

McARTHUR GENERATING STATION

Report in Support of a Request for a

RENEWAL LICENCE

Under The Water Power Act and Regulations



IMPORTANT

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Executive Summary

The purpose of this document is to demonstrate that Manitoba Hydro has fulfilled all obligations required to obtain a Renewal Licence under The Water Power Act C.C.S.M. c. W60 (The Water Power Act) for the McArthur Falls Generating Station (GS). This document provides details on the observances of all the terms and conditions under the 1965 Final Licence and Manitoba Regulation 25/88R pursuant to The Water Power Act (the Regulation). Manitoba Hydro is providing this documentation to assist the Minister responsible for The Water Power Act in the decision to issue a Renewal Licence for the McArthur Falls GS.

McArthur Falls GS has an installed capacity of about 60 Megawatts (MW) (80,000 horsepower). McArthur Falls GS is located approximately 120 kilometres (km) northeast of Winnipeg on the Winnipeg River and it is roughly 42 km upstream of Lake Winnipeg.

Manitoba Hydro operates the McArthur Falls GS under the authority of a Final Water Power Act Licence and a Third Short-Term Extension Licence (STEL). Manitoba issued the Final Licence on November 30, 1965 and it covered a term of fifty years from January 1, 1955 to January 1, 2005. Manitoba Hydro submitted the application to renew the Final Licence on February 26, 1999. Manitoba Water Resources Branch (now Environment and Climate Change) responded on March 25, 1999 requesting additional information. However due to licensing requirements for other projects, Manitoba Hydro requested STELs to allow the licence renewal to occur at a later date. The First STEL covered the period from January 1, 2005 to September 30, 2015. The Second STEL covered the period from October 1, 2015 to September 30, 2020. The Third STEL covers the period from October 1, 2020 to September 30, 2025.

Division 1 of this document provides an overview of the project, its history and operation. Division 2 provides context for the decision to renew the licence for another 50 years. Division 3 demonstrates how Manitoba Hydro has fulfilled terms of the Short-Term Extension and Final Licences and shows compliance with pertinent articles of the Regulation. Division 4 concludes the report highlighting Manitoba Hydro's commitment to the ongoing safe operation of McArthur Falls GS and its request for a Renewal Licence under The Water Power Act.

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Division 1 – Introduction and Background

Purpose

The purpose of this document is to demonstrate that Manitoba Hydro has fulfilled all obligations required to obtain a Renewal Licence under The Water Power Act C.C.S.M. c. W60 (The Water Power Act) for the McArthur Falls Generating Station (GS). The document provides details on the observances of all the terms and conditions under the 1965 Final Licence and Manitoba Regulation 25/88R pursuant to The Water Power Act (the Regulation). Manitoba Hydro is providing this documentation to assist the Minister responsible for The Water Power Act in the decision to issue a Renewal Licence for the McArthur Falls GS.

Report Overview

Division 1 of this document provides background information including an overview of the project, its history and operation, and highlights Manitoba Hydro's commitment to dam safety and the project's significance in the overall system. Division 2 summarizes the key aspects of the Renewal Licence requiring provincial decision and approval. Division 3 demonstrates how Manitoba Hydro has fulfilled terms of the Short-Term Extension and Final Licences and shows compliance with pertinent articles of the Regulation. Manitoba Environment and Climate Change (MECC) agreed to the selection of pertinent articles of the Regulation. This document references previous names of MECC. Division 4 concludes the report highlighting Manitoba Hydro's commitment to the ongoing safe operation of McArthur Falls GS and its request for a Renewal Licence under The Water Power Act.

The Water Power Act

Manitoba grants the right to develop water power under the authority of The Water Power Act and the Regulation. The Water Power Act is part of a suite of natural resource allocation acts through which the province allows various entities to develop Crown resources for the benefit of all Manitobans. It is broad in its application in that it provides authority for Manitoba to; allocate provincial water powers and Crown lands required for the development of water power, expropriate private lands, authorize the construction of all undertakings with respect to the water power development, regulate all power and energy produced, and to authorize all incidental matters.

The Water Power Act allows for a licence to take on one of three main types: Interim, Final and Renewal, depending on the stage of development. Manitoba issues an Interim Licence prior to start of construction subject to certain terms and conditions. Upon successful completion of the development and satisfaction of the Interim Licence terms and conditions

and the Regulation, the licensee is entitled to receive a Final Licence. When granted, a Final Licence will expire in no more than fifty years from the date the project went into service. Between four and six years before expiry, the licensee is expected to apply for a Renewal Licence.

Since 2009, Manitoba's regulations include a provision for Short Term Extension Licences (STELs). STELs can add a term up to five years to a Final Licence and can also retroactively apply to an expired Final Licence. STELs must include the terms and conditions in the Final Licence.

More information on Water Power Act Licensing is available on the provincial web site at: <https://www.gov.mb.ca/sd/water/water-power/index.html>.

Licensing Background

Manitoba Hydro currently operates the McArthur Falls GS in accordance with the Third STEL for the development of water power at the McArthur Falls Site on the Winnipeg River. The Third STEL was issued September 8, 2020 and is in effect until September 30, 2025. The First STEL covered the period from January 1, 2005 to September 30, 2015 and the Second STEL covered the period from October 1, 2015 to September 30, 2020.

Manitoba Hydro is the holder of a Final Licence for the water power development at the McArthur Falls Site. Manitoba Hydro requested a Final Licence on September 14, 1959. Manitoba issued the Final Licence on November 30, 1965 in accordance with the provisions of The Water Power Act for a term of 50 years from January 1, 1955 to 2005. Copies of all licences are included in Appendix B.

Manitoba Hydro submitted the application to renew the Final Licence on February 26, 1999 in accordance with Section 46 of the Regulation. Manitoba Water Resources Branch (now Environment and Climate Change) requested additional information on March 25, 1999. On September 28, 2009, Manitoba Hydro provided an update to the Province on licence activities.

Final Licence Area

Manitoba drawing number 21-4-1050 (Manitoba Hydro's file number 0108-E-0223) shows the Final Licence area (land within the severance line) which includes lands impacted by raised water levels (from downstream of Seven Sisters GS to McArthur GS). The Final Licence area includes a segment of the Winnipeg River approximately 2.5 km downstream

of Seven Sisters GS to approximately 0.65 km downstream of McArthur Falls GS, Lac Du Bonnet, and the Lee River upstream to Provincial Road 313.

Atomic Energy of Canada Limited (AECL) owns land adjacent to the Winnipeg River. Manitoba Hydro and AECL signed an agreement in 1962 that allows Manitoba Hydro operations to affect AECL parcels. A copy of the agreement is shown in [Appendix F](#).

Project Description

The McArthur Falls GS consists of a powerhouse, spillway and dikes with an original nameplate capacity of 80,000 horsepower which is equivalent to about 60 MW. The station was constructed from 1952 to 1955, after the Pine Falls Generating Station construction, to supply provincial customers with electricity. It was the last generating station built on the Winnipeg River. The configuration of this station and its primary structures remain unchanged including all eight generating units.

The McArthur Falls Generating Station is located approximately 120 km northeast of the City of Winnipeg and approximately 42 km upstream of Lake Winnipeg, as shown in Figure 1. It is also north of the Town of Lac du Bonnet and is located in the RM of Lac Du Bonnet, in Treaty 1 and Treaty 3 traditional territory and in the homeland of the Red River Metis. Figure 2 is a general arrangement drawing that shows the layout of powerhouse, dikes and spillway (noted as sluiceway on drawing). Figure 3 shows a photograph of the McArthur Falls Generating Station powerhouse and switchyard.

The Winnipeg River drainage basin is an approximately 150,000 square kilometre area that lies mostly in northwestern Ontario but also includes the south east portion of Manitoba and northern Minnesota in the United States. Most of the basin is located within the Canadian Shield and is scattered with many lakes and rivers including the Winnipeg, Bird, Lee, Whitemouth and English Rivers. The basin is mainly forested and rocky.

Although the Winnipeg River system is approximately 765 km in length, running from a few kilometres west of Lake Superior to Lake Winnipeg, the Winnipeg River is approximately 260 km long from Lake of the Woods in a north-westerly direction, draining into Lake Winnipeg. Due to the multi-purpose nature of the Winnipeg River drainage basin, Lake of the Woods Control Board (LWCB) manages outflows from Lake of the Woods and Lac Seul in Ontario which effects timing of flow on the Winnipeg River. The International Rainy-Lake of the Woods Watershed Board also monitors the ecological health of the Lake of the Woods and Rainy Lake boundary waters.

Manitoba Hydro owns and operates six hydraulic generating stations on the Winnipeg River listed below from east to west:

1. Pointe Du Bois Generating Station
2. Slave Falls Generating Station
3. Seven Sisters Generating Station
4. McArthur Falls Generating Station
5. Great Falls Generating Station
6. Pine Falls Generating Station

Physical Structures

The station components include an eight-unit powerhouse with east gravity structure, an eight-bay gated spillway with east and west gravity structures and a total of fifteen dikes. The dikes are divided by the spillway and powerhouse into the east dikes with a total length of 0.37 km, the center dikes with total length of 0.58 km and the west dikes with a total length of 8.8 km. Manitoba Hydro aligned the structures to take advantage of the natural rock islands in the river channel. The dam and the dikes impound the river near the Town of Lac Du Bonnet. Figures 1 to 4 show general arrangements of concrete and earth structures. Tables 1 and 2 summarize major characteristics of the station and project components.

Table 1: McArthur Falls GS Major Characteristics

Construction Period	1952 to 1955
Nameplate Capacity (2018)	59.66 MW (80,000 hp)
Average Annual Generation (2012-2022)	392.1 million kW-h
Waterfall Drop (head)	7.01 metres (m)
Maximum Licence Forebay Elevation	254.81 m (836.0 ft)

Table 2: McArthur Falls GS Component Characteristics

Powerhouse	Number of Units	8 (propeller type-Nagler type design)
	Length	177.2 m
	Deck Elevation	256.62 m
	Discharge Capability (at full gate)	962.8 cubic metres per second (m ³ /s)
	Generating Capacity	8 Units @ 7.46 MW/unit=59.66 MW ¹
	Length	37.2 m

East Powerhouse Gravity Dam	Design Crest Elevation	256.62 m
Spillway	Number of Bays	8 bays
	Length	125.0 m
	Deck Elevation	256.64 m
	Discharge Capability (at normal operating forebay elevation)	6,220 m ³ /s
Gravity Dam (East)	Length	115.8 m
	Design Crest Elevation	256.64 m
Gravity Dam (West)	Length	97.5 m
	Design Crest Elevation	256.64 m
Earthfill Dikes	Length 1E	274.0 m
	Length 2E	30.0 m
	Length 3AE	70.0 m
	Length Center Dike No. 1 & 2	579.0 m
	Length 1W	533.0 m
	Length 2W	312.0 m
	Length 5W	61.0 m
	Length 6W	90.0 m
	Length 7W	79.0 m
	Length 8W	290.0 m
	Length 9W	177.0 m
	Length 10W	472.0 m
	Length 11W	79.0 m
	Length 17W	6681.0 m
	Design Crest Elevation (all)	256.64 m

Project Upgrades

Manitoba Hydro has not upgraded the units at McArthur Falls GS. [Appendix C](#) shows the 2008 to 2022 maintenance and construction record summary information on page 68.

Operational Description

Manitoba Hydro currently operates the McArthur Falls GS under a Third STEL issued on September 8, 2020 in accordance with the provisions of The Water Power Act. The STEL is in effect until September 30, 2025. The operating terms of the Third STEL are identical to those of the Final Licence issued on November 30, 1965.

Manitoba Hydro's System Control Centre remotely operates the McArthur Falls GS from Winnipeg. Maintenance and emergency staff are stationed at the Winnipeg River Operations Centre located adjacent to the Great Falls Generating Station. Manitoba Hydro operates the generating station in a run-of-river mode. Flow releases in Ontario and local watershed runoff affect Winnipeg River inflows.

The flow on the Winnipeg River as it enters Manitoba is regulated in Ontario upstream of Manitoba Hydro's generating stations. The Lake of the Woods Control Board (LWCB) is a Canadian board which manages the water levels of Lake of the Woods and Lac Seul, and the flows in the Winnipeg River and English River downstream of these lakes to their junction. The LWCB consists of four members: one representing Federal interests, two representing Ontario and one representing Manitoba. Manitoba Hydro represents its views as a stakeholder in meetings with the LWCB to provide input into LWCB's regulation strategy based on current and projected water conditions in Manitoba.

The McArthur Falls forebay operating range normally experienced since construction varies from the licence limit of 254.81 m (836.0 feet) to 254.66 m (835.5 feet) as shown in Figure 5.

The McArthur forebay level may be gradually reduced during high flow events to help reduce impacts to upstream stakeholders but Manitoba Hydro's internal operating procedure requires that the water level be maintained at the Town of Lac du Bonnet dock (Water Survey of Canada gauge 05PF062) below 254.97 m. The maximum drawdown is about 0.15 m for record high flow. Under low flow conditions, McArthur operation may shape flows within a day. Flows and generation can be increased during the day to supply additional power and reduced overnight when power demand is lower. This can result in up to 0.15 m daily water level variation in the forebay at times.

Historic Power Generation

The installed turbines are rated at 7.46 MW (10,000 horsepower) at a design head of 7.01 metres (23.0 feet), a total of 59.66 MW (80,000 horsepower) for eight units. This forms the basis for the licensed capacity in Term 2 of the Final Licence.

[Figure 6](#) shows the monthly power generation and McArthur Falls' powerhouse capacity from the issuance of the Final Licence to the end of 2022. As shown, McArthur Falls GS regularly generated power near 55.93 MW (75,000 horsepower). The primary factors responsible for the gap between the capacity limit and actual generation include the Ontario tie line transmission limit, the reduced head due to higher than normal inflows and maintenance.

[Figures 7 to 14](#) on pages 47 to 50, show the current nameplates of each of the units.

Manitoba Hydro's objective is to plan for the secure and economic operation of Manitoba Hydro's system of reservoirs and generating stations while considering the effects on stakeholders and the environment. Manitoba Hydro optimizes energy generation across the overall system through the development and implementation of modern technology and computer programs. A computer-based control system in the System Control Centre in Winnipeg enables operators to monitor Manitoba Hydro's generating stations, transmission lines and exports. The computer systems are able to automatically adjust electricity generation to correspond with customers' needs. The Market Optimized Short Term (MOST) computer model enables operators to make optimal decisions based on real time inputs.

Existing Project Significance in Manitoba Hydro System

Currently, McArthur Falls Generating Station provides about 1% of the energy generated in the Manitoba Hydro system, with the Winnipeg River stations providing over 8% of the total capacity in the Manitoba Hydro system in 2022/23 (In 1977, the Winnipeg River Stations supplied approximately 36% of the total Manitoba load). Even though the McArthur Falls Generating Station is relatively small, the Winnipeg River generating stations make efficient use of the water resource as the water travels from the Ontario border to Lake Winnipeg.

The natural falls and the river's relative proximity to Winnipeg made the Winnipeg River an excellent prospect for hydroelectric development. As the electricity demand increased for industrial, agricultural and domestic needs, seven generating stations were built on the Winnipeg River between 1902 and 1955.

Manitoba Hydro completed the **Farm Electrification Program** in 1954 and with the construction of Winnipeg River plants, electricity became more available and affordable to people across the province. By that time, Manitoba had the distinction of being western Canada's most electrified province (75% of all farms in Manitoba had electrical service).

McArthur Falls can efficiently continue to generate electricity for decades to come. McArthur Falls GS is financially viable as it results in a positive rate of return in a hydro system that is known for some of the lowest energy rates in Canada.

Finally, McArthur Falls GS is an integral part of an overall hydro system which generates renewable energy as it helps to reduce carbon emissions. By doing so, it supports the Manitoba Clean Energy Strategy which focuses on protecting the environment while promoting a prosperous and environmentally conscious economy.

Dam Safety Summary

Manitoba Hydro's **Dam Safety Program** is based on the Canadian Dam Association (CDA, 2007) Guidelines and operates in accordance with two key CDA principles:

Principle 1a

The public and the environment shall be protected from the effects of dam failure, as well as release of any or all retained fluids behind a dam, such that the risks are kept as low as reasonably practicable.

Principle 2d

Documented surveillance procedures shall be followed to provide early identification and to allow for timely mitigation of conditions that might affect dam safety.

Manitoba Hydro's program objectives aim to detect changes in the condition of dams and to initiate timely remedial measures when necessary. The program includes visual inspections, instrument data analysis, engineering analysis, testing, evaluations, and reporting. Manitoba Hydro follows inspection guidelines for surveillance of concrete and embankment dams based on the dam classification, condition and professional judgment.

Concrete and embankment dams are inspected at regular intervals for any anomalies or deficiencies. Manitoba Hydro staff performs routine inspections monthly for the embankment dams and every two months for the concrete structures, including the spillway. Specialists from Manitoba Hydro's Asset Information & Risk Management Department perform detailed inspections of all dams annually.

Dam Safety Reviews (DSR) of generating stations and water control structures are undertaken on a prescribed schedule. This type of review is a systematic evaluation of dam safety through a comprehensive performance assessment of the structures and review of original design, construction, operation and maintenance records to ensure that the generating station meets current industry standards. The CDA Guidelines are the applicable standard. Qualified external consulting engineering firms carry out DSRs and typically include a site inspection of the station, dams, and spillway gates, including mechanical and electrical aspects of gate operation. A comprehensive DSR report includes observed deficiencies and recommendations for follow-up.

McMillen Jacobs Associates performed a DSR at McArthur Falls in 2014. Their report listed various recommendations which were assessed to determine an action plan, priority where applicable, and a suitable time frame for implementation. Several deficiency investigations are now complete, while the remaining are prioritized within the appropriate work management system. Manitoba Hydro is planning the next McArthur Falls Dam Safety Review for 2026/27.

Manitoba Hydro maintains **Dam Safety Emergency Plans** for all of its generating stations. These plans are consistent with the CDA's Dam Safety Guidelines and bulletins and are issued to local authorities and emergency response agencies to assist in responding to an emergency situation. The **McArthur Dam Safety Emergency Plan** contains detailed information regarding the verification and classification of the emergency, and contains communication notification and reporting procedures, as well as guidance for emergency response.

Manitoba Hydro updates notification charts in the emergency plans annually to reflect ongoing personnel and content change.

Annual Reporting

From the start of station operations in 1955 to 2007, Manitoba Hydro regularly provided Manitoba with raw data records from its generating stations. Since 2007, Manitoba Hydro has submitted the **Annual Water Levels and Flows Compliance Report** to the Province. The report contains information on data collection, verification and reporting related to Water Power Act licences, as well as a summary of deviations from licence conditions during the year. Manitoba Hydro and Manitoba Environment and Climate Change (MECC) use the information in this report as a framework for discussions regarding future system operation and monitoring licence compliance.

MEC publishes the **Annual Water Levels and Flows Compliance Reports** on its website at https://www.gov.mb.ca/sd/about/articles-and-publications/index.html?wg=water_power_licensing.

The **McArthur Falls Licence Implementation Guide (LIG)** defines the methodology for evaluating, notification of, and reporting non-compliance with respect to critical water levels. Manitoba Hydro prepared this guide to document a common understanding with the regulator of compliance with the water regime terms of the McArthur Falls Water Power Act Licence. MEC has approved this document and publishes it on its website at <https://www.gov.mb.ca/sd/water/water-power/mcarthur-falls-generating-station/index.html>.

[Appendix E](#) includes a copy of the 2017 LIG.

Community Involvement

One of Manitoba Hydro's foundational principles is respectful engagement with communities and stakeholders affected by its system and operations with a priority to respect and support Indigenous peoples in all aspects of its business. In addition to having a business unit dedicated to External & Indigenous Relations and Communications, Manitoba Hydro has a section within the Waterway Approvals and Monitoring Department tasked with community and stakeholder engagement on hydro system waterways (Waterway Community Engagement Section).

Manitoba Hydro's Waterway Community Engagement Section strives to be inclusive with everyone having an interest in waterways affected by Manitoba Hydro regardless of licence status. The staff in this section identified and reached out to over 20 municipalities, Indigenous communities and non-government organizations along the Winnipeg River, including those in the vicinity of the McArthur Falls Generating Station. Manitoba Hydro staff has had discussions with individuals, groups and communities that have raised concerns or interest in learning about Manitoba Hydro's operations. Manitoba Hydro engages with Indigenous communities with an interest in Winnipeg River operations, including the McArthur Falls Generating Station, on an ongoing basis.

The 2021 Pointe du Bois and Slave Falls Short-Term Extension Licences include a requirement for Manitoba Hydro to report annually on Indigenous engagement about the ongoing operation of these generating stations. The Winnipeg River Indigenous Engagement Report describes engagement activities undertaken with respect to all plants on the Winnipeg River, as dialogue with Indigenous communities is not generally specific to an individual generating station. Manitoba Hydro engages with Black River First Nation, Brokenhead Ojibway Nation, Hollow Water First Nation, Peguis First Nation, Sagkeeng First Nation and the Manitoba Metis Federation about Winnipeg River operations.

