



CAMP

Coordinated Aquatic Monitoring Program

Annual Activity Report

2015/2016

Submitted to:
Minister of Sustainable Development

President/CEO Manitoba Hydro

Submitted by:
MOU Working Group

June 2016

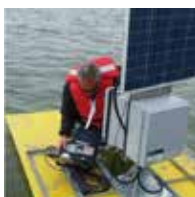


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1.0 Summary

The 2015/16 Coordinated Aquatic Monitoring Program (CAMP) marks the eighth year of monitoring since implementation in 2008/09. The program was initiated to address comments received from affected communities and the Clean Environment Commission (CEC) about the need for system-wide monitoring to better understand the potential effects of hydroelectric operations on the aquatic environment. CAMP uses an ecosystem-based approach and samples key biological/chemical/physical parameters at different levels of the food web and hydrometric data to describe the ecological condition and status of aquatic ecosystem health in the waterways in which Manitoba Hydro operates. The parameters selected were scientifically determined based on the “best advice” of scientists and regulators that participated in annual CAMP workshops that started in November 2007. Attendees included representatives from Manitoba Conservation and Water Stewardship, Manitoba Hydro, Fisheries and Oceans Canada, University of Manitoba, Environment Canada and North/South Consultants Inc.

At these workshops, the program is assessed and adjusted as appropriate to ensure it maintains scientific credibility and is on scope for meeting the objectives of the Memorandum of Understanding. Recent developments to the program include:

- System sedimentation monitoring along the upper Nelson River from the outlet of Lake Winnipeg to the Kelsey GS.
- Shoreline erosion and sedimentation monitoring using remote sensing.
- Preparation of the 6-year summary report.
- Development of digital data collection templates for biophysical components and the use of “Rapid Capture” software for collection of Physical Environment Data.
- Progress on the Data Integration Strategy.
- Collaboration on a research project related to bio-productivity indicators, with the International Institute for Sustainable Development / Experimental Lakes Area (IISD-ELA).

Additional items to be developed over the next few years include:

- Development and implementation of a joint Manitoba – Manitoba Hydro CAMP Communications Plan.
- Exploring web technologies that enable data to be integrated from different systems and shared via the website.
- Third Party peer review of the 6-year summary report by IISD-ELA to assess the technical parameters being sampled and data collection methods (e.g. selection of indicators) as well any trends observed and the success of the program in describing aquatic ecosystem health.
- Implementation of activities to meet the new Aquatic Invasive Species Regulations (e.g. permit acquisition, decontamination equipment and processes, etc.)
- Tendering of the aquatic ecosystem data collection contract. The contract is currently held with North South Consultants but it expires March 31, 2018.
- Possibly adding riparian, wetland, and terrestrial areas to the monitoring regime. These additions will be dictated by decisions made by the province in light of outcomes from the Lake Winnipeg Regulation relicensing and the Regional Cumulative Effects Assessment processes.
- Review physical environment/habitat monitoring requirements and develop a three to five- year plan for monitoring.

2.0 Background

The purpose of this report is to provide the signatories of the “Memorandum of Understanding about the Program of LWR/CRD Monitoring Activities (MOU)” with a summary of the 2015/16 Coordinated Aquatic Monitoring Program. The MOU, signed in 2006 by the Province of Manitoba and Manitoba Hydro (Attachment 1), outlines the need to develop a system-wide aquatic monitoring program to address concerns related to potential effects associated with Manitoba Hydro operations. The Coordinated Aquatic Monitoring Pilot Program (CAMPP) was developed and implemented in 2008/09 and operated for the first three years to test sampling methodologies. This 2015/16 annual activity report represents the fifth year of a fully implemented, post-pilot phase, Coordinated Aquatic Monitoring Program (CAMP).

3.0 Meetings

Several meetings were held throughout the year between different groups relevant to CAMP, including the main working group, smaller subcommittee, broader workshops, and community meetings.

3.1 Working Group

On May 5, 2015, a draft workplan for 2015/16 program was presented to the MOU Working Group, which is the oversight committee identified in the MOU (see Attachment 2). Items that were presented and discussed include:

- Review of the 2014/15 CAMP
- Update on CAMP reporting and data management
- Presentation and discussion of proposed 2015/16 CAMP workplan
- Update on community dialogue efforts.

No significant concerns or issues were raised by the Working Group members during the meeting or the two week review period and the 2015/16 workplan was subsequently accepted as presented.

3.2 Subcommittee

The subcommittee is composed of groups of technical experts from Manitoba Hydro, Manitoba and North South Consultants Inc. for each of the specific parameters sampled in CAMP. There were no specific technical subcommittee meetings during 2015/16. Instead, the May and January meetings were sufficient to address any questions.

