



TECHNICAL REPORT

CANADIAN ZINC CORPORATION PRAIRIE CREEK MINE PROJECT

Submitted to:
Mackenzie Valley Environmental Impact Review Board
June 3rd, 2011

EA 0809-002

Executive SUMMARY

Transport Canada (TC) is responsible for transportation policies and programs. It ensures that air, marine, road and rail transportation are safe, secure, efficient and environmentally responsible. TC is participating in the environmental assessment for the Canadian Zinc Corporation (CZN), Prairie Creek Mine in accordance with our departmental mandate pursuant to the *Navigable Waters Protection Act* (NWPA). TC's involvement in the assessment has consisted of a review of the construction and operation of the proposed bridge crossings along the all season road and winter access road. Transport Canada, if requested, will provide specialist advice on potential impacts of the development to the public right of navigation in navigable water ways. TC's focus in reviewing proposed developments in and around Canadian waterways is to ensure a balance between the public right of navigation and the need to build works — that is any structure, device, or other thing that may interfere with navigation, such as bridges, dams or docks — in navigable waters. The NWPA provides for the prohibition to build works in navigable waters, unless the work has been approved by the Minister of Transport. TC's technical review of the Prairie Creek Mine Project proposal is divided into two sections: the winter access road, and the proposed four bridge crossings. The following is a summary of TC's conclusion and recommendation for Prairie Creek Mine.

TC is recommending that CZN adhere to TC's *Minor Works and Waters* (Navigable Water Protection) *Order for winter crossings* (see Appendix I of this document), and ensure that the terms and conditions are followed during the construction of the proposed winter access road. Failure to construct the work in accordance with the standards and criteria identified in the document and outlined in the *Order* as referenced in section 13 of the NWPA may result in enforcement action.

TC has conducted a cursory review of the four proposed bridge crossings and our Navigable Water Protection Program (NWPP) is currently completing a *Navigability Impact Assessment* for the identified waterways. Please note that the proposed watercourses may fall under the class of minor navigable waters and if applicable, the waterways may be deemed minor navigable waters and the works being considered may be exempt from the NWPA application process. TC has established a two-stage review process — *Initial and Secondary Review*, to be used by proponents in determining whether or not a particular navigable water meets the definition of a minor navigable water. The NWPP's *2010 Minor Waters User Guide* (see Appendix II of this document) can aid in assessing navigability the proposed waterways. The criteria established in the *Order* under each class and referenced in the *2010 Minor Waters User Guide* **must be fully met** in order for the navigable water to be considered “minor” under the provisions of the Act.



TABLE OF CONTENTS

Table of Contents

1.0	INTRODUCTION.....	2
2.0	TECHNICAL COMMENTS – WINTER CROSSINGS	3
2.1	BACKGROUND.....	3
2.2	Documents Referenced.....	3
2.3	Proponent’s Conclusion	3
2.4	TC’s Conclusions and Recommendations	3
3.0	TECHNICAL COMMENTS – BRIDGE CROSSINGS	4
3.1	BACKGROUND.....	4
3.2	Documents Referenced.....	4
3.3	Proponent’s Conclusion	4
3.4	TC’s Conclusions and Recommendations	5
4.0	SUMMARY OF RECOMMEDATIONS.....	6
	Appendix I – Minor Works and Waters Order for winter crossings.....	8
	Appendix III – Minor Water User Guide 2010.....	10



1.0 INTRODUCTION

The Canadian Zinc Corporation's ("CZN") Prairie Creek Mine project is a proposed underground mine and milling operation located in the southern Mackenzie Mountains in the south-west corner of the Northwest Territories. Approximately 120,000 tonnes of lead-zinc concentrate a year will be transported via a 180km access road to the Liard Highway. Seasonal road operation provides significant challenges because of the quantities to be moved in a short period of time.

In June 2009, the Nahanni National Park Reserve ("NNPR") was officially expanded. The Mine area is now surrounded by the expanded park but is not part of the park, and approximately half of the length of CZN's access road crosses the park.

Transport Canada has completed its technical review of the proposed Prairie Creek Mine project in accordance with our departmental mandate pursuant to the *Navigable Waters Protection Act*. Our review consisted of the following: CZN Developer's Assessment Report (DAR), Technical sessions, and CZN's Navigable Waters Protection Program Application (submitted May 27, 2011). TC is submitting the following comments for the environmental assessment of the Prairie Creek Mine Proposal.

2.0 TECHNICAL COMMENTS – WINTER CROSSINGS

2.1 BACKGROUND

The Canadian Zinc Corporation's Prairie Creek Mine is proposing to construct a 180 km access road from the project site to the Liard Highway. The access route is a combination of the existing alignment constructed and operated in the 1980s and winter road re-alignments. This road will be constructed and operated on a seasonal (winter) basis from approximately November 1st to March 31st of each year.

2.2 Documents Referenced

- Canadian Zinc Corporation. Prairie Creek Mine Developers Assessment Report. Addendum. May 2010. Section 6.0 Access Road Improvements.
- DAR Volume 3 of 4. Appendix 14. Prairie Creek Mine Winter Road Re-Alignment Air and Ground Stream Crossing Fish Habitat Assessments: Memo

2.3 Proponent's Conclusion

The construction of the seasonal portion of the access road will utilize a number of winter crossing structures, which will include snow-fills, and temporary span structures. CZN provided information on the 28 waterways (DAR Appendix 14) associated with the construction of the winter access road. Twenty-four watercourses were evaluated from the air, via helicopter, and four waterways were assessed in-stream.

2.4 TC's Conclusions and Recommendations

At this time Transport Canada has no concerns regarding the winter crossings associated with the seasonal portion of the access route. TC advises that CZN abide by TC's *Minor Works and Waters* (Navigable Water Protection) Order for winter crossings (see Appendix II of this document), and ensure that the following terms and conditions are strictly met during the construction and operation of the winter access road:

1. Before spring break-up commences, all parts of the works, including piers, abutments, log fills and debris, shall be completely removed from the navigable waters, including the area from the waters' edge to the high water mark; and
2. Before the navigable waters are thawed to such an extent that navigating by a vessel other than an icebreaker is possible, the bed of the navigable waters be restored to its natural contours if the works disturbed it.

Failure to construct the work in accordance with the standards and criteria identified in the *Minor Works and Waters Order for winter crossings* and outlined in the *Order* as referenced in section 13 of the NWPA may result in enforcement action.



