PORCUPINE FLOOD ABATEMENT PROGRAM

A BRIEF

PREPARED BY

THE MATTAGAMI REGION CONSERVATION AUTHORITY

APRIL, 1980

(REVISED) JUNE, 1980 *

HISTORY OF THE AREA

Porcupine Lake is located in the City of Timmins in the Township of Tisdale and Whitney. The earliest settlement of the Porcupine mining area started on the shores of Porcupine Lake and two townsites have developed on the shores of the Lake, South Porcupine on the westerly side of the Lake, and Porcupine on the north and north-easterly shores. The Porcupine River enters the Lake from the West and exists via the Porcupine River to the north.

Porcupine Lake has a history of flooding. Records kept by Dome Mine Ltd. at their water pumphouse indicate that flooding has occurred at least sixteen times since 1913. Despite this record of flooding, encroachment in areas prone to flooding has taken place resulting in property damage and serious inconvenience to residents of South Porcupine and Porcupine.

The Authority's Mandate

In 1974, the area of jurisdiction of the Mattagami Region Conservation Authority was expanded to include the watersheds of the Mattagami River and the Frederick House Rivers. Prior to 1974, the Authority had no jurisdiction in areas around Porcupine Lake.

In the Spring of 1976, unseasonably high temperatures caused a quick snowmelt and run-off and subsequent flooding on Porcupine Lake and River. Following this event, the Conservation Authority as a part of its mandate to control flooding and property damage decided to embark on a program to determine the causes of the flooding and what remedial measures would be required to reduce water levels on the system and the perennial damages suffered.

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AREA STUDIES

Three studies have been completed in the Porcupine Lake and Porcupine River area, all of which are submitted in support of this brief.

THE PORCUPINE LAKE AND RIVER STUDY completed by Acres Consulting Services Ltd. was delivered to the Authority in January, 1978. Although special emphasis was placed on the hydrotechnical aspects of Porcupine Lake and River including high and low lake levels, the report also addresses other considerations in a total overview of the watercourse system.

Environmental aspects including sources of pollution, water quality and weed growth are discussed in the report while socioeconomic aspects feature comments on the recreation uses of the lake, fish and waterfowl, float aircraft use and flood damage.

The study identified the main cause of flooding of Porcupine Lake as being the inability of the Porcupine River downstream from the Highway 101 bridge to accommodate excessive flows from the Lake during spring run-off or periods of high precipitation. More specifically, the control section of the Porcupine River from the Highway 101 bridge to a rock outcropping just upstream of the Texas Gulf rail line has a very low gradient which is further complicated by excessive weed growth, beaver activity, debris accumulation and mine tailings slippage.

Ameliorative measures of varying degrees of complexity and cost were recommended in this original report but further study of the Porcupine River was also recommended.

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In 1978, the Authority hired the firm of T. E. Rody Ltd., Ontario Land Surveyors, to prepare a plan of the Porcupine River showing the profile of the river bottom, gradient of the river bottom and areas of beaver activity and debris accumulation. This plan, produced in the Fall of 1978, confirmed the length of the control section of the River, pinpointed the areas of restriction to normal flows and further, affirmed the extremely low gradient of the River in the control section.

In 1979, the Authority authorized Acres Consulting Services Ltd. to proceed with the Porcupine River Channel Improvement Study. The purpose of this study was to complete further hydrotechnical analysis on the lower Porcupine River and alternative methods of channel clearance with varying standards of channelization. Backwater calculations were performed for alternatives studied to determine flood elevations on Porcupine Lake and resulting benefits from flood damage reduction.

Public Participation

When it appeared in 1978, that flooding was not the only problem associated with the Porcupine Lake and River system, it was decided by the Authority to set up meetings under a Porcupine Lake and River Management Group. This group, which met several times in 1979 and 1980 was composed of representatives from the City of Timmins, Ministry of Natural Resources, Ministry of the Environment and the Mining Industry. The purpose of these meetings was to seek input from these agencies on the watercourse problems and to keep them advised of progress towards possible solutions.

In May of 1979, a public meeting was held in South Porcupine to advise residents of flooding and related problems

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and solutions that were being investigated on the watercourse system.