The Heritage Resources Management Program

Manitoba Hydro is committed to safeguarding cultural and heritage resources through its Heritage Resource Management Program (HRMP). The HRMP is designed to aid in heritage resource planning, management, training and mitigation. The HRMP also undertakes annual archaeological monitoring throughout Manitoba Hydro's hydraulic system related to registered heritage sites at potential risk due to Manitoba Hydro's operations. This work includes notification and collaboration with local communities on a rotational basis depending on annual field work requirements.

Coordinated Aquatic Monitoring Program

Manitoba Hydro and the Province of Manitoba jointly manage the **Coordinated Aquatic Monitoring Program (CAMP)** through a partnership. This long-term program studies and monitors the health of water bodies affected by Manitoba Hydro's generating system. The geographic scale of CAMP makes it the largest holistic ecosystem-based aquatic monitoring program in Manitoba. The purpose of CAMP is to strengthen the understanding of the effects of hydroelectric activity on the aquatic ecosystem and support more informed decision making when it comes to water management.

CAMP has an established annual monitoring site at Lac du Bonnet. Monitoring at this site has helped characterize the fish species composition, water quality, and other aquatic ecosystem conditions along the Winnipeg River.

CAMP information is located on the website www.campmb.com.

The provincial website has additional information on water quality at <https://gov.mb.ca/water/lakes-beaches-rivers/index.html>.

As noted in the May 12, 2021 Churchill River Diversion Final Water Power Act Licence cover letter, CAMP will be expanding in the future to include "shoreline erosion, shoreline wetland issues and monitoring of terrestrial and riparian components and shoreline health with the inclusion of Indigenous community participation and Indigenous traditional knowledge."

Environment Act Licensing

The intent of Environment Act (EA) Licensing is to develop and maintain an environmental protection and management system in Manitoba which will ensure that the environment is protected and maintained to sustain a high quality of life, including social and economic development, recreation and leisure for present and future generations. The EA has been in effect in Manitoba since March 31, 1988. Manitoba Hydro is not required to obtain EA

licences for any of its legacy projects including McArthur Falls as these projects predate this legislation.

Manitoba Hydro is still required to obtain EA licences and permits for the addition of supporting infrastructure associated with generating stations such as wastewater treatment plants, lagoons and landfills.

In the event that McArthur Falls would undergo major changes to the existing project configuration, the project would be evaluated and an EA licence would be applied if appropriate. The Pointe Du Bois spillway is a recent example of Manitoba Hydro requiring an Environmental Impact Statement (EIS) for new works on the Winnipeg River. Manitoba Hydro maintains compliance with its EA licences and manages other environmental risks through Manitoba Hydro's **Environmental Management System** described below.

The Provincial website has more information on Environment Act Licensing.
https://www.gov.mb.ca/sd/permits_licenses_approvals/eal/index.html.

Environmental Management System at Manitoba Hydro

Manitoba Hydro has developed and implemented an **Environmental Management System** (EMS) that meets international standards.. The EMS is a set of tools and processes a company uses to realize its environmental goals. Having a good EMS enables a company to identify its environmental impacts, set goals to manage them, implement plans to meet those objectives, evaluate performance, and make continual improvements to the system.

We are a member of the Canadian Electricity Association (CEA) and an active participant in the Sustainable Electricity Program. Sustainable electricity is an industry-wide sustainability initiative developed and implemented by CEA and its utility members. Sustainable electricity is our response to the challenge of creating a sustainable tomorrow.

Manitoba Hydro's EMS information can be found at the corporate website:
https://www.hydro.mb.ca/environment/env_management/

Erosion

Manitoba Hydro previously determined that its hydraulic operations impact water levels, shoreline erosion, and bank stability at locations along the Winnipeg River and its tributaries within the Water Power Act licence limits located downstream and in the forebays of Seven Sisters, McArthur Falls, Great Falls and Pine Falls Generating Stations. In an effort to mitigate these adverse impacts, Manitoba Hydro acquired property (water storage land) and developed severance lines during initial licensing of these generating stations. The purpose

of water storage land (WSL) was to allow storage of water and for erosion and bank instabilities to occur without impacting private property. However, over time it was recognized that continuing erosion and bank instabilities would extend beyond WSL at some locations.

In 1997 the **Winnipeg River Bank Protection Program (WRBPP)** was created by Manitoba Hydro to address potential impacts of its operations on private property within the Water Power Act licence limits. Where there is a risk of erosion and/or riverbank movements extending beyond WSL and impacting private property, Manitoba Hydro may purchase additional WSL or perform riverbank remedial works on a priority basis in exchange for the acquisition of additional Water Storage Land from the landowner. The additional Water Storage Land would be added to the landowner's Shore Lands Use Permit for their continued use and enjoyment. The priority of works to be performed is determined by Manitoba Hydro's WRBPP Engineer with regard for the proximity of erosion and/or bank movements relative to the location of the property boundary with particular emphasis on the location of habitable structures. Manitoba Hydro also monitors the overall condition of WSL, prioritizes potential remedial works/purchases, and interacts with the public and local government to promote proper development/usage of WSL.

Public Safety

In 2009 Manitoba Hydro introduced a **Public Water Safety Around Dams (PWSD)** program. As part of the program, Manitoba Hydro developed a site specific PWSD Management Plan for each of its generating stations and control structures. These Site Management Plans address public water safety issues by identifying hazards to the public created by the presence and operation of the Manitoba Hydro facility/structure and then implementing the safety Control Measures required in response. Implementation of these Control Measures occurred from 2013 to 2023 based on the priority of the identified risks. As part of the PWSD Program, these individual Site Management Plans and implemented Control Measures are reviewed on a planned 5 year frequency.

Manitoba Hydro maintains a PWSD Site Management Plan for the McArthur GS. Manitoba Hydro installed a safety boat boom in 2014 and deploys it annually in the spring and removes it in the fall. Manitoba Hydro will install fencing, gates and signage at McArthur Falls GS in 2023. This installation will help address potential public safety hazards and will close public access across the station. However, there is a protocol for Indigenous resources users to maintain access across the station to undertake rights-based activities. Manitoba Hydro sent out notices with contact information.

Manitoba Hydro places reminders regarding the federal prohibition against fishing within 23 metres of a dam in multiple public areas and in publications.

The public can review safety information around our facilities on Manitoba Hydro's website https://www.hydro.mb.ca/safety/around_our_facilities/.

PUBLIC WATER SAFETY AROUND DAMS PROGRAM

Manitoba Hydro developed the Public Water Safety Around Dams program to address potential public safety hazards around hydroelectric facilities and water control structures.

WHY DO WE NEED THIS PROGRAM?

Due to frequent and unpredictable changes in water levels and flow conditions, the waterways near hydroelectric facilities and water control structures can be dangerous to the public. This is especially true in the areas immediately upstream and downstream of the facilities and control structures. These potential hazards are not always well-known to the public.

Beginning in 2013, Manitoba Hydro conducted a risk analysis at each hydroelectric facility and water control structure to identify high, medium and low priority hazards. Safety measures were then selected based on the frequency of public exposure and the probability of an accident. These include the installation of signage, fencing, booms, and audible and visual warning devices such as sirens, strobe lights, and cameras.

Safety measures for high priority hazards were installed immediately following the risk analysis. Manitoba Hydro continues to move forward with the installation of safety measures for medium and low priority hazards.

The Public Water Safety around Dams Program maintains site management plans for each hydroelectric facility and water control structure. Site management plans are reviewed every five years, or sooner if conditions change, to determine if additional safety measures are required to address potential hazards.


WHERE WILL SAFETY MEASURES BE INSTALLED?

The installation of new safety measures began in 2017 and has continued each following year. Installation work will continue throughout 2023.


LOCATION	SAFETY MEASURES			
	Signage	Fencing	Booms/ Buoys	Warning Systems
Brendan Generating Station (G.S.)	✓	✓		
Churchill Weir ¹	X		X	
Cross Lake Weir	✓			
Eggar Lake Dam	✓	X		
Grand Rapids G.S.	✓	✓	✓	
Great Falls G.S.	✓	✓	✓	
Jungsg G.S.	✓	✓	✓	
Kerriway G.S.	X		X	
Kelley G.S.	✓	✓	X	
Kenzie G.S.	✓	✓	✓	✓
Laurie River G.S.	✓	X		
Laurie River II G.S.	✓	X		
Limestone G.S.	✓	✓		✓
Long Spruce G.S.	✓	✓	✓	✓
Manson Control Structure (C.S.)	✓	✓		
Mukerku G.S.	✓	✓	✓	
Nepi Falls C.S.	✓	X	✓	
Nepi C.S. ²	✓	✓	X	
Pine Falls G.S.	✓	✓	✓	
Pineau au Bassin G.S.	✓	✓	✓	✓
Rat River Boom #4	✓			
Russell Lake Dam	✓			
Talbott G.S.	✓	✓	✓	
Seven Sisters G.S.	✓	✓	✓	
Steve Falls G.S.	✓	✓	✓	
Thompson Ice Boom	✓			

1 The construction of a boat channel is also planned at the Churchill Weir to provide safe access to the recreational area on the west side of the river.
2 The Nepiway C.S. is being developed by the Neepawa Hydro-power Limited Partnership.
3 The safety boom has been installed upstream of the Nepiway C.S. and new safety buoys are planned to be installed downstream.
✓ Indicates work that has been completed.
X Indicates work is ongoing or planned.


Manitoba Hydro
energy for life



Sign installed at Waskewan Generating Station



Fencing and gate installed at Grand Rapids Generating Station



Safety boom at Kettle Generating Station

WHAT DOES THE WORK INVOLVE?

Signage:
Installation of new sign plates and sign support structures to notify the public of hazardous areas.

Fencing:
Installation of chain link fencing, person and vehicle gates, handrails, kickplates and vehicle guardrails at or near hazardous locations.

Booms/Buoys:
Installation of safety booms and/or buoys in open water of hazardous areas.

Warning Systems:
Installation of audible and visual warning devices at Limestone and Long Spruce Generating Stations to alert the public of upcoming changes in water flow or water levels prior to opening the spillway.
Installation of a camera system at Kettle Generating Station to assist staff with visual checks prior to opening the spillway.

ARE THERE ANY EMPLOYMENT OR BUSINESS OPPORTUNITIES?


Manitoba Hydro has publicly tendered the fencing, sirens/cameras and boom/buoy work through the MEIR electronic bid submission system. The fencing installation work was split into regional work packages that included the evaluation of Indigenous content.

ARE REGULATORY REVIEWS OR PERMITS REQUIRED?

Manitoba Hydro is working to ensure that the Public Water Safety Around Dams Program is in compliance with all environmental regulations. All required authorizations will be obtained to address federal and provincial legislation, including the Canadian Fisheries Act, Heritage Resources Act, Migratory Birds Convention Act, Navigation Protection Program and the Provincial Parks and Wildlife Act.

FOR MORE INFORMATION CONTACT:

Gary Bishop
Public Water Safety around Dams Program
Phone: (204) 470-3992
Email: gbishop@hydro.mb.ca
Available in accessible formats upon request.
May 2023



Division 2 – Renewal Licence Request

Renewal Licence Term

Manitoba Hydro is committed to the safe and productive long term operation of the McArthur Falls GS and requests a 50 year term for this Renewal Licence. Section 45(1) of the Regulation limits the term of a Final Licence to no more than 50 years from the completion of the initial development. It is up to the Minister to determine the duration of the Renewal Licence term.

Renewal Licensed Capacity

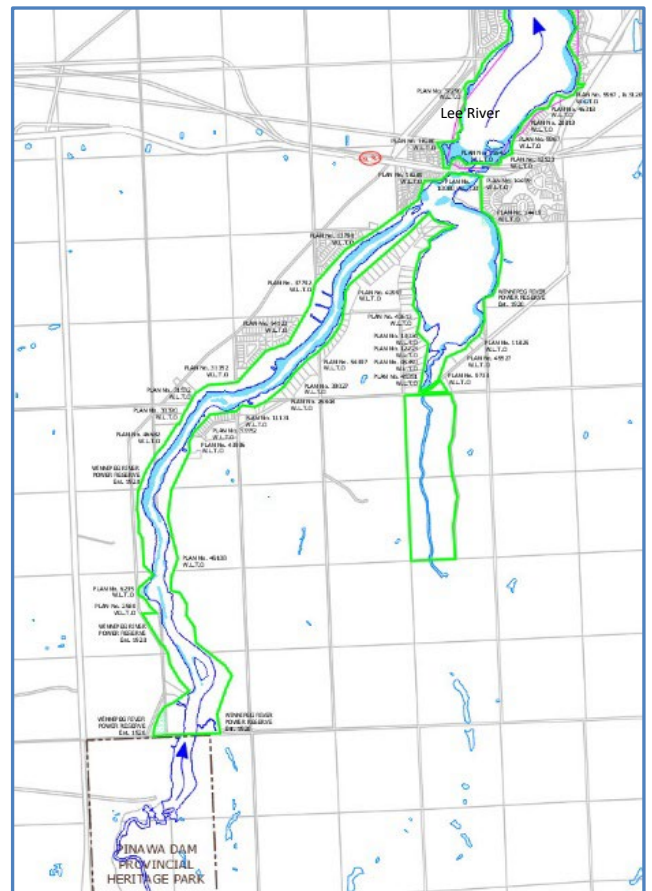
Manitoba Hydro requests that the Renewal Licence reflects the installed nameplate capacity of 80,000 horsepower which is equivalent to approximately 60 MW. Manitoba Hydro is requesting no change to the licence capacity.

Renewal Licence Area

The proposed Renewal Licence area (land within the severance line) remains much the same as the Final Licence area with the addition of lands along the Pinawa Channel upstream of Provincial Road 313 to the Pinawa Dam Provincial Heritage Park. These additional lands are included in Figure 15.

The Pinawa Rockfill Dam, associated with the Seven Sisters Generating Station, passively regulates the flow in the Pinawa Channel. Manitoba Hydro proposes to extend the McArthur Severance Line on the Pinawa Channel from PR 313 to the northern extent of the Pinawa Dam Provincial Heritage Park, which is seen as a natural breakpoint in the severance line. In a similar manner, Manitoba Hydro proposed to extend the Seven Sisters Severance Line along the Pinawa Channel from the Pinawa Rockfill Dam to the southern extent of the Pinawa Dam Provincial Heritage Park.

Partial view of Figure 15: Proposed McArthur GS Severance Line for the Pinawa Channel Area from PR 313 to northern extent of the Pinawa Dam Provincial Heritage Park (See Figure 15 on page 51)



The Water Power Act allocates Crown lands required in connection with the development of water power. A Renewal Licence implies a renewal of the decision to allocate Crown lands for another set term of time as defined by the Minister and specified by the Renewal Licence. A new severance line drawing that reflects all approved changes to the Renewal Licence area as defined by a severance line will be submitted separately from this report under Manitoba Hydro drawing file 1-00108-PE-07311-0001 and Manitoba file number WPL-1-00108-PE-07311-0001 . Figure 15 on page 51 displays an image of the proposed Renewal Licence area.

The Renewal Licence area is a combination of lands required for the project and impacted by the project. Manitoba Hydro is basing the Renewal Licence area as defined by the Final and Short Term Extension Licences. It includes lands required for project structures, site access, and present and future maintenance activities. It also includes all lands impacted by project operations including;

- lands which could be unsafe to the public,
- lands which experience a modified water regime due to project operations, and
- lands which could prove to be geotechnically unstable as a result of project operations.

Manitoba Hydro conducted a site visit to view project components and corresponded with site staff regarding present and future land use to confirm the proposed severance line location. Manitoba Hydro and Manitoba Environment and Climate Change (MECC) must review and approve the proposed Renewal Licence area as part of the Renewal Licence process.

The Water Power Act Regulations require that the severance line that delineates a licence area is legally definable. Therefore, the severance line must be based on legal survey plans on record in the provincial land titles system or on the Dominion Government Survey System, or on a combination of both. Manitoba Hydro obtained and reviewed the property assessment information available from the the Real Estate Services Branch (RESB) to evaluate the availability of legal information surrounding the lands required for the project. The nearest available legal survey information was chosen to define the Renewal Licence severance line. Where legal survey plans did not exist, the severance line was defined by the nearest legal subdivision line of the Dominion Government Survey System. The resulting severance line is therefore a combination of legal surveys obtained from Land Titles Office and the section grid defined by the Dominion Government Survey System and is entirely legally definable.

RESB is a Provincial department that handles property sales, leases and permits, appraisals and land acquisition services for Provincial land. The RESB will contact

Manitoba Hydro for comment on any development proposed for provincial land within the McArthur Falls severance line area.

The proposed licence area for the Renewal Licence is based on the licence area defined in the Final Licence and up to date information derived from:

- computer based hydraulic and geotechnical reviews,
- 2015 property assessment information available from the Crown Lands and Property Agency (now the Real Estate Services Branch)
- a site visit to view existing project components and to interview site staff regarding present and future land use, and
- topographic imagery (LiDAR 2009).

Division 3 – Compliance with Final Licence and Regulations

This division of the report provides detailed supporting information that demonstrates the fulfillment of the requirements of the Final Licence, the Short Term Extension Licences (STELs) and Manitoba Regulation 25/88R pursuant to The Water Power Act (the Regulation). Manitoba issued the Final Licence in 1965 and it may contain references that are obsolete.

Observance of Final Licence Terms

1. The Licensee may divert and use continuously for the development of power at the said McArthur Falls site all the water of the Winnipeg River which may be flowing at the said site from time to time during this term of this Final Licence, subject, however, to the provisions of Section 72 of the Regulations.

Observance

Manitoba Hydro has and continues to exercise its rights granted under this term of the licence. Regulation 72 states: *“Every licence shall be deemed to have been executed on the express condition that the licensee shall (a) divert, use or store the water authorized to be diverted, used, or stored by him in such a manner as not to interfere, in the opinion of the minister, with the maximum advantageous development of the power and other resources of the river or stream upon which the works are located; (b) conform to and comply with any orders in respect of the control or regulation of the flow of the waters of such river or stream as may be made from time to time by the minister or any person authorized by the minister in that behalf; and (c) at no time cause or permit the surface level of the waters of such river or stream or of any storage reservoir operated by the licensee to be raised or lowered beyond the limits which shall be fixed from time to time by the minister or by a person authorized by the minister in that behalf.”*

Manitoba Hydro owns and operates all generating stations on the Manitoba portion of the Winnipeg River. Manitoba Hydro operates the McArthur Falls GS for reliable power generation as part of the integrated power system while considering social and environmental effects. The Minister or another authorized person has issued no specific orders other than those defined by the Final Licence and Short Term Extension Licences. Observance of the maximum operating limit is provided in Term 4 of the Final Licence.

2. The undertaking authorized to be maintained and operated by the Licensee under this Final Licence shall comprise the following: a concrete dam with sluice gates and non-overflow sections; an earthfill dam; a powerhouse with eight vertical type units of 10,000 horsepower capacity; dikes; switching station; transmission line; and all necessary works, machinery and equipment for the complete development,

generation and transmission of electric power available at the said McArthur Falls site, all as shown by plans and descriptions thereof filed in the office of the said Director at Winnipeg, as follows:

<i>Manitoba Water Control and Conservation Branch File Number</i>	<i>Licensee's File Number</i>	<i>Description</i>
21-4-1051	520-C-1123 (Rev. A)	Earth Embankment, Location Plan, North Section
21-4-1053	520-C-1125 (Rev. A)	Earth Embankment, Location Plan, Centre Section
21-4-1052	520-C-1124	Earth Embankment, Location Plan, South Section
21-4-1054	520-C-1126 (Rev. A)	Earth Embankment, Sections and Details
21-4-3006	520-D-1045	Main Sluiceway, Plan, Elevations and Sections, Concrete Details
21-4-3007	520-D-1039 (Rev. A)	Powerhouse, General Arrangement, Typical Cross Sections
21-4-3008	520-D-1041 (Rev. A)	Powerhouse Upstream Elevation
21-4-3009	520-D-1042 (Rev. A)	Powerhouse Downstream Elevation
21-4-3010	520-D-1043 (Rev. A)	Powerhouse End Elevations
21-4-1055	520-B-1404 (Rev. E)	Earth Embankment No.1 Centre Dike, Plan and Sections
21-4-1066	520-C-1174 (Rev. B)	Earth Embankment Profile

Observance

Manitoba Hydro constructed the Undertaking as described in the plans listed above.

