

**Operation Guidelines for the Vermilion River
Water Management System**

A Ministerial Response to the
Vermilion River Operations Review
Stakeholder Committee

Alberta Environment

October 2001

Introduction

Background:

In July of 1997, the County of Two Hills wrote to the Minister of Environmental Protection to express concerns about flooding on the Vermilion River and its implications for a number of landowners along the river. In response, Ty Lund, Minister of Environmental Protection, requested that a local advisory committee be formed to review past operations and to make recommendations on future management options for the existing control system.

The Vermilion River Operations Review Stakeholder Committee was formed with the assistance of staff from Alberta Environment and the first meeting was held in May of 1999. A Recommendation Report was prepared by the committee and submitted to the Minister of Environment, Halvar Jonson, in December of 2000. The following contains detailed department responses to each of the committee's recommendations.

Format:

Section I of this document reflects the Vermilion River Operations Review Stakeholder Committee's recommendations that were focussed on current water operations on the Vermilion River. Section II addresses committee recommendations that went beyond the scope of current operations to address a variety of water related concerns as expressed by the committee.

Each recommendation from the *Vermilion River Operations Review Stakeholder Committee: Recommendation Report* (December 2000) is included in this document. The committee's individual recommendations are numbered under their original headings and set in bold italics. Alberta Environment's response is provided after each recommendation or set of recommendations.

Section I

Core Operational Issues

1.0 Drainage

Committee Recommendation 1.1

Provide information to the Local Municipalities and landowners on the downstream impact of drainage programs.

Alberta Environment Response

When Alberta Environment receives an application under the *Water Act* for drainage works in the basin, the Public Notice protocol will be expanded to include providing notice of the application to the four counties for posting in their offices. This will provide the counties and landowners a better opportunity to be aware of and to receive information about an application. It will enable them to determine whether a proposed drainage project affects them and how to make any concerns known to Alberta Environment.

Committee Recommendation 1.2

The Department of Environment must not support additional drainage programs in the Vermilion watershed, without considering downstream impacts. Licenses should require a method of water control that allows holding and controlled release of the water to avoid peak flows. The Department should encourage implementation of hold and controlled release water management for existing licenses.

Alberta Environment Response

Alberta Environment administers the *Water Act*. The *Water Act* requires that an approval be obtained to undertake drainage works. When considering whether to issue an approval under the *Water Act* for drainage works, the applicant must address the adequacy of the outlet (downstream impact).

Alberta Environment administers the *Alberta Water Management and Erosion Control Program* which is intended to provide financial assistance to local authorities to resolve surface water and erosion problems. The program also provides financial assistance to Drainage Districts to maintain their licensed drainage works to design.

Standard *Water Act* requirements will be considered in the review of agriculture drainage applications. Included in these considerations are the following criteria:

- the drainage should not contribute to or result in increased peak flow volumes that would negatively impact landowners along the river (a standard criterion).
- if the proposed drainage would negatively impact landowners, Alberta Environment would require that a hold and release design be used to control the timing of the release.
- Alberta Environment will consider the wetland protection goals of the interim wetland policy, *Wetland Management in the Settled Area of Alberta: An Interim Policy*. The policy contains

direction for the management of slough/marsh wetlands and outlines some general management strategies to support the goal of the policy.

Policy Goal: *To sustain the social, economic, and environmental benefits that functioning wetlands provide, now and in the future.*

Committee Recommendation 1.3

The Department of Environment must take immediate action to stop illegal drainage (e.g. more enforcement, increased fines) and take steps to mitigate the impact of major unauthorized drainage activities.

Alberta Environment Response

Alberta Environment will continue to take action on unauthorized drainage activities as they are identified and reported. The expanded function of Conservation Officers (from Alberta Sustainable Resource Development) will enable a higher level of field monitoring, reporting and enforcement response. Fines for illegal drainage have been significantly increased in the new *Water Act*.

Committee Recommendation 1.4

The Department of Environment should provide compensation for flooding to landowners on the Vermilion River, if existing drainage licenses within the watershed are shown to be causing the flooding. [Note: the compensation recommendation is not supported by all members of the Stakeholder Committee.]

