

CORPORATE RISK MANAGEMENT REPORT

FALL 2018



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Corporate Risk Management Report

1.0 INTRODUCTION

The Corporate Risk Management Report provides Manitoba Hydro's stakeholders with information on the status of major risks facing the Corporation as it carries out its mandate.

Manitoba Hydro has a relatively low tolerance for risk as it is solely responsible for the provision of natural gas and electricity to Manitobans. In balancing the costs of risk mitigation with risk consequences to rates and service, some degree of risk should be accepted in order to maximize value for stakeholders. These risks are managed with an objective to:

- Identify risks to delivering the Corporation's mandate and objectives.
- Implement policy, plans and management controls to reduce the probability of risk events to reasonable levels at an acceptable cost.
- Take action to mitigate the consequences of risk events.
- Capture opportunities to provide benefits to all stakeholders.
- Maintain an adequate level of financial reserves.

The financial and operational risks associated with the management of an integrated utility include:

- The impacts of weather on supply and demand.
- Changing customer expectations and behaviour.
- Regulatory approval of increases to electricity and natural gas rates.
- Export price and market uncertainties including access, transmission and contractual relationships.
- Availability and cost of debt necessary to fund the business.
- Skilled labour availability and costs.
- Cost of completion of in-progress capital programs.
- Infrastructure degradation and system sustainment.
- Accelerated technological change.
- Emergencies and disasters.

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2.0 RISK OVERVIEW

2.1 Risk Trends and Changes

Manitoba Hydro works within a dynamic and complex business environment with many diverse stakeholders. The summary below highlights trends and material changes since the November 2017 report.

- The completion of Bipole III and its two convertor stations strengthens the reliability and security of Manitoba Hydro's electricity supply. In previous risk reports, the high consequence risk of a long-term outage from the loss of Bipole I and II and/or the convertor stations has decreased significantly due to additional redundancies in the system.
- At approximately 60% complete, several years of construction remain on the Keeyask Generating Station Project. Significant delays or cost increases could have material financial, reputational and contractual consequences.
- There is increasing risk that the required Provincial or Federal regulatory approvals may not be received in time to start construction of the Manitoba-Minnesota Transmission Project by target dates which may put our export contract with Minnesota Power in jeopardy.
- Many of the Corporation's 50-year licenses under *The Water Power Act* will require renewal over the coming years. The potential processes, scope, costs and implications of the re-licensing of legacy facilities are unclear. There will be significant additional costs if new environmental licensing requirements are added to the process.
- The utility business model is evolving, and customer behaviours are changing. Improvements and cost reductions in emerging energy technologies could put further downward pressure on market prices, impact customer behaviour and affect Manitoba Hydro's marketing opportunities, thus reducing the value or useful life of existing assets.
- Significant new customer connections, such as cryptocurrency miners, can disrupt historical trends in electric load growth. Load growth beyond the forecast accelerates the need for large investment in additional generation resources and bulk transmission.
- Over the medium to long term, uncertainty exists around potential changes to the way the export market functions, as well as how the market values energy and capacity. Natural gas and renewables will continue to put pressure on electricity prices, both for opportunity sales and new contracts. Deviation from the electricity price forecast could have a material financial and strategic impact to the corporation.
- Without ongoing adequate annual rate increases, the Corporation expects to be operating in a loss position when Keeyask goes into service. The future trajectory of domestic electricity rates is uncertain as Order 59/18 by the Public Utilities Board (PUB) did not endorse a long-term plan or financial targets for rate setting. Assuming annual rate increases of approximately 3.6%, cumulative losses would be expected in the five

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years following Keeyask in-service (based on 2016 forecasts with select revisions adjusted for PUB accounting directives).

- Over the past year our safety and occupational health metrics have been increasing. Due to the inherent nature of the operational work performed by Manitoba Hydro, safety is of key concern to the Corporation. The continual improvement of safety and health measures is always a priority.
- Manitoba Hydro is in a growth period with several major capital projects underway leading to an elevated sensitivity to interest rates changes. Risk is mitigated through prudent debt management strategies and operating within policy limits. Financial forecasts include interest rates increases; however, an additional 1% increase (above forecast) may have a potential cumulative impact on retained earnings in the order of \$1 billion over 10 years.
- Manitoba Hydro's Demand Side Management (DSM) plan assumes current levels of programming and does not contain initiatives to reach the higher 1.5% target contained in Bill 19. Neither the increased costs to reach the 1.5% target, nor the reduction in domestic revenues from reduced usage are included in the current financial forecast, potentially resulting in a significant reduction of net income. Appropriate adjustments will be made once Efficiency Manitoba begins operations and details are provided to Manitoba Hydro.
- The IBEW collective agreement expires on December 31, 2018. Negotiations for the renewal of the existing collective agreement commence on October 29, 2018. Should a new collective agreement not be concluded by January 1, 2019, IBEW could exercise their rights to commence strike action in early January.
- The Corporation continues to make progress on asset management strategies to modernize its system and address overloaded substations in Winnipeg. Transmission and Distribution System capacity constraints still exist in some regions, presenting challenges associated with security of supply and complexities associated with connecting new customers in those regions.
- While there is a high level of confidence in the Corporation's ability to provide reliable energy, Manitoba Hydro is managing specific high profile reputational risks and issues with impacted stakeholders.
- The Fisheries Act (Canada) is currently under review and stands to be amended under Bill C68 which could reduce operational flexibility and require additional mitigation activities to protect fish and fish habitat at the Corporation's hydroelectric generating facilities.

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2.2 Risk Group Summary Table

A. Financial Planning Inputs & Assumptions	
1. Interest Rates	8. Credit
2. Electricity Rates	9. Demand Side Management Assumptions
3. Non-Commodity Gas Rates	10. Exchange Rates
4. Liquidity	11. Water Conditions
5. Inflation	12. Load Growth Uncertainty
6. Upstream Gas Cost	13. Loss of Large Industrial Load
7. Energy/Fuel Price Volatility	
B. Export Business Contribution	
1. Export Price Uncertainty	5. Transmission Interconnection Capacity
2. Regulatory Environment	6. Taxation
3. Protectionism	7. Power Financial Instruments
4. Export Market Access	8. Loss of Signed Export Contracts
9. Manitoba Minnesota Transmission Project (MMTP) In-service Date Delay	
C. Completion of Major Capital Projects	
1. Inadequate Contingency	2. Delay to In-Service Date
D. Continuity of Supply	
1. Loss of Plant	4. Short Term Loss of Supply
2. Retaining Structures and Flow Control	5. System Shutdown (Gas)
3. Extreme Drought – Shortfall of Energy Supply	6. Corporate Emergency Management
E. Business & Operational Stability	
1. Operational Controls	6. Union/Employee Issues
2. Operational Impact (Environmental)	7. Workforce Management
3. Technology Infrastructure	8. Infectious Disease
4. Supply Chain	9. Indigenous Relationships
5. Electrical Distribution System Asset Risk	10. Cyber Security
F. Strategic Influences	
1. Emerging Energy Technologies	4. Corporate Reputation
2. Strategic Direction & Execution	5. Financial Targets
3. Climate Change	
G. STABILITY OF REGULATORY & LEGAL ENVIRONMENT	
1. Re-licensing Of Legacy Facilities	6. Contracts and Ventures

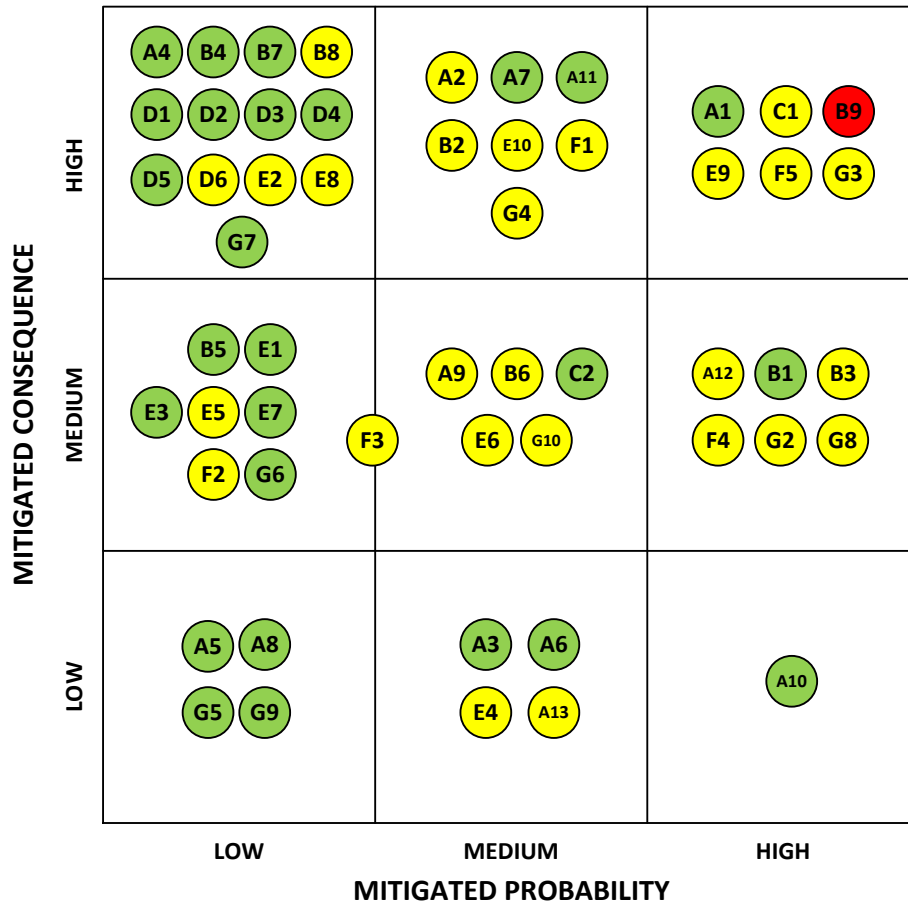
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2. Concerned Stakeholders	7. Legal Compliance
3. Safety & Health	8. Reliability of Supply (Environmental)
4. Environmental Legislation (Fisheries)	9. Upstream Regulation
5. Reliability Standards	10. Indigenous Legal