3. Lands of the Province which may be entered upon, used or occupied for the maintenance and operation of the said works shall be the following:
 - (a) Lands of the Province not covered by water required for main diverting works, powerhouses, etc. – All those parts of the following lands not covered by the waters of the Winnipeg River, as shown outlined in green on Record Plan No. 21-4-1057 filed in the office of the said Director at Winnipeg and which is the Licensee's No. 0106-E-0227 (Rev. 0):

- (i) The west half and north-east quarter of Section Thirty-four (34) in Township Sixteen (16) and Range Eleven (11) East of the Principal Meridian in Manitoba.
 - (ii) The south-east quarter of Section Three (3) and the south-west quarter and Legal Subdivision Two (2) of Section Two (2), all in Township Seventeen (17) and Range Eleven (11) East of the Principal Meridian in Manitoba.
 - (iii) Road allowance between the said north-east quarter of Section Thirty-four (34) and south-east quarter of Section Three (3).
 - (iv) Road allowance between the said south-east quarter of Section Three (3) and south-west quarter of Section Two (2).
- (b) Lands of the Province covered by water required for main diverting works, powerhouses, etc. – All those parts of the south-east quarter of Section Three (3) and the south-west quarter of Section Two (2), all in Township Seventeen (17) and Range Eleven (11) East of the Principal Meridian in Manitoba, covered by the waters of the Winnipeg River as shown outlined in red on the said Plan No. 21-4-1057.
- (c) Lands of the Province required only to be flooded in connection with the storage or pondage of water – All those portions of the following Townships shown outlined in brown on said Plan No. 21-4-1057, excepting thereout, first all those lands heretofore described as required for works and, second, all those lands shaded yellow on the said Plan No. 21-4-1057:
- (i) Township Fourteen (14), Fifteen (15), Sixteen (16) and Seventeen (17) in Range Eleven East of the Principal Meridian in Manitoba.
 - (ii) Township Fifteen (15), Sixteen (16) and Seventeen (17) in Range Twelve (12) East of the Principal Meridian in Manitoba.
 - (iii) Townships Sixteen (16) and Seventeen (17) in Range Thirteen (13) East of the Principal Meridian in Manitoba.
 - (iv) Township Seventeen (17) in Range Fourteen (14) East of the Principal Meridian in Manitoba.

Observance

Manitoba Hydro's refinement of the severance line showing the lands required for the project as identified in plans referenced in Term 3 is attached. This line is legally definable either by Dominion Government Survey System (provincial section grid) or legal survey plans and is being reviewed by MEC. The drawing showing the refined line, if approved, will form part of

the Renewal Licence and is shown on Manitoba drawing WPL-1-00108-PE-07311-0001 (Manitoba Hydro drawing No. 1-00108-PE-07311-0001).

4. The Licensee shall not raise the headwater of its development to an elevation higher than 836.0 above mean sea level, Canadian Geodetic Datum, 1929 Adjustment. A higher elevation may be created only with prior written permission by the Director and in accordance with Section 72 of the Regulations.

Observance

Manitoba Hydro has always provided operations data to the province in relation to this term. Throughout the project's operation Manitoba Hydro submitted hydraulic and energy generation data to the province in raw form for review and evaluation. The format and frequency of the data changed over time from daily to hourly time step, with submission frequency increasing from an annual to a monthly basis.

In 2005, Manitoba Hydro implemented a compliance monitoring program which includes submitting annual compliance reports to Manitoba. Manitoba Hydro submitted the first Annual Water Level and Flow Compliance report to the province in 2007. Using the criteria of any single hourly water level exceeding an elevation of 836.0 ft, annual compliance from 2007 to 2022 has ranged from 99.75% to 100% with an average annual compliance of 99.94% of the time (Table 3). Manitoba Environment and Climate Change publishes all Annual Water Level and Flow Compliance Reports on its website at:

https://www.gov.mb.ca/sd/about/articles-and-publications/index.html?wg=water_power_licensing

The [McArthur Falls GS Licence Implementation Guide](#) (LIG) for Water Levels defines the criteria for compliance with this licence term. The guide shows the location of the water level monitoring station, outlines methodology used to determine water level compliance, and describes reporting procedures that Manitoba Hydro follows. Manitoba Hydro reports compliance with the McArthur Falls Water Power Act Licence against the hourly forebay water level measured at the McArthur Falls Generating Station. Manitoba Sustainable Development (now Environment and Climate Change) approved the McArthur Falls LIG on December 29, 2017. The letter of approval and LIG are shown in [Appendix E](#) on pages 82 to 97.

Table 3 Annual Water Level Compliance Reported in Annual Water Levels and Flows Compliance Report

Year	Hourly Forebay Water Level Readings in a Year	Number of Times Reading Above Licence Limit	Percentage of Readings Below Licence Limit	Number of Reportable Events*
2022	8760	0	100.0	0
2021	8760	0	100.0	0
2020	8784	0	100.0	0
2019	8760	10	99.89	1
2018	8760	1	99.99	0
2017	8760	0	100.0	0
2016	8783	0	100.0	0
2015	8760	3	99.97	0
2014	8760	7	99.92	0
2013	8760	14	99.84	0
2012	8784	13	99.85	0
2011	8760	22	99.75	1
2010	8760	6	99.93	1
2009	8760	0	100.0	0
2008	8784	0	100.0	0
2007	8760	8	99.91	0

*Reportable events were defined as those exceeding the Equipment Error Tolerance (EET) level of 0.1 ft and requiring provincial notification and explanation of events leading to the exceedance.

Table 4 summarizes water level compliance on a daily basis and shows the relative improvement in compliance by decade since the Final Licence came into effect. A chart of daily water levels for the same period is provided in [Figure 5](#) on page 45. As shown, water level compliance improved in the 1980's and continued to exceed 99% for over three decades.

Table 4 Historic Daily Average Water Level Compliance by Decade

Time Period	Days Exceeding Limit	Total Days	% Compliant
2020-2022	0	1095	100.0%
2010-2019	0	3651	100.0%
2000-2009	0	3653	100.0%
1990-1999	3	3652	99.9%
1980-1989	48	3653	98.7%
1967-1979	289	4535	93.6%

Manitoba Hydro's compliance monitoring program and increased operator experience/training contributed to improving performance. Also, modern water level measurements and instrumentation has significantly increased information accuracy and speed. A computer-based control system installed in the System Control Centre in Winnipeg enables operators to monitor generating stations remotely. These programs and technologies have led to improvement of forebay water level compliance.

5. The Licensee shall by purchase or otherwise acquire all necessary flooding rights on privately-owned lands forming the shores of the river above its development, and shall assume full responsibility for damage to such lands beyond the limits of the rights so acquired if caused by the operation of its development at headwater elevations above those from time to time authorized.

Observance

Manitoba Hydro acquired all necessary flooding rights within the severance line. There is a combination of purchased water storage land, easements with private landowners and Crown land along the Winnipeg River. Manitoba Hydro obtained Water Storage Land adjacent to the Winnipeg River within Manitoba Hydro licence limits to allow for inundation, erosion activity and bank instabilities to occur without impacting private property or structures.

Manitoba Hydro created the **Winnipeg River Bank Protection Program (WRBPP)** in 1997 to address potential impacts of its operations on private property within the Water Power Act Licence limits.

6. In accordance with Section 45 of the Regulations, the term of this Final License shall be fifty (50) years from and after the first day of January, A.D. 1955, and the said term shall thereafter be subject to renewal or extension in accordance with the provisions of the laws and Regulations relating thereto and then in force.

Observance

This provision requires no observance statement by the licensee.

7. On the second day of January in each and every year during the term of this Final License, the Licensee shall pay an annual rental in advance of three hundred dollars (\$300.00) for the use and occupation of lands of the Province described in Article 3 hereof.

Observance

Manitoba Hydro paid land rental on a fiscal year basis (before April 1 of each year) from 1966 to 1991. This was a result of invoicing being done on a fiscal year basis and an assumption of a 60-day grace period as defined by article 48(3.5)(b) regarding water rentals. In an October 30, 1991 letter, the Director advised Manitoba Hydro that land rentals would be from that time onward invoiced in November for payment on the first normal working day of the following January. Manitoba Hydro has complied with this requirement. Manitoba adjusted land rental rates over time to reflect more up to date land values along the Winnipeg River with changes coming in effect in 1996 and 2011. Manitoba Hydro has made payments in accordance with rates dictated by the Regulation of the day. The Deputy Minister of Natural Resources notified Manitoba Hydro on November 4, 1996 of a change in billing practice from a calendar year to a fiscal year basis beginning with the 1997-1998 fiscal year. Since then land rentals were payable on April 1. Copies of the 1991 and 1996 letters are shown in [Appendix D](#) on pages 73 and 75 respectively.

8. The Licensee shall also pay an annual rental during the term of this Final Licence for the use of water for the development of power, determined in accordance with the principles set out in Section 48 of the Regulations and payable at the times and in the manner therein provided, and at the following rates:
 - (a) The rentals in the first twenty years of the term of this Licence shall be the greater of:
 - (i) an annual rental of fifty (50) cents per installed horsepower;
 - (ii) an annual rental of one dollar and twenty-five cents (\$1.25) per horsepower year output.
 - (b) The annual rental to be paid after the expiry of the said twenty year period shall be determined as provided in the regulations in force at such time.

Observance

Manitoba Hydro paid annual water rentals in accordance with the Regulation and provincial direction of the time. The Deputy Minister of Natural Resources notified Manitoba Hydro in a February 29, 1996 letter of a change in billing practice from an annual to a monthly basis beginning in April 1996. Since then Manitoba Hydro submits generation data and then invoices and payments are generated on a monthly basis. [Appendix D](#) shows a copy of the 1996 letter on page 74.

9. The Licensee shall assume the proportionate share of the capital cost of water storage in Lake of the Woods and Lac Seul, which prior to the first day of January, A.D. 1955,

was charged to the McArthur Falls site as an undeveloped power site; and shall, commencing with an initial payment on the first day of January, A.D. 1956, make like equal annual payments on the first day of January in each succeeding year ending with the payment due on the first day of January, A.D. 1980. These annual payments shall be determined on the basis of an amortization of the capital cost of storage on Lake of the Woods and Lac Seul computed using an interest rate of five per cent per annum over the period commencing on the first day of January, A.D. 1955, and ending on the first day of January, A.D. 1980. The Licensee shall also from the first day of January, A.D. 1955 pay annually the proportionate share chargeable to its development of the annual operating costs of the aforesaid storage; the first of such annual payments shall be made on the first day of January A.D. 1956 and subsequent annual payments thereafter shall be made on the first day of January of each and every year until the termination of this Licence; each payment to represent the Licensee's share of the said annual operating costs for the proceeding calendar year.

Observance

Manitoba Hydro paid annual payments from 1952 to 1979 for storage on Lake of the Woods and Lac Seul.

Currently, Manitoba Hydro makes payments to Ontario Power Generation as part of the Lac Seul agreement.

10. The Severance Line as defined in Section 1 of the Regulations shall be as shown in red and marked "Severance Line" upon the said Record Plan numbered 21-4-1050 filed in the office of the said Director, and which is the Licensee's Drawing No. 0108-E-0223 (Rev.0).

Observance

This provision requires no observance statement by the licensee.

11. All record plans filed with the Director and referred to in this Final License are incorporated herewith and made a part hereof.

Observance

This provision requires no observance statement by the licensee.

12. This Final License is issued upon the express condition that it shall be subject to the provisions of the Regulations and all amendments thereto.

Observance

This provision requires no observance statement by the licensee.

Observance of Current Short-term Extension Licence Terms

1. This Third Short-term Extension Licence shall apply from October 1, 2020 to and including September 30, 2025.

Observance

This provision requires no observance statement by the licensee. [Appendix B](#) shows a copy of the Third Short-term Extension Licence on page 66.

2. On the second day of January in each year the Licensee shall pay an annual rental in advance for the use and occupation of lands of the Province described in parts (a), (b), and (c) of Article 3 of the Final Licence at the rates set from time to time by Regulation under The Water Power Act.

Observance

Manitoba Hydro pays land rental rates annually in advance on a fiscal year basis in accordance with the Regulation and Ministerial notification of changes in billing practice. Land rental payments are discussed in the observance of Final Licence Term 7.

3. The Licensee shall pay an annual rental for the use of water for the development of power at the rates set from time to time by Regulation under The Water Power Act and payable at the times and in the manner provided for by Regulation under The Water Power Act.

Observance

Manitoba Hydro pays water rental rates monthly in arrears in accordance with the Regulation and Ministerial notification of changes in billing practice. Final Licence Term 8 outlines water rental payments.

4. The terms and conditions set out in the Final Licence apply as if set out specifically in this Third Short-term Extension Licences, except where inconsistent with the terms and conditions set out specifically in this document, in which case the terms and conditions set out in this document will apply.

Observance

This provision requires no observance statement by the licensee.

5. The Licensee shall comply with The Water Power Act and the Water Power Regulation.

Observance

Manitoba Hydro believes it has fulfilled its obligation under The Regulation as demonstrated through its observances of pertinent articles as follows.

Observance of Pertinent Water Power Act Regulation Articles

This section of the report provides supporting information for pertinent articles of the Regulation to demonstrate the fulfillment of the requirements of the Regulation. Manitoba Environment and Climate Change (MECC) has agreed to the selection of those articles of the Regulation that are pertinent to the Renewal Licence application. Each article is shown in italics followed by a statement how the licensee has fulfilled its obligations.

Renewal or termination

46 (1) Not less than four nor more than six years prior to the termination of any licence, the licensee may apply in writing for an extension of rights held under such licence, and applications may also be filed with the director by any persons looking to the future utilization of the site to which the licence applies. Any application for this purpose including the application for renewal of the licence shall be in such form and contain such statements and information as will satisfy the laws and regulations then in force, and such application for renewal by the licensee shall in every case be accompanied by a suitable undertaking on the part of the licensee that he or she will comply with all the said laws and regulations.

Observance

Manitoba Hydro submitted the application to renew the Final Licence on February 26, 1999. The four to six year window for application as defined by Section 46 (1) spanned January 1, 1999 to January 1, 2001. Manitoba Water Resources Branch responded on March 25, 1999 requesting additional information. Copies of the letters of application and provincial response are attached in [Appendix A](#) on pages 53 and 54.

Land use rental rates

48 (3.1) A licensee shall pay rent for the use of Crown lands occupied for water power purposes under a license issued under the Act or a regulation at the annual rate of \$1.80 per acre.

Observance

Manitoba Hydro has made annual land rental payments since the beginning of project operation at the rate in effect at the time. Manitoba Hydro provides details for observance of Final Licence Term 7 on page 23.

Water use rental rates

48 (3.2) A licensee shall pay rent for the use of water under a licence issued under the Act or a regulation. (a) in the case of a licensee with a total capacity of 268,096 horsepower or more, at an annual rate equal to the greater of (i) the horsepower capacity of the licensed installation during the year, multiplies by \$8.13, or (ii) the horsepower year output of licensed

installation during the year, multiplied by \$10.16; and (b) in the case of a licensee with a total capacity less than 268,096 horsepower, at an annual rate equal to the greater of (i) the horsepower capacity of the licensed installation during the year, multiplied by \$3.96, or (ii) the horsepower year output of the licensed installation during the year, multiplied by \$9.90.

Observance

Manitoba Hydro has made annual and monthly water rental payments in accordance with the Final Licence Term 8, or at the rate in effect at the time. Manitoba Hydro provides details for observance of Final Licence Term 8 on page 24.

Water use rental statement

48(3.4) A licensee shall, on or before March 1 following each rental period, submit all data required by the director for the determination of the annual water use rental for the rental period. On receipt of the required data, the director shall without delay prepare and provide to the licensee a statement of the water use rent payable by the licensee for the rental period.

Observance

Manitoba Hydro has submitted all data required by the director for the determination of the annual water use rental in accordance with Section 48(3.4) throughout the duration of the Final Licence. The Deputy Minister of Natural Resources notified Manitoba Hydro on February 29, 1996 of a change in billing practice from an annual to a monthly basis beginning in April 1996. Since then, all data required for the determination of water rentals for the McArthur Falls GS, has been submitted on a monthly basis. [Appendix D](#) provides a copy of the February 29, 1996 letter on page 74.

Time of payment of rentals

48(3.5) The rent for each rental period is payable (a) in the case of land use rental, on January 2 of the rental period; and (b) in the case of water use rental, within 60 days after receipt of the director's rental statement for the year for the rental period.

Observance

Requisite payments have been provided as follows:

- (a) Manitoba Hydro paid land use rentals on a fiscal year basis during the term of the Final Licence. The January 2nd due date was observed from 1991 to 1996. A final change to billing practice included payments being made on a fiscal year beginning with the 1997-1998 fiscal year. Details provided in observance of Final Licence Term 7 on page 23.
- (b) Manitoba Hydro paid water use rentals in arrears on a fiscal year basis and within 60 days of the director's rental statement. Details provided in observance of Final Licence Term 8 on page 24.

48(11) Every licensee generating electrical energy, unless excused by the director in writing from compliance with this subsection, shall install an approved curve drawing recording wattmeter and shall preserve and produce for inspection all records made by such wattmeter.

Observance

The McArthur Falls GS is equipped with meters which continuously measure power at each generator. The meters transmit the power readings to the control room where they are recorded electronically in the station operating records. These records are available to the province.

Care of lands

54(1) The interim or final licensee shall at all times maintain the lands, works and property held or used by the licensee in respect of his or her licence in a manner satisfactory to the minister, including the maintenance of all flooded or other areas in a sanitary condition and the improvement of the lands from the point of view of landscape architecture, and shall do all in his or her power to protect the lands and the interest of the Crown therein against injury by anyone engaged on or about the works, or by any other person.

Observance

Manitoba Hydro considers safety of its staff and the public at Manitoba Hydro facilities important. As such, Manitoba Hydro implements Manitoba Hydro's **Public Water Safety Around Dams Program** at McArthur Falls GS. Page 13 discusses some of McArthur Falls' key safety features. Manitoba Hydro also strives to meet or exceed all provincial regulatory requirements related to workplace health and safety through its regular development and enforcement of safety policies, safe work procedures, communication regarding safety awareness, investigation of incidents and deployment of improvement measures, and employee training.

54(2) Every interim or final licensee shall do everything reasonable within his or her power, both independently and on request of the minister to prevent and suppress fires on or near the lands to be occupied under the licence.

54(3) For the purpose of limiting the spread of fires or for other reasonable purposes, every interim or final licensee shall clear and keep clear the lands of the province along his or her transmission lines for such width and in such manner as the minister may direct.

54(4) Every interim or final licensee shall, to the satisfaction of the minister, dispose of all brush, refuse or unused timber on lands of the province resulting from the construction and

maintenance of the works, and shall keep the lands covered by his or her licence clear of unnecessary combustible material at all times.

Observance for Sections 54(2) to 54(4)

Manitoba Hydro maintains site lands and transmission rights-of-way to reduce the risk of fires and implements Manitoba Hydro's **Corporate Fire Prevention and Protection Program** designed to eliminate risks of fire or explosion.

56 Every interim or final licensee shall protect all telephone, telegraph and power transmission lines in existence prior to the construction of his or her own lines where crossed by or in close proximity thereto to the satisfaction of the director or competent provincial authority if any, and shall operate, maintain and render safe to the public his or her own transmission, telephone and other lines to the satisfaction of the director or the said authority if any.

Observance

Manitoba Hydro uses Canadian Standards Association clearance standards in the design of Manitoba Hydro's transmission system for safety of staff and the public. Manitoba Hydro further enhances public safety through regular maintenance, signage, and public safety education campaigns.

57(1) Except as expressly provided in this regulation, the interim or final licensee shall not erect any buildings or structures whatever upon any lands of the province without first submitting plans thereof to the director and securing the director's approval for such building or structure and the site thereof.

Observance

Manitoba Hydro has notified the province of all significant maintenance and rehabilitation of works which would require Manitoba Hydro to erect any structures.

58 No roads, trails, telephone lines, buildings or other improvements that are the property of the Crown shall be removed, altered or in any way affected by any interim or final licensee in the construction or operation of his or her works, without the minister's consent in writing having been first obtained, and except upon such conditions as the minister by such writing may impose. The minister, if the minister considers it necessary, may require the licensee to furnish a bond for the satisfactory carrying out of the provisions of this section.

Observance

Since the issuance of the Final Licence in 1965, there have been no removals, alterations or other effects to Crown-owned improvements.

59 Any lands desired by an interim or final licensee for subdivision for townsite or other purposes shall be set out in the application, interim or final licence separately from lands required for other purposes connected with the undertaking, and the promotion of any such townsite shall be subject to the approval of the minister and to such conditions with respect to town planning, landscape architecture and sanitation as the minister may impose.

Observance

Manitoba Hydro's Final Licence did not allocate land for a townsite.

61 Any authority granted under this regulation for entry upon, or for the use or occupation of lands situated within any forest reserve or park shall, notwithstanding any provisions of this regulation, be subject to the careful observance by the interim or final licensee of the provisions of any regulation relating to forest reserves and parks, and also of any conditions which the minister may, from time to time, impose with respect to the care, upkeep and management of such forest reserve or park.

Observance

Manitoba Hydro complies with all provincial legislation as it relates to forest reserves and parks.

Works, maintenance and operation

62(1) The licensee shall at all times install and use first class, modern, standard works, plant, and equipment, giving consideration to their requisite suitability of design, safety, strength, durability, efficiency, and all other relevant factors whatsoever, and shall maintain the same in good repair and condition, and shall exercise all due skill and diligence so as to secure satisfactory operation thereof.

