public park or for public access to the area (Sec 671 MGA). The strip of land calculated by the RSMM will be dedicated to the MD of Foothills as Environmental Reserve (where the MD takes ownership), or, if the MD agrees, the landowner has the option of entering into an environmental reserve easement (where the landowner retains ownership but must abide by MD bylaws in respect to development and use) with the MD. The use of environmental reserve parcels for exclusive, private purposes will not be tolerated. As the owner of environmental reserve, the MD of Foothills has the responsibility to control access and use to ensure that these sensitive landscapes are sustained for current and future generations.

***When do I need to dedicate reserve lands?***

The subdivision authority of the MD of Foothills shall require the dedication of Environmental Reserve if the lands proposed for subdivision consist of: a) a swamp, gully, ravine, coulee or natural drainage course, b) land that is subject to flooding, or land that is unstable, or c) land abutting the bed and shore of any lake, river, stream or other body of water. If the lands adjacent to the minimum required 6 meter strip are also subject to subsidence, flooding, contain swamps and natural drainage courses, the required dedication of ER may result in a wider strip than 6 meters.

***What is the purpose of an Environmental Reserve?***

The strips of land abutting a lake, river/stream or wetland are taken for two purposes: to prevent pollution, or to provide public access to and beside the bed and shore. Environmental Reserve is dedicated to protect provincially owned beds and shores and water resources from "pollution". Therefore, the definition of pollution that a municipality adopts constitutes pollution in their community. The MD of Foothills defines aquatic pollution as the addition of excess nutrients and steps will be taken to protect aquatic systems from additional nutrients from making their way into watercourses via point and non-point source discharges. One of the most effective ways to protect aquatic ecosystems and prevent pollution is to ensure that riparian areas are intact, healthy and functional.

Riparian zones act as buffers and protect water quality. Contaminants are adsorbed onto sediments, taken up by vegetation and transformed by soil microbes into less harmful forms. Defining a riparian area (riparian buffer strip) that is large enough to effectively protect the water and the aquatic ecosystem is necessary. Each water body requires unique set riparian buffer widths and development setbacks. It is essential that municipalities determine appropriate land uses adjacent to bodies of water,

including wetlands, to avoid or minimize development impacts of valuable water resources, as stated in the provincial and municipal *Land Use Bylaws*. The importance of identifying and protecting a properly-sized buffer strip is extremely important for source water protection.

***How much land will be taken as an Environmental Reserve?***

The amount of land the MD of Foothills will require to be dedicated as Environmental Reserve will range from 15 - 75 meters. The amount of land required will vary with the changing slope, height of banks, groundwater influence, soil type and texture, and vegetative cover present on the land.

***Will I be compensated for the land?***

While a municipality is not required to compensate the landowner for any lands taken as “reserve” during the subdivision process, there are benefits of Environmental Reserve dedication. Environmental Reserve prevents pollution, including nutrients, from entering a water body. By preventing these nutrients from entering the water body, noxious algal blooms and the chances of winter fish kills from excessive aquatic plant growth and decay are minimized. Other benefits of Environmental Reserve dedication include public access to the water body, wildlife-attracting habitat as well as shoreline erosion prevention.

The trend of residing in an urban subdivision in a rural setting is increasing nationally. As the population shifts to these desirable rural subdivisions, more pressure is placed on the environment. The Riparian Setback Matrix Model gives the community the ability to benefit from the environmental social and economic services of the land.

## How to Use the Riparian Setback Matrix

The amount of Environmental Reserve (ER) will be determined by using the Riparian Setback Matrix Model. Environmental Reserve will be determined at several sites along the water's edge. The area dedicated as ER will vary across the site. Some areas will require more ER and others will require less. The dedicated ER will vary throughout the parcel of land depending on slope of the land, height of any banks present, groundwater influence, soil type and vegetative cover.

The amount of property bordering the water's edge will also affect how Environmental Reserve is determined. To start using the Riparian Setback Matrix, setback points will need to be established. The number of points used to determine Environmental Reserve will vary based on area.

### 1. Establish the number and location of setback points required.

#### 1.1. Whereas the location of the point will be:

1.1.1. At the point where vegetation (living or dead) characteristic of an aquatic environment changes to that of upland vegetation. This vegetation includes but is not limited to; Sedges, Bulrushes, Cattails and Willows.

1.1.2. If no vegetation exists, the setback point will be determined from the current edge of water.

#### 1.1.3. Whereas the length of land bordering the water body, stream or wetland is:

1.1.3.1. **Greater than 200 meters** – The outside setback point will be no more than 100 meters from the property line along the water body, stream or wetland. The subsequent setback points will be equally spaced no more than 200 meters apart.

1.1.3.2. **200 meters to 50 meters** – Two (2) setback points will be required equal distance apart and equal distance from each property line.

1.1.3.3. **Less than 50 meters** – One (1) setback point will be required at the discretion of the Municipal District of Foothills. Please contact MD Foothills administration to determine the location of this setback point.

### 2. Slope of the land must be determined by a legal land surveyor at each of the setback points. From each setback point, determine the slope of the land perpendicular to the water body, stream or wetland. The setback distance for slope is calculated as follows:

2.1. If the slope is **<5%**, the setback distance requirement is 10 m.

2.2. If the slope is **5-9.9%**, the stated % the setback distance will be 10 m + 1 m for every 1 % increase in slope after the minimum.

2.3. If the slope is **10-15%** consult with MD of Foothills administration to determine if a geotechnical survey will be required.

2.4. If the slope is **≥ 15 %**, then a geological survey is required. The total setback required for this site will be determined by a registered professional. The determined setback must take into

- account the slope, height of bank, groundwater influence, soil type and vegetative cover. Setback requirements will be subject to the approval of the subdivision authority.
- 2.5. Record slope, under measured slope in Step 1 and enter the calculated distance adjustment in the TOTAL Box in Step 1.
  - 2.6. If the determined setback is greater than or equal to 75 m, skip to step 6; otherwise, continue to step 3.
  3. **Height of Bank** must be determined by a legal land surveyor at each of the setback points. From each setback point, determine the height of bank perpendicular to the water body, stream or wetland. NOTE: Height of bank will be determined at the same time as slope by the surveyor.
    - 3.1. Put a check mark next to the appropriate bank height in Step 2.
    - 3.2. Identify and enter the required distance adjustment in the TOTAL Box in Step 2.
    - 3.3. If the required distance adjustment is 75 m you can stop here. The required distance adjustment for this site is 75 m. The Environmental Reserve allocation will be determined horizontally, perpendicular to the water body, stream or wetland from the setback point.
    - 3.4. If the determined setback is greater than or equal to 75 m, skip to step 6; otherwise, continue to step 4.
  4. Determine the **depth to the water table** for the site. This information can be obtained from a geotechnical report, or from local well data by a qualified hydrogeologist.
    - 4.1. Put a check mark next to the appropriate groundwater depth in Step 3.
    - 4.2. Identify and enter the required distance adjustment in the TOTAL Box in Step 3.
    - 4.3. If the determined setback is greater than or equal to 75 m, skip to step 6; otherwise, continue to step 5.
  5. Determine the **vegetation cover of each type** for the site.
    - 5.1. From each setback point, determine the vegetation type perpendicular to the water body, stream or wetland, by creating a 1m x 10m plot.
    - 5.2. Determine the percent of the plot that is grass, shrub, forested, cleared or impermeable.
    - 5.3. Multiply the percentage of each vegetation cover class by the respective distance adjustment for each type.
    - 5.4. Put the required adjusted distance beside the respective vegetation cover.
    - 5.5. Add up the setback requirements from all vegetation cover types to obtain the total vegetation cover setback.
    - 5.6. Continue to step 6.
  6. **Determine the baseline setback** based on slope, bank height, groundwater depth, and vegetation cover.
    - 6.1. If any of the setbacks calculated from steps 2 – 5 are equal to 75 m, the baseline setback for that point is 75 m.
    - 6.2. Otherwise, the baseline setback is the maximum of the setbacks determined in steps 2 – 5.
  7. Determine the **soil type and texture** for the site.

- 7.1. The soil type and texture with respect to proportions of sand, silt, clay, organic material (peat), rocks and gravel should be determined by a qualified professional.
- 7.2. Based on the percentages of each soil particle fraction, determine the soil texture category that the soil at the site falls into, and use this texture/type to determine the setback soil multiplier.
8. Multiply the distance obtained in step 6 by the soil multiplier determined in step 7. This is the final setback for the site.
9. **To establish Environmental Reserve**, determine setback distances from each setback point. Connect setback points. Setback to the property line will be done perpendicularly from the nearest determined setback point. (See diagram on Page 9 for clarification).

## Example Setback Calculations

A parcel of land is situated with 75m of shoreline along a lake.

### ***CALCULATING SLOPE SETBACKS***

The measured slope at both survey sites on the parcel of land is 9%. This slope falls in the category that does not require a check with MD of Foothills administration. The setback distance will be 10 m + 4m for the additional 4% slope over 5% ( $10\text{m} + 4\text{m} = 14\text{m}$ ).

### ***CALCULATING BANK HEIGHT SETBACKS***

The measured bank height at both survey sites on the parcel of land is 2 m. The setback distance calculated for bank height will be 10 m (all sites with bank heights less than 5 m are assigned a setback of 10 m).

### ***CALCULATING GROUNDWATER DEPTH SETBACKS***

Based on a hydrogeological study of the area, reviewed by a qualified hydrogeologist, the depth of the water table for the parcel of land is determined to be approximately 15 m. This places the depth in the 10-19.9 m depth category, and the resulting setback is 15 m.

### ***CALCULATING VEGETATION SETBACKS***

Plot 1 is covered by 20% grass & herbaceous vegetation, 30% shrubs, 40% forested, 10% bare ground, and 0% impermeable surfaces.

- a. Forested ( $40\% \times 0.20$ ) = 8 m
- b. Shrub ( $30\% \times 0.25$ ) = 7.5 m
- c. Grass & herbaceous ( $20\% \times 0.30$ ) = 6 m
- d. Bare ground ( $10\% \times 0.50$ ) = 5 m
- e. Impermeable surfaces ( $0\% \times 0.60$ ) = 0 m

TOTAL Vegetation Setback = (6 m + 7.5 m + 8 m + 5 m + 0 m) = 26.5 meters.

Plot 2 is covered by 20% forested, 0% shrub, 50% grass & herbaceous vegetation, 30% bare ground, and 0% impermeable surfaces.

- a. Forested ( $20\% \times 0.20$ ) = 4 m
- b. Shrub ( $0\% \times 0.25$ ) = 0 m
- c. Grass & herbaceous ( $50\% \times 0.30$ ) = 15 m
- d. Bare ground ( $30\% \times 0.50$ ) = 15 m
- e. Impermeable surfaces ( $0\% \times 0.60$ ) = 0 m

TOTAL Vegetation Setback = (4 m + 0 m + 15 m + 15 m + 0 m) = 34 meters.

#### ***CALCULATING SOIL TEXTURE MODIFICATION OF SETBACKS:***

Plot 1 (same as Plot 1 above) found to be on a soil with 10% clay, 30% silt, and 60% sand, which corresponds to a sandy loam.

The soil multiplier for a sandy loam is 1.0.

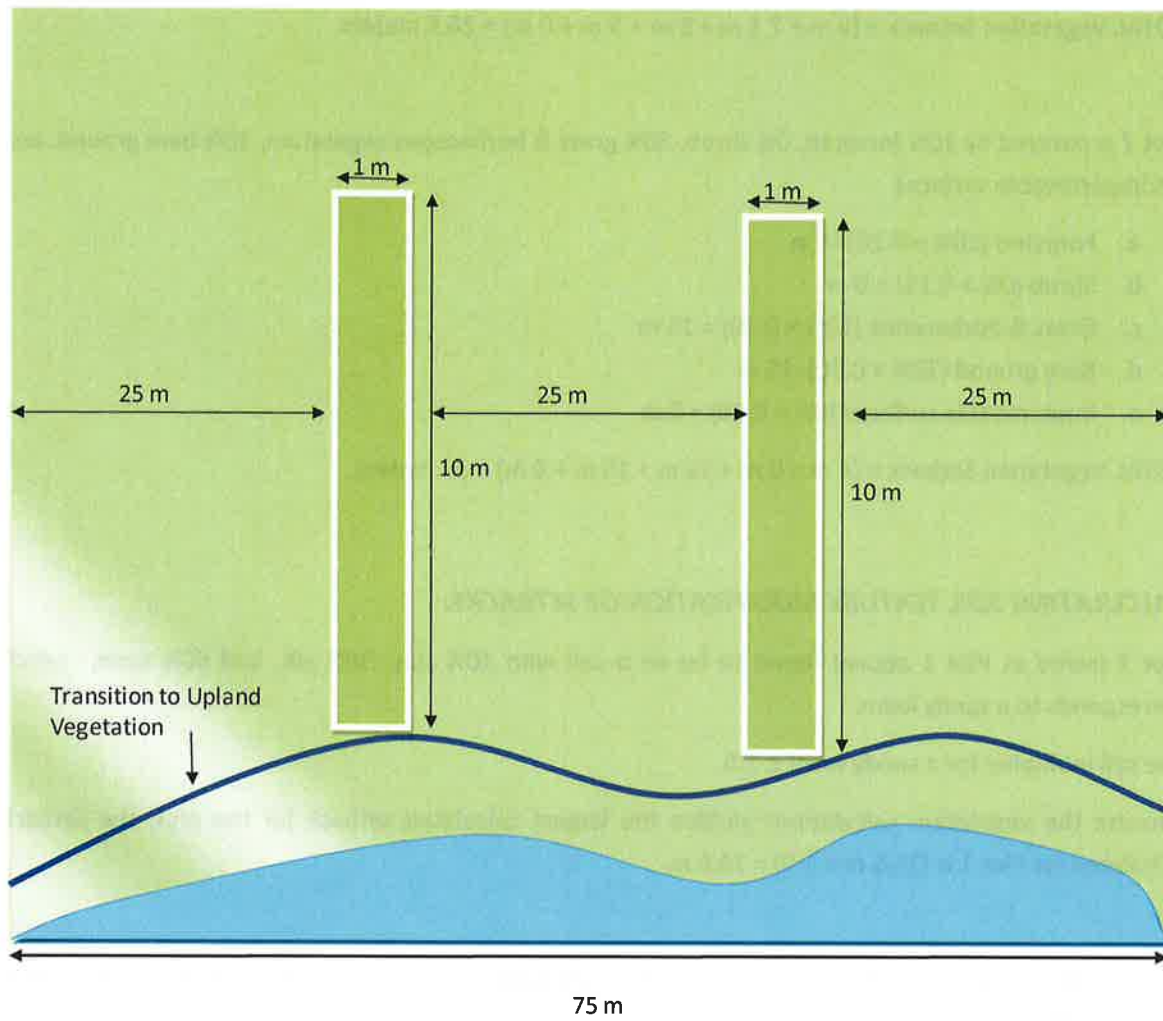
Because the vegetation calculations yielded the largest calculated setback for the plot, the setback calculated for Plot 1 is ( $26.5 \text{ m} \times 1.0$ ) = 26.5 m.

Plot 2 (same as Plot 2 above) found to be on a soil with 35% clay, 35% silt, and 30% sand, which corresponds to a clay loam.

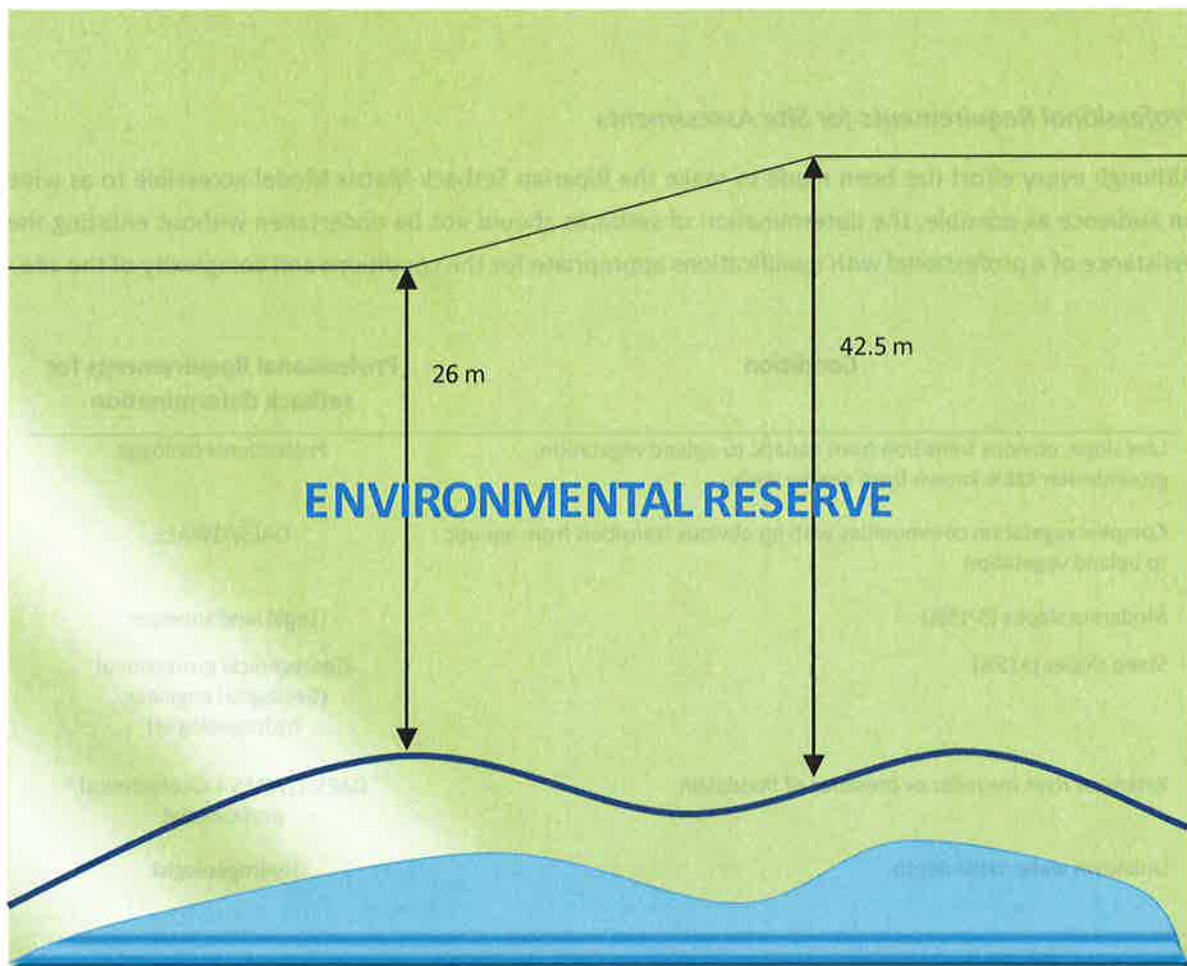
The soil multiplier for a clay loam is 1.25.

Because the vegetation calculations yielded the largest calculated setback for the plot, the setback calculated for Plot 2 is ( $34 \text{ m} \times 1.25$ ) = 42.5 m.

See the attached Riparian Setback Matrix Model sample worksheets and the schematic diagrams of two setback point below for more clarification.



**Figure 1.** Laying out setback determination sites and vegetation sampling plots for a parcel of land 75 m long.



**Figure 2.** Establishment of Environmental Reserve Boundaries based on the setbacks calculated

***Professional Requirements for Site Assessments***

Although every effort has been made to make the Riparian Setback Matrix Model accessible to as wide an audience as possible, the determination of setbacks should not be undertaken without enlisting the assistance of a professional with qualifications appropriate for the conditions and complexity of the site.

Condition	Professional Requirements for setback determination
Low slope, obvious transition from aquatic to upland vegetation, groundwater table known from nearby wells	Professional biologist
Complex vegetation communities with no obvious transition from aquatic to upland vegetation	QAES/QWAES
Moderate slopes (5-15%)	Legal land surveyor
Steep slopes (>15%)	Geotechnical professional (Geological engineer, hydrogeologist)
Extensive river meander or presence of floodplain	QAES/QWAES + Geotechnical professional
Unknown water table depth	Hydrogeologist

### ***Vegetation Definitions***

**Grass & Herbaceous Plants:** Any grass or non-woody vegetation (including grasses, forbs, rushes, sedges).

**Shrub:** Shrubs will be defined as woody plants differing from a tree by its low stature (>2m) and by generally producing several basal shoots instead of a single trunk. Tree seedlings (saplings) <2m will also be considered as shrubs.

**Forested:** A tree or group of trees with an average height of 2 m and an associated understory.

**Cleared:** An area where the soil is exposed. There may be sporadically occurring plants present.

**Aquatic Vegetation:** Plants that grow in water or in saturated soils (i.e. bulrushes, sedges, cattails, rushes, willows).

**Upland Vegetation:** Plants that grow away from the water in drier soils (i.e. aspen, birch, white spruce and pine trees; shrubs such as rose, mountain ash, juniper and Saskatoon; grasses such as fescue, common grass, wild rye and wheat grass).