3.0 TECHNICAL COMMENTS – BRIDGE CROSSINGS

3.1 BACKGROUND

CZN proposes to construct bridge structures at the following four locations; **Km 6.0 Casket Creek, Km 13.1 Funeral Creek, Km 23.0 Drum Creek, and Km 52.9 Polje Creek**, two in the area including the Mine are encircled by the expanded Nahanni National Park Reserve, and two in the park itself. All other crossings will be by ice or snow-fill, or by use of temporary spans, in winter.

3.2 Documents Referenced

- Canadian Zinc Corporation. Prairie Creek Mine Developers Assessment Report. Addendum. May 2010. Section 6.0 Access Road Improvements.
- DAR Volume 3 of 4. Appendix 14. Prairie Creek Mine Winter Road Re-Alignment Air and Ground Stream Crossing Fish Habitat Assessments: Memo
- Canadian Zinc Corporation. Prairie Creek Mine Navigable Waters Protection Program Application. May 27, 2011.

3.3 Proponent’s Conclusion

i. Km 6.0 Casket Creek

The crossing location is at latitude 61° 35’ 57.49” N, longitude 124° 49’ 54.87”. Casket Creek is a tributary of Prairie Creek. The lower reach crossed by the access road consists of an outwash fan. During spring and peak flows, there are several channels carrying water. However, there are 2 main channels. After spring and unless there is heavy rainfall, flows are quite small and can be entirely sub-surface within fan gravels. All channels are quite shallow, with water depths less than 30 cm and channel widths less than 2 m.

A bridge was constructed over the largest channel against the southern edge of the fan. The southern abutment is intact rock, and the northern abutment is cobble. Culverts were installed in the road bed further north to pass flows in channels which seasonally carry water.

ii. Km 13.1 Funeral Creek

The crossing location is at latitude 61° 36’ 31.93” N, longitude 124° 43’ 31.49”. Funeral Creek is also a tributary of Prairie Creek. The crossing location is near the headwaters of one of 3 streams that join to form Funeral Creek main stem. The channel at the crossing location is approximately 1 m wide, with banks 0.5-0.75 m high. Flow depth is 5-10 cm. A crossing structure will be made with steel beams and wood decking, similar to the Casket Creek Bridge.

iii. Km 23.0 Drum Creek

The proposed crossing location is at latitude 61° 35’ 13.38” N, longitude 124° 34’ 56.15”. Drum Creek is a locally named tributary of Sundog Creek. The road presently ramps down into a box canyon and fords the stream. A new bridge span is proposed downstream over rock abutments. At the proposed bridge location, the stream is approximately 2-2.5 m wide and 0.5 m deep. Abutments are about 8 m high. There is a waterfall about 10 m high at Km 25.0.

iv. Km 52.9 Polje Creek

The crossing location is at latitude 61° 36’ 19.88” N, longitude 124° 06’ 59.79” and is inside the Park. The only access is on foot or by helicopter. Polje Creek is a tributary of Sundog Creek. The attached photo sheet shows the creek near the crossing location in



early September 2009 after a period of heavy rainfall. The channel was 12 m wide and about 0.5 m deep. The channel to be about 6-7 m wide with banks 1.5 m high.

3.4 TC's Conclusions and Recommendations

TC has conducted a cursory review of the four proposed bridge crossings and our Navigable Water Protection Program (NWPP) is currently completing a *Navigability Impact Assessment* for the identified waterways.

Please note that the proposed watercourses may fall under the class of minor navigable waters and if applicable, the waterways may be deemed minor navigable waters and the works being considered may be exempt from the NWPA application process. The NWPP's *2010 Minor Waters User Guide* (see Appendix II of this document) can aid in assessing navigability the proposed waterways.

TC has established a two-stage review process — *Initial and Secondary Review*, to be used by proponents in determining whether or not a particular navigable water meets the definition of a minor navigable water. If the measurements of the navigable water **do not pass** either review process, **an application for approval under the NWPA is required.**

It is recommended that the proponent keep detailed and accurate records of the review process and measurements taken, including pictures of all measuring locations and existing natural obstructions.

The Initial Review is the primary review method that consists of measuring only the average depth and width of the navigable water. If either of the following conditions is met, the navigable water may be considered a minor navigable water and an approval under the NWPA is not required:

1. average depth of the navigable water measured at the high-water level is **< 0.30 m**
or
2. average width of the navigable water measured at the high-water level is **< 1.20 m**

The Secondary Review is the subsequent review method that consists of analyzing the remaining navigable water characteristics in combination with the average width of the section of the navigable water to see if both are sufficiently restrictive.

If the average width over the 200 m long section of the navigable water is 1.20 m or more but not more than 3.00 m and one of the following four conditions are also true, the navigable water may be considered a minor navigable water and an application for approval under the NWPA is not required. The four conditions include:

1. average depth of the navigable water measured at the high-water level is 0.60 m or less;
2. the slope is greater than 4 percent;
3. the sinuosity ratio is greater than 2; or
4. there are 3 or more natural obstacles.

If the average width through the 200 m long section of the navigable water is greater than 3.00 m, the navigable water **cannot be** considered a minor navigable water and an approval under the NWPA **is required.**



4.0 SUMMARY OF RECOMMENDATIONS

1. TC has no concerns at this time regarding the winter crossings associated with the seasonal portion of the access route. TC advises that CZN abide by TC's *Minor Works and Waters Order for winter crossings* and ensure that the terms and conditions are strictly met during the construction and operation of the winter access road.
2. TC has conducted a cursory review of the four proposed bridge crossings and our Navigable Water Protection Program (NWPP) is currently completing a *Navigability Impact Assessment* for the identified waterways.
3. Please note that the proposed watercourses may fall under the class of minor navigable waters and if applicable, the waterways may be deemed minor navigable waters and the works being considered may be exempt from the NWPA application process



APPENDIX I: Minor Works and Waters Order for winter crossings

Works and

is document and
action.

and conditions are imposed on a minor g work?

sings determined under these criteria to be
ne following terms and conditions must be
l to during construction:

ing break-up commences, all parts of
including piers, abutments, log fills
, shall be completely removed from the
waters, including the area from the waters'
e high-water mark; and

e navigable waters are thawed to such
that navigating by a vessel other than
ker is possible, the bed of the navigable
all be restored to its natural contours if the
urbed it.

NOTE

If your project involves temporary works, these works *may* be subject to the criteria listed in section 10 of the *Minor Works and Waters Order* and referenced in the Transport Canada publication *Temporary Works* (TP 14893).

