

MATTAGAMI REGION
CONSERVATION AUTHORITY
FLOOD CONTINGENCY PLAN 2022



Mattagami River Flood 1960



MATTAGAMI REGION CONSERVATION AUTHORITY

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FLOOD RESPONSE PROCEDURES SUMMARY

The following is a brief summary of the procedures and responsibilities of the Mattagami Region Conservation Authority (MRCA) under its Flood Contingency Plan.

1. Conservation Authority staff will continuously monitor watershed conditions throughout the year for the possibility of flooding. Monitoring includes the collection and analysis of snow courses, streamflow data, weather, and dam operations data as provided by various agencies within the Upper Mattagami River Watershed including Porcupine Lake, the Mattagami River, Town Creek and Kamiskotia Lake.
2. Depending on watershed conditions, the MRCA, in conjunction with the Timmins Flood Advisory Committee (TFAC), will issue flood messaging to the municipality, local media, and the Provincial Surface Water Monitoring Centre (SWMC) in Peterborough.
3. Authority staff will continuously monitor all flood damage centres. The Timmins Flood Advisory Committee will continue to meet and make recommendations to the Emergency Management Coordinator. Based on the level of threat, the Municipal Emergency Management Coordinator may, at their discretion, implement their Municipal Emergency Plan.
4. In the event of the declaration of a municipal emergency, Conservation Authority staff will continue to liaise with the Timmins Flood Advisory Committee, MNDMNR Timmins District office and the Municipal Emergency Management Coordinator.

Municipal or provincial personnel, who believe that flooding is occurring or is anticipated, should contact the Conservation Authority at the following numbers:

David Vallier, MRCA General Manager
705-360-2660 ext. 7482

Kevin Gagnon, MRCA Field Supervisor
705-360-2660 ext. 7464

If Conservation Authority staff is unavailable, the Municipal Emergency Management Coordinator should be contacted as per the Municipal Emergency Plan.

Tom Laughren, City of Timmins Fire Chief
705-360-2626 ext. 4082

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1.0 INTRODUCTION

Historical records show that flooding within the City of Timmins has occurred regularly since the 1920's. The Mattagami River floods of 1960 and 1996 and the Town Creek flood of 1961 resulted in the loss of life and extensive property damage. It was soon after the two floods in 1960 and 1961 that the Mattagami Region Conservation Authority (MRCA) was established (originally the Mattagami Valley Conservation Authority) and a comprehensive program of water management was implemented. Although much effort has been put into the installation of flood control works and the regulation of new development in flood prone areas, flooding still poses a threat to life and property. Records indicate that a spring thaw combined with warm, wet weather is the leading cause of high water. However, intense summer storms with heavy, localized rainfall can also be very destructive, especially within the smaller waterbodies such as Crawford Creek and Town Creek.

The MRCA Flood Contingency Plan documents the responsibilities and procedures of the Conservation Authority before and during flood emergencies. It is revised, updated and distributed annually to the various agencies and individuals involved in an emergency response to flooding.

The Emergency Management and Civil Protection Act (R.S.O. 1990, c.E.9, amended 2009) in Ontario stipulates that the province and municipalities must develop and implement emergency management programs. A risk management approach is taken when dealing with emergency management, which includes prevention, mitigation, preparedness, response, and recovery (MCSCS, 2016). Some features of risk management include emergency plans, emergency operations centres, emergency information, training programs and exercises, public education, and Hazard Identification and Risk Assessments (HIRA). One of the natural hazards identified in Ontario through HIRA is flooding.

2.0 RESPONSIBILITIES

Conservation Authorities and the Ministry of Northern Development, Mines, Natural Resources and Forestry (MNDMNR) share the responsibility for flood warning and forecasting in Ontario. The MRCA fulfils this responsibility for their area of jurisdiction by maintaining and distributing the MRCA Flood Contingency Plan. The Conservation Authority forecasts flooding potential and issues flood messages to the City of Timmins and the province.

As with all emergencies, municipalities have the primary responsibility for the welfare of residents, and should incorporate flood emergency response into municipal emergency planning.

2.1 Mattagami Region Conservation Authority

- Monitor and collect data related to rainfall, snow depth/water equivalent and ice conditions.
- Inform the public of watershed conditions throughout the year and more specifically during the spring and fall.

- Provide technical advice to the City of Timmins related to preventing or reducing the effects of flooding.
- Provide planning support and advice to the City of Timmins with respect to minimizing the impact of flooding.
- Participate in the development of flood emergency plans with the City of Timmins.
- Maintain a Flood Contingency Plan to alert residents, municipal representatives, media, local police, the Ontario Provincial Police, and the MNDMNRF of high water conditions and any potential flood threats.
- Issue Water Conditions Statements, Flood Watch / Warning messages to City of Timmins, partners and news media and issue notice of cancellations of flood messages when appropriate.
- When flooding is imminent for either the Mattagami River or Porcupine Lake flood centres, the MRCA will implement the appropriate Flood Warning Call-Out List as detailed in Appendix A.
- Initiate coordinated contingency emergency planning by the City of Timmins as per the guidelines and directives contained within the Municipal Emergency Plan.
- Maintain awareness of the status of a flood emergency response through consultation with the local OPG staff.
- Continue to update the City of Timmins and the MNDMNRF of the current situation and outlook.
- Liaise with the City of Timmins in matters related to declaring a municipal emergency and securing provincial resources as necessary.
- Maintain awareness of the status of the provincial response to a flood emergency, through consultation with the MNDMNRF Timmins District office.
- During flood emergencies, provide Conservation Authority staff 24/7 contact information to the MNDMNRF and the City of Timmins.
- Designate personnel who will carry out the functions mentioned above and any other functions as are appropriate.