In April 1980, another meeting was held to advise Evans Street residents of the results and studies completed on water flows through the Porcupine River system and the intention of the Authority to acquire certain properties most susceptible to periodic flooding.

General Conclusions and Recommendations

From the studies completed, and the recommendations of the engineering consultants hired, the Authority was able to determine a number of factors:

1. The main reason for flooding conditions on Porcupine Lake is the deteriorating condition of the lower Porcupine River from the Highway 101 bridge north to the rapids located upstream of the Texas Gulf railway spur line, and that the Authority should proceed with a project of channel clearance followed by an annual maintenance program on this section of the River.

2. The cost of a major channel re-construction project on the control section of the Porcupine River cannot be justified given the benefit to be realized in flood damage reduction. Presuming that a minor channel clearance project proceeds, certain properties around Porcupine Lake would still be susceptible to flooding under a 1-100 year flood condition, and therefore a project to acquire certain properties that are periodically inundated should proceed.

3. Certain other properties around Porcupine Lake that are not included in the land acquisition scheme would remain prone to flooding, but to a lesser degree, given a 1-100 year flood event and therefore a program should be developed

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to floodproof these other properties and if feasible, implemented through a Private Lands Assistance Program.

4. Given the history of flooding on Porcupine Lake and the potential for future flooding situations occurring, that no development should be allowed within the 1-100 year floodline for Porcupine Lake and Porcupine River.

Land Acquisition Phase

A number of properties in the Evans Street area of South Porcupine have been identified as being prone to flooding given the 1-100 year flood event on Porcupine Lake or from storm waters of Porcupine River as it enters Porcupine Lake. It is recognized that these properties will be susceptible to inundation despite any remedial works that might be completed on the lower Porcupine River. *The properties chosen for acquisition are located between the 919-920 foot contour and are first phase properties in the Authority's flood warning system for Porcupine Lake. Generally, the properties would be difficult to floodproof and access to non-flooding lands during a flood would not be possible. The properties have also been identified by the municipality's Neighbourhood Improvement Area Plan for the area as being generally in only fair or poor condition.

The Authority intends to proceed with the purchase of these properties over the next several years as they become available on the market and as funds become available to the Authority.

The lands in question which are outlined in Schedule 'A' and Schedule 'B' attached hereto, including four commercial properties, fourteen residential properties, twenty-five undeveloped vacant lots and 90 acres of vacant tract land. It is worthy of note that the City of Timmins already owns much of the property in the land acquisition area. These municipally-owned lands are shown on Schedule 'B'.

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* Although some sixty other properties have been identified as being susceptible to flooding during a regional flood event, they are generally in better condition than those properties slated for acquisition. It is also anticipated that peak flood levels on Porcupine Lake can be reduced as much as one foot (1') by a channel clearance program on the lower Porcupine River reducing possible flood damage to these properties which at present, remain within the flood line. An actual field survey by the Authority of floodplain properties around Porcupine Lake in 1979 shows lowest opening in foundation walls in these remaining properties as being generally above a lowered design flood elevation.

For the purpose of estimating costs of this phase, 1975 assessment figures were used, plus allowances for inflation, to arrive at the following estimated total project costs:

1.	Estimated cost of land and structures	$492,000.
2.	Legal and Appraisal fees	20,000.
3.	Demolition and grading	22,000.
4.	Authority staff costs	5,000.
	sub total	539,000.
5.	Add contingencies and other costs	10,000.
	TOTAL	$549,000.

SCHEDULE 'A' - Description of Property and Owner
SCHEDULE 'B' - Project Area Plan

The Authority intends to spend $100,000. in 1980 for land acquisition and forecasts expenditures in future years as follows:

1981 - $150,000.
1982 - 150,000.
1983 - 150,000.

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Channelization Phase - Porcupine River Control Section

Acres Porcupine River Channel Improvement Study recommends that the Authority proceed with alternative Case 2 as the minimum project required to maintain flows in the channel and subsequent stable elevations on Porcupine Lake.

