

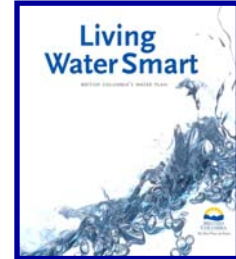
# **Agriculture and British Columbia's Water Plan**

**Draft**  
April 29, 2010

# Agriculture and British Columbia's WATER PLAN

In June 2008 the province released *Living Water Smart*, British Columbia's Water Plan. The plan provides a road map or direction for water management in British Columbia and makes a number of commitments that will be achieved over the next few years and beyond. Goals that are established with respect to agriculture include:

- Farms and ranches will have enough water to irrigate their crops
- Agriculture will use efficient irrigation methods
- Crops suited to our soils and climate will be grown
- Preserve top soil to absorb and retain water
- Where possible use reclaimed water
- Improve stream health and restore stream banks and riparian areas
- Keep animals out of waterways
- Use fertilizers, pesticides and compost properly to take of our soils and water
- Capture runoff and ensure only clean water enters creeks and streams

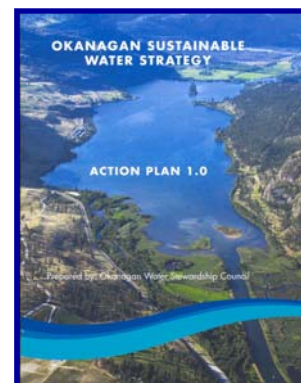


The Water Plan also makes the following commitments:

- By 2020 water use in the BC will be 33 percent more efficient
- By 2012 all large water users will measure and report their water use
- Government will secure access to water for agricultural lands
- The agriculture sector will need to be more efficient
- By 2012 new approaches to water management will address impacts from increased drought risk and climate change
- Adapting to climate change and reducing impacts on the environment will be a condition for receiving provincial infrastructure funding
- Developments on flood plains must be flood proofed to high provincial standards
- Wetland and waterway function will be protected
- Fifty percent of new municipal water needs will be acquired through conservation by 2020
- Government will expand BC's hydrometric and climate station network
- Government will publish a report on state of the water by 2012 and every 5 years after that

The Okanagan Basin Water Board has developed a *Sustainable Water Strategy* for the Okanagan Basin. The strategy builds on many of the initiatives that have been outlined in the *Living Water Smart* plan. Action items that are identified in the plan that are oriented to agriculture include:

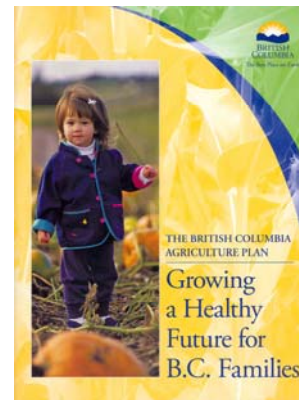
- Manage livestock in watersheds through the installation of fencing at key locations and the provision of off-stream watering facilities
- Establish an Agricultural Water Reserve that links agriculture water budget allocations to the ALR.
- Extend the date on irrigation licences to allow for irrigation later in the season
- Implement drought management planning based on a provincial template
- Prepare a comprehensive water management plan for the Okanagan Basin
- Use certified irrigation designers to design systems



- Where appropriate maintain affordable agricultural water rates by splitting systems, increasing use of treated wastewater, implementing education and incentive programs
- Ensure water storage is identified as a strategic and critical component to water management in the Okanagan
- Maintain and expand the network of hydrometric and climate stations operating in the Okanagan

The Ministry of Agriculture and Lands has developed an Agriculture Plan ***Growing a Healthy Future for BC Families***. Strategy 8 of the plan identifies the need to integrate agriculture in provincial water management policies and programs. The plan calls for:

- Processes that provide clarity to agricultural users about sustainable water withdrawals
- Management of environmental impacts
- Establishing reserves for agricultural land
- Funding programs for water infrastructure
- Programs encouraging water conservation and leadership on water use efficiency
- Work with local, regional and federal governments to address long term flood control measures



The above documents and plans provide direction for a water plan in British Columbia and guidance on issues that need to be resolved for agriculture. The list of issues in this document were formed and based on these plans. A meeting of Ministry of Agriculture and Lands' staff, other agencies and the British Columbia Agriculture Council ranked each issue with respect to risk and consequence and those are shown on each note.

