MANITOBA-MINNESOTA TRANSMISSION PROJECT

Clean Environment Commission Hearing

Manitoba Hydro

Human environment

Valued components assessed

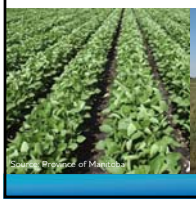
Heritage Resources	Employment & Economy	Infrastructure & Services	Agriculture
Land & Resource Use	Visual Quality	Human Health Risk	Community Health

2

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


Source: Province of Manitoba


Source: Province of Manitoba

3

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

4

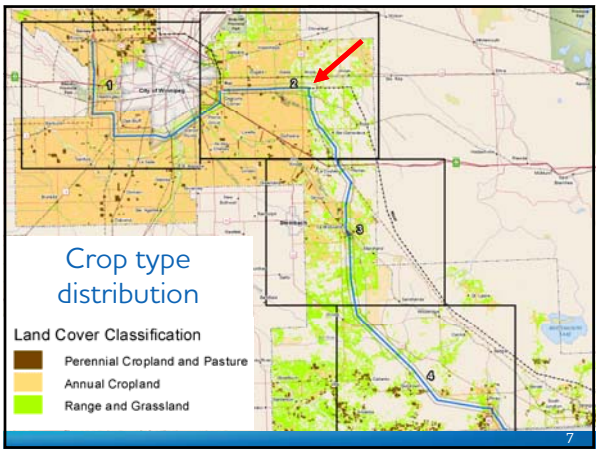
Opportunities for engagement

- Pre-project stakeholder workshops
- Public open houses
- Community meetings
- Targeted meetings (e.g., HyLife, Maple Leaf)
- Landowner Information Centres
- Aboriginal Traditional Knowledge
- Key Person Interviews

5

Routing Phase	Criteria
Alternative Corridor Model	• Proposed developments • Agricultural capability • Crop types (annual, hayland, pasture) • Artisanal farms, organic farms, sod production • Irrigated land • Intensive livestock operations • Aerial application areas
Alternative Route Evaluation Model	• Agricultural capability • Current land use (crop vs. forage/hay) • Proximity to intensive hog operations • Proximity to agricultural buildings (barns, storage, etc) • Diagonal crossings of high capability lands

6



Four types of compensation

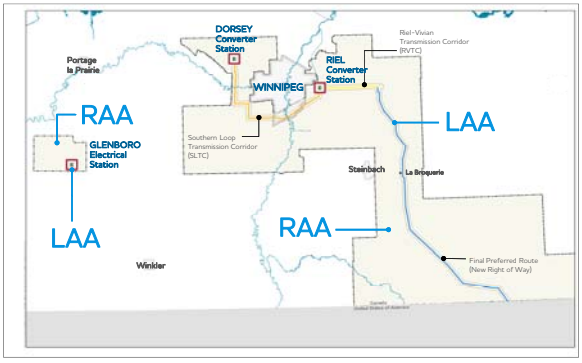
1. Land compensation
2. Construction damage compensation
3. Structure impact compensation
4. Ancillary damage compensation

Manitoba-Minnesota Transmission Project Landowner Compensation Information

Manitoba Hydro

9

Agriculture assessment areas



10

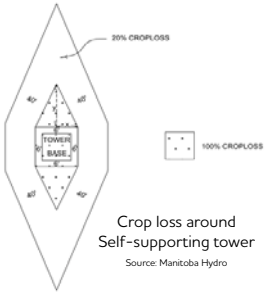
Overview | What We Heard | What We Assessed | Key Issue Review | Mitigation, Monitoring and Follow-up | Conclusions

Methods

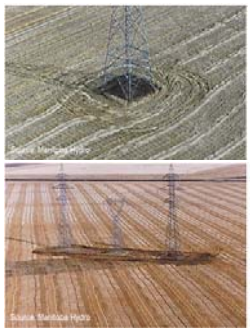
- Specific methods used:
  - KPIs with industry stakeholder groups
  - Crop productivity estimates developed
  - Compaction and erosion risk ratings developed
  - Classified livestock operations
  - Literature review
    - Including "Farming Around Hydro Towers", PAMI (2015)