Case 2 calls for a thorough clearing of the main river channel including all beaver dams, fallen logs, debris jams and excessive weed accumulation. This alternative is the most defensible of all seven various schemes investigated by the consulting firm as it results in a benefit-cost ratio which exceeds 1.0 as the cost of construction relates to flood damage reduction. The Case 2 alternative as described in the Study is estimated to cost $130,000. *and reduce peak 1-100 year flood levels on Porcupine Lake by one (1) foot.

In pursuing a channel clearance project to aid in reducing flood damage, the Authority is also cognizant of the need to maintain a stable and acceptable water level on Porcupine Lake to satisfy recreational, aesthetic and float aircraft requirements while at the same time, ensuring that flows in Porcupine Lake are maintained to dilute wastes from the Whitney Pollution Control Plant. The Authority is also aware, from reports from Acres Consulting Services Ltd. that a low water level flow-over weir may be required at the outlet from Porcupine Lake to maintain an acceptable lake level during periods of drought.

To this end, the Authority intends to proceed with the following work in the summer of 1980:

a) Extensive field and reconnaissance in the control section of the Porcupine River by water, to evaluate actual conditions of the watercourse, and by land, to thoroughly investigate all routes to access to the River to areas of severe or substantial blockage.

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b) Gain access where feasible to areas of substantial blockages and clear these areas using mechanized equipment.

c) Hire day labour workers as required to complete minor channel clearance work.

d) Monitor on a regular basis, flows on Porcupine River and associated levels on Porcupine Lake.

Costs for 1980 are anticipated as follows:

1)	Salaries - reconnaissance and flow monitoring	$ 4,000.
2)	Equipment rental and supplies	6,000.
3)	Day labour	16,000.
4)	Machine rental	20,000.
5)	Contingencies	4,000.
		$50,000.

Future Channelization Works

During the 1980 summer season, following the evaluation of work completed and field surveys of existing conditions, the need for more channelization will be analyzed. The need for a low water weir at the Porcupine Lake outlet will also be reassessed.

Should the decision be made to proceed with a channel improvement scheme as described by Acres as Case 2 in Appendix B, Porcupine Channel Improvement Study, the following costs can be anticipated.

1)	Project field office and set up	$ 7,000.
2)	Access Road construction	35,000.
3)	Machine Rental for channel clearance	90,000.
4)	Legal costs re access	5,000.
5)	Staff time, rentals etc.	5,000.
6)	Contingencies	14,000.
		156,000.
	Add Weir construction	25,000.
		$181,000.

This phase of channelization, if required, would proceed as described or in part, only after careful consideration by the Authority in consultation with the Regional Office of the Ministry of Natural Resources.

Schedule 'C', attached hereto, shows the control section of the lower Porcupine River.

Private Lands Assistance Program

The acquisition of certain floodplain lands in the Evans Street area of South Porcupine will remove these properties most seriously and most frequently affected by a 1-100 year flood event. Another sixty (60) residential dwellings have been identified as being susceptible to flood damage but to a lesser degree.

The Authority intends over the next year to investigate the feasibility and methods of reducing flood damage to these properties which will remain within the 1-100 year flood line. Berms and concrete flood walls have been suggested as possible solutions while floodproofing of some individual properties requires further assessment.

In co-operation with the Regional Office of the Ministry of Natural Resources, the Authority will develop a Private Lands Assistance Program whereby those property owners who have a sincere desire to floodproof their properties to provide protection to a design flood elevation may be assisted.

Funding for such a scheme would be requested on an annual basis from the Regional Office of the Ministry of Natural Resources to a maximum annual sum of, say, $10,000.

A Private Lands Assistance Program, while being considered for areas around Porcupine Lake, could also be expanded to include other flood prone areas within the watershed.

Development Control

Studies completed to date reinforce the need for development control in the area of Porcupine Lake and River. Despite channel improvements that are contemplated for the lower Porcupine River control section, given the right combination

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of snowmelt and rainfall, flood occurrences on Porcupine Lake remain a manifest possibility.

The Authority intends to pursue a policy of restricting all development within the 1-100 year flood line. The Authority also intends to expand its schedules to Ontario Regulation 813/74 to include the Porcupine Lake area, which will require applications to be filed and approved by the Authority prior to the placing of fill in any area considered prone to flooding.