Observance

The installed equipment, machinery and structural components at McArthur Falls are designed according to appropriate engineering standards and Manitoba Hydro performs regular maintenance to keep units operating safely and efficiently. It is in Manitoba Hydro's best interest to continuously optimize all components that have a role in producing electricity.

Manitoba Hydro provides an **Annual Flow and Water Level Compliance Report** to the province which also contains an annual summary of major construction and maintenance activities. [Appendix C](#) provides a summary of activities from 2008-2022 on pages 68 to 70.

64 The licensee, before making any material change in any existing works or in their location, shall submit a complete and satisfactory statement and plans of such proposed change to the director, and shall not proceed to carry out the same until such proposed change has been authorized.

Observance

There have been no material changes to the structures listed in the Final Licence.

65(1) The director may require any licensee to install and maintain in good operating condition at such places and in such manner as the director shall approve, accurate meters, measuring weirs, gauges or other approved devices which shall be adequate for determining the amount of water used or power developed in the operation of the works, for determining the flow of the stream or streams from which water is or will be diverted, and for determining the amount of water held in or drawn from storage.

65(2) The licensee shall keep accurate and satisfactory records of the determinations referred to in subsection (1) and shall from time to time make such returns, supported if necessary by statutory declaration, as the director may require.

Observance for subsections 65(1) and 65(2)

McArthur Falls GS is equipped with modern instrumentation necessary to adequately report on water usage and energy generation. Manitoba Hydro records water level data, unit discharge, spillway discharge, head, and plant output electronically in the station operating records as a record of station hydraulic activity. Manitoba Hydro maintains records of all gauge readings and submits energy and flow data to the province as part of monthly water rental billing. On an annual basis, Manitoba Hydro submits an **Annual Water Level and Flow Compliance Report** to the province which the province uses for licence compliance monitoring.

Stream regulation and control

72 Every licence shall be deemed to have been executed on the express condition that the licensee shall (a) divert, use, or store the water authorized to be diverted, used, or stored by him in such a manner as not to interfere, in the opinion of the minister, with the maximum advantageous development of the power and other resources of the river or stream upon

which the works are located; (b) conform to and comply with any orders in respect of the control or regulation of the flow of the waters of such river or stream as may be made from time to time by the minister or any person authorized by the minister in that behalf; and (c) at no time cause or permit the surface level of the waters of such river or stream or of any storage reservoir operated by the licensee to be raised or lowered beyond the limits which shall be fixed from time to time by the minister or by a person authorized by the minister in that behalf.

Observance for subsections 72(a) to 72(c)

Manitoba Hydro optimizes the usage of the available water. Manitoba Hydro maximizes plant operations by operating when possible at the most efficient head and wicket gate opening based on periodic field tests. Manitoba Hydro also attempts to optimize the use of available stream flows on a system wide basis using computer models.

To date, the province has not ordered operations respecting the control or regulation of flow at the McArthur Falls GS.

Observance of Final Licence Term 4 pertaining to a maximum water level limit is addressed on page 21.

Accounting

78 (1) Every licensee shall keep a true and detailed account of all expenditures made in each calendar year in respect of the works, lands and properties and such other information as follows: (a) respecting the works: (i) the actual cost thereof, giving separately each class of expenditures as indicated in the definition of "actual cost", (ii) amounts expended in that year for enlargements and permanent improvements authorized by the minister, and (iii) depreciation in value from any and all causes for that year; (b) respecting lands, tenements and appurtenances not included in clause (a), a statement setting out, in each case, the actual cost thereof in accordance with the provisions of section 36; (c) respecting capital stock: (i) the amount authorized and the number of shares into which it is divided, (ii) the number of shares subscribed for and allotted, the number of shares forfeited to date, and the owners, for the time being, of all outstanding shares, (iii) the amount of calls made on each share, and the total amount received from shareholders in cash on account of stock, (iv) the number of shares, if any, issued as fully paid up shares as consideration for any service rendered or otherwise, specifying in each case for what consideration such shares were issued, and (v) the amounts of dividends declared and paid; (d) respecting bonds and debentures: (i) the amount authorized, and the period of redemption, (ii) the amount sold (face value) and the rate of interest, (iii) the amount realized from sales, (iv) the annual amount set aside as sinking fund

to meet bonded indebtedness, and the date of commencement; (e) the indebtedness other than stock and bonds, specifying the nature and amounts, and the rate of interest such indebtedness is bearing; (f) a statement showing the total revenues of the undertaking, specifying the amount received from each and every source; (g) the maintenance and operation expenditures, separating those expenditures which are incurred at or near the works from head office and other expenditures relating to general administration; (h) the names of officers and the classification of employees, with salaries, expenses, or other remuneration paid or allowed; (i) the proposed extensions during ensuing years; (j) if a company, such annual return shall have attached thereto a copy of bylaws of the company, showing all amendments thereto during the year covered by that return; (k) such other data as the minister may require.

78(2) Every licensee shall file annually with the director on or before March 1 by a return for the year ending December 31 preceding a detailed summary of all information included under clauses 1(a) and (b).

Observance for subsections 78(1) and 78(2)

Manitoba Hydro tracks financial information for the integrated system as a whole except for projects involving a partnership or separate legal entity. Manitoba Hydro does not submit annual financial information specific to McArthur Falls GS with the director on or before March 1. Instead, Manitoba Hydro publishes an annual corporate report on a fiscal year basis ending on March 31st and makes these annual reports available to all Manitobans. The most current annual report is located at <https://www.hydro.mb.ca/corporate/financial/>.

The annual reports contain financial reviews and consolidated financial statements which reference current system value of property, plant, and equipment. Financial information presented in the annual reports is prepared in accordance with International Financial Reporting Standards (IFRS) and undergoes an independent audit. The independent auditors' report summarized in Manitoba Hydro's 2020-2021 annual report concluded that "the accompanying financial statements present fairly, in all material respects, the consolidated financial position of the Entity as at March 31, 2021, and its consolidated financial performance and its consolidated cash flows for the year then ended in accordance with the International Financial Reporting Standards (IFRS)."

Detailed information pertaining to clauses 1(a) and (b) of Section 78 is available upon request.

Transfers

80(1) Lands inside the severance line used or occupied for the purposes of the undertaking shall not be alienated, sold, or disposed of by the licensee without either (a) the consent of the minister; or (b) failing such consent, an order of the court; and subject to such terms as the minister or the court may lay down for the protection of the undertaking.

Observance

Manitoba Hydro carries out all licence area amendments with the consent of the Minister or delegate.

Miscellaneous provisions

82 Before executing any licence, the minister shall submit to the prospective licensee a draft of the proposed licence and shall secure from the licensee an acceptance thereof and an undertaking to observe and fulfill all the terms and conditions which under the licence and under this regulation such licensee is required to observe or fulfill, with particular reference to the right of Her Majesty to take over the works, lands and properties held by the licensee in connection with the licence in certain contingencies as this regulation provides. Such acceptance and undertaking shall be made to bind the executors, administrators and assigns, or in the case of a corporation the successors and assigns of the prospective licensee.

Observance

This provision requires no observance statement by the licensee.

87 Notwithstanding any rights granted or approval given by any licence, every licensee shall comply fully with the provisions of the Navigable Waters Protection Act (Canada) and any rules and regulations promulgated thereunder, and shall also comply fully with the provisions of any provincial statutes or regulations governing the preservation of the purity of waters or governing logging, forestry, fishing, wildlife or other interests present or future which might be affected by any operations conducted under the licence and shall also observe and carry out any instructions of the minister concerning any of those matters not inconsistent with the said statutes and regulations.

Observance

Manitoba Hydro is committed to and continues to observe the provisions of the Canadian Navigable Waters Act (formerly the Navigable Waters Protection Act (NWPA) and Navigation Protection Act (NPA)) and all provincial statutes and regulations.

McArthur Falls received the NWPA approval on November 19, 1953. McArthur Falls received NPA approval for installation of a safety boom and buoys on December 9, 2013.

Minister may issue short-term extension licences

92 (1) Despite section 46, if (a) a final licence has expired; or (b) the licensee has not applied for an extension of the final licence within the period set out in subsection 46 (1); the minister may, upon written application from the licensee in a form satisfactory to the minister and containing any information required by the minister, issue to the licensee a short-term extension licence for a term of not more than five years from the date issued.

Observance

Manitoba Hydro requested to extend the Final Licence on February 4, 2010 in accordance with Section 92 of the Water Power Regulation, Manitoba Regulation 25/88R of The Water Power Act for five years.

Manitoba Water Stewardship issued a Short Term Extension Licence (STEL) on November 3, 2010. Manitoba Hydro then requested to extend the Final Licence for a second time on June 26, 2015 for five years. Manitoba Conservation and Water Stewardship (now Environment and Climate Change) issued a Second STEL on September 8, 2015 for five years. It applied from October 1, 2015 to September 30, 2020. Manitoba Hydro requested a Third STEL on March 18, 2020 for a five year term and Manitoba Conservation and Climate (now Manitoba Environment and Climate Change) issued a Third STEL on September 8, 2020. It applies from October 1, 2020 to September 30, 2025.

92(2) A short-term extension licence may apply retroactively to the time that the final licence expired, in addition to a term of not more than five years as set out in subsection (1).

Observance

The first STEL states “this Short-term Extension Licence shall apply from January 1, 2005 to and including September 30, 2015” which includes the time period that the Final Licence expired. This is therefore a valid form of the WPA licence. The Second STEL was from 2015 to 2020. The Third STEL is from 2020 to 2025 and validates the WPA licence until 2025.

92 (6) A short-term extension licence may be renewed for one or more terms, provided that the term of any such renewal does not exceed five years. A renewed short-term extension licence must include the terms and conditions contained in the final licence, except where the minister considers it in the public interest to amend any term or condition, and may include such other terms or conditions as the minister may impose.

Observance

Manitoba Hydro requested a Third STEL on March 18, 2020 from Manitoba Conservation and Climate (now Manitoba Environment and Climate Change) who renewed the McArthur

Falls STEL on September 8, 2020. The Third STEL extension applies until September 30, 2025.

Renewal of final licence

93(1) Where a short-term extension licence is issued under subsection 92(1), or authorized under subsection 92(5), the licensee shall be deemed to have applied for an extended final licence, and section 46 applies with necessary changes.

Observance

This provision requires no observance statement by the licensee.

93(2) The minister may (a) conduct any public hearing that the minister considers necessary in accordance with subsection 46(3); and (b) provide for any consultations with First Nations or aboriginal communities about an extended final licence; during the term of the short-term extension licence.

Observance

This provision requires no observance statement by the licensee.

Division 4 – Closure Statement

Manitoba Hydro continues to operate the McArthur Falls Generating Station in accordance with the Third Short Term Extension Licence and the terms of the expired Final Licence (2002) for the development of water power at the McArthur Falls Site on the Winnipeg River. Manitoba Hydro operates and maintains the generating station and associated structures based on the Canadian Dam Association Dam Safety Guidelines. Manitoba Hydro maximizes operations of the McArthur Falls Generating Station to produce reliable energy for the benefit of all Manitobans. McArthur Falls GS continues to be integral to the overall system energy supply. Manitoba Hydro submits this report to Manitoba Environment and Climate Change to provide supporting information in the decision to issue a Renewal Licence under the Water Power Act for another set term as specified by the Minister.