2.2 City of Timmins

- Maintain its own Municipal Emergency Plan (EMO, 2008).
- In the event of a flood, determine the appropriate response in accordance with their municipal emergency planning and dedicate resources to minimize personal risk, property damage and ensure the welfare of the residents.
- The MRCA Flood Contingency Plan will be posted in a convenient location so the municipality can contact appropriate agencies and individuals during a flood event. During a flood emergency, this will include 24/7 contact information for the Conservation Authority and Emergency Management Ontario (EMO). EMO will be able to reach out to other provincial agencies as appropriate.
- If municipal resources are fully committed and additional resources are required, the municipality should directly contact EMO through the Provincial Emergency Operation Centre (PEOC) Duty Officer.

2.3 Provincial Responsibilities

The MNDMNRFC Surface Water Monitoring Centre monitors weather forecasts and water levels across the province and provides that information to Conservation Authorities. They provide information to the MRCA through online databases that help with forecasting and minimizing flooding potential. If conditions indicate the potential for flooding, the local Conservation Authority is notified, confirms the local information, and issues Flood Messages as required.

The MNDMNRFC provides expertise in hazard management and response. MNDMNRFC owns and operates a variety of dams based on dam operations plans, including assessment of potential for exceeding design capacity. Where MNDMNRFC is aware that another dam owner is unavailable, MNDMNRFC has the authority to operate the dam in the absence of that dam owner.

The MRCA's watershed is located within the MNDMNRFC Timmins District. When provincial assistance is required outside the City of Timmins, the area in question should communicate directly with the MNDMNRFC Timmins District office who will assess the need and the province's capacity to respond to the event.

MNDMNRFC may support a municipal request for assistance during a flood emergency through the District when it activates its District Managers Emergency Response Plan and Response Team. Assistance is coordinated through the Ministry Emergency Operations Centre.

3.0 TIMMINS FLOOD ADVISORY COMMITTEE (TFAC)

The TFAC is comprised of Ontario Power Generation Inc. (OPG), Mattagami Region Conservation Authority (MRCA) and the Ministry of Northern Development, Mines, Natural Resources and Forestry (MNDMNRFC). The primary mandate of the Timmins Flood Advisory Committee (the "Committee") is to act as a vehicle for the exchange of information among all committee members about water management in the watershed. In consideration of this information, OPG, MNDMNRFC and MRCA, who are the primary members of the Committee, will make integrated water management decisions required to accommodate the numerous system uses and users. These decisions must respect the multitude of uses/users, and should use natural watershed boundaries, rather than political boundaries.

TFAC is committed to:

- open communication;
- achieving a balance between the needs and desires of all system users in an equitable manner;
- enhancing and refining the use of information management and technology to support decision-making; and
- supporting the management of flows, water levels (high and low) and dam operations as related to public safety, fisheries, recreation, waterpower generation and water supply.

A meeting of the Timmins Flood Advisory Committee shall be held each year between March 20 and March 31. The Committee shall maintain a liaison with its members throughout the spring runoff period until such time that any flood risk has passed.

During those meetings specific to flood emergency planning, forecast and warning, weather information, snow course data and streamflow readings will be reviewed and flooding potential assessed. The Committee will ensure that those with delegated responsibilities throughout any period of flood threat maintain a high level of emergency preparedness. When conditions warrant, the MRCA will release Flood Messages on behalf of the Committee.

3.1 Committee Advisors

In addition to its primary members, the Committee shall also include community stakeholders from the City of Timmins in an advisory capacity as outlined in the Terms of Reference. The Committee Advisors:

- will have an opportunity to review information pertaining to water management in the watershed and provide comments to the three primary members.
- will assist the primary members in implementing public communication and consultation processes.
- bring knowledge of and experience on the Upper Mattagami Watershed.

A list of members on the Timmins Flood Advisory Committee, including Committee Advisors, is found in Appendix B.

4.0 FLOOD WATCHES, WARNINGS AND STATEMENTS

The Surface Water Monitoring Centre (SWMC) issues provincial flood messages to the Conservation Authority, the MNDMNR districts and posts on the SWMC electronic bulletin board. A Provincial Flood Watch issued by the SWMC to the Authority provides information about the potential for flooding. Authority staff will assess local conditions and determine if a specific public announcement is warranted.

Messages issued by the SWMC are not to be confused with Conservation Authority messages that are issued locally to the City of Timmins, government agencies and the public.

Flood message terminology has been standardized across the province and is used by all Conservation Authorities, the MNDMNR as well as Environment Canada and the Weather Network. These announcements indicate the state of readiness needed to address potential flooding situations and are issued to the local media and the public. There are four levels of messaging used ranging from “normal” to “flood warning” with each having a specific colour code and graphic. The Mattagami Region Conservation Authority and the Timmins Flood Advisory Committee use these public flood messaging announcements as part of its communications system. Sample messages are found in Appendix H.

4.1 Terminology

Normal

There are no flood conditions.



Watershed Conditions Statement

A general notice of weather conditions that could pose a risk to personal safety or which have the potential to lead to flooding. There are two types of statements.