11

Loss or degradation of land

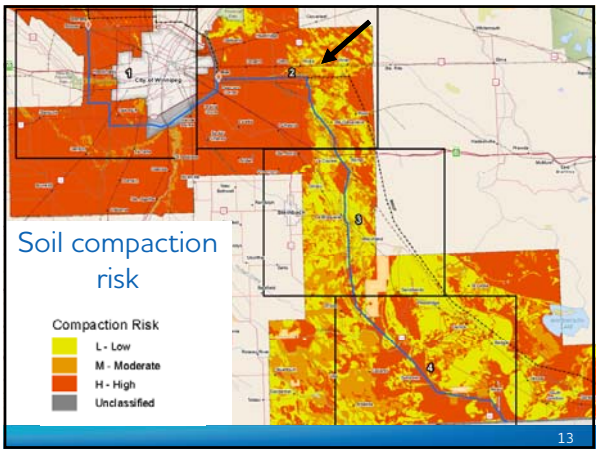


Crop loss around Self-supporting tower
Source: Manitoba Hydro



Permanent loss (operation) – structure footprints + 3m buffer

12



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

Evaluation of effects to land

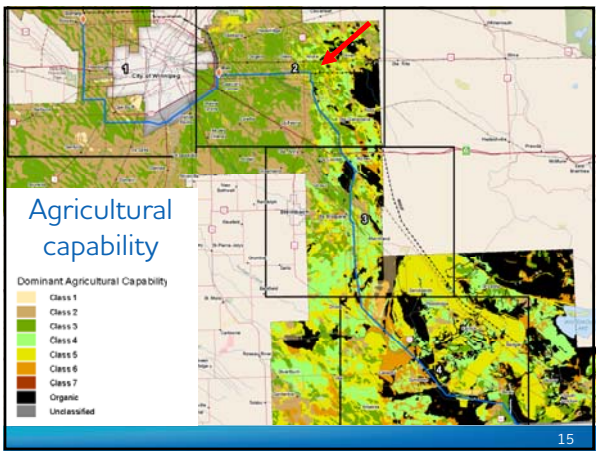
Determined and mapped and evaluated:

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

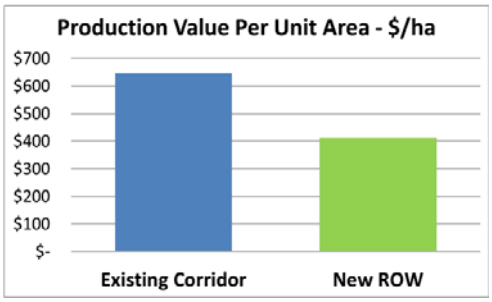
---------- Land loss ----------

-- Degradation --

14



Average yearly crop production values



Lower per unit area production values in New ROW

16

17

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

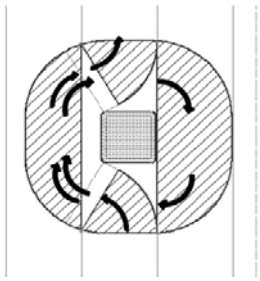
Key findings – effects to land

- 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

18

Conflict with activities–equipment operation

Many types, shapes & sizes

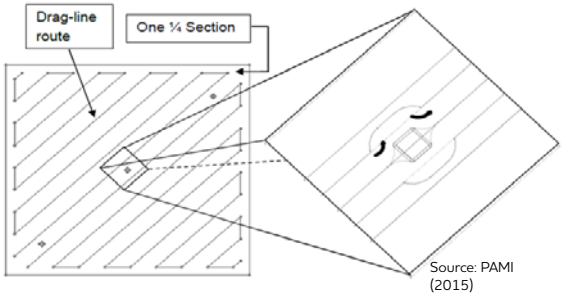


Source: PAMI (2015)

Overlap around towers

19

Drag line operation in field with diagonal crossing

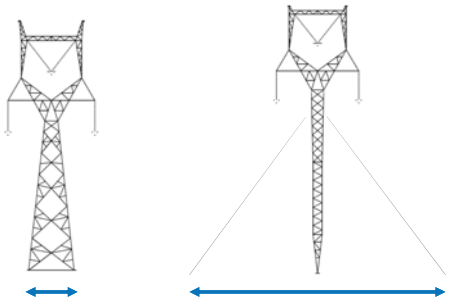


Source: PAMI (2015)

Additional drag line starting point may be required

20

Tower type



Self-supporting tower

Guyed tower

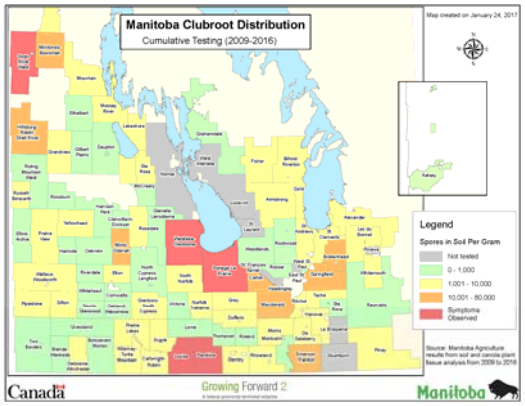
21

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

22



23

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

24

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

25

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

26

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

27

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

28

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


Source: Manitoba Hydro


Source: Manitoba Hydro

29

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

30


Overview
What We Heard
What We Assessed
Key Issue Review
Mitigation, 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
31