FIGURES

Figure 1 McArthur Falls Generating Station General Arrangement

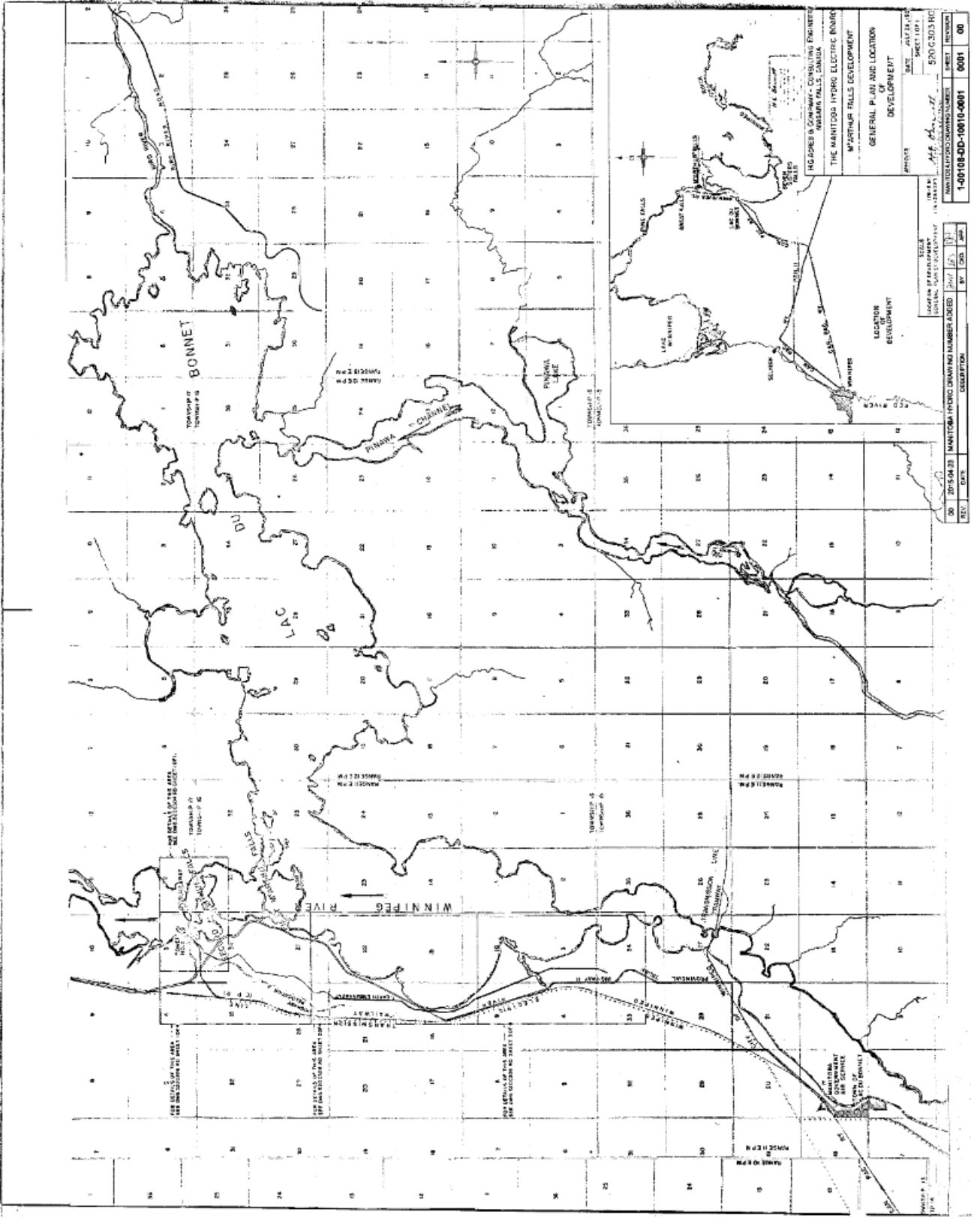


Figure 2 General Plan of Development

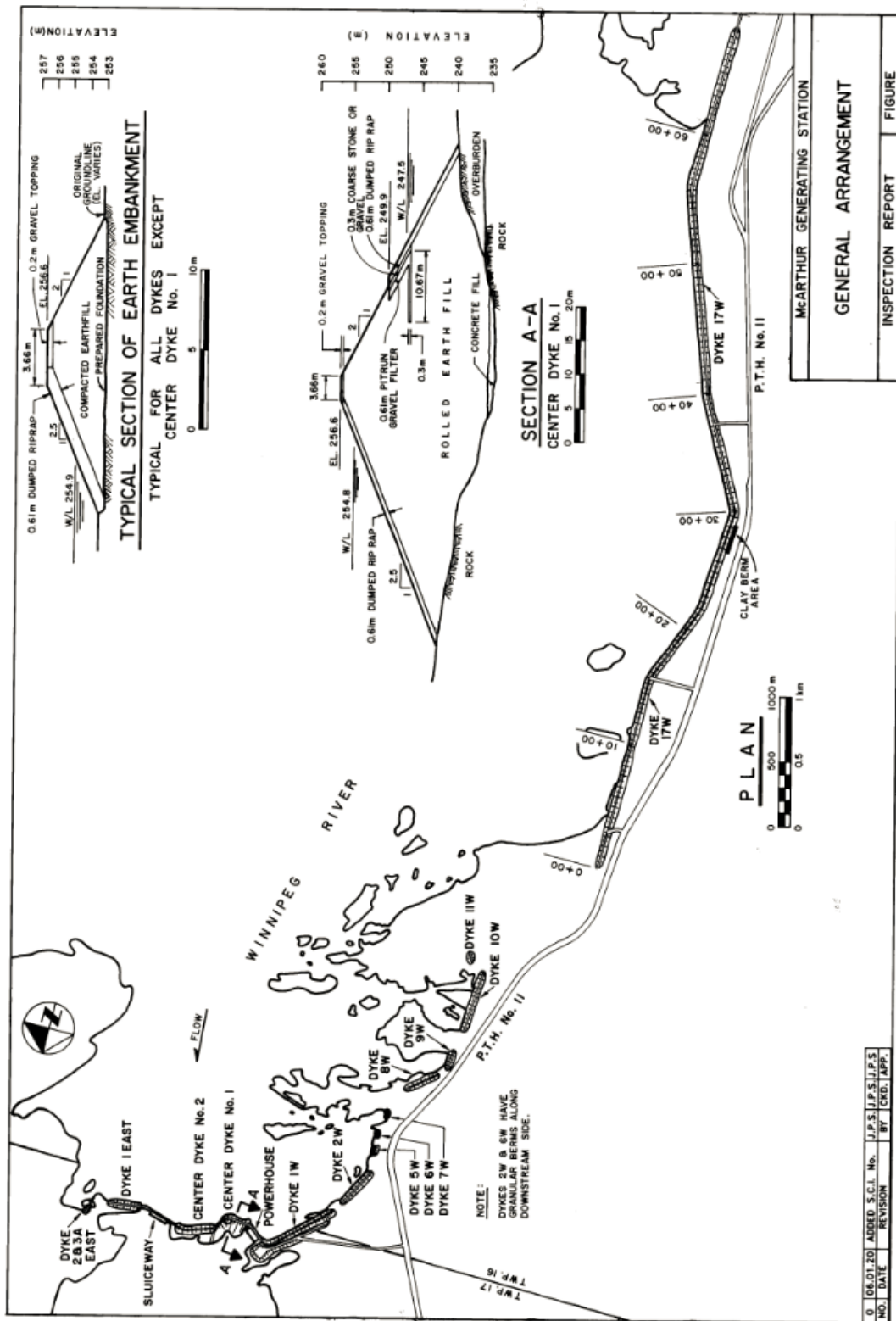


Figure 3 McArthur Falls Generating Station

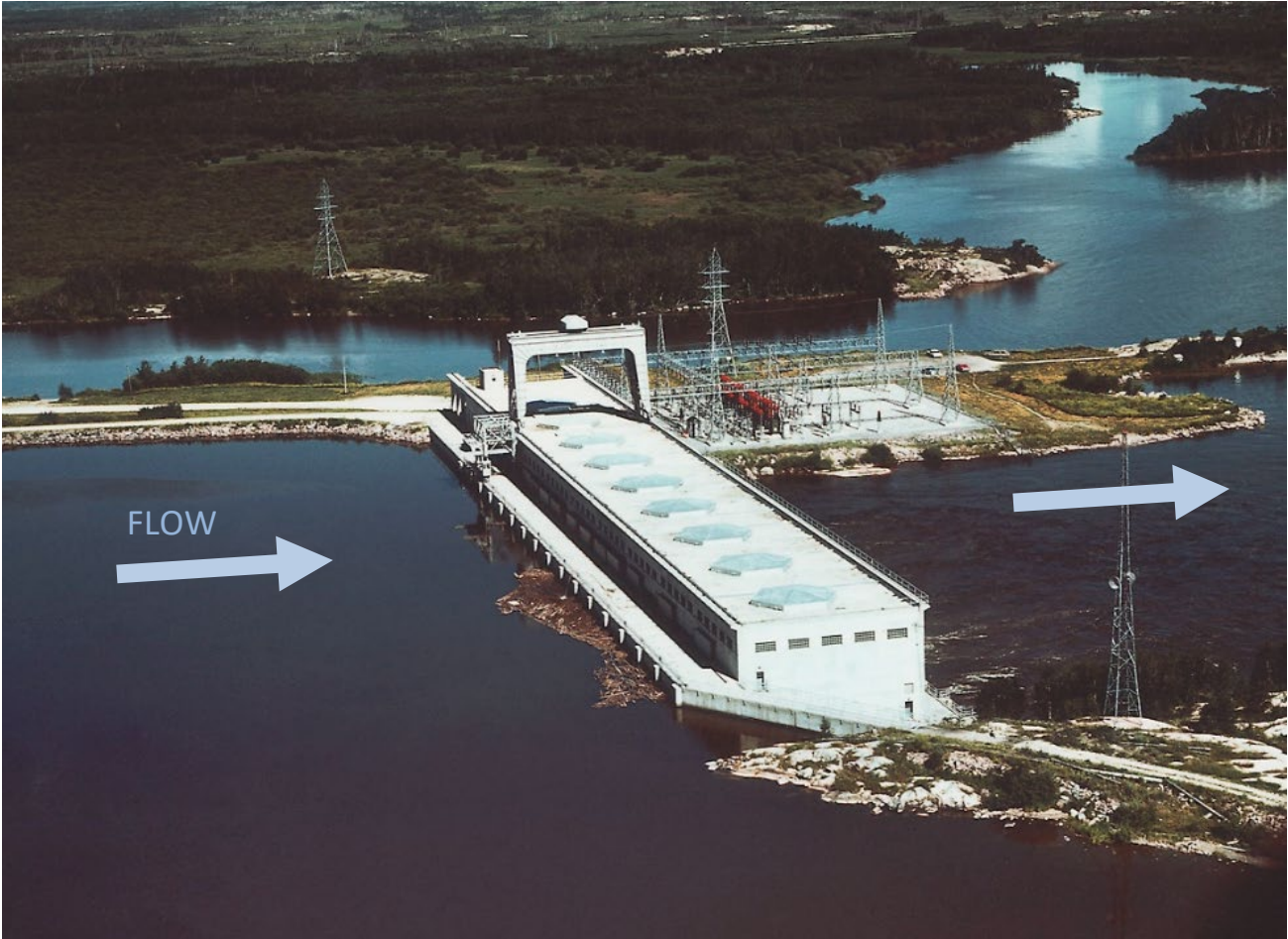


Figure 5 McArthur Falls GS Historic Water Level Compliance

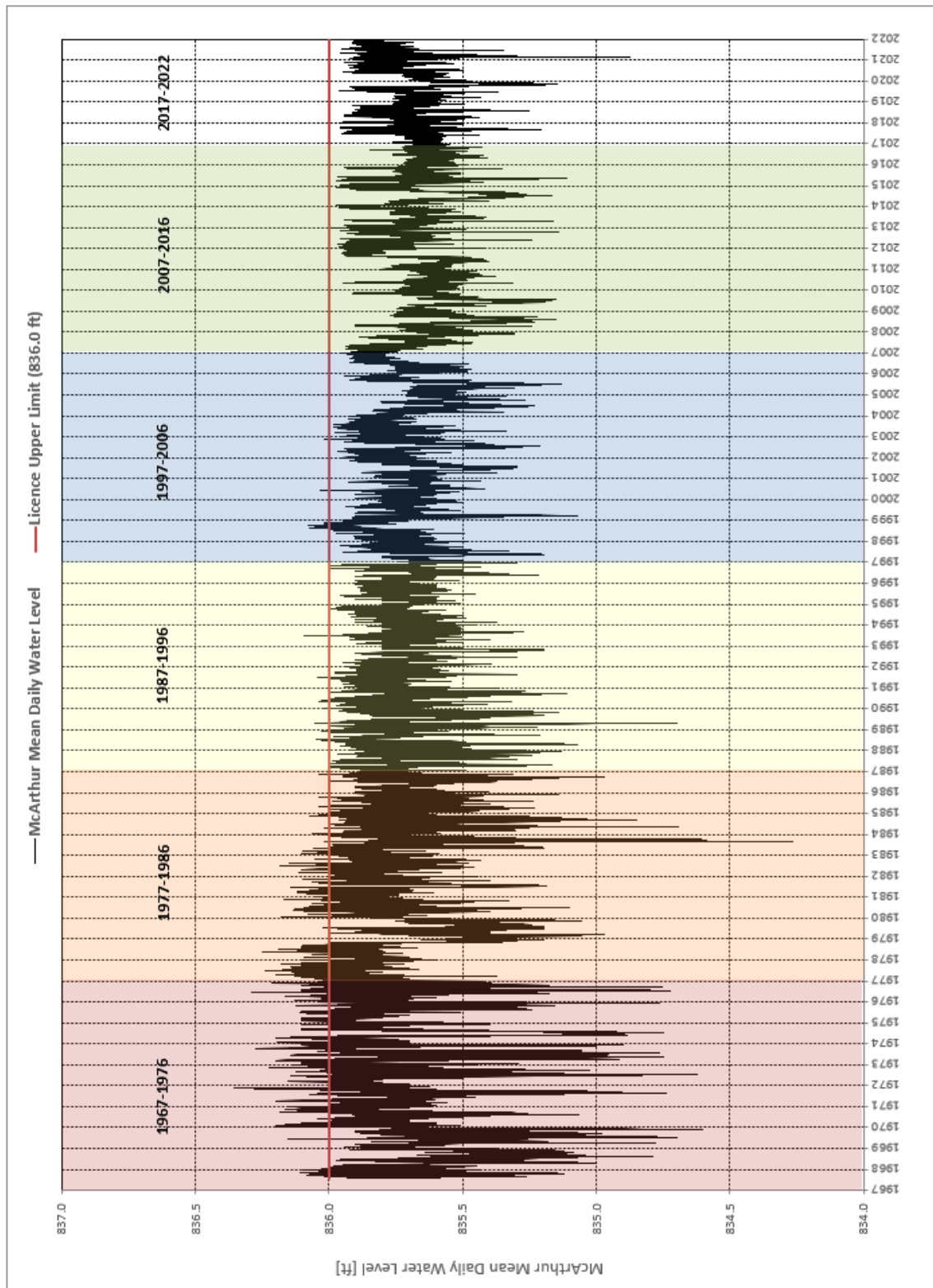


Figure 6 McArthur Falls GS Historic Power Generation (horsepower)

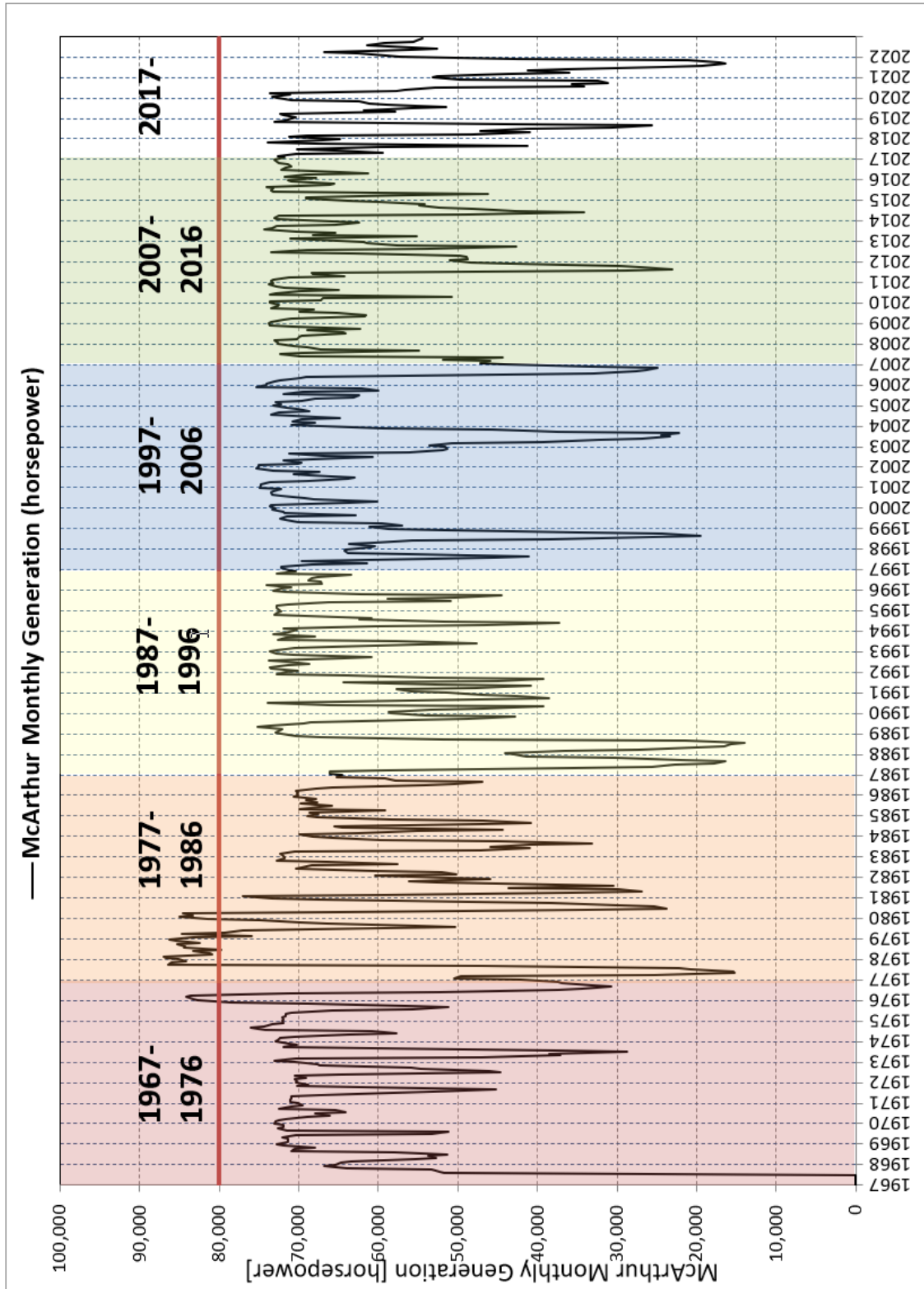


Figure 7 Unit No. 1 Nameplate Original

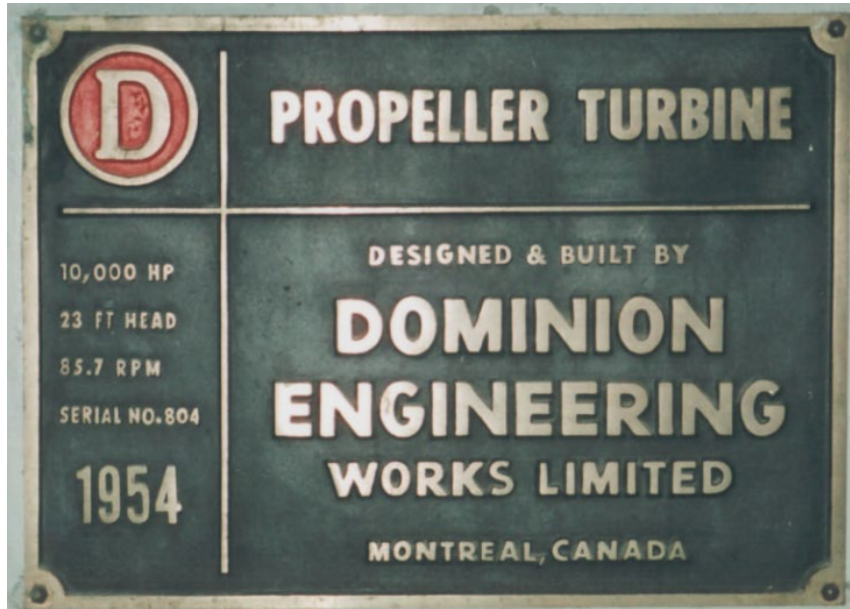


Figure 8 Unit No. 2 Nameplate Original



Figure 9 Unit No. 3 Nameplate Original



Figure 10 Unit No. 4 Nameplate Original

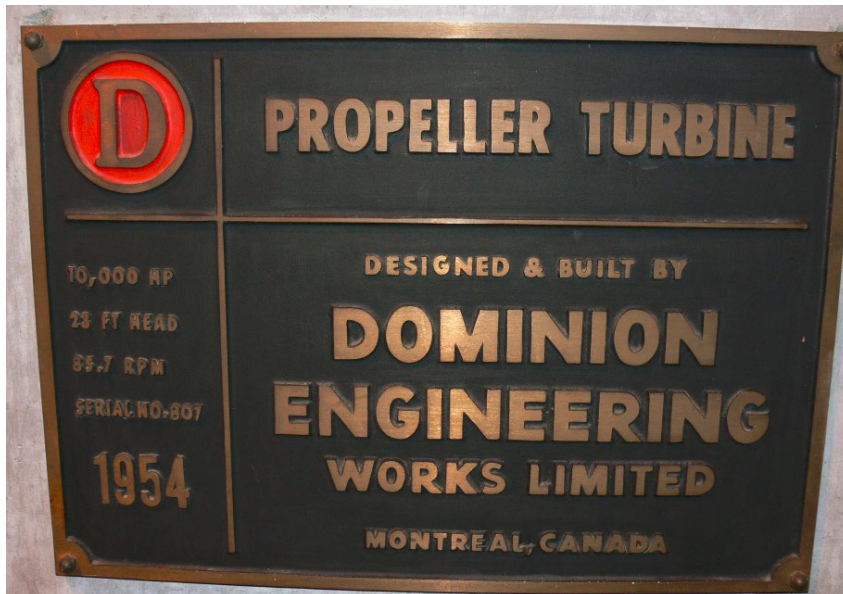


Figure 11 Unit No. 5 Nameplate Original

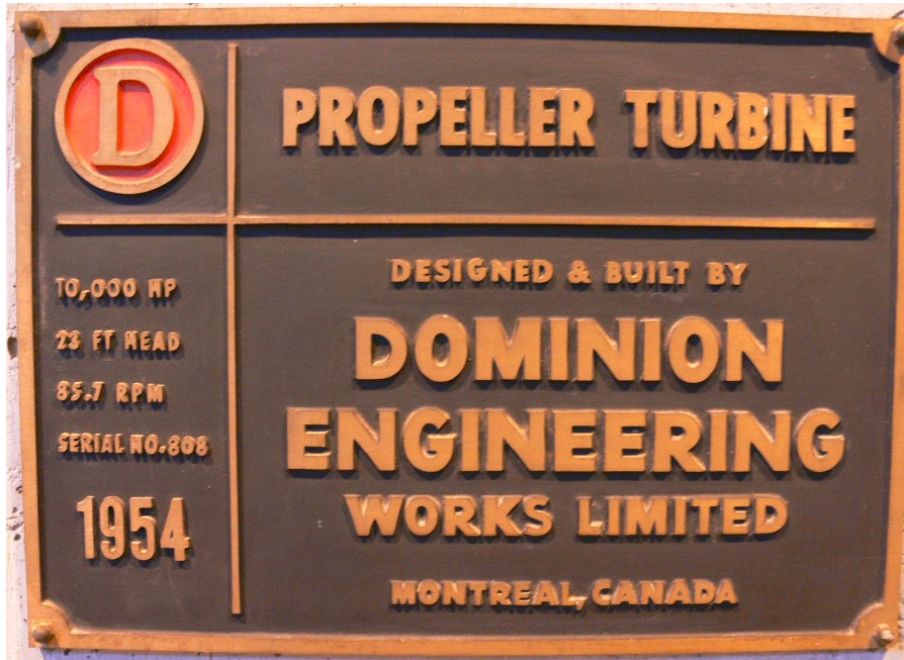


Figure 12 Unit No. 6 Nameplate Original



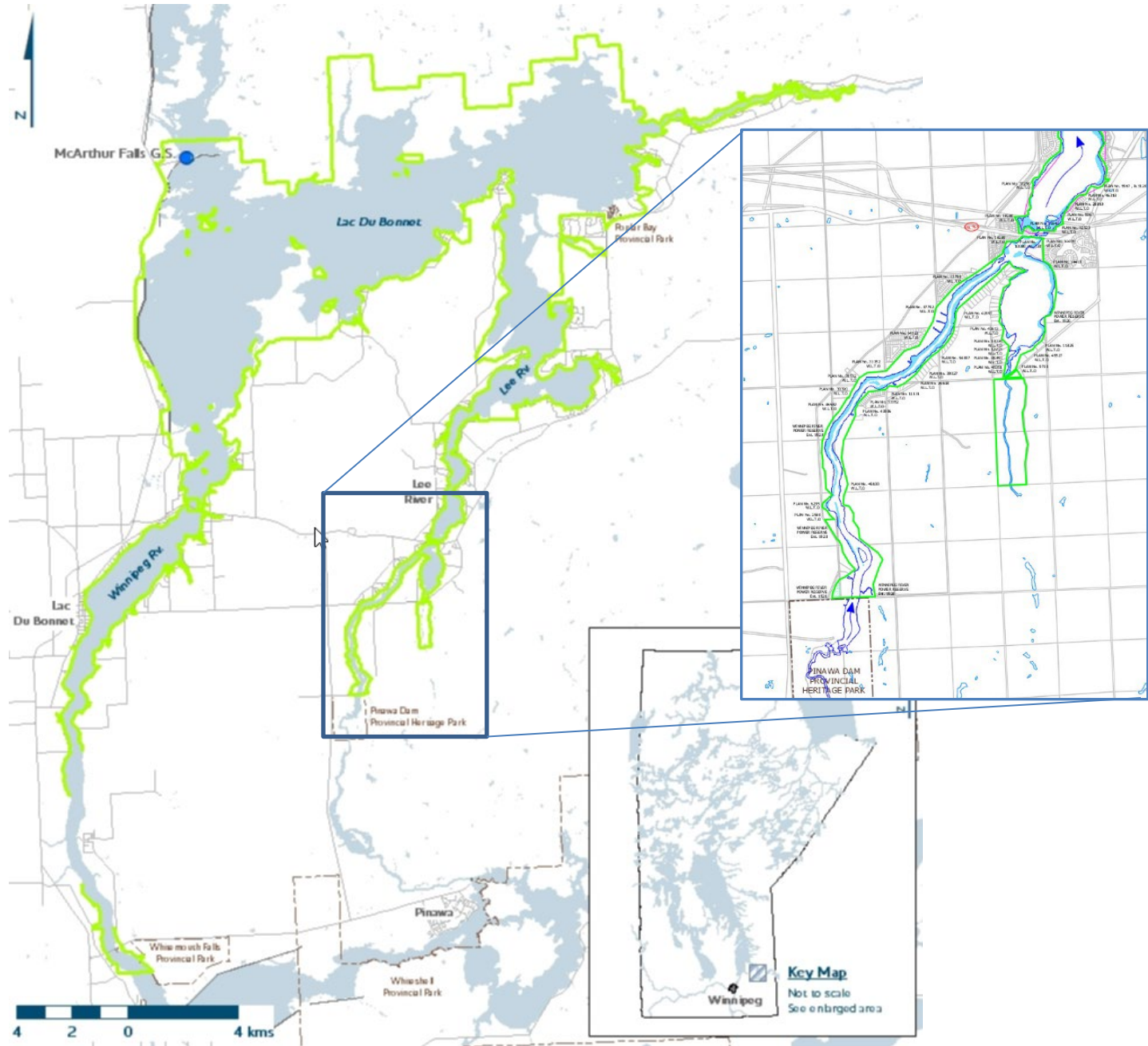
Figure 13 Unit No. 7 Nameplate Original



Figure 14 Unit No. 8 Nameplate Original



Figure 15 – McArthur GS Proposed Severance Line 2023



Appendix A – Renewal Licence Request



PO Box 815 • Winnipeg MANITOBA CANADA • R3C 2P4
Telephone / N° de téléphone : (204) 474-3018
Fax / N° de télécopieur : (204) 452-5639
hszbig.niewicz@hydro.mb.ca

1999 02 26

Mr. S.D. Topping
Director
Water Resources Branch
Box 11
200 Saulteaux Cresc.
Winnipeg MB R3J 3W3

Dear Mr. Topping:

Re: MCARTHUR FALLS LICENCE RENEWAL APPLICATION

Manitoba Hydro hereby applies for the renewal of the McArthur Falls Final Licence under the provisions set out in subsection 46(1) of the Water Power Act and Regulations. This renewal application falls within the specified two year period of "not less than four nor more than six years prior to the termination" of the licence on 2004 12 31.

To our knowledge, Manitoba Hydro has met all the requirements of the existing licence and complied with all laws, regulations and special requests from the Director or Minister. Manitoba Hydro intends to continue these practises at the McArthur Falls site.

Yours truly,

Original signed by:

A large black rectangular redaction box covering the signature of the sender.

H.S. Zbigniewicz, P. Eng.
Manager
Hydraulic Engineering & Operations

HJE/ljm/990226-1.w61

Appendix B – Final Licence & Short Term Extension Licences

PROVINCE OF MANITOBA
DEPARTMENT OF AGRICULTURE AND CONSERVATION
WATER CONTROL AND CONSERVATION BRANCH

FINAL LICENSE FOR THE DEVELOPMENT OF WATER POWER
McArthur Falls Site, Winnipeg River

Issued in accordance with the provisions of the Water Power Act, Chapter 288, Revised Statutes of Manitoba, 1954, and amendments, and of the Regulations in force thereunder to govern the mode of granting and administering Provincial water power rights.