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2.3 Corporate Risk Map

The following risk map illustrates the results of residual risk for each of the risks identified in Section 2.2.



Guidelines for assessing Probability and Consequence can be found in Appendix C.

Action levels for each risk have been classified as green, yellow, or red according to the following:

Green	Yellow	Red
No additional action required at this time as the risk is under control and is not subject to significant change.	There are or appears to be some emerging issues that need to be closely monitored and addressed. Additional action is required to bring the risk back to the established tolerance. Management has time to respond in an orderly manner.	The risk has become critical to business operations and requires day to day senior management attention.

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3.0 RISK GROUPS

Risk groups reflect major outcomes of risk along with the identification and status of component risks. Certain individual risks or even risk groups may form a component part of several risk groups reflecting the direct and collateral impact certain issues can have on the Corporation’s risk profile.

3.1 Financial Planning Inputs & Assumptions (Group A)

There are many inputs and assumptions in Manitoba Hydro’s integrated planning process. Component forecasts for economic factors, load growth, water conditions and fuel prices all contain a level of uncertainty that comes together in the Integrated Financial Forecast (IFF). These risks are well understood by Manitoba Hydro with internal policies, practices and controls in place to mitigate unfavourable variances from expected outcomes.

3.1.1 Group A – Financial Planning Inputs & Assumptions

Ref	Individual Risk Factor	Mitigated Probability	Mitigated Consequence	Tolerance	Rating
A1.	Interest Rates	High	High	Medium	Green
A2.	Electricity Rates	Medium	High	Medium	Yellow
A3.	Non-Commodity Gas Rates	Medium	Low	Medium	Green
A4.	Liquidity	Low	High	Low	Green
A5.	Inflation	Low	Low	Medium	Green
A6.	Upstream Gas Cost	Medium	Low	Medium	Green
A7.	Energy / Fuel Price Volatility	Medium	High	Medium	Green
A8.	Credit	Low	Low	Medium	Green
A9.	Demand Side Management Assumptions	Medium	Medium	Medium	Yellow
A10.	Exchange Rates	High	Low	Medium	Green
A11.	Water Conditions	Medium	Medium	Medium	Green
A12.	Load Growth Uncertainty	High	Low	Medium	Green
A13.	Loss of Large Industrial Load	Medium	Low	Medium	Yellow
E5.	Electrical Distribution Asset Risk	Medium	Medium	Medium	Yellow
B.	Export Business Contribution Risks	Medium	Medium	Medium	Green
C.	Completion of Major Capital Projects Risks	High	High	Low	Yellow

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3.2 Export Business Contribution (Group B)

Under Manitoba Hydro’s regulatory construct in its electric business, the Manitoba domestic ratepayers are responsible for 100% of system costs. Contributions from the export of power are allocated amongst customer classes to reduce domestic rates. The availability and economics of export markets, inclusive of capability to enter into new, long-term export contracts is critical to enabling the contributions of export sales in order to reduce domestic rates. The vast majority of Manitoba Hydro’s current export revenues are derived from sales to customers and markets in the United States. As such, cross-border issues present a complex array of risks Manitoba Hydro must manage and mitigate.

3.2.1 Group B – Export Business Contribution Component Risk Summary

Ref	Risk Factor	Mitigated Probability	Mitigated Consequence	Tolerance	Rating
B1.	Export Price Uncertainty	High	Medium	Medium	Green
B2.	Regulatory Environment	Medium	High	Medium	Yellow
B3.	Protectionism	High	Medium	Medium	Yellow
B4.	Export Market Access	Low	High	Low	Green
B5.	Transmission Interconnection Capacity	Low	Medium	Low	Green
B6.	Taxation	Medium	Medium	Medium	Yellow
B7.	Power Financial Instruments	Low	High	Low	Green
B8.	Loss of Signed Export Contracts	Low	High	Low	Yellow
B9.	MMTP In-service Date Delay	High	High	Med	Red
A11.	Water Conditions	Medium	Medium	Medium	Green
G5.	Reliability Standards	Low	Low	Low	Green
C.	<i>Completion of Major Capital Projects</i>	High	High	Low	Yellow

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3.3 Completion of Major Capital Projects (Group C)

Manitoba Hydro is in the process of completing the Keeyask Generating Station at an estimated cost of \$8.7 billion. Keeyask along with the recently completed Bipole III will combine to more than double the debt of the Corporation, thus materially changing its financial profile and risk. Further slippage on construction costs and schedule risk the financial standing of the Corporation in addition to risking an impact to Indigenous and customer relationships, reputation and standing with certain stakeholders. The Manitoba Minnesota Transmission Project (MMTP) is at risk from regulatory delays and stakeholder concerns, which could also have impacts on the Great Northern Transmission Line (GNTL) on the U.S. side of the border.

3.3.1 Group C – Completion of Major Capital Projects Component Risk Summary

Ref	Risk Factor	Mitigated Probability	Mitigated Consequence	Tolerance	Rating
C1.	Inadequate Contingency	High	High	Low	Yellow
C2.	Delay to In-service Date	Medium	Medium	Low	Green
A4.	Liquidity	Low	High	Low	Green
A5.	Inflation	Low	Low	Medium	Green
G2.	Concerned Stakeholders	High	Medium	Low	Yellow
E9.	Indigenous Relationships	High	High	Low	Yellow

3.4 Continuity of Supply (Group D)

As per the Manitoba Hydro Act, Manitoba Hydro is solely responsible for the provision of natural gas and electricity to Manitobans. As such, it is essential to the province’s social and economic well-being that the Corporation ensures a continuance of supply.

3.4.1 Group D – Continuity of Supply Component Risk Summary

Ref	Risk Factor	Mitigated Probability	Mitigated Consequence	Tolerance	Rating
D1.	Loss of Plant	Low	High	Low	Green
D2.	Retaining Structures and Flow Control	Low	High	Low	Green
D3.	Extreme Drought (Shortfall of Energy Supply)	Low	High	Medium	Green
D4.	Short Term Loss of Supply	Low	High	Low	Green
D5.	System Shutdown (Gas)	Low	High	Low	Green
D6.	Corporate Emergency Management	Low	High	Low	Yellow

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E10. Cyber Security	Medium	High	Low	
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3.5 Business and Operational Stability (Group E)

This Risk Group is comprised of risk factors that contribute to Manitoba Hydro maintaining a reliable, predictable supply and operating in a cost efficient manner.

3.5.1 Group E – Business and Operational Stability Component Risk Summary

Ref	Risk Factor	Mitigated Probability	Mitigated Consequence	Tolerance	Rating
E1.	Operational Controls	Low	Medium	Low	
E2.	Operational Impact (Environmental)	Low	High	Medium	
E3.	Technology Infrastructure	Low	Medium	Low	
E4.	Supply Chain	Medium	Low	Medium	
E5.	Electrical Distribution Asset Risk*	Low	Medium	Medium	
E6.	Union / Employee Issues	Medium	Medium	Medium	
E7.	Workforce Management	Low	Medium	Low	
E8.	Infectious Diseases	Low	High	Low	
E9.	Indigenous Relationships	High	High	Low	
E10.	Cyber Security	Medium	High	Low	
G2.	Concerned Stakeholders	High	Medium	Low	
G3.	Safety & Health	High	High	Low	
G8.	Reliability of Supply (Environmental)	High	Medium	Medium	

* Previously called Aging Infrastructure - Distribution

3.6 Strategic Influences (Group F)

This Risk Group captures determinates of whether Manitoba Hydro is positioned to meet its mission in the future as its operating environment and position in the industry changes and evolves.

