VERMILION RIVER OPERATIONS REVIEW

STAKEHOLDER COMMITTEE

RECOMMENDATION REPORT

DECEMBER 2000

December 21, 2000

Vermilion River Stakeholder Committee
C/o Box 920
Rimbey, Alberta.
T0C 2J0

Halvar Jonson,
Minster of the Environment
228, 10800-97 Avenue
Edmonton, Alberta.
T5K 2B6

Dear Mr. Jonson,

On behalf of the Vermilion River Stakeholder Committee, I am pleased to forward the Committee's Recommendation Report on the future operation of the Vermilion River water system.

In July of 1997, Ty Lund as Minister of the Environment requested that a local advisory committee be formed to address flooding concerns along the Vermilion River. The committee would review past operation of the River, and recommend future management options. In May of 1999, the Vermilion River Stakeholder Committee was convened by Alberta Environment with participation by landowners, municipalities and conservation organizations. The Committee has worked to identify issues with current water operations, and reach consensus on recommendations for future water management.

In June of 2000, the Stakeholder Committee held public meetings in Vermilion, Two Hills and Vegreville to receive feedback on their proposed recommendations. The Committee has considered the public comments received and attempted to accommodate the concerns identified.

The Recommendation Report addresses a wide range of issues. The primary recommendations related to water operations include:

- Better management of drainage programs,
- Increase storage capacity within the watershed to reduce peak flows and extend the duration of flows,
- Improve maintenance of existing constructed channels,
- Operate the Morecambe Structure and Vermilion Dams to reduce flooding and provide riparian flows,
- Set up an ongoing Advisory Committee for the operation of the Vermilion River system,
- Implement programs to improve the health of riparian vegetation

The Stakeholder Committee asks that you give serious consideration to the Recommendation Report. We would appreciate the opportunity to meet with you to discuss your response to each of our recommendations. The Committee can be contacted through Derry Armstrong of your staff.

Derry Armstrong
On behalf of the Vermilion River Stakeholder Committee

Cc Ed Stelmach, MLA, Vegreville- Viking
Steve West, MLA Vermilion
Counties of Beaver, Minburn, Two Hills, Vermilion River, Lamont, Camrose
Town of Vergeville, Two Hills, Vermilion
Frank Cardinal, Director Parkland Region
Bernie Arnold, Manager Camrose Area

SUMMARY

The Vermilion River has a long history of water management problems. After a major spring flood in 1974, Alberta Environment initiated a number of water management projects to improve conditions. Since that time, operation of the projects has been difficult and controversial.

Stakeholder Committee

The Vermilion River Operations Review Stakeholder Committee was formed in 1999 at the request of the Minister of the Environment. The Stakeholder Committee was asked to review past operations of the Vermilion River water system and recommend future management options. The Committee included representatives from landowners along the system, conservation organizations, and local municipalities. Alberta Environment staff acted as resource people to assist the Committee in their deliberations.

This report presents the findings and recommendations of the Vermilion River Stakeholder Committee.

Issues

Local residents, municipalities and members of the Stakeholder Committee identified a range of issues related to water management along the Vermilion River. In the upper watershed the issues relate to a desire to drain lands to increase agricultural production. Near Vegreville and Two Hills, the concerns relate to flooding, especially in the summer months. Below Morecambe, the major issues raised is a lack of water in the summer and fall seasons.

Recommendations

The Stakeholder Committee has made a number of recommendations on water operations and overall water management of the Vermilion River system. The primary recommendations related to water operations include:

- Better management of drainage programs,
- Increase storage capacity within the watershed to reduce peak flows and extend the duration of flows,
- Improve maintenance of existing constructed channels,
- Operate the Morecambe Structure and Vermilion Dam to reduce flooding and provide riparian flows,
- Set up an ongoing Advisory Committee for the operation of the Vermilion River system,

In addition, the Committee made recommendations that relate to overall water management for the Vermilion River including:

- Encourage a change in urban and rural management practice to improve water quality,
- Implement programs to improve the health of riparian vegetation,
- Investigate methods of increasing fish populations,
- Work to address and resolve major Mayweed infestations along the River.