Waterbody Name: (UNNAMED WATERBODY) - PLOT 1		Waterbody Location: NW-XX-YY-ZZ-W5	
Waterbody Type (circle one): <u>Lake/Pond</u>		River/Stream	Wetland
<b>STEP 1</b>	<b>Slope Category (%)</b>	<b>Slope (%)</b>	<b>Distance Adjustment</b>
	0 - 4.9		10 m
	5 - 9.9	<u>9%</u>	10 m + 1 m per % of slope over 5%
	<u>10 - 14.9</u>		Same as above†
	≥ 15		Requires a geotechnical survey††
	<b>SLOPE SETBACK</b>	<u>14 m</u>	
<b>STEP 2</b>	<b>Height of Bank</b>	<b>Bank Height (m)</b>	<b>Distance Adjustment</b>
	< 5 m	<u>2 m</u>	10 m
	5 to 30 m		2x height of bank
	≥ 30 m		60 m
	<b>BANK HEIGHT SETBACK</b>	<u>10 m</u>	
<b>STEP 3</b>	<b>Groundwater Influence</b>	<b>Select one:</b>	<b>Distance Adjustment</b>
	Distance to water table		
	0 - 9.9 m		30 m
	10 - 19.9 m	<u>X</u>	15 m
	≥ 20 m		10 m
	<b>GROUNDWATER SETBACK</b>		
<b>STEP 4</b>	<b>Vegetative Cover Type</b>	<b>% Cover</b>	<b>Distance Adjustment (m / % cover type)</b>
	Forested	<u>40%</u>	0.15
	Shrub	<u>30%</u>	0.25
	Grass and Herbaceous Plants	<u>20%</u>	0.30
	Bare Ground	<u>10%</u>	0.50
	<u>Impermeable surfaces</u>	<u>0%</u>	0.60†††
	<b>VEGETATION SETBACK</b>	<u>26.5 m</u>	
<b>STEP 5</b>	<b>Soil Texture/Type</b>	<b>Select one:</b>	<b>Distance Adjustment (multiplier) ††††</b>
	Peat (minimum 50% organic matter in soil)		1.0
	Sand, Sandy Loam, or Loamy Sand	<u>X</u>	1.0
	Loam, Silty Loam, or Silt		1.1
	Clay Loam, Sandy Clay Loam, Silty Clay Loam, Sandy Clay, Silty Clay, or Clay		1.25
	Rock and gravel (more than 50% rock and gravel)		1.25
	<b>SOIL SETBACK MULTIPLIER</b>	<u>1.0</u>	
<b>STEP 6</b>	<b>Overall Setback Calculation</b>		
	Determine maximum setback from Steps 1-4 above	<u>26.5 m</u>	
	Multiply baseline setback by soil texture multiplier	<u>1.0</u>	
	<b>TOTAL CALCULATED SETBACK:</b>	<u>26.5 m</u>	

Waterbody Name: (UNNAMED WATERBODY) - PLOT 2		Waterbody Location: NW-XX-YY-ZZ-W5	
Waterbody Type (circle one): <u>Lake/Pond</u>		River/Stream	Wetland
<b>STEP 1</b>	<b>Slope Category (%)</b>	<b>Slope (%)</b>	<b>Distance Adjustment</b>
	0 - 4.9	<u>          </u>	10 m
	5 - 9.9	<u>9%</u>	10 m + 1 m per % of slope over 5%
	10 - 14.9	<u>          </u>	Same as above†
	≥ 15	<u>          </u>	Requires a geotechnical survey††
<b>SLOPE SETBACK</b>		<u>14 m</u>	
<b>STEP 2</b>	<b>Height of Bank</b>	<b>Bank Height (m)</b>	<b>Distance Adjustment</b>
	< 5 m	<u>2 m</u>	10 m
	5 to 30 m	<u>          </u>	2x height of bank
	≥ 30 m	<u>          </u>	60 m
<b>BANK HEIGHT SETBACK</b>		<u>2 m</u>	
<b>STEP 3</b>	<b>Groundwater Influence</b>	<b>Select one:</b>	<b>Distance Adjustment</b>
	Distance to water table	<u>          </u>	
	0 - 9.9 m	<u>          </u>	30 m
	10 - 19.9 m	<u>X</u>	15 m
	≥ 20 m	<u>          </u>	10 m
<b>GROUNDWATER SETBACK</b>		<u>          </u>	
<b>STEP 4</b>	<b>Vegetative Cover Type</b>	<b>% Cover</b>	<b>Distance Adjustment (m / % cover type)</b>
	Forested	<u>20%</u>	0.15
	Shrub	<u>0%</u>	0.25
	Grass and Herbaceous Plants	<u>50%</u>	0.30
	Bare Ground	<u>30%</u>	0.50
	Impermeable surfaces	<u>0%</u>	0.60†††
<b>VEGETATION SETBACK</b>		<u>34 m</u>	
<b>STEP 5</b>	<b>Soil Texture/Type</b>	<b>Select one:</b>	<b>Distance Adjustment (multiplier) ††††</b>
	Peat (minimum 50% organic matter in soil)	<u>          </u>	1.0
	Sand, Sandy Loam, or Loamy Sand	<u>          </u>	1.0
	Loam, Silty Loam, or Silt	<u>          </u>	1.1
	Clay Loam, Sandy Clay Loam, Silty Clay Loam, Sandy	<u>          </u>	
	Clay, Silty Clay, or Clay	<u>X</u>	1.25
	Rock and gravel (more than 50% rock and gravel)	<u>          </u>	1.25
<b>SOIL SETBACK MULTIPLIER</b>		<u>1.25</u>	
<b>STEP 6</b>	<b>Overall Setback Calculation</b>		
	Determine maximum setback from Steps 1-4 above	<u>34 m</u>	
	Multiply baseline setback by soil texture multiplier	<u>1.25</u>	
<b>TOTAL CALCULATED SETBACK:</b>		<u>42.5 m</u>	



## FOOTHILLS COUNTY SCREENING STANDARDS



This page left purposely blank for duplex printing



# TABLE OF CONTENTS

1.0	INTRODUCTION .....	1
2.0	SCREENING IN FOOTHILLS COUNTY .....	2
3.0	TARGET ACTIVITIES AND FACILITIES .....	3
4.0	LEVELS OF SCREENING .....	7
4.1	FULL SCREENING .....	7
4.2	PARTIAL SCREENING .....	7
4.3	BUFFER SCREENING .....	8
5.0	DETERMINING THE SUGGESTED LEVEL OF SCREENING .....	9
6.0	SCREENING METHODS.....	12
6.1	SCREENING METHODS - SPECIFICATIONS.....	14
	FENCES AND WALLS: .....	14
	EARTH BERMS:.....	14
	LANDSCAPING:.....	15
6.2	SCREENING METHODS - EXAMPLES .....	15
7.0	DEVELOPING & SUBMITTING THE SCREENING PLAN.....	18
	STEP 1:.....	18
	STEP 2:.....	18
	STEP 3:.....	19
	STEP 4:.....	19
	STEP 5:.....	19
8.0	MAINTENANCE REQUIREMENTS .....	20
	LANDSCAPING:.....	20
	FENCING AND HARDSCAPING: .....	20
9.0	CONCLUSION.....	21
	APPENDIX 1 - SAMPLE SCREENING PLANS.....	22
	APPENDIX 2 - PLANT LIST .....	25
	APPENDIX 3 - HWY 2A INDUSTRIAL ASP POLICY AREAS .....	26
	APPENDIX 4 - WARNING: UTILITY & PIPELINE LOCATIONS.....	27



This page left purposely blank for duplex printing



## 1.0 INTRODUCTION

### 2020 Update:

In late 2019, in response to concerns brought forward by business owners in the Highway 2A Corridor, Foothills County Council directed administration to undertake a review and amendment of the Screening Standards. The instructions were to simplify the document, incorporate some flexibility, and reduce the requirements for landscape screening in the Highway 2A corridor.

The Screening Standards had been originally adopted in December 2010 in response to concerns regarding the negative visual impact of RV storage lots and other outdoor storage uses in the County. The document was intended to provide a comprehensive screening strategy for industrial and commercial development in order to preserve the natural beauty of the area. Dillon Consulting provided assistance with the development of the original screening strategy.

The Screening Standards identify the types of development in Foothills County that are considered to be potentially visually obtrusive and would benefit from screening. These “target activities and facilities” include the outdoor storage of vehicles, materials, or other goods, exterior work or assembly areas, waste and recycling areas, loading areas, mechanical and electrical equipment, as well as parking and sales lots.

Based on the categories of target activities and facilities, Dillon Consulting recommended a system consisting of three (3) different screening levels. In order of highest to lowest level of screening they are: full screening, which approximates 100% screening of the property from adjacent properties, partial screening, which achieves about 50% screening, and buffer screening, which should obscure approximately 25% of the development from adjacent roads or properties. A table is provided to assist in determining what level of screening is appropriate for different “target activities and facilities”.

The level of screening, as well as the method of screening is to be proposed by applicants for development and will be evaluated by Council or the Approving Authority. In order to assist the developer in determining how to achieve the desired results, the Screening Standards provide examples of Full, Partial and Buffer screening and a variety of methods that can be used to achieve each of them.



## 2.0 SCREENING IN FOOTHILLS COUNTY

Screening is defined in **Foothills County's Land Use Bylaw** as:

*A fence, earth berm, hedge or trees used to visually and/or physically separate areas or functions.*

The Land Use Bylaw also indicates that:

*The Development Authority may require that landscaping and/or screening is provided in conjunction with any development, and is addressed as part of the Development Permit application. The intent of landscaping and screening is to contribute to a reasonable standard of appearance for developments, to provide a positive overall image for the County and to encourage good environmental stewardship (Section 9.14.2).*

Further,

*Landscaping and screening requirements may be applied to commercial and industrial uses. Where landscaping and screening is required, it shall be completed in accordance with the County's "Screening Standards" (Section 9.14.3).*

The Land Use Bylaw prescribes landscaping and screening for a number of specific uses including, cannabis production facilities, commercial storage facilities, recreational vehicle storage and dog facilities. There are also a number of land use districts where the completion of landscaping and screening in accordance with the Screening Standards is required including Business Park District, Community Commercial District, Highway Commercial District, Rural Business District, Hamlet Industry District, General Industry District, Industrial Edge District, Natural Resource Extraction District and a number of direct control districts.

These standards are intended to provide guidance to landowners or developers who are making changes to an existing commercial or industrial use, or are proposing a new commercial or industrial use or development, on how they can prevent their business from creating a negative visual impact on surrounding properties. The Screening Standards will help them anticipate if screening might be required at their site, how much screening would be appropriate, and options as to how the screening could be achieved. The Standards also outline requirements for an application.

This document is provided as a guideline to suggest what the screening requirements may be for commercial or industrial development in Foothills County. It should be noted that the requirements are different depending on whether the proposed development is inside or outside of the Highway 2A Corridor. This is because in the Corridor, the entire area is contemplated for industrial or commercial uses so the visual impacts of development are not the same as in other areas where there are likely to be adjacent residential uses. While these Standards provide a good understanding of what may be required; ultimately, Council or the Approving Authority will determine whether screening is required and the appropriate level of screening for any proposal.



### 3.0 TARGET ACTIVITIES AND FACILITIES

To help applicants determine if screening may be required for their development, a list of the types of activities and facilities for which screening is generally recommended has been compiled. The list is not comprehensive or exhaustive and ultimately Council or the Approving Authority will decide if a proposed development requires screening.

Screening Standards are applied based on the likelihood that the activity or facilities proposed will detract from the visual character of the area or have a negative impact on adjacent development. It should be noted that these standards are for commercial and industrial applications, they are not intended to be applied to Agricultural, General uses or to structures or equipment in support of the same on land that is zoned as Agricultural District.

#### Target Activities and Facilities:

1. **Outdoor Storage Areas:** Outdoor storage is defined in the land use bylaw as “*the accessory storage of equipment, vehicles, goods, and materials in the open air where such storage of goods and materials does not involve the erection of permanent structures or the material alteration of the existing state of the land*”. This category would include storage areas for heavy equipment, lumber, pipe, tanks, manufactured goods or materials for manufacturing processes, it does not include RV storage.
2. **Vehicle Storage Areas:** This category would include cars, farm equipment, recreational vehicles, tractor trailers, boats etc. It does not include typical parking lots unless vehicles are stored there for an extended period.
3. **Stockpile Areas:** This includes large stockpiles of materials such as sand or aggregate used for industrial purposes, or areas for storing or stockpiling bulk landscaping materials, materials used for manufacturing processes, or those awaiting packaging, as well as finished product waiting to be shipped. \*
4. **Exterior Work Areas:** This includes exterior areas for assembly, construction or repair and industrial processing.
5. **Garbage, Recycling, Composting or Waste Areas:** This would include areas for waste disposal, settling ponds, recycling storage or processing and composting sites as well as portable washrooms. Auto Wreckers and similar activities would be covered here as well.
6. **Loading Areas:** This category includes loading docks and bays or other outdoor loading areas for commercial or industrial buildings.
7. **Mechanical and Electrical Equipment:** This would typically include large air conditioning units, ventilation units, transformers, small trash receptacles and other such equipment.
8. **Sales Lots:** This category would include areas used for the storage and display of vehicles or equipment that are available for sale or lease and recognizes the desire to utilize these areas for advertising.
9. **Parking Lots:** This category includes areas designed to accommodate the parking of more than 25 cars.

**\*Note:** Gravel Pits are regulated by Alberta Environment and Parks and must comply with *all requirements under the applicable provincial legislation as well as any conditions specific to an approval granted by AEP.*



**Examples of each type of Target Activities or Facilities:**



**Category 1: Outdoor Storage Areas**

**Figure 3.1**



**Category 1: Outdoor Storage Areas**

**Figure 3.2**



**Category 2: Vehicle Storage Areas**

**Figure 3.3**



**Category 2: Vehicle Storage Areas**

**Figure 3.4**





**Category 3: Stockpile Areas**

**Figure 3.5**



**Category 4: Exterior Work Areas**

**Figure 3.6**



**Category 5: Garbage, Recycling, Composting or Waste Areas**

**Figure 3.7**



**Category 5: Garbage, Recycling, Composting or Waste Areas**

**Figure 3.8**



**Category 6: Loading Areas**

**Figure 3.9**



**Category 7: Mechanical & Electrical Equipment**

**Figure 3.10**



**Category 8: Sales Lots**

**Figure 3.11**



**Category 9: Parking Lots**

**Figure 3.12**

## 4.0 LEVELS OF SCREENING

Depending on the category of target activity or facility and its location there are three (3) different levels of screening that could be implemented. In order of highest to lowest level of screening they are: full screening, which approximates 100% screening of the property from adjacent roads or properties, partial screening, around 50% screening from adjacent roads or properties, and buffer screening, which should obscure approximately 25% of the development from adjacent roads or properties. A more detailed description of the three types of screening follows.

### 4.1 FULL SCREENING

Full screening is used to provide a complete visual barrier of a selected area, using fences, walls, berms, tightly spaced evergreen plant material or some combination of these methods. Full screening may also be provided by locating the activity behind a building or structure.

Full screening may be considered appropriate when the intent is to fully block the view from the adjacent roads or lands. Garbage storage areas and electrical or mechanical equipment locations are examples of areas that may benefit from full screening. There may be circumstances where full screening is used in conjunction with partial or buffer forms of screening on a site.



**Closely spaced evergreen trees are one method of providing full screening**

### 4.2 PARTIAL SCREENING

Partial screening is used when the intent is to visually block approximately 50% of the activity or facility from adjacent properties or roadways. A partial screen provides a sense of visual transparency between portions of the site and adjacent roads/lands. This moderate level of screening is appropriate for a variety of sites.

A combination of structures, walls/ fences, coniferous/deciduous plant material and earth berms may be used to create partial screening by blocking approximately 50% of the site from view. Fences may allow for 50% opacity, trees are planted farther apart and earth berms may only be half the height necessary to block the view. A hedge of deciduous shrubs, such as lilacs or Caragana provides significant coverage for 50% of the year. A combination of multiple screening elements may be used to create an interesting visual barrier from both inside and outside the site.

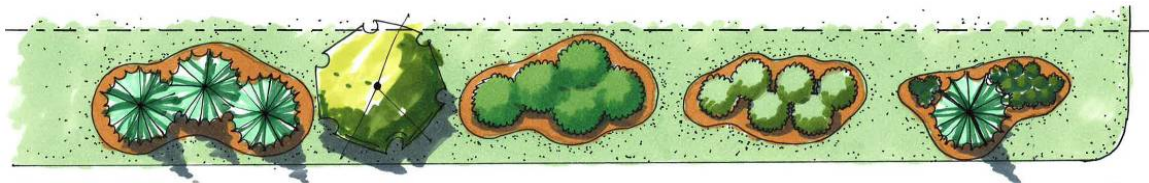


**A mixed landscape is an appropriate method of providing partial screening**

### **4.3 BUFFER SCREENING**

Buffer screening is used to provide a low level of screening or 'landscape softening'. Vehicle sales lots and commercial parking areas are suggested examples of areas that may benefit from buffer screening.

Fences, low walls, earth berms and a mix of deciduous and coniferous trees and shrubs can be used as components of buffer screening.



**A landscape buffer screen is one method of providing the 25% screening suggested for buffer screening**

## 5.0 DETERMINING THE SUGGESTED LEVEL OF SCREENING

In Section 3 of this document, a number of types of activities and facilities for which screening may be required were described. Some of these would benefit from minimal screening, while for others, a more complete screening would be appropriate.

The precise level of screening that will be required of a landowner or developer will be at the discretion of Council or the Approving Authority and will be dependent upon such factors as the visibility of the site as well as adjacent land uses. A general guideline for what will be required is provided in the following table. To determine what level of screening is required:

**First:** look up the activity and location in Table 5.1.

**Then:** answer the qualifying questions to determine if the level should/may be adjusted.

**TABLE 5.1 SCREENING LEVELS BY ACTIVITY OR FACILITY CATEGORY**

Category		Location		
		Highway 2A General Area*	Highway 2A Enhanced Area*	Outside Highway 2A Corridor
1	Outdoor Storage Areas	Partial	Partial	Full
2	Vehicle Storage Areas	Partial	Partial	Full
3	Stockpile Areas	Buffer	Partial	Partial
4	Exterior Work Areas	None	Buffer	Partial
5	Garbage, Recycling, Composting or Waste Areas	Partial	Full	Full
6	Loading Areas	None	Buffer	Partial
7	Mechanical & Electrical Equipment	None	Full	Full
8	Sales Lots	None	None	Buffer
9	Parking Lots	None	Buffer	Partial

\* The Enhanced Area of the Highway 2A Corridor includes lands in the Highway 2A Industrial ASP area that are in the Industrial Edge, Gateway Interface or the Industrial / Commercial policy areas as Shown on the Map in **Appendix 3**. The General Area includes all remaining lands in the ASP area.

**Note:** Foothills County Council or the Approving Authority may require a higher or lower level of screening than is indicated in the chart.



## QUALIFYING QUESTIONS FOR TABLE 5.1

Is the proposed development:

1	In or adjacent to a hamlet?	If yes, may need to increase level of screening.
2	In an intermunicipal development plan (IDP) area?	If yes, may need to increase level of screening.
3	In an Area Structure Plan or Area Concept Plan area that addresses design guidelines or screening?	If yes, may need to increase or decrease level of screening accordingly.
4	Located on a major road or provincial highway?	If yes, may need to increase level of screening.
5	Located adjacent to residential development?	If yes, may need to increase level of screening.
6	Located adjacent to a natural area?	If yes, may need to increase level of screening.
7	Located near a major recreational facility?	If yes, may need to increase level of screening.
8	On a site that has rolling terrain?	If yes, may be able to decrease level of screening depending on location of visually obtrusive activity or facility.
9	On a site that is well treed?	If yes, may be able to decrease level of screening depending on location of visually obtrusive activity or facility.
10	On a large site that provides setback between target use and adjacent parcels?	If yes, may be able to decrease level of screening on the sides where there is a great distance from target activity to property lines
11	Adjacent to similar uses, or other uses that may be considered visually obtrusive?	If yes, may be able to decrease level of screening or eliminate screening at least on sides adjacent to similar or visually obtrusive use.
12	A sales lot?	Screening requirements may be reduced along the road side of the parcel for advertising purposes. However, may need to be increased along any boundaries adjacent to residential properties.
13	In a location where screening would be ineffective or could not achieve the desired effect (for instance in an area much lower than the surrounding lands or roads)?	Screening requirements may be reduced or eliminated but landscaping to improve the appearance of the site may still be required.



**Following are some examples of how to utilize Table 5.1 and the qualifying questions:**

Example 1:

There is a proposal for an RV storage facility in the Highway 2A Corridor General Area. This would fall under Category 2 - Vehicle storage areas. For Category 2 in the General Area of the Highway 2A Corridor Table 5.1 suggests partial screening.

However, the proposed facility is located on a flat site with no trees that is on a highway and adjacent to a residential development. Thus, Council or the Approving Authority may, at their discretion, require full screening.

Example 2:

There is a proposal for a restaurant within a Hamlet. The restaurant will require a large mechanical fan off the kitchen, a used grease collection bin and a garbage dumpster.

According to Table 5.1, the mechanical equipment and the garbage/waste area will likely require full screening. As the proposed site is within a hamlet and located adjacent to residential lots it is likely that Council or the Approving Authority will adhere to the recommended full screening.