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3.6.1 Group F – Strategic Influences Component Risk Summary

Ref	Risk Factor	Mitigated Probability	Mitigated Consequence	Tolerance	Rating
F1.	Emerging Energy Technologies	Medium	High	Medium	
F2.	Strategic Direction & Execution	Low	Medium	Medium	
F3.	Climate Change	Low-Med	Medium	Medium	
F4.	Corporate Reputation	High	Medium	Medium	
F5.	Financial Targets	High	High	Medium	

3.7 Stability of Regulatory and Legal Environment (Group G)

Manitoba Hydro operates within a complex system of laws and regulations on a local, provincial, national and international level. Maintaining compliance is essential to ongoing operations and preserving the Corporation’s reputation. Evolving regulation can threaten the Corporation’s continued operations, growth and financial position.

3.7.1 Group G – Stability of Regulatory and Legal Environments Component Risk Summary

Ref	Risk Factor	Mitigated Probability	Mitigated Consequence	Tolerance	Rating
G1.	Re-licensing of Legacy Facilities*	TBD	TBD	TBD	TBD
G2.	Concerned Stakeholders	High	Medium	Low	
G3.	Safety & Health	High	High	Low	
G4.	Environmental Legislation (Fisheries)	Med	High	Low	
G5.	Reliability Standards	Low	Low	Low	
G6.	Contracts & Ventures	Low	Medium	Low	
G7.	Legal Compliance	Low	High	Low	
G8.	Reliability of Supply (Environmental)	High	Medium	Medium	
G9.	Upstream Regulation	Medium	Medium	Medium	
G10.	Indigenous Legal	Medium	Medium	Low	

**Note - Re-licensing of Legacy Facilities is a newly identified risk and is under assessment*

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4.0 HIGHEST PRIORITY RISKS

Manitoba Hydro has identified the following risks as being of most critical attention and focus over the next 12 months or longer. Each reflect elevated levels of probability, high consequences even after any mitigation initiatives and a current status that is outside of the Corporation's assessed risk tolerance for each.

4.1 Interest Rates (A1)

Manitoba Hydro is in a growth period with several major capital projects underway, leading to an elevated sensitivity to interest rates changes. The Bank of Canada raised its policy interest rate to 1.75 per cent, up from 1.50 per cent on October 24, 2018. This was the fifth rate increase in the last 15 months. Moving forward, the bank expects higher interest rates will be necessary over time to keep inflation near its target.

On a consolidated basis, risk sensitivity analysis in IFF18 adjusted for Board Order 59 shows that a change in interest rates (+50 bps, +100 bps, +150 bps and +200 bps in each of fiscal 2019, 2020, 2021 and 2022+) may result in an incremental change to retained earnings of approximately \$52 million to 2020/21. However, given the large size of the existing debt portfolio, as well as the need to add further debt to support the capital investments, the incremental change to 2027/28 arising from the same change in interest rate rises is forecasted to be approximately \$1 billion.

To mitigate this risk, the interest rate risk on the existing debt portfolio has been reduced by decreasing the percentage of floating rate debt within the existing debt portfolio and by selecting debt maturities that upon refinancing will not compete with new borrowing requirements. Manitoba Hydro will continue to favour long term fixed rate financing and will also enhance its financing flexibility by maintaining positive cash balances. Manitoba Hydro will continue monitoring the Corporation's financing requirements and financial market conditions in order to prudently manage the level of interest rate risk within the existing and future debt portfolio.

4.2 Electricity Rates (A2)

The Public Utilities Board sets electricity rates for domestic customers using Cost-of-Service Regulation. There is a risk that the Public Utilities Board may not grant the rate increases requested by the Corporation.

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The future trajectory of domestic electricity rates is uncertain as Order 59/18 by the Public Utilities Board (PUB) did not endorse a long term plan or financial targets for rate setting. Without ongoing adequate annual rate increases, the Corporation will be operating in a loss position. Assuming annual rate increases of approximately 3.6%, cumulative losses would be expected in the five years following Keeyask in-service (based on 2016 forecasts with select revisions adjusted for PUB accounting directives).

The Manitoba Hydro-Electric Board, working with management, will be reviewing its financial targets in the context of its income and balance sheet objectives in order to enable Manitoba Hydro to manage its financial risks while avoiding severe or sudden rate increases.

4.3 Completion of Major Capital Projects (C1, C2)

Manitoba Hydro is making significant investments in new Generation and Transmission projects and initiatives in order to increase capacity and energy or provide increased reliability. These projects include construction of the Keeyask Generating Station and development of the Manitoba-Minnesota Transmission Project. These plans will require a total investment of approximately \$9 billion (CEF18). While Bipole III has been completed, several years of construction remain in the Keeyask Generating Station Project and construction has yet to begin on the Manitoba-Minnesota Transmission Project. Any significant delays or cancellation would have material financial, reputational and contractual consequences.

There are very significant risks associated with such large initiatives that will challenge the Corporation's ability to meet Manitoba's energy needs while keeping customer rates affordable and maintaining the Corporation's financial strength. These challenges include completing the projects on time and on budget, maintaining relationships with all stakeholders that could affect execution of these projects, and funding the investments while preserving the financial integrity of the Corporation.

4.4 Corporate Reputation (F4)

Reputation risk exposes Manitoba Hydro's ability to achieve its overall strategic and operational goals in an effective and efficient manner. Reputational impacts have the potential to prevent Manitoba Hydro from gaining the "social licence" required to successfully operate, maintain and upgrade our system. The impacts of reputation cover a broad range of activities at Manitoba Hydro.

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4.5 Meeting Financial Targets (F5)

Financial strength is essential to withstanding the risks and uncertainties that are inherent in the Corporation's operations while maintaining long-term rate stability and predictability for customers.

The Manitoba Hydro-Electric Board, working with management, will need to consider and establish financial targets (or reaffirm existing ones) to anchor a new long range financial plan and strategy. The financial plan will then guide business decisions and rate applications to the Public Utilities Board with significant implications for customers.

4.6 Concerned Stakeholders (G2)

During this period of significant system growth, Manitoba Hydro is collaborating and negotiating with many impacted stakeholders. Regular media coverage of issues may negatively impact stakeholders' perceptions of Manitoba Hydro, and potentially influence stakeholder decisions affecting the Corporation. Manitoba Hydro actively manages this risk with respectful dialogue and consultation with impacted stakeholders.

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5.0 OTHER AREAS OF CONCERN

Manitoba Hydro has an elevated level of concern with the following risk factors many of which are of a new or evolving nature:

5.1 Demand Side Management Assumptions (A9)

In 2017, the Province of Manitoba enacted Bill 19 thereby creating a new Crown Corporation (Efficiency Manitoba) charged with designing and implementing Demand Side Management (DSM) programming.

Bill 19 introduced legislated targets of 1.5% annual reduction for electricity consumption and 0.75% for natural gas. If achieved by Efficiency Manitoba, this would represent a significant increase in reduction targets as compared to the DSM plan embedded in IFF16. The cost and net load growth consequences of the new Efficiency Manitoba plans are not yet known.

The transition plan for DSM activities out of Manitoba Hydro is not yet known leaving uncertainty as to employment status (including severance liability), customer engagement and other issues in the interim.

5.2 Load Growth Uncertainty (A12)

Current uncertainty regarding future rate increases impacts the ability to project price elasticity impacts on load growth. Moreover, the goals of Efficiency Manitoba, particularly in the near term, remain unclear but to the extent demand side management savings differ from forecast it could impact load growth and the timing of new supply sources being needed. Finally, Manitoba Hydro has received significant interest in interconnection from potentially speculative crypto-currency customers.

The Manitoba load forecast, resource planning assumptions and IFF are updated annually to reflect any changes in long-term domestic demand due to factors such as energy pricing, economic activity, population and housing, among others.

5.3 Export Price Uncertainty (B1)

While the long term price forecast has dropped over the last decade, it appears somewhat stable for now and any variation is anticipated to be within the high and low

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price forecast sensitivity range over the next three years. Manitoba Hydro will continue to monitor energy market intelligence associated with many factors, including developments in technology, policy and market design and obtains long term price forecasts from several independent forecasters.

5.4 Regulatory Environment (B2)

Unfettered market access is key to the Corporation's ability to maximize export revenues. Regulatory, trade law, trade agreements, taxation and/or industry changes both in Canada and the U.S. are risks to export revenues. Changes may lead to increased costs for the Corporation or limits on access to the U.S. and Canadian markets. Changes may include market rules that could conflict with the legal requirements governing the Corporation or discriminatory treatment of Manitoba Hydro.