3.3 Annual Workshop

Usually one annual CAMP workshop is held with approximately 30 people representing federal and provincial agencies, private consultants and Manitoba Hydro staff. The intent of the workshop is to disseminate information related to CAMP activities and receive feedback on future directions. This year, one workshop was held to review the substantial CAMP progress since inception and discuss future activities. The workshop was held on January 27, 2016.



3.4 Community Meetings

Manitoba Conservation and Water Stewardship presented and discussed CAMP at a variety of community meetings in 2015/16. Communications this year focused on completing presentation of the CAMP 3-Year Summary Report to Resource Management Boards that have not received it yet. A list of these community meetings is provided in Attachment 3.

4.0 Summary of Activities

The following summary documents the major activities undertaken by CAMP in 2015/16.

4.1 Field Program

A total of 26 waterbodies or riverine reaches (17 on-system and 9 off-system) were sampled for water quality, benthic macroinvertebrates, and fish community during the 2015/2016 CAMP (Attachments 4 and 5). In addition, water quality was sampled in the Burntwood River near the inlet to Split Lake (annual monitoring site for the water quality program) and at the outlets of Lake Winnipeg (Two-Mile Channel and the upper Nelson River near Warren Landing). The total number of areas sampled varied from 29 (benthic macroinvertebrates) to 32 (water quality) depending on the component.

4.1.1 Program Changes

There were no substantive changes, and no new waterbodies or sites added, to the CAMP program in 2015/2016. Targeted sampling for zebra mussel veligers (i.e larvae) was added to CAMP beginning in 2015/2016 under the water quality and benthic macroinvertebrate field programs at Cedar, Playgreen and Cross lakes and at the Lake Winnipeg outlets (water quality program only).

4.1.2 Aquatic Habitat

An aquatic habitat (bathymetry and substrate) survey was completed at Split Lake in spring 2015. Split Lake was selected as a lower cost option over the middle basin of Cedar Lake.

4.1.3 Water Quality

Water quality sampling was completed at all sites as planned.

4.1.4 Benthic Invertebrates

Benthic invertebrate sampling was completed at all sites as planned.

4.1.5 Phytoplankton

Samples for phytoplankton analysis (i.e., community composition and biomass) were collected from the four routine annual monitoring sites (Cross, Setting, Split and Assean lakes) in the open-water season and submitted for analysis as planned.



4.1.6 Fish Community

Fish community sampling was completed at all sites as planned.

4.1.7 Mercury in Fish

Fish tissue samples (i.e., muscle) were collected during fish community monitoring at the two annual waterbodies (Threepoint and Leftrook lakes) and two rotational waterbodies (Playgreen and Stephens Lake south) and samples were analysed for mercury.

4.1.8 Sediment Monitoring

Sediment monitoring occurred for the second year in Southern Indian Lake (Area 4) in 2015/16. Data reports are in progress.

4.2 Reporting Framework

The Six-Year Summary Report covering 2008-2014 is being prepared by North/South Consultants to analyse and report on trends in key aquatic indicators. The report was expected to be completed in 2015/16; however, the Regional Cumulative Effects Assessment (RCEA) reporting took priority and resources were redirected from the CAMP report to meet RCEA deadlines. The Six-Year report is now expected to be completed in mid 2016/17. Once the report is complete, IISD-ELA will be conducting a peer review on it to identify potential areas of improvement for the program.

The CAMP website will continue to be updated with data as it is collected, and made available to the public.

4.3 Data Sharing

Requests for CAMP data continue to be received from the public. Three requests for data were received in 2015/16, and included a University of Manitoba researcher, the World Wildlife Fund, and the BaySys program. Currently, data must be manually extracted from the database and forwarded to the requester. The future goal is that web-based technologies will enable the public to access the data directly, increasing efficiency in sharing.

5.0 Emerging Items

5.1 Data Management Strategy

Manitoba Hydro continues to work on migrating the EnvIS (Environmental Information System) data management operations, which will also handle CAMP data, into a system called Star LIMS. Just having completed milestone 1 of 6 in Phase 1 of the EnvIS migration project, Star LIMS will be used to manage the CAMP sample collection and lab results with a target date of April of 2017. Phase 2 of the EnvIS migration project will start in May of 2017 and is targeted for completion in April 2018. The CAMP Data Integration will start in May of 2018.

CAMP web site data updates are being managed with data templates populated by North South Consultants and loaded to the CAMP web site database that allow for dynamic charting.