- **Watershed Conditions Statement—Water Safety**

A Water Safety Statement is a general notice of potential watershed conditions that pose a risk to personal safety such as high flows, unsafe ice, slippery banks or high lake levels. Flooding is not expected.



- **Watershed Conditions Statement—Flood Outlook**

A Flood Outlook Statement is an early notice of the potential for flooding based on weather forecasts calling for heavy rain, snow melt, high wind or other conditions that could lead to high runoff and unsafe river, lake or bank conditions. It is a general public information message to encourage awareness.



Flood Watch

A Flood Watch message serves as notification that flooding is possible in specific watercourses or municipalities.

Municipalities, emergency services and individual landowners in flood-prone areas should prepare. It is usually issued following the onset of overbank flow or high lake levels. These messages do not require specific action but, having been advised of the potential flood conditions, municipal emergency personnel should initiate a review of their emergency plan and monitor potential problem areas. Flood Watches may be updated depending upon weather and runoff conditions, and will be followed by a notice of cancellation once the potential for flooding has passed.



The content of a standard Flood Watch consists of:

- watch number and sender
- date and time of issuance
- summary of weather forecast information
- description of potential flood magnitude
- assessment of flooding implications
- contact names and numbers for further information

Flood Warning



A Flood Warning is used to warn of impending flooding and should be taken very seriously. A Flood Warning provides notice to the municipality and emergency services that action is required on their part. Flood Warnings may be updated depending upon weather and runoff conditions, and will be followed by a notice of cancellation once the potential for flooding has passed.

The content of a standard Flood Warning consists of:

- warning number and sender including date and time of issuance
- period message is in effect
- general watershed conditions
- long range forecast
- implication of current conditions and long range forecast
- contact names and numbers for further information

Termination Message (Notice of Cancellation)

A termination message is issued when the event has concluded. Although it may be combined with an updated Watch or Warning message as described above.

Municipal Emergency Declaration

A declaration of a municipal emergency is made by an appropriate elected official, usually the Mayor. This municipal declaration would state that the flooding situation is critical and that a coordinated response by several agencies, both government and private, may be required.

Provincial Emergency

A declaration of a provincial emergency is made by the Premier of Ontario. It states that an urgent situation exists within all or part of the province that exceeds the capacity of the province with available resources or requires special measures to be implemented as per the Provincial Emergency Response Plan in accordance with the Emergency Management and Civil Protection Act (EMCPA).

5.0 COMMUNICATIONS AND RECORDS

The MRCA administers its Flood Contingency Plan through the Mattagami Region Conservation Authority office at 100 Lakeshore Road in Timmins. The Authority Coordinator shall be the General Manager in consultation with the Conservation Authority Chair. As such, it is the Coordinator's role to be the key contact person with the Surface Water Monitoring Centre, the MNDMNR District Coordinator and the Municipal Emergency Management Coordinator.

Communications from the Conservation Authority office will be via telephone, email, mobile phone and the internet.

Communication with the Surface Water Monitoring Centre can be directly by telephone or through the internet.

5.1 Record Keeping

The Conservation Authority collects and keeps all records including flow measurements, snow courses, water elevations and photographs. Ontario Power Generation and the MNDMNRF also keep data on snow courses, weather and stream flows.

5.2 Flood Warning Call-Out List

Once it has been determined that flooding is imminent for either the Mattagami River or Porcupine Lake flood centres, the Conservation Authority will implement the appropriate Flood Warning Call-Out List (Appendix A). The list is based on information derived from the Authority's flood plain mapping, property surveys and hydraulic models.

6.0 WATERSHED MONITORING AND DATA ACQUISITION

The Upper Mattagami River Watershed is monitored through a system of streamflow gauges, snow courses and a weather forecasting network. The information is collected by several agencies including the Mattagami Region Conservation Authority, Ontario Power Generation, Environment Canada's Water Survey and Atmospheric Environment Services branches and the MNDMNRF's Surface Water Monitoring Centre. Additional monitoring details are found in Appendix D.

7.0 WATERSHED CHARACTERISTICS

Flooding within the City of Timmins can be characterized as two main types; a spring freshet accompanied by warm, wet weather; and, an intense seasonal storm with heavy, localized rain over a short period of time. To a lesser degree, flooding can also result from beaver activity on the smaller watercourses and by ice damming within culverts and channels.

Several watercourses within the City of Timmins are regulated by a system of dams and control weirs. These are operated and managed by Ontario Power Generation, the MNDMNRF and the Conservation Authority as multi-purpose structures, including flood control.

Information about MRCA Flood Damage Centres is found in Appendix E.

Information about MRCA Dam Operations and Management is found in Appendix F.

8.0 UPDATING AND DISTRIBUTION OF THE PLAN

The MRCA Flood Contingency Plan outlines the responsibilities of the Mattagami Region Conservation Authority prior to and during a flood emergency. The information contained herein is revised annually. Digital copies of this plan will be provided to:

- Chair and Vice-Chair of the Conservation Authority
- City of Timmins CAO
- Director of Public Works or designate
- Municipal Emergency Management Coordinator
- Police Chief

- Fire Chief
- Local MNDMNRF Response Coordinator - Timmins District
- Ontario Power Generation
- Ontario Provincial Police
- MNDMNRF Regional Emergency Response Coordinator

A public facing version of this document will be made available on the MRCA website.