COMMITTEE MEMBERSHIP

The Stakeholder Committee for the Vermilion River Operations Review was comprised of landowners, municipalities and organizations with an interest in the Vermilion River. The Stakeholder Committee was convened by Alberta Environment to provide recommendations on the future operation of the water system on the Vermilion River. The Committee has worked hard to reach consensus on our recommendations to the Minister of the Environment.

The Committee acknowledges the assistance of the Alberta Environment staff who assisted us, namely Derry Armstrong, Al Corbett, Terry Krause and Doug Yeremy.

Ron Hrudey
County of Two Hills

Darwin Ullery
County of Minburn

Grant Meiklejohn
County of Vermilion River

Bob Dueck
County of Beaver

Jim Charpentier
Holden Drainage District

Milton MacGregor
Holden Drainage District

Rolland Benoit
Reach # 2
Vegreville

Dennis Trachuk
Reach # 3
Warwick

Jack Denman
Reach #4
Watt Lake

Robert Kutash
Reach # 4
Watt Lake

Pat Gordeyko
Reach # 5
Bens Lake/Vermilion Lakes

Ralph Boe
Reach # 6
Beauvallon

Barry Kutryk
Reach # 6
Beauvallon

Malcolm Henderson
Reach # 7
Mannville

Ken Dary
Reach # 7
Mannville

Mercer Bell
Reach # 8
Vermilion

Rob Kent
Reach # 8
Islay

Jim Wohl
Ducks Unlimited

Diana Rung
Alberta Conservation Association

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1.0 Introduction

In July of 1997, the County of Two Hills wrote to the Minister of Environmental Protection about flooding on the Vermilion River and the concerns of local landowners. In his letter of response, Minister Ty Lund, requested that a local advisory group be formed to review the past operations of the Vermilion River and recommend future management options of the existing control system.

Department of Environment staff (formerly Environmental Protection) met with the local municipalities along the Vermilion River to canvass their advice on forming an advisory committee. With the support of the municipalities, the Department held a series of public meeting in various communities along the river. At the meetings, people were asked to outline their concerns about the current operations of the Vermilion River system. Local representatives were also identified at the meetings to sit on an advisory or stakeholder committee.

In May of 1999, the *Vermilion River Operations Review Stakeholder Committee* held its first meeting. Over the next year, the Stakeholder Committee discussed a variety of problems and water management issues along the entire Vermilion River system from Holden to Marwayne. During their work, the committee decided to consider all water management issues and did not limit their comments to the operation of existing structures. The committee felt that a lot of the problems could not be addressed by modifying current operations and that other options should also be suggested in their report.

This Recommendation Report represents the work of the Vermilion River Stakeholder Committee. The Committee believes that implementation of the recommendations could significantly improve the operation of the water system on the Vermilion River. However, the Committee recognizes that all of the problems will not be resolved and periods of flooding and drought will still happen.

2.0 Background

The Vermilion River System is a typical slow moving, meandering channel through highly productive farmland east of Edmonton. The headwaters are located in the Holden-Viking area with the river flowing north through Vegreville and Two Hills, then south-east to Mannville and Vermilion, and east to join the North Saskatchewan River. The drainage basin covers more than 2,500 square kilometres and the river is approximately 275 kilometres in length. After a major spring flood event in 1974, Alberta Environment initiated a number of projects that have affected drainage in the basin.

Holden Drainage District was established in 1918 and predates Alberta Environment's water management projects. The District was established as a local authority to assist farmers drain low-lying lands to increase agricultural production.

Channelization at Vegreville was completed in 1978 as a direct consequence of the 1974 flooding. This work consisted of channel work only; no dykes or flood control structures were constructed.

Channelization from Bens Lake to Morecambe improved flow between Bens Lake and the six Vermilion Lakes. The channel is designed mainly for drainage capacity and not to contain the flood runoff. The design may control the duration of the runoff event. Some habitat improvement was included in this portion of the work, consisting mainly of islands in the Vermilion Lakes to provide waterfowl nesting sites.