WHEREAS Manitoba Hydro, a corporation duly incorporated by Act of the Legislature of the Province of Manitoba, and whose head office address is 820 Taylor Avenue in the City of Winnipeg, (hereinafter called "the licensee") has completed and is operating a hydro-electric development at the McArthur Falls site on the Winnipeg River in the Province of Manitoba;

AND WHEREAS the said development has been constructed in accordance with plans filed with and approved by the Director of Provincial Water Powers at Winnipeg, (hereinafter called "the Director") but without the issue to the licensee of an Interim License under the provisions of the Water Power Act, R.S.M. 1954, Cap. 288 (hereinafter called "the Act") and the Manitoba Water Power Regulations being Manitoba Regulation 95/45 and all amendments thereto (hereinafter called "the Regulations");

AND WHEREAS the licensee by letter dated September 14, 1959, signed by D. M. Stephens, Chairman and General Manager, has applied to the Director for a Final License for the said McArthur Falls Development, and the licensee has done all those things which in the opinion of the Director are required to be done prior to the issue of the said Final License;

AND WHEREAS the licensee has duly executed an acceptance of the terms and conditions of this Final License and has undertaken to observe and fulfill all the terms and conditions which under this Final License and under the Act and Regulations thereunder the said licensee is required to observe and fulfill;

NOW THEREFORE, under authority of and subject to the provisions of the Act and Regulations thereunder this Final License is issued, granting to the Licensee:

- (a) The right to impound, divert and use waters of the Winnipeg River at and near the McArthur Falls Site,
- (b) The right to develop electric power and energy from the said waters,
- (c) The right to generate, transmit, distribute, sell and deliver the said electric power and energy and for that purpose to use and occupy the lands of the Province hereinafter described, and
- (d) The right to operate and maintain the undertaking, the location and description of which is shown upon the record plans numbered and filed in the office of the Director at Winnipeg.

SUBJECT, nevertheless, to the provisions of the Regulations and any other regulations now or hereafter in force governing the granting and administering of Provincial water-powers and the lands required in connection with the development and use thereof, and to the following special terms and conditions, namely:

1. The Licensee may divert and use continuously for the development of power at the said McArthur Falls site all the water of the Winnipeg River which may be flowing at the said site from time to time during the term of this Final License, subject, however, to the provisions of Section 72 of the Regulations.
2. The undertaking authorized to be maintained and operated by the Licensee under this Final License shall comprise the following: a concrete dam with sluice-gates and non-overflow sections; an earth-fill dam; a powerhouse with eight vertical type units of 10,000 horsepower capacity; dykes; switching-station; transmission line; and all necessary works, machinery and equipment for the complete development, generation and transmission of electric power available at the said McArthur Falls site, all as shown by plans and descriptions thereof filed in the office of the said Director at Winnipeg, as follows:

Manitoba Water Control and Conservation Branch File Number	Licensee's File Number	Description
21-4-1051	520-C-1123 (Rev. A)	Earth Embankment, Location Plan, North Section
21-4-1053	520-C-1125 (Rev. A)	Earth Embankment, Location Plan, Centre Section
21-4-1052	520-C-1124 (Rev. A)	Earth Embankment, Location Plan, South Section
21-4-1054	520-C-1126 (Rev. A)	Earth Embankment, Sections and Details
21-4-3006	520-D-1045 (Rev. A)	Main Sluiceway, Plan, Ele- vations and Sections, Concrete Details
21-4-3007	520-D-1039 (Rev. A)	Powerhouse, General Arrange- ment, Typical Cross Sections
21-4-3008	520-D-1041 (Rev. A)	Powerhouse, Upstream Elevation
21-4-3009	520-D-1042 (Rev. A)	Powerhouse, Downstream Elevation
21-4-3010	520-D-1043 (Rev. A)	Powerhouse, End Elevations
21-4-1055	520-B-1404 (Rev. B)	Earth Embankment No. 1 Centre Dyke, Plan and Sections
21-4-1066	520-C-1174 (Rev. B)	Earth Embankment Profile

3. Lands of the Province which may be entered upon, used or occupied for the maintenance and operation of the said works shall be the following:

(a) Lands of the Province not covered by water required for main diverting works, powerhouses, etc.

All those parts of the following lands not covered by the waters of the Winnipeg River as shown outlined in green on Record Plan No. 21-4-1057 filed in the office of the said Director at Winnipeg and which is the Licensee's No. 0108-E-0227 (Rev. 0):

- (i) The west half and north-east quarter of Section Thirty-four (34) in Township Sixteen (16) and Range Eleven (11) East of the Principal Meridian in Manitoba.
- (ii) The south-east quarter of Section Three (3) and the south-west quarter and Legal Subdivision Two (2) of

Section Two (2), all in Township Seventeen (17)
and Range Eleven (11) East of the Principal Meridian
in Manitoba.

(iii) Road allowance between the said north-east quarter of
Section Thirty-four (34) and south-east quarter of
Section Three (3).

(iv) Road allowance between the said south-east quarter of
Section Three (3) and south-west quarter of Section Two (2).

(b) Lands of the Province covered by water required for main diverting
works, powerhouses, etc.

All those parts of the south-east quarter of Section Three (3)
and the south-west quarter of Section Two (2), all in Township
Seventeen (17) and Range Eleven (11) East of the Principal Meridian
in Manitoba, covered by the waters of the Winnipeg River as shown
outlined in red on the said Plan No. 21-4-1057.

(c) Lands of the Province required only to be flooded in connection
with the storage or pondage of water

All those portions of the following Townships shown outlined in
brown on the said Plan No. 21-4-1057, excepting thereout, first,
all those lands heretofore described as required for works and,
second, all those lands shaded yellow on the said Plan No. 21-4-1057:

(i) Township Fourteen (14), Fifteen (15), Sixteen (16) and
Seventeen (17) in Range Eleven (11) East of the Principal
Meridian in Manitoba.

(ii) Township Fifteen (15), Sixteen (16) and Seventeen (17)
in Range Twelve (12) East of the Principal Meridian in
Manitoba.

(iii) Townships Sixteen (16) and Seventeen (17) in Range
Thirteen (13) East of the Principal Meridian in Manitoba.

(iv) Township Seventeen (17) in Range Fourteen (14) East of
the Principal Meridian in Manitoba.

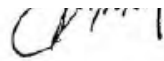
4. The licensee shall not raise the headwater of its development to an
elevation higher than 836.0 above mean sea level, Canadian Geodetic
Datum, 1929 Adjustment. A higher elevation may be created only with
prior written permission by the Director and in accordance with Section
72 of the Regulations.

5. The Licensee shall by purchase or otherwise acquire all necessary flooding rights on privately-owned lands forming the shores of the river above its development, and shall assume full responsibility for damage to such lands beyond the limits of the rights so acquired if caused by the operation of its development at headwater elevations above those from time to time authorized.
6. In accordance with Section 45 of the Regulations, the term of this Final License shall be fifty (50) years from and after the first day of January, A. D. 1955, and the said term shall thereafter be subject to renewal or extension in accordance with the provisions of the laws and Regulations relating thereto and then in force.
7. On the second day of January in each and every year during the term of this Final License the Licensee shall pay an annual rental in advance of three hundred dollars (\$300.00) for the use and occupation of lands of the Province described in Article 3 hereof.
8. The Licensee shall also pay an annual rental during the term of this Final License for the use of water for the development of power, determined in accordance with the principles set out in Section 48 of the Regulations and payable at the times and in the manner therein provided, and at the following rates:
 - (a) The rentals in the first twenty years of the term of this License shall be the greater of:
 - (i) An annual rental of fifty (50) cents per installed horsepower;
 - (ii) An annual rental of one dollar and twenty-five cents (\$1.25) per horsepower year output.
 - (b) The annual rental to be paid after the expiry of the said twenty year period shall be determined as provided in the regulations in force at such time.
9. The Licensee shall assume the proportionate share of the capital cost of water storage in Lake of the Woods and Lac Seul, which prior to the first day of January, A. D. 1955, was charged to the McArthur Falls site

as an undeveloped power site; and shall, commencing with an initial payment on the first day of January, A.D. 1956, make like equal annual payments on the first day of January in each succeeding year ending with the payment due on the first day of January, A.D. 1980. These annual payments shall be determined on the basis of an amortization of the capital cost of storage on Lake of the Woods and Lac Seul computed using an interest rate of five percent per annum over the period commencing on the first day of January, A.D. 1955, and ending on the first day of January, A.D. 1980. The licensee shall also from the first day of January, A.D. 1955 pay annually the proportionate share chargeable to its development of the annual operating costs of the aforesaid storage; the first of such annual payments shall be made on the first day of January, A.D. 1956 and subsequent annual payments thereafter shall be made on the first day of January of each and every year until the termination of this license; each payment to represent the licensee's share of the said annual operating costs for the preceding calendar year.

10. The Severance Line as defined in Section 1 of the Regulations shall be as shown in red and marked "Severance Line" upon the said Record Plan numbered 21-4-1050 filed in the office of the Director, and which is the Licensee's Drawing No. 0108-E-0223. (Rev.0).
11. All record plans filed with the Director and referred to in this Final License are incorporated herewith and made a part hereof.
12. This Final License is issued upon the express condition that it shall be subject to the provisions of the Regulations and all amendments thereto.

ISSUED at Winnipeg this 30th day of November A.D. 1965
at the direction of the Honourable the Minister of Agriculture and Conservation.

 Minister of Agriculture & Conservation

**PROVINCE OF MANITOBA
MANITOBA WATER STEWARDSHIP**

**SHORT-TERM EXTENSION LICENCE
FOR THE DEVELOPMENT OF WATER POWER
McArthur Falls Site, Winnipeg River**

Issued to Manitoba Hydro, being a duly incorporated by Act of the Legislature of the Province of Manitoba whose head office address is at 360 Portage Avenue, Winnipeg, Manitoba, R3C 2P4
Issued in accordance with The Water Power Act (C.C.S.M. c. W60),
and the Water Power Regulation (M.R. 25/88R).

WHEREAS:

- A. Manitoba Hydro (hereinafter called "the Licensee") is the holder of a Final Licence for the development of water power at the McArthur Falls Site, dated November 30, 1965 (a copy of that Final Licence is attached as Schedule "A" to this Short-term Extension Licence);
- B. The term of the Final Licence was for a term of fifty (50) years from January 1, 1955;
- C. The Licensee by letter dated February 26, 1999 signed by H.S. Zbigniewicz, Manager of Hydraulic Engineering and Operations, applied for a renewal of the McArthur Falls Final Licence;
- D. The Final Licence has not yet been renewed, and the Licensee has applied by letter dated February 4, 2010 signed by W. V. Penner, Manager, Hydraulic Operations Department, to the Executive Director of Regulatory and Operational Services of Manitoba Water Stewardship for a Short-term Extension Licence for the McArthur Falls development in accordance with section 92 of the Water Power Regulation and has done all things which, in the opinion of the Executive Director, are required to be done by the Licensee prior to the issuance of a Short-term Extension Licence;
- E. It is contemplated that decisions will be made about the application for a renewal of the Final Licence during the term of this Short-term Extension Licence.
- F. The Licensee has duly executed an acceptance of the terms and conditions of this Short-term Extension Licence and has undertaken to observe and fulfill all the terms and conditions which the Licensee is required to observe and fulfill under this Short-term Extension Licence.

This Short-term Extension Licence is issued, granting to the Licensee:

- (a) The right to impound divert and use water of the Winnipeg River at and near the McArthur Falls Site,
- (b) The right to develop electric power and energy from the said waters,
- (c) The right to generate, transmit, distribute, sell and deliver the said electric power

and energy and for that purpose to use and occupy the lands of the Province described in the Final Licence, and

- (d) The right to operate and maintain the undertaking, the location and description of which is shown upon the record plans numbered and filed in the office of the Executive Director at Winnipeg.

on the same terms and conditions as set out in the Final Licence, subject to the following specific terms and conditions:

1. This Short-term Extension Licence shall apply from January 1, 2005 to and including September 30, 2015.
2. On the second day of January in each year the Licensee shall pay an annual rental in advance for the use and occupation of lands of the Province described in parts (a), (b), and (c) of Article 3 of the Final Licence at the rates set from time to time by Regulation under *The Water Power Act*.¹
3. The Licensee shall pay an annual rental for the use of water for the development of power at the rates set from time to time by Regulation under *The Water Power Act* and payable at the times and in the manner provided for by Regulation under *The Water Power Act*.²
4. The terms and conditions set out in the Final Licence apply as if set out specifically in this Short-term Extension Licences, except where inconsistent with the terms and conditions set out specifically in this document, in which case the terms and conditions set out in this document will apply.
5. The Licensee shall comply with *The Water Power Act* and the Water Power Regulation.

ISSUED at Winnipeg this 3rd day of November, 2010.

Minister of Water Stewardship

¹ Rental rates for land use are currently set out in s. 48(3.1) of the Water Power Regulation.

² Rental rates for the use of water for the development of power are currently set out in s. 48(3.2) of the Water Power Regulation.

**PROVINCE OF MANITOBA
MANITOBA WATER STEWARDSHIP**

**SECOND SHORT-TERM EXTENSION LICENCE
FOR THE DEVELOPMENT OF WATER POWER
McArthur Falls Site, Winnipeg River**

Issued to Manitoba Hydro, being a duly incorporated by Act of the Legislature of the Province of Manitoba whose head office address is at 360 Portage Avenue, Winnipeg, Manitoba, R3C 2P4
Issued in accordance with The Water Power Act (C.C.S.M. c. W60),
and the Water Power Regulation (M.R. 25/88R).

WHEREAS:

- A. Manitoba Hydro (hereinafter called "the Licensee") is the holder of a Final Licence for the development of water power at the McArthur Falls Site, dated November 30, 1965 (a copy of that Final Licence is attached as Schedule "A" to this Second Short-term Extension Licence);
- B. The term of the Final Licence was for a term of fifty (50) years from January 1, 1955;
- C. The Licensee by letter dated February 26, 1999 signed by H.S. Zbigniewicz, Manager of Hydraulic Engineering and Operations, applied for a renewal of the McArthur Falls Final Licence;
- D. The Final Licence has not yet been renewed. The Final Licence was extended by a Short-Term Extension Licence, dated November 3, 2010 with a term to and including September 30, 2015. The Licensee has applied by letter dated June 26, 2015 signed by W. V. Penner, Manager, Hydraulic Operations Department, to Rob Matthews, Manager of Water Use Licensing, Manitoba Conservation and Water Stewardship for a renewal of the Short-term Extension Licence for the McArthur Falls development in accordance with section 92(6) of the Water Power Regulation and has done all things which, in the opinion of the Executive Director, are required to be done by the Licensee prior to the issuance of this Second Short-term Extension Licence;
- E. It is contemplated that decisions will be made about the application for a renewal of the Final Licence during the term of this Second Short-term Extension Licence.
- F. The Licensee has duly executed an acceptance of the terms and conditions of this Second Short-term Extension Licence and has undertaken to observe and fulfill all the terms and conditions which the Licensee is required to observe and fulfill under this Second Short-term Extension Licence.

This Second Short-term Extension Licence is issued, granting to the Licensee:

- (a) The right to impound divert and use water of the Winnipeg River at and near the McArthur Falls Site,

- (b) The right to develop electric power and energy from the said waters,
- (c) The right to generate, transmit, distribute, sell and deliver the said electric power and energy and for that purpose to use and occupy the lands of the Province described in the Final Licence, and
- (d) The right to operate and maintain the undertaking, the location and description of which is shown upon the record plans numbered and filed in the office of the Executive Director at Winnipeg.

on the same terms and conditions as set out in the Final Licence, subject to the following specific terms and conditions:

1. This Second Short-term Extension Licence shall apply from October 1, 2015 to and including September 30, 2020.
2. On the second day of January in each year the Licensee shall pay an annual rental in advance for the use and occupation of lands of the Province described in parts (a), (b), and (c) of Article 3 of the Final Licence at the rates set from time to time by Regulation under *The Water Power Act*.¹
3. The Licensee shall pay an annual rental for the use of water for the development of power at the rates set from time to time by Regulation under *The Water Power Act* and payable at the times and in the manner provided for by Regulation under *The Water Power Act*.²
4. The terms and conditions set out in the Final Licence apply as if set out specifically in this Second Short-term Extension Licences, except where inconsistent with the terms and conditions set out specifically in this document, in which case the terms and conditions set out in this document will apply.
5. The Licensee shall comply with *The Water Power Act* and the Water Power Regulation.

ISSUED at Winnipeg this 26th day of August, 2015.

Minister
Conservation and Water Stewardship

¹ Rental rates for land use are currently set out in s. 48(3.1) of the Water Power Regulation.

² Rental rates for the use of water for the development of power are currently set out in s. 48(3.2) of the Water Power Regulation.

**PROVINCE OF MANITOBA
MANITOBA CONSERVATION AND CLIMATE**

**THIRD SHORT-TERM EXTENSION LICENCE
FOR THE DEVELOPMENT OF WATER POWER
McArthur Falls Site, Winnipeg River**

Issued to Manitoba Hydro ("the Licensee"), being a duly incorporated by Act of the Legislature of the Province of Manitoba whose head office address is at 360 Portage Avenue, Winnipeg, Manitoba, R3C 2P4

Issued in accordance with The Water Power Act (C.C.S.M. c. W60),
and the Water Power Regulation (M.R. 25/88R).

WHEREAS:

- A. The Licensee is the holder of a Final Licence for the development of water power at the McArthur Falls Site, dated November 30, 1965 (a copy of that Final Licence is attached as Schedule "A" to this Third Short-term Extension Licence);
- B. The term of the Final Licence was for a term of fifty (50) years from January 1, 1955;
- C. The Licensee by letter dated February 26, 1999 signed by H.S. Zbigniewicz, Manager of Hydraulic Engineering and Operations, applied for a renewal of the McArthur Falls Final Licence in accordance with subsection 46(1) of the Water Power Regulation;
- D. The Final Licence has not yet been renewed. The Final Licence was extended by two Short-Term Extension Licences, the first dated November 3, 2010 with a term to and including September 30, 2015 and the second dated August 26, 2015 with a term to and including September 30, 2020. The Licensee has applied by letter dated March 18, 2020 signed by W. V. Penner, Manager, Hydraulic Operations Department, to the Manager of Water Power Act Licensing Section of the Department of Conservation and Climate for a renewal of the Short-term Extension Licence for the McArthur Falls development in accordance with subsection 92(6) of the Water Power Regulation and has done all things which, in the opinion of the Director, are required to be done by the Licensee prior to the issuance of this Third Short-term Extension Licence;
- E. It is contemplated that decisions will be made about the application for a renewal of the Final Licence during the term of this Third Short-term Extension Licence.
- F. The Licensee has duly executed an acceptance of the terms and conditions of this Third Short-term Extension Licence and has undertaken to observe and fulfill all the terms and conditions which the Licensee is required to observe and fulfill under this Third Short-term Extension Licence.

This Third Short-term Extension Licence is issued, granting to the Licensee:

- (a) The right to impound divert and use water of the Winnipeg River at and near the McArthur Falls Site,
- (b) The right to develop electric power and energy from the said waters,
- (c) The right to generate, transmit, distribute, sell and deliver the said electric power and energy and for that purpose to use and occupy the lands of the Province described in the Final Licence, and
- (d) The right to operate and maintain the undertaking, the location and description of which is shown upon the record plans numbered and filed in the office of the Director at Winnipeg.

on the same terms and conditions as set out in the Final Licence, subject to the following specific terms and conditions:

1. This Third Short-term Extension Licence shall apply from October 1, 2020 to and including September 30, 2025.
2. On the second day of January in each year the Licensee shall pay an annual rental in advance for the use and occupation of lands of the Province described in parts (a), (b), and (c) of Article 3 of the Final Licence at the rates set from time to time by Regulation under The Water Power Act.¹
3. The Licensee shall pay an annual rental for the use of water for the development of power at the rates set from time to time by Regulation under The Water Power Act and payable at the times and in the manner provided for by Regulation under The Water Power Act.²
4. The terms and conditions set out in the Final Licence apply as if set out specifically in this Third Short-term Extension Licences, except where inconsistent with the terms and conditions set out specifically in this document, in which case the terms and conditions set out in this document will apply.
5. The Licensee shall comply with The Water Power Act and the Water Power Regulation.

ISSUED at Winnipeg this 8th day of September, 2020.

Witness

Blair McTavish
A/Deputy Minister
Conservation and Climate

¹ Rental rates for land use are currently set out in s. 48(3.1) of the Water Power Regulation.

² Rental rates for the use of water for the development of power are currently set out in s. 48(3.2) of the Water Power Regulation.

Appendix C – Maintenance and Construction Record

The major maintenance and construction activities that occurred between 2008-2022 calendar years are summarized for the McArthur Falls Water Power Act licence area:

2008

- Center Dike #2 riprap rock repairs were made at the downstream toe.
- As part of the Winnipeg River Bank Protection Program, the riverbank was stabilized at four properties upstream of the generating station to prevent further localized erosion.
- Sluiceway Gate #5 bushings were replaced.