Alberta Environment Response

Currently, there is no indication that compensation is warranted because there is no evidence to indicate that flooding is caused by any licensed works in the Vermilion River basin.

Compensation for a flood event is provided under the *Disaster Recovery Regulation* when the Minister has declared it an extraordinary event resulting in widespread damage and loss.

2.0 Storage

Committee Recommendation 2.1

The Department of Environment takes direct action, not including expropriation, to develop storage reservoirs in the watershed, especially the upper watershed. The reservoirs can temporarily hold water during periods of high flow with later slow release in order to offset the impact of past drainage activities. [Note: the emphasis on the upper watershed is not supported by all members of the Stakeholder Committee.]

Committee Recommendation 2.2

The Department of Environment actively pursue partnerships with landowners and other agencies, on a voluntary basis, to develop multiple small storage reservoirs on tributary streams throughout the watershed.

Alberta Environment Response

Alberta Environment will not initiate and build storage structures/reservoirs in the basin (the potential Holden (see 2.3) and Watt Lake (see 2.4) structures being exceptions). However, the department will encourage and/or support external organizations (particularly Ducks Unlimited) to explore the potential development of appropriate small-scale storage projects for wetland habitat enhancement. The wetland enhancement projects should benefit the basin by holding water early in the year and slowly releasing it later in the season to help maintain riparian flows.

Committee Recommendation 2.3

The Department of Environment and the Holden Drainage District #1 construct a structure near the eastern outlet of the District to temporarily store and slow the flow of water from summer storms.

Alberta Environment Response

In support of Holden Drainage District's offer to provide a storage facility site, Alberta Environment will work with the drainage district and other stakeholders to investigate the feasibility and priority of constructing a structure near the district's outlet. The purpose of the facility would be to reduce peak flows of summer floods.

Committee Recommendation 2.4

The Stakeholder Committee supports the relocation of the Watt Lake structure as one component of the overall effort to increase storage capacity within the watershed, subject to the agreement of the Watt Lake landowners.

Alberta Environment Response

The department will continue to look into the relocation of the Watt Lake structure in collaboration with Ducks Unlimited. Benefits of the project are primarily habitat enhancement with some potential water storage benefits.

3.0 Channels

Committee Recommendation 3.1

Maintain the constructed channels in the system on a regular basis to ensure their effectiveness.

Alberta Environment Response

Alberta Environment will continue to maintain the department's licensed channels, on an as-needed basis, to the standards required by the license.

Committee Recommendation 3.2

Implement an ongoing program of beaver monitoring in the main river channel where flooding problems may be increased by debris.

Committee Recommendation 3.3

Remove debris caused by beavers in reaches where flooding has been a problem, and below structures where the debris may cause problems when water is released from the structure.

Alberta Environment Response

Alberta Environment will clean beaver debris from constructed channels licensed to the department when the channel does not flow to the licensed standard. Debris will also be cleared when it directly interferes with the operation of a water control structure licensed to the department (i.e. Morecambe control structure and Vermilion Dam).

Wholesale removal of beaver debris from the river channel will not be supported by the department as it can have negative impacts on aquatic habitat, wetland areas, riparian areas, and flow regimes.

Committee Recommendation 3.4

Alberta Environment should increase the financial assistance available to municipalities for beaver management.

Alberta Environment Response

Funding for beaver management no longer comes directly from Alberta Environment but is provided to municipalities in the form of an annual grant from Alberta Agriculture, Food and Rural Development. Alberta Environment will not initiate new funding apart from the existing grant program.

Committee Recommendation 3.5

Review all of the bridges along the Vermilion River to ensure they have the ability and capacity of accommodate floodwaters, especially due to ice jams.

Alberta Environment Response

This recommendation was reviewed with Alberta Transportation's Central Region Bridge Manager. Alberta Transportation is the government department responsible for the control and management of bridges on primary highways and will soon be assuming responsibility for bridges on all secondary

highways. Local municipalities are responsible for bridges on local roads and any private bridges are the responsibility of individual landowners.

Primary highway bridges are usually designed for 1:100 year flood events, Secondary bridges for 1:50 year events, and local bridges for 1:25 year events. It is possible that bridge structures could create backwater effects in extreme flood events. Site-specific concerns related to bridge opening adequacy should be forwarded through the responsible authorities for consideration.