5.5 Protectionism (B3)

Discriminatory standards and subsidies that favour in-state renewable technologies are reducing the value of Manitoba Hydro's long term firm power in the U.S.. There is risk that U.S. federal subsidies to wind and solar energy producers will be extended into the future and to other generation technologies which would put additional downward pressure on long term and short term market prices. The Trump administration is unpredictable in trade policy and electricity exports could become a target. This would add to the downward price pressure currently being experienced.

Manitoba Hydro actively monitors this issue and participates in lobbying in the U.S. through the Canadian Electrical Association. Manitoba Hydro is also promoting new transmission to Saskatchewan to allow additional exports into an unsubsidized market.

5.6 Taxation (B6)

U.S. Tax legislation and regulations are complex, ever evolving, vary significantly between states, and can be impacted by the form and type of transaction as well as the frequency, duration and particular states that Manitoba Hydro employees conduct business with or travel to for business purposes. Uncertainty exists around Manitoba Hydro's potential U.S. tax liability relating to U.S. export sales and natural gas storage activities. To assess the potential risk exposure, Manitoba Hydro has engaged a U.S. law

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firm to undertake a comprehensive legal review of Manitoba Hydro and its subsidiaries' business activities with respect to potential liability for U.S. federal and state taxes and any associated reporting and filing obligations.

5.7 Transmission System Expansion Delays (B9, G8)

Increased public scrutiny and regulatory oversight as well as recent appeals have increased the amount of time and cost needed to obtain regulatory approvals for system expansion works. These factors will influence the Corporation's future facility requirements by either placing highly restrictive conditions on their construction and operation, altering design specifications, delaying receipt of regulatory approvals, or potentially denying their construction. In addition, recent federal environmental legislation reviews have resulted in the former Canadian Environmental Assessment Agency having a broader mandate and changes to the National Energy Board; these changes are likely to impact future Manitoba Hydro projects.

Discussions with Provincial and Federal officials need to continue to ensure that the Environment Act Licence and NEB Certificate are issued in a timely manner such that MH can complete MMTP construction by June 1, 2020.

5.8 Electrical Distribution System Asset Risk (E5)

The performance of the electrical distribution system is threatened by system capacity and asset condition risks. Load growth in downtown Winnipeg and degradation of the asset base have outpaced expansion and renewal investment. Approximately 25% of the distribution stations supplying the City of Winnipeg and surrounding area are loaded beyond their firm rating. Also, a disproportionate number of distribution system assets installed during rapid system expansion in the 1950's and 1960's are nearing the end of their effective usefulness. As a result, customer service may be impacted by increasing frequency and duration of service interruption.

Operational and capital plans are implemented to reduce the distribution system risks. A Corporate Asset Management framework is under development to guide asset decisions and manage operational risks.

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5.9 Union/Employee Issues (E6)

Interaction between the Corporation and its unions generally remains positive and co-operative. The IBEW collective agreement is set to expire on December 31, 2018 while the CUPE, Unifor and AHMSSE collective agreements are in place through to the end of 2020. Preparations are ongoing with respect to IBEW negotiations with talks expected to commence in October 2018. Nevertheless, strike planning activities will commence in October 2018 to ensure the corporation is prepared for a work stoppage.

5.10 Indigenous Relationships and Legal (E9, G10)

Manitoba Hydro's relationships with Indigenous peoples and communities are complex and have been identified as one of the key areas of focus in Manitoba Hydro's Corporate Strategic Framework, where the priority is to "Respect and support Indigenous people in all aspects of our business."

While Manitoba Hydro has made extensive efforts to address impacts arising from its existing development, some legacy issues remain. These issues remain a negative influence on Manitoba Hydro's ongoing relationships and engagement with communities, as well as on public perception of Manitoba Hydro's role in that relationship. Successful resolution of outstanding and new issues often involves the additional complexity of obtaining alignment with other stakeholders such as government.

5.11 Cyber Security (E10)

The growth of electronic communication and automation, while delivering significant benefits, has also increased risk to the Corporation. This risk includes any cyber-attack that could impact the resiliency, reliability, confidentiality, availability or the integrity of Manitoba Hydro information and operational technology assets, including the theft of personal and or business information, and or the disruption/misuse of critical operations/assets.

Countermeasures, management controls and processes are in place to mitigate this risk. The Corporation has implemented a series of measures to further augment cyber-security efforts under the governance of the Enterprise Security Council. Concurrently, to meet current NERC security standards Manitoba Hydro has also undertaken several

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cyber and physical security upgrade projects targeted at increasing safeguards over critical cyber assets.

5.12 Emerging Energy Technologies (F1)

Technology improvements and decreasing costs of emerging technologies (energy storage, bioenergy, solar, wind, etc.) could continue to put downward pressure on export market prices and impact long term pricing premiums available to Manitoba Hydro. Lower cost emerging technologies could also present Manitoba with an opportunity to respond to electrification and load growth.

The adoption of emerging technology on the Manitoba Hydro grid has disruptive potential. Rapid growth of technologies such as solar, electric transportation (including fast charging infrastructure) energy storage, and blockchain technology have the potential to erode the customer base, increase costs and add complexity to system. There is a risk that government incentives or subsidies create growth in technologies ahead of our ability to adapt policy and rate structure.

5.13 Re-licensing Of Legacy Facilities (G1)

Newly identified risk under review

5.14 Safety & Health (G3)

Due to the inherent nature of the operational work performed by Manitoba Hydro, safety is of key concern to the Corporation. The Corporation is focused on activities that promote accountability, safety and health leadership, safe work practices, strict compliance with environmental regulations, and preservation of employee health. Safety measures are tracked to inform how well the Corporation is doing with respect to safety, and to guide action required to move towards safer work environments.

Safety programs planned for the 2018/19 year include: Introducing Human Error reduction tools to the Corporation and delivering the remaining programs from the seven point safety enhancement strategy.

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6.0 HIGH CONSEQUENCE RISKS

The most significant risks facing Manitoba Hydro are those rated as high consequence due to the potential magnitude of impact on the Corporation's ability to achieve its mandate.

6.1 Energy/Fuel Price Volatility (A7)

Manitoba Hydro is subject to significant price risk on market sales and purchases of electricity and delivered natural gas purchases as a result of price volatility. There is a risk that under favourable water flow conditions, sales revenues from the electricity markets may be lower than forecast because of lower than forecast market prices. Conversely the cost of purchased electricity and the delivered cost of natural gas could be higher than expected when the Corporation is in a drought.

Manitoba Hydro has agreements, infrastructure, monitoring and oversight systems in place to ensure price risk is manageable within tolerance. The new MMTP 500 kV interconnection is being planned with an in-service date of June 2020. This will increase Manitoba Hydro's access to the market, reduce the amount of exports exposed to off peak prices, reduce the amount of imports exposed to on peak prices, and reduce Manitoba Hydro's dependency on natural gas generation.

6.2 Export Market Access (B4)

Manitoba Hydro continues to adapt its business practices to ensure it maintains the legal capacity to participate in the export markets. It participates through the Manitoba and Canadian government to ensure it has the ongoing ability to trade with the U.S. In addition, it works with industry organizations such as the Canadian Electricity Association when advocacy efforts are undertaken to ensure ongoing and unfettered trade.

Energy trade provisions were not changed in the recent U.S.-Mexico-Canada Agreement (USMCA) and most ongoing concern over trade with the U.S. has diminished significantly.

6.3 Infrastructure Risk (Risk Group D)

Although a low probability, a catastrophic infrastructure failure (such as a dam breach) continues to be the most significant risk facing the Corporation and its customers. Potential impacts include prolonged loss of system supply, the inability to maintain

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minimum energy services, loss of life, severe environmental damage and significant costs to the Manitoba economy. Failure can be caused by a number of factors including an extreme weather event, sabotage, fire, human error, or technical malfunction.

Manitoba Hydro has an especially low tolerance for infrastructure risk. Significant efforts are expended on managing this risk in a manner that avoids the occurrence of a catastrophic event and minimizing consequences should a catastrophic event occur. With the completion of Bipole III and Riel converter station in 2018, the risks for continuity of supply due to loss of transmission have significantly decreased.

Actions are continually being taken to enhance emergency preparedness and emergency management processes. In the longer term, major investment in renewal and expansion of the infrastructure system are underway to maintain and improve system reliability, energy security and safety.

6.4 Extreme Drought – Shortfall of Energy Supply (D3, A11)

The Manitoba Hydro system is designed in a manner to supply sufficient energy reliably under the condition of the historical drought of record. The probability of this magnitude of drought is low (on the order of a 100-year event).

Manitoba Hydro normally has surplus dependable energy available, has access to non-firm energy supplies and has the ability to financially settle certain of its export contracts. As a result, there is a very low probability of actual shortages occurring within the next 10 years.