With the use of ArcGIS Server/Online and Kisters KiWIS, Manitoba Hydro has started some preliminary work on integrating EnvIS CAMP data, erosion and sediment data, and hydrometric data into a single web based environment. This is a starting point for the CAMP working group to explore web technologies that enable data to be integrated from different systems and shared publicly.

5.2 Sediment and Erosion Monitoring

The sediment and erosion monitoring program is continuing to be reviewed and adjusted to meet the program's stated objectives. The physical environment and habitat monitoring requirements will be reviewed and a 3 to 5 year monitoring plan will be developed.

The team is investigating the use of remote sensing to understand distribution of suspended sediment in lakes and rivers with the objective of having a practical, efficient method for monitoring suspended sediment on a system-wide scale. It will also provide a greater understanding of sediment dynamics, including timing and duration of high turbidity events. Plans are in place to review and develop shoreline erosion monitoring, in addition to suspended sediment, using remote sensing.

5.3 Aquatic Ecosystem Data Collection Contract

The aquatic ecosystem data collection contract that is currently with North South Consultants will need to be reviewed/revised and tendered. The contract expires March 31, 2018.

6.0 Conclusion

Since its inception in 2008, CAMP has grown in scope, functionality and popularity. It has become an integral and well-respected program for Manitoba Hydro and Manitoba, as evidenced during the recent CEC hearings for the Keeyask Generation Project and Lake Winnipeg Regulation. Several positive references were made about the program by the CEC and other groups, including how it is helping inform decision making and enhance the collective scientific understanding of hydroelectric effects on the aquatic environment. The RCEA was also informed by CAMP data.

Depending on the outcome of RCEA public engagement and the CEC report on Lake Winnipeg Regulation Licence finalization, it is possible that CAMP monitoring will be modified / enhanced to address issues raised during those processes.

Overall, CAMP has become a positive, high-profile project for the corporation and province and it is expected to continue to grow in utility and support in the coming years.





Attachment 1

Memorandum of Understanding

Memorandum of Understanding about Program of LWR/CRD Monitoring Activities, dated October 16, 2006.

The Government of Manitoba and Manitoba Hydro are committed to work together on matters relating to monitoring of hydrometric (water level and stream flow) and environmental data in certain areas in the Lake Winnipeg Regulation and Churchill River Diversion system.

Manitoba and Manitoba Hydro have the common objective of developing a program of activities ("the activities"), building on the existing monitoring program of Manitoba Hydro, that would provide objective information about hydrometric and environmental effects of hydro-electric development on agreed rivers and lakes comprising the Lake Winnipeg Regulation and Churchill River Diversion systems ("the system"). The information from the activities could be of benefit to Manitoba, Manitoba Hydro and other interested parties, including communities in the area of the Lake Winnipeg Regulation/Churchill River Diversion project. Objectives of the program of activities would include:

- (a) assisting in evaluating whether and to what extent the water regime in areas of the system is or will be affected by the addition of additional hydro-electric facilities;
- (b) assisting in identifying adverse effects and positive effects resulting from effects on the water regime; and
- (c) assisting in considering measures that may be undertaken to address any identified adverse effects.

Manitoba and Manitoba Hydro may establish additional objectives of the activities.

Manitoba and Manitoba Hydro recognize that Manitoba Hydro has made commitments to monitoring and follow up programs as part of the environmental licensing process for the Wuskwatim Generating Station. These commitments will be considered in developing the activities.

The program of activities will be reviewed each year and annual workplans will be developed by Manitoba and Manitoba Hydro to assist in achieving the program of activities. The agreed workplan for the fiscal year ending March 31, 2007 is attached as Appendix A to this Memorandum.

Manitoba and Manitoba Hydro will consider methods of making information from the activities available to interested parties.

It is intended that the nature and scope of activities will be developed starting in Fiscal Year 2006-07 (starting April 1, 2006) and will continue until Manitoba and Manitoba Hydro agree to no longer proceed with a program of activities.

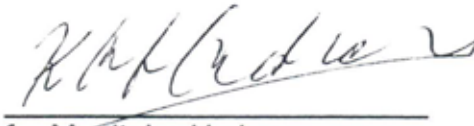
As part of the development of the annual program of activities, Manitoba and Manitoba Hydro will consider the resources each will provide in order to carry out the activities

It is intended that Manitoba and Manitoba Hydro personnel will prepare an Annual Report to be delivered to the Minister of Water Stewardship and the Minister of Conservation, on behalf of Manitoba and to the President and CEO of Manitoba Hydro. Additional reports may be prepared as Manitoba and Manitoba Hydro determine to be appropriate. The Annual Report may include:

- a description of the activities for that year;
- a description of any information determined as a result of the activities;
- information about any circumstances where water levels or flows were outside of ranges provided for in licences;
- methods of making the information available to interested parties and to the public;
- any other matters that are considered appropriate. It is expected that Manitoba and Manitoba Hydro will make the Annual Reports available to the public.

