

MANITOBA-MINNESOTA TRANSMISSION PROJECT

Clean Environment Commission Hearing



Human environment

Valued components assessed

Heritage Resources	Employment & Economy	Infrastructure & Services	Agriculture
Land & Resource Use	Visual Quality	Human Health Risk	Community Health

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Overview | What We Heard | What We Assessed | Key Issue Review | Mitigation, Monitoring and Follow-up | Conclusions

Why agriculture?

- Predominant land use
- Important driver of local and provincial economies
- Diverse operations with regional to individual variability
- Project construction and presence will affect activities



Source: Province of Manitoba

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Overview What We Heard What We Assessed Key Issue Review Mitigation, Monitoring and Follow-up Conclusions

Lessons learned

- Importance of landowner engagement
- Biosecurity concerns
- Routing and tower placement
 - Preference along half-mile or parallel roads
 - Diagonal crossings should be avoided or reduced



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Overview What We Heard What We Assessed Key Issue Review Mitigation, Monitoring and Follow-up Findings and Conclusions

What we heard

- Loss and degradation of land
- Farm infrastructure and equipment operation
- Aerial application and airstrips
- Livestock health
- Biosecurity for crops and livestock




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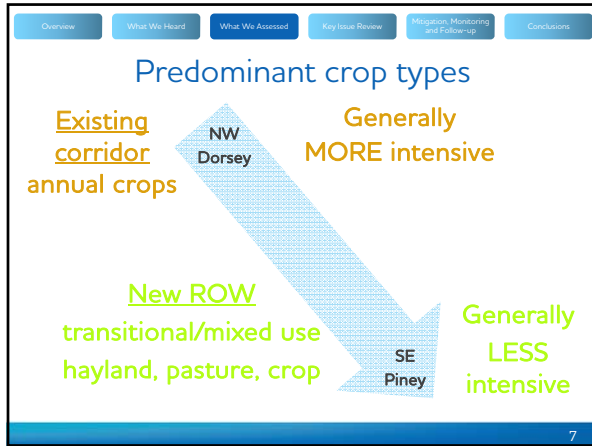
Overview What We Heard What We Assessed Key Issue Review Mitigation, Monitoring and Follow-up Conclusions

Issues considered through routing

- Diagonal crossings
- Existing linear features paralleled
- Interference with buildings (operations)
- Liquid manure application (hog)
- Land capability, crop type & productivity
- Aerial application area
- Irrigation & tile drainage



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Diagonal crossings

Crop Type	Existing Corridor	New ROW
	----- km	-----
Annual cropland	8.1	4.6
Perennial & pasture	0.1	4.2
Range & grassland	0.8	17.5
Total	9.0	26.3

*Small amount of diagonal crossing in improved crop land
Where diagonal, paralleling existing features*

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- Landowner compensation**
- Mitigation will reduce residual effects
 - they won't be eliminated
 - Compensation is considered the "last line of defence"
 - Program addresses:
 - Direct construction/operational effects to land use
 - Damages to land or infrastructure
 - Indirect impacts to operations
- Considers effects on individual landowners/producers**

Overview What We Heard **What We Assessed** Key Issue Review Mitigation, Monitoring and Follow-up Conclusions

Effects we assessed

1. Loss or degradation of agricultural land
 - Temporary loss of land (ROW during construction)
 - Permanent loss of land (structures through operation)
 - Soil degradation
2. Conflict with agricultural activities
 - Equipment operation
 - Cropland biosecurity
 - Livestock health
 - Specialty operations

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Overview What We Heard **What We Assessed** Key Issue Review Mitigation, Monitoring and Follow-up Conclusions

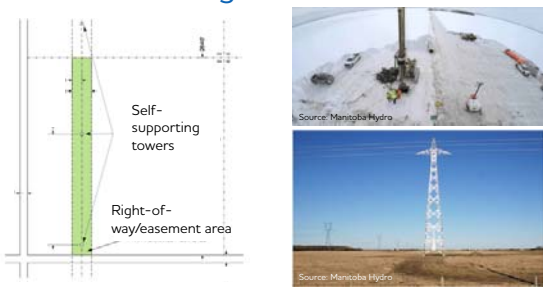
Methods

- Specific methods used:
 - KPIs with industry stakeholder groups
 - Crop productivity estimates developed
 - Compaction and erosion risk ratings developed
 - Classified livestock operations
 - Literature review
 - Including "Farming Around Hydro Towers", PAMI (2015)

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Overview What We Heard **What We Assessed** Key Issue Review Mitigation, Monitoring and Follow-up Conclusions

Loss or degradation of land



The diagram shows a cross-section of a hydro tower with labels for 'Self-supporting towers' and 'Right-of-way/easement area'. Below the diagram are two photographs: the top one shows a construction site with a tower under construction, and the bottom one shows a completed tower in a field. Both photos are attributed to 'Source: Manitoba Hydro'.