6.5 Environmental Legislation (Fisheries) (G4)

Manitoba Hydro is subject to and must comply with environment legislation that governs the construction, operation and maintenance of Manitoba Hydro facilities. Legislation such as the Fisheries Act (Canada) and Species at Risk Act (SARA) have the potential to apply costly restrictions to the operation of existing infrastructure, and to increase process requirements to obtain permits and/or approvals.

Almost all of the Corporation's hydroelectric generating stations are located where Lake Sturgeon is found. Lake Sturgeon populations have been severely depleted over the past 100 years and the species is currently under review for listing as endangered under SARA at most locations in Manitoba. This impact is due primarily to historical

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commercial overharvest, plus additional stressors including hydroelectric development and ongoing Indigenous domestic harvest. It is possible that at most generation sites the Department of Fisheries and Ocean could determine that the stations are negatively affecting the fish and/or its habitat. If Lake Sturgeon is listed as “Endangered” under the SARA the Corporation could face significant restrictions on current operations, structural modifications to infrastructure, and costly recovery measures.

Most of Manitoba Hydro hydroelectric generating system facilities pre-date the inclusion of habitat protection provisions in the Fisheries Act (Canada) and all were authorized based on the “standards of the day”. However, day-to-day operations modify water flows from the natural state and incidentally kill fish. The Fisheries Act (Canada) is currently under review and stands to be amended under Bill C68 by 1) entrenching a restrictive habitat compensation approach, 2) increasing the Department of Fisheries and Ocean’s ability to enforce terms and conditions of authorizations without demonstrating actual impact, and 3) including specific reference to ecological flows as a component of fish habitat that must be considered.

Manitoba Hydro is proactively involved in reviewing and commenting on the proposed legislation and associated regulations through the Canadian Electricity Association and the Canadian Hydropower Association, as well as providing its own submissions on any items of particular concern.

APPENDIX A - CORPORATE RISK PROFILE SUMMARIES

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Risk	Description	Rating			Current Status	Action Level	Action Required
		Prob	Con	Tol			

A. Financial Planning Inputs & Assumptions							
1. Interest Rates	Changes in interest rates impact financial performance.	High	High	Med	Within established policies and guidelines. The aggregate of floating rate debt, short term debt, and fixed rate long term debt to be refinanced within the subsequent 12 month is below the 35% policy limit		Continue to monitor economic and financial market conditions, while undertaking appropriate debt management strategies and operating within policy limits.
2. Electricity Rates	Manitoba Hydro works within a regulated rate environment with oversight by the Manitoba Public Utilities Board. Annual electric rate increases will be required over the next 10 years to achieve the desired long-term financial targets for the corporation.	Med	High	Med	The Manitoba Public Utility Board approved a 2018/19 rate increase of 3.6% in Order 59/18. Financial targets and associated rate trajectory are under review.		The Manitoba Hydro-Electric Board, working with management, will need to consider and establish financial targets (or reaffirm existing ones) to anchor construction of a new long range financial plan and strategy. Financial targets will then guide business decisions and will have significant implications for rate payers.

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Risk	Description	Rating			Current Status	Action Level	Action Required
		Prob	Con	Tol			
3. Non-Commodity Gas Rates	The Manitoba Public Utilities Board may issue a directive to reduce non-commodity gas rates.	Med	Low	Med	File a General Rate Application with the Manitoba Public Utilities Board on or before November 30, 2018.		An application and forecast are being prepared emphasizing that growth in earnings is essential to enable required capital investments, maintain an appropriate capital structure and keep costs low for customers in the longer term.
4. Liquidity	Having sufficient cash or cash equivalents to meet financial obligations as they become due.	Low	High	Low	On average, positive cash balances have exceeded the \$600 million guideline in 2018/19.		Cash receipts and disbursements are closely monitored on a daily basis. Short term debt balances and forecasted cash requirements are also monitored.
5. Inflation	Increases in inflation rates result in cost increases which the Corporation is forced to recover through increases in domestic customer rates.	Low	Low	Med	Inflation remains a risk with the global economy and key commodity prices.		Continue to monitor inflation impacts, insert inflation provisions into multi-year contracts where possible, and ensure all costs fully justified. Adjust domestic rates as required.
6. Upstream Gas Cost	A significant increase in the cost of natural gas commodity and/or upstream pipeline transportation and storage services could result in an adverse reaction from customers to resulting rate increases.	Med	Low	Med	Gas commodity cost uncertainty is mitigated to a degree through Centra's Rate Volatility Management Program which primarily smooths costs but passes through underlying market prices to customers. However, natural gas (like any commodity) is inherently subject to price volatility arising from periodic supply/demand imbalances. Customers also have access to fixed rate offerings and an equal payment plan.		Communicate commodity cost increases and underlying market conditions to the PUB in a timely manner. Participate in NEB regulatory proceedings on matters related to the NGTL system and TCPL Mainline. Monitor FRPGS risk

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Risk	Description	Rating			Current Status	Action Level	Action Required
		Prob	Con	Tol			
					<p>Centra's Fixed Rate Primary Gas Service (FRPGS) includes a self-insurance risk premium and risk thresholds will mitigate financial impacts and trigger a review of the program.</p> <p>There is also the potential for significant future cost increases for transportation services on the NOVA Gas Transmission Limited (NGTL) system and the TransCanada PipeLines (TCPL) Canadian Mainline to which Centra is currently captive.</p>		thresholds.
7. Energy/Fuel Price Volatility	Market energy/fuel prices are high when Manitoba Hydro requires additional energy supply or low when the Corporation has energy available for export.	Med	High	Med	Although long-term trends continue to reflect low market prices as a result of low gas prices, electricity prices can increase on a short-term basis due to congestion in the MISO LMP market.		Forward purchases of power to mitigate drought cost risk.
8. Credit	The Corporation is exposed to financial loss through credit default.	Low	Low	Med	Within established policies and guidelines.		Maintain existing controls, closely monitor global credit issues, establish enhanced credit risk measurement capability to quantify credit risk exposure and ensure use of consistently applied practices to mitigate exposure.

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Risk	Description	Rating			Current Status	Action Level	Action Required
		Prob	Con	Tol			
9. Demand Side Management	Future DSM targets and energy savings add uncertainty to the costs and consequences of DSM.	Med	Med	Med	Manitoba Hydro's forecast for DSM energy savings is based on current DSM programming and services until Efficiency Manitoba is operational.		Continue to monitor the timing and potential impact of DSM targets and programs on forecasts.
10. Exchange Rates	Fluctuations in foreign currency impact financial performance.	High	Low	Med	Within established policies and guidelines. A \$0.10 change in FX rate results in a \$7.1M change in net income (2018/19 forecasts).		Continue to monitor USD cash forecast and take appropriate actions to stay within the risk targets.
11. Water Conditions	Reduced water supply impacts generation output.	Med	Med	Med	Variation in water (fuel) supply is a fundamental characteristic of a predominantly hydro system.		Normal mitigation measures including conservation of reservoir storage and forward purchasing of power are managing this risk within tolerance.
12. Load Growth Uncertainty	Variation in the domestic load from forecast can impact when new resources are required and the quantity of surplus available for export.	High	Med	Med	A load forecast is updated annually. Uncertainty exists due to the difficulty in estimating the impact of changing technologies.		Update load forecast and resource development plans as required. Closely monitor new load requests
13. Loss of Large Industrial Load	Industrial customers are impacted by many economic and business factors other than energy costs which influence their decisions to continue operations in Manitoba and are outside the control of Manitoba Hydro.	Med	Low	Med	Uncertainty of the future rate strategies may result in industrial customers re-assessing the impact to their cost of continued operations in Manitoba. During the recent PUB hearing, the Board ordered Manitoba Hydro to file a Time-of-Use Rate design proposal for General Service Large class customers.		Assess Time-Of-Use Rate design options in consultation with General Service Large class customers to best balance benefits between customers while meeting the Corporation's overall revenue requirements.

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Risk	Description	Rating			Current Status	Action Level	Action Required
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B. Export Business Contribution							
1. Export Price Uncertainty	The average price received from future export sales may differ from forecast.	High	Med	Med	Technological developments for natural gas production & policy for wind/solar incentives for wind development are occurring but are within tolerance limits.		Manitoba Hydro maintains a balanced portfolio with long-term contracts to reduce exposure to price variation. Continue to monitor energy market intelligence associated with many factors, continue to promote waterpower as a clean, reliable and renewable source of electricity, and advocate for equitable treatment of hydropower relative to other renewable resources.
2. Regulatory Environment	Regulation changes could restrict Manitoba Hydro's market access or devalue its wholesale power products.	Med	High	Med	Market rules are continually evolving with new rules being imposed that could impact future access. These include jurisdictional overreach by FERC and MISO Tariff changes including changes to PPA requirements.		Manitoba Hydro collectively manages its market access risks through a comprehensive set of activities to monitor and address any potential threats to market access.

