MODULE 11 – WATER INTAKE STRUCTURES APPLICABILITY SNAP-SHOT

Guidelines

- Temporary water withdrawal from a watercourse using an above ground intake hose/pipe or filling a bulk water tank for various purposes (*e.g.* dust control, concrete/asphalt curing, hydroseeding, etc.), provided the maximum withdrawal rate does not exceed 10 litres/minute for every square kilometre of drainage area upstream of the withdrawal point, except in emergency situations when the water is being drawn for firefighting purposes

Wetlands

- Water withdrawal is not permitted in a wetland

11.0 WATER INTAKE STRUCTURES

11.1 DEFINITION

Structures used to withdraw water from a watercourse for the purpose of irrigation, domestic supply, manufacturing, firefighting, aquaculture facilities, or other uses.

11.2 OBJECTIVES

While withdrawing water from a watercourse, the following precautions should be taken.

- The volume of water withdrawn must maintain sufficient flow and depth of water in the watercourse to ensure that fish habitat is protected, and fish passage is maintained
- Downstream water quality must be maintained
- Care must be taken to minimize disturbances to the bed and banks of the watercourse during the installation or replacement of a permanent water intake structure (*i.e.* dry hydrant)

11.3 WATER WITHDRAWAL WITHIN CERTIFICATION

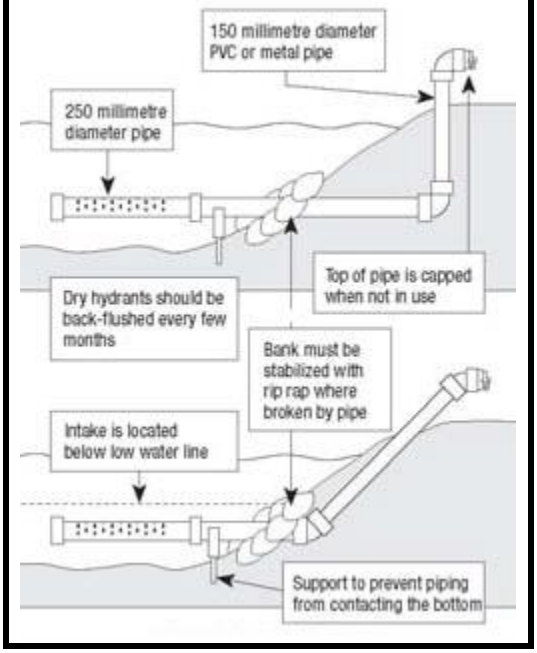
Under the Watercourse Alteration Certification Program, the following is permitted:

- The extension, replacement, or maintenance of an existing water intake structure (*e.g.* pumping station, dry hydrant) provided there is no increase in the rate of water withdrawal
- Temporary water withdrawal from a watercourse using an above ground intake hose/pipe or filling a bulk water tank for various purposes (*e.g.* dust control, concrete/asphalt curing, hydroseeding, etc.), provided the maximum withdrawal rate does not exceed 10 litres/minute for every square kilometre of drainage area upstream of the withdrawal point, except in emergency situations when the water is being drawn for firefighting purposes

11.3.1 Dry Hydrants

Dry hydrants are water intake structures consisting of a standpipe buried in the bank of a watercourse with a horizontal pipe connected to the bottom end, which extends into the watercourse. See *Figure 11-1*. The end of the pipe must be screened in accordance with the specifications outlined for all water intake structures (see Section *11.4.1 Environmental Considerations*), and the structure is subject to all rules and regulations governing water intake structures. Water is withdrawn from a dry hydrant on an ‘as needed’ basis by a mobile pump carried on a fire truck.

Figure 11-1 Dry hydrants



11.4 PLANNING CONSIDERATIONS

11.4.1 Environmental Considerations

Whether the water is withdrawn from a flowing watercourse such as a stream, creek, river, or brook, or a standing body of water such as a lake or a pond, the following concerns must be addressed before the project begins:

- The water withdrawal must not cause any fish or other aquatic organisms to be removed from their habitat. The intake must be screened to prevent these organisms from entering the structure. For more information, please refer to the Fisheries and Oceans Canada's Code of Practice for End-of-Pipe fish protection screens for small water intakes in fresh water: https://www.dfo-mpo.gc.ca/pnw-ppe/codes/screen-ecran-eng.html.
- The volume of water remaining in the watercourse must be adequate for the maintenance of aquatic habitat and fish passage. Decreasing the volume of water in a watercourse may result in an increase in temperature, making it intolerable for some species of fish. A decrease in water level or flow can also diminish suitable living space for fish, reduce the habitat and production and delivery of food organisms and accelerate sediment deposition.
    - If the depth of water is decreased, it may pose a barrier to fish passage. Depth of water required by fish for swimming varies, but on average, 15 to 23 centimetres (6 to 9 in) are considered the minimum depth of water required.

- Water intake structures must be installed so that they do not present an obstruction to migrating fish. Permanent structure installed must not destroy fish habitat. Any bed or bank disturbance caused by installation must be stabilized immediately to prevent the sedimentation of the watercourse, which could negatively impact fish habitat.
- The quality of the water at the site and downstream of the site must be maintained during and after water withdrawal.

11.4.2 Water Requirements

Determination of allowable pumping or water withdrawal rates must consider the time period for which the water is needed. Many irrigation projects require water during dry seasons, during which the required maintenance flow may not allow for the removal of any water. In these cases, planning should include a reservoir to be filled during periods of higher flows.

If the water is to be withdrawn on a continuous basis, for example, in a fish hatchery, a calculation of the low flows expected for the watercourse at the point of withdrawal would be useful to predict whether the maintenance flows allow for any water removal during the low flow period.

11.5 GUIDELINES

The following guidelines should be followed during the extension, replacement, or maintenance of an existing water intake structure (*e.g.* pumping station, dry hydrant) or the establishment of a temporary water withdrawal system (*e.g.* using an above ground intake hose/pipe or filling a bulk water tank for various purposes).

- If instream excavation is required to create a sump to facilitate water extraction, it must be strictly carried out manually using handheld equipment and be carried out between June 1st and September 30th only.
- Water withdrawal is not permitted in a wetland under the Watercourse Alteration Certification Program.
- During temporary water withdrawal, the intake hose/pipe must remain above ground. Soil disturbance must not be carried out to facilitate this activity.
- The water intake must be constructed with bed and bank reinforcement to adequately protect the watercourse and intake works from local erosion.
- Permanent water intake structures must be secured and protected from ice and floating debris.
- The water intake structure must not pose a hazard to navigation.
- The intake of the suction hose and any water intake or outlet pipes must be screened to prevent aquatic organisms from entering the structure. For more information, please refer to the Fisheries and Oceans Canada's Code of Practice for

End-of-Pipe fish protection screens for small water intakes in fresh water: https://www.dfo-mpo.gc.ca/pnw-ppe/codes/screen-ecran-eng.html.

- The maximum withdrawal rate must not exceed 10 litres/minute for every square kilometre of drainage upstream of the inlet, except when the water is being used for firefighting purposes.
- During low water conditions, the water level of the watercourse must be monitored to ensure that there is enough water for fish to swim. If the water level drops, water withdrawal shall cease immediately and may not commence again until the water level has risen.
- Any disturbance to the banks or bed caused by the installation, replacement, or maintenance of a water intake structure must be immediately stabilized to prevent sedimentation of the watercourse.