2009

- As part of the Winnipeg River Bank Protection Program, the riverbank was stabilized at five properties upstream of the generating station to prevent further localized erosion.

2010

- The spillway, east and west powerhouse abutment gravity dams were anchored as part of the Dam Safety Program.
- The spillway hoist cables and bushings were replaced on two gates.
- As part of the Winnipeg River Bank Protection Program, the riverbank was stabilized at one property upstream of the generating station to prevent further localized erosion.
- The 115kV switchyard breakers were replaced.

2011

- The hydro-mechanical automatic voltage regulators were removed from service, disassembled and restored on all units.
- Roller bushings and cables were replaced in sluiceway bays #1, 2, 3 and 6.
- Ground anchors were installed to stabilize the spillway.
- Fall protection was added around the top of the generators.

2012

- Fall Protection upgrades were completed.
- Anchoring of spillway and gravity dams was completed.

2013

- Stabilization berms at specific locations downstream of Dike 17 West were constructed.

2014

- No major events to report

2015

- Converted water and sewer systems to store and haul systems
- Provided access and ventilation to service bay basement for sewer and water systems

2016

- Commenced replacement of accumulator tanks for Units 1-8
- Completed Battery Bank and Inverter upgrade
- Completed sluiceway rollway and pier top anchoring
- Completed stabilization berm as per CDA guidelines along Dike 17W

2017

- Completed replacement of station service transformers

2018

- No major events to report

2019

- All 4 station service transformer replacements are completed
- Replaced the station diesel fire pump controller

2020

- Sprayed herbicide to clear vegetation on embankment dams
- Storage frame for draft tube stoplogs was installed

2021

- Mechanically cleared vegetation at dike 1 west
- Storage frame for draft tube stoplogs was installed
- Installed new U1 & 2 breakers

2022

- Sprayed herbicide and mechanically cleared vegetation on embankment dams

Appendix D – Correspondence

Appendix D

This appendix contains copies of key documents referenced previously in this report related to the licence renewal process. The following is a list of all relevant documents along with the page number location:

- October 30, 1991 letter from the Minister of Natural Resources to the Executive Vice President of Manitoba Hydro notifying of change in land rental billing to calendar year, page 73.
- February 29, 1996 letter from the Deputy Minister of Natural Resources to the Executive Vice President of Manitoba Hydro notifying of change in water rentals from annual to monthly, page 74.
- November 4, 1996 letter from the Deputy Minister of Natural Resources to the Energy, Security & Sales Manager of Manitoba Hydro notifying of change in billing of land rentals from calendar year to fiscal year beginning April 1, page 75.
- February 26, 1999 letter from Hydraulic Engineering & Operations Manager of Manitoba Hydro to the Director Water Resources Branch to apply for the renewal of the McArthur Falls Final Licence, page 77.
- March 25, 1999 letter from Water Resources Branch Director to Hydraulic Engineering & Operations Manager of Manitoba Hydro to respond to renewal request, page 78.
- September 28, 2009 letter from Hydraulic Operations Department Manager of Manitoba Hydro to the Regulatory & Operational Services Executive Director providing a renewal licensing update, page 79.
- October 23, 2009 letter from Regulatory and Operational Services Executive Director of Water Stewardship to Hydraulic Operations Department Manager reponse to renewal licensing update, page 81.



Minister of
Natural Resources

Legislative Building
Winnipeg, Manitoba, CANADA
R3C 0V8

October 30, 1991

RECEIVED

NOV 4 1991

EXECUTIVE VICE-PRESIDENT

Mr. R.O. Lambert, P. Eng.
Executive Vice-President
Manitoba Hydro
P.O. Box 815
Winnipeg, Manitoba
R3C 2P4

Dear Mr. Lambert:

Pursuant to Section 85 of the Water Power Regulation, you are hereby notified that the time of payment of rentals on Crown land required for water power purposes will be changed starting with the rentals due for 1992.

Currently, the annual land rentals (payable in advance) and the water power rentals (payable in arrears) for all the hydro-electric generating stations are invoiced for payment by the end of the fiscal year. Land rentals for Churchill River Diversion and Lake Winnipeg Regulation are invoiced individually.

Effective immediately, all land rentals associated with water power developments, due to this department by Manitoba Hydro, will be invoiced during November for payment by the first normal working day of the following January.

Your cooperation in providing payment of the account by the due date would be appreciated.

 Harry J. Enns
Minister

cc. L.J. Whitney
V.M. Austford

Manitoba

RECEIVED



Deputy Minister of
Natural Resources

FEB 29 1996

Legislative Building
Winnipeg, Manitoba, CANADA
R3C 0V8

EXECUTIVE VICE-PRESIDENT
ENGINEERING AND ENVIRONMENT

FEB 29 1996

Mr. Ralph O. Lambert
Executive Vice President
Manitoba Hydro
P.O. Box 815
Winnipeg, Manitoba
R3C 2P4

Dear Mr. Lambert:

The purpose of this letter is to notify Manitoba Hydro of a change in billing practice for water use rental as provided in The Water Power Act and Regulations.

Heretofore charges for water power rental have been applied at the end of each calendar year based on the actual usage for that year. Beginning with the month of May 1996, water power rental charges will be applied monthly. The methodology of doing so will be decided after consultation with Manitoba Hydro staff.

Early in May, an invoice will be issued for the months of January, February, March, and April of 1996 to bring the water use rental charges up to date for the start of monthly billing.

The details of the monthly billing procedure will be communicated to you after the above noted consultations have taken place.

Staff look forward to working cooperatively with Manitoba Hydro in the implementation of this revised billing practice.

Yours truly,

David Tomasson
Deputy Minister

CIRCULATE

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ADC	
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✓ RRR	
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RECEIVED
FEB 29 1996
DIVISION MANAGER
SYSTEM OPERATIONS DIVISION

Manitoba



Deputy Minister of
Natural Resources

Legislative Building
Winnipeg, Manitoba, CANADA
R3C 0V8

NOV - 4 1996

35C-H

Mr. A.D. Cormie, P. Eng.
Manager
Energy, Security & Sales
Power Supply
Manitoba Hydro
820 Taylor Avenue
Winnipeg, Manitoba
R3M 3T1

Dear Mr. Cormie:

The purpose of this letter is to notify Manitoba Hydro of a change in billing practice for land use rentals as provided in The Water Power Act and Regulation.

Heretofore, land use rentals have been payable at the beginning of each calendar year, on January 2. Beginning with the 1997-1998 fiscal year, land use rentals will be payable at the beginning of the fiscal year, on April 1.

The purpose of this change is to eliminate the need to accrue the revenue received to the proper fiscal year as required under the accounting procedure recently adopted by the department.

Early in February of each year, an invoice will be issued for the annual land use rentals for the ensuing fiscal year. Payment of this amount will be required on April 1. Early in November, 1996, an invoice will be issued for January, February, and March of 1997. The payment of this amount, which is 90/365 of the annual rentals, will be required on January 2, 1997.



- 2 -

This payment will bring the land use rentals up-to-date for the start of the fiscal year billing interval.

My staff looks forward to working cooperatively with Manitoba Hydro in the implementation of this revised billing practice.

Yours truly,

David Tomasson
Deputy Minister



PO Box 815 • Winnipeg MANITOBA CANADA • R3C 2P4
Telephone / N° de téléphone: (204) 474-3018
Fax / N° de télécopieur: (204) 452-5639
hszbig.niewicz@hydro.mb.ca

1999 02 26

Mr. S.D. Topping
Director
Water Resources Branch
Box 11
200 Saulteaux Cresc.
Winnipeg MB R3J 3W3

Dear Mr. Topping:

Re: MCARTHUR FALLS LICENCE RENEWAL APPLICATION

Manitoba Hydro hereby applies for the renewal of the McArthur Falls Final Licence under the provisions set out in subsection 46(1) of the Water Power Act and Regulations. This renewal application falls within the specified two year period of "not less than four nor more than six years prior to the termination" of the licence on 2004 12 31.

To our knowledge, Manitoba Hydro has met all the requirements of the existing licence and complied with all laws, regulations and special requests from the Director or Minister. Manitoba Hydro intends to continue these practises at the McArthur Falls site.

Yours truly,

Original signed by:



H.S. Zbigniewicz, P. Eng.
Manager
Hydraulic Engineering & Operations

HJE/ljm/990226-1.w61



PO Box 815 Stn Main · Winnipeg Manitoba Canada · R3C 2P4
Telephone / N° de téléphone : (204) 360-3018 · Fax / N° de télécopieur : (204) 360-3136
wvpenner@hydro.mb.ca

2009 09 28

Our file #00108-07311-0016_00

Mr. S.D. Topping, P.Eng.
Executive Director
Regulatory & Operational Services
Manitoba Water Stewardship
Box 11, 200 Saulteaux Crescent
Winnipeg MB R3J 3W3

Dear Mr. Topping:

Re: **MCARTHUR FALLS WATER POWER LICENCE - FIRST RENEWAL**

We are replying to your March 25, 1999 information request on the McArthur Falls Generating Station. We will continue to work with your Department on the McArthur Falls Water Power Act Licence as part of our ongoing effort to address this outstanding Water Power licence.

Manitoba Hydro continues to operate the generating station in compliance with the Final Licence dated 1965 11 30 which expired in 2004.

The configuration of this station and its primary structures remains unchanged including all eight generating units. The installed name plate rating for each of the units is 10,000 horsepower.

Manitoba Hydro's Dam Safety Program is based on the Canadian Dam Association Guidelines. Both concrete and earth structures continue to be inspected at regular intervals for any anomalies or deficiencies. Routine inspections by Manitoba Hydro staff are performed bi-weekly for the earth structures and bi-monthly for the concrete structures, including the spillway. Intermediate inspections of all water retaining structures are performed by specialists from Manitoba Hydro's Engineering Services Division annually. Dam Safety Review (DSR) inspections are performed by external experts on a periodic basis with the most recent completed by SNC Lavalin. They determined that "the dam is well maintained and safely operated". As part of the Water Power Act licence renewal process, we will be providing a condition assessment report of the generating station and its associated structures.

Mr. S.D. Topping, P.Eng
2009 09 28
Page 2

The severance line shown on drawing 21-4-1050 (licensee's drawing no 0108-E-0223), referenced in the Final Licence, defines the licence area for this generating station. There have been numerous drawing revisions to reflect the amendments made to the licence area since the signing of the licence on 1965 11 30. Manitoba Hydro intends to acquire additional lands along the Lee River/Pinawa Channel so that the upstream end of the licence area on this waterway will terminate at the decommissioned Pinawa Generating Station. As lands are acquired we will request that they be included as part of the area defining the McArthur Falls licence.

Our next steps include:

- Land acquisition and licence area updating
- Structural report preparation
- Review of licence compliance
- Development of a licence implementation guide
- Tour of the facility (can be arranged at your convenience)

We look forward to working in collaboration with you and your staff on the renewal of this licence.

Please call me at 360-3018 if you need additional information.

Yours truly,

Original signed by:

A black rectangular redaction box covering the signature of the sender.

W.V. Penner, P.Eng.
Manager
Hydraulic Operations Department

Appendix E – McArthur Licence Implementation Guide

Environmental Stewardship Division
Environmental Approvals Branch
Water Power Act Licensing Section
Box 16, 200 Saulteaux Crescent, Winnipeg MB R3J 3W3
T: 204-945-6118 F: 204-948-2357

December 29, 2017

File: 21.4

Mr. W. V. Penner, P. Eng.
Manager, Hydraulic Operations Department
Manitoba Hydro
16-360 Portage Avenue
Winnipeg, MB R3C 0G8

Dear Mr. Penner:

Re: McArthur Falls Generating Station – Licence Implementation Guide

This correspondence acknowledges receipt and acceptance of the McArthur Falls Generating Station – Licence Implementation Guide for Water Levels (October 2017) received with your letter dated November 1, 2017. The Guide documents a common understanding of the water regime terms of the McArthur Falls Water Power Act licence.

If you have any questions regarding this letter please feel free to contact Mr. Puru Singh, P. Eng. at 204-945-3613 or the undersigned at 204-945-6118.

Yours truly,

Rob Matthews, P. Geo
Manager,
Water Power Act Licensing Section,
Sustainable Development

c: B. Webb, P. Singh



360 Portage Ave (16) • Winnipeg Manitoba Canada • R3C 0G8
Telephone / N° de téléphone : 204-360-3018 • Fax / N° de télécopieur : 204-360-6135
wpenner@hydro.mb.ca

2017 11 01

R. Matthews, P. Geo.
Manager, Water Power Licensing
Manitoba Sustainable Development
200 Saulteaux Crescent
Winnipeg MB R3J 3W3

Dear Mr Matthews:

MCARTHUR GENERATING STATION - LICENCE IMPLEMENTATION GUIDE

Enclosed for your approval is a Licence Implementation Guide for the McArthur Falls Generating Station. This Licence Implementation Guide documents a common understanding of the water regime terms of the McArthur Falls *Water Power Act* Licence. The *Water Power Act* Licence specifies operating limits that must be met for compliance with the licence. As such, this document sets out the mutually understood and agreed to:

1. Methodology to be used for determining critical water levels;
2. Definition of licence compliance; and
3. Protocol for reporting.

Please contact me at 204-360-3018 if you have any questions or require additional information.

Yours truly,

Original signed by, *Wesley Penner*

W.V. Penner, P. Eng.
Manager
Hydraulic Operations Department

PCG/sl/00108-07311-0027_00
Att.

Manitoba Hydro
McArthur Falls Generating Station
Licence Implementation Guide for Water Levels

Prepared for:

Water Power Act Licensing Section
Manitoba Sustainable Development
200 Saulteaux Crescent
Winnipeg, Manitoba R3J 3W3

Prepared by:

Hydraulic Operations Department
Manitoba Hydro
360 Portage Avenue
Winnipeg, Manitoba R3C 0G8

October 2017

Report No. WP&O 17/11

Version History

Version	Description	Date
Rev_0	Issued to Manitoba Sustainable Development for Approval	2017-10-31

Manitoba Hydro
McArthur Falls Generating Station
Licence Implementation Guide for Water Levels



PREPARED BY: _____
P.G. CHANEL

REVIEWED BY: _____
B.W. GIESBRECHT

NOTED BY: _____
W.V. PENNER

DATE: 2017-10-31

REPORT NO: WP&O 17/11

Executive Summary

Introduction

Manitoba Hydro prepared this guide to document a common understanding of compliance with the water regime terms of the McArthur Falls Water Power Act Licence. This document sets out the mutually understood and agreed to:

- 1) Methodology to be used for determining critical water levels;
- 2) Definition of licence compliance; and
- 3) Protocol for reporting.

McArthur Falls Forebay Water Level

The **McArthur Falls Forebay Water Level** is directly measured at the beginning of each hour at the generating station.

Compliance

Compliance with the McArthur Falls Water Power Act Licence will be measured against the **McArthur Falls Forebay Water Level**.

Reporting

In the event that the **McArthur Falls Forebay Water Level** is not in compliance with the licence limit, Manitoba Hydro will notify Manitoba Sustainable Development within one week of the incident. A follow-up report on causes contributing to the event and changes to operations, if any are needed to prevent such an event in the future, will be provided to Manitoba Sustainable Development. A record of water levels and licence compliance will also be provided in an annual report.

Change Management

Proposed revisions to this guide will be drafted by Manitoba Hydro and reviewed by Manitoba Sustainable Development from time to time. Following review and approval of revisions by Manitoba Sustainable Development, a revised copy of this guide will be produced and distributed by Manitoba Hydro.

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1. Introduction

McArthur Falls Generating Station is located approximately 120 km northeast of the City of Winnipeg, 15 km north of the Town of Lac du Bonnet and 30 km downstream of the Seven Sisters Generating Station.

Construction of the McArthur Falls Generating Station began in 1952 and was completed in 1955. McArthur Falls is the newest of the six generating stations operating on the Winnipeg River.

Manitoba Hydro currently operates the McArthur Falls Generating Station under a Short-Term Extension of the Final Licence. The Short-Term Extension Licence (STEL) was issued in accordance with the provisions of The Water Power Act on October 1, 2015. The STEL is in effect until September 30, 2020 and the operating terms are identical to those of the final licence issued on November 30, 1965. McArthur Falls Generating Station has a licenced capacity of 59.7 MW (80,000 horsepower).

1.1 Definitions

For the purposes of this guide, unless the context otherwise requires, the following terms shall have the respective meanings set out below and grammatical variations of such terms shall have corresponding meanings:

ASL means above sea level

Controlling Benchmark means Geological Survey of Canada (GS of C) benchmark 6K. Benchmark 6K is a shank in bedrock located on a rocky point about 750 feet downstream from the powerhouse.

McArthur Falls Gauge refers to a float attached to a steel tape that is draped over a pulley connected to a Selsyn (self-synchronous) system that measures the forebay water level.

McArthur Falls Forebay Water Level means the hourly water level as measured by the **McArthur Falls Gauge**.

1.2 Datum

In accordance with Article 4 of the McArthur Falls Final Water Power Act Licence, water level information for the operation of the McArthur Falls Project is measured in terms of elevations ASL, GS of C, Canadian Government Vertical Datum (CGVD) 1928, 1929 Local Adjustment.

1.3 Quality Control

1.3.1 Benchmarks

Vertical control surveys have been performed to establish appropriate local benchmarks around the McArthur Falls Generating Station.

McArthur Falls benchmarks were established by level transfer from **Controlling Benchmarks** using spirit levelling methods.

1.3.2 Direct Water Level Measurements

Staff monitor the **McArthur Falls Gauge** equipment weekly and as necessary to maintain gauge performance. Direct water level measurements are taken during these checks and compared to the level indicated by the water level sensor. Direct water level measurements that differ by more than 0.1 feet are reported and repaired.

1.3.3 Gauge Readings

The forebay gauge consists of a float attached to a steel tape that is draped over a pulley connected to a Selsyn (self-synchronous) system. This system electronically transmits the angular position of the pulley to a receiving device in the control room. The position information is converted to a water level, indicated on a display and also output to the Remote Transmittal Unit for transmission to Manitoba Hydro's System Control Centre.

1.4 Quality Assurance Procedure for Water Level Data

Plant Data

Data is collected on site and signed off by the operating supervisor. Data is then sent to the Energy Operations Planning & Technology Department of Manitoba Hydro, uploaded into a database and checked for errors. Data errors are then corrected or verified by plant operating staff with technical assistance from Energy Operations Planning & Technology staff as needed. Once data has been verified, it may be used for operations planning, studies, model development and reporting.

2. McArthur Falls Forebay Water Level

Article 4 of the McArthur Falls Final Water Power Act Licence places a limit on the **McArthur Falls Forebay Water Level**. A map showing the location of the **McArthur Falls Gauge** is provided in Appendix A. Water levels are largely influenced by the operation of the McArthur Falls Generating Station and local meteorological events. Due to the size of the forebay and location of the **McArthur Falls Gauge**, wind effects on the **McArthur Falls Forebay Water Level** are negligible.

McArthur Falls Forebay Water Level measurements are taken continuously and recorded at the beginning of each hour and reported to Manitoba Hydro's System Control Centre.

3. Compliance

3.1 McArthur Falls Water Power Act Licensing Requirement

Maximum Water Level

Article 4 of the licence stipulates that:

"The Licensee shall not raise the headwater of its development to an elevation higher than 836.0 feet above mean sea level, Canadian Geodetic Datum, 1929 Adjustment. A higher elevation may be created only with prior written permission by the Director and in accordance with Section 72 of the Regulations."

The forebay water level shall be in compliance with the limit described above if the hourly **McArthur Falls Forebay Water Level:**

- a) does not exceed 836.0 feet by more than 0.1 feet; and
- b) does not exceed 836.0 feet more than two times or for more than two consecutive hours in any 24-hour period.

Based on the accuracy and location of the **McArthur Falls Gauge**, Manitoba Hydro defines instances where the licence limit is exceeded by 0.1 feet as reportable events.

3.2 Reporting

3.2.1 Compliance Reporting

In the event that the **McArthur Falls Forebay Water Level** is not in compliance with the licence limit as described in Section 3.1, notification shall be made to Manitoba Sustainable Development within one week of the incident. A follow-up report on causes contributing to the event and changes to operations, if any are required to prevent such an event in the future, will be provided to Manitoba Sustainable Development.

3.2.2 Maintenance and Emergencies

During maintenance and emergencies there may be times when Manitoba Hydro is required to deviate from a licence condition for safety or other purposes. Manitoba Hydro will be considered compliant with the licence as long as:

1. Advanced notification by email is provided to Manitoba Sustainable Development of the upcoming licence deviation together with the reason, a description of the operating plan, details of the expected licence deviation, a summary of impacts to stakeholders, and confirmation that stakeholders will also be notified; and
2. Advanced notification is provided to stakeholders of pertinent impacts to flow and water levels; and

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McArthur Falls GS Licence
Implementation Guide

3. Following the work, notification by letter is provided to Manitoba Sustainable Development on the final specifics of the licence deviation.

3.2.3 Regular Annual Reporting

Water levels and licence compliance will be reported annually to Manitoba Sustainable Development.