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Risk	Description	Rating			Current Status	Action Level	Action Required
		Prob	Con	Tol			
3. Protectionism	U.S. sentiment towards imports of hydro may negatively impact Manitoba Hydro's export sales.	High	Med	Med	Manitoba Hydro's exports are currently being harmed by renewable standards that discriminate against imported hydro. Subsidies for wind and solar continue to undermine the value of Manitoba Hydro's long term export product. U.S. energy policy is unpredictable and there is risk that other supplies (such as coal or nuclear generation) could be subsidized as well, further eroding market prices for electricity.		Manitoba Hydro is expanding sales to Saskatchewan where prices are more attractive and the risk of subsidies is much less. Manitoba Hydro continues to maintain a U.S. industry and regulatory presence and lobbies in both U.S. and Canada for equitable application of energy policy and market rules.
4. Export Market Access	The Corporation loses its legal capability to sell power outside the province due to legal and industry change issues.	Low	High	Low	Rules are constantly changing in export markets. U.S. politics have increased uncertainty requiring vigilant monitoring and advocating consistent with corporate interests.		Actively participate in organizations and processes related to rule development and application. Ongoing assessment.
5. Transmission Interconnection Capacity	Reduction in transmission interconnection capacity would reduce export revenue.	Low	Med	Low	Manitoba Hydro influences ratings through a cooperative process with MISO, and tie line partners. The Corporation also participates in reserve sharing agreements to maximize transfer capability.		Maintain current efforts. To further mitigate risk, Manitoba Hydro is proceeding with a second 500 KV interconnection (MMTP/GNTL) to the U.S. and an additional 230 kV interconnection with Saskatchewan
6. Taxation	Uncertainty exists around U.S. Tax laws and regulations which could create tax liability on U.S. export sales and natural gas storage activities.	Med	Med	Med	Increasing breadth of export market activities including new markets/States necessitates a comprehensive review of activities.		All major activities are under review by legal/tax advisors.

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Risk	Description	Rating			Current Status	Action Level	Action Required
		Prob	Con	Tol			
7. Power Financial Instruments	By their nature, financial instruments have various risks associated with them which must be managed.	Low	High	Low	Within established guidelines.		Active middle office function oversight is required to monitor exposures and compliance with established guidelines.
8. Loss of Signed Export Contracts	U.S. Wholesale Customers could walk away from signed Power Purchase Agreements	Low	High	Low	The probability of U.S. customers walking away from signed PPAs is rated as low. The PPAs signed with MH's counterparties are legally binding and contain no termination provisions for convenience.		Manitoba Hydro will continue to maintain a positive and constructive relationship with our U.S. Wholesale customers.
9. Manitoba Minnesota Transmission Project	MH does not receive the necessary provincial or federal regulatory approvals in a timely manner or construction delays are incurred, which result in a delay to the MMTP in-service date past June 1, 2020.	High	High	Med	<p>Provincial - the MB Clean Environment Report recommended a provincial license be issued. A decision by the Province to issue an Environment Act Licence remains pending.</p> <p>Federal - MH is awaiting a recommendation from the National Energy Board and a subsequent decision from the Governor in Council on whether to issue the MMTP a Certificate.</p> <p>There is increasing risk that MH might not receive the Provincial or Federal regulatory approvals to start construction of the Manitoba-Minnesota Transmission Project by target dates, resulting in cost increases and potential delays to the in-service date past June 2020.</p>		Discussions with Provincial and Federal officials to ensure that any information they need in order to facilitate their decision making is available. Manitoba Hydro continues to communicate the need to complete MMTP construction by June 1, 2020.

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Risk	Description	Rating			Current Status	Action Level	Action Required
		Prob	Con	Tol			

C. Completion of Major Capital Projects

1. Inadequate Contingency	The Keeyask project requires additional contingency funds be allocated to the project control budget.	High	High	Low	Current project cost forecasts suggest the current contingency budget will be adequate.		Continue to monitor the project cost and schedule forecast and implement mitigation activities to reduce project risks.
2. Delay to In-Service Date	The Keeyask project schedule is delayed past the control schedule in-service date (ISD).	Med	Med	Low	Current project schedule forecasts suggest that the current schedule contingency will be adequate.		Continue to monitor the project schedule forecast on a monthly basis and implement mitigation activities to reduce project delays.

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Risk	Description	Rating			Current Status	Action Level	Action Required
		Prob	Con	Tol			

D. Continuity of Supply							
1. Loss of Plant	Loss of plant can affect the Corporation's finances, reputation and impact human life.	Low	High	Low	The risk of loss is mitigated through operational risk treatment, insurance and emergency planning.		Continue to assess exposures of loss and develop appropriate risk reduction alternatives and emergency plans.
2. Retaining Structures & Flow Control	The failure of water retaining structures could have impacts which range from insignificant to catastrophic.	Low	High	Low	The risk of dam breach is addressed by ensuring the integrity and reliability of water control equipment and structures through diligent maintenance and vigilant surveillance, as well as preparing for emergencies, as per Canadian Dam Association guidelines. Residual risk of dam failure can be mitigated but not eliminated.		Maintain Dam safety program and improve structures where deficiencies are known.
3. Extreme Drought – Shortfall of Energy Supply	Extreme drought with a severity worse than the drought of record has the potential to cause a shortfall in energy supply.	Low	High	Med	Drought is an ongoing high priority risk for Manitoba Hydro. Current water levels are within normal variation.		Maintain current water resource management systems and continue applied research on extreme drought risk.
4. Short Term Loss of Supply	The Corporation is vulnerable to an event(s) that would cause a short term loss of system supply (electricity) resulting in the inability to meet its energy supplies requirements.	Low	High	Low	Manitoba Hydro's reliability performance shows an increased trend of outage frequency and duration, and generation forced outage rates have increased in the last four years. The Corporation is continually upgrading the system.		Maintain reliability standards and ensure system reliability through planned maintenance and upgrades. Regularly maintain, review and update emergency preparedness plans for system restoration and response.

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Risk	Description	Rating			Current Status	Action Level	Action Required
		Prob	Con	Tol			
5. System Shutdown (Gas)	Catastrophic system failure could result in an interruption of the supply of natural gas.	Low	High	Low	<p>For redundancy purposes Manitoba Hydro's distribution systems are interconnected to two lines (Lines 5 and 6) of the TransCanada PipeLines (TCPL) Canadian Mainline.</p> <p>TCPL has design practices in place to minimize the possibility of a catastrophic event occurring. The design practices have been effective over the course of several incidents in past decade with the exception of the 2014 Otterburne, Manitoba pipeline rupture that resulted in a loss of service to a number of communities.</p> <p>Manitoba Hydro has limited compressed natural gas (CNG) capacity now in service just south of the city of Winnipeg. These facilities are designed to temporarily supply approximately 1,200 residential natural gas customers within a 100 km radius of the CNG station.</p>		<p>Maintain and review emergency response procedures and conduct exercises.</p> <p>Continuous monitoring of electrical distribution system to identify capacity constraints.</p> <p>Continue to review the opportunity to upgrade single supply feed systems within the province that have no redundancy, and advance capital expenditures for approval in the context of competing CIJs.</p>

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Risk	Description	Rating			Current Status	Action Level	Action Required
		Prob	Con	Tol			
6. Corporate Emergency Management	The Corporation is exposed to a catastrophic event, likely weather induced, that results in an extended outage of the electric and natural gas infrastructure with a limited ability to restore damaged infrastructure.	Low	High	Low	The CEMP continues to be enhanced with the revision of the Emergency Preparedness Policy and the establishment of the Executive Emergency Management Committee (EEMC). Initiatives currently underway include developing a corporate plan for business continuity for continuation of essential services and critical functions (electrical and gas restoration).		Continuous oversight by the Executive Emergency Management Committee (EEMC) to confirm Business Continuity Plans (BCP), Hazard Risk Assessment (HRA), Preparedness, Response and Recovery Plans are reviewed and tested to ensure Manitoba Hydro has the ability and can respond to emergency events.