Appendix A: Flood Warning Call-Out List

Properties in the call out lists are those most prone to flooding during high water events on the Mattagami River and Porcupine Lake. As part of the MRCA Flood Contingency Plan for the City of Timmins, this list will allow the Conservation Authority and emergency personnel to forewarn flood plain residents of increased flows and higher lake levels along those watercourses.

Mattagami River

There are approximately 400 residential and commercial properties located within the flood plain of the Mattagami River. These properties are distributed over seven flood stages and are listed in the following pages of this plan.

Porcupine Lake

There are approximately 160 residential and commercial properties located within the floodplain of Porcupine Lake and the Porcupine River. These properties are distributed over three flood stages and are listed in the following pages. The Design Flood Elevation for Porcupine Lake is 922.8 feet (281.27 m) C.G.D., based on a 1 in 100 year flood flow, with slightly higher elevations for those properties located adjacent the Upper Porcupine River and Evans Street.

Appendix D: Monitoring and Data Acquisition

Snow courses are used to measure the depth and water content of the snow pack. Streamflow gauges are utilized to measure both the amount of water flowing past a particular point on a river as well as lake levels. Weather forecasts are obtained from a national monitoring network and provide short-range and long-range information on precipitation and temperature. This information is combined to provide an accurate picture of real-time watershed conditions and to predict future conditions. Readings in any given year are compared to past records to determine what percent of normal present conditions represent. Records are compiled and stored by all the agencies involved.

Snow Courses

At the present time there are a total of seven snow courses in the Upper Mattagami River Watershed:

- Porcupine (No. 7101) — monitored by the Conservation Authority
- Mountjoy (No. 7102) — monitored by the Conservation Authority
- Mattagami — monitored by Ontario Power Generation
- Shillington — monitored by Ontario Power Generation
- Shining Tree — monitored by Ontario Power Generation
- Timmins Airport — monitored by the MNRF
- Gogama MNRF — monitored by the MNRF

Snow pack conditions are monitored until the spring freshet is complete. The present snow course network covers most of the major sub watersheds of the Upper Mattagami River Watershed. The SWMC issues snow cover maps for the province identifying snow depth, water content, snow density and percent of normal.

Streamflow Gauges

A system of streamflow gauges maintained by Water Surveys of Canada monitors water surface elevations throughout the Upper Mattagami River Watershed. The following is a list of those facilities currently in operation. You can also access this information online - https://wateroffice.ec.gc.ca/mainmenu/real_time_data_index_e.html

Mattagami River—Federal gauge Station Number 04LA002 with formal records dating back to 1969. Maintained by Water Surveys of Canada and accessed off Dalton Road. Data Logger/DCP gauge reading is used with stage-discharge chart to obtain flow measurement.

Mountjoy River—Data Logger/DCP gauge (04LA004) keyed in to local datum (top of steel guard rail on the upstream side of the bridge) and with records dating back to 1992. Readings are all in metric. Bench mark is located adjacent building.

Tatachikapika River—Data Logger/DCP gauge (04LA003) keyed in to local datum (top of steel hand rail on the upstream side of the bridge) and with records dating back to 1992. Readings are all in metric. Bench mark is located on southeast corner of bridge in concrete.

Porcupine Lake—Data logger/phone line gauge (04MD005) is located on the south shore of Porcupine Lake and keyed into Canadian Geodetic Datum and in metric measurement. This gauge can be cross-checked with a staff gauge located on the north west side of the Highway 101 bridge at Shallow Lake.

Porcupine River at Hoyle—Data Logger/DCP gauge (04MD004) with records dating back to 2007. Readings are all in metric.

Minisinakwa Lake—Maintained by the MNRF under the Water Surveys of Canada cost-share agreement, this gauge station, number 04LA005, was activated in 2002. It is located immediately upstream of the MNRF's Minisinakwa Lake Dam.

Kamiskotia River—Data Logger/DCP gauge (04LB002) with records dating back to 2008. Readings are all in metric.

Mollie River—Data Logger/DCP gauge (04LA006) with records dating back to 2007. Readings are all in metric.

Weather Forecasts

The Conservation Authority accesses weather information through government sources and the private sector. The Surface Water Monitoring Centre of the MNRF in Peterborough is the primary source of information. During the spring runoff this information is supplemented with forecasts from Ontario Power Generation and, if available, the Regional Fire Centre of the Ministry of Natural Resources & Forestry. Real time weather data on temperature and rainfall is available through Environment Canada and Flight Services at the Timmins Airport.

Staff Gauges

As part of its overall monitoring system, staff gauges are maintained at various locations throughout the City of Timmins. On the Porcupine River system, gauges are located at Evans Street, Golden Avenue and the Highway 101 E bridge at the outlet to Porcupine Lake. On the Mattagami River, a staff gauge can be read at the bridge pier (west side) Highway 101 W (Mattagami bridge). Gauges are also installed in conjunction with the streamflow gauges at the Mountjoy and Tatchikapika Rivers. A staff gauge is also available on the Little Kamiskotia River at the outlet to Kamiskotia Lake.

Ice Monitoring

Ice thickness on major streams and lakes is not monitored on a regular basis. However, ice buildup is watched closely on Town Creek and Crawford Creek. Both locations are monitored starting in the early winter.

Appendix E: Flood Damage Centres

The following locations are considered the main flood damage centres within the City of Timmins.