Summary

The Porcupine Flood Abatement Program as described herein is considered an overview to the solution of problems associated with flooding on Porcupine Lake and River. The Program calls for the acquisition and clearance of those lands and structures most seriously affected by flooding, clearance of the lower Porcupine River to aid in the augmentation of flood flows from Porcupine Lake, a Private Lands Assistance Program to review the details of flood protection for those properties in floodplain areas and a policy to restrict future encroachment in flood prone areas.

Summary of Anticipated Costs

	1980	1981	1982	1983
Evans St. Land Acquisition	100,000	150,000	150,000	150,000
Porcupine River Channelization	50,000	181,000		
Private Lands Assistance	-	10,000	10,000	10,000
Development Control	-	-	-	-
	150,000	341,000	160,000	160,000

* underlined expenditures may be revised or deleted following further study and/or development of programs.

SCHEDULE 'A'

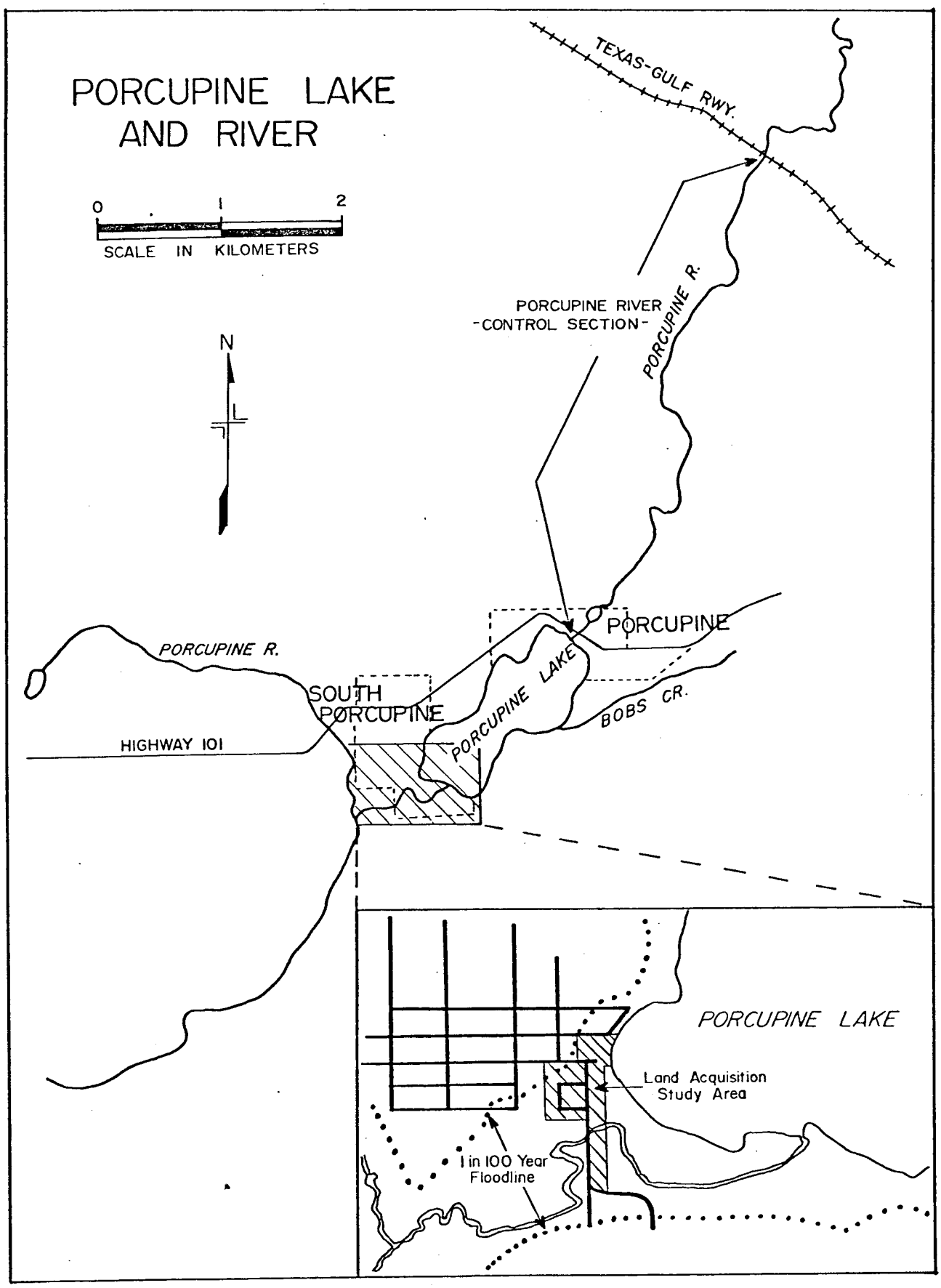
EVANS STREET LAND ACQUISITION PROJECT

NO.	OWNER	ADDRESS	PLAN	ASSESSMENT
1.	Wright	20 Warren	L 133, M20S	1730
2.	Belisle	86 Evans	L 138, 139, 326, M20S	2030
3.	Turcotte	94 Evans	L 142, M20S	1990
4.	Bell	78 Evans	L 136, 137, M20S	1810
5.	Warford	33 Evans	L 41, 43, 44, 46, M20S	2070
6.	Belisle	57 Evans	L 45, M20S	2150
7.	Kennedy	85 Evans	L 151, 153, M20S	1600
8.	Kowalczyk	19 Evans	Pt. L 149 & 150, M10S	1730
9.	Salo	21 Evans	Pt. L 149 & 150, M10S	1800
10.	Unchulenko	Lakeview Rd.	L 142, M10S	160