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Risk	Description	Rating			Current Status	Action Level	Action Required
		Prob	Con	Tol			

E. Business & Operational Stability							
1. Operational Controls	Unexpected operational outcomes adversely impact the Corporation's performance.	Low	Med	Low	Adequate control structures in place and working. Exceptions reported and corrective actions taken.		Maintain effective control mechanisms.
2. Operational Impacts	Environmental concerns real or perceived can negatively impact corporate operations.	Low	High	Med	There are a number of environmental issues that are or could affect future operations of the Corporation. The most significant include the potential of Lake Sturgeon being listed as endangered (see 3.1 below), and the need to address environmental and societal impacts and expectation for legacy facilities.		Continue to work with Manitoba Sustainable Development to produce RCEA Next Steps report and discuss how to proceed with re-licensing. Continue to enhance existing Corporate programs designed to minimize or prevent negative environmental impacts.
3. Technology Infrastructure	Unforeseen physical security events could impact computer operations and this would affect business processes.	Low	Med	Low	Controls and processes are in place to mitigate risk. Further measures are being developed and implemented to augment efforts, consistent with recommendations of the 2017 Enterprise Technology Security Assessment.		Complete actions to address security risks in the Enterprise IT Security Assessment
4. Supply Chain	Inability to access goods and services and / or failure to comply with trade agreements.	Med	Low	Med	Material and services delivered within policy. Access to construction services favourable as overall marketplace is depressed and contractors have surplus capacity.		Continue risk management protocol, including monitoring market trends, sourcing strategic alliance partners, compliance with trade agreement, reducing single source provider and stocking emergency spares of critical items

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Risk	Description	Rating			Current Status	Action Level	Action Required
		Prob	Con	Tol			
5. Electrical Distribution System Asset Risk	Decreased levels of customer service, manifested as larger and longer duration local service interruptions, exacerbated due to stations being loaded beyond their firm rating, and compromised outage response as the frequency of assets reaching the end of their effective usefulness increases	Low	Med	Med	Planned station capacity improvements are on target to address the deficits by 2030 or earlier. Plans are in place to manage risks to acceptable levels while capacity and condition deficits are being addressed.		Continue to monitor risks and revise plans as required to meet operational objectives. Continue to develop asset management tools & techniques to manage asset risk.
6. Union-Employee Issues	Negotiations with unions may temporarily reach an impasse which could result in a work disruption or stoppage.	Med	Med	Med	The IBEW collective agreement is set to expire on December 31, 2018. CUPE, Unifor and AHMSSE collective agreements renewed through to 2020.		Negotiations with the IBEW begin October 29 th , 2018. The development of a management business continuity plan is underway to provide some mitigation in the event of a strike. Negotiations are presently underway with the IBEW for the provision and delivery of essential services by striking employees.
7. Workforce Management	Restructuring, changes in processes, eliminating work functions, etc continue post the reduction of 820 employees through the 2017 voluntary departure program to ensure internal/external service delivery and that organizational priorities are met.	Low	Med	Low	Significant workforce reductions and retirements have led to the departure of experienced and knowledgeable personnel. It has also put a strain on remaining staff to cover the work.		Execution of detailed succession plans for critical positions, and reallocation of resources to serve priority areas. Regular update of retirement forecasts and recruitment plans. Continued implementation of training programs and focus efforts towards streamlining and redefining work.

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Risk	Description	Rating			Current Status	Action Level	Action Required
		Prob	Con	Tol			
8. Infectious Diseases	A significant disease outbreak will impact a large number of employees resulting in major disruptions to business operations.	Low	High	Low	An Influenza Pandemic Plan has been developed. The Occupational Health Nurse monitors health authority requirements and make changes to the plan as required.		Continue to monitor and make any required changes to meet health authority requirements.
9. Indigenous Relations	Poor relationships will have negative impacts on future Corporate activities.	High	High	Low	Reasonable arrangements are in place with the communities that do not have workable management frameworks. If a community raises an adverse effects concern, Manitoba Hydro will endeavour to investigate and address the concern. Employment numbers are generally exceeding targets. There are strained relations with many communities and resource user groups, including groups who have impact arrangements in place with Manitoba Hydro.		Continue working with indigenous communities to resolve outstanding issues to the extent possible and reasonable.
10. Cyber Security	Cyber Security incidents that could result in the theft of information and/or the disruption or misuse of critical operations/assets.	Med	High	Low	Controls and processes are in place to mitigate risk. Further measures are being developed and implemented to augment efforts, consistent with recommendations of the 2017 Enterprise Technology Security Assessment.		Continue to develop and implement further measures under the governance of the Enterprise Security Council. Continuous review of key systems and processes to mitigate fraud attempts such as phishing.

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Risk	Description	Rating			Current Status	Action Level	Action Required
		Prob	Con	Tol			

F. Strategic Influences							
1. Emerging Energy Technologies	New technology changes traditional utility model economics and customer behaviour.	Med	High	Med	Further improvements and cost reductions in new emerging energy technologies could put further downward pressure on market prices, impact customer behaviour and affect Manitoba Hydro marketing opportunities, thus potentially reducing the value or useful life of existing assets.		Continue to assess new technologies and consider the potential impact on customer requirements and overall resources to meet Manitoba Hydro objectives.
2. Strategic Direction Execution	Missed opportunities, unmitigated risks or adverse trends, unfavourable business decisions.	Low	Med	Med	Annual Business Plan approved for 2018-19. Corporate and Operating groups monitor the external business environment for opportunities and threats.		Strategic business planning is underway with Executive Committee and the MHEB.
3. Climate Change	A changing climate can impact hydro-electric generation, Manitoba load and export revenues.	Low-Med	Med	Med	Climate change is likely to have broad impacts throughout the corporation. Any required adaptation to operations and resource plans will be made as information becomes available.		Continue to monitor progress on determining climate change impacts and respond accordingly.
4. Reputation	The occurrence of negative publicity affects the Corporation's operations in a significant negative manner.	High	Med	Med	While there is overall confidence in the Corporation's ability to provide reliable energy, Manitoba Hydro is managing specific high profile reputational risks and issues with related stakeholders.		Continue to take steps to enhance the Corporation's reputation, through all its daily actions, including comprehensive, timely communications, respectful interactions with stakeholders, and provision of safe, reliable, and affordable energy services to customers. Continue to monitor emerging issues closely, and ad resources to deal with situations as they

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Risk	Description	Rating			Current Status	Action Level	Action Required
		Prob	Con	Tol			
							occur /prior to escalation.
5. Financial Targets	The future trajectory of domestic electricity rates is dependent on the financial targets to be set by Manitoba Hydro and approved by the Manitoba Public Utilities Board.	High	High	Med	The future trajectory of domestic electricity rates is uncertain. The Manitoba Hydro-Electric Board, working with management, will need to consider and establish financial targets (or reaffirm existing ones) to anchor a new long range financial plan and strategy. The financial plan will then guide business decisions and rate applications to the Public Utilities Board with significant implications for customers.		The Manitoba Hydro-Electric Board, working with management, will need to consider and establish financial targets (or reaffirm existing ones) to anchor construction of a new long range financial plan and strategy. Financial targets will guide business decisions and will have significant implications for rate payers.

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Risk	Description	Rating			Current Status	Action Level	Action Required
		Prob	Con	Tol			

G. Stability of Regulatory & Legal Environment							
1. Re-licensing Of Legacy Facilities	New risk – under review	TBD	TBD	TBD	Under review		Under review
2. Concerned Stakeholders	Stakeholder engagement processes may not be satisfactory to impacted stakeholders and could delay or restrict the construction of new infrastructure.	High	Med	Low	During this period of significant system growth, Manitoba Hydro is in consultation with many impacted stakeholders, some with high profile and specific issues to be addressed.		Proactively identify and address issues to the extent possible to maximize opportunities to adhere to construction schedules.
3. Safety & Health	Manitoba Hydro strives to avoid an incident that will result in loss of life or significant injury.	High	High	Low	Focus on continuous safety improvements has resulted in a steady decline in workplace severity and frequency rates. Manitoba Hydro is committed to continuously improving safety performance and instilling a safe and health culture in all activities.		Focus on continuous safety improvements and instilling a cultural of safety and health. Strategies include implementing Good Catch and human error reduction strategies as well as the recommendation from Risk Prevention Team Report.
4. Environmental Legislation (Fisheries)	If Lake Sturgeon is listed as “Endangered” and/or proposed changes to Bill C68 are legislated, the Corporation could face significant restrictions on operations	Med	High	Low	Uncertainty remains regarding whether the Federal Government will decide to list Lake Sturgeon under SARA and the potential economic impact. The Fisheries Act (Canada) stands to be amended under Bill C68.		The Corporation is proactive in a broad range of activities with the many stakeholders and is reviewing and commenting on proposed legislation
5. Reliability Standards	The Corporation could face negative consequences if it does not comply with mandatory NERC reliability standards enforceable in Manitoba.	Low	Low	Low	NERC Standard Compliance is required by Manitoba law. Manitoba Hydro has adopted a culture of compliance that has become operationalized throughout the corporation.		Manitoba Hydro must monitor and adapt policies and procedures as a result of existing standards continually being revised and new ones being adopted on a regular basis.