Mattagami River—along its entire length from the Ogden-Mountjoy Township boundary to the Sandy Falls Dam. Structures include dwellings, commercial sites, accessory buildings and structures such as gazebos and docks, and storage yards containing vehicles and lumber. This flood damage centre is affected mainly by freshet flows with the highest threat occurring from mid-April to the end of May. High flows during the fall can result in some nuisance flooding. The first stage of flooding is considered to occur when river flows exceeds 280 cms at Sandy Falls Dam.

Porcupine Lake and River—including the Upper Porcupine River at Quebec Avenue and Evans Street and the entire shoreline of Porcupine Lake. The latter includes the westerly end of the lake and the Bristol Road area. The highest flood threat occurs during the spring freshet from the beginning of April to the beginning of June although prolonged summer rains can raise lake levels substantially. A potential flood threat from the Goldcorp Mine Number Six tailings pond has also been identified. Porcupine Lake is in its first flood stage when the lake elevation exceeds 280.5 metres C.G.D.

Town Creek—from its headwaters at Murray Street to Rea Street North. Although all structures have been removed from the flood plain, high water as a result of ice blockages within channels and culverts remains a threat in the late winter and early spring. Intense summer storms will result in backup of storm and sanitary sewers throughout the Town Creek watershed. Some road flooding will also result.

Polaris Creek—several dwellings are at risk along Waterloo Road adjacent the Polaris Creek. Flooding is the result of either intense summer storms or a spring runoff combined with ice-blocked channels.

Frederick House Lake and River—the entire lake shoreline including the Frederick House River to Nighthawk Lake. The potential for flooding is the result of high water levels during the spring freshet. Several residences and accessory structures are affected.

Crawford Creek—that part of the watershed located within South Porcupine. Flooding may occur in the late spring as a result of an ice blockage within the culvert section of the creek either at the inlet on Crawford Street or at the outlet at Highway 101.

Kamiskotia Lake—the entire lake shoreline. The potential for flooding is the result of high water levels during the spring freshet and beaver activity downstream on the Little Kamiskotia River. Several residences and accessory structures are located within the flood plain.

Mountjoy Creek—the entire creek system from Riverside Drive North to Sandy Falls Road to the Mattagami River. The potential for flooding is the result of high water levels during the spring freshet and beaver activity.

In addition to these main flood centres, localized flooding may occur at various locations throughout the City of Timmins as a result of beaver activity. To address this problem, the Mattagami Region Conservation Authority, with the participation of the City, the MNR and the local Fur Council, has implemented a beaver management strategy.

Appendix F: Dam Operations and Management

Several watercourses within the City are regulated by a system of dams and control weirs. These are operated and managed by Ontario Power Generation, the Ministry of Natural Resources & Forestry and the Conservation Authority as multi-purpose structures, including flood control.

Mattagami River—The Mattagami River system is the largest watercourse flowing through the City of Timmins and is responsible for the most extensive flood damage centre in the community. Upstream of the City, the river is partially regulated by a series of five dams and reservoirs established primarily for power generation purposes. The ability of these dams to hold back and regulate flows in order to reduce downstream flooding during the spring freshet is limited. There is however some capacity to "shave peaks" of flood flows. This ability to reduce the severity of a particular flood event forms part of the Conservation Authority's overall flood management program. The Upper Mattagami River system is managed on the basis of a "water year". This "year" reflects not only when water is stored and released as a result of natural inflows and outflows, but also when the water is needed the most. Starting in late fall, all storages are brought up to maximum elevations in anticipation of peak winter power demands. By mid-April reservoir storages will have been lowered to a minimum, ready to be filled by the spring freshet. During the period of mid-April to mid-June, elevations and outflows are regulated to meet several water management goals including "peak shaving" of flood flows to reduce downstream flood damages, maintaining minimum elevations at pickerel spawning locations and ensuring minimum water requirements are met at the Timmins water filtration plant. After mid-June all reservoirs are kept at near full capacity to meet the recreational needs of cottagers and commercial operators. Through August and September, reservoirs are lowered to accommodate inflows associated with the fall rains. Once the reservoirs are again full in the late fall, the "water year" is repeated. Streamflow contributed by the Tatachikapika and Mountjoy Rivers is unregulated and contributes approximately one-third of the flow passing through Timmins.

Porcupine Lake—Unlike the Mattagami River system, the Porcupine River is largely an unregulated watercourse with only two minor water control structures located on it. Downstream at the Owl Creek mine site the Authority owns and operates a low flow weir designed to maintain minimum summer water levels on Porcupine Lake. This weir however cannot be used for flood control purposes. Instead, the Authority will open the weir's gates in the late fall to lower river and lake levels to about 914 feet (278.6 m) C.G.D. in anticipation of the spring runoff. Once the spring freshet has passed, the weir is again closed and used to keep water levels at about 915.5 (279 m) feet until the next fall.

The other flow control structure on the Porcupine River is the Number Six Tailings Dam owned and operated by Goldcorp Mines Ltd. Located upstream of Porcupine Lake, the dam is a large structure designed to hold tailings and to decant excess process water once this water has met provincial water quality guidelines. This tailings impoundment is able to contain substantial quantities of water and can have a significant downstream impact if water has to be released during the spring freshet. There is no capacity within the system to "shave peaks" as can be done on the Mattagami River. The Porcupine Lake and River system has a very flat gradient resulting in slow outflows and a high susceptibility to flooding.

