



Transport
Canada

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MINOR WATERS USER GUIDE

2010



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Canada



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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*.

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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 administrating 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.

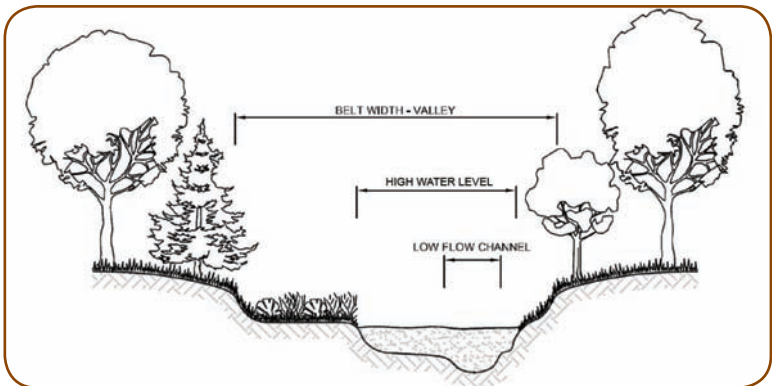


Figure 1 - Illustration of a typical channel



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)

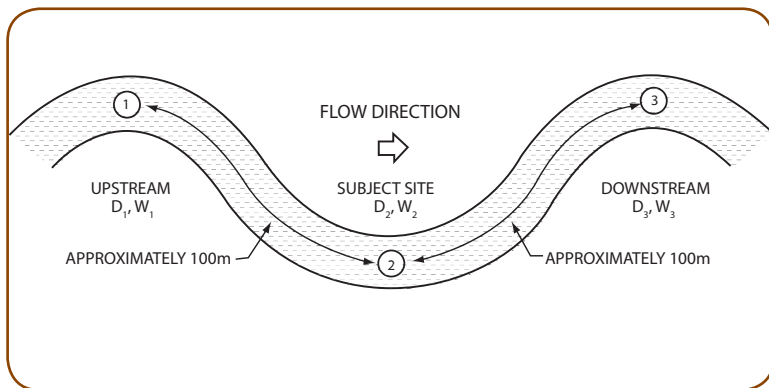


Figure 2 - Measuring width and depth



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:

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

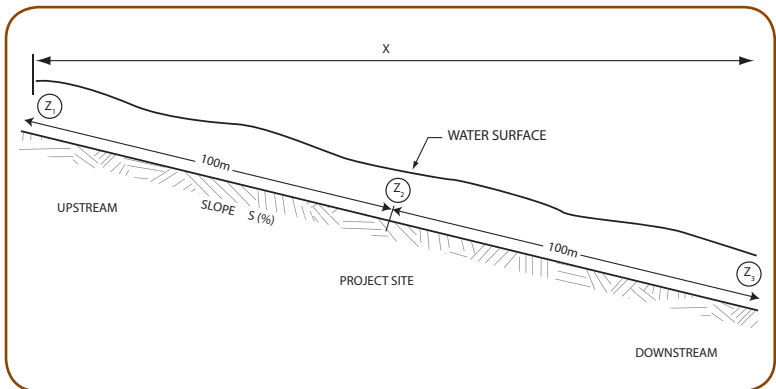


Figure 3 - Illustration of channel slope



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.

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

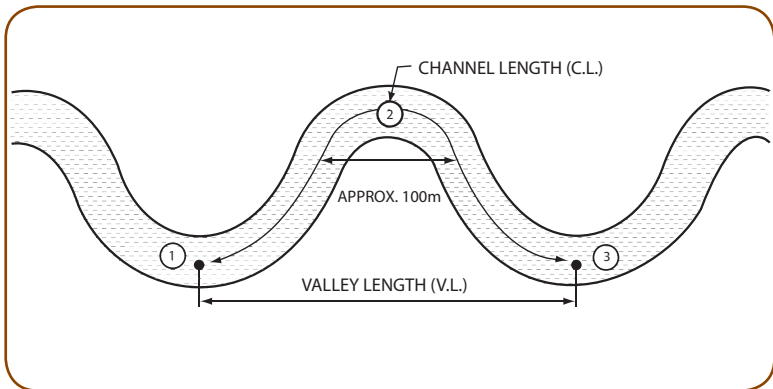


Figure 4 – Illustration of channel sinuosity

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 NWP is required.

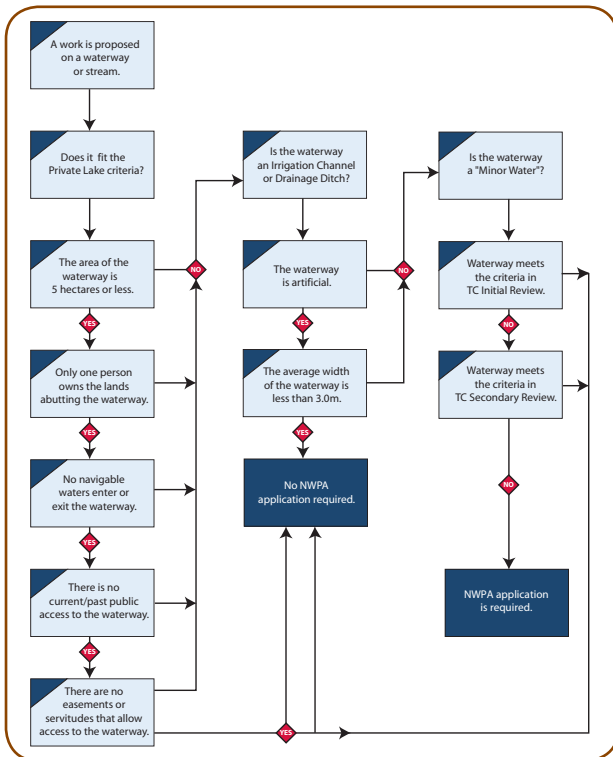


Figure 5 — Minor waters review flowchart



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 NWP

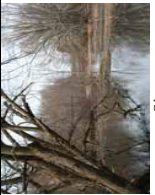

A local conservation authority wishes to pursue in-stream erosion protection works for one of the water body in its watershed. They contract an engineering consulting firm to design the erosion protection and to evaluate whether the water body might be excluded from the application process of the NWP. 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 NWP.

9.0 SAMPLE RECORD SHEET

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

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



10.0 CONTACT INFORMATION

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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