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Risk	Description	Rating			Current Status	Action Level	Action Required
		Prob	Con	Tol			
6. Contracts & Ventures	Contracts are not fulfilled or business ventures expose the Corporation to undesirable events.	Low	Med	Low	Corporation ensures adherence through an effective contract and venture control system.		Maintain control systems.
7. Legal Compliance	The Corporation does not comply with legal requirements.	Low	High	Low	For a large diverse company it is not realistic to reduce the risk of non-compliance to zero. Actions are intended to provide realistic assurance that compliance risks are being addressed.		Ongoing actions to address compliance issues at various levels of the Corporation.
8. Reliability of Supply	On-going public scrutiny, additional environmental licensing regulatory oversight, appeals and numerous regulatory conditions could obstruct the Corporation's ability to build the necessary facilities required to provide a reliable supply of energy in a timely and cost-effective manner.	High	Med	Med	<p>Increased public scrutiny and regulatory oversight as well as recent appeals have increased the amount of time and cost required to obtain regulatory approvals. In addition, recent federal environmental legislation reviews (Bill C69) have resulted in the former Canadian Environmental Assessment Agency having a broader mandate and changes to the National Energy Board.</p> <p>These changes are likely to impact future Manitoba Hydro projects, and the MMTP as described in more detail in B9.</p>		<p>Continue to:</p> <ul style="list-style-type: none"> - Possess the knowledge and skills to make decisions that minimize the environmental impact of facilities. - Undertake early and comprehensive stakeholder engagement processes. - Be proactive in addressing concerns and pre-construction licence conditions. - Implement comprehensive environmental protection programs.

Corporate Risk Management Report

APPENDIX A

Risk	Description	Rating			Current Status	Action Level	Action Required
		Prob	Con	Tol			
9. Upstream Regulation	Unexpected upstream regulation and /or water withdrawals may reduce water supplies and hydraulic generation.	Low	Low	Med	The Corporation maintains an up-to-date present use long term stream flow record. The Corporation participates in processes that could impact the supply or timing of water flows into Manitoba. The Corporation is studying the overall impact of climate change on the supply and timing of water flows.		Continued monitoring of water resource developments across the Nelson, Churchill watersheds including the impacts from Climate Change.
10. Indigenous Legal	Unfavourable rulings could negatively impact Corporate operations.	Med	Med	Low	Demands exist from several sources which could ultimately result in unfavourable rulings. Management systems have not identified any compliance concerns that are not being addressed. Statements of Claims have been filed against Manitoba Hydro.		Measures include (1) Legal responses to legal challenges. (2) Maintain and continuously improve compliance management systems (3) Filing statements of defense, and (4) Monitoring developments in the field of Indigenous law, including Supreme Court decisions.

APPENDIX B – CORPORATE RISK MANAGEMENT FRAMEWORK

The Corporation has adopted the following six step Risk Management Process, Risk Rating Criteria and Risk Tolerance Rating Criteria to consistently identify, assess and manage risks:

1. Mission / Mandate

The process of identifying and managing risk is initiated at the Corporate, Business Unit, Division, Department, or project level by focusing on the underlying mission / mandate and specific strategic goals established for that particular area of the Corporation.

2. Risk Identification

Risks are identified based on the factors that influence the performance of the area of the Corporation being assessed.

3. Potential Impact

Risks are analyzed for potential impact and measured in terms of consequence and probability. Consequence is quantified in terms of system reliability, safety, finance, environmental impact and customer satisfaction. For each consequence identified, the probability is determined of the event occurring.

4. Risk Treatment

Actions are taken to reduce the probability of a negative event occurring or to reduce the negative consequences should a negative event occur. Risk treatment can include a reduction of the risk through modification of operational activities, a sharing of the risk through external insurance or acceptance of the risk as a normal consequence of the business and/or operations. The acceptance of risk is subject to that risk being within the approved tolerance levels of the Corporation.

5. Residual Risk

Certain levels of residual risk may remain even after actions have been taken to reduce their probability and consequences. An assessment is performed to confirm that the residual risk levels are within approved tolerances.

6. Reporting and Monitoring

Systems are implemented to monitor key risks, and information provided by these systems is used to facilitate management actions. Reporting systems ensure that senior management and other stakeholders are appropriately informed and risks are managed within the Corporation's approved risk tolerances.

APPENDIX C – CORPORATE RISK PROFILE SUMMARY COMPLETION GUIDE

CORPORATE RISK PROFILE SUMMARY COMPLETION GUIDE

- a) **Description** – A detailed description of the risk.
- b) **Probability (P)** – The predicted likelihood of the risk occurring. Manitoba Hydro uses the following probability ratings as shown below:

Rating	Description
Low	Event is not likely to occur within 10 years
Med	Event is likely to occur within 5 to 10 years
High	Event is likely to occur within 1 to 4 years

Note: Please provide details to back up the Probability rating applied to this risk.

- c) **Consequence (C)** – The evaluation of the potential consequences of each identified risk from five different perspectives as applicable. These perspectives and their corresponding measures are described below along with examples of scenarios of varying degree:

Perspective	Measures	Low	Medium	High
I. Financial	3-year cumulative net income	\$0 - \$50M	\$51 - \$150M	> \$150M
	Capital Investment	< \$250M	\$250M - \$1B	> \$1B
II. System Reliability	Domestic Customers	Outage affecting < 50 customers for < 4 hours. Not life threatening.	Outage affecting between 50 and 500 customers for up to 24 hours. Have ability to serve critical loads. Not life threatening.	Do not have capacity to serve Manitoba load for extended period of time. Life threatening. Loss of public confidence.
	MW generation or interconnection capacity	NERC level 1 - In compliance with industry reliability standards.	Loss of < 2,000 MW. NERC level 2 – Load management procedures in effect. In compliance with industry reliability standards.	Loss of > 2,000 MW. NERC level 3 – Firm load interruption imminent or in progress; and/or non-compliant with industry reliability standards.

III. Safety – Employee and Public	High risk accidents, severity rate, frequency rate and public contacts	Minor injuries. In compliance with laws and industry standards.	Disabling injuries. In compliance with laws and industry standards.	Severe injuries and fatalities; and/or non-compliance with legislation and industry standards resulting in imprisonment for MH management, significant fines and loss of public trust.
IV. Environment	Environmental impact – air emissions, water management, spills, land and habitat disturbances, etc.	Minor impact to environment. In compliance with stakeholder expectations, laws, and regulations. Ability to obtain and renew environmental licensing and operating approvals.	Local and contained damage to the environment. In compliance with stakeholder expectations, laws and regulations. Ability to obtain and renew environmental licensing and operating approvals.	Severe widespread and uncontained damage to environment; and/or non-compliance with stakeholder expectations, laws, and regulations resulting in imprisonment for MH management, significant fines, loss of public trust and long term operating restrictions.
V. Customer Value	Retail electricity rates	No rate increase	Annual increase < 10%	Annual increase > 10%
	Reliability and quality service	Restoration of service within 4 hours with no threat to public safety. < 1.3 outages / customer / year	Restoration of service within 24 hours with no threat to public safety. 2 outages / customer / year	Outage for extended period of time. Life threatening. Loss of public confidence.
	Reputation	Local media coverage with negligible impact on stakeholders.	A highly visible event attracting national media coverage or environment concern; and/or a	A highly visible event attracting international media coverage or environment

			moderate negative impact on stakeholders.	concern; and/or a significant negative impact on stakeholders such as a breach of privacy, contractual obligation or environmental stewardship.
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Note: Please provide details to back up the Consequence rating applied to this risk.

d) **Tolerance (T)** - The extent to which the amount of residual risk is deemed to be reasonably acceptable within the resources available to Manitoba Hydro. To the extent that tolerances fall beyond reasonably acceptable levels, actions have been taken (or are being taken) to mitigate that risk. Tolerance is rated as either, low, medium or high based on the following parameters:

Rating	Description
Low	Zero or limited variability is accepted. Low tolerance is usually associated with an area where the consequences of negative events are significant and the Corporation has the ability to control the risk.
Med	Some variability is accepted. Medium tolerance may also be associated with high risk but the ability of the Corporation to control the risk may be limited.
High	Significant variability is accepted. Consequence is always low.

Note: Please provide details to back up the Tolerance rating applied to this risk.

e) **Status** – Detailed description of the current risk status.

f) **Action Level** - To ensure appropriate management control, monitoring, and mitigation; each risk must be assigned an Action Level rating as described below:

Rating	Description
Green	No additional action required at this time as the risk is under control and is not subject to significant change.
Yellow	There are or appears to be some emerging issues that need to be closely monitored and addressed. Additional action is required to bring the risk back to the established tolerance. Management has time to respond in an orderly manner.
Red	The risk has become critical to business operations and requires day to day senior management attention. If not resolved quickly, it could have catastrophic impacts on the organization.

Note: Please provide details to back up the Action Level rating applied to this risk.

g) **Action Required** – Detailed description of the action(s) to be taken to mitigate the risk.