Committee Recommendation 3.6

Consider alternatives to constructing channels to address localized flooding. Alternatives could include voluntary flood plain purchases with leasebacks, flood easements and conservation easements.

Alberta Environment Response

Alberta Environment is not considering the construction of any new channels and the department will not initiate or lead any new channel construction proposals. Approvals for channel construction to address localized flooding will only be considered as a solution of last resort. Alternative, non-structural solutions will be sought first.

4.0 Structures

Morecambe Structure

Committee Recommendation 4.1

Increase the number of precipitation and flow monitoring stations in the watershed to improve the flood warning system and provide better data to manage the water flow.

Committee Recommendation 4.2

When storm events occur in the upper watershed, operate the Morecambe Structure to draw down the Vermilion Lakes in advance of the flood. Start the release of water slowly to reduce downstream impacts and increase the release rate over subsequent days.

Alberta Environment Response

Alberta Environment will resume operating the Morecambe structure in an effort to reduce flooding impacts in the area. By using new monitoring technology that was implemented in May 2000, the operator will gain access to important flow information to support operation of the Morecambe structure.

However, it is important that landowners understand operating the Morecambe structure requires the management and balancing of risks between upstream and downstream interests. Risks of operating the structure will also have to be balanced against the risks of not operating the structure.

To commence operating the Morecambe structure, Alberta Environment will undertake the following steps:

- 1) Re-implement the operational guidelines as outlined in the *Morecambe Structure Proposed Operation Strategy, Alberta Environment, 1987* that was outlined and endorsed by members of the Vermilion River Stakeholder Committee while developing their recommendations. Operation of the structure will require a technical review of the possible operation scenarios and outcomes.
- 2) Operational staff will access and utilize a real-time data collection system (Hydrol) for day-to-day river flow monitoring. This information will then be used to support operation of the Morecambe structure.
- 3) As experience is gained through operations, Alberta Environment will evaluate the results and consider any necessary adjustments to the operational guidelines and monitoring network.

Committee Recommendation 4.3

Notify the Counties of Minburn and Vermilion River and landowners below the Morecambe Structure before releasing water.

Alberta Environment Response

Alberta Environment will establish a notification protocol for informing counties and landowners prior to releasing water from the Morecambe structure. The details of this protocol will be worked out by the department in consultation with members of the advisory committee (see recommendation 5.0). The department favours a call-out procedure that involves the active support and participation of advisory committee members or respective appointees.

Committee Recommendation 4.4

The Morecambe structure may be operated in the late summer and fall to augment downstream riparian river flow. The Vermilion Lakes should not be allowed to drop below a minimum geodetic elevation of 1964.5 feet or 598.75 metres (note that one foot or 0.3 metres below FSL was the arbitrary limit chosen). Riparian operations will be reviewed yearly by the proposed advisory committee to consider the benefits of previous operations and possible improvements.

Alberta Environment Response

Alberta Environment will undertake to consider riparian flow benefits as part of the overall flood management operation of the Morecambe structure. All flood management activities will rely on advice of the advisory committee (section 5.0) and input from other government departments, local authorities and non-government organizations.

Minimum lake levels sufficient for habitat maintenance on the Vermilion Lakes will be an important consideration when operating the structure for riparian flows.

Committee Recommendation 4.5

No increase of Vermilion Lakes water levels should be considered unless it can be established that there will be no detrimental effect on upstream landowners and mitigation measures have been implemented.

Alberta Environment Response

Alberta Environment has no plan for raising the level of the Vermilion Lakes.

Vermilion Dam

Committee Recommendation 4.6

Operate the Vermilion Dam in concert with the Morecambe Structure during flood control operations.

Alberta Environment Response

Alberta Environment will operate the Vermilion Dam in concert with the Morecambe Structure to optimize flood control efforts. It must be noted, however, that the Vermilion Dam riparian gate has a very limited capacity to mitigate floods.

Committee Recommendation 4.7

Notify the Town of Vermilion, the County of Vermilion River, and landowners below the Vermilion Dam before increasing the release of water.