Temporary loss (construction) – entire ROW for two seasons

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Overview What We Heard What We Assessed Key Issue Review Mitigation, Monitoring and Follow-up Findings and Conclusions

Loss or degradation of land

- Construction and maintenance traffic can cause compaction
- Determined compaction risk within the PDA

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Overview What We Heard What We Assessed Key Issue Review Mitigation, Monitoring and Follow-up Conclusions

Evaluation of effects to land

Determined and mapped and evaluated:

Agricultural capability	Crop productivity	Compaction risk
Inherent ability to support crops	Current production levels	Primary degradation mechanism

----- Land Loss ----- -- Degradation --

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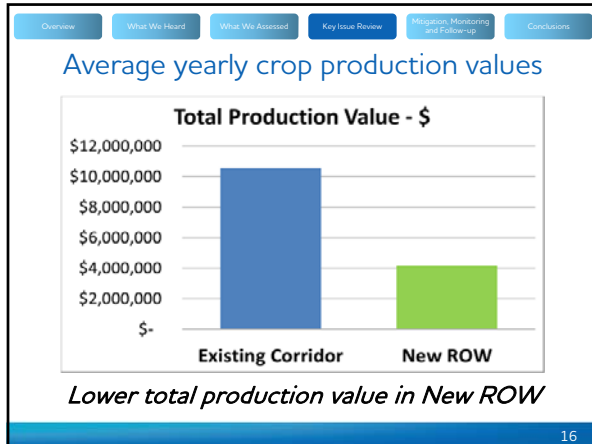
Overview What We Heard What We Assessed Key Issue Review Mitigation, Monitoring and Follow-up Conclusions

Agricultural Capability by Project Component

Project Component	Class 1-3	Class 4-5	Class 6-7	Organic
Existing Corridor	90%	4%	0%	0%
New RoW	20%	40%	14%	25%

Lower agricultural capability within New ROW

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- Key mitigation measures**
- Self-supporting towers in improved agricultural land
 - Continued landowner engagement
 - Address concerns for individuals
 - Rehabilitation for damage, for example:
 - soil degradation
 - damage to tile drainage systems
 - Management of equipment traffic including:
 - scheduling to reduce compaction & rutting

- Key findings – effects to land**
- New ROW areas – lower agricultural capability, crop production value, compaction risk
 - Avoided agricultural buildings
 - 6 buildings within Existing Corridor PDA; 0 in New ROW PDA
 - Temporary land loss expected to last ≤ 2 growing seasons
 - Existing corridor – 1,637 ha
 - New ROW – 331 ha
 - Glenboro South Station – 6 ha
 - Permanent land loss area – 11.7 ha (0.4% of PDA)
 - Compaction risk is an important consideration
 - 67% of the PDA rated as High

Overview What We Heard What We Assessed **Key Issue Review** Mitigation, Monitoring and Follow-up Conclusions

Conflict with activities – equipment operation

Presence of tower and conductors:

- Interfere with field operations (ground and aerial)
- Result in overlapping equipment travel and input application
- Increase time management, effort and cost

Ground-based equipment *Aerial application*



Source: topcropmanager.com Source: pami.com


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Overview What We Heard What We Assessed **Key Issue Review** Mitigation, Monitoring and Follow-up Conclusions

Conflict with activities – equipment operation

Drag-line, direct injection of liquid manure

- Increased management effort but practice can continue (PAMI, 2015)



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Overview What We Heard What We Assessed **Key Issue Review** Mitigation, Monitoring and Follow-up Conclusions

Key mitigation measures

- Design mitigation
 - Self-supporting towers vs guyed
 - Average tower interval 470 m (approx. 2 per qtr section)
- Continued landowner engagement to reduce effects on individuals
 - Tower spotting potential
 - avoid tile drainage infrastructure
 - limit field access issues
 - Communication regarding interruptions to operations

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Overview What We Heard What We Assessed **Key Issue Review** Mitigation, Monitoring and Follow-up Conclusions