11.	Unchulenko	Golden Ave.	L 112, M10S	1170
12.	Unchulenko	Golden Ave.	Pt. L 113, M10S	1170
13.	Dyrczon	Leighton	L 160, M20S	110
14.	Dyrczon	Leighton	L 158, M20S	110
15.	Dyrczon	Leighton	L 156 M20S	110
16.	Dyrczon	Evans	L 155, M20S	960
17.	Dyrczon	Evans	L 157, M20S	960
18.	Dyrczon	Evans	L 159, M20S	960
19.	Unchulenko	Lakeview	L 143, M10S	120
20.	Unchulenko	Strachen	L 141, M10S	1250
21.	Robertson	Main	L 220, 221, M14S	2930
22.	Levinson	Whitney	L 203, 204, M25S	500
23.	Levinson	Whitney	L 205, 206, M25S	500
24.	Levinson	Whitney	L 217, 218, M25S	500
25.	Levinson	Whitney	L 219, 220, M25S	500
26.	Durham	Whitney	Con 2, N. Pt. L 12	1520
27.	Barrett	9 Evans	W 5', L 113, 114	
			E 24' L 115, M10S	7300

SCHEDULE 'A'

NO.	OWNER	ADDRESS	PLAN	ASSESSMENT
28.	Ditullio	13 Evans	L 139, 140, M10S	3750
29.	Unchulenko	Golden	L 111, M10S	1000
30.	Rumleski	Crawford	L 159, M10S	1730
31.	Bouchard	Lakeview	Pcl. 4025, W & T	11700
32.	Venture Claims	Quebec	Pcl. 3708 W & T	690
33.	Dome Mines	Legion	Pt. Pcl. 2766 SWS	975
34.	Priatel	Golden	L 108, M10S	1520
35.	Moskal	Golden	L 109, M10S	3130
36.	Larche	Golden	Pcl. 7459 W & T	800
37.	Unchulenko	15 Evans	L 139, 140, M10S	2390
38.	Priatel	Golden	L 107, M10S	6650

SCHEDULE 'C'


PORCUPINE LAKE
AND RIVER
0
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SCALE IN KILOMETERS
TEXAS-GULF RWY.
PORCUPINE RIVER
-CONTROL SECTION-
PORCUPINE R.
N
PORCUPINE
PORCUPINE R.
SOUTH
PORCUPINE
PORCUPINE LAKE
BOBS CR.
HIGHWAY 101
PORCUPINE LAKE
Land Acquisition
Study Area
1 in 100 Year
Floodline