Alberta Environment Response

Alberta Environment will establish a notification protocol for informing counties and landowners prior to releasing water from the Vermilion Dam. The details of this protocol will be worked out by the department in consultation with members of the advisory committee. The department favours a call-out procedure that involves the active support and participation of advisory committee members or respective appointees.

Committee Recommendation 4.8

The Vermilion Dam may be operated in the summer and fall to maintain a riparian flow downstream for as long as possible. The Vermilion reservoir should not be allowed to drop below a minimum geodetic elevation of 1888.0 feet or 575.50 metres (note that one foot or 0.3 metres below FSL was the arbitrary limit chosen). Riparian releases should begin no earlier than August 1 and no later than September 15 of each year and should be dependent on the amount of flow within the downstream river channel.

Alberta Environment Response

Considering recommendations 4.4, 4.6, and 5.1, Alberta Environment will operate the Vermilion Dam to maximize benefits to the entire river system. Operational decisions for the Vermilion Dam will incorporate information and advice from the advisory committee (section 5.0), local authorities, other government departments, and affected non-government organizations.

5.0 Advisory Committee

Committee Recommendation 5.1

Set up an advisory committee to assist Department staff in the ongoing operation of Department structures. The advisory committee would work within an established operating procedure in response to current conditions. The committee will include owners and occupants of land adjacent to the river from all reaches of the watershed.

Alberta Environment Response

Alberta Environment will establish a Vermilion River operations advisory committee. In general, the committee's purpose would be to advise the operator on optimal strategies for managing flows given current conditions and established departmental operating procedures. Further consultation will be required to determine details of how the committee will be established, structured and what its mandate will be. These details will be determined through consultation with the participating municipalities. A formal committee Terms of Reference will need to be prepared by the committee and Environment staff, and approved by the department before proceeding.

Section II

Other Water Management Issues

6.0 Water Quality

Committee Recommendation 6.1

Conduct an inventory of the watershed to identify sources of silt and other contaminants that enter the River, and develop strategies to address the problems. (e.g. Snow dumps in areas that melt directly into the river.)

Alberta Environment Response

Alberta Environment will continue to monitor, identify and address point and non-point pollution sources in the Vermilion basin. Problems will be identified by department staff in their field activities and investigated when reported by municipal officials or members of the public. Actions taken will be in accordance with requirements of the *Water Act*.

Committee Recommendation 6.2

Re-assess the timing of releases from the sewage lagoons:

- *relative to periods of higher natural flows,*
- *in terms of coordinating with possible water releases from dams,*
- *in terms of coordinating with other communities.*

Committee Recommendation 6.3

Monitor phosphorus releases/levels relative to the Alberta Surface Water Quality Guidelines.

Committee Recommendation 6.4

Alberta Environment should assist municipalities to implement new sewage treatment technologies that will improve the quality of effluent released into the Vermilion River.

Alberta Environment Response

The Vermilion River, a tributary to the North Saskatchewan River, slowly winds its way through the Aspen Parkland Region of East-Central Alberta. Unlike the North Saskatchewan River, it receives no mountain snowmelt and is fed only by surface runoff and groundwater inputs. Consequently, river flows are naturally low, except during spring runoff or after heavy rains. This flow pattern, combined with the nutrient-rich soils of the drainage basin, result in a fertile river system. Abundant growth of submerged vegetation and odours associated with rich organic sediments, decomposing vegetation and low dissolved oxygen under ice, are features of water quality which could be expected even under natural conditions that typified the river before European settlement.

Since settlement, much agricultural, urban, industrial and infra-structural development has occurred in the Vermilion River basin. All of these activities have the potential to influence the quality of the Vermilion River. However, agricultural activities and municipal wastewater discharges are generally thought of as being the largest contributors of nutrients. Nutrients (including phosphorus, nitrogen and organic matter) contributed by these activities exacerbate water quality problems in the river.

While municipalities must ensure that Alberta Environment's wastewater treatment requirements are met, the onus is on individual land owners to ensure that beneficial land use management practices, near the water's edge and in the rest of the drainage basin, are applied.