Example 3:

There is a proposal for a car dealership on a parcel along Highway 2A north of Okotoks, the subject parcel is outside of the IDP area and presently abuts country residential parcels on two sides. This would fall under category 8 – Sales Lots.

According to Table 5.1, sales lots outside of the Highway 2A Industrial Corridor require partial screening. Looking at the qualifying questions #5 and #12 are relevant in this case. In consideration of question 5, since the use is adjacent to residential development, screening may need to be increased along the boundary adjacent to the residential development. In consideration of #12, screening could be reduced along the road side. The recommendation in this case would be to increase the screening level from partial to full screening on the boundaries of the development that abut residential lands and reduce the screening to buffer level or even none along the road side of the development.



## 6.0 SCREENING METHODS

There are four methods that are generally considered appropriate for screening, these are:

1. Fence or Wall,
2. Earth Berm,
3. Landscaping,
4. Combination.

Once the appropriate level of screening (full, partial or buffer) has been determined using the table and questions in Section 5, the next step is to determine which method will be used to achieve the desired level of screening. The following table describes how the three levels of screening may be achieved using each of the four screening methods.

**TABLE 6.1 – SCREENING METHODS**

Screening Method	Screening Level	Description	Pros	Cons
Fence or Wall	Full Screening	Solid constructed fence or wall of sufficient height and length to obscure the activity or facility that requires screening. Acceptable Materials Include: Concrete Block, Concrete Panels, Brick, Wood, Aluminum, PVC, Stucco <b>Note: Chain-link fencing with vinyl inserts is not considered appropriate outside of the General Area of the Highway 2A Corridor.</b>	Attractive and generally low maintenance requirements.	Relatively large initial expense. May be difficult to build on rolling or densely vegetated land.
Fence or Wall	Partial Screening	Solid constructed fence or wall of sufficient height and length to obscure approximately 50% of the activity or facility that requires screening. Acceptable Materials: See above	See above	See above
Fence or Wall	Buffer Screening	Sections of fence or wall, may be only partially solid – may have sections of wrought iron or lattice or openings which provide for views through. It must obscure approximately 25% of the activity or facility that requires screening. Acceptable Materials: See above and add Lattice, Wrought Iron and Glass Block.	See above	See above



Earth Berm	Full Screening	A mound or bank of earth of sufficient length and height to obscure all of the activity or facility that requires screening.	Relatively inexpensive. Very low maintenance requirements. May mitigate noise as well.	Not attractive unless combined with landscaping and/or hardscaping. May need to remove existing vegetation to accommodate.
Earth Berm	Partial Screening	A mound or bank of earth of sufficient length and height to obscure approximately 50% of the activity or facility that requires screening.	See above	See above
Earth Berm	Buffer Screening	A mound or bank of earth of sufficient length and height to obscure approximately 25% of the activity or facility that requires screening.	See above	See above
Landscaping	Full Screening	Densely planted rows or groupings of evergreen trees of sufficient height and length to completely obscure the activity or facility that requires screening.	Attractive, and works on flat or rolling terrain and can work with existing vegetation.	Relatively large initial expense. Maintenance and water requirements.
Landscaping	Partial Screening	Rows or groupings of trees and shrubs, both evergreen and deciduous of sufficient density to obscure approximately 50% of the activity or facility that requires screening.	See above	See above
Landscaping	Buffer Screening	Rows or groupings of trees and shrubs, both evergreen and deciduous of sufficient density to obscure approximately 25% of the activity or facility that requires screening.	See above	See above
Combina- tion	Full Screening	Utilizing a combination of two or more of the following of sufficient density to entirely obscure the activity or facility that requires screening: fencing or walls, berms, and rows or groupings of trees and shrubs (evergreen and/or deciduous).	Potentially the most attractive option.	May be expensive. Water and maintenance requirements may be significant particularly if plants on top of berms.
Combina- tion	Partial Screening	Utilizing a combination of two or more of the following of sufficient density to obscure approximately 50% of the activity or facility that requires screening: fencing	See above	See above



		or walls, berms, and rows or groupings of trees and shrubs (evergreen and/or deciduous).		
Combina- tion	Buffer Screening	Utilizing a combination of two or more of the following of sufficient density to obscure approximately 25% of the activity or facility that requires screening: fencing or walls, berms, and rows or groupings of trees and shrubs (evergreen and/or deciduous).	See above	See above

## 6.1 SCREENING METHODS - SPECIFICATIONS

### FENCES AND WALLS:

1. Screening fences or walls must comply with Foothills County's Land Use Bylaw.
2. Fences and walls must meet development setbacks to property lines, municipal roads and highways as outlined in Section 9.14 of the Land Use Bylaw unless relaxed through the development permit process.
3. Maximum fence height is 3.05m (10 ft.) unless otherwise accepted by the Approving Authority.
4. Solid metal fences must have capping along unfinished edges on top and bottom.
5. Fences and walls shall be constructed with components of sufficient size, and strength to prevent sagging or leaning.
6. Screening fences or walls shall be consistent in quality, design and character with buildings on the same site.
7. Fences or walls should incorporate pillars or articulation for visual interest.
8. Security toppers, if installed, shall be angled wire or as accepted by the Approving Authority.
9. No razor wire is permitted on screening walls or fences.
10. Chain link fences with vinyl slats will generally not be supported as screening fences.
11. Where significant lengths of uninterrupted fencing or walls are required, pockets of landscaping are encouraged.

### EARTH BERMS:

12. An earth berm shall not impact drainage on the parcel it is located on, unless supported by appropriate studies to the satisfaction of the County's Public Works department and the Approving Authority.
13. An earth berm shall not negatively impact drainage on an adjacent parcel.
14. Earth berms shall be constructed with a maximum 3:1 slope on sides and ends (3 horizontal units for each vertical unit).
15. Earth berms shall be designed and constructed to the satisfaction of the Approving Authority.



16. Earth berms shall be covered with turf, ground cover or rip-rap to reduce erosion.
17. Earth berms shall be seeded with a seed mix approved by Foothills County's Agricultural Fieldman or their designate. Hydro-seeding or drill seeding is strongly encouraged.
18. If landscaping is incorporated into an earth berm, locating it on the top of the berm is discouraged unless irrigation with harvested stormwater or reclaimed water is available.

## LANDSCAPING:

19. Potable water shall not be used to irrigate landscaping used for screening.
20. Landscape screening shall be comprised of drought tolerant plant material.
21. Trees and shrubs shall be chosen and planted so that at maturity they do not interfere with overhead or underground utility service lines or traffic site lines.
22. Planting beds for landscape screening shall incorporate appropriate ground cover to the satisfaction of the Approving Authority, to reduce weed growth.
23. Ground cover materials shall be appropriately contained to prevent migration and shall be topped-up or replaced as necessary to maintain function and appearance.
24. Minimum size for coniferous trees is 1 meter height, 600mm root ball diameter
25. Minimum #5 pot for all shrubs;
26. Minimum 40mm caliper for deciduous trees, 600mm root ball diameter
27. All planting beds should be mulched to a depth of 75mm.
28. Minimum 125mm depth of topsoil for sod, minimum 150mm depth of topsoil for seed;
29. Shrubs to be in 600mm depth topsoil bed;
30. Landscaping shall be regularly maintained by the property owner and dead materials shall be replaced annually.

## 6.2 SCREENING METHODS - EXAMPLES



**Fence or Wall Screen – Full Screening**



**Fence or Wall Screen – Partial Screening**

*Note: Decreasing height and/or length or creating gaps in fencing can change a wall or fence from full to partial screen or partial to buffer screen.*



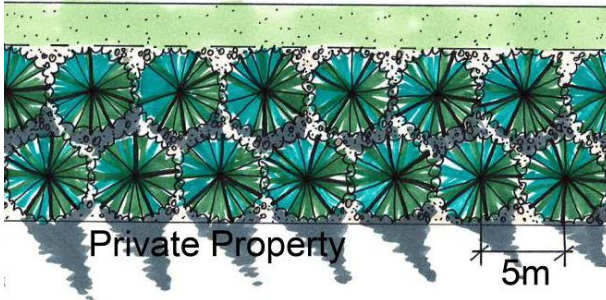


**Fence or Wall Screen – Buffer Screening**



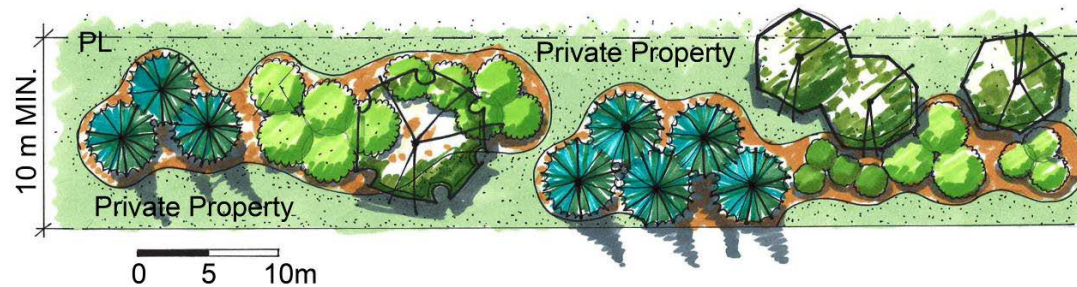
**Earth Berm Screen – Full or Partial Screening**

*Note: Decreasing height and/or length can change a berm from full to partial or buffer screen.*

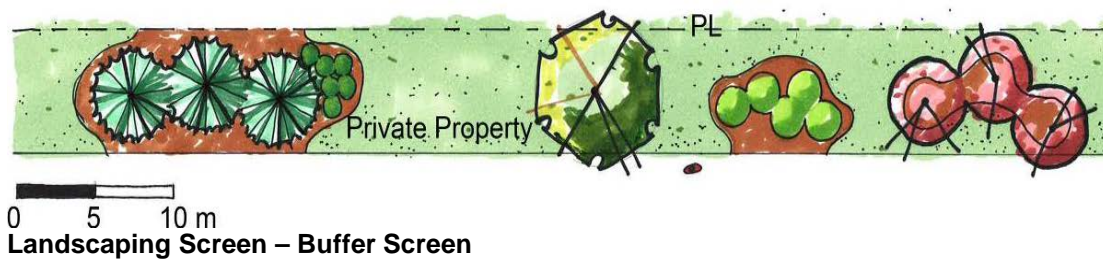


**Landscaping Screen – Full Screen**

*Note: Full screening using landscaping alone is very difficult in most areas of Foothills County. Full screening using a combination of landscaping with fencing or earth berms is suggested as more attainable.*



**Landscaping Screen – Partial Screen**



**Combination Screen – Full Screening (Fence with Landscaping)**



**Combination Screen – Buffer Screen (Berm with Landscaping)**

*Note: Placing landscaping on top of berms is not recommended unless provisions can be made for irrigation with non-potable or reclaimed water.*



**Combination Screen – Full, Partial or Buffer Screening (Earth Berms and Mixed Planted Landscaping)**



## 7.0 DEVELOPING & SUBMITTING THE SCREENING PLAN

A complete application for a proposed development that is likely to require screening should include the Proposed Screening Plan. This scaled drawing of the site will show proposed access, any rights of way or easements existing on the site, any required setbacks and all existing and proposed development. It will clearly indicate which areas are likely to require screening, the type of screening proposed (full, partial or buffer screening), and the methods that will be used to achieve the screening. It may be desirable to have a Professional Landscape Architect prepare the Proposed Screening Plan particularly if the proposed development is likely to require extensive screening.

Section 6.0 of this document provides an overview of different methods of screening and how they can be used to achieve the desired level of screening. Following are some suggested steps for developing and submitting a Proposed Screening Plan.

### STEP 1:

Prepare a detailed site plan to scale, or approximately to scale, that includes:

- Legal description and boundaries of project parcel including dimensions;
- All required setbacks from property lines;
- Any easements or rights of way existing on the site (e.g. access easements, power lines or utility rights of way);
- Existing and proposed access to the site with adjacent roads labelled;
- Existing and proposed internal roadways, driveways, parking areas and loading areas;
- The locations of all existing and proposed buildings and other improvements such as retaining walls, fences, gates, signs, pathways etc. (labelled as existing or proposed);
- The location of any significant natural site features, for example areas with significant slope, water courses or wet areas, areas with existing trees or shrubs etc.;
- The location of any existing or proposed product display, storage, refuse, recycling and/or exterior work areas;
- The locations of existing and proposed landscaped areas;
- Site contours or grading as required;
- Any other information as required by Council or the Approving Authority;

### STEP 2:

Determine the suggested level of screening by referring to Table 5.1 and answering the accompanying qualifying questions. This should result in an idea of the likely screening requirements.



### STEP 3:

Referring to Table 6.1 – Screening Methods and the Screening Methods examples and specifications in Section 6.0 of this document, determine the most appropriate method(s) for achieving the level of screening that is likely to be required.

### STEP 4:

Add the proposed screening to the detailed site plan to create a Proposed Screening Plan. Some examples of screening plans are included in **Appendix 1** for reference. The Plan should include a schedule that identifies how the screening will be constructed including construction details for walls, fences or berms and a plant list identifying species, quantities and sizes of trees and shrubs to be used, if any. A Maintenance Plan for the screening should also be provided.

### STEP 5:

Submit the Proposed Screening Plan in both 11x17 hard copy and digital pdf (or equivalent) as part of a development permit application for the proposed development. Further to the approval of the Proposed Screening Plan, applicants will generally be required to execute a Development Agreement regarding the construction of the screening in advance of commencing construction. This agreement may include provisions related to the execution of other agreements(s), proof of required insurance, payment of review fees, terms for maintenance and submission of a surety. Provisions regarding screening may also be incorporated into an overall Development Agreement for the whole development for which a development permit is being sought.

#### Note on Plant Species:

A list of plant material that is considered suitable for Foothills County is provided, in **Appendix 2**. This list includes the hardiness (by zone) to assist with plant selection for specific sites. More exposed areas will tend to require hardier plants more suited to colder zones than sheltered locations. The use of native plant material is usually preferred, however, the number of native species is quite limited and many foreign species have been successfully used in Alberta for decades.

The mature size of the plant material is given, but these are average sizes only. Some plants will grow to surpass these sizes, while some will not achieve the average sizes. The more favourable the growing conditions, the more likely the plants will achieve or surpass average sizes.

Species not included on the plant list may be used at the discretion of the Approving Authority.



## 8.0 MAINTENANCE REQUIREMENTS

Once the screening has been installed according to specifications, there will be a maintenance requirement to ensure that it does not become unsightly due to dead or dying vegetation, an abundance of weeds, or fences or walls that are in need of maintenance or repair. The ongoing maintenance and upkeep of all landscaping and screening is expected to continue for the life of the project and is the responsibility of the property owner.

The maintenance plan for the screening, including procedures and schedules for maintenance should be included in the Proposed Screening Plan that is submitted as part of the development permit application. Maintenance requirements may also be included as part of a development agreement. As a guideline, or in absence of a development agreement, the following are the general maintenance requirements for screening installations.

### LANDSCAPING:

- All plant material is to be kept in a healthy, vigorous growing condition;
- Un-mulched beds and tree pits must be freshly cultivated and free of weeds, rubbish, and debris;
- Mulched beds should be free of weeds, rubbish and debris, the mulch should be contained with a barrier so it does not migrate and should be replenished as required to maintain function and appearance;
- Remove all dead branches. Prune broken portions of branches back to live material;
- Replace dead trees and shrubs annually.

### FENCING AND HARDSCAPING:

- Fences, walls or other structures used in screening must be kept in good repair; any damage from weather, wildlife, livestock, traffic accidents or vandalism must be repaired in a timely manner.
- Fences or walls should be repainted or refinished at such time as they begin to appear unsightly from age or degradation.



## 9.0 CONCLUSION

The purpose of the Screening Standards is to provide guidance to landowners or developers who are operating or proposing to operate a commercial or industrial enterprise anywhere in Foothills County. The suggested level of screening for a particular use will vary depending on its location, the type of surrounding development and the individual site conditions. The goal is to prevent businesses from creating a negative visual impact on surrounding properties or along major roads or highways. It should be noted that the screening requirements in the Highway 2A Corridor are generally less than elsewhere for similar types of development. This is due to the nature of that area as an established industrial area.

These guidelines were developed to help protect the visual quality of the lands in the County and are not intended to impose undue hardship on business owners. The guideline package may assist applicants for commercial or industrial projects in anticipating if screening might be required for their project, and provide guidance to allow them to successfully navigate the design and approvals process.

Foothills County Council or the appointed Approving Authority will generally consider a Proposed Screening Plan submitted by a developer as part of the overall development permit application. They will determine, at their discretion, if and how much screening is required based on the particulars of the specific development. The goal is to work with applicants to ensure that future developments maintain or enhance the visual quality of Foothills County and to preserve our rural character for future generations.



## APPENDIX 1 - SAMPLE SCREENING PLANS

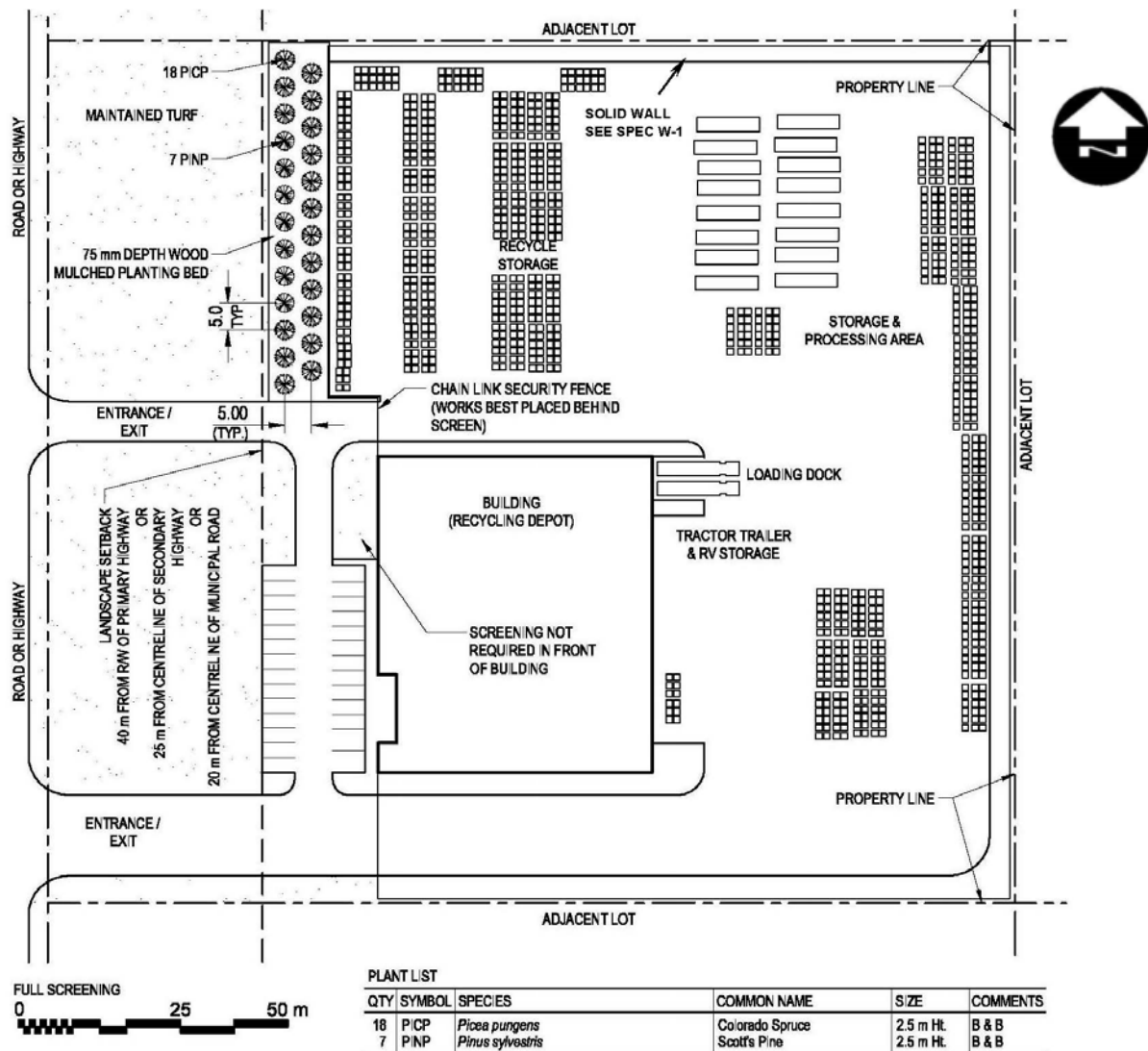
### SAMPLE SCREENING PLAN - FULL SCREENING

This example shows a hypothetical recycling facility that is proposed for lands in the General Area in the Hwy 2A Corridor. The exterior storage area and processing & storage area of this facility fall under Category 5 - Garbage, recycling, composting or waste areas which according to Table 5.1 require Partial Screening in the General Areas of the Hwy 2A Corridor.

This facility is proposed adjacent to Hwy 2A which is a Provincial Highway so the level of screening required along that side has been increased to full screening. A double row of evergreen trees is proposed to accomplish this.

