

Constructed Ditch FACTSHEET

NEW DITCH CONSTRUCTION

Agricultural producers often need to construct new ditches to provide an outlet for drainage or to bring irrigation water to their farm. Ditches and pumps are also often required to convey water that is held within flood protection dikes. This factsheet provides helpful pointers to consider prior to constructing a new ditch and working near flood protection dikes.

Agency Contact

A Ditch Maintenance Form must be sent to DFO for new ditches that are constructed on your property that are connected to existing constructed ditches on your property.

- Consult Factsheet No. 2, *Agricultural Watercourse Classification*, to determine if the new ditch is being connected to an existing constructed ditch or a channelized stream.

Proper management guidelines should be followed to ensure that ditch construction does not impair downstream water quality.

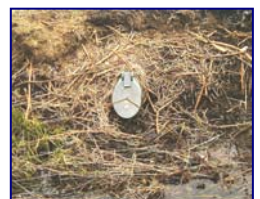
The Ministry of Water, Land and Air Protection (WLAP) and Fisheries and Oceans Canada (DFO) must be notified if the new ditch discharges directly into a natural or channelized stream as the ditch outlet is considered works in and about a stream. Proper sediment control is required in all situations. See *Sediment Control*, Factsheet No. 8 in this series.

Drainage Ditches

Agricultural drainage ditches are usually constructed in lowlands to intercept upland runoff, remove water collected in field depressions and to provide an outlet for a field drain tile system.

Before constructing a new ditch consider the following:

- Ditches take up valuable land. Consider whether the ditch is actually required and whether a drain collector pipe may not be a better alternative.
- Ditches that intercept upland runoff may be classified as channelized streams and will be subject to *Water Act* and *Federal Fisheries Act* regulations.
- Ditches that drain wetlands often support fish habitat and will require DFO approval prior to construction.
- If fish access the ditch or if the ditch provides a food supply for fish the *Federal Fisheries Act* will apply to future maintenance works on the ditch.
- Ditches that intercept springs or groundwater seepage will provide cool water and habitat that may be very beneficial to fish. Future maintenance work on these ditches may require a prior agreement with DFO.
- Sedimentation, weed problems and vegetation growth in the channel will require future maintenance. When conducting work follow the conditions and guidelines as outlined in other factsheets in this series.
- Manure application must be done in a manner that prevents runoff into watercourses. Additional ditches on your farm may make manure application more difficult.



Construction Techniques

- Do not connect the new ditch to the outlet channel until works are completed and the bank slopes are stable.
- Stabilize ditch banks by seeding or planting with vegetation and if possible be fencing livestock away from the ditch bank.
- Seed grasses along the ditch bank and a distance of 2 m from the top of bank.
- For small ditches, consider installing a drainpipe with a flap gate for the last 6 m before the outlet. This will reduce fish access, allow farm access across the ditch and allow the ditch to be isolated when maintenance is required.
- For larger ditches fish access cannot be prevented unless the ditch is pumped. However, a control structure that allows for the ditch to be isolated during maintenance may still be of benefit.

Irrigation Diversion Channels

Irrigation diversion channels are used in many parts of British Columbia to convey water diverted from streams and reservoirs to irrigation systems. Irrigation withdrawals must be licensed and generally only operate during the irrigation season from April till the end of September.

In many instances these ditches will end at a gravity irrigation intake or a pumping system that supplies an irrigation system. These channels must be properly screened to prevent fish from entering the channel as fish will become trapped when the diversion is shutdown at the end of the season.



Installation, maintenance and cleaning of diversions must be

done in a manner to protect fish and fish habitat. See *Irrigation Management Guide* for further information.