Morecambe Structure is located at the outlet of the last Vermilion Lake, and is the primary flow control structure on the system. The dam is designed to allow for pre-releasing of water from the Vermilion Lakes, and to allow all flood flow through the structure without increasing the upstream water levels. The original operating procedures required upstream flow monitoring to determine potential flood threat and operating the gates to drawdown the Vermilion Lakes. Outflow would then be controlled to minimize upstream and downstream flooding.

Since construction of the Morecambe Structure, the Department has operated it twice in an attempt to reduce flood damage, but it has not been completely successful. In 1991 there were problems when pre-release to reduce water levels upstream was thought to have increased flooding downstream. The Department has not operated the Morecambe Structure since 1991.

Channelization downstream from Morecambe was completed in 1976 to ensure the river would pass a minimum of 400 cfs (11.3 cms) at bank full stage.

Vermilion Dam at the Town of Vermilion was constructed in 1980-81 to replace an existing dam that provided a recreation reservoir and a crossing of the river for Highway 41. The dam provides no flood control potential and the only controlled water releases

are via a small sluice gate that provides riparian flow. Although all inflows pass directly through the site, the reservoir provides some storage reduction of peak flows.

The river channel upstream and down stream of the Vermilion Dam has not been improved, although studies completed by the Department recommended some improvement of the channel downstream. The channel's natural condition varies with beaver activity, siltation and debris buildup.

Monitoring the flow of water in the Vermilion River system requires an extensive network because conditions throughout the basin vary greatly. Some weather and water level data collection stations are in place, and informal contact with residents is maintained to supplement the monitoring system.

Maintenance of the system is currently done on an as-required basis. Department personnel react to complaints or concerns of residents or local authorities when concerns are brought forward. The frequency of these complaints depends on the level and intensity of runoff events, which can occur throughout spring and summer and vary from year to year.

3.0 Issues Identified

Local residents, the municipalities and members of the Stakeholder Committee identified a considerable number of issues related to the management of water flows in the River. In addition, a broad spectrum of other types water management issues were also raised. The following summarizes the issues identified for the different reaches or segments of the river, starting at the upper watershed. The information is presented as it was raised, in no particular order or ranking.

The following map summarizes the Water Issues identified for the River. The Reach locations are outlined in an appendix.

Reach #1 Holden Drainage District

- general concerns expressed about the impact of upstream drainage on downstream landowners within the Drainage District.
- Problems with unauthorized drainage into the District and from within the District.
- Concern that the Vermilion River Operations Review would reduce or restrict the ability of the Drainage District to release water into the System

Reach # 2 Holden to Vegreville

- too much water in the spring and not enough in summer.
- Beaver debris in channel causes flooding.
- floods deposit debris on uplands that interfere with farming operations.
- flooding of pasture, hayland and crop.
- not consulted regarding upstream works - results in too much water and debris
- Holden water runs out as same time as the east branch of the river. Used to run at different times so less flooding on mainstem.
- concern with unlicensed drainage
- there are periods/years with a lack of water
- high water levels/floods are persisting longer than previously because of more water coming in from diversions/drainage.
- flooding occurs at road crossings that hold back water

Reach #3 Vegreville to Bens Lake

- flood risk is approximately a 1:25 year frequency
- flooding of pasture occurs but considered beneficial for short periods
- question of what affect beavers might have on flooding
- beaver dams are beneficial for holding back water for cattle
- problem is with blockage from logs jammed at bridges causing flooding

- ice jams also occur in conjunction with log jams making the problem worse
- intense flow out of Vegreville, due to channelization, causes flooding immediately downstream.
- would like to see a steady flow throughout the year for watering cattle, also provides cleaner, fresher water and supports fish populations
- Spring Creek flooding problems are made worse by upper basin channelization and drainage.
- concern about unauthorized and authorized drainage on tributary streams
- municipal lagoon drainage during low flow periods results in pooling and stagnation of poor quality water.