Gillies Lake - Located within the Town Creek watershed, Gillies Lake is used during the winter months for low flow augmentation purposes. A gate and valve system permit the slow, continuous release of about 0.5 to 1.0 cfs into the Town Creek starting at freeze up around the middle of November. Flow augmentation, in conjunction with low flow channels, has helped control downstream ice build-up in the culverts between Vimy and Waterloo. During the spring freshet, lake levels are monitored and the outlet regulated to ensure no shoreline flooding occurs. Summer lake levels are kept at around 5 to 10 cm below the gravity overflow of the outlet.

Appendix G: Historic Snow Course Data Summary

The following charts summarize the historical snow course data collected by Ontario Power Generation and the Mattagami Region Conservation Authority.

HISTORIC SNOW COURSE DATA REPORT

MOUNTJOY

Year	1-Mar		15-Mar		1-Apr		15-Apr		1-May		15-May	
	SD	WC	SD	WC	SD	WC	SD	WC	SD	WC	SD	WC
1948	-	-	-	-	-	-	-	-	-	-	-	-
1949	-	-	-	-	-	-	-	-	-	-	-	-
1950	-	-	-	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-	-	-	-	-
1955	-	-	-	-	-	-	-	-	-	-	-	-
1956	-	-	-	-	-	-	-	-	-	-	-	-
1957	-	-	-	-	-	-	-	-	-	-	-	-
1958	-	-	-	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-
1961	-	-	-	-	-	-	-	-	-	-	-	-
1962	-	-	-	-	-	-	-	-	-	-	-	-
1963	-	-	-	-	-	-	-	-	-	-	-	-
1964	-	-	-	-	-	-	-	-	-	-	-	-
1965	-	-	-	-	-	-	-	-	-	-	-	-
1966	-	-	-	-	-	-	-	-	-	-	-	-
1967	-	-	-	-	-	-	-	-	-	-	-	-
1968	-	-	-	-	-	-	-	-	-	-	-	-
1969	-	-	-	-	-	-	-	-	-	-	-	-
1970	-	-	-	-	-	-	-	-	-	-	-	-
1971	-	-	-	-	-	-	-	-	-	-	-	-
1972	-	-	-	-	-	-	-	-	-	-	-	-
1973	-	-	-	-	-	-	-	-	-	-	-	-
1974	-	-	-	-	-	-	-	-	-	-	-	-
1975	-	-	-	-	-	-	-	-	-	-	-	-
1976	-	-	-	-	-	-	-	-	-	-	-	-
1977	-	-	-	-	-	-	-	-	-	-	-	-
1978	-	-	-	-	-	-	-	-	-	-	-	-
1979	-	-	-	-	-	-	-	-	-	-	-	-
1980	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-
1990	-	-	-	-	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	-	-	-	-	-
1992	-	-	-	-	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-	-	-	-	-
1994	40	86	48	111	53	121	20	61	0	0	0	0
1995	72	112	26	76	32	79	27	89	0	0	0	0
1996	-	-	86	130	91	183	85	140	-	-	59	91
1997	95	243	110	267	92	231	59	246	24	78	0	0
1998	74	119	75	135	41	117	15	42	0	0	0	0
1999	70	109	64	116	-	-	25	69	0	0	0	0
2000	39	127	37	91	23	66	18	55	-	-	-	-
2001	73	137	85	135	66	137	29	86	0	0	0	0
2002	95	180	111	206	93	188	63	140	15	46	0	0
2003	76	137	72	132	63	142	43	127	18	41	0	0
2004	72	140	82	173	52	145	46	155	16	53	0	0
2005	59	114	77	162	49	69	18	41	0	0	0	0
2006	70	173	69	157	54	119	41	101	0	0	0	0
2007	54	89	50	102	27	81	42	127	0	0	0	0
2008	65	134	78	124	89	150	61	155	0	0	0	0
2009	87	147	84	165	81	160	88	188	31	51	0	0
2010	45	76	21	41	4	12	0	0	0	0	0	0
2011	46	71	54	99	52	86	25	46	9	28	0	0
2012	71	142	57	94	5	11	0	0	0	0	0	0
2013	65	130	81	157	73	168	86	193	50	132	0	0
2014	62	109	80	135	81	137	80	114	25	53	3	5
2015	81	152	83	142	83.8	180.3	55	114	16	46	0	0
2016	77	189	60.3	136	60	172	49.5	176	13.6	56.4	0	0
2017	55.1	116.6	52.2	146.3	49.4	123.7	31.9	77.22	3.6	4.8	0	0
2018	60.8	113.8	64.1	126	59.5	119.9	62.9	132.85	29.4	62.8	0	0
2019	97.8	219	99.8	190	77.2	209	82.3	221	58.2	160	19	39.4
2020	81.6	170.4	82.3	188	81.2	166.6	68.7	182.4	49.9	148.6	25.4	81.5
2021	37.1	73.4	35.2	83	12.7	39.1	0	0	0	0	0	0

SD - Snow Depth in cm				Metric				WC - Water Content in mm				
Normal	67.4	133.7	68.7	136.4	57.2	126.4	43.6	109.9	13.8	36.9	3.9	8.0
Maximum	97.8	243.0	111.0	267.0	93.0	231.0	88.0	246.0	58.2	160.0	59.0	91.0
Minimum	37.1	71.0	21.0	41.0	4.0	11.0	0.0	0.0	0.0	0.0	0.0	0.0