Manitoba and Manitoba Hydro may amend this Memorandum from time to time by further Memorandum.


for Manitoba


for Manitoba Hydro

Oct. 16, 2006
Date

06 09 06
Date

Attachment 2

Summary of 2015/16 CAMP Meetings

MOU Working Group Meeting – May 5, 2015

AGENDA

- Review of 2014 Working Group meeting summary & action
- Review the 2014/15 CAMP
- Reporting Update and New Initiatives
- IISD Aquatic Indicators Report
- 6-Year Report Update
- Erosion and Sediment Monitoring
- Discussion of proposed 2015/16 CAMP work plan
- Update on the system-wide community dialogue

Workshop – January 27, 2016

AGENDA

- Brief overview and history of CAMP progress and milestones
- Summary of Sediment & Erosion program and Remote Sensing Study
- Summary of open water sampling
- Update on 6-year report
- Update on CAMP Website & Data Management
- Research Proposal: “Indicators of fish productivity for monitoring on the Manitoba Hydro system” - (IISD/ELA)
- Future plans:
 - LWR CEC report recommendations, RCEA implications
 - Sediment & Erosion program
 - Spring meeting for 2016/17 workplan review



Attachment 3

Listing of CAMP Community Discussions/Presentations 2015/16

The following table lists the Community/Resource Management Board (RMB) meetings where CAMP was discussed; attended by Don Macdonald (Regional Fisheries Manager, Manitoba Fisheries Branch):

Date	Location/Group
May 19, 2015	O-Pipon-Na-Piwin Cree Nation (OPCN) Resource Users Meeting
September 3, 2015	Norway House Resource Management Board
October 14, 2015	Split Lake Resource Management Board
November 9, 2015	Norway House Article 7 Four Party Meeting on Environmental Monitoring
January 8, 2016	OPCN Environmental Monitoring Committee

Efforts to meet with the Nelson House Resource Management Board and present a copy of the CAMP 3-Year Summary Report were not successful due to a combination of rescheduled meeting dates and scheduling conflicts. This remains a priority for the coming year.



Attachment 4

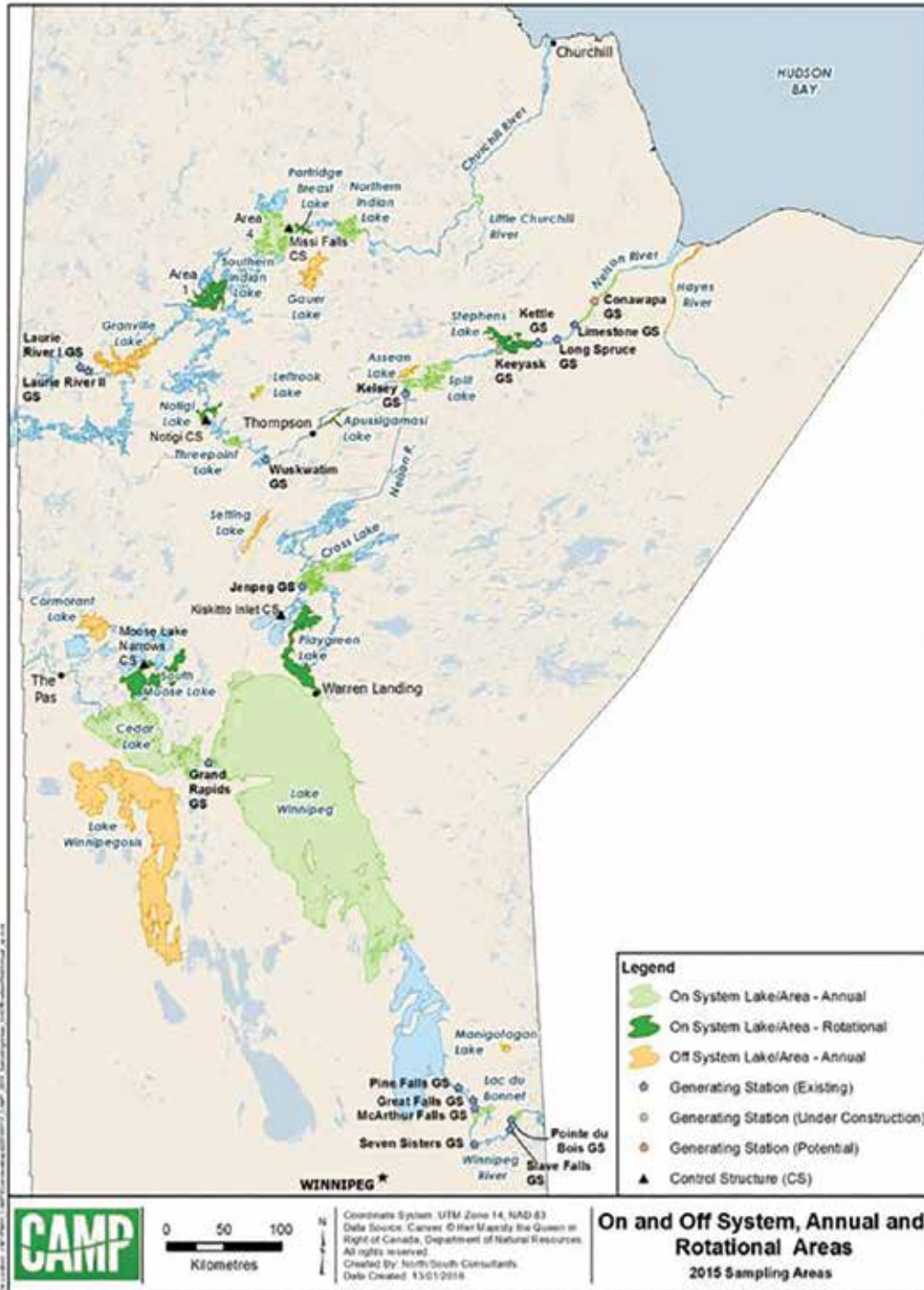
2015/16 Sampling Parameters and Waterbodies