Reach # 4 Watt Lake and Channel

- **Concern that the channel maintenance work has made the channel lower and wider than the original design.**
- **Concerns that the stop logs in the control culvert were not being operated to keep the water at the Crown boundary.**
- **Concern about the exact elevation of the bottom of the Watt Lake control culvert and the elevation of Crown boundary of Watt Lake.**

Reach # 5 Bens Lake to Morecambe

- flooding of pasture and hay land is okay in spring, but not in July and August.
- flood problems have increased with more drainage in the head waters
- there is a tremendous loss of roads due to flooding in this area
- the water drains too slowly out of this reach. Need to move floodwater out faster.
- there is a beaver problem between the lower Vermilion Lakes and it impedes the out flow
- operate Morecambe structure to mitigate floods in this reach
- should operate Morecambe in the fall in preparation for spring run-off
- need to keep existing channels open and clean
- need to look into the impact of aquatic vegetation on flow and drainage
- significant level of concern poor water quality due to effluent releases from the Two Hills sewage lagoons.
- Concern about the impact of cattle on water quality.

Reach # 6 Morecambe to Birch Creek

- there is an overall lack of water in this reach.
- there is a lack of water in late summer and fall.
- would like to see a steady flow throughout the year (for cattle and other reasons).

- avoid stagnation of water. Need continuous flow throughout year to achieve this.
- spring floods are OK for pasture and hay fields if not inundated too long.
- regarding any release in August, control the flow and do not flood hay meadows.
- it is hard to control the flow with the number of beaver dams that result in flooding.
- control the number of beaver dams but do not remove them all.
- beaver ponds are beneficial in that they provide water for cattle.
- improve the fish habitat. It used to be much better.
- the Vermilion dam keeps fish from moving upstream.
- need fish by-pass at the Vermilion dam.

Reach # 7 Birch Creek to Vermilion

- the largest problem associated with a lack of water is in the late summer
- most important is to maintain a continuous flow in the river.
- stagnant water is very poor quality and not good enough for cattle.
- spring floods are beneficial if they do not last too long (2 - 3 weeks).
- good hay and pasture is only possible with spring floods of two weeks or so. Very important to production.
- need better communications to avoid flooding from release of Morecambe.
- fast releases are not desired as they would take out beaver dams that provide benefits.
- there is a need to keep some beaver dams to prevent bank erosion.
- would like to have at least some notification when taking out beaver dams.
- don't remove all the beaver dams as they hold water in the system and provide benefits to river and cattle.
- there is a problem with different priorities above and below Morecambe (below being a lower priority - need equity).
- better production of pike in the river would provide a public benefit – need continual flow.
- need fish ladders for movement around structures to maintain healthy fish populations.
- one should either leave the system alone or control it completely.
- the river is OK the way it is..

Reach # 8 Vermilion to North Saskatchewan River

(There are two distinct problems in this reach. One is in the flats where flooding is more prevalent. Here they wanted the water moved along faster. In the other section the main concern is a lack of water and desire for continuous flow throughout the year.)

- prefer natural flow conditions - leave river alone.
- lack of or no flow in the river is a problem. Need a flow for cattle August to October.

- the flow should be regulated. Need more water in the fall. A continuous flow would also be better for fish and habitat.
- hayland flooding is a significant problem.
- late summer flooding causes problems for hay crops. Need to keep water within the channel at this time.
- need to channelize the river to move water through and avoid flooding of hay meadows.
- need good flow in the spring to ensure the channel gets flushed.
- beaver dams hold back the flow and cause siltation of the channel. The channel needs to be cleared.
- need to dredge the channel to keep water moving more quickly, particularly in area of flats.
- need to control pollution and also allow free and continuous flow of the river to maintain clean water. Need better sewage treatment.
- salt runoff from Vermilion snow removal is a significant problem.
- there is poor water quality and it is not fit for cattle.
- too much stagnation due to the Vermilion Dam leading to poor water quality.
- there is an erosion problem where banks are of sandy soil and flow is too fast.