SD - Snow Depth in inches				Imperial				WC - Water Content in inches				
Normal	26.5	5.3	27.1	5.4	22.5	5.0	17.2	4.3	5.4	1.5	1.6	0.3
Maximum	38.5	9.6	43.7	10.5	36.6	9.1	34.6	9.7	22.9	6.3	23.2	3.6
Minimum	14.6	2.8	8.3	1.6	1.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0

HISTORIC SNOW COURSE DATA REPORT

PORCUPINE

Year	1-Mar		15-Mar		1-Apr		15-Apr		1-May		15-May	
	SD	WC	SD	WC	SD	WC	SD	WC	SD	WC	SD	WC
1948	67	140	65	135	50	155	12	41	-	-	-	-
1949	88	122	81	152	84	201	41	114	-	-	-	-
1950	92	165	96	201	88	198	-	-	-	-	-	-
1951	95	185	96	241	88	259	44	99	-	-	-	-
1952	58	89	73	122	74	145	52	127	6	15	-	-
1953	87	157	-	-	53	157	37	104	0	0	0	0
1954	50	94	70	142	79	183	42	97	0	0	0	0
1955	58	109	65	119	71	163	12	33	0	0	0	0
1956	80	137	89	147	88	160	55	152	58	175	-	-
1957	79	196	83	206	73	170	70	142	0	0	0	0
1958	69	124	61	150	49	127	0	0	0	0	0	0
1959	66	132	75	147	75	170	54	147	10	28	0	0
1960	101	236	97	229	104	264	84	241	44	135	19	61
1961	60	89	66	130	42	102	41	122	4	10	-	-
1962	100	211	86	201	70	196	51	157	37	114	-	-
1963	63	135	72	152	56	178	65	180	13	33	-	-
1964	85	229	97	272	105	318	104	333	11	46	-	-
1965	89	160	80	152	84	183	70	157	36	119	0	0
1966	60	150	72	180	69	201	62	185	20	51	-	-
1967	110	279	120	335	101	312	73	262	50	188	-	-
1968	75	185	74	183	45	152	0	0	0	0	0	0
1969	86	216	87	231	95	251	91	246	-	-	-	-
1970	71	157	72	163	69	173	53	163	0	0	0	0
1971	85	170	82	183	104	267	72	224	34	137	-	-
1972	81	185	95	267	118	257	73	231	30	112	0	0
1973	69	137	43	122	33	119	21	66	-	-	-	-
1974	79	198	-	-	80	208	86	257	27	109	17	65
1975	60	160	86	244	-	-	-	-	37	127	0	0
1976	82	180	97	211	67	249	62	254	0	0	0	0
1977	89	188	67	178	67	165	30	99	0	0	0	0
1978	81	191	88	211	103	282	84	279	49	155	-	-
1979	-	-	165	277	101	335	71	239	46	149	0	0
1980	48	76	50	87	62	122	45	89	2	5	-	-
1981	44	118	52	139	23	84	14	59	0	0	0	0
1982	73	170	68	170	64	174	50	170	34	94	-	-
1983	68	102	60	117	82	177	58	135	38	116	0	0
1984	51	158	62	177	53	174	51	177	0	0	0	0
1985	66	145	68	157	69	169	66	176	8	33	0	0
1986	68	137	80	161	74	183	58	168	8	8	0	0
1987	58	137	43	96	35	108	0	0	0	0	0	0
1988	90	230	94	272	102	251	58	201	48	188	0	0
1989	72	137	50	140	64	213	69	218	48	178	0	0
1990	109	292	82	241	74	292	57	198	29	109	0	0
1991	70	119	84	155	65	137	59	117	0	0	0	0
1992	85	191	83	201	81	206	73	201	29	83	0	0
1993	-	-	-	-	-	-	-	-	-	-	-	-
1994	-	-	-	-	52	114	75	40	-	-	-	-
1995	77	127	89	147	52	127	44	155	-	-	-	-
1996	111	156	101	184	-	-	100	147	92	167	-	-
1997	107	277	121	310	99	284	76	264	40	137	-	-
1998	87	152	88	179	54	170	24	79	-	-	-	-
1999	58	81	69	112	-	-	37	101	-	-	-	-
2000	37	137	42	132	24	81	21	71	-	-	-	-
2001	76	165	94	185	83	175	39	99	0	0	0	0
2002	99	198	111	239	108	274	72	236	32	86	0	0
2003	80	163	75	145	69	188	52	160	30	79	0	0
2004	74	155	89	188	60	168	47	175	17	63	0	0
2005	66	109	74	94	50	76	25	74	0	0	0	0
2006	75	184	77	193	65	147	48	106	0	0	0	0
2007	57	122	53	109	38	79	53	162	0	0	0	0
2008	71	147	84	175	96	193	67	178	0	0	0	0
2009	96	163	92	180	91	216	99	241	48	119	0	0
2010	51	91	28	61	19	53	0	0	0	0	0	0
2011	57	109	65	109	60	122	37	48	33	99	0	0
2012	80	152	65	107	12	31	0	0	0	0	0	0
2013	70	152	88	170	85	218	95	236	57	162	0	0
2014	72	132	83	127	87	150	86	91	33	86	4	15
2015	89	201	90	175	93	210.8	68	145	23	69	0	0
2016	79.8	201.9	63	132	64.5	169.4	61.4	204.7	27.1	95	0	0
2017	60.4	134.4	58	152.9	55.6	142	40.5	93.2	2	3.1	0	0
2018	66.2	118.6	72.1	131.6	66.5	139.4	68.1	151.4	34.4	75.2	0	0
2019	104.2	222	105.2	197	86.9	240	88.5	242	60.4	188	19.2	50.6
2020	84	190	86.3	206.8	84	180.9	74.3	212.6	48.1	159	23.2	76.2
2021	39	85	37.8	100.6	17	46.2	0	0	0	0	0	0