**This document is draft and a work in progress – please provide comments, suggestions, corrections thoughts and ideas on implementation or action. Information on resources and costs have been left out at this time however suggestions on this section can be offered.**

Comments can be forwarded to Ted van der Gulik, P. Eng Senior Engineer at the following:

[Ted.vandergulik@gov.bc.ca](mailto:Ted.vandergulik@gov.bc.ca)

Phone: 604-556-3112

Cover Photo taken by Barry Smith at Oyama, British Columbia

## Water Strategy Issue Summary

#	Category	Description of Issue	Rating	Implication
1	Securing Water	Reserve Water for Agricultural Lands	<b>EXTREME</b>	Legislation
2	Securing Water	Water Purveyors Secure Water to ALR Lands	<b>EXTREME</b>	Bylaws
3	Securing Water	Expansion of Water Storage Facilities	<b>EXTREME</b>	Policy
4	Securing Water	Planning for Climate Change Adaptation	<b>MEDIUM</b>	Policy
5	Securing Water	Secure Access for Livestock Water	<b>EXTREME</b>	Licensing
6	Securing Water	Agriculture Water for First Nations	<b>EXTREME</b>	Policy
7	Securing Water	Encourage Use of Reclaimed Water	<b>LOW</b>	Policy
8	Water Governance	Do Not Support Unauthorized Use of Water	<b>LOW</b>	Licensing
9	Water Governance	Users Adhere to Annual Use and Peak Withdrawal	<b>MEDIUM</b>	Licensing
10	Water Governance	Area Based Regulation of Groundwater Use Supported	<b>EXTREME</b>	Licensing
11	Water Governance	Agricultural Water Purveyors Have Ag Representation	<b>EXTREME</b>	Policy
12	Water Governance	Transfer or Trading of Water Rights Remain Within Ag Sector	<b>EXTREME</b>	Legislation
13	Pricing	Water Pricing Will Consider Agriculture's Ability to Pay	<b>HIGH</b>	Bylaws
14	Pricing	Industry Support Pricing Structure that Promotes Beneficial Mgmt	<b>HIGH</b>	Policy
15	Pricing	Societal Benefits of Ag Storage Facilities Recognized	<b>LOW</b>	Policy
16	Water Use	Establish a Policy for Part Season Licensing	<b>MEDIUM</b>	Licensing
17	Water Use	Extend Irrigation Season Licences	<b>HIGH</b>	Licensing
18	Water Use	Maximize Beneficial Acreage Supplied by Licence	<b>HIGH</b>	Policy
19	Water Use	Monitor Water Use on Purveyed Systems and Large Users	<b>MEDIUM</b>	Funding
20	Water Use	Promote Certified Agricultural Irrigation Designs	<b>EXTREME</b>	Policy
21	Water Use	Encourage Irrigation Scheduling to Improve Efficiency	<b>EXTREME</b>	Extension
22	Water Use	Develop Equitable Drought Management Planning Process	<b>HIGH</b>	Policy
23	Water Use	Improve Irrigation System Efficiencies	<b>HIGH</b>	Funding
24	Water Use	Water Conservation Incentives	<b>MEDIUM</b>	Funding
25	Water Use	Water Use Related Carbon Offsets	<b>LOW</b>	Policy
26	Water Quality	Agriculture Has Suitable Water Quality for Use	<b>MEDIUM</b>	Funding
27	Water Quality	Reduce Agriculture's Impact on Water Quality	<b>HIGH</b>	Funding
28	Water Quality	Balance Fish and Agriculture's Needs	<b>MEDIUM</b>	Policy
29	Water Quality	Funding Infrastructure for Irrigation Districts	<b>HIGH</b>	Funding
30	Flood and Drainage	Master Drainage Plans Consider Agriculture	<b>EXTREME</b>	Policy
31	Flood and Drainage	Farmland Not Used for Stormwater Retention	<b>HIGH</b>	Policy
32	Flood and Drainage	Urban Developments Increase Flooding of Agricultural Lowlands	<b>HIGH</b>	Bylaws
33	Flood and Drainage	Obtain Funding for Drainage Infrastructure	<b>EXTREME</b>	Funding
34	Extension	Educate Public on Agriculture and Water Issues	<b>HIGH</b>	Extension