Issues identified by Towns and Counties

- Lack of water
- Sufficient water supply for fish population
- Spread of weeds along river
- Beaver dams
- Keeping channel open and clear of debris. Allow spring flush of river
- Need adequate sewage dilution capacity
- Need balanced flow through out the year
- During high water years can lose bridges, culverts and road wash outs
- Flooding of hay fields restricts access for farming
- Flooding below Morecambe
- Flooding around Watt lake and impact on roads and residences
- Water wells, sewage lagoons, and bridges are located in the river flats and could be damaged by flooding
- Erosion problems
- Poor water quality above the Vermilion Dam.
- Protection of riparian habitat
- Watt Lake project affect on landowners and downstream

4.0 Recommendations

The Vermilion River Stakeholder Committee has thoroughly considered the issues identified about management of the water operations for the river system. The following recommendations are intended to address the issues and improve future water conditions.

The Recommendations are presented under general headings, with a brief preamble section to provide background, general statements on the overall intention of the recommendations, and finally a listing of specific recommendations.

The first group of recommendations relate directly to the management of the water flows and operation of the water control structures along the river including:

- **Drainage and Storage**
- **Channels**
- **Structures**
- **Advisory Committee**

In addition the Committee has made a number of recommendations that relate to the overall water management for the Vermilion River including:

- **Water Quality**
- **Riparian Management**
- **Fisheries**
- **Mayweed**

4.1 Drainage and Storage

Preamble

- In the Vermilion watershed there has been a long history of drainage programs to improve agricultural production. Some of the drainage programs have been authorized by licenses, but other drainage projects have proceeded without proper authorization.

- The natural drainage profile of the watershed is steep in the upper reaches, flat around Two Hills, dropping more steeply through the Mannville area, flat below Vermilion, and then dropping rapidly again to Marwayne. The natural drainage profile results in flooding in the flatter areas of the River, although flooding does occur throughout the watershed.

- The cumulative impacts of drainage in the upper watershed may have increased the frequency and intensity of flooding in the middle reaches of the River.

- Drainage programs within the watershed have reduced the natural storage of water, thereby reducing the duration of water flow. In the late summer and fall, water levels in the lower reaches of the river have been reduced, and occasionally stop altogether.

Intent

- **Manage drainage programs to reduce the peak flow of water and extend the duration of natural water flows.**

- **Increase the storage capacity within the watershed to hold water during periods of high flow and release water during periods of low flow.**

- **Encourage alternative practices that will reduce the amount of land that is drained, such as wildlife habitat improvements.**

Drainage Recommendations

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

- **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.**

- **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.**

- **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.)***

<u>Storage Recommendations</u>

- **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.)***

- **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.**

- **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.**

- **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.**

4.2 Channels

Preamble

- Channels have been constructed at several locations along the Vermilion River to reduce flooding and speed the flow of water. The constructed channels also reduce the duration of flow, thus affecting the length of time that water flows in the lower reaches of the River.

- Constructed channels are found within the Holden Drainage District, at Vegreville, in the Watts Lake/Bens Lake/ Vermilion Lakes reach, and below the Morecambe Dam.

- The channels are subject to siltation and vegetation growth that impedes the flow of water. The constructed channels need to be periodically cleaned out to maintain the water flow.

- The capacity of the channels to accommodate flows is not consistent throughout the system. The channel in the Holden Drainage District is 380 cfs, at Vegreville approximately 2,800 cfs, through Bens Lake 175 cfs, below Morecambe 800 cfs, and the natural channel below Vermilion is estimated at 50 cfs.

- Beaver activity occurs within constructed and natural channels. Beaver dams and vegetation debris from beavers causes blockages at culverts and bridges during floods, increasing flood damage.

Intent

- **Maintain the constructed channels to allow them to reduce flooding and speed the flow of water.**

- **Keep the natural channel of the main river clear of major debris that could result in increased flood damage.**

- **Consider the impact of channel construction and maintenance on the natural flow of water in the lower reaches of the River.**

Channels Recommendations

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

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

- **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 should increase the financial assistance available to municipalities for beaver management.**

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

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

4.3 Structures

Preamble

- Flooding on the Vermilion River system is a natural occurrence that cannot be completely controlled. Spring floods are considered of benefit to the agricultural community in some reaches of the River because they increase soil fertility and moisture levels. However, summer floods cause problems for agricultural activities.