Region	Site	On System	Off System	Fish Community	Water Quality	Benthic Macroinvertebrates	Mercury in Fish	Phytoplankton Community
Winnipeg River	Upstream of Pointe du Bois	x		Annual	Annual	Annual		
	Upstream of Pointe du Bois	x		Annual	Annual	Annual		
	Manigotagan Lake		x	Annual	Annual	Annual		
Saskatchewan River	Cedar Lake - southeast	x		Annual	Annual	Annual		
	Cormorant Lake		x	Annual	Annual	Annual		
	Moose Lake	x		Rotational	Rotational	Rotational		
Upper Churchill River	Southern Indian Lake (Area 4)	x		Annual	Annual	Annual		
	Granville Lake		x	Annual	Annual	Annual		
	Southern Indian Lake (Area 1)	x		Rotational	Rotational	Rotational		
Lower Churchill River	Northern Indian Lake	x		Annual	Annual	Annual		
	Churchill R. at Little Churchill R.	x		Annual	Annual	Annual		
	Gauer Lake		x	Annual	Annual	Annual		
	Partridge Breast Lake	x		Rotational	Rotational	Rotational		
Churchill River Diversion	Threepoint Lake	x		Annual	Annual	Annual	Annual	
	Leftrook Lake		x	Annual	Annual	Annual	Annual	
	Notigi Lake	x		Rotational	Rotational	Rotational		
	Apussigamasi Lake	x		Rotational	Rotational	Rotational		
Upper Nelson River	Cross Lake - West basin	x		Annual	Annual	Annual		Annual
	Setting Lake		x	Annual	Annual	Annual		Annual
	Playgreen Lake	x		Rotational	Rotational	Rotational	Rotational	
Lower Nelson River	Split Lake	x		Annual	Annual	Annual		Annual
	Assean Lake		x	Annual	Annual	Annual		Annual
	Nelson R. Mainstem - d/s Limestone GS	x		Annual	Annual	Annual		
	Hayes River		x	Annual	Annual	Annual		
	Stephens Lake - north arm	x		Rotational	Rotational	Rotational		
	Stephens Lake - south	x		Rotational	Rotational	Rotational	Rotational	
Lake Winnipeg	Lake Winnipeg - Mossy Bay	x		Annual		Annual		
	Lake Winnipeg - Grand Rapids	x		Annual	Annual	Annual		
	Lake Winnipeg - Sturgeon Bay	x		Annual				
	2-Mile Channel	x			Annual			
	Warren Landing	x			Annual			
	Lake Winnipegosis		x	Annual	Annual	Annual		

MCWS - Water Quality Section	
MCWS - Fisheries Branch	
Consultants	

Attachment 5

Map of Waterbodies Sampled in 2015/16





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