## Water Strategy Issue Summary

#	Description of Issue	Link to Water Act Modernization Process
1	Reserve Water for Agricultural Lands	Establish a process for Water Reserves for Agriculture
2	Water Purveyors Secure Water to ALR Lands	Water purveyors required to establish water use plans that protect agricultural water
3	Expansion of Water Storage Facilities	Water policy allows reservoirs to be sized to provide more than one year of use and allow carry over storage.
4	Planning for Climate Change Adaptation	none
5	Secure Access for Livestock Water	Historical livestock water use is recognized and livestock water licencing system implemented.
6	Agriculture Water for First Nations	none
7	Encourage Use of Reclaimed Water	No link to Water Act Modernization but reclaimed water use guidelines are being updated.
8	Do Not Support Unauthorized Use of Water	Already in water act. Agricultural producers support first in time, first in right principal.
9	Users Adhere to Annual Use and Peak Withdrawal	Not consistently applied throughout province. Licences should state peak flow rates and annual withdrawal
10	Area Based Regulation of Groundwater Use Supported	Groundwater licencing supported through groundwater management planning process
11	Agricultural Water Purveyors Have Ag Representation	Link to governance
12	Transfer or Trading of Water Rights Remain Within Ag Sector	If trading of water rights in enacted, trading only within agriculture sector is supported.
13	Water Pricing Will Consider Agriculture's Ability to Pay	Water rates should consider agriculture's ability to pay
14	Industry Support Promotion of Beneficial Mgmt	none
15	Societal Benefits of Ag Storage Facilities Recognized	none
16	Establish a Policy for Part Season Licensing	Water Act to allow part season licencing for agricultural producers
17	Extend Irrigation Season Licences	Water Act to extend irrigation season in spring and fall - licenced volume for each licence will not change
18	Maximize Beneficial Acreage Supplied by Licence	Water Act to allow producers to alter the land or area to be irrigated to optimize beneficial use
19	Monitor Water Use on Purveyed Systems and Large Users	Large water users to report water use - suggest an online system to accommodate this
20	Promote Certified Agricultural Irrigation Designs	Promote the use of certified designers for irrigation systems to increase efficiency
21	Encourage Irrigation Scheduling to Improve Efficiency	none
22	Develop Equitable Drought Management Planning Process	Water Act require and support Drought Management Plans
23	Improve Irrigation System Efficiencies	none
24	Water Conservation Incentives	none
25	Water Use Related Carbon Offsets	none
26	Agriculture Has Suitable Water Quality for Use	none

27	Reduce Agriculture's Impact on Water Quality	Environmental Management Act - not WAM issue
28	Balance Fish and Agriculture's Needs	Establish a process for determining minimum stream flow requirements for fish that supported by all agencies
29	Funding Infrastructure for Irrigation Districts	None
30	Master Drainage Plans Consider Agriculture	Rainwater and stormwater management be intergrated into water act
31	Farmland Not Used for Stormwater Retention	none
32	Urban Developments Increase Flooding of Agricultural Lowlands	Rainwater and stormwater management be intergrated into water act
33	Obtain Funding for Drainage Infrastructure	none
34	Educate Public on Agriculture and Water Issues	none

# Agriculture Water Strategy

## Securing Water

Draft

**EXTREME**

**Issue Title: Reserve Water for Agricultural Lands**

**01**

**Issue:**

Production of fresh fruit, vegetable and dairy products require a secure and sustainable supply of quality fresh water. In addition cattle and animals require good quality water to survive and are critical part of the food production system in BC. Agriculture is in competition for water with fisheries, industry, recreation and municipal uses. To ensure a sustainable agriculture industry, water resources need to be reserved for agriculture.

**Background:**

In 2001, BC had a population of 4 million. Given the estimated land requirement of 0.524 hectares per person, approximately 2.15 million hectares of food producing land was needed to meet British Columbians' food needs. Approximately 10% or 215,000 hectares of that land need to be in the fruit, vegetable and dairy producing areas and have access to irrigation. In 2005, the BC Ministry of Agriculture and Lands estimated that 189,000 hectares of farmland in BC had access to irrigation. In 2001 the total area of farms in fruit, vegetable and dairy production areas of the province reported irrigating 88,000 hectares – approximately 40% of what is needed for self-reliance (215,000 ha).

By 2025, BC's population is expected to grow by 30%. With similar production technology, 2.78 million hectares of food producing land will be needed, of which 281,000 hectares will need access to irrigation.

**Methodology:**

Establish an agriculture water reserve for all major basins in the province. All agricultural lands with high productivity and proximity to water sources will have a water demand determined. The water reserve will take into account future demands due to climate change. The desired approach is to use the Irrigation Water Demand Tool that has been developed by the Ministry of Agriculture and Lands and Agriculture and Agri-Food Canada to calculate present and future water demands. The model uses a scientific approach that calculates water demand based on crop, soil, irrigation system and climate data. The model is currently operational for the Okanagan basin and will be able to operate for the Bonaparte, Similkameen, and Nicola basins in early 2009. The water demand determined from the model can be used to assess current supply and how much additional supply may be required.

**Required Action:**

The province and local stewardship groups conduct watershed management and planning processes for major basins in British Columbia. Using the data generated from the agriculture model develop a water allocation plan for the basin that reserves water for agriculture but takes into account fishery, domestic and agricultural needs. Land use surveys will need to be completed for regions where a water reserve for agriculture is being established.

**Other Stakeholders Roles:**

Local governments – provide cadastral and collect land use information with support of MAL.

**Constraints, Risks and Dependencies:**

Obtaining enough funding and staff resources to be able to implement model and obtain relevant data for major basins in British Columbia.

**Resources (Human):**

**Resources (\$):**

**Resource (Other):**

**Major Milestones, Tasks and Activities:**

Model operational for Okanagan October 2008. Report prepared April 2010.

Model operational for Similkameen, Nicola and Bonaparte Basins December 2010. Report completed for each basin by March 2011.