- The Morecambe Structure was constructed in 1976 to act as a flood management tool, allowing pre-release of water from Vermilion Lakes to reduce the impact of major summer rainfall events in the Vermilion Lakes basin.

- Operation of the Morecambe Structure in 1983 and 1990 resulted in the flooding of downstream landowners and damage to hay crops. The Department has not operated the Structure since 1990.

- Morecambe Structure operation is currently restricted to allowing water levels above elevation 1965.5 feet to pass through the lakes simulating the natural flow condition. Permission of the Department of the Environment's Deputy Minister is required to allow operation of the structure to pre-release water before a potential flood, or to release water for riparian flow.

- The Vermilion River profile through the Vermilion Lakes has very little drop from the Bens Lake area to the Morecambe structure. During times of high flows, the water backs up in the upper lakes, flooding the riparian area and affecting farm management practices.

- The Vermilion Dam was built in 1981 and 1982 to replace an existing dam built to provide power generation. The new dam was designed to maintain the existing reservoir for recreation at Vermilion Provincial Park, to provide a source for municipal water for the Town of Vermilion and to provide for water flow augmentation in the Vermilion River downstream of the dam.

- Vermilion Dam operation currently requires requests from downstream landowners for riparian flow to be reviewed by Department personnel. Staff consider the existing reservoir levels, projected inflow and possible release rates to determine if any release is recommended and if amounts released will provide significant benefit.

Intent

- **Operate the Morecambe Structure to reduce the severity and duration of upstream and downstream flooding, reducing agricultural impacts in flood prone areas, while considering the impacts on wildlife habitat in the Vermilion Lakes.**

- **Operate the Morecambe Structure in the late summer and fall to provide downstream riparian flow.**

- **Operate the Vermilion Dam to provide riparian flows, especially in the late summer and fall, while maintaining a minimum water level in the Vermilion Reservoir.**

Recommendations for Morecambe Control Structure

- **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.**

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

- **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.**

- **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. Riparian operations will be reviewed yearly by the proposed advisory committee to consider the benefits of previous operations and possible improvements.**

- **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.**

Recommendations for Vermilion Dam

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

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

- **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. 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.**

4.4 Advisory Committee

- **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.**

4.5 Water Quality

Preamble

- People within the watershed frequent express concerns that water quality has declined in the Vermilion River system.

Intent

- **Encourage a change in both urban and rural management practices to improve the water quality of the Vermilion River.**

- **Minimize the impact of releases from sewage lagoons on water quality.**

Water Quality Recommendations

- **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.)**

- **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.**

- **Monitor phosphorous releases/levels relative to the *Alberta Surface Water Quality Guidelines.***

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

4.6 Riparian Management

Preamble

- Considerable change has occurred in the vegetation pattern within the watershed over the last 100 years with clearing for agriculture and human developments.

- A reduction in the amount of riparian vegetation along the river has resulted in faster surface drainage into the river, increased levels of sedimentation, and higher nutrient levels.

Intent

- **Improve the health of the riparian vegetation along the Vermilion River system in order to improve water quality, reduce peak flows, and improve fish and wildlife habitat.**

Riparian Management Recommendations

- **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.**

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

- **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).**

4.7 Fisheries

Preamble

- The Vermilion River has probably never supported a large resident fish population, but acts as nursery site for fish in the North Saskatchewan River.

- The Vermilion River does not have good fish habitat on a year round basis resulting in sporadic population distribution. The River has been segmented by the Vermilion Dam and Morecambe structure that stop the migration of fish upstream.

- Recent sampling found no fish in the Vermilion River above Bens Lake, and primarily suckers and minnows in the reach from Bens Lake to Vermilion. A few pike were caught in the Vermilion Lakes.

Fisheries Recommendation

- **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.**

4.8 Mayweed

- **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.**