You should note that other laws and regulations may be applicable to your project.

For more information, visit Transport Canada's website at <http://www.tc.gc.ca/marinesafety/oep/nwpp/menu.htm> or call 1-877-842-5606.

A Minor Work

Historically, many projects pose no threat to the ongoing safety of navigation if positioned and constructed in accordance with specific standards and criteria. Such projects are considered by Transport Canada as minor works and, as such, no application under the NWPA will be required.

The NWPA is a federal law designed to protect the public right of navigation. It ensures that works constructed in navigable waters are reviewed and regulated to minimize the overall impact on navigation.

© Her Majesty the Queen in Right of Canada, represented by
the Minister of Transport, 2009

ISBN: 978-1-100-50293-9
Catalogue No. T29-12/2009



APPENDIX II: Minor Waters User Guide 2010



Transport
Canada

Transports
Canada



TP 14838
(03/2010)

MINOR WATERS USER GUIDE

2010



TC-1002965

Canada 



© Her Majesty the Queen in Right of Canada, represented by the Minister of Transport, Infrastructure and Communities, 2010.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise in whole or in part, without prior written permission of Transport Canada. Requests may be forwarded to marinesafety-securitemaritime@tc.gc.ca.

The information in this publication is, to the best of our knowledge, reflective of the *Minor Works and Waters (Navigable Waters Protection Act) Order*, that came into force on June 7, 2009 and made pursuant to section 13 of the *Navigable Waters Protection Act*.

TP 14838
TC-1002965

ISBN: 978-1-100-13740-7
Catalogue No.: T29-60/2009E-PDF

For additional copies of this publication, please visit <http://transact-en.tc.gc.ca> or contact Transport Canada's Order Desk at **1-888-830-4911** — International at **613-991-4071**.

*Printed on Forest Stewardship Council compliant paper.
To learn more, visit www.fsccanada.org.*

MINOR WATERS USER GUIDE 2010

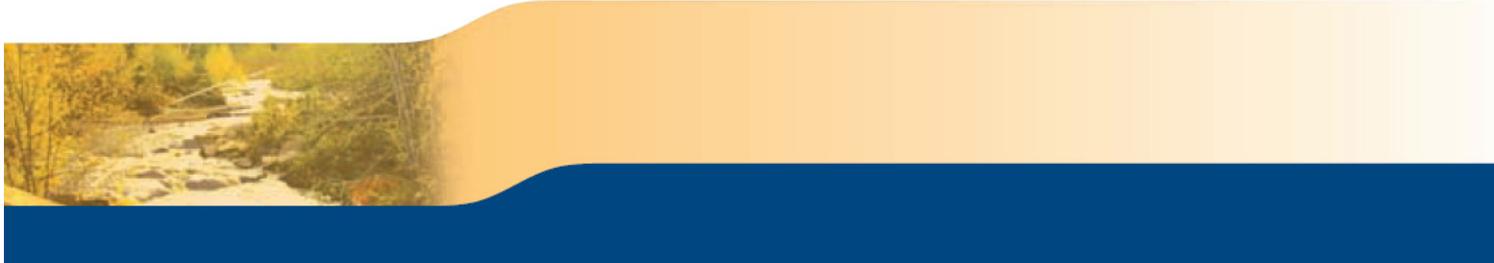


TABLE OF CONTENTS

1.0 Background.....	1
2.0 Purpose.....	1
3.0 Definitions	2
4.0 Private Lakes.....	3
5.0 Artificial Irrigation Channels and Drainage Ditches.....	3
6.0 Minor Navigable Waters.....	4
6.1.1 Application and Methodology.....	4
6.1.2 Average Depth (D) and Width (W) of the navigable water measured at the high-water level	5
6.1.3 Slope (S)	7
6.1.4 Sinuosity (K)	8
6.1.5 Natural Obstructions (O).....	8
7.0 Criteria And Review Process.....	9
7.1.1 Initial Review	10
7.1.2 Secondary Review.....	10
7.2 Minor Waters Review Process Flow Chart.....	11
8.0 Scenarios	12
9.0 Sample Record Sheet	15
10.0 Contact Information.....	16



1.0 BACKGROUND

The *Navigable Waters Protection Act* (NWPA) ensures a balance between the public right of navigation and the need to build works — that is any structure, device, or other thing that may interfere with navigation, such as bridges, dams or docks — in navigable waters. The NWPA provides for the prohibition to build works in navigable waters, unless the work has been approved by the Minister of Transport. Proponents looking to build works in, on, over, under, across or through navigable water, must first apply to the Transport Canada (TC) Navigable Waters Protection Program (NWPP). The NWPP is responsible for administering the provisions under the Act.

On March 12, 2009, the amendments to the NWPA came into force as a part of the Government of Canada’s initiative to accelerate infrastructure and major resource projects. One objective of these amendments was to streamline the federal review process for works on navigable waters by establishing classes of waters that are “minor” in nature and therefore, not subject to the application requirements under the Act.

The following specific classes of minor navigable waters are incorporated into the amendments to the NWPA (section 13) by means of the *Minor Works and Waters (Navigable Waters Protection Act) Order*:

1. Private lakes
2. Artificial irrigation channels and drainage ditches
3. Minor navigable waters

2.0 PURPOSE

The purpose of this user guide is to assist industry professionals by outlining the criteria and methodology required in order to assess waters that may fall under the classes of minor navigable waters established in the Order. If waterways are deemed to be minor navigable waters, the works being considered are exempt from the NWPA application process.

The criteria established in the Order under each class and referenced in this guide **must be fully met** in order for the navigable water to be considered “minor” under the provisions of the Act.



Works placed on *any* of these classes of minor navigable waters contrary to the established criteria **will be subject to an application** for approval and to the enforcement provisions of the NWPA.

3.0 DEFINITIONS

The following definitions apply to this user guide:

- **Drainage Ditch:** An artificial trench solely intended for the purposes of receiving and conducting surface and ground water that has an average width of less than 3.00 metres (m) and excludes any natural lake, river, reservoir, etc.
- **High-water level:** The level at which a navigable water begins to overflow its natural banks.
- **Irrigation Channel:** An artificial canal or supply channel solely intended for conveying water from a source supply for agricultural purposes that has an average width of less than 3.00 m and excludes any natural lake, river, reservoir, etc.
- **Natural obstacle:** A natural physical obstruction in navigable waters, such as a beaver dam, a deadfall, a steep drop or thick vegetation that prevents the passage of a vessel.
- **Sections of navigable waters:** 200 m long sections of navigable waters which may be continuous.
- **Sinuosity ratio of navigable waters:** The ratio of the length of the centre line of the navigable waters to the length of a straight line that starts and ends at the same points as the centre line.
- **Slope of navigable waters:** The differential elevation of the water surface from the upstream end of the centre line of the navigable waters to the downstream end of that line.