# Agriculture Water Strategy

## Securing Water

Draft

EXTREME

Securing Water

### Issue Title: Water Purveyors Secure Water to ALR Lands

02

#### Issue:

Water purveyors are using water allocated to agriculture to expand urban development within their boundaries.

#### Background:

Water purveyors in the Okanagan and Kootenays were originally established to primarily supply irrigation water for agriculture purposes. A Letters Patent issued by the Province authorized the formation of the Irrigation District to supply water to a specified agricultural area. The province also granted a water use and storage licence that provided a water allocation to the specified area to be irrigated within the district boundaries.

An aging farm population has resulted in many farmers taking all or a portion of their farms out of production. The land use survey conducted in the Okanagan indicates that there are 3500 hectares of land that have an irrigation system installed but it is not being used. In addition irrigation systems have become more efficient in the past 20 years which results in reduced water use. Some water purveyors are seeing a drop in the water demand by the agriculture sector and are reallocating the water to urban development.

The agriculture land base within the irrigation district boundaries requires that sufficient water remain allocated to the sector. While use may be reduced temporarily because of changing demographics the water cannot be reallocated to other uses on a permanent basis. Irrigation demands may be decreased but frost protection, crop cooling, chemigation and fumigation practices may require additional water. In addition irrigation demands will likely increase in the future due to a changing climate.

The agriculture sector is not requesting an increase in the allocation but to maintain the historical allocation that was established for the agricultural land.

#### Methodology:

There are approximately 50 large purveyors that have large areas of agricultural land and have more than 100 domestic connections. Water Purveyors develop a water use plan that considers agricultural requirements. Identify the agriculture land base within each purveyor boundary. Establish an irrigation duty that corresponds with accepted practices and is based on a 10% risk factor (i.e. there is sufficient water for 9 years out of 10). Future water demand taking into climate change should also be considered. Determine a peak flow rate based on climate and soil conditions for each user. The Irrigation Water Demand Model can be used in the Okanagan to determine the annual duty for each district based on current land use.

#### Required Action:

Purveyors develop a water use plan before changes to agricultural demands can be made. If water for the agriculture land base is to be reduced it must consider current and future land use as well as current and future water demand information. The Okanagan Sustainable Water Strategy promotes the need to reserve and secure water for the agriculture land base.

#### Other Stakeholders Roles:

Okanagan Basin Water Board, British Columbia Agriculture Council, Water Supply Association of British Columbia, Water Purveyors.

#### Constraints, Risks and Dependencies:

Sufficient information available to determine agriculture's water requirements. Climate change impacts not available in all regions.

#### Resources (Human):

#### Resources (\$):

#### Resource (Other):

#### Major Milestones, Tasks and Activities:

Water Purveyors implement water use plans by 2012.

# Agriculture Water Strategy

## Securing Water

Draft

EXTREME

Securing Water

**Issue Title:** Expansion of Water Storage Facilities

**03**

**Issue:**

There is a need for increased water storage to sustain growth in the agriculture sector and to accommodate the increased water demand due to climate change, but the opportunities may be limited due to availability of good sites and recreational developments on reservoirs.

**Background:**

In most areas of B.C. the winter snow packs melt and create a spring freshet during the months of May and June. This surplus flow can be stored and used later in the growing season when stream flows are low and fully recorded.

British Columbia currently has over 2500 dams licensed for storage for agricultural irrigation purposes. In many cases these dams have functioned very well and have also provided flood protection. Many of these dams have been built over 40 or 50 years ago and are in need of upgrading or replacement to meet the dam safety construction guidelines.

Climate change and growth in the irrigated agriculture sector in the future can only be accommodated by increasing water storage as many streams are currently fully recorded and have no additional water available to be licensed.

The province has in the past leased many recreational lots on crown land that are adjacent to reservoirs used for domestic and irrigation use. Renewing the leases or selling the lots outright to users will curtail the opportunity for raising the dams and increasing storage volumes in the future. Many of these reservoirs also supply domestic water. Allowing for developments to occur close to the reservoirs will also impact water quality and the province's drinking water action plan.

**Methodology:**

Identify areas in the Province that require additional water to keep up with current and future irrigation demand. Future water requirements should also consider the impacts of climate change. The Irrigation Water Demand Model that has been developed for the Okanagan Basin could be used to provide an estimate of demand. Areas that are in need of additional supply should have water storage assessments done, identifying possible locations for new dams or improving an existing dam.

Implement a provincial policy that protects crown lands adjacent to reservoirs to allow for expansion and to protect drinking water quality.

Infrastructure funding for reservoir construction and the required studies and evaluations is required.

**Required Action:**

Identify and rank watersheds that are at high risk for droughts or water shortages. Improve the hydrometric network so an improved assessment of increasing storage potential in watersheds can be done. Highly ranked watersheds that face shortages and have storage potential should be identified for further analysis.