SD - Snow Depth in cm			Metric						WC - Water Content in mm			
Normal	75.2	158.4	78.2	172.0	70.1	179.8	53.1	146.1	21.5	66.2	1.7	5.6
Maximum	111.0	292.0	165.0	335.0	118.0	335.0	104.0	333.0	92.0	188.0	23.2	76.2
Minimum	37.0	76.0	28.0	61.0	12.0	31.0	0.0	0.0	0.0	0.0	0.0	0.0

SD - Snow Depth in inches			Imperial						WC - Water Content in inches			
Normal	29.6	6.2	30.8	6.8	27.6	7.1	20.9	5.8	8.5	2.6	0.7	0.2
Maximum	43.7	11.5	65.0	13.2	46.5	13.2	40.9	13.1	36.2	7.4	9.1	3.0
Minimum	14.6	3.0	11.0	2.4	4.7	1.2	0.0	0.0	0.0	0.0	0.0	0.0

Appendix H – Sample Messages

SAMPLE WATERSHED CONDITIONS STATEMENT

XX CA WATERSHED CONDITIONS STATEMENT-WATER SAFETY

TO: AFFECTED MUNICIPALITY, MNRF, OTHERS

CA MESSAGE NO. ##

DATE:MM/DD/YYYY

With the arrival of warmer temperatures, the spring melt is getting underway. As a result, there may be a water safety risk throughout the area including XX Lake, XX River, XX Creek, and XX Lake.

Water levels in local rivers, creeks and lakes are currently not a concern and flooding is not anticipated at this time, but conditions are subject to change. As the melt continues, local rivers, streams and the flood control channels will experience a rise in water levels and flows. Water levels and weather forecasts will be monitored on a daily basis. Updates will be issued as more information is made available, or if water conditions change.

City residents are cautioned against venturing out on lakes, rivers and small streams where slippery stream banks, thin ice, dangerous currents and fast moving cold water will make all waterways very hazardous. Parents especially, are urged to warn their children of these dangers.

Residents can visit the XX website for the latest information on watershed conditions and public advisories.

This message will be in effect until (or updated before) MM/DD/YYYY.

SAMPLE WATERSHED CONDITIONS STATEMENT

XX CA WATERSHED CONDITIONS STATEMENT-FLOOD OUTLOOK

TO: AFFECTED MUNICIPALITY, MNRF, OTHERS

CA MESSAGE NO. ##

DATE:MM/DD/YYYY

A disturbance out of the U.S. south east will bring rain over the next 48 hours. Rainfall amounts over this period could total 50(mm).

Given the above forecast, we expect a significant rise in rivers and streams throughout the watershed. No flooding is currently expected.

Although no flooding is anticipated area residents and businesses are asked to be prepared. These preparations would include moving any unsecured items from along the shore to higher ground as well as preparing a Household Emergency Plan that outlines what you need to do should you be asked to leave your home. City residents, especially children, are cautioned against venturing out on lakes, rivers and small streams. Thin ice, slippery stream banks, dangerous currents and fast moving cold water will make all waterways very hazardous.

This safety watch is in effect until MM/DD/YYYY.

Sample FLOOD WATCH

XX CA FLOOD WATCH

TO: AFFECTED MUNICIPALITY, MNRF, OTHERS

CA MESSAGE NO. ##

DATE:MM/DD/YYYY

The most recent streamflow information for the XX River watershed shows that the elevation of area rivers and streams are rising in response to the recent precipitation and continued snowmelt.

A Flood Watch message serves as notification to the general public that the potential for flooding exists. On the XX River system, water elevations are continuing to rise and could reach the critical first stage flood level over the coming days. At this point in time, residents may experience some flooding of low lying areas.

Residents living near lakes and rivers are reminded to remove unsecured material and equipment from shoreline areas as water elevations continue to rise. They should also be prepared with a household emergency plan should a flood emergency be declared. Parents are asked to let their children know about the dangers of playing in and around lakes, rivers and streams.

This watch is in effect until 08:00 MM/DD/YYYY at which time it will either be updated or cancelled.

Sample FLOOD WARNING

XX CA FLOOD WARNING

TO: AFFECTED MUNICIPALITIES, MNRF, OTHERS

CA MESSAGE NO: ##

DATE:MM/DD/YYYY

The current Flood Watch for XX River has been upgraded to a Flood Warning. A Flood Warning message serves as notification to the general public that flooding is about to occur.

- Heavy rain overnight has resulted in a significant rise in river and stream levels.
- Water levels are continuing to rise in response to the warm weather, precipitation and associated snow melt. Everyone living near the XX River is encouraged to monitor the conditions that are developing.
- Based on the current forecast flooding is expected to occur in the following areas:

This message will be updated at 12:00 on MM/DD/YYYY.