4.0 PRIVATE LAKES

Private Lakes refer to lakes that measure 5 hectares or less in area which must meet the following established criteria in order to be exempt from the application provisions of the NWPA¹:

1. all land abutting the navigable water is owned by one person or company other than the federal or provincial government;
2. no navigable waters enter or exit the lake;
3. there is no current or past public access to the lake;
4. there are no easements or servitudes that allow access to the lake.

Works proposed on these private lakes may proceed without application under section 5 of the NWPA.

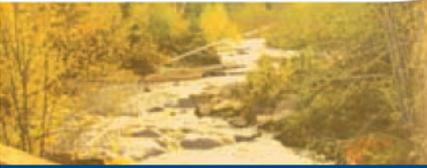
5.0 ARTIFICIAL IRRIGATION CHANNELS AND DRAINAGE DITCHES

Many navigable waters across Canada were constructed or created specifically for the purposes of moving surface water for either agricultural irrigation or surface water drainage. While some of these navigable waters may yield significant flows, TC recognizes that most of these small channels were never intended for navigation.

A navigable water meeting the definitions of either ‘irrigation channel’ or ‘drainage ditch’ (see section 3.0 *Definitions* of this guide) in section 3.0 of this guide and outlined in the Order (section 12) **is not subject to the application process under the NWPA.** However, a navigable water that has an average width of 3.00 m or more or a natural river or water body that has been converted to an irrigation channel or drainage ditch are not subject to this class exemption.²

¹ *Minor Works and Waters (Navigable Waters Protection Act) Order* – section 13

² *Minor Works and Waters (Navigable Waters Protection Act) Order* – section 12



6.0 MINOR NAVIGABLE WATERS

TC has established five navigable water characteristics to be used in determining whether or not a particular navigable water meets the definition of a minor navigable water. If a section of navigable water is classified as minor navigable water, an application for approval under the NWPA is not required for any work on that section.³

The five TC navigable water characteristics are:

- average depth;
- average width;
- channel slope;
- sinuosity ratio; and
- frequency of natural obstacles.

6.1.1 Application and Methodology

When taking measurements for the purpose of determining if a work may be subject to or exempt from the NWPA application provisions, certain methodology must be followed. The midpoint of the work being considered on the navigable water must be built 100 m from *each end of the section* of the navigable water (in the middle of the 200 m section).

When taking these measurements, it is recommended that three or more separate locations on the navigable water be used. It is not necessary to locate the upstream or downstream site exactly 100 m away from the subject site, as long as the areas chosen are at locations representative of the section of the navigable water. When choosing the individual measuring sites, care must be taken to avoid navigable water features such as choke points, settling and pooling areas, large boulders, areas of scouring, or any other unnatural or unrepresentative characteristics. Such sites are localized in nature and do not provide an accurate representation of the hydraulic characteristics of the navigable water as a whole.

³Minor Works and Waters (Navigable Waters Protection Act) Order – section 11

6.1.2 Average Depth (D) and Width (W) of the navigable water measured at the high-water level

Vessels need a certain minimum depth and width in order to allow them to safely travel across a navigable water. For the purposes of meeting TC's criteria of a minor navigable water, measurements of both depth and width must be referenced to the high-water level.

The levels to be used in taking measurements are determined as the level at which a navigable water begins to overflow its natural banks and has a specific depth and width. As illustrated in Figure 1, field observation may indicate the presence of an obvious floodplain (care should be taken to use the current floodplain and not terraces that represent old floodplains), the highest point of depositional features (point bars and centre bars), changes in bank materials, change in bank slope (ensure this does not indicate the existence of a terrace), bank undercuts, the presence of vegetation, etc.

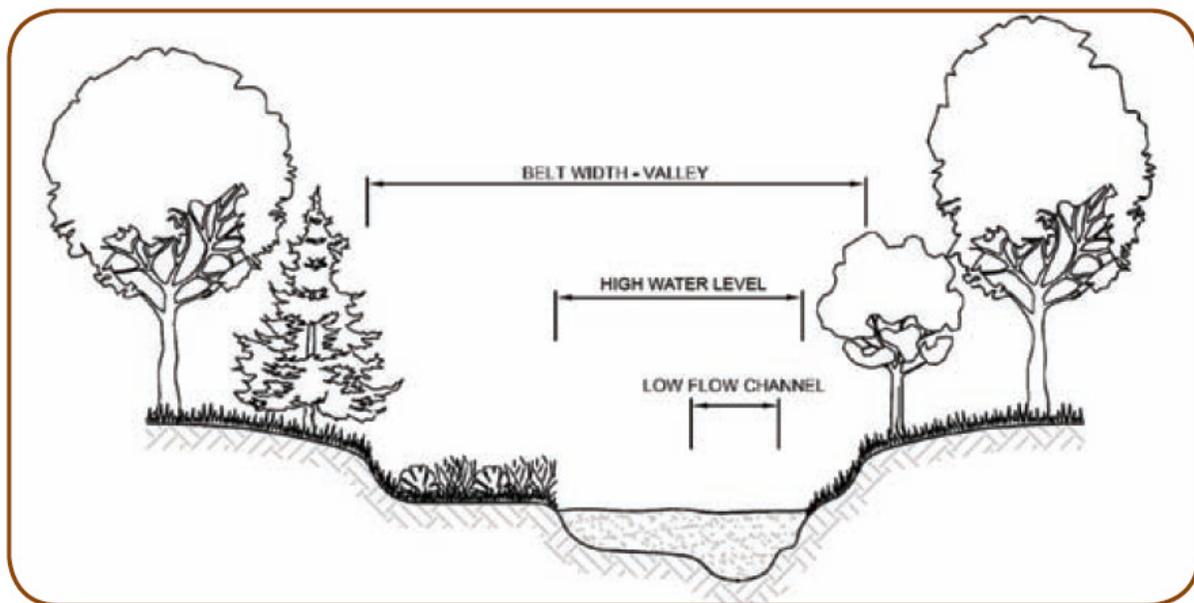


Figure 1 - Illustration of a typical channel



The average depth and width are established by calculating the respective depths and widths along the reference 200 m section of the navigable water. In order to calculate this “average,” three or more measurements along the navigable water are required. At a minimum, it is recommended that measurements are taken at the following three locations, as shown in Figure 2:

1. 100 m \pm upstream (D_1 & W_1)
2. Subject site (D_2 & W_2)
3. 100 m \pm downstream (D_3 & W_3)

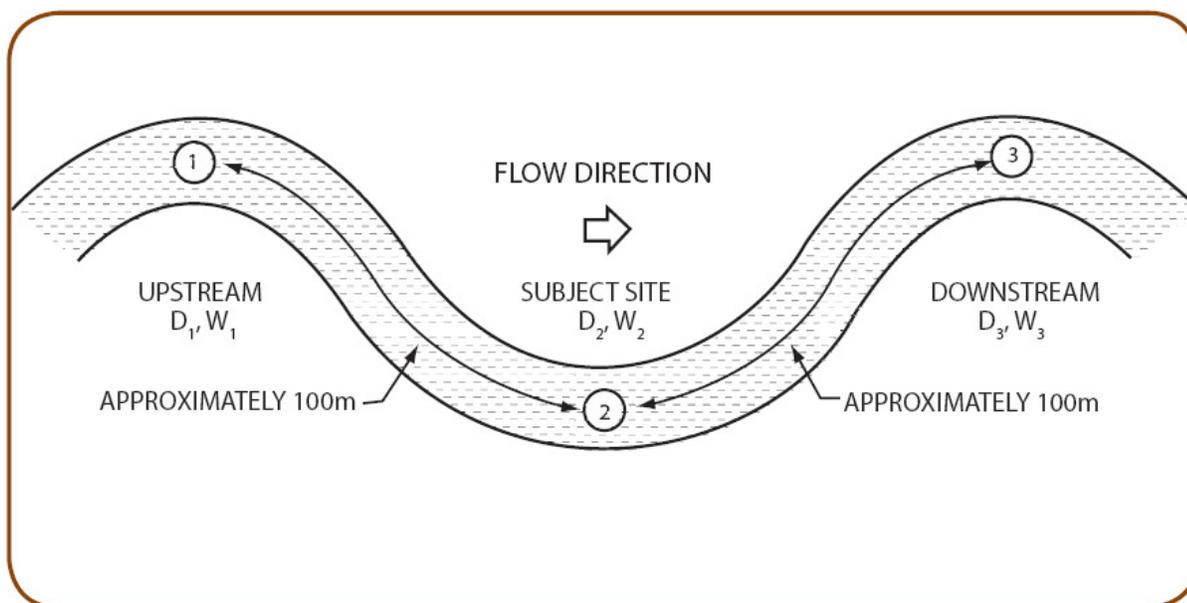


Figure 2 - Measuring width and depth



6.1.3 Slope (S)

One of the most intuitive relationships between the hydraulic characteristics of a navigable water is that between velocity and channel slope.

Channel slope may be measured directly using an elevation survey of the thalweg, the line defining the lowest points along the length of a river bed. The vertical fall measured over the 200 m section of the navigable water divided by the total length of the section will yield the slope. As illustrated in Figure 3, the slope is calculated using the surveyed elevations at the upstream and downstream measuring locations (Z_1 and Z_3) and the total distance between the upstream and downstream locations (X) using the following equation:

$$S(\%) = \frac{(Z_1 - Z_3)}{X} \times 100$$

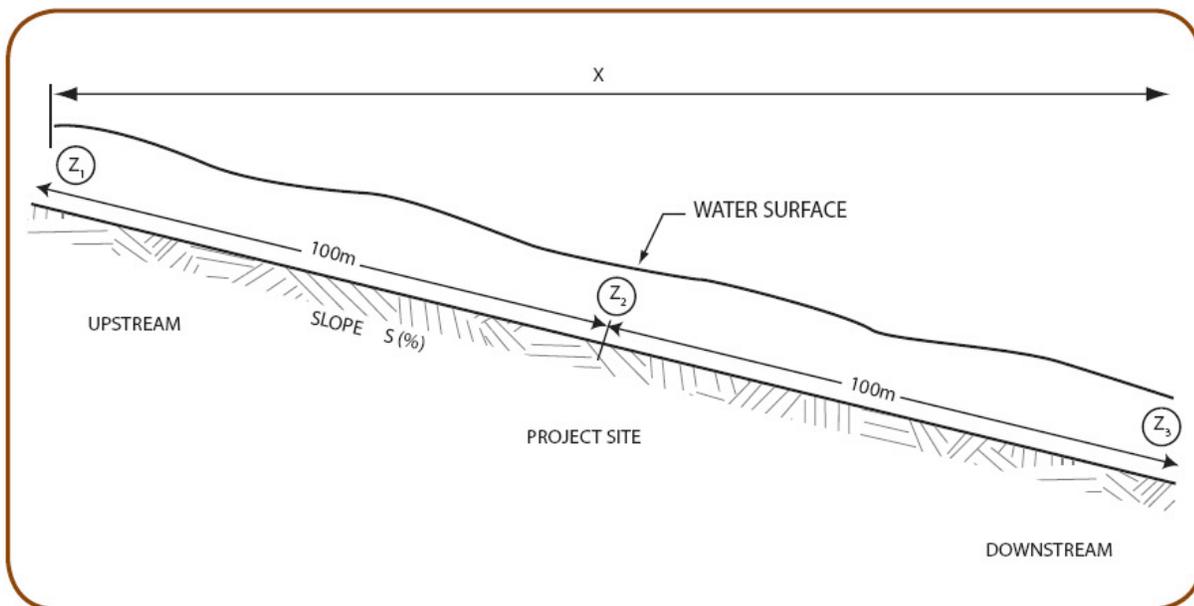
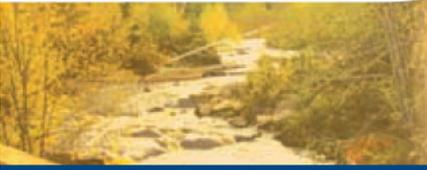


Figure 3 - Illustration of channel slope



6.1.4 Sinuosity (K)

In order for a vessel to be able to travel across a navigable water, the full length of the vessel must be able to fit within the banks of the bend. Sinuosity is a measurement of the extent to which a navigable water meanders from its straight line as illustrated in Figure 4. The accuracy of the sinuosity measurement increases as the length over which the measurement is taken increases.

	K = Sinuosity
$K = \frac{C.L.}{V.L.}$	C.L. = Channel length measured along centreline
	V.L. = Length of channel valley

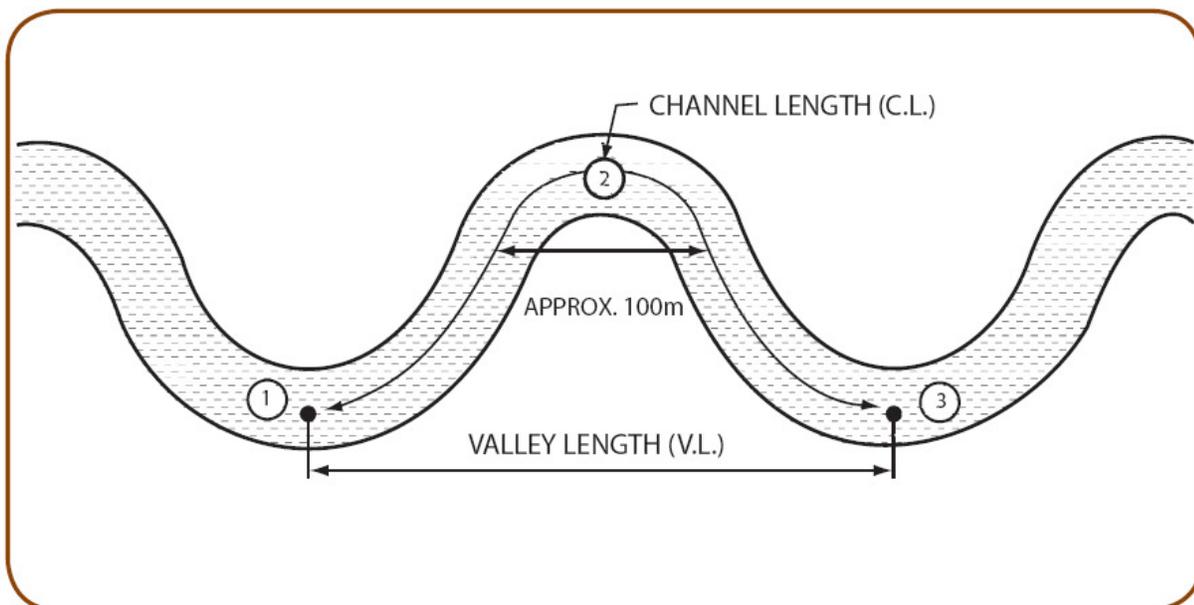


Figure 4 – Illustration of channel sinuosity

6.1.5 Natural Obstructions (O)

A natural obstruction is a natural physical obstacle that prevents the passage of a vessel on a navigable water and requires portaging in order to continue along the navigable water. For the purpose of determining if a particular navigable water can be deemed to be a minor navigable water, at least one of the natural obstacles must be upstream and another must be downstream from the midpoint.



Natural obstructions may include, but are not limited to, beaver dams, deadfalls, large steep drops or thick vegetation growing in the channel. Some of these obstructions, such as beaver dams and deadfalls, may be short-lived. However, it is likely that new ones will replace these obstructions.

The determination of frequency of natural obstructions will require a field inspection to determine the number of natural obstructions along the 200 m long sections of the navigable water, up and down stream.

Natural obstructions **do not include** man-made structures such as bridges, culverts, dams or weirs.

7.0 CRITERIA AND REVIEW PROCESS

The identification of a navigable water as a *minor* navigable water relies on the measurement of the characteristics provided in this guide. When these characteristics are applied to actual navigable waters, a number of patterns emerge, which allow the proposed characteristics to be broken up into two major categories. One category consists of characteristics that are sufficient by themselves to define a navigable water as minor. The other category is composed of those characteristics that will have to be paired with another characteristic in order to define a navigable water as being a minor.

The two characteristics that are sufficient by themselves to define a navigable water as minor are depth and width. If the navigable water is not physically deep or wide enough, none of the other characteristics matter and the navigable water can be considered minor. The remaining characteristics — slope, sinuosity, and the presence of natural obstructions — can indicate the possibility of a minor navigable water, but are not sufficient by themselves to conclusively make that determination.

This pattern naturally lends itself to a two-stage review process — *Initial and Secondary Review*. If the measurements of the navigable water **do not pass** either review process, **an application for approval under the NWPA is required**. Section 6.1.1, *Application and Methodology*, of this guide contains more detailed information on how and when to take these measurements.



It is recommended that the proponent keep detailed and accurate records of the review process and measurements taken, including pictures of all measuring locations and existing natural obstructions.

7.1.1 Initial Review

The Initial Review is the primary review method that consists of measuring only the average depth and width of the navigable water. If either of the following conditions is met, the navigable water may be considered a minor navigable water and an approval under the NWPA is not required:

1. average depth of the navigable water measured at the high-water level is **< 0.30 m**
- or**
2. average width of the navigable water measured at the high-water level is **< 1.20 m**

7.1.2 Secondary Review

The Secondary Review is the subsequent review method that consists of analyzing the remaining navigable water characteristics in combination with the average width of the section of the navigable water to see if both are sufficiently restrictive.

If the average width over the 200 m long section of the navigable water is 1.20 m or more but not more than 3.00 m and one of the following four conditions are also true, the navigable water may be considered a minor navigable water and an application for approval under the NWPA is not required. The four conditions include:

1. average depth of the navigable water measured at the high-water level is 0.60 m or less;
2. the slope is greater than 4 percent;
3. the sinuosity ratio is greater than 2; or
4. there are 3 or more natural obstacles.

If the average width through the 200 m long section of the navigable water is greater than 3.00 m, the navigable water **cannot be** considered a minor navigable water and an approval under the NWPA **is required**.



7.2 Minor Waters Review Process Flow Chart

The flow chart in Figure 5 outlines the navigable water review process and incorporates the Private Lakes, Irrigation Channels and Drainage Ditches and the Minor Navigable Waters criteria. Use the following process for any work in, on, over, under, through or across any navigable water, to determine whether or not an application for approval under the NWPA is required.

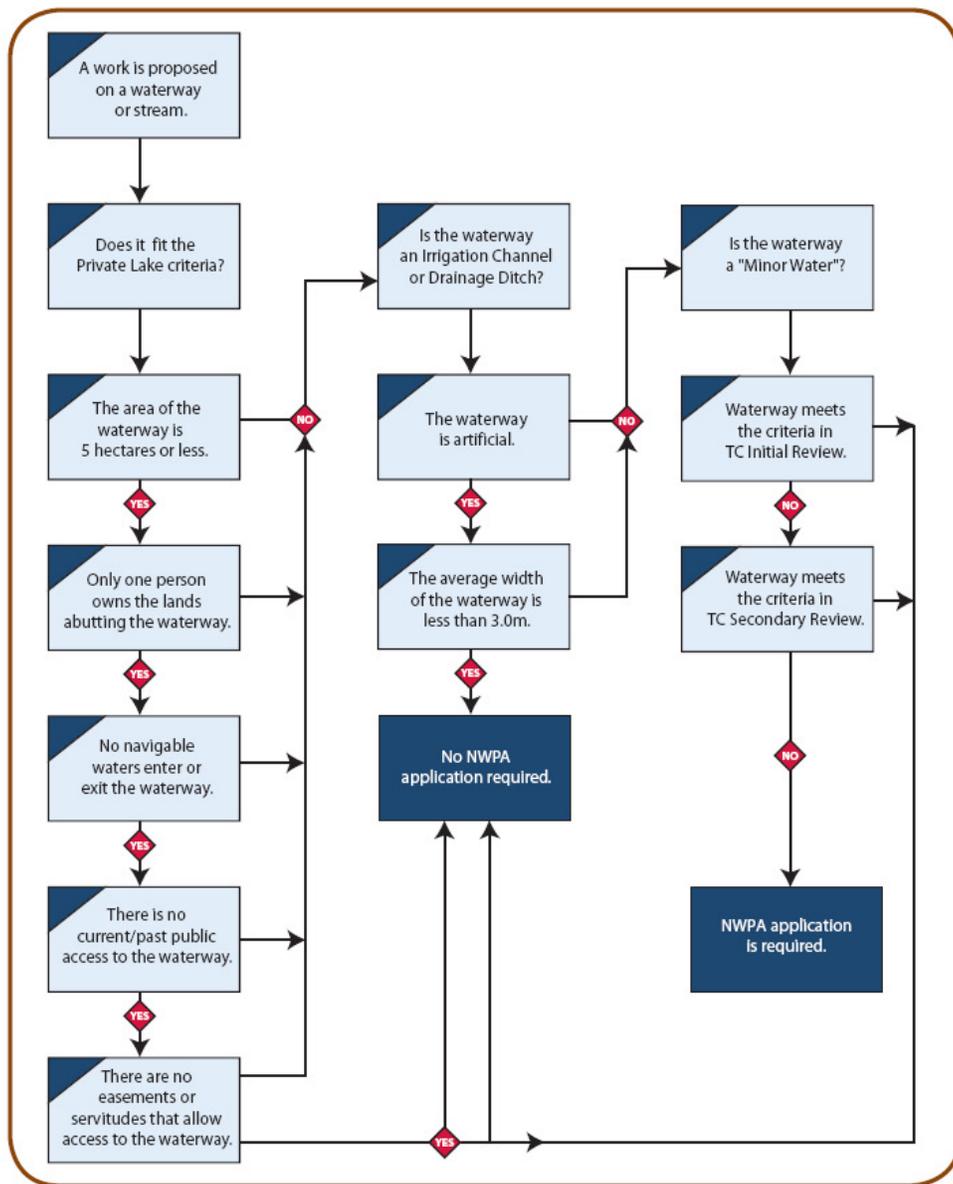


Figure 5 — Minor waters review flowchart



8.0 SCENARIOS

The following scenarios are intended to illustrate the process outlined in this guide and do not imply the preclusion of any additional liaison or approvals required by any other agencies.

Scenario 1 – Private Lake

Landowner A is proposing to construct a bridge crossing from land to a small island on a water body on his private property. The landowner constructed the small lake for his personal use. There are no rivers or streams, navigable or otherwise, entering or exiting the lake and the public has never been afforded access to the lake. Because Landowner A is the sole owner of all lands abutting the water body and the public must trespass over his land to access the navigable water, it is deemed to be a private lake and any works proposed on it would be exempt from the application provisions of the NWPA.

Scenario 2 – Artificial Irrigation Channel/Drainage Ditch

Landowner B is proposing to construct a bridge crossing a water body near his property. The water body was originally constructed by the local township to aid in draining excess surface water from low-lying lands. The average width is 2.75 m along its length. Because this water body was artificially created, has an average width of less than 3.00 m and is **solely** intended to conduct surface and ground water, any works proposed to cross it would be exempt from the application provisions of the NWPA.

Scenario 3 – Natural Irrigation Channel/Drainage Ditch

Landowner C is proposing to construct a bridge crossing over a water body near his property. The water body was originally a natural water way before being modified for use as an irrigation channel. The average width of the navigable water is 2.50 m along its length. Given that this navigable water is not an artificial channel, it cannot be excluded from the application requirements. Instead, Landowner C should proceed to the Initial and Secondary Review process to see if the water body fits the *minor navigable water* criteria.



Scenario 4 – Natural Navigable Water Under Initial Review

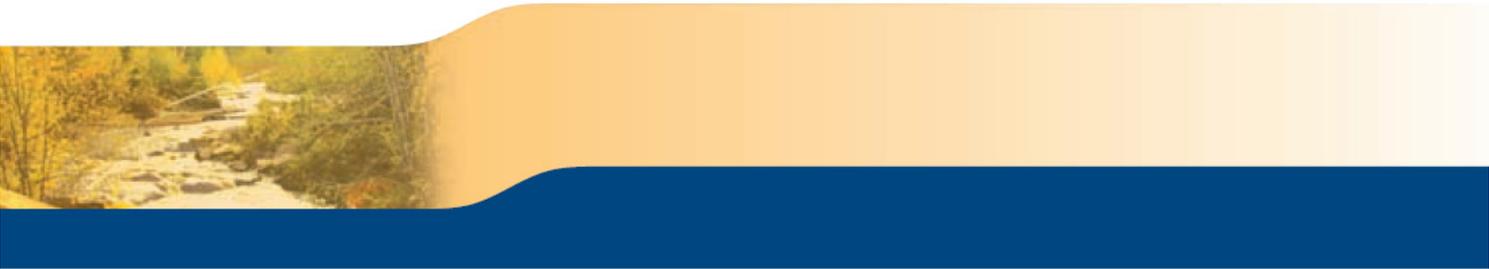
Landowner C in scenario 3 above has contracted an engineering consulting firm to design the bridge crossing and to examine the water body to see if it meets the criteria for a minor navigable water under the Initial Review. The engineer obtains width and depth measurements at three separate locations along the 200 m length of the water body. At each of the measuring locations the engineer is careful to avoid choke points where large boulders reduce the width and depth at those locations. The results of the measurements taken at the high-water level show the average width to be 0.90 m and the average depth to be 0.40 m. Therefore the navigable water can be considered a *minor navigable water* and is excluded from the application requirements under the NWPA.

Note that the average depth was measured to be 0.40 m, which is greater than the minimum of 0.30 m; however, only one of the requirements – width or depth – need to be met to be considered a *minor navigable water*.

Scenario 5 – Natural Navigable Water Under Secondary Review

A local municipality wishes to install a small culvert structure on a natural water body within the municipal right-of-way. The municipality contracts an engineering consulting firm to design the culvert and to determine if the navigable water can be considered a minor navigable water under TC criteria and therefore excluded from the application requirements under the NWPA. The engineer obtains average width and depth measurements at three separate locations. The average width and depth were measured to be 2.30 m and 0.50 m, respectively, neither of which meet the minor navigable waters criteria under the Initial Review.

The engineer then proceeds to the Secondary Review, and finds that the measured average width and depth meet the criteria for a minor navigable water when considered together. Specifically, the width is between 1.20 m and 3.00 m and the depth is less than 0.60 m. The navigable water can be considered a minor navigable water and it is excluded from application requirements under the NWPA.



Scenario 6 – Natural Navigable Water Requires Application under NWPA

A local conservation authority wishes to pursue in-stream erosion protection works for one of the water body in its watershed. They contract an engineering consulting firm to design the erosion protection and to evaluate whether the water body might be excluded from the application process of the NWPA. The average width and depth were measured as 2.60 m and 0.70 m, respectively, neither of which meet the criteria under the Initial Review.

The engineer then proceeds to the Secondary Review. The average width is between 1.20 m and 3.00 m, fulfilling half of the necessary criteria. Analysis of the other four criteria yields:

- average depth of 0.70 m is greater than the maximum 0.60 m;
- slope of 1.5 percent is less than the required 4 percent;
- sinuosity of 1.2 is straighter than the required sinuosity of 2.0; and
- no natural obstructions fall within the 200 m length of navigable water.

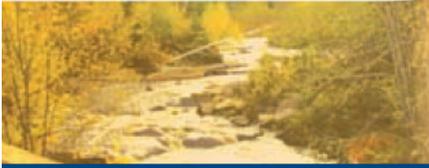
Since none of the supplementary criteria meet the requirements under the Secondary Review, the navigable water cannot be considered a minor navigable water. Therefore the erosion protection works will requires an application for approval under the NWPA.

9.0 SAMPLE RECORD SHEET

Transport Canada – Navigable Waters Protection Act Data Collection Sheet – Minor Waters

 <p>Key Map</p>	 <p>Site</p>	 <p>Upstream 100m</p>	 <p>Downstream 100m</p>
Field Data Collected			
Av Width	+100m	Site	-100m
Av Depth	Total		
Obst Type	Obst #1	Obst #2	Obst #3
Obst Location			
Slope	WW Length	Valley Length	Total
Sinuosity	200m	-100m	Total
Comments:			
  <p>National HQ Office Tower C, Place de Ville, Ottawa, ON</p>			
Decision Notes			
1. Is the WW a Private Lake?	Yes	No	
2. Is WW Irrigation Channel-Drainage Ditch	Yes	No	Is it artificial?
Is its sole purpose conveyance of water?	Yes	No	
Is its average width less than 3.0m wide?	Yes	No	
Minor Water Initial			
Is its average width less than 1.2m?	Yes	No	
Is its average depth less than 0.3m?	Yes	No	
4. Minor Water Secondary			
Is its average width between 1.2m – 3.0m?	Yes	No	Which secondary factor does it meet?
Is this water excluded?	Yes	No	
Which Exclusion applies (1-4)?			
Site Information			
Waterway Name			
NTS Topographic #			
Legal Site Description			
Lat/Long or UTM			

Note: This form is intended for use with the "Transport Canada Minor Waters User Guide 2010." (TP 14838)



10.0 CONTACT INFORMATION

Atlantic Region – Newfoundland-and-Labrador

Navigable Waters Protection Program
Transport Canada
Cabot Place, Suite 740
P.O. Box 1300
100 New Gower Street
St. John's NL
A1C 6H8

Phone: 709-772-2284

Fax: : 709-772-3072

Atlantic Region - Maritimes

Navigable Waters Protection Program
Transport Canada
Queen Square
P.O. Box 1013
45 Alderney Drive, 11th Floor
Dartmouth NS
B2Y 4K2

Phone: 902-426-2726

Fax: 902-426-7585

Quebec Region

Navigable Waters Protection Program
Transport Canada
Gare Maritime Champlain
901 Cap-Diamant Street
Quebec QC
G1K 4K1

Phone: 418-648-4549

Fax: 418-648-7640

Ontario Region

Navigable Waters Protection Program
Transport Canada, Marine Office
100 S Front Street, 1st Floor
Sarnia ON
N7T 2M4

Phone: 1-866-821-6631

Fax: 519-383-1989



Prairie and Northern Region

Navigable Waters Protection Program
Transport Canada
Canada Place
1100-9700 Jasper Avenue
Edmonton AB
T5J 4E6

Phone: 780-495-8215 Fax: 780-495-8607
Email: nwp-pen.pn@tc.gc.ca

Pacific Region

Navigable Waters Protection Program
Transport Canada
Pacific Regional Office
820-800 Burrard Street
Vancouver BC
V6Z 2J8

Phone: 604-775-8867 Fax: 604-775-8828

National Capital Region

National Manager,
Navigable Waters Protection Program
Marine Safety

Transport Canada
Tower C, Place de Ville
330 Sparks Street, 10th Floor
Ottawa ON
K1A 0N8

Phone: 613-990-5929 Fax: 613-998-0637

For more information on the *Navigable Waters Protection Act* and Program, please visit the Transport Canada, Marine Safety main page at <http://www.tc.gc.ca/marine/menu.htm> or call 1-877-842-5606.



NOTES