Provincial policy protecting watersheds that provide drinking water and are required for future storage should be initiated.

**Other Stakeholders Roles:**

Local governments, producer groups, MOE, and DFO

**Constraints, Risks and Dependencies:**

Obtaining enough funding and staff resources to be able to conduct assessments.

**Resources (Human):**

**Resources (\$):**

**Resource (Other):**

**Major Milestones, Tasks and Activities:**

All major irrigation basins in the Province of British Columbia that face severe water shortages are assessed and ranked. Drinking water protection policy for interior regions is implemented.

# Agriculture Water Strategy

## Securing Water

Draft

**MEDIUM**

**Issue Title:** Planning for Climate Change Adaptation

**04**

**Issue:**

Climate change will have an impact on water resources throughout British Columbia, which will affect agricultural production.

**Background:**

Climate change projections for British Columbia indicate that summers will tend to be hotter and drier and winters will tend to have increased levels of precipitation. Hotter growing seasons in will result in higher water demand for agricultural crops and the competition for water from other sectors will make it difficult for the agriculture sector to obtain a larger allocation. Instream water requirements for fish and the ecology will also be in direct competition with agricultural water use.

Careful planning will ensure that water resources are available for agriculture regardless of climate change. Preparation measures may include increasing the water storage capacity of individual producers or municipalities, helping producers monitor and reduce their water use, encouraging producers to plant more drought-resistant crops, and establishing protocols to assist producers during drought and flood events.

**Methodology:**

In cooperation with relevant stakeholders, determine the best actions to take in preparation for predicted climate changes. Separate these items into actions for individual producers, municipal and regional government, and provincial government. Then, prioritize these items and review funding opportunities for each item.

**Required Action:**

Phase 1: Meet with relevant stakeholders to create the list of actions.

**Other Stakeholders Roles:**

- The AAFC is conducting research in partnership with the Climate Change Adaptation section of MOE that examines predicted climate change scenarios and their impact on crop suitability and water resources throughout BC. This research can inform water resource planning for agriculture.
- Municipal and regional governments will need to take an active role in this planning process, as they are likely to play a direct role in any necessary infrastructure changes.
- The Climate Action Initiative Committee (CAIC) will also need to take an active role in the planning process, as assisting producers with climate change adaptation is part of their mandate. They may be able to fund or coordinate stakeholder meetings.

**Constraints, Risks and Dependencies:**

- There is a degree of uncertainty associated with predicted climate change scenarios.
- In some cases, it may not be possible to guarantee that particular actions will assist with climate change adaptation.
- Effective planning and action may require significant resources.

**Resources (Human):**

**Resources (\$):**

**Resource (Other):**

**Major Milestones, Tasks and Activities:**

Conduct stakeholder meetings by April 2009 and prioritize action items by August 2009.

# Agriculture Water Strategy

## Securing Water

Draft

**EXTREME**

**Issue Title: Secure Access for Livestock Water**

**05**

**Issue:**

Farmers and Ranchers are unable to secure a water licence for livestock watering as many streams in British Columbia are fully allocated, despite the fact that cattle have been and currently are drinking directly from the stream.

**Background:**

The livestock industry in the Province of B.C. has been operating for over 100 years and relies on grazing tenures to supply cattle with feed from late spring to early fall. Access to water is required to maximize the use of grazing lands (on both private and crown lands). Historically cattle have been allowed to access streams to obtain drinking water. Allowing livestock to access the streams directly for drinking water can cause damage to the riparian area and may impact on the water quality. This issue is of particular concern in watersheds that are used as a drinking water source by communities or individuals.

In recent years programs have been established to promote stream health and riparian protection by discouraging or excluding livestock from accessing streams for drinking purposes. This may include fencing, restricting watering areas to locations that provide safe access and providing off stream watering facilities. Producers are required to fund most of the costs of these facilities. Producers that complete an Environmental Farm Plan may obtain funding to implement BMP's.

The Ministry of Environment does not issue a water licence where an off stream watering facility is proposed if the stream is deemed to be "fully recorded", even if cattle have been historically accessing the stream. Agencies may not fund the facility if a licence cannot be secured. Producers may also be unwilling to invest in the infrastructure if the water cannot be secured through a licence. Protecting stream health becomes difficult if the off stream watering facility cannot become recognized under the Water Act.

The Ranching Task Force has asked the province to resolve the livestock water licensing issue. Grand-fathering of historical water use should be considered.

**Methodology:**

Regional drinking water plans and watershed plans determine where the off-stream watering is required. The livestock operator applies for a livestock watering licence. Ministry of Agriculture and Land's Livestock Watering Manual be used to determine the amount of withdrawal required by the licence based on livestock numbers. The licence can stipulate time of use and number of head that may be watered. Historical use must be verified prior to a licence being issued. A time limit for grandfathering applications also should be established.