4. Change Management

4.1 Regular Updates

Proposed revisions to this Guide will be drafted by Manitoba Hydro and reviewed by Manitoba Sustainable Development from time to time. Following review and approval of revisions by Manitoba Sustainable Development, a revised copy of this Guide will be produced and distributed by Manitoba Hydro.

Appendix A

Forebay Water Level Gauge Location

7

McArthur Falls GS Licence
Implementation Guide

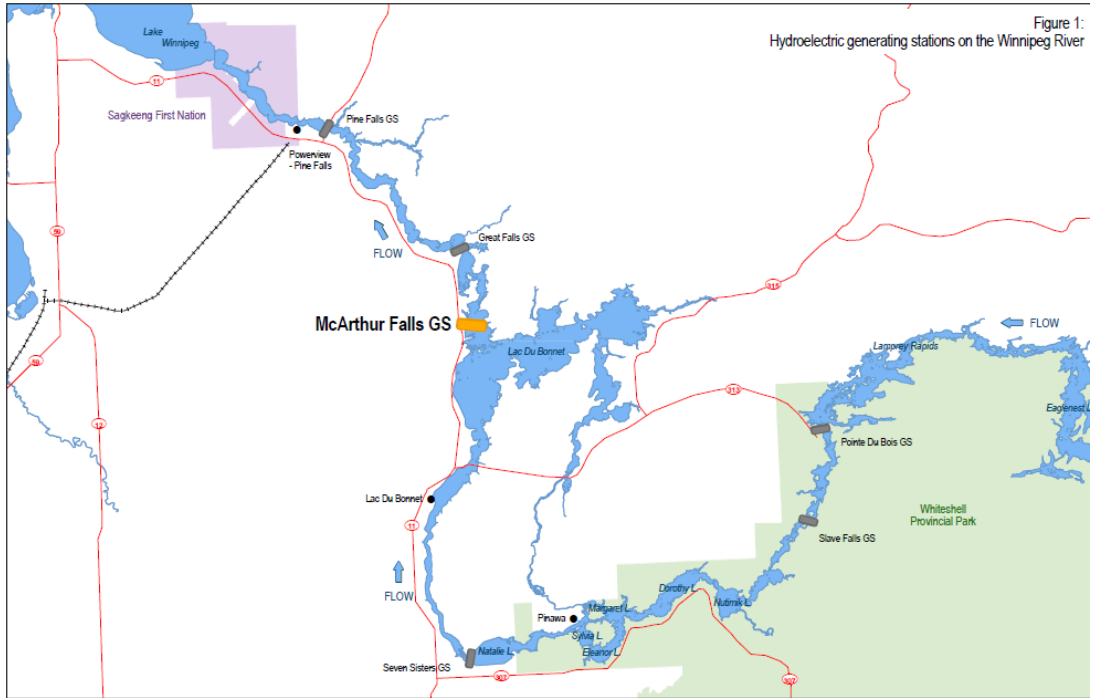


Figure 1: Hydroelectric generating stations on the Winnipeg River



		MANITOBA HYDRO	
		HYDRAULIC OPERATIONS DEPARTMENT	
DRAWN BY		MCARTHUR FALLS GENERATING STATION	
PGC		FOREBAY WATER LEVEL GAUGE LOCATION	
YEAR	PROJECT		
2017	LICENCE IMPLEMENTATION GUIDE		FIGURE 2

McArthur Falls GS Licence Implementation Guide

Appendix F – Atomic Energy of Canada Limited (AECL) Agreement

DATED this day of , 1962

BETWEEN:

ATOMIC ENERGY OF CANADA LIMITED

OF THE FIRST PART,

- and -

THE MANITOBA HYDRO-ELECTRIC BOARD

OF THE SECOND PART.

A G R E E M E N T

The Manitoba Hydro-Electric Board
Legal Department

Atomic Energy of Canada
Limited (AECL) Agreement

THIS AGREEMENT made the 13th day of June 1962,
BETWEEN:

ATOMIC ENERGY OF CANADA LIMITED
(hereinafter called "AECL")

OF THE FIRST PART,

- and -

THE MANITOBA HYDRO-ELECTRIC BOARD
(hereinafter called "Manitoba Hydro")

OF THE SECOND PART.

WHEREAS by a Memorandum of Understanding, dated June 21, 1960 between The Government of the Province of Manitoba and AECL relating to the development of a nuclear research establishment and townsite associated therewith on the Winnipeg River in the neighbourhood of Seven Sisters, Manitoba, it was, amongst other things, provided that AECL should acquire certain lands in Township 14, Ranges 10 and 11 East of the Principal Meridian, with appropriate rights of access to the Winnipeg River, that so far as reasonably within the control of the Government of the Province of Manitoba or of any person or corporation deriving rights or powers through the said Government and having regard to the provisions of the Lake of the Woods Control Board agreement, the water levels of the Winnipeg River at the townsite should be kept within the limits of 893 feet and 903 feet above mean sea level and at the plantsite within the limits of 830 feet and 845 feet above mean sea level or within such other limits as might from time to time be agreed upon between the parties to the said Memorandum of Understanding, and that neither AECL, nor its successors

Atomic Energy of Canada
Limited (AECL) Agreement

or assigns, would make any claim against Manitoba Hydro in respect of the erosion, slipping, or deterioration of the bank of the Winnipeg River or of damage to any building, improvement or chattel on the bank of the said river, caused by fluctuations in the level of the said river within the said limits;

AND WHEREAS Manitoba Hydro is the holder of certain rights and interests in the lands hereinafter described which border on the Winnipeg River;

AND WHEREAS it has been agreed that Manitoba Hydro shall release its rights and interests in the said lands upon the terms and conditions hereinafter set out in lieu of retaining the said rights and interests and granting to AECL rights of access, passage and use over the said lands;

NOW THEREFORE THIS AGREEMENT WITNESSETH and is hereby agreed by and between the parties hereto as follows:

1. Manitoba Hydro shall release to and in favour of Her Majesty the Queen in right of the Province of Manitoba all its right, title and interest in and to the following described land, namely:

Parcel No. 1 - In Township 14 and Range 11 East of the Principal Meridian in Manitoba, and being:

Firstly - All that portion of Section 29 required for water storage which lies on the East side of the Winnipeg River, shown bordered red and green on a plan deposited in the Winnipeg Land Titles Office as No. 6014.

Secondly - All those portions of Sections 17, 18, 19 and 20 required for water storage as the same are shown bordered red and green on said plan No. 6014.

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Parcel No. 2 - In Township 14 and Range 12 East of the Principal Meridian in Manitoba, and being:

Firstly - All those portions of Section 3, of the South half of Section 4 and the fractional Southeast quarter of Section 5 which lie to the North of the North bank of the Winnipeg River, as the same are shown coloured pink on a plan hereto attached as Schedule "A";

Secondly - All those portions of Sections 10 and 11 lying to the South of the Pinawa Channel, excepting out of said portion of Section 10 so much thereof as is not more than 100 feet radially distant from the Diversion Dam on the said Pinawa Channel;

Thirdly - All those portions of said Section 3 shown as three islands in the Winnipeg River and coloured pink on said plan;

Fourthly - All those portions of Sections 1, 2, 11 and 12 shown coloured pink on said plan.

Fifthly - All that portion of the East half of Section 8 shown as Winnipeg River Power Reserve on a map or plan of Sections 8, 9, 16, 17 and 18 in the said Township and Range approved and confirmed at Ottawa on the 14th day of June, 1923 by T. Shanks.

Sixthly - All those portions of Sections 9 and 16 and of the East half of Section 17 shown as Winnipeg River Power Reserve on said map or plan dated the 14th day of June, 1923 which lie to the South and Southwest of the Pinawa Channel as the same is shown on a map or plan of said Township and Range approved and confirmed at Ottawa on the 8th day of April, 1909 by E. Deville.

2. Manitoba Hydro will ensure that so far as reasonably within its control and having regard to the provisions of the Lake of the Woods Control Board agreement, the water levels of the Winnipeg River in the vicinity of Parcel No. 1 shall be kept within the limits of 830 feet and 845 feet above mean sea level or within such other limits as may from time to time be agreed upon between the parties, and the water levels of the Winnipeg River in the vicinity of Parcel No. 2 shall be kept within the limits of 893 feet

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2. (cont'd)

and 903 feet above mean sea level, or within such other limits as may from time to time be agreed upon between the parties; the levels aforesaid being based upon the 1928 Geodetic Survey of Revision and the levels aforesaid being measured as of a calm day without regard to wind and waves.

3. AECL acknowledges that the water level in the Winnipeg River is subject to fluctuations brought about, among other things, by the opening and closing of the gates of the various hydro-electric power plants constructed on the Winnipeg River and AECL further acknowledges that Manitoba Hydro shall continue to have the right from time to time and whenever it sees fit to continue to raise and/or lower the level of the waters of the Winnipeg River within the limits referred to in Section 2 hereof without being liable for whatever damage may naturally result therefrom, and accordingly AECL covenants and agrees with Manitoba Hydro that it will design and construct all buildings and other improvements on the lands hereinbefore described so as to take into account the fluctuations in river level within the limits fixed by or as contemplated by Section 2 hereof; and with respect to the lands hereinbefore described, AECL, for itself, its successors and assigns, covenants and agrees that it will use and occupy the said lands entirely at its own risk and will not make any claims or demands against Manitoba Hydro in respect of the erosion, slipping or deterioration of the bank of the Winnipeg River or of damage to any building, improvement or chattel on the said lands caused by or resulting from fluctuations in the level of the said river within the said limits; and AECL, for itself, its successors and assigns, as operators of the said research est-

3. (cont'd)

abishment, agrees that it will not make any claims or demands against Manitoba Hydro in respect of such adjoining or neighbouring lands acquired by AECL, its successors and assigns, for the purpose of the plantsite or the townsite as may reasonably be considered by Manitoba Hydro as apt to be affected by the raising of the said waters as aforesaid in respect of damage to any building, improvement or chattel on such last mentioned lands caused by or resulting from fluctuations in the level of the said river within the said limits.

4. The parties hereto will execute and deliver such further documents and assurances as may reasonably be requested of them respectively for registration or otherwise in order to carry out the intent of this agreement.

5. This agreement and the covenants herein contained shall run with the said lands and shall bind and enure to the benefit of AECL and Manitoba Hydro their respective successors and assigns, and upon their and each of their successors in title to the said lands, or any part or parts thereof.

IN WITNESS WHEREOF the parties hereto have hereunto affixed their corporate seals attested by the hands of their proper officers in that behalf the day and year first above written.

ATOMIC ENERGY OF CANADA LIMITED

By: J. L. GRAY
President

G. M. JARVIS
Secretary

THE MANITOBA HYDRO-ELECTRIC BOARD

By: W. D. FALLIS
General Manager

J. F. FUNNELL
Secretary

Atomic Energy of Canada Limited (AECL) Agreement

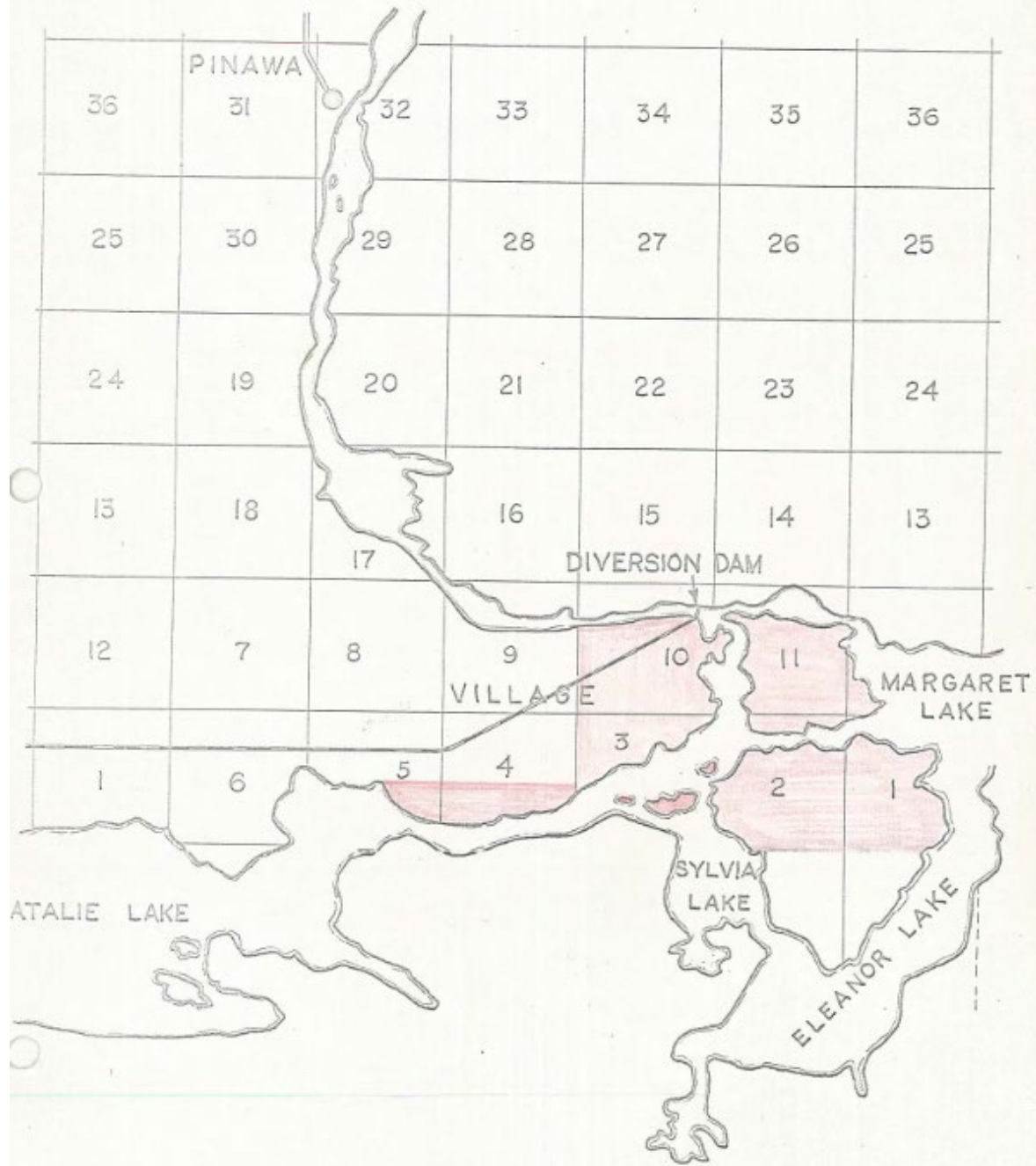
SKETCH
OF
PART Twp. 14, Rge. 12 E.P.M.
MANITOBA

SCALE 1 INCH = 1 MILE

NOTE:

PORTIONS OUTLINED IN PINK TO BE RELEASED BY
M.H.E.B. TO A.E.C.L.

SCHEDULE "A"



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Limited (AECL) Agreement

Appendix G – Glossary

Glossary

Canadian Dam Association Guidelines: The guidelines were published in 2007 and revised in 2013. “The guidelines consist of principles that are applicable to all dams, and an outline of processes and criteria for management of dam safety in accordance with the principles.”

Churchill River Diversion (CRD): The diversion of water from the Churchill River to the Nelson River via the Rat River and the impoundment of water in Southern Indian Lake.

Community: In ecology, a community is an ecological unit composed of a group of organisms or a population of different species occupying a particular area, usually interacting with each other and their environment. For people, a community is a social group of any size, whose members reside in a specific locality.

Control structure: A type of structure designed to control the outflow from a waterbody.

Cubic metres per second (cms or m³/s): is a flow rate that quantifies the number of cubic metres of water flowing in one second.

Dam: A barrier built to hold back water.

Dam Safety Emergency Plans: The Canadian Dam Association (CDA) Guidelines specify that “all dams should have emergency response procedures and emergency preparedness plans in place if lives are at risk or if implementation of emergency procedures could reduce the potential consequences of failure”. The purpose of the emergency preparedness plan (EPP) is to provide contingency plans for a dam safety emergency, to ensure that all foreseeable eventualities have been thoroughly studied and to provide an appropriate, workable response plan to ensure safety of the public.

Dam Safety Reviews (DSRs): A Dam Safety Review is a systematic evaluation of the safety of a dam by means of comprehensive inspection of the structures, assessment of performance and review of the original design and construction records to ensure that they meet current criteria.

Discharge: is another word for flow rate often measured in cubic metres per second or cubic feet per second.

Drainage Basin: A large area of land that collects water and then drains into a body of water. (used synonymously with Watershed).

Dike: An earth embankment constructed to contain the water in the reservoir and limit the extent of flooding.

Ecosystem: A dynamic complex of plant, animal and micro-organism communities and their non-living components of the environment interacting as a functional unit. (Canadian Environmental Assessment Agency)

Environment: The components of the Earth, including a) land, water and air, including all layers of the atmosphere, b) all organic and inorganic matter and living organisms, and c) the interacting natural systems that include components referred to in a) and b). (Canadian Environmental Assessment Agency)

Environmental effect: In respect of a project, any change that the project may cause in the environment, including any change it may cause to a listed wildlife species, its critical habitat or the residences of individuals of that species, as those terms are defined in subsection 2(1) of the Species At Risk Act.

Environmental monitoring: Periodic or continuous surveillance or testing, according to a predetermined schedule, of one or more environmental components. Monitoring is usually conducted to determine the level of compliance with stated requirements, or to observe the status and trends of a particular environmental component over time. (Canadian Environmental Assessment Agency)

Erosion: A process by which the Earth's surface is worn away by the actions of water and wind.

Farm Electrification Program: Starting in 1942, Manitoba Power Commission started the Farm Electrification Program due to farmers petitioning the provincial government to provide electrical service. By 1954, the Farm Electrification program was virtually completed, with about 75 per cent of all farms in Manitoba having electrical service.

Flooding: The rising of a body of water so that it overflows its natural or artificial boundaries and covers adjoining land that is not usually underwater.

Flow: Motion characteristic of fluids (liquids or gases); any uninterrupted stream or discharge.

Forebay: Impoundment area immediately upstream from a dam or hydroelectric plant intake structure that forms the downstream portion of the reservoir.

Generating Station (GS): A structure that produces electricity. Its motive force can be provided in a variety of ways, including burning of coal or natural gas, or by using water (hydro) power. Hydroelectric generating stations normally include a complex of powerhouse, spillway, dam(s) and transition structures; electrical energy is generated by using the flow of water to drive turbines.

Hydroelectric: Electricity produced by converting the energy of falling water into electrical energy.

Impoundment: The containment of a body of water by a dam, dike, powerhouse, spillway or other artificial barrier.

Kilovolt (kV): The unit of electromotive force or electrical pressure equivalent to 1,000 volts (V).

Landscape: The ecological landscape as consisting of a mosaic of natural communities; associations of plants and animals and their related processes and interactions.

LiDAR: LiDAR is a remote sensing technology that measures distance by illuminating a target with a laser and analyzing the reflected light. It is used to make high-resolution maps.

Megawatt (MW): The unit of electrical power equivalent to 1,000,000 watts.

Mitigation: A means of reducing adverse effects. Under the *Canadian Environmental Assessment Act*, and in relation to a project, mitigation is the elimination, reduction or control of the adverse environmental effects of a project, and includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means.

Model: A description or analogy used to help visualize something that cannot be directly observed. Model types range from a simple set of linkage statements or a conceptual diagram to complex mathematical and/or computer model.

Monitoring: Measurement or collection of data.

Outflow: The water flowing out of a water body (lake, reservoir, etc.).

Parameter: Characteristics or factor; aspect; element; a variable given a specific value.

Power: The instantaneous amount of electrical energy generated at a hydroelectric generating station, usually expressed in megawatts.

Powerhouse: Structure that houses turbines, generators, and associated control equipment, including the intake, scroll case and draft tube.

Reservoir: A body of water impounded by a dam and in which water can be stored for later use. The reservoir includes the forebay.

Shoreline: The narrow strip of land in immediate contact with a lake or river.

Spillway: A concrete structure that is used to pass excess flow so that the dam, dikes, and the powerhouse are protected from overtopping and failure when inflows exceed the discharge capacity of the powerhouse.

Species: A group of organisms that can interbreed to produce fertile offspring.

Topography: General configuration of a land surface, including its relief and the position of its natural and manmade features.

Transmission Line: A linear arrangement of towers and conductors which carries electricity from generating stations and transmission stations to load centres like communities and industries to meet electrical needs.

Tributary(ies): A river or stream flowing into a lake or a larger river or stream.

Velocity: A measurement of speed.

Water quality: Measures of substances in the water such as nitrogen, phosphorus, oxygen and carbon.

Water regime: A description of water body (*i.e.*, lake or river) with respect to water levels, flow rate, velocity, daily fluctuations, seasonal variations, *etc.*

Watershed: A large area of land that collects water and then drains into a body of water. (used synonymously with Drainage Basin)

Weir: A low dam built across a river to raise the level of water upstream or regulate its flow.