The adjacent use to the north is in the Enhanced Area of the corridor and is designated as Business Park so full screening is required on that side, a solid wall with brick pillars is proposed to meet this requirement.

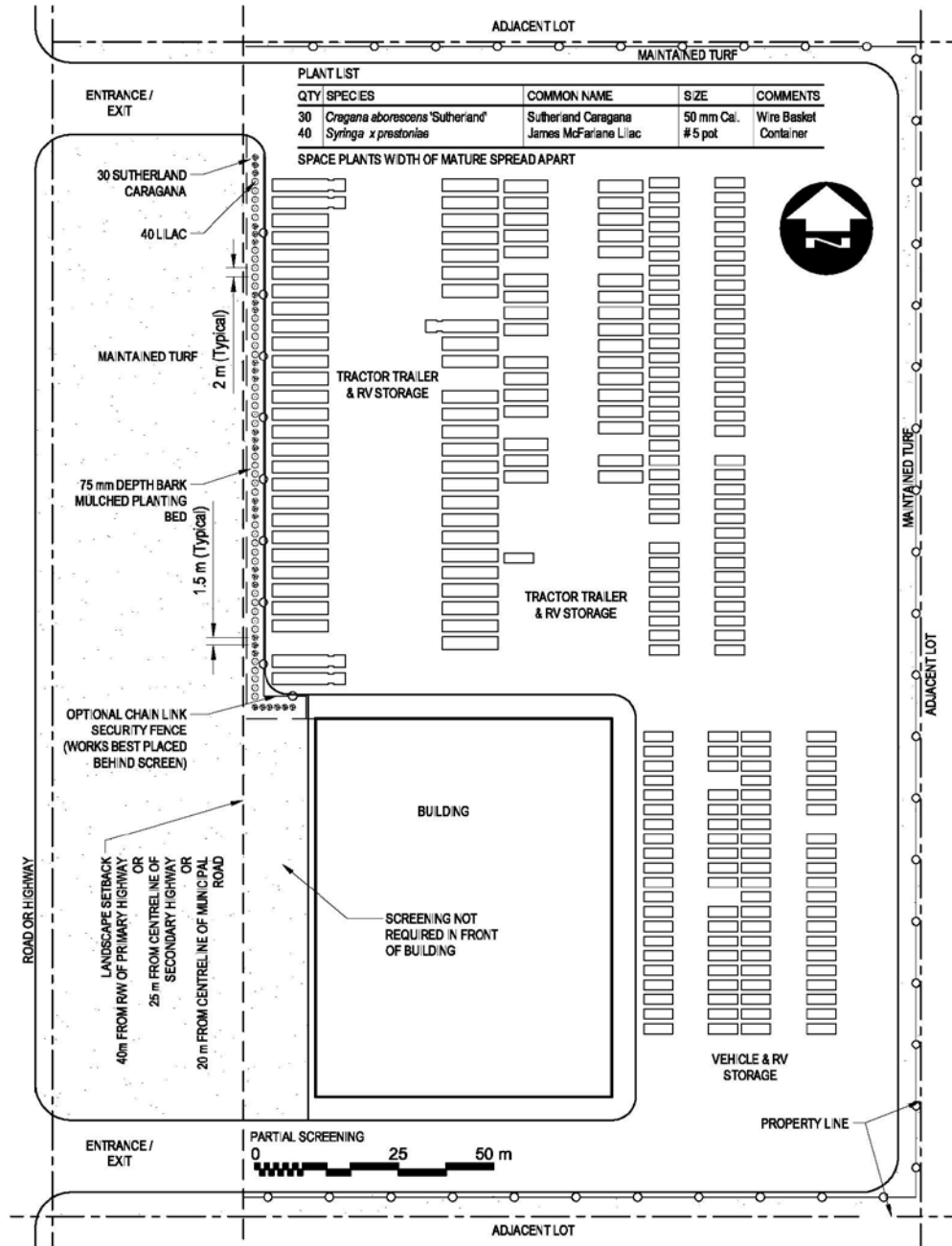
The adjacent uses to the east and south are considered compatible uses and it was determined that screening on those sides was not required so a chain link security fence is proposed there.



## SAMPLE SCREENING PLAN - PARTIAL SCREENING

This hypothetical proposal is for a Tractor Trailer and RV storage facility in the General Area of the Hwy 2A Corridor. This use falls under Category 2 - Vehicle parking and storage areas, which according to Table 5.1 require Partial Screening in the General Areas of the Hwy 2A Corridor. This facility is proposed on an internal road and is not visible from the highway so the level along the road does not need to be increased. It is proposed that the partial screening required along the road side of the facility will be achieved by planting a hedge of Caragana and Lilac.

All the adjacent lots are designated as General Industry and the uses are considered compatible industrial uses and so the level of screening along those sides was reduced and screening was deemed not required.

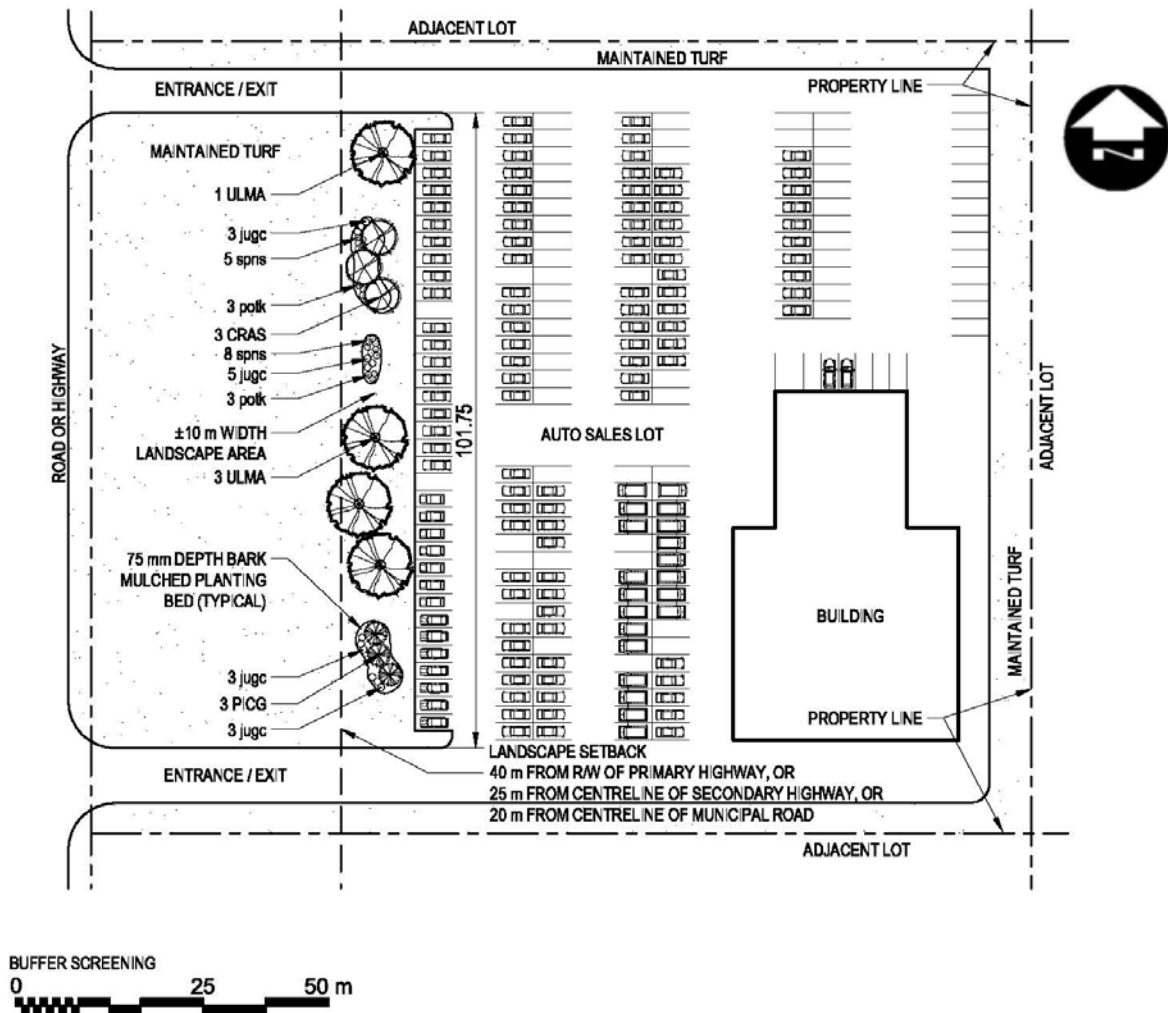


## SAMPLE SCREENING PLAN - BUFFER SCREENING

This hypothetical proposal is for a car dealership outside of the Highway 2A Corridor falls under Category 8 - Parking and sales lots. According to Table 5.1 for this use outside of the 2A Corridor, partial screening is suggested.

In this case, the proposal is located in an Area Concept Plan (ACP) area. This ACP contemplates locating a number of similar uses in the same area and provides design guidelines that call for buffer screening along the road side and no screening of property lines adjacent to parcels with compatible land use.

The buffer screening is proposed using a mixture of trees and shrubs that provide select views into the sales lot from the adjacent road.



### PLANT LIST

QTY	SYMBOL	SPECIES	COMMON NAME	SIZE	COMMENTS
3	CRAS	<i>Crataegus succulenta</i>	Fleshy Hawthorne	50 mm Cal.	Wire Basket
3	PICG	<i>Picea glauca</i>	White Spruce	2.5 m Ht.	B & B
4	ULMA	<i>Ulmus americana</i>	American Elm	50 mm Cal.	Wire Basket
<b>SHRUBS</b>					
12	jugc	<i>Juniperus horizontalis</i> 'Gold Coast'	Gold Coast Juniper	# 2 pot	Container
6	potk	<i>Potentilla fruticosa</i> 'Katherine Dykes'	Katherine Dykes Potentilla	# 2 pot	Container
13	spns	<i>Spirea nipponica</i> 'Snowmound'	Snowmound Spirea	# 2 pot	Container

100 m X (3 SMALL SHRUBS + 1 TREE / 10 m) = 30 SHRUBS + 10 TREES

33% OF PLANTS ARE CONIFEROUS (EVERGREEN)



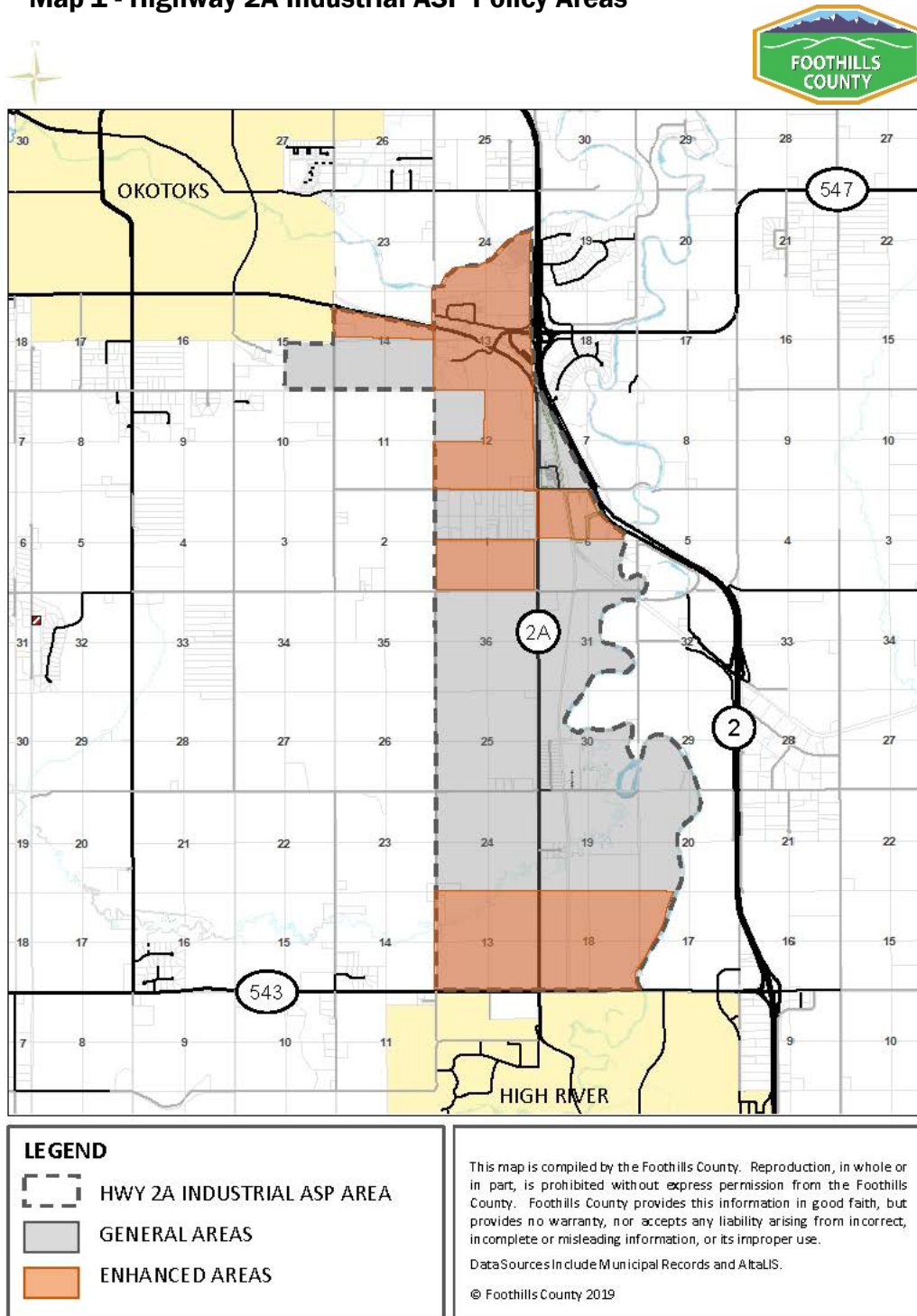
## APPENDIX 2 - PLANT LIST

Scientific Name	Common Name	Spread (m)	Zone	Height (m)
<b>Deciduous Trees</b>				
<i>Crataegus x species</i>	Hawthorn	4	3	5
<i>Fraxinus x species</i>	Ash	3	2-3	10
<i>Malus x species</i>	Crabapple trees, varies and	3	2	5
<i>Populus x species</i>	Poplar and Aspen species, various cultivars.	12	2-3	12
<i>Salix pentandra</i>	Laurel-Leaf Willow	12	2-3	12
<i>Sorbus x species</i>	Mountain Ash, various cultivars	5	2	8
<b>Evergreen Trees</b>				
<i>Picea pungens</i>	Colorado blue Spruce, various cultivars	5	2	20
<b>Evergreen Shrubs</b>				
<i>Juniperus x species</i>	Juniper shrubs, various cultivars	2	2	0.3
<i>Pinus x species</i>	Pine shrubs, various cultivars	5	4	10
<b>Deciduous Shrubs</b>				
<i>Amelanchier x species</i>	Saskatoon	4	2	5
<i>Aronia melanocarpa</i>	Chokeberry	1	3	1.5
<i>Berberis x species</i>	Barberry, various cultivars	1.3	3	1.3
<i>Eleagnus commutata</i>	Wolf Willow	2	2	2
<i>Hippophae rhamnoides</i>	Sea Buckthorn (male and female)	4	2	4
<i>Physocarpus x species</i>	Ninebark	1	2	1.3
<i>Potentilla fruticosa x variety</i>	Potentilla	1	2	1
<i>Rosa rubrifolia</i>	Redleaf Rose	1.2	3	1.2
<i>Rosa woodsii</i>	Woods Rose	1	2	1
<i>Sambucus x species</i>	Elder, various cultivars	3	2	3
<i>Sorbaria sorbifolia</i>	False Spirea	2	2	2
<i>Sorbus decora</i>	Showy Mountain Ash (shrub)	4	3	5
<i>Spiraea x species</i>	Spirea, various cultivars	1	2-3	1
<i>Symphoricarpos albus</i>	Snowberry	1	2	1.2
<i>Symphoricarpos occidentalis</i>	Buckbrush	1	1	1.2
<i>Syringa vulgaris</i>	Common Lilac	2	2	2.5
<i>Viburnum x species</i>	Cranberry, various cultivars	3	3	3



## APPENDIX 3 - HWY 2A INDUSTRIAL ASP POLICY AREAS

**Map 1 - Highway 2A Industrial ASP Policy Areas**



## APPENDIX 4 - WARNING: UTILITY & PIPELINE LOCATIONS

As with any activity that requires excavation, it is of paramount importance that you contact **Alberta One Call** at least 3 working days prior to commencing work on any screening installation to request that the buried utilities on your property be located and marked. It's easy and there is no charge. Requests can be submitted by phone or on their website.

You will need to have the following information ready:

- your dig area information (address or legal land description, whether you will be digging on public or private property, which portion of the site you will be digging on etc.)
- the type of work you are doing and
- the date you require locates to be completed by

Please note: It is the excavator's responsibility to make sure there is no damage to the located utilities during excavation, and placing a request with the One Call Centre does not remove that responsibility.

## CALL BEFORE YOU DIG!

**Telephone: 1-800-242-3447**

**Website: <http://www.albertaonecall.com/submit-a-locate-request/>**



## APPENDIX H

### *The Municipal District of Foothills No. 31*

#### SPECIAL EVENTS

1. Purpose:  
The purpose of this document is to provide background information with regard to requirements for Special Events that are to be held within the boundaries of the Municipal District of Foothills No. 31.
2. Definitions:
  - (1) *Special Event* shall be identified as a one-time or infrequently occurring activity that is designed to bring individuals together, and may last anywhere from a few hours to a few days. Special Events may include, but are not limited to activities such as: music festivals, dance festivals, organized sporting events, and cultural gatherings; whether indoors or outdoors, to which members of the public are invited and/or admitted for a charge or free of cost. For these purposes, this shall not include community-sponsored events such as Christmas parties, breakfasts, card parties, or other similar social functions;
  - (2) *Special Event Permit* shall mean a permit pursuant to application for the same;
  - (3) *Council* means the Council of the M.D. of Foothills No. 31;
  - (4) *Health Officer* means the Medical Officer of Health appointed by the Provincial Board of Health, or a person designated by the Medical Officer of Health, or where no Medical Officer of Health has been appointed, the local Board of Health or the Board of a Health Unit as the case may be or such a person as is designated by the local Board of Health or the Board of a Health Unit;
  - (5) *Permit Holder* means a person or entity that has applied for and obtained a permit to operate a Special Event pursuant to M.D. of Foothills Bylaw 11/97;
  - (6) *Licensing Officer* means the Council or such person as Council may designate;
  - (7) *Municipality* means the Municipal District of Foothills No. 31;
  - (8) *Supervisor of Medical Services* means the Supervisor appointed by the local hospital Board designated to oversee Ambulance Services for the area.
3. No person shall operate, maintain, hold, conduct, promote or advertise a Special Event in the municipality unless he or she has first obtained a Special Event Permit from the Licensing Officer in respect of such activity.  
The Licensing Officer shall not issue a Special Event Permit in respect of a proposed Event unless a development permit has been issued pursuant to the Land Use Bylaw covering the proposed event.
4. Applications for a Special Event shall be made to the Licensing Officer in writing at least 120 days prior to the proposed date of the Event and shall be accompanied by filing an application fees as follows:

	Filing Fee	Application Fee
Up to 500 people	\$ 75.00	\$ 525.00
501 – 2,500 people	\$ 75.00	\$ 750.00

2,501 – 10,000 people	\$ 75.00	\$3,400.00
10,001 plus	\$ 75.00	\$6,800.00

The filing fee shall be non-refundable. The application fee will be refunded if the Special Event permit is not issued, but is otherwise non-refundable.

Applications shall contain the following information:

- (a) The name, age, residence, mailing address and telephone number or numbers of the person making such application. If the application is made by a partnership, the names and addresses of all partners shall appear. Where the applicant is an incorporated company, the application shall be signed by at least two Directors of the incorporated company and shall contain the addresses of such corporate Directors and shall have attached a certified copy of the Certificate of Incorporation;
  - (b) A written statement of the kind, character, or type of event which the applicant(s) proposes to conduct, operate, or carry on;
  - (c) The address or legal description(s) of the property(ies) where the proposed event is to be conducted, operated, or carried on. Additionally the applicant(s) shall submit proof of ownership of the place where the event is to be conducted or a statement signed by the owner of the premises indicating his or her consent that the site be used for the proposed event;
  - (d) The date or dates and the hours during which the event is to be conducted;
  - (e) An estimated of the number of customers, spectators, participants, and other persons expected to attend the event for each day it is conducted;
  - (f) The names and addresses of anyone contributing, investigating, or having financial interest greater than \$500.00 in producing the event;
  - (g) A financial statement to give assurance of the ability of the applicant(s) to meet the conditions of the permit being applied for;
  - (h) A detailed written explanation of the applicant's plans to provide security and fire protection, water supply and facilities, sewage and drainage facilities, food supplies and facilities, sanitation facilities, First Aid facilities and service, vehicle parking space, vehicle access, policing, and on-site traffic control and, if it is proposed or expected that the spectators or participants will remain at night or overnight, the arrangements for illuminating the premises and for camping or similar facilities. The applicant's plan shall include what provisions shall be made for the numbers of attendees in excess of the estimated, provisions for the clean up of the premises and provisions for the removal of rubbish after the event has concluded. A site plan showing the arrangement of the facilities, including those for parking, egress, and ingress, shall be submitted with such application.
5. Every application for permit shall be accompanied by a surety, in a form and amount acceptable to the municipality, to cover any claims which might be brought against the municipality for any reason as a result of the event being held within the municipality; such surety to return to the applicant(s) when the municipality deems there will be no such claim forthcoming.