Non agricultural water licences may wish to transfer water for cattle use as an incentive to keep cattle out of streams.

**Required Action:**

Ministry of Environment implement a livestock water licencing system that is supported by the BCCA and BCAC.

**Other Stakeholders Roles:**

British Columbia Agriculture Council and the BC Cattleman's Association administer the B.C. Environmental farm plan that can be used as an outreach tool to understand the process and regulations that may be part of this process.

**Constraints, Risks and Dependencies:** Ability to obtain required information to grandfather historical water use. The ability for BCCA and BCAC to participate and dedicate resources.

**Resources (Human):**

**Resources (\$):**

**Resource (Other):**

**Major Milestones, Tasks and Activities:**

Licencing process established by 2010.

# Agriculture Water Strategy

## Securing Water

Draft

**EXTREME**

**Issue Title:** Agriculture Water for First Nations

**06**

**Issue:**

Much of British Columbia's productive agricultural lands are found within First Nations jurisdiction and require access to water to expand their agricultural capability.

**Background:**

By 2025, BC's population is expected to grow by 30%. It is estimated that 2.78 million hectares of food producing land will be needed, of which 281,000 hectares will need access to irrigation. Climate change projections for British Columbia generally indicate that summers will get hotter and drier while precipitation in the winter time will increase. Longer and hotter growing seasons will result in higher water demand for agricultural crops. Water supplies in streams during summer months may decrease and the competition for water from other sectors will make it difficult for the agriculture sector to obtain a larger allocation. Instream water requirements for fish and the ecology will also be in direct competition to agricultural water use.

First Nations agricultural lands will need to be included in the food producing lands if the province is to become self sufficient in food. Agricultural development also provides an economic opportunity for First Nations. The Ministry of Agriculture and Lands has identified a need for 5 First Nation Agrologists to work with the First Nations in the province on agriculture related issues.

**Methodology:**

Establish an agriculture water reserve for all major basins in the province. All agricultural lands with high productivity and proximity to water sources will have a water demand determined. The water reserve will take into account future demands due to climate change. The desired approach is to use the Irrigation Water Demand Tool that has been developed by the Ministry of Agriculture and Lands and Agriculture and Agri-Food Canada to calculate present and future water demands. The model uses a scientific approach that calculates water demand based on crop, soil, irrigation system and climate data.

Incorporate First Nations into the Irrigation Water Demand Tool so that water needs can be determined for First Nation Lands. First Nations lands will be identified separately from other agricultural lands so they can be given a higher priority if required.

**Required Action:**

Develop data sharing agreements with First Nations in the Okanagan, Similkameen, Nicola and Bonaparte regions to allow sharing of information for the Irrigation Water Demand Model. Land use data on First Nations lands need to be collected to complete the dataset in these regions.

**Other Stakeholders Roles:**

Okanagan Nation Alliance GIS department become a partner on the database development.

**Constraints, Risks and Dependencies:**

Ability for First Nations to provide required resources. Ability to share information between Provincial Government and First Nations.

**Resources (Human):**

**Resources (\$):**

**Resource (Other):**

**Major Milestones, Tasks and Activities:**

Data sharing agreements in place by December 2010. Okanagan report on irrigated lands to be completed by December 2009. Nicola, Similkameen and Bonaparte reports to be completed in 2010.

# Agriculture Water Strategy

## Securing Water

Draft

LOW

**Issue Title:** Encourage Use of Reclaimed Water

**07**

**Issue:**

Increased use of reclaimed water by the agriculture sector should be included as part of the province's water plan.

**Background:**

Reclaimed water has been used on agricultural lands in the province of B.C. for the past 25 years. Vernon, Armstrong, Osoyoos and Cranbrook are the locations commonly noted as using reclaimed water. The most common use has been to irrigate golf courses, forage and pasture lands although Osoyoos also irrigates some tree fruits. The alternative to using reclaimed water is to implement a higher level of treatment, which is expensive, and then release the treated effluent into natural watercourses or ground water. The use of this reclaimed water is governed by the Municipal Sewage Regulations which must be strictly followed prior to application to agricultural land. Proper storage, irrigation system design and management are very important to ensure that runoff and over application do not occur. Reclaimed water should be considered a resource to irrigate lands that are short of water or do not have any other source of irrigation supply.

**Methodology:**

Living Water Smart plan indicates that reclaimed water is a resource and the need to educate the public, producers and municipal leaders of the benefits of using this resource. Identify agriculture lands that could benefit from the use of reclaimed water. Determine the amount of reclaimed water that can be used by various crops on these lands. Initiate a program that provides infrastructure funding for reclaimed water use in the agriculture and urban sector.

**Required Action:**

Federal and provincial infrastructure programs recognize the value of using reclaimed water for irrigation. Provide education programs to producers, municipalities and the general public.

**Other Stakeholders Roles:**

British Columbia Agriculture Council help develop a policy of reclaimed water use by the agriculture sector.

