Pipeline Water Body Crossing Classifications

PRESENTED BY:

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Engineering with integrity.

Webinar Instructions

- Pose questions via chat
- Questions will be addressed at end of presentation
- Participant microphones muted
- Webinar is being recorded for future reference
- Webinar and documents will be available on Group 10 website: *www.g10e.ca*

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Introduction

Group 10 Engineering Ltd. developed a water body classification.

Used for classifying the **Significance** of water bodies in relation to pipeline crossings or pipelines in proximity to water bodies.

Does not replace risk assessment processes. **Should only be used in conjunction with established risk determination methods.**

Intended for integrity management of existing pipelines.

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Background

- Alberta Pipeline Safety Review -2012
  - » Safety of Pipelines Near Waterbodies
- CAPP - Best Practice
  - » Guide for Designated Pipeline Sections in High-Impact Areas

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Purpose of Classification System

Purpose is to:

- Establish a consistent basis for assigning risk to waterbodies
- Support identification of ***Significant*** waterbodies
- Support reasoning for the exclusion of map identified water crossings.

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Benefits of Classification System

- Supports emphasis on high impact areas
- Supports a risk based approach
- Reduces cost
- Provides a framework to support compliance
- Provides a basis for ERP priority

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What types of Water Bodies

- Two Classification Groups:
  - » Rivers and Streams
  - » Lakes, Sloughs, Muskeg

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What is *Significant?*

"Significant" describes combined magnitude of risk in terms of:

- Likelihood
  - » Exposure/scour
  - » Impact (large objects)
  - » Hydrodynamic loading(vortex shedding)

- Potential Consequence
  - » Environment
  - » Wildlife
  - » Human Impact

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Classification Factors

- Width of water body
- The potential flow energy
- AESRD* classification
  - » Fish Bearing waterbody and sensitivity of fish
- Recreational or commercial use
- Water source for human consumption
- Protected wildlife habitat

* *Equivalent local jurisdictional wildlife sensitivity classifications can replace AESRD classes*

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Qualitative

- User can use discretion
- Move up or down in class as appropriate based on other factors
- Capture reasoning and associate class
- Modify as necessary to adopt local jurisdiction considerations

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Mapping Example

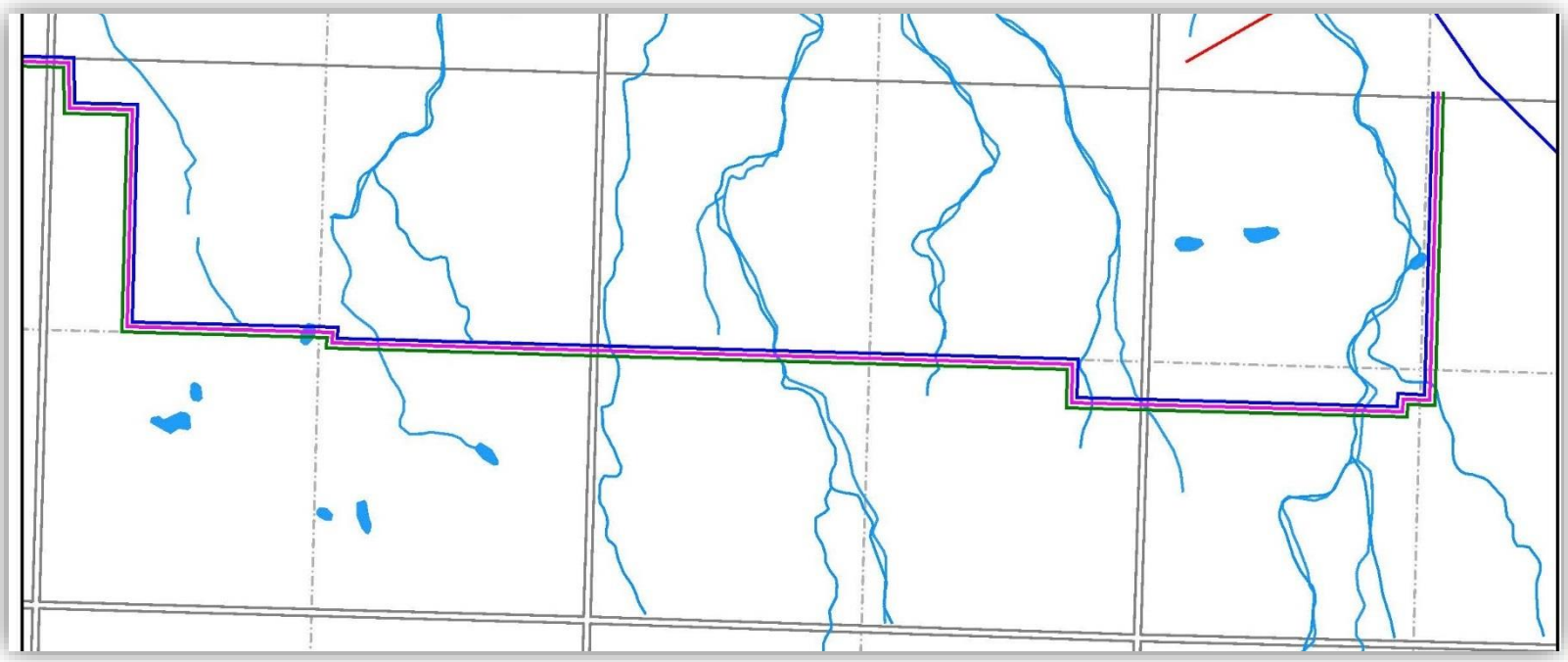

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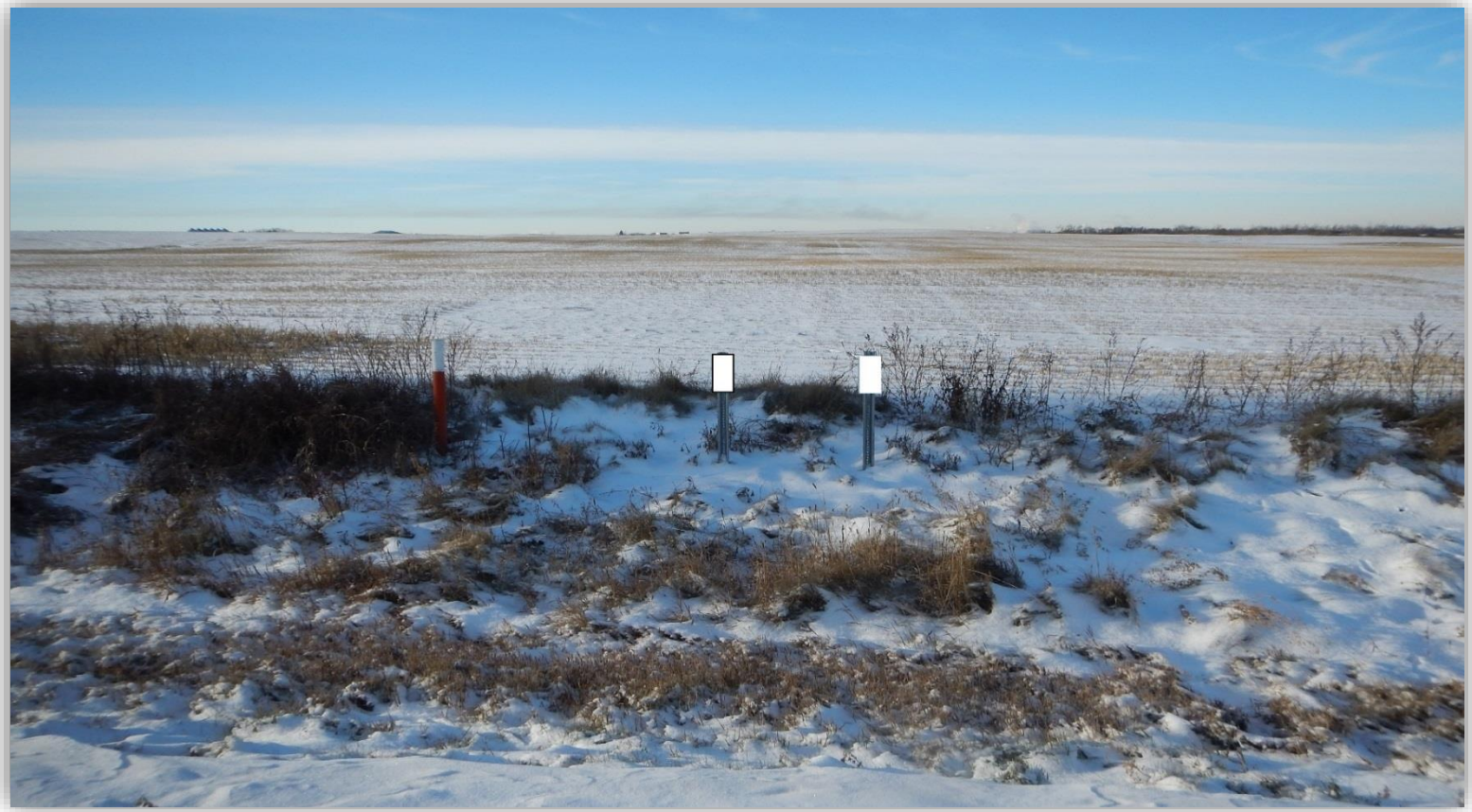
Photo of Mapped Area



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Water Body Classifications

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Classifications Groups

Rivers & Streams

- R0 – Insignificant
- R1 – Low Significance
- R2 – Moderate Significance
- R3 – High Significance
- R4 – Very High Significance

Lakes, Sloughs & Muskeg

- L0 - Insignificant
- L1 – Low Significance
- L2 – Moderate Significance
- L3 – High Significance
- L4 – Very High Significance

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Classification Distance Considerations

- Classifications should consider the impact within 2km distance of the crossing
  - » River or stream -2km downstream of crossing
  - » Lakes, sloughs, or muskeg -2km of distance

- If pipeline right of way is within 100 meters of a waterbody but does not cross it, the classification of that water body should be adopted

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River or Stream Classifications

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R0-Insignificant

Water only present seasonally and not classed as per AESRD. Considered seasonal drainage. No risk of hydrodynamic and impact loads should pipe become exposed.

- Very low potential of spill spreading beyond local area
- Risk equivalent to remaining right of way
- Treat as per normal ROW

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R1-Low Significance

Full time water flow and does not exceed 2 meters in water width at maximum flow and is AESRD Class D or un-classified. Low risk of hydrodynamic and impact loads should pipe become exposed.

- Low potential of spill spreading beyond local area due to flowing water
- Minimal potential for flow related failure due to low flow energy levels
- Low potential impact to wildlife and people

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R2-Moderate Significance

Full time water flow and exceeds 2 meters in water width at maximum flow, but is not greater than 8 meters in width, and is AESRD classed B,C,D or unclassified. Moderate risk of hydrodynamic and impact loads should pipe become exposed.

- Moderate impact from spill spreading beyond local area due to flowing water
- Moderate potential impact to wildlife and people

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R3-High Significance

Exceeds 8 meters in water width at maximum flow but not greater than 20 meters, or is normally used for recreational/commercial purposes, or is AESRD Class A. High risk of hydrodynamic and impact loads should pipe become exposed.

- Spill likely to extend over a great distance and have high impact
- Hydrodynamic and impact load potential is high
- High potential impact to wildlife and people

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R4-Very High Significance

Greater than 20 meters in water width at maximum flow and is considered a major tributary or river, or is a source of fresh water for human consumption, irrespective of AESRD classification or width. High risk of hydrodynamic and impact loads should pipe become exposed.

- Spill has very high impact and will extend great distances.
- Flow volumes/energy have extreme risk of pipe exposure and probability of hydrodynamic and impact loads.
- Very High potential impact to wildlife and people

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Lakes, Sloughs or Muskeg

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L0 - Insignificant

No in or out flow of water, and is considered trapped water, seasonally dry.

- Very low potential of spill spreading beyond local area
- Risk equivalent to remaining right of way

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L1 – Low Significance

Never dry and is less than 100 meters at its widest point. Has no in or out flow of water, or is muskeg with no visible flow or channel*. Not a protected wildlife habitat and not used by humans for recreation or commercial.

- Spill should be contained to waterbody
- Low potential for impact to wildlife or people

**If visible channel treat as river or stream*

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L2 – Moderate Significance

Greater than 100 meters in width but not greater than 300 meters at its widest point. Has in and outflow, is not a water supply for human consumption and is not considered a protected wildlife habitat. Rivers or streams associated with waterbody are AESRD classified B,C,D or unclassified.

- Moderate probability that spill will spread beyond local area
- Moderate potential impact to wildlife and people

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L3 – High Significance

Greater than 300 meters in width but not greater than 800 meters at its widest point. Has in and outflow or is a protected wildlife habitat, or is normally used for recreational/commercial purposes or river/streams associated with waterbody are AESRD class A. Is **not** used for human consumption.

- High Significance of spill
- High potential impact on wildlife and people
- Potential for media attention

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L4 – Very High Significance

Greater than 800 meters in width at its widest point. Has inflow and outflow, or is a source of water for human consumption, or is a protected wildlife habitat, or is normally used for recreational/ commercial purposes, irrespective of AESRD classification of rivers/streams associated with waterbody.

- Spill will have very high impact on humans and fish/wildlife
- Very High environmental impact
- Could draw significant media attention

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Questions?

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Thank You

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