6. Every person applying for a permit pursuant to application for the same, shall satisfy the Licensing Officer and Health Officer that he or she is able to meet the conditions and requirements set out by the Provincial Health Authority;
7. Every Special Event permit shall be subject to the following conditions and requirements which shall be complied with at all times by the Permit Holder;
  - (a) Security Protection: Every Permit Holder shall provide, at their own expense, security protection. This shall include the provision of a minimum of one security officer for every 100 persons expected to be in attendance;
  - (b) Water and Sanitation Facilities: Every Permit Holder shall provide an ample supply of potable water for drinking and sanitation purposes at the site of the event. The minimum supply of water to outdoor events shall be 68 litres of water for each person in attendance per day. All water shall meet Health Authority standards. Public and private flush-type water closets, lavatories and drinking facilities, and sewage and drainage systems, as well as items incidental to the operation of the foregoing shall be required as determined by the Health Officer.

This condition shall only be deemed to have been met when the Health Officer has accepted such arrangements as satisfactory;
  - (c) Food Concessions: Where the site of the proposed event is more than 200 metres distant from public eating places, food handling places or like establishments, the applicant(s) shall provide such food facilities as may be required by the Health Officer to adequately provide food services to those persons attending the event;
  - (d) Every Permit Holder shall be required to furnish such trash cans and garbage receptacles as may be required by the Health Officer. An adequate supply of plastic bag liners to fit the trash cans shall be provided and each container shall at all times have a plastic bag liner inserted. The pickup and removal of trash, refuse, garbage and rubbish shall be at least once a day or more often as required by the Health Officer. A signed contract with a licensed refuse collector shall be submitted and filed with the Health Officer. The removal of all trash and refuse shall be at the Permit Holder's expense;
  - (e) First Aid Facilities: Every Permit Holder shall provide such First Aid facilities at the site of the event as may be required by the Supervisor of Medical Services. The Permit Holder shall provide ambulance services to transport persons attending the event from the site of the event to the nearest hospital where need arises. The type of ambulance service shall be as required by the Supervisor of Medical Services;
  - (f) Parking Areas: Every Permit Holder shall provide adequate parking spaces for persons attending the event by motor vehicle. The Permit Holder may be called upon to provide a separate parking space for every two persons expected to attend the event by motor vehicle. Such parking areas shall be clearly marked. The Licensing Officer must approve an applicant's "parking plan" before a license shall be issued;
  - (g) Access and Parking Control: The Permit Holder shall provide adequate ingress and egress to the event site and parking areas. All necessary roads, driveways and entrance ways shall exist to ensure the orderly flow of traffic into the premises from a highway or road which is part of the highway system or which is a highway maintained by the municipality. A special access way for fire equipment,

ambulance and other emergency vehicles may be required. The Licensing Officer shall approve the Permit Holder's plan for ingress and egress before a license shall be issued. Additionally, a Permit Holder may be required to show that traffic guards are under his or her employ to insure orderly traffic movement and the ability to relieve traffic congestion in the vicinity of the event area;

- (h) Hours of Operation: All events which are subject to a permit close and cease operation continuously between the hours of 2:00 a.m. and 6:30 a.m. of each and every day;
  - (i) Communications: The applicant shall be required to establish a communication system for public use where ordinary communications are not available. The Licensing Officer may require provision of proof of reliable mobile communications at the site of the event;
  - (j) Miscellaneous: The Licensing Officer may impose such additional conditions as are reasonably required in order to protect the health, welfare and property of local residents and persons attending any event.
8. A Permit Holder is responsible for complying with all relevant federal, provincial and municipal laws.
9. The Licensing Officer may grant relief from any of the above requirements where it appears that such an action is in the best public interest. This ability to grant relief shall be limited to those items within the control of the Licensing Officer under Bylaw 11/97 and does not relieve the Permit Holder from any conditions or requirements imposed by law, contract, or otherwise.
10. Any person who:
- (a) operates, maintains, holds, conducts, promotes or advertises an event within the municipality without first having obtained a Special Event permit; or;
  - (b) having obtained a Special Event permit, fails to comply with the conditions attached to the permit;
- is guilty of an Offence and is liable on conviction to a fine of no more than \$2,500.00 and not less than \$1,500.00;
- and in addition, to a fine of no more than \$2,500.00 for every Offence that continues,
- and in default of payment, to imprisonment for a term not exceeding 30 days.

## **APPENDIX I**



### **RURAL APPROACH STANDARDS**

All accesses onto a Provincial Highway must be approved by Alberta Transportation. All subdivision / boundary adjustment approvals are subject to having a proper legal access onto the proposed lot as well as legal access(s) for all other approach(s) onto the balance of the parcel. Only one approach is allowed for a parcel 10 acres or less. All approach(s) shall comply with the following guidelines:

- Sight distance on approach shall be as per **Table 7**.
- The Municipality retains the authority to allow for discretionary variances and the relaxation of standards for both existing and newly constructed approach(s).
- There shall be no obstruction on the approach (gate, curbing, fence, control box, mailbox, etc).
- Angle of the approach shall be 90 degrees to the roadway.
- Approach shall not be closer than 60 m (197 ft) from the centre line of an intersection, mailbox location, bridge, or any at-grade railway crossing.
- Approach shall not be closer than 15 m (50 ft) from an existing approach on the same side of the road.
- Approach shall be built with the same material as of new or existing road (clay or granular type materials) at a minimum 250 millimeter gravel base and the surface structure the same as the abut road or under the discretion of the Municipality.
- The side slopes of the approach shall be a 3:1 ratio. NOTE: 3 meters (10 ft) slope (length) for 1 meter (3 ft) of rise (height).
- The surface of the approach is to be crushed gravel to MD standards of 20 mm (3/4 inch) at a minimum depth of 50 mm (2 inches).
- Paved approach shall be ACP at a minimum depth of 90 mm and shall meet the specifications of Commercial "B" mix asphalt for the City of Calgary. The approach shall be paved from the shoulder of the road to the property line or for a minimum distance of 8 meters (26 ft). A field approach is exempt unless otherwise specified.
- Maximum gradient of the approach shall not exceed +2% to -2% from the shoulder of the road to the property line or for a minimum distance of 8 meters (26 ft). In the case of +1% or greater gradient the surface must be crowned +2% in both directions from the centre of the approach to accommodate for drainage.
- If a culvert is required, it shall be of new corrugated steel, minimum 500 mm (20 inch) diameter. All culvert couplers shall be buried below the depth of the ground cover over the culvert. Minimum ground cover over culvert is 0.3 meters (1 ft.).
- Rip Rap must be placed around the ends of the culvert, as per attached drawings.
- A 6.0 meter (20 ft) buffer between any power pole, power pole anchor or utility pedestal to the beginning of the culvert end must be maintained.
- A standard approach shall have a minimum surface width of 6 meters (20 ft) at the property line with a 3 meter intersecting radius at the 12 meter (40 ft) road allowance. Minimum 12 m (40 ft) culvert is required.
- A common approach shall have a minimum surface width of 9 meters (30 ft) at the property line with a 3 meter intersecting radius at the 15 meter (50 ft) road allowance. Minimum 15 m (50 ft) culvert is required.
- A commercial approach shall have a minimum surface width of 8 meters (26 ft) at the property line with a 6 meter intersecting radius at the 20 meter (65 ft) road allowance. Minimum 14 m (46 ft) culvert is required.
- All disturbed areas adjacent to the approach must be maintained to original grade, loamed, seeded and reclaimed in a manner to allow for natural grasses to re-grow.
- All debris or top soils must be removed from the road allowance and hauled to a safe distance so that no wash out is deposited onto the road allowance.
- Upon the completion of approach(s) construction onto the parcel, and acknowledging that all the above stated conditions have been met, notify the MD of Foothills for a final inspection.
- **CALL BEFORE YOU DIG!** Remember; call **1 800 242 3447** call before you dig and Alberta One Call will arrange to have buried utilities in your area located for you at no charge



## RURAL APPROACH STANDARDS

TABLE-7

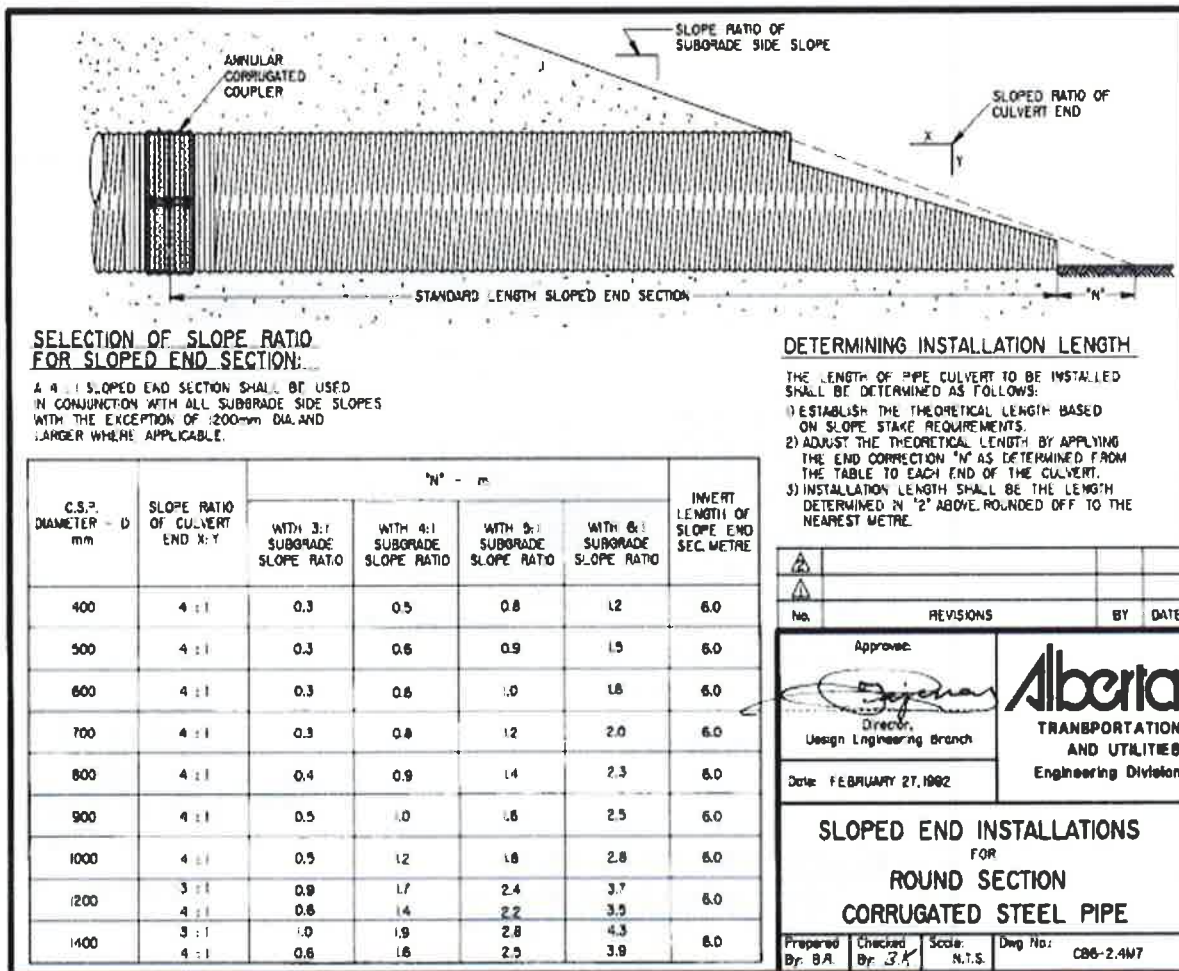
### Sight Distance

The height of the object shall be 1.10 meter on the main road. The eye height shall be used at the intersection 1.10meter for passenger vehicle and 1.80 for single unit trucks/buses.

Posted Speed (km/h)	Minimum sight distance required from intersecting road/approach (m)
40	65
50	90
60	115
80	180



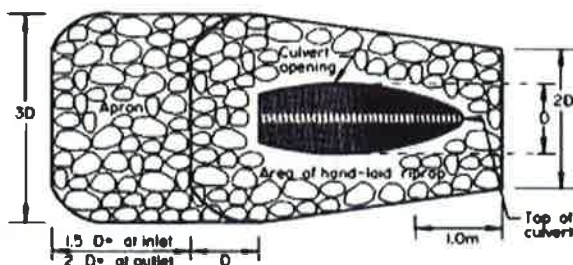
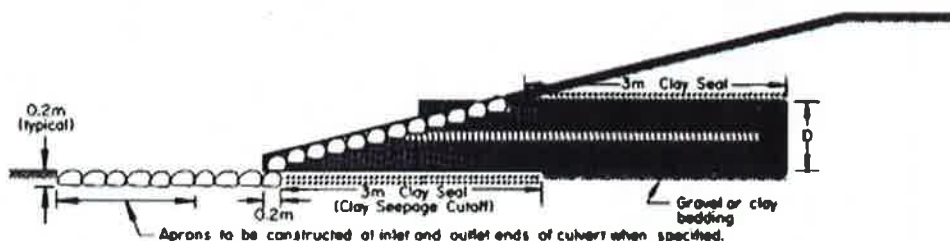
## RURAL APPROACH STANDARDS





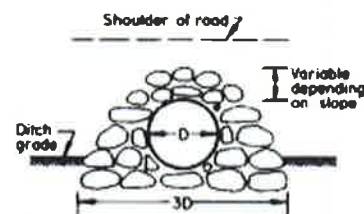
# RURAL APPROACH STANDARDS

## SECTION



• These are typical minimum dimensions.

## PLAN VIEW



## ELEVATION

### ESTIMATED RIPRAP SURFACE AREAS\*

PIPE DIAMETER (mm)	AREA OF ONE END EXCLUDING APRON (m <sup>2</sup> )	AREA OF ONE END INCLUDING INLET APRON (m <sup>2</sup> )	AREA OF ONE END INCLUDING OUTLET APRON (m <sup>2</sup> )
500	2	3	4
600	3	5	6
700	4	6	7
800	5	8	9
900	6	10	11
1000	7	12	13
1100	9	14	16
1200	10	16	19
1400	13	22	25

\* THE ESTIMATED RIPRAP SURFACE AREAS SHOWN IN THIS TABLE ARE BASED ON A 4:1 SIDESLOPE.

### NOTE:

THIS DRAWING SUPPLEMENTS SPECIFICATION 2.5 RIPRAP AND APPLIES TO CULVERTS LESS THAN 1500mm EQUIVALENT DIAMETER.

△			
△			
No.	REVISIONS	BY	DATE

*Carla*  
Executive Director,  
Roadway Engineering Branch

**Alberta**  
TRANSPORTATION  
AND UTILITIES  
Engineering Division

Date: 9/1/22

## HAND LAID RIPRAP (Rock or Sacked Material)

Prepared By: L.T. Checked By: B.K. Scale: N.T.S. Draw No.: CB6-2.5 MI

## **APPENDIX J**

### **COMMUNITY STANDARDS BYLAW**

#### **BYLAW NO. 45/2013**

BEING A BYLAW OF THE MUNICIPAL DISTRICT OF FOOTHILLS NO. 31, IN THE PROVINCE OF ALBERTA, FOR THE PURPOSE OF REGULATING COMMUNITY STANDARDS AND CONTROLLING AND REDUCING NUISANCES AND UNSIGHTLY PREMISES WITHIN THE MUNICIPAL DISTRICT OF FOOTHILLS NO. 31.

WHEREAS pursuant to the provisions of the *Municipal Government Act*, RSA 2000, c. M-26, a council may pass bylaws for municipal purposes respecting the following matters:

- a) the safety, health and welfare of people and the protection of people and property;
- b) nuisances, including unsightly property; and
- c) the enforcement of bylaws;

AND WHEREAS the *Municipal Government Act* authorizes a municipality to pass bylaws regarding the remedying of contraventions of bylaws; and

AND WHEREAS Council deems it necessary to repeal and replace Bylaw No. 34/2009.

NOW THEREFORE, Council of the Municipal District of Foothills No. 31, in the Province of Alberta, in open meeting hereby enacts as follows:

#### **PART 1 - INTERPRETATION AND DEFINITIONS**

##### **Short Title**

1. This bylaw may be cited as the "Community Standards Bylaw."

##### **Definitions**

2. In this bylaw, unless the context otherwise requires:
  - (a) "Agricultural" means systems of tillage and Animal husbandry which involve methods used on large areas of land for the raising of crops or the rearing of livestock (provided that the density of the operation does not exceed 1 Animal unit per 3 acres of land) whether separately or in conjunction with one another in unified operations and includes Buildings and other structures incidental to the agricultural operation where the intent of the Building or structure is to be used as an "arena, private", "arena, limited public" or "arena, commercial" as defined in the Municipal District Land Use Bylaw, as amended or repealed and replaced from time to time;
  - (b) "Animal" means a vertebrate, other than a human being or fish;
  - (c) "Board" means the Community Standards Appeal Board;
  - (d) "Building" includes a structure or anything constructed or placed on, in, over or under land but does not include a Highway, road, or bridge forming part of a Highway or road;
  - (e) "Construction" means the building or maintenance of roads, earthworks or the temporary process of demolishing or building any structure, or repairing or improving a Building that already exists, including landscaping, home repair, property improvement and any work in connection with that process;
  - (f) "Council" means the Council of the Municipal District;
  - (g) "Day-time" means the period:

- (i) beginning at 7:00 a.m. and ending at 9:00 p.m. of the same day on a Weekday; or
  - (ii) beginning at 9:00 a.m. and ending at 9:00 p.m. of the same day on a Weekend;
- (h) **"Highway"** means any thoroughfare, street, road, trail, avenue, parkway, driveway, viaduct, lane, alley, square, bridge, causeway, trestle way or other place or any part of any of them, whether publicly or privately owned, that the public is ordinarily entitled or permitted to use for the passage or parking of Vehicles and includes:
  - (i) a sidewalk, including a boulevard adjacent to the sidewalk;
  - (ii) if a ditch lies adjacent to and parallel with the roadway, the ditch, and;
  - (iii) if a highway right of way is contained between fences or between a fence and one side of the roadway, all the land between the fences, or all the land between the fence and the edge of the roadway, as the case may be;

but does not include a place declared by regulation not to be a highway;
- (i) **"Municipal District"** means:
  - (i) The Municipal District of Foothills No. 31, a municipal district duly established pursuant to the laws of the Province of Alberta; or
  - (ii) The area within the legal boundaries of the Municipal District of Foothills No. 31;
- (j) **"Municipal Manager"** shall mean the chief administrative officer of the Municipal District or his/her delegate;
- (k) **"Night-time"** means the period beginning at 9:00 p.m. and ending the following day at:
  - (i) 7:00 a.m. if the following day is a Weekday; or
  - (ii) 9:00 a.m. if the following day is a Weekend;
- (l) **"Noise"** means any loud, unnecessary or unusual sound or any sound whatsoever which, in the opinion of an Officer in his sole discretion, having regard for all circumstances, including the time of day and the nature of the activity generating the sound, is likely to unreasonably annoy, disturb, injure or detract from the comfort, repose, health, peace or safety of any Person within the limits of the Municipal District;
- (m) **"Nuisance"** means any condition or use of Premises which, in the opinion of an Officer, constitutes an unreasonable interference with the use and enjoyment of other Premises, and includes, without limiting the foregoing, those circumstances listed in Section 6 of this Bylaw;
- (n) **"Occupant"** means any Person, including the Owner of the Premises, who is in possession or control of the Premises, including but not limited to, a lessee, licensee, tenant, contractor or agent of the Owner;
- (o) **"Off-Highway Vehicles"** has the same meaning as in the *Traffic Safety Act*, RSA 2000, c. T-6, as amended or repealed and replaced from time to time;
- (p) **"Officer"** means the Bylaw Enforcement Officer, a Community Peace Officer or a member of the RCMP who is authorized to enforce bylaws or for the purpose of inspection and enforcement under the Bylaw, an Officer is a designated officer of the Municipal District;

- (q) **"Owner"** of a property or Premises means:
- (i) a Person who is registered under the *Land Titles Act* as the owner of the land;
  - (ii) a Person who is recorded as the assessed Person on the tax assessment roll of the Municipal District;
  - (iii) a Person who has purchased or otherwise acquired the land, whether he has purchased or otherwise acquired the land directly from the owner or from another purchaser and has not yet become the registered owner thereof; or
  - (iv) a Person holding himself out as the Person having the powers and authority of ownership of the property or Premises or who for the time being exercises the powers of authority and ownership.
- (r) **"Person"** includes a corporation, other legal entities and an individual having charge or control of a Premise;
- (s) **"Premises"** includes the lands, Buildings, and other structures located on any property situated in whole or in part within the Municipal District and includes any Buildings owned or leased by the Municipal District;
- (t) **"Provincial Offences Procedure Act"** means the *Provincial Offences Procedure Act*, RSA 2000, c. P-34, as amended or repealed and replaced from time to time;
- (u) **"Remedial Order"** means an order written pursuant to Section 545 or 546 of the *Municipal Government Act*; RSA 2000, c. M-26, as amended or repealed and replaced from time to time;
- (v) **"Residential Development"** means any land that is the site of one or more residential Buildings and is designated by the Municipal District Land Use Bylaw as one of the following Land Use Districts:
- (i) Residential or Country Residential (CR);
  - (ii) Direct Control (DC), where the applicable land use guidelines allows a use which is residential; or
  - (iii) A Hamlet;
- (w) **"Signalling Device"** means any device that produces an audible sound used for the purpose of drawing a Person's attention, including a horn, gong, bell, klaxon or public address system;
- (x) **"Truck"** means any Vehicle that has a gross allowable maximum weight in excess of 5450 kilograms as listed on the official registration certificate issued by the Government of the Province of Alberta, regardless of the actual weight of the Vehicle at a specific time, and includes a truck-tractor and tractor-trailer, but does not include a concrete mixer or a garbage truck;
- (y) **"Unightly Premises"** means any Premises whether land, Buildings, improvements to land or Buildings, Personal property or any combination of the above, located on lands within the Municipal District, which, in the opinion of an Officer, is unsightly to such a degree as to detrimentally affect the repose, amenities, use, value or enjoyment of the surrounding lands in reasonable proximity to the Unightly Premises, or is otherwise detrimental to the surrounding area or in an unsightly condition as defined in the *Municipal Government Act*, and includes, without limiting the foregoing, those circumstances listed in Section 6 of this Bylaw;
- (z) **"Vehicle"** has the same meaning as in the *Traffic Safety Act*, RSA 2000, c. T-6, as amended or repealed and replaced from time to time;

- (aa) **"Violation Ticket"** – means a ticket issued pursuant to Part 2 of the *Provincial Offences Procedure Act*;
- (bb) **"Woodland"** means any natural bush, grass or trees which would not normally be maintained or groomed in order to protect its natural state;
- (cc) **"Weekday"** means Monday through Friday, inclusive, unless it falls on a holiday, as defined in the *Interpretation Act*, R.S.A. 2000, c. I-8, as amended or repealed and replaced from time to time; and
- (dd) **"Weekend"** means Saturday and Sunday or any other holiday as defined in the *Interpretation Act*, R.S.A. 2000, c. I-8, as amended or replaced from time to time;
3. The Owner of property is ultimately responsible for all activities on the property which may constitute prohibitions of this Bylaw.
4. Nothing in this Bylaw relieves a Person from complying with any Federal or Provincial Law or Regulation, other bylaw or any requirements of any lawful permit, order or license.

## **PART 2 - UNSIGHTLY PREMISES AND NUISANCE**

### **General Prohibitions**

5. No Person, including an Owner or Occupant of a Premises, shall cause or permit the Premises or a use of that Premises to constitute a Nuisance or Unsightly Premises.
6. Conditions constituting a Nuisance or Unsightly Premises may include, but shall not be limited to:
- (a) the accumulation of rubbish, refuse, garbage, papers, packages, containers, bottles, cans, manure, Animal feces, human excrement, sewage, the whole or part of an Animal carcass, dirt, soil, gravel, rocks, sod, petroleum products, hazardous materials, disassembled equipment or machinery, broken household furniture, chattels or goods, boxes, cartons, discarded fabrics and the like;
  - (b) uncut grass or the presence of weeds which, in the opinion of the Officer, are excessive or which demonstrate neglect by the Owner or Occupant; with the exception of natural Woodland or brush, provided it does not constitute a fire hazard;
  - (c) the presence of more than one (1) unlicensed Vehicle within a Hamlet or on any parcel of land less than two (2) acres or the presence of more than three (3) unlicensed Vehicles on any other parcel of land;
  - (d) Vehicle parts, equipment or machinery that has been rendered inoperative by reason of disassembly, age or mechanical condition, including household appliances;
  - (e) the flow of water from hose, eaves trough, or downspout or similar device on the Premises directed towards adjacent Premises if it is likely that the water from the hose, eaves trough, downspout or similar device will enter the adjacent Premises;
  - (f) the open or exposed storage on the Premises of any industrial fluid, including, but not limited to, engine oil, brake fluid, or antifreeze;
  - (g) the accumulation of Animal material, yard material, ashes or scrap building material;
  - (h) the accumulation of building materials, whether new or used, unless the Owner or Occupant can establish that a Construction or renovation undertaking is being carried out on the Premises and that the project has begun or the beginning of the work is eminent and that the material is stacked or stored in an orderly manner;
  - (i) any form of scrap, litter, trash, or waste of any kind.

7. Notwithstanding Section 6(a), the accumulation of manure or other Animal waste on property located in an Agricultural district shall not constitute a Nuisance under this Bylaw.
8. In determining whether a Premises is a Nuisance or an Unsightly Premises, an Officer may have regard to the use and location of the property.
9. In accordance with Section 542 of the *Municipal Government Act*, as amended or repealed and replaced from time to time, an Officer may enter onto Lands, upon providing the Owner or Occupant with reasonable notice, for the purpose of carrying out an inspection to ensure compliance with the provisions of this Bylaw, enforcement of any other action that is required or authorized under this Bylaw.

#### **Maintenance Standards Residential Developments**

10. All Buildings, structures and improvements to property in a Residential Development shall be maintained consistent with the surrounding area, so that the:
  - (a) foundations;
  - (b) exterior walls;
  - (c) roof;
  - (d) windows, including frames, shutters and awnings;
  - (e) doors, including frames and awnings;
  - (f) steps and sidewalks, driveways; and
  - (g) fencesare kept in a reasonable state of repair.
11. All fixtures, improvements, renovations, or additions to any Building, structure or improvement of property in a Residential Development, including but not limited to:
  - (a) exterior stairs;
  - (b) porches;
  - (c) decks;
  - (d) patios;
  - (e) landings;
  - (f) portable seasonal lawn furniture and accessories;
  - (g) gazebo;
  - (h) balconies; or
  - (i) other similar structures

must be kept in a reasonable state of repair consistent with the surrounding area and must not constitute a safety hazard, the determination of which shall be in an Officer's sole discretion.

#### **Exclusions And Exemptions**

12. The provisions of Part 2 – Unsightly Premises and Nuisance of this Community Standards Bylaw shall not apply to the following situations or activities:

- (a) bona fide and permitted commercial, industrial, Agricultural, Construction, demolitions, renovation, landscaping, clean-up, storage or other related activities; for which any applicable municipal, provincial, or federal permits have been granted, if required, from being carried out on, or in relation to a Premises;
  - (b) Municipal District municipal activities;
  - (c) landfills and transfer stations within the Municipal District;
  - (d) any operation or activity operating under valid development approval conditions of the Municipal District outlined within.
13. The Owner or Occupant of a Premises that carries on or permits the carrying on of any of these activities as set out in Section 12 of this Bylaw, shall ensure that all reasonable steps are taken to minimize the duration and visual impact of any resulting untidiness or unsightliness of the Premises.

### **PART 3 - NOISE**

#### **General Prohibitions**

14. No Person shall in either Day-time or the Night-time:
- (a) make, continue, cause, or allow to be made or continued any excessive, unnecessary, or unusual Noise of any type;
  - (b) allow or permit any real or Personal property that is owned, occupied or controlled by that Person to be used in a way that allows excessive, unnecessary, or unusual Noise of any type to emanate from such property;
  - (c) operate, allow or permit the operation of a speaker system of any type as an unnecessarily loud volume, thereby creating excessive Noise; or
  - (d) operate a Vehicle, including Off-Highway Vehicle, if the exhaust muffler is cutout, disconnected or has had the baffle plate or other part removed.
15. Except as authorized pursuant to this Bylaw, no Owner or Occupant of a Premises shall make or cause or allow to be made or continue any Noise which emanates from the Premises and disturbs or annoys a Person, including any loud outcry, clamor, shouting, movement, music or activity

#### **Activities In Residential Developments**

16. No Person shall operate:
- (a) a lawn mower;
  - (b) motorized garden tool;
  - (c) a power tool outside of any Building or structure;
  - (d) a model aircraft driven by an internal combustion engine of any kind;
  - (e) snow clearing device powered by an engine of any kind; or
  - (f) a motorized snow or leaf blowing device;
  - (g) or any other motorized device which may cause a disturbing Noise.
- in a Residential Development during the Night-time.

17. A Person who owns, occupies or controls a Truck, as defined in this Bylaw, or school bus must not at anytime allow it to remain running for longer than twenty (20) minutes when it is stationary in a Residential Development or within 150 metres of a Residential Development.

#### Vehicle Noises

18. Except as authorized through development permit approval, no Person shall permit a Vehicle located on Premises to emit Noise which emanates from that Premises and disturb or annoy a Person, including Noise from racing, excessive engine revving and stereo and amplification equipment in the Vehicle. For the purposes of this Part of the Bylaw, a Vehicle includes a Vehicle and Off-Highway Vehicle but does not include tractors or other Vehicles operated in the maintenance of property, or production of crops or livestock
19. If a Vehicle is involved in an offence referred to in Article 18, the registered owner of that Vehicle is guilty of an offence.

#### Exclusions And Exemptions

20. The provisions of this Part of the Community Standards Bylaw do not apply to:
- (a) emergency Vehicles;
  - (b) Construction in Residential Developments during the Day-time, whether or not the Construction requires any municipal permits;
  - (c) work on a municipal street or on a public utility carried out by the Owner or operator of the public utility, or its contractors;
  - (d) any activity within the sole jurisdiction of the Government of Canada or the Province of Alberta;
  - (e) Spruce Meadows and other equestrian facilities, livestock auction markets, community centers such as halls, Agricultural grounds, and recreation facilities, golf courses;
  - (f) landfills or transfer stations;
  - (g) work performed in relation to a Highway or public utility by the Owner or operator of the public utility, or its contractors;
  - (h) the aeronautical related activities of any airports located within or nearby the Municipal District;
  - (i) activities or event exempted under the Municipal District Land Use Bylaw;
  - (j) film industry activities; or
  - (k) work or activities deemed to be an emergency.
21. The provisions of this Part of the Community Standards Bylaw must not be interpreted to prevent:
- (a) the ringing of bells in churches, religious establishments, and schools;
  - (b) the use of a Signaling Devices of a Vehicle in its normal operation for the purpose of giving warning to other drivers or pedestrians;
  - (c) the sounding of any alarm or warning to announce a fire or other emergency;
  - (d) the playing of a band or other activities relating to a lawful parade or public demonstration.

#### **Miscellaneous Prohibitions**

22. No Person shall operate an Off-Highway Vehicle on an unapproved track, municipal road allowance, ditch, Environmental or Municipal Reserve, Public Reserve, gravel pit or any other public property.
23. All properties, whether commercial, industrial, Residential Developments, or Agricultural must store household and miscellaneous rubbish in an Animal and weather-proof container.
24. (a) A Person shall not leave any litter, garbage, refuse or other waste material on any lands owned or controlled by the Municipal District except in a receptacle designed and intended for such use or at an approved waste management facility.  
(b) If a Vehicle is involved in an offence referred to in subsection (a), the Owner of that Vehicle is guilty of an offence.
25. (a) No Person shall release a captured Animal within the Municipal District, unless permission authorizing the release has been granted by the Municipal Manager.  
(b) If a Vehicle is involved in an offence referred to in subsection (a) the Owner of that Vehicle is guilty of an offence.

#### **Signage**

26. No Person shall place, or allow to be placed signage that is in contravention of the Municipal District Land Use Bylaw.

### **PART 4 - REMEDIAL ORDERS AND THE CREATION OF THE COMMUNITY STANDARDS APPEAL BOARD**

#### **Remedial Orders**

27. Where an Officer believes a Person has contravened any provision of this Bylaw, they may:
  - (a) issue a Remedial Order and/or;
  - (b) issue a Violation Ticket;
28. Every Remedial Order written with respect to this Bylaw must:
  - (a) indicate the Person to whom it is directed and the Owner;
  - (b) identify the property to which the Remedial Order relates by municipal address or legal description;
  - (c) identify the date that it is issued;
  - (d) identify how the Premises fails to comply with this or another bylaw;
  - (e) identify the specific provisions of the Bylaw the Premises contravenes;
  - (f) identify the nature of the remedial action required to be taken to bring the Premises into compliance;
  - (g) identify the time within which the remedial action must be completed;

- (h) indicate that if the required remedial action is not completed within the time specified, the Municipal District may take whatever action or measures necessary to remedy the contravention;
  - (i) indicate that the expenses and costs of any action or measures taken by the Municipal District under this Part are an amount owing to the Municipal District by the Person to whom the order is directed;
  - (j) indicate that the expenses and costs referred to in this Section may be attached to the tax roll of the property if such costs are not paid by a specified time;
  - (k) indicate that an appeal lies from the Remedial Order to the Community Standards Appeal Board if a notice of appeal is filed in writing with the Secretary of the Community Standards Appeal Board within fourteen (14) days of the date of the Remedial Order.
29. If, in the opinion of an Officer, service of the Remedial Order cannot be reasonably affected, or if the Officer believes that the Owner of the Premises is evading service, the Officer may post the Remedial Order in a conspicuous place on the Premises to which the Remedial Order relates, or on the private dwelling place of the Owner of the Premises, as registered at the Land Titles Office or on the municipal tax roll for the Premises, and the Remedial Order shall be deemed to be served upon the expiry of three (3) days after the Remedial Order is posted.
30. Every Person who fails to comply with a Remedial Order issued pursuant to this Bylaw within the time set out in the Remedial Order commits an offence.

#### **Appeal of Remedial Orders**

31. A Person to whom a Remedial Order is directed may seek an appeal of the Remedial Order by filing an appeal in writing to the Secretary of the Community Standards Appeal Board within fourteen (14) days of receipt of the Remedial Order.
32. A decision of the Board delivered orally is a decision served pursuant to Section 547 of the *Municipal Government Act*, RSA 2000, c. M-26, as amended or repealed and replaced from time to time.
33. An appeal must state the name of the Person to whom the Remedial Order was directed, the municipal address of the property to which the Remedial Order being appealed from relates, a day-time telephone number at which the Person may be reached, and an address at which documents in relation to the appeal may be delivered.

#### **Community Standards Appeal Board**

34. The Community Standards Appeal Board is hereby constituted under the following terms:
- (l) The Board shall be a committee of Council;
  - (m) The Board shall consist of five (5) members, one (1) Councilor and four (4) members of the general public;
  - (n) The Board may adopt a set of rules and procedures with respect to the conduct of appeals;
  - (o) In the event that any member of Council appointed as a member of the Board can not be in attendance at a meeting of the Board, any other Member of Council may sit as a substitute for that member of the Board.
35. Pursuant to Section 203 of the *Municipal Government Act*, Council hereby delegates its authority under Section 547 of the *Municipal Government Act*, to the Community Standards

Appeal Board. As a result of such delegation, the Board may hear appeals of Remedial Orders issued pursuant to this Bylaw; orders issued pursuant to Section 545 of the *Municipal Government Act* regarding contraventions of other Bylaws or enactments that the Municipal District is authorized to enforce; and orders issued pursuant to Section 546 of the *Municipal Government Act*.

#### **PART 5 - ENFORCEMENT**

36. A Person who contravenes any provision of this Bylaw is guilty of an offence and is liable, upon summary conviction, to a fine in an amount not less than that established in this Part, and not exceeding \$10,000.00, and to imprisonment for not more than six months for non-payment of a fine. Without restricting the generality of Section 36, the following fine amounts are established for use on Violation Tickets if a voluntary payment option is offered:
- (a) the specified penalty for the offence as set out in Schedule "A"; and
  - (b) double the specified penalty set out in Schedule "A" for any subsequent offence.
38. An Officer is hereby authorized and empowered to issue a Violation Ticket to any Person whom the Officer has reasonable grounds to believe has contravened any provision of this Bylaw. A Violation Ticket issued with respect to a violation of this Bylaw shall be served upon the Person responsible for the contravention in accordance with the *Provincial Offences Procedure Act*. If a Violation Ticket is issued in respect of an offence, the Violation Ticket may: specify the fine amount established by this Bylaw for the offence; or
- (b) require a Person to appear in court without the alternative of making a voluntary payment.
41. A Person who commits an offence may: if a Violation Ticket is issued in respect of the offence; and
- (b) if the Violation Ticket specifies the fine amount established by this Bylaw for the offence;
- make a voluntary payment by submitting to a Clerk of the Provincial Court, on or before the initial appearance date indicated on the Violation Ticket, the specified penalty set out on the Violation Ticket.
42. Where a Clerk of the Provincial Court records in the court records the receipt of a voluntary payment pursuant to this Bylaw and the *Provincial Offences Procedure Act*, the act of recording constitutes acceptance of the guilty plea and also constitutes a conviction and imposition of a fine in the amount of the specified penalty.
44. Nothing in this Bylaw shall be construed to limit or hinder the ability of the Municipal District to enforce this Bylaw by way of an order issued pursuant to Section 545 or 546 of the *Municipal Government Act*.

#### **Severability**

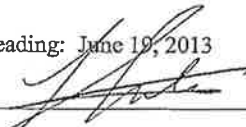
46. Every provision of this Bylaw is independent of all other provisions. If any provision of this Bylaw is declared invalid for any reason by a Court of competent jurisdiction, all other provisions of this Bylaw shall remain valid and enforceable.

#### **Repeal**

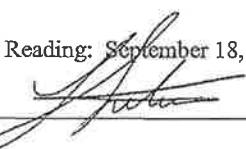
47. Bylaw No. 34/2009, the Community Standards Bylaw, as amended is repealed.

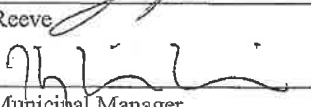
#### **Effective Date**


48. This bylaw shall come into force when it has received third and final reading and has been signed by the Reeve and the Municipal Manager.

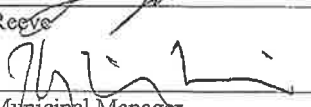
First Reading: June 19, 2013  


Reeve  
  
Municipal Manager

Second Reading: September 18, 2013  


Reeve  
  
Municipal Manager

Third Reading: September 18, 2013  


Reeve  
  
Municipal Manager

PASSED IN OPEN COUNCIL assembled at the Town of Okotoks in the Province of Alberta this  
18<sup>th</sup> day of September, 2013.

**SCHEDULE "A"**  
**SPECIFIED PENALTIES**

Section	Offence	Specified Penalty
5	Nuisance Property or Unsightly Premises	\$500
10	Building, structure, or improvement in unreasonable state of repair	\$200
11	Fixtures, improvements, renovations, or additions in unreasonable state of repair	\$200
14(a)	Make, continue, cause or allow Noise	\$200
14(b)	Allow or permit property to be used in a way that allows excessive Noise	\$300
14(c)	Permit the operation of a speaker system at a loud volume	\$300
14(d)	Operate a motorized Vehicle without a muffler	\$500
15	Cause or allow excessive Noise that emanates from the Premises	\$200
16(a) to (g)	Operating a hand lawn mower, motorized garden tool, power tool, model aircraft, and snow clearing device, motorized snow or leaf blowing device, and/or any other motorized device which may cause a disturbing Noise in a Residential Development during the night time.	\$500
17	Allowing a Truck or school bus to remain running for longer than 20 minutes when it is stationary in a Residential Development or within 150 meters of a Residential Development.	\$200
18	Vehicle Noise	\$200
22	Operating an Off-Highway Vehicle in prohibited areas.	\$500

23	Failure to store rubbish in an Animal or weather proof container	\$200
24(a)	Litter/dumping on Municipal District land	\$500
25(a)	Unauthorized release of Animal	\$500
26	Place/allow signage on property in contravention of Land Use Bylaw	\$500
30	Failure to Comply with Remedial Order	\$1000

## FOOTHILLS COUNTY

### BYLAW 15/2019

Being a bylaw of Foothills County, in the Province of Alberta, to authorize the regulation and control of dogs, for the purpose of promoting responsible dog ownership and ensuring the maintenance of public safety throughout the municipality.

**WHEREAS:** Pursuant to the provisions of the Municipal Government Act, Statutes of Alberta, RSA 2000, C. M-26 and amendments thereto, Council may pass a Bylaw for the purpose of regulating and controlling dogs and activities in relation to them;

**WHEREAS:** Council deems it necessary to provide for the regulation and control of dogs within the limits of the Municipality;

**WHEREAS:** Council deems it necessary to replace the existing Dog Bylaw #86/2010

**NOW THEREFORE, THE COUNCIL OF FOOTHILLS COUNTY, IN THE PROVINCE OF ALBERTA, DULY ASSEMBLED, ENACTS AS FOLLOWS:**

#### TITLE

1. This Bylaw may be cited as the "Responsible Dog Ownership Bylaw".

#### DEFINITIONS

2. In this Bylaw, the following words shall have the meanings given herein. When not inconsistent with the context, words used in the present tense include the past and future; words in the plural, include the singular; words in the singular include the plural; words in the masculine gender, include feminine and neuter genders; words in the feminine and neuter genders, include the masculine gender. The word "shall" is always mandatory, and not merely directory.

- (a) "Animal" means any domestic dog;
- (b) "Animal Services Centre" means a facility determined by the Municipality for the safekeeping and holding of impounded or seized animals and collecting fees as set out within this Bylaw;
- (c) "Attack" means an assault by an animal upon a person or other animal consisting of more than one bite and which causes injury to that person or other animal;
- (d) "Bite" means an application of force by an animal by means of its mouth and teeth upon a person or other animal which results in pain or injury of any nature being inflicted upon that person or other animal;
- (e) "Court" means a Court of competent jurisdiction in the Province of Alberta;
- (f) "Former Owner" means the person who at the time of impoundment or seizure of an animal was the owner of an animal which has subsequently been sold, destroyed, or otherwise disposed of;
- (g) "Highway" has the meaning as defined in the Traffic Safety Act, R.S.A. 2000, C. T-6, as amended or replaced from time to time;
- (h) "Justice" has the meaning as defined in the Provincial Offences Procedure Act, R.S.A. 2000, C. P-34, as amended or replaced from time to time;
- (i) "Leash" means a chain or other material capable of restraining the animal on which it is being used;
- (j) "Licence Tag" means an identification tag issued by the municipality showing the licence number of a dog that has been declared a vicious animal under this Bylaw;
- (k) "Livestock" includes, but is not limited to:

- (i) horse, mule, ass, swine, emu, ostrich, llama, alpaca, sheep or goat;
  - (ii) domestically reared or kept deer, reindeer, moose, elk, or bison;
  - (iii) farm-bred, fur-bearing animals including foxes and mink;
  - (iv) animals of the bovine species;
  - (v) animals of the avian species including chickens, turkeys, ducks, geese or pheasants; and
  - (vi) all other animals that are kept for agricultural purposes, but does not include cats, dogs or other domesticated household pets;
- (l) "Motor vehicle" has the same meaning as found in the Traffic Safety Act, RSA 2000, Chapter T-6 and the regulations thereunder, as amended or replaced from time to time;
- (m) "Municipality" means the municipal corporation of Foothills County within the boundary thereof as the context requires;
- (n) "Muzzle" means a humane device of sufficient strength placed over an animal's mouth to prevent it from biting;
- (o) "Nuisance Animal" means an animal declared to be a Nuisance Animal by the Protective Services Coordinator in accordance with Section 25 of this Bylaw;
- (p) "Owner" means any natural person or body corporate:
- (i) who has legal title to the animal; or
  - (ii) who has possession or custody, or care and control of the animal, either temporarily or permanently; or

- (iii) who claims and receives an animal from the custody of the animal services centre; or
- (iv) to whom a licence tag was issued for an animal in accordance with this Bylaw; or
- (v) who harbours the animal, or allows the animal to remain on his premises; or
- (iv) who is the registered owner of a motor vehicle in which the animal is found or any motor vehicle that is transporting an animal in or on.
- (q) "Peace Officer" means a person engaged by the Municipality as a Community Peace Officer, a Bylaw Enforcement Officer, a Designated Officer or a member of the Royal Canadian Mounted Police to carry out the provisions of this Bylaw;
- (r) "Protective Services Coordinator" means the person appointed as the Protective Services Coordinator and includes that person's designate;
- (s) "Provincial Court" means the Provincial Court of Alberta;
- (t) "Running at Large" means:
  - (i) an animal which is not under the control of a person responsible by means of a leash and is actually upon property other than the property in respect of which the owner of the animal has the right of occupation,
  - (ii) an animal which is under the control of a person responsible by means of a leash and which causes damage to persons, property or other animals;
- (u) "Severe Injury" means any injury that requires medical attention excepting wound cleaning and basic first aid and includes: wounds requiring sutures or

surgery, disfiguring or scarring lacerations, broken bones, severe sprains or any other similar serious injury;

- (v) "Trespasser" has the same meaning as found in the Trespass to Premises Act, Chapter T-7, RSA 2000 as amended or replaced from time to time;
- (w) "Unaltered Dog" means a dog that has not been spayed or neutered;
- (x) "Vicious Animal" means any animal which has been declared to be a vicious animal pursuant to the provisions of this Bylaw, pursuant to the provisions of a Bylaw of another municipality, or any animal that has been the subject of an order issued by a Justice pursuant to the Dangerous Dogs Act, R.S.A. 2000, c. D-3, as amended or replaced from time to time;
- (y) "Working Dog" means any dog kept for the purposes of working, herding or guarding livestock that is actively working with a livestock operation in this regard.

### **INTERPRETATION**

- 3. (1) Nothing in this Bylaw relieves a person from complying with any requirement of any lawful permit, order or licence.
- (2) Any heading or sub-headings in this Bylaw are included for guidance purposes and convenience only, and shall not form part of this Bylaw.
- (3) Where this Bylaw refers to another Act, Bylaw, Regulation or Agency, it includes reference to any Act, Bylaw, Regulation or Agency that may amend or be substituted therefore.
- (4) All the Schedules attached to this Bylaw shall form a part of this Bylaw.

## VICIOUS ANIMAL LICENSING

4. (1) No person shall own or keep any vicious animal within the municipality unless such vicious animal is licenced as provided in this Bylaw.
- (2) The holder of a licence for a vicious animal must be eighteen (18) years of age or older.
- (3) The owner of a vicious animal shall ensure that the vicious animal wears a current licence purchased for that vicious animal, when the vicious animal is off the property of the owner.
- (4) The owner of a vicious animal shall obtain an annual licence for such vicious animal at such times and in the manner as specified in Subsection 19 and shall pay an annual fee as set out in Schedule 'A' of this Bylaw.
- (5) The owner of a vicious animal shall:
  - (a) obtain a licence for such vicious animal on the first day on which the municipal office is open for business after the animal has been declared vicious;
  - (b) obtain a licence on the first day on which the municipal office is open for business after he becomes the owner of the vicious animal;
  - (c) obtain a licence for the vicious animal on the day specified by the Protective Services Coordinator each year.

## VICIOUS ANIMAL LICENCING INFORMATION

5. (1) When applying for a vicious animal licence under this Bylaw, the owner shall provide the following:

- (a) a description of the vicious animal including breed, name, gender and age;
  - (b) the name, address and telephone number of the owner;
  - (c) if the owner is a body corporate, the name, address and telephone number of the natural person responsible for the vicious animal;
  - (d) information establishing that the vicious animal is spayed or neutered;
  - (e) any other information which the Protective Services Coordinator may require; and
  - (f) the annual licence fee for the vicious animal, as set out in Schedule 'A' of this Bylaw.
- (2) No person shall give false information when applying for a vicious animal licence pursuant to this Bylaw.
- (3) An owner shall forthwith notify a peace officer, employed by the municipality, of any change with respect to any information provided in an application for a licence under this Bylaw.

#### **REPLACEMENT OF LOST VICIOUS ANIMAL LICENCE**

6. Upon losing a vicious animal licence, an owner of a vicious animal may obtain a licence replacement for a fee as set out in Schedule 'A' of this Bylaw.

#### **NON-TRANSFERABLE**

7. A vicious animal licence issued pursuant to this Bylaw is not transferable.

#### **NO REBATE**

8. No owner shall be entitled to a licence rebate under this Bylaw.

## UNCERTIFIED CHEQUES

9. Where a vicious animal licence required pursuant to this Bylaw has been paid for by the tender of an uncertified cheque, the licence:
  - (1) is issued subject to the cheque being accepted and cashed by the bank without any mention of this condition being made on the licence; and
  - (2) is automatically revoked if the cheque is not accepted and cashed by the bank on which it is issued.

## **RESPONSIBILITIES OF OWNERS**

### RUNNING AT LARGE

10. The owner of an animal shall ensure that such animal is not running at large.

### UNATTENDED ANIMALS

11.
  - (1) The owner of an animal shall ensure that such animal shall not be left unattended while tethered or tied on premises where the public has access, whether the access is expressed or implied, in a manner that allows the animal to interfere with the free movement of people accessing the premises.
  - (2) The owner of an animal left unattended in or on a motor vehicle shall ensure:
    - (a) the animal is restrained in a manner that prevents contact between the animal and any member of the public; and
    - (b) the animal has suitable ventilation and is not subjected to injurious heat or cold conditions when left unattended in that motor vehicle.

## COMMUNICABLE DISEASES

12. The owner of an animal which is suffering from a communicable disease shall:
- (a) not permit the animal to be in any public place;
  - (b) not keep the animal in contact with or in proximity to any other animal;
  - (c) keep the animal locked or tied up; and
  - (d) immediately report the matter to the Office of the Chief Provincial Veterinarian (Alberta Animal Health and Assurance Branch) and the Protective Services Coordinator.

## NUISANCES

### REMOVING EXCREMENT

13. (1) If an animal defecates on any public or private property other than the property of its owner, the owner shall remove such feces immediately.
- (2) If an animal is on any public or private property other than the property of its owner, the owner shall have in his possession a suitable means of facilitating the removal of the animal's feces.
- (3) The owner of an animal shall ensure that feces left by it on the property of the owner does not accumulate to such an extent that it seriously interferes with other property owners reasonable enjoyment of their property, due to excessive odor and/or unsightliness.

## NOISE

14. (1) The owner of an animal shall ensure that such animal shall not excessively bark, howl or otherwise make or cause excessive noise which disturbs any person and unreasonably interferes with that person's peaceful enjoyment of his property.
- (2) Whether or not any such barking, howling or other such noise is excessive and unreasonably interferes with a person's peaceful enjoyment of his property is a question of fact to be determined by a Court hearing a prosecution pursuant to this Section of the Bylaw.

## SCATTERING GARBAGE

15. (1) The owner of an animal shall ensure that such animal shall not upset any waste receptacle or scatter the contents thereof either in or about a street, lane or other public property or in or about any premises not belonging to or in the possession of the owner of the animal.
- (2) The owner of an animal shall immediately return any such upset waste receptacle to an upright position, and remove any contents that may have been scattered in or about a street, lane, or other public property or in or about any premises not belonging to or in the possession of the owner of the animal, or contact the owner or occupant of premises where garbage has been upset and scattered, so as not to further trespass upon such property.

## THREATENING BEHAVIOURS

16. (1) The owner of an animal shall ensure that such animal shall not:
- (a) bark at, or chase other animals, livestock, or other domesticated household pets, in a threatening manner;

- (b) bark at, or chase bicycles, motor vehicles, or other vehicles;
  - (c) growl, lunge, snarl, chase or otherwise threaten a person or persons, whether on the property of the owner or not, unless the person chased or threatened is a trespasser on the property of the owner;
  - (d) bite or cause damage to property, animals, livestock or other domesticated household pets, whether on the property of the owner or not;
  - (e) do any act other than biting or attacking, that injures a person or persons whether on the property of the owner or not, unless the person injured is a trespasser on the property of the owner;
  - (f) bite a person or persons, whether on the property of the owner or not, unless the person bitten is a trespasser on the property of the owner;
  - (g) attack a person or persons, whether on the property of the owner or not, unless the person attacked is a trespasser on the property of the owner;
  - (h) bite or attack a person or persons, whether on the property of the owner or not, causing severe injury, unless the person bitten or attacked is a trespasser on the property of the owner;
  - (i) cause severe injury to an animal, livestock or other domesticated household pets;
  - (j) cause death to another animal, livestock or other domesticated household pets.
- (2) No owner shall use or direct an animal to attack, chase, harass or threaten a person, animal, livestock or other domesticated household pets.

- (3) Notwithstanding subsections 16(1)(a), 16(1)(d) and 16(2), a working dog that is actively working with a livestock operation, following generally accepted practices of livestock management, is exempted.

## HEARINGS AND ORDERS

### VICIOUS ANIMALS

17. (1) The owner of an animal alleged to be a vicious animal, shall be provided notice of a hearing for determination by the Provincial Court not less than ten (10) days before the date of the hearing.
- (2) The Protective Services Coordinator may order the owner of an animal alleged to be a vicious animal to surrender the animal to a Peace Officer and the animal shall be taken and held in an animal services centre, for the purposes of completing a behavioural assessment, at the owner's cost, pending the outcome of the hearing and any appeals.
- (3) The Protective Services Coordinator may allow the owner to keep possession of an animal alleged to be a vicious animal, pending the outcome and disposition of the hearing in Provincial Court and any related appeals, by issuing interim contain and control conditions, which in the opinion of the Protective Services Coordinator, ensures the safety of the public.
- (4) The owner of an alleged vicious animal shall comply with a surrender order made by the Protective Services Coordinator, or any interim contain and control conditions prescribed by the Protective Services Coordinator pursuant to this section.
18. (1) Upon hearing the evidence, the Justice shall make an order in a summary way declaring the animal as a vicious animal if the Justice finds as a fact that the animal has caused severe injury to a person, whether on public or private property.

- (2) Upon hearing the evidence, the Justice may make an order declaring the animal a vicious animal or order the animal destroyed, or both, if in the opinion of the Justice, the animal poses an unreasonable risk to public safety due to the animal's potential to cause serious damage or injury to persons, property or other animals, livestock or other domesticated household pets, taking into account the following factors:
- (a) whether the animal, when unprovoked, has shown a tendency to pursue, chase or approach in a menacing fashion any person or persons or other animal, livestock or other domesticated household pets upon the street, sidewalk or on any public or private property;
  - (b) whether the animal has attempted to bite, or has bitten any person or animal, livestock or other domesticated household pets;
  - (c) whether the animal has injured, attacked or caused severe injury to any person or animal, livestock or other domesticated household pets;
  - (d) the aggression scale classification made by a Peace Officer pursuant to Section 27, as found in Schedule 'D'. (Dunbar Scale)
  - (e) the circumstances surrounding any previous biting, attacking, or injuring incidents;
  - (f) whether the animal has caused death to another animal, livestock or other domesticated household pet.
- (3) The order of a Justice declaring an animal vicious shall embody all of the requirements in Sections 19, 20, 21, 22, 23 and 24.

- (4) A vicious animal order pursuant to this Bylaw continues to apply if the animal is sold, given or transferred to a new owner.
- (5) The owner of a vicious or dangerous dog must immediately notify the Protective Services Coordinator upon relocating within or to the municipality. The Protective Services Coordinator may take cognizance of an order issued in another jurisdiction and direct that the order applies within the municipality.

## **REGULATIONS**

- 19. (1) Prior to a licence tag being issued, the owner of a vicious animal shall within ten (10) days after the animal has been declared vicious:
  - (a) have a licenced veterinarian tattoo or implant an electronic identification microchip in or on the vicious animal identifying the animal with a unique identifier to the animal;
  - (b) provide the information contained on the tattoo or in the microchip to a Peace Officer; and
  - (c) if the vicious animal is not spayed or neutered, have the vicious animal spayed or neutered.
- 20. (1) The owner of a vicious animal shall:
  - (a) forthwith notify a Peace Officer, employed by the municipality, should the vicious animal be sold, gifted, or transferred to another person or die; and
  - (b) remain liable for the actions of the vicious animal until formal notification of the sale, gift or transfer is given to a Peace Officer pursuant to subsection 20(1)(a).

21. (1) The owner of a vicious animal shall ensure that such vicious animal does not engage in any threatening behaviours prohibited by Section 16 of this Bylaw.
- (2) The owner of a vicious animal shall ensure that such vicious animal does not damage or destroy public or private property.
- (3) The owner of a vicious animal shall ensure that such vicious animal is not running at large.
- (4) The owner of a vicious animal shall forthwith notify a Peace Officer of the vicious animal running at large.
22. (1) The owner of a vicious animal shall ensure that when such vicious animal is on the property of the owner such vicious animal is:
- (a) confined indoors and under the control of a person eighteen (18) years of age or older; or
- (b) when such vicious animal is outdoors, such vicious animal is:
- (i) in a locked pen or other structure, constructed pursuant to Section 23 in order to prevent the escape of the vicious animal, and capable of preventing the entry of any person not in control of the vicious animal; or
- (ii) securely muzzled, and under the control of a person eighteen (18) years of age or older by means of a leash not exceeding one (1) meter in length in a manner that prevents it from being in contravention of Section 16 of this Bylaw.
- (2) The owner of a vicious animal shall ensure that at all times, when off the property of the owner, such vicious animal is securely:
- (a) muzzled; and

- (b) harnessed or leashed on a lead which length shall not exceed one (1) meter in a manner that prevents it from being in contravention of Section 16 of this Bylaw, as well as preventing damage to public or private property; and
  - (c) under the control of a person eighteen (18) years of age or older.
- 23. (1) The owner of a vicious animal shall ensure that the locked pen or other structure:
  - (a) shall have secure sides and a secure top, and if it has no bottom secured to the sides, the sides must be embedded in the ground to a minimum depth of thirty (30) centimeters;
  - (b) shall provide the vicious animal with shelter from the elements;
  - (c) shall be of the minimum dimensions of one and one-half (1.5) meters by three (3) meters and be a minimum one and one-half (1.5) meters in height;
  - (d) is located on the property of the owner in a manner that complies with the provisions of the municipality's Land Use Bylaw, as amended or replaced from time to time.
- 24. (1) The owner of a vicious animal shall, within ten (10) days of the date of the order declaring the animal to be vicious, display a sign on his premises warning of the presence of the vicious animal in the form illustrated in Schedule 'F'.
- (2) A sign required by Subsection 24(1) shall be placed at each entrance to the premises where the vicious animal is kept and on the pen or other structure in which the vicious animal is confined.

- (3) A sign required by Subsection 24(1) shall be posted to be clearly visible and capable of being seen by any person accessing the premises.

## **NUISANCE ANIMALS**

25. (1) The Protective Services Coordinator may declare an animal to be a nuisance animal;
- (a) in declaring an animal to be a nuisance animal, the Protective Services Coordinator shall have regard to Sections 10, 14, 15, and 16 of this Bylaw and any other matter which in the opinion of the Protective Services Coordinator is relevant including whether the animal's behaviour or actions have resulted in contraventions of this bylaw more than once.
- (2) The Protective Services Coordinator may apply such conditions on the owner and animal as deemed appropriate to eliminate the nuisance.
- (3) The declaration of an animal as a nuisance animal shall be reviewed annually by the Protective Services Coordinator, taking into account Subsection 25(1) and may be continued, with or without conditions, or revoked.
- (4) The owner of an animal shall comply with all conditions set out in a nuisance animal declaration made by the Protective Services Coordinator pursuant to this section.

## **ANIMAL CONTROL OPERATIONS**

### **NOTICE TO CONTAIN AND CONTROL**

26. (1) The Protective Services Coordinator may allow an owner to keep possession of an animal alleged to have been engaged in any threatening behaviour as

set out in Section 16 of this Bylaw by serving a notice with contain and control conditions which, in the opinion of the Protective Services Coordinator, ensures the safety of the public.

- (2) The contain and control conditions shall be reviewed annually by the Protective Services Coordinator, taking into account any further contraventions of this Bylaw and may be continued, revised or revoked.
- (3) The owner of an animal shall comply with all contain and control conditions set out in a notice issued by the Protective Services Coordinator pursuant to this section.

#### **AGGRESSION SCALE CLASSIFICATION**

27. A Peace Officer investigating a complaint involving the threatening behaviour of an animal shall classify the behaviour by means of reference to the Dr. Ian Dunbar's Aggression Scale, which is set out in Schedule 'D' of this Bylaw.

#### **SEIZURE**

28. (1) A Peace Officer may seize, retain and take to an animal services centre any animal, nuisance animal or vicious animal:
- (a) which is found running at large; or
  - (b) which is alleged to have engaged in any threatening behaviours set out in Section 16 of this Bylaw; or
  - (c) pending the outcome of a behavioural assessment and/or an application to declare the animal to be a vicious animal or to destroy the animal; or
  - (d) which is alleged to have contravened a provision of a contain and control notice or an interim contain and control notice; or

- (e) which is required to be impounded pursuant to the provisions of any Statute of Canada or of the Province of Alberta, or any Regulation made thereunder.
- (2) A Peace Officer may enter onto any property surrounding any building, whether or not such property is enclosed by a fence or other such enclosure, and seize any animal which has been observed running at large and is alleged to have been exhibiting threatening behaviour as set out in Section 16 of this Bylaw and to take such reasonable measures necessary to subdue any such animal, including the use of tranquilizer equipment and other capture devices, and take such animal to an animal services centre.

### **OBSTRUCTION AND INTERFERENCE**

- 29.
  - (1) No person, whether or not that person is the owner of an animal, nuisance animal, or vicious animal, which is being pursued or has been pursued or seized by a peace officer shall:
    - (a) interfere with or attempt to obstruct a Peace Officer who is attempting to seize or who has seized an animal which is subject to seizure;
    - (b) open any vehicle in which a seized animal has been placed; or
    - (c) remove, or attempt to remove, from the animal services centre and/or the possession of a Peace Officer, any animal which has been seized.
  - (2) No person shall:
    - (a) untie, loosen or otherwise free an animal which has been tied or otherwise restrained;
    - (b) negligently or willfully open a gate, door or other opening in a fence or enclosure in which an animal has been confined and thereby allow the animal to run at large in the municipality;

- (c) entice an animal to run at large;
- (d) tease an animal caught or confined in an enclosed space;
- (e) throw or poke any object into an enclosed space when an animal is caught or confined therein;
- (f) provide false information to or obstruct a Peace Officer.

30. Section 29 shall not apply to a Peace Officer who is attempting to seize or who has seized an animal which is subject to seizure pursuant to this Bylaw.

### NOTIFICATIONS

31. (1) If a Peace Officer knows or can ascertain the name of the owner of any seized animal, he shall serve the owner with a copy of the Notice in Schedule 'E' of this Bylaw, either personally or by leaving it with any adult person at, or by mailing it to or by leaving it at, the last known address of the owner.
- (2) An owner of an animal to whom a Notice is mailed pursuant to Subsection 31(1) is deemed to have received a Notice within seven (7) days from the date it is mailed. A Notice served personally on the owner or any adult person at the last known address of the owner shall be deemed to be served on the day of service.

### RECLAIMING

32. (1) Subject to the provisions of subsection 35, the owner of any seized animal, nuisance animal or vicious animal may reclaim the animal, nuisance animal or vicious animal by:

- (a) paying to the municipality the costs of any behavioural assessments, impoundment, any care, subsistence or veterinary charges incurred as set out in Schedule 'A' of this Bylaw;
- (b) where a licence is required under this Bylaw, obtaining the licence for such animal, nuisance animal or vicious animal;
- (c) complying with any and all provisions which may be imposed in accordance with this Bylaw.

### INSPECTIONS

33. Subject to the entry notice provisions of the Municipal Government Act, R.S.A. 2000, c. M-26, a Peace Officer of the municipality, who has been appointed as a Designated Officer, bearing proper identification, may enter a premises to conduct an inspection in order to determine whether or not this Bylaw or an order issued pursuant to this Bylaw is being complied with and, where it is determined that this Bylaw or an order has been contravened, may seize and remove from the premises an animal and take the animal to an animal services centre.
34. No person shall interfere with or attempt to obstruct a Peace Officer, who is attempting to conduct an inspection or seizure of an animal pursuant to section 33.

### AUTHORITY OF THE PROTECTIVE SERVICES COORDINATOR

35. (1) The Protective Services Coordinator may:
- (a) receive animals into protective care at an animal services centre arising from an emergency due to fire, flood or other reasons;
  - (b) retain animals temporarily at an animal services centre;

- (c) charge the owner fees, pursuant to Schedule 'A', costs of behavioural assessments, impoundment, any care, subsistence or veterinary charges incurred as set out in Schedule 'A' of this Bylaw;
  - (d) at the end of the protective care period, if no other arrangements are made between the owner and the Protective Services Coordinator or the owner cannot be ascertained, treat such animals as seized animals;
  - (e) offer for sale, euthanize or otherwise dispose of all unclaimed animals which have been seized or deemed to be seized.
- (2) The Protective Services Coordinator shall not sell, euthanize, or otherwise dispose of a seized animal until an animal is retained in the animal services centre for:
- (a) seven (7) days after the owner has received notice or is deemed by Subsection 31 to have received notice that the animal has been seized; or
  - (b) seventy-two (72) hours, if the name and address of the owner is not known.
- (3) The Protective Services Coordinator, may retain a seized animal for a longer period if in his opinion, the circumstances warrant the expense or there are reasonable grounds to believe that the seized animal is a continued danger to a person, animal, livestock or other domesticated household pets or property.

#### **EUTHANIZING DUE TO INJURY**

36. Any veterinarian, being properly and fully qualified as required by the Province of Alberta, may destroy any animal delivered to the veterinarian after injury to the animal, providing the injury is determined by the veterinarian to be of such serious nature, based upon his professional opinion, that the animal must be destroyed immediately and such costs of destruction may be billed to the municipality and the municipality is at

liberty to take all steps considered necessary to recover such costs from the owner of the animal.

#### **REQUIRE SPAY / NEUTER**

37. The Protective Services Coordinator may, before selling an unclaimed seized animal, require that the animal be spayed or neutered.

#### **FEE FOR EUTHANIZING**

38. When the Protective Services Coordinator decides to euthanize a seized animal pursuant to this Bylaw, the owner shall pay to the municipality a fee as set out in Schedule 'A' of this Bylaw.

#### **FULL RIGHT AND TITLE**

39. The purchaser of a seized animal pursuant to the provisions of this Bylaw shall obtain full right and title to the animal and the right and title of the former owner of the animal shall cease thereupon.

#### **GENERAL PENALTY PROVISIONS**

40. (1) Every owner of an animal who contravenes any of the provisions of this Bylaw by:
- (a) doing any act or thing which the person is prohibited from doing; or
  - (b) failing to do any act or thing the person is required to do,
- is guilty of an offence.
- (2) Any person who is convicted of an offence pursuant to this Bylaw is liable on summary conviction to a fine not exceeding ten thousand dollars (\$10,000.00) and in default of payment of any fine imposed, to imprisonment for not more than one (1) year.

## VIOLATION TICKETS AND PENALTIES

41. (1) Where a Peace Officer believes that a person has contravened any provision of this Bylaw, he may commence proceedings by issuing a violation ticket in accordance with the Provincial Offences Procedure Act, R.S.A. 2000, c.P-34, as amended or replaced from time to time.
- (2) The specified penalty payable in respect of a contravention of any provision of this Bylaw is the amount shown in Schedule 'B' of this Bylaw in respect of that provision.
- (3) The minimum penalty payable in respect of a contravention of a provision of this Bylaw is the amount shown in Schedule 'B' of this Bylaw in respect of that provision.
- (4) Notwithstanding subsection 41(2):
- (a) where any person has been in contravention of the same provision of this Bylaw twice within one (1) twelve (12) month period the specified penalty payable in respect of the second offence is double the amount shown in Schedule 'B' of this Bylaw in respect of that provision; and
  - (b) where any person has been in contravention of the same provision of this Bylaw three (3) or more times within one (1) twelve (12) month period, the specified penalty payable in respect of the third or subsequent offence is triple the amount shown in Schedule 'B' of this Bylaw in respect of that provision.
- (5) Notwithstanding subsection 41(3):
- (a) where any person has been in contravention of the same provision of this Bylaw twice within one (1) twelve (12) month period, the minimum penalty payable in respect of the second offence is double the amount shown in Schedule 'B' of this Bylaw in respect of that provision; and

- (b) where any person has been in contravention of the same provision of this Bylaw three (3) or more times within one (1) twelve (12) month period, the minimum penalty payable in respect of the third or subsequent offence is triple the amount shown in Schedule 'B' of this Bylaw in respect of that provision.
- (6) Notwithstanding subsections 41(2) and 41(4), if an animal has been declared to be a nuisance animal, and where, subsequent to the declaration, any person is in contravention of any provision of this Bylaw in respect of that animal, the specified penalty payable in respect of the offence is double the amount shown in Schedule 'B' of this Bylaw in respect of that provision.
- (7) Notwithstanding subsections 41(3) and 41(5), if an animal has been declared to be a nuisance animal, and where, subsequent to the declaration any person is in contravention of any provision of this Bylaw in respect of that animal, the minimum penalty payable in respect of the offence is double the amount shown in Schedule 'B' of this Bylaw in respect of that provision.

#### VICIOUS ANIMAL FINES

- 42. (1) Subsections 41(2) (3) (4) (5) (6) and (7) do not apply to vicious animals.
- (2) The specified penalty on summary conviction in respect to a contravention of this Bylaw with respect to vicious animals shall be the amounts as shown in Schedule 'C' of this Bylaw regarding vicious animals.
- (3) The minimum fines on summary conviction in respect to a contravention of this Bylaw with respect to vicious animals shall be the amounts s shown in Schedule 'C' of this Bylaw regarding vicious animals.

- (4) Notwithstanding subsection 42(2):
- (a) where any person has been in contravention of the same provision of this Bylaw twice within one (1) twelve (12) month period, the specified penalty payable in respect of the second offence is double the amount shown in Schedule 'C' of this Bylaw in respect of that provision; and
  - (b) where any person has been in contravention of the same provision of this Bylaw three (3) or more times within one (1) twelve (12) month period, the specified penalty payable in respect of the third or subsequent offence is triple the amount shown in Schedule 'C' of this Bylaw in respect of that provision.
- (5) Notwithstanding subsection 42(3):
- (a) where any person has been in contravention of the same provision of this Bylaw twice within one (1) twelve (12) month period, the minimum penalty payable in respect of the second offence is double the amount shown in Schedule 'C' of this Bylaw in respect of that provision; and
  - (b) where any person has been in contravention of the same provision of this Bylaw three (3) or more times within one (1) twelve (12) month period, the minimum penalty payable in respect of the third or subsequent offence is triple the amount shown in Schedule 'C' of this Bylaw in respect of that provision.

### **CONTINUING OFFENCES**

43. In the case of an offence that is of a continuing nature, a contravention constitutes a separate offence in respect of each day, or part of a day, on which the offence continues.

## MANDATORY COURT OR INFORMATION

44. No provision of this Bylaw shall prevent any Peace Officer from issuing a violation ticket requiring the court appearance of the defendant, pursuant to the provisions of the Provincial Offences Procedure Act, R.S.A. 2000, c.P-34, as amended or replaced from time to time, or from laying an information instead of issuing a violation ticket.

## LIABILITY FOR FEES

45. The levying and payment of any fine or the imprisonment for any period provided in this Bylaw shall not relieve a person from the necessity of paying any fees, charges or costs from which he is liable under the provisions of this Bylaw.

## ORDERS BY A JUSTICE

46. (1) A Justice, after convicting an owner of an offence under this Bylaw may, in addition to the penalties provided in this Bylaw, if the Justice considers the offence sufficiently serious, direct, order or declare one or more of the following:
- (a) that the owner prevent the animal from doing mischief or causing the disturbance or nuisance complained of;
  - (b) that the owner have the animal removed from the municipality;
  - (c) that the animal is a vicious animal;
  - (d) that the animal be humanely destroyed;
  - (e) that the owner be prohibited from owning any animal for a specified period of time; or

- (f) make such other order, direction or declaration that in the opinion of the Justice, is necessary to protect the public, animals, livestock or other domesticated household pets from the animal.
- (2) When a Justice considers making a direction, order or declaration pursuant to this section, the Justice shall take into account the factors set out in Section 18 of this Bylaw.

### **PROOF OF LICENCE**

- 47. The onus of proving a person has a valid and subsisting licence is on the person alleging the licence.

### **CERTIFIED COPY OF RECORDS**

- 48. A copy of a record of the municipality, certified by the person duly appointed as the Designated Officer for the same as a true copy of the original, shall be admitted in evidence as prima facie proof of the facts stated in the record without proof of the appointment or signature of the person signing it.

### **GENERAL**

- 49. Schedules 'A', 'B', 'C', 'D', 'E' and 'F' as attached, form a part of this Bylaw.

- 50. Any owner who has been informed that:

- (a) any licence issued under this Bylaw has been revoked or cancelled; or
  - (b) the animal has been determined to be a nuisance animal

may appeal the determination to the Protective Services Coordinator, in writing, within fourteen (14) days of being notified that the licence has been revoked or cancelled, or that the animal has been determined to be a nuisance animal.

51. Within thirty (30) days of receiving a notice of appeal by an owner pursuant to section 50, the Protective Services Coordinator shall review the revocation or declaration and receive such information as in the opinion of the Protective Services Coordinator, is relevant and determine whether there are just and reasonable grounds to revoke or cancel a licence or confirm or revoke the nuisance animal declaration and the decision of the Protective Services Coordinator shall be final.
52. No action for damages shall be taken against the municipality or any person acting under the authority of this Bylaw in respect of the destruction, sale or other disposal of any animal seized pursuant to this Bylaw.
53. It is the intention of the Council of the municipality that each section of this Bylaw should be considered as being separate and severable from all other sections. Should any section or part be found invalid by a court of competent jurisdiction, it is intended that the invalid section or part shall be severable, and the remainder of the Bylaw will remain in effect.
54. It is the intention of the Council of the municipality that all offences created pursuant to this Bylaw be construed and considered as being Strict Liability Offences.
55. This Bylaw shall come into full force and effect upon the date of the third and final reading and bylaw #86/2010 is hereby repealed upon this Bylaw coming into effect.

Read a first time: February 27, 2019

Read a second time March 13, 2019

Read a third time March 13, 2019

## SCHEDULE 'A'

### FEES

First impoundment –per animal	\$80.00
Second impoundment – per animal (within twelve (12) months)	\$100.00
Third impoundment – per animal (within twelve (12) months)	\$150.00
Fourth and subsequent impoundment – per animal (within twelve (12) months)	\$250.00
Care and subsistence each full day of impoundment (not including intake or release day)	Market daily rate as set by Animal Services Centre
Vicious animal licence fee (annual)	\$250.00
Replacement vicious animal tag	\$10.00
Veterinary services	Amount expended
Destruction of dog	Amount expended
Behavioural Assessment	Amount expended

Amount(s) to be paid to Foothills County or the Animal Services Centre, by the owner of the animal in order to reclaim an animal

## SCHEDULE 'B'

### OFFENCE PENALTIES

SECTION	OFFENCE	MINIMUM PENALTY	SPECIFIED PENALTY
10	Animal Running at Large	\$250.00	\$300.00
11(1)	Leave animal unattended that interferes with public access to premises	\$200.00	\$250.00
11(2)(a)	Unattended animal improperly restrained in / on motor vehicle	\$200.00	\$250.00
11(2)(b)	Unattended animal subjected to injurious heat / cold in motor vehicle	\$300.00	\$500.00
12(d)	Fail to report suspected case of communicable disease	\$200.00	\$250.00
13(1)	Fail to remove animal feces	\$200.00	\$300.00
13(2)	No suitable means to remove feces	\$100.00	\$150.00
13(3)	Excessive accumulation of feces on property of owner	\$300.00	\$500.00
14(1)	Animal make / cause excessive noise	\$250.00	\$300.00
15(1)	Animal scatter garbage	\$150.00	\$200.00
16(1)(a)	Animal bark at / chase animals, livestock, other domesticated household pets	\$200.00	\$300.00
16(1)(b)	Animal bark at / chase bicycles, motor vehicles, other vehicles	\$300.00	\$400.00
16(1)(c)	Animal growl / lunge / snarl / chase / threaten a person	\$350.00	\$450.00

SECTION	OFFENCE	MINIMUM PENALTY	SPECIFIED PENALTY
16(1)(d)	Animal bite / cause damage to property, animals, livestock, domesticated pets	\$400.00	\$500.00
16(1)(e)	Animal injure a person	\$500.00	\$600.00
16(1)(f)	Animal bite a person	\$600.00	\$700.00
16(1)(g)	Animal attack a person	\$1000.00	\$1500.00
16(1)(h)	Animal bite / attack a person causing severe injury	\$1500.00	\$2000.00
16(1)(i)	Animal cause severe injury to animal, livestock or domesticated household pet	\$500.00	\$800.00
16(1)(j)	Animal cause death to animal, livestock, domesticated household pet	\$900.00	\$1200.00
16(2)	Direct animal to attack / chase / harass / threaten a person, animal, livestock, domesticated household pet	\$500.00	\$800.00
25(4)	Fail to obey nuisance animal conditions	\$400.00	\$650.00
26(3)	Fail to obey contain and control conditions	\$600.00	\$850.00
29(1)(a)	Obstruct or interfere with peace officer - seizure	\$800.00	\$1000.00
29(1)(b)	Open vehicle in which seized animals have been placed	\$600.00	\$850.00
29(1)(c)	Remove or attempt to remove seized animal	\$600.00	\$850.00
29(2)(a)	Untie / loosen / free restrained animal	\$250.00	\$500.00

SECTION	OFFENCE	MINIMUM PENALTY	SPECIFIED PENALTY
29(2)(b)	Open gate / door / opening in fence or enclosure allowing animal to run at large	\$250.00	\$500.00
29(2)(c)	Entice an animal to run at large	\$250.00	\$500.00
29(2)(d)	Tease an animal in an enclosure	\$250.00	\$500.00
29(2)(e)	Throw / poke object at animal in an enclosure	\$250.00	\$500.00
29(2)(f)	Provide false information / obstruct peace officer	\$800.00	\$1000.00
34	Interfere with / obstruct a designated officer / peace officer	\$800.00	\$1000.00

**SCHEDULE 'C'**  
**VICIOUS ANIMAL OFFENCE PENALTIES**

SECTION	OFFENCE	MINIMUM PENALTY	SPECIFIED PENALTY
4(1)	Unlicensed vicious animal	\$1000.00	\$1500.00
4(3)	Vicious animal not wear licence tag	\$500.00	\$650.00
5(2)	Provide false information on vicious dog licence application	\$500.00	\$650.00
17(4)	Fail to comply with surrender order / interim contain and control conditions – alleged vicious animal	\$1000.00	\$1500.00
18(5)	Owner fail to notify Protective Services Coordinator of relocation	\$500.00	\$650.00
19(1)(a)	Fail to tattoo / implant microchip on / in vicious animal	\$500.00	\$650.00
19(1)(b)	Fail to provide tattoo / microchip information to peace officer	\$500.00	\$650.00
19(1)(c)	Fail to have vicious animal spayed / neutered	\$500.00	\$650.00
20(1)(a)	Fail to notify peace officer of sale gift/transfer death vicious animal	\$250.00	\$500.00
21(1)	Vicious animal conduct threatening behaviour	\$2000.00	\$3000.00
21(2)	Vicious animal damage/destroy property	\$1000.00	\$1500.00
21(3)	Vicious animal running at large	\$1000.00	\$1500.00
21(4)	Fail to notify peace officer of vicious animal running at large	\$600.00	\$800.00
22(1)(a)	Fail to keep vicious animal confined indoors and under control by person 18 yrs of age or older	\$1000.00	\$1500.00

SECTION	OFFENCE	MINIMUM PENALTY	SPECIFIED PENALTY
22(1)(b)(i)	Fail to keep vicious animal confined on property of owner	\$1000.00	\$1500.00
22(1)(b)(ii)	Fail to keep vicious animal muzzled on property of owner	\$1000.00	\$1500.00
22(2)(a)	Fail to keep vicious animal muzzled when off property of owner	\$1000.00	\$1500.00
22(2)(b)	Fail to keep vicious animal harnessed / leashed properly when off property of owner	\$1000.00	\$1500.00
22(2)(c)	Vicious animal not under control of a person at least 18 yrs old when off property of owner	\$1000.00	\$1500.00
23	Improper locked pen or structure for vicious animal	\$1000.00	\$1500.00
24	Fail to post / properly post vicious animal sign	\$1000.00	\$1500.00

**SCHEDULE 'D'**  
**DR. IAN DUNBAR'S AGGRESSION SCALE**

Assessment of the severity of biting problems based on an objective  
evaluation of wound pathology

<b>Level 1</b>	Dog growls, lunges, snarls – no teeth touch skin. Mostly intimidation and / or threatening behaviour.
<b>Level 2</b>	Teeth touch skin but no puncture. May have red mark and/or minor bruise from dog's head or snout, may have minor scratches from paws and/or nails. Minor surface abrasions or lacerations.
<b>Level 3</b>	Punctures one (1) to three (3) holes, single bite. No tearing or slashes. Victim not shaken side to side. Bruising.
<b>Level 3.5</b>	Multiple Level 3 bites.
<b>Level 4</b>	Two (2) to four (4) holes from a single bite, typically contact and/or punctures from more than canines, considerable bruising. Black bruising, tears and/or slashing wounds. Dog clamped down and held and/or shook head from side to side.
<b>Level 5</b>	Multiple Bites at Level 4 or above. A concerted, repeated attack causing severe injury.
<b>Level 6</b>	Any bite resulting in death of an animal

This scale was developed by Dr. Ian Dunbar, PHD. B VetMed, MRCVS, of Berkeley California. From his studies Dr. Dunbar has been able to separate and classify bites into a generalized six level assessment protocol. This scale is used as a standard throughout the world in canine aggression investigations and behaviour assessment.

SCHEDULE 'E  
NOTICE OF SEIZURE

**NOTICE OF SEIZURE / IMPOUNDMENT**

DATE:\_\_\_\_\_TIME:\_\_\_\_\_

TO: \_\_\_\_\_  
(Name)

\_\_\_\_\_  
(Address)

---

DESCRIPTION OF DOG

Breed:\_\_\_\_\_ Colour:\_\_\_\_\_ Sex:\_\_\_\_\_ Tag #:\_\_\_\_\_

---

You are hereby notified that a dog registered under the above address, or a dog bearing no identification, but is believed to belong to you, has been seized / impounded pursuant to the provisions of Foothills County Responsible Dog Ownership Bylaw # 15/2019.

Unless the said dog is claimed and all fees / charges are paid on or before \_\_\_\_\_, 20\_\_\_\_, the said dog will be sold, destroyed or otherwise disposed of pursuant to the said Bylaw.

Officer Name  
And Contact Information

SCHEDULE 'F'  
VICIOUS ANIMAL SIGN

# WARNING!

# VICIOUS DOG ON PREMISES



Foothills County

Responsible Dog  
Ownership Bylaw  
# 15/2019