**Constraints, Risks and Dependencies:**

Certain commodities in the agriculture sector feel that using reclaimed water may make it harder to market their products when compared to fresh water use by their competitors. The total picture of the effects of long term reclaimed water use on soil, crops and human health is not fully understood. There is a not in my back yard syndrome with the public that live next to potential sites. Improper application may create runoff and/ or contamination of streams and groundwater.

**Resources (Human):**

**Resources (\$):**

**Resource (Other):**

**Major Milestones, Tasks and Activities:**

Increased agricultural land using reclaimed water. Better understanding by the public, producers and municipalities about the use of reclaimed water and the benefits. Less municipal effluent being discharged to watercourses and ground water.

# Agriculture Water Strategy

## Water Governance

Draft

LOW

**Issue Title:** Do Not Support Unauthorized Use of Water

**08**

**Issue:**

A water licence from the Ministry of Environment is required to use surface water supplies such as streams, rivers and lakes for irrigation in the Province of British Columbia.

**Background:**

When the Province of British Columbia was first settled in the 1800's there was a perception that water supplies were unlimited and anyone could use as much as they wanted. As the population increased, the demand for water increased and water disputes started occurring. As a result the province implemented a water licensing system in the late 1800's. Water licences were established on a priority date and use. Irrigation licences were given a higher priority than most other licences except residential use. In the past water licences were policed more closely than they are today. Due to the increase in the number of water licences and the shortage of staff, current complaints, disputes or abuse of the system are only investigated.

Where a water licence cannot be obtained, irrigators often dig a well close to the stream to obtain water. If the well is drawing from the stream, the well should then be considered as an intake system and a water licence obtained.

**Methodology:**

Unauthorized use of water by the agriculture sector is not supported. While it is unlikely that additional staff will be hired to check on compliance with the act, farmers are expected to comply with the act, requiring a water licence to withdraw from a stream and ensuring that the amount of water taken does not exceed the licensed amount.

The Environment Farm Planning program can be used to ensure compliance with the water act is obtained prior to a farm being given a completed and signed off plan.

Educating the public on water licences and efficient use of water would also help reduce unauthorized use.

**Required Action:**

Train and ensure Environmental Farm Planners are checking for compliance with the Water Act prior to signing off the plan. Work with MOE and DFO to ensure compliance with the Water Act is achieved. Ensure water licence information is provided when educational seminars for the public and farming community on water use, irrigation and efficiency are held.

**Other Stakeholders Roles:**

MOE and DFO have a mandate to check if users are in compliance with the Water Act.

**Constraints, Risks and Dependencies:**

Insufficient staff available to check all areas – only regions of high concern will likely be monitored.

**Resources (Human):**

**Resources (\$):**

**Resource (Other):**

**Major Milestones, Tasks and Activities:**

Farmers comply with the provisions of the Water Act and cases of non compliance are rare.

# Agriculture Water Strategy

## Water Governance

Draft

MEDIUM

**Issue Title:** Users Adhere to Annual Use and Peak Withdrawal

**09**

**Issue:**

Most water licences issued for irrigation purposes identify an annual water use allocation but not a peak withdrawal rate. Establishing a peak withdrawal rate will help to stabilize stream flows.

**Background:**

Provincial water licences were first established in the late 1800's. Water licences were issued on a first come first serve basis and were given priority dates based on the date of application. Water licences for irrigation purposes stated the annual amount that may be withdrawn, the legal property on which it could be used and the total land area that could be irrigated. Many of British Columbia's streams are now fully allocated and cannot support all of the water licences that were issued. Since licences did not have a maximum withdrawal rate, a water user could essentially remove all of their licence in a very short period of time reducing the amount of water available downstream. In times of drought or low flow, impacts on fish can be exacerbated by users having a higher withdrawal rate than is necessary for effective irrigation.

**Methodology:**

The B.C. Sprinkler Irrigation Manual, BC Irrigation Management Guide and the Irrigation Assessment Guide, which is an Environment Farm Planning document, all provide a procedure for determining the annual water allocation and the peak flow rate for an irrigated area based on soil type, climate and an alfalfa reference crop. The annual allocation and peak withdrawal rates are established for a sprinkler system on an alfalfa crop as the base requirement. Producers can use more efficient systems and grow other crops but must adhere to the annual requirement and peak flow established for the base scenario.

Water licences will be issued with the information provided by the guides indicated above. Many licences in the past used this same information.

An annual allocation and peak withdrawal rate be established on all new licences and historical licences where appropriate.

Irrigation designers follow the peak withdrawal rates allowed when designing irrigation systems and ensure that the system stays within these parameters. Peak withdrawal rates should also be established on withdrawals from groundwater.

Producers report peak withdrawal rates and annual use on the water use reporting tool suggested in strategy item #20.