Most municipalities currently rely on lagoon systems. When properly maintained and operated, lagoons that discharge once per year achieve a level of treatment that is equivalent to secondary treatment. When applications for lagoon upgrades or new construction are submitted, Alberta Environment encourages the implementation of "best practical technology". Such technologies include tertiary treatment, wetland treatment and irrigation. Tertiary treatment removes more nutrients than secondary treatment, hence results in improved discharge quality (and involves a continuous discharge). This level of treatment is expensive and currently only required for communities with populations over 20,000. Wetland treatment or irrigation are options that would not involve a direct discharge to the river, however, these options require specific conditions and their practicality needs to be examined on a case-by-case basis.

Municipalities are permitted to release their lagoons within the time periods provided in their respective approvals under the *Environmental Protection and Enhancement Act*. The coordination of lagoon releases can be established through a cooperative municipal effort. If requested, Alberta Environment will participate to consider available options for the operation of its licensed water control structures.

The implementation of measures to protect riparian areas as recommended in the Stakeholder Committee Report will help improve conditions in the river (see section 7.0). Healthy riparian areas act as natural filters that reduce nutrient and silt movement from land to water. In recent years, Alberta Agriculture, Food and Rural Development and Prairie Farm Rehabilitation Administration have expended a lot of effort in the area of water quality protection. Valuable information that can help producers manage their land to reduce impacts on surface waters can be obtained from these agencies.

7.0 Riparian Management

Committee Recommendation 7.1

Provide information to landowners to increase awareness of the benefits of improving the health of the riparian vegetation, and of methods/techniques available to improve riparian health.

Committee Recommendation 7.2

Encourage partnerships between interested landowners, government agencies and conservation organizations to improve riparian health.

Committee Recommendation 7.3

Provide financial incentives to landowners that volunteer to maintain or improve riparian vegetation (similar the PFRA Permanent Cover Program). Incentives may include providing landowners with cattle watering alternatives, or appropriate seed or stock for planting/reclaiming riparian areas (grass/sedge seed, or shrub stock).

Alberta Environment Response

Sound riparian management in the Vermilion River basin will make an important contribution towards improving water quality and maintaining adequate riparian flows. Successful stewardship programs are typically initiated at the community level where individual producers develop management strategies that are suited to their own needs and circumstances. Considerable resources are required to support such community initiatives and there are numerous agencies that can provide assistance in various forms.

Although there are many possible organizations to provide assistance, three key agencies/programs are: Cows and Fish; Alberta Environmentally Sustainable Agriculture Program, Alberta Agriculture Food and Rural Development; and Prairie Farm Rehabilitation Administration.

Local municipalities have proven to be invaluable partners in the development and success of many stewardship initiatives. If members of the Vermilion River Stakeholder Committee (or potentially the advisory committee suggested in recommendation 5.0) would like to pursue some form of producer-based riparian management initiative, your respective local municipalities would be a good place to start. Initial meetings with representatives from the appropriate agencies can then be set up to help determine what resources and assistance your group may require to achieve its goals. The stakeholder committee's riparian recommendations are an encouraging first step towards addressing local producer issues and concerns about the health of the Vermilion River.

8.0 Fisheries

Committee Recommendation 8.1

Investigate methods of increasing the fisheries population, in conjunction with improvements in the water quality and improvements in the duration of water flows in the River.

Alberta Environment Response

Any significant improvement in fish populations on the Vermilion River would first require the re-establishment of a fish passage between the Vermilion and North Saskatchewan Rivers. This would require the installation of a fish ladder at the Vermilion Dam and the feasibility of this would have to be investigated. Given that the Vermilion River is marginal fish habitat at best, the benefits of a fish ladder are highly questionable at this time. Any such assessment of the costs and benefits would have to be undertaken in the context of provincial fisheries management priorities.

In the short term, Alberta Environment and Alberta Sustainable Resource Development will strive to protect the river and existing fish habitat from further damage.

9.0 Mayweed

Committee Recommendation 9.1

Alberta Environment should work in cooperation with Alberta Agriculture and the local Counties to address and resolve the problem of major Mayweed infestations along the Vermilion River.

Alberta Environment Response

Alberta Environment is working in cooperation with Alberta Agriculture, Food and Rural Development to ensure that Mayweed problems are addressed on lands under Alberta Environment's jurisdiction. Alberta Environment will continue to take full responsibility for controlling Mayweed on lands controlled by the department.