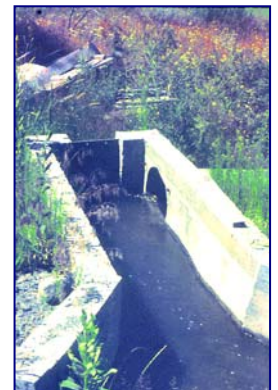
If the irrigation ditch has a return channel that delivers unused irrigation water back to the stream they may be classified as a channelized stream. It is important to ensure that adequate water is supplied at all times to protect resident fish. If the channel provides good fish habitat, year round flow should be considered.

Water diverted from storage reservoirs may use constructed channels or existing streams to deliver water to the irrigation intake.



Irrigation Channel Construction Considerations :

- Keep fish out of channels that do not have flows in them year round.
- Irrigation diversion ditches that supply water directly to a pump or gravity feed line should be screened to prevent fish access. The screen area must be of sufficient size to keep flow velocities below 0.1 ft/sec.
- If the channel is to return water to the stream, consult with DFO on screening requirements. If fish are allowed access into the channel the irrigation intake must be appropriately screened. See the *BC Sprinkler Irrigation Manual* for screening requirements.
- Only construct diversion channels in soils that will minimize water losses due to seepage.
- Do not construct diversion ditches in areas that are prone to sloughing and can cause material or debris to enter into the stream.
- Annual maintenance should be done prior to diverting irrigation water into the ditch.
- Stabilize and protect ditch banks with vegetation. For further details see *Bank Stabilization*, Factsheet No. 10 in this series.
- A flow control structure should be installed to regulate the diversion into the ditch. Take only the amount of water as specified by the irrigation licence.



If concrete is used in the construction of the diversion structure, use prefab concrete wherever possible. If

concrete is to be mixed on site ensure that the diversion is isolated from the stream and that concrete cannot enter the stream during construction. Concrete leachate is alkaline and highly toxic to fish and aquatic life.

Dikes

The highly productive agricultural lands in BC’s floodplains are commonly protected by flood protection dikes owned and maintained by local diking authorities (diking districts or local governments). The construction, operation and maintenance of flood protection dikes in British Columbia is regulated by the provincial *Dike Maintenance Act* and the office of the Inspector of Dikes in the Ministry of Water, Land and Air Protection. A person must not construct a new dike, or make changes to a dike without the approval of the Inspector, or Deputy Inspector of Dikes.

This law does not apply to a “private dike”, which “means a dike built on private property that protects only that property.” If a producer needs to construct a berm along a part of his property to reduce flooding and this berm only protects that property, then this berm would be a private dike.

Section 2(4) of the *Dike Maintenance Act* says:

(4) A person or a diking authority must not do any of the following unless it is done either with the prior written approval of the inspector or in accordance with the regulations made under section 8 (2):

- (a) lower, or cause or allow to be lowered, the elevation of a dike or decrease, or cause or allow to be decreased, the width or cross section of a dike;
- (b) install, or cause or allow to be installed, any culvert, pipe, flood box or any structure through a dike;
- (c) construct, or cause or allow to be constructed, any works on or over a dike or dike right of way;
- (d) alter, or cause or allow to be altered, the foreshore or stream channel adjacent to a dike;
- (e) construct a new dike.

Examples of activities that may be prohibited and/or require approval from the local diking authority and the Deputy Inspector of Dikes include:

- excavation of ditches or ponds near the toe of existing dikes
- construction of an irrigation supply line or other works through or over a dike
- construction of access ramps for equipment to traverse the dike, and gates and fences on the dike.
- construction of a new dike that protect more than one property (new flood protection dikes must meet engineering standards and be owned and operated by local government)

Any issues of concern with flood protection dikes should be brought to the attention of the local diking authority and the office of the nearest Deputy Inspector of Dikes.



Reference Information

Dike Design and Construction Guide – Best Management Practices for British Columbia

For diking authority and Deputy Inspector of Dikes contact information please see:

<http://wlapwww.gov.bc.ca/wat/flood/structural.html>

Contact Information

Agency Contact Requirements for Constructed Ditch Maintenance, Factsheet No. 3 in this series contains a list of local agency contacts and other organizations that may be able to provide some assistance.