**Required Action:**

Use methodology in BC Sprinkler Irrigation Manual to determine peak withdrawal rates and annual water allocation and implement for all new licences.

**Other Stakeholders Roles:**

BC Ministry of Agriculture complete new sprinkler manual to provide information for licencing.

**Constraints, Risks and Dependencies:**

Many areas to be irrigated do not have good climate data to develop an annual water allotment or peak withdrawal rate.

**Resources (Human):**

**Resources (\$):**

**Resource (Other):**

**Major Milestones, Tasks and Activities:**

Protocol's developed by 2011.

# Agriculture Water Strategy

## Water Governance

Draft

**EXTREME**

<b>Issue Title:</b> <b>Area Based Regulation of Groundwater Use Supported</b>	<b>10</b>
<b>Issue:</b> While groundwater use in the province is currently not regulated, the province's water strategy commits to protecting groundwater quality and quantity.	
<b>Background:</b> The Province of British Columbia is one of the last jurisdictions in North America to regulate groundwater. The Water Act was extended to include groundwater in 1960, however this section of the act has never been fully proclaimed. The Province recently has established standards for well construction and implemented certification of well drillers and pump installers to help protect groundwater quality. However, the Province currently does not have authority to regulate where a well can be drilled or the amount of water that can be withdrawn from a well. There are many situations in the province where groundwater supplies are dwindling and the current use is starting to exceed the supply. New users are drilling deeper wells to access water, often resulting in water supply to older and shallower wells being reduced. The Province tried to implement groundwater regulations through the "Stewardship of the Water of British Columbia" in 1992 but was met by opposition, primarily in rural British Columbia where users perceived the process to be just another form of revenue for the province.	
<b>Methodology:</b> Establish "Groundwater Management Areas" where issues on groundwater quality and quantity are evident. In these areas the construction of all new wells would require a permit, existing and new wells would require a licence and compliance with statutory provisions governing licensing and permitting requirements, procedures and fees would be mandatory. By proceeding with specific "Groundwater Management Areas" initially, the province does not have to licence all of the estimated 75,000 wells at the same time. Implementation of licensing and monitoring can be graduated and target problem areas only. The peak flow rate for agricultural use would be determined from the B.C. Sprinkler Irrigation Manual for irrigation systems and Factsheet 590.304-1 for livestock water use. The Environmental Farm Planning document "Irrigation Assessment Guide" also provides a similar process for determining peak flow rates. The EFP Planning Workbook provides checks that producers can do to protect the well and groundwater from contamination. Regulations implemented in groundwater areas should recognize existing agricultural wells and allow existing wells to be grandfathered.	
<b>Required Action:</b> Update the Water Act to allow for the implementation of licensing and monitoring of water use in Groundwater Management Areas that have significant quantity or quality issues.	
<b>Other Stakeholders Roles:</b> Ministry of Environment – Water Act Modernization Process	
<b>Constraints, Risks and Dependencies:</b> Consultation process that will get decision makers and users on side. The Langley pilot Groundwater Management Plan has been met with resistance.	
<b>Resources (Human):</b>	<b>Resources (\$):</b>
<b>Resource (Other):</b>	
<b>Major Milestones, Tasks and Activities:</b> Groundwater enacted in the new Water Act by 2011.	

# Agriculture Water Strategy

## Water Governance

Draft

**EXTREME**

<b>Issue Title:</b> <b>Agricultural Water Purveyors Have Agricultural Representation</b>	<b>11</b>
<b>Issue:</b> Irrigation Districts are being amalgamated into local governments resulting in a loss of agricultural representation on the operation of the water system.	
<b>Background:</b> Irrigation Districts were originally established to supply water to farmers for the purposes of irrigation. Irrigation Districts are primarily located in the Okanagan and the Kootenays but there are Irrigation Districts found in other parts of the province as well. While these purveyors were originally initiated to provide irrigation water, as the districts changed from ditch and flood systems to pipe and sprinkler systems they also started to supply domestic water. Most Irrigation Districts now have more domestic customers than they do irrigation customers even though the volume of irrigation water supplied is much higher than the domestic component. Farmers have traditionally had good representation on the board of trustees that govern the operation of Irrigation Districts. Many Irrigation Districts are now being amalgamated into local governments as municipal councils want to have control over their water sources and supply. Funding for water supply and water treatment infrastructure improvements is also much easier to obtain when the infrastructure is owned and operated by a regional authority. See note 28 which is related to this issue. The representation on the municipal councils that control the water delivery systems is often not comparable to the water used by each sector. The concern is that while in many cases the majority of water is still provided for agricultural production, farmers no longer control the governance of the water supply or resource. Water systems controlled by local governments are sometimes reallocating water to urban development that historically was used by the agriculture sector. See note 2 which is related to this issue. In addition pricing of the water supply is no longer in the control of the primary user. The concern is that the few that use most of the water can be controlled by the many that use a small portion