Key findings - equipment operation


- New ROW outside of primary aerial application area
- Small amount (4.6 km) of diagonal crossing in annual cropland within New ROW
- Project effects will be limited to:
 - PDA for some types of conflicts (e.g., ground operations for seeding, harvesting, pesticide application)
 - LAA for others (e.g., aerial application of pesticides, drag hose manure application)
- 20 hog & dairy operations in LAA

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Overview What We Heard What We Assessed **Key Issue Review** Mitigation, Monitoring and Follow-up Conclusions

Conflict with activities - cropland biosecurity

- Project activities could result in spread of soil-borne pathogens and pests between fields
- Identified soil-borne pathogens and pests of concern in project area
 - Clubroot – soil-borne pathogen of primary concern
 - Others raised – Verticilium wilt; soybean cyst nematode




Source: Province of Manitoba Source: Province of Manitoba

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Overview What We Heard What We Assessed **Key Issue Review** Mitigation, Monitoring and Follow-up Conclusions

Key mitigations - cropland biosecurity

- Manitoba Hydro Biosecurity policy and SOP
 - Clean equipment before and after field access
 - Limiting equipment to PDA & existing access
- Sampling fields for biosecurity
 - Per discussion with MB Agriculture



Source: isperopmanager.com

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Overview What We Heard What We Assessed **Key Issue Review** Mitigation, Monitoring and Follow-up Conclusions

Conflict with activities – livestock health

- Concerns related to project interactions with livestock:
 - Construction/maintenance workforce contact
 - Open/increase access for wildlife to livestock production areas
 - Increase potential for stray voltage effects on dairy cows
- Assessment informed by literature review and discussion with specialists



Source: Province of Manitoba Source: Manitoba Hydro Source: Province of Manitoba

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Overview What We Heard What We Assessed **Key Issue Review** Mitigation, Monitoring and Follow-up Findings and Conclusions

Key mitigation - livestock health

- Manitoba Hydro policy on biosecurity policy and SOP
 - Clean equipment – on arrival at site
- Limiting equipment to PDA & access points
- Exclusion fencing (e.g., around towers in calving areas)
- On-going engagement with producers
 - Timing of construction activities
 - Stray voltage and other concerns



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Overview What We Heard What We Assessed **Key Issue Review** Mitigation, Monitoring and Follow-up Conclusions

Key findings - livestock health

- Biosecurity program will control contact with livestock
- Route avoids the elk area in Manitoba
- Research indicates no adverse effects on the health of livestock due to magnetic or electric fields (or audible noise)
 - closest dairy operation approximately 140 m from ROW
- Stray voltage concerns will be investigated by Manitoba Hydro
 - determine cause and action will be taken if required

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Overview What We Heard What We Assessed Key Issue Review **Mitigation, Monitoring and Follow-up** Conclusions

Cumulative effects


- Past projects have resulted in land loss and conflict
- 52% of the RAA is under agricultural cropping
- 2.5% is considered otherwise developed
- Planned projects will have additive effects:
 - transmission projects
 - Energy East Pipeline Project
 - residential development; and
 - transportation projects

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Overview What We Heard What We Assessed **Key Issue Review** Mitigation, Monitoring and Follow-up Conclusions

Cumulative effects – key findings

- Future planned projects will remove <500 ha within RAA
 - <0.2% of 445,249 ha of agricultural land in the RAA
 - Project's contribution will be small (2% of overall)
- Combined effect will be adverse but is not anticipated to impair the capacity of agriculture in the RAA
 - agriculture anticipated to continue at or near pre-project disturbance levels



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Overview What We Heard What We Assessed **Key Issue Review** Mitigation, Monitoring and Follow-up Conclusions

Monitoring & follow-up

- Pre-construction sampling for crop biosecurity in fields traversed
- Post-construction monitoring
 - compaction & rutting
 - crop performance monitoring
- Reclamation/rehabilitation of damage
 - including soil compaction and tile drainage systems
- Site-specific issues to be evaluated as required
- Dedicated landowner liaisons

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Overview | What We Heard | What We Assessed | Key Issue Review | **Message, Monitoring and Follow-up** | Conclusions

Summary and conclusions

- Routing and design limited effects to agriculture
- Temporary land loss will last ≤ 2 growing seasons
- Small amount of land removed from production
- Mitigation & environmental protection will be implemented
- Compensation designed to offset residual effects

Project residual and cumulative effects are considered to be not significant

Source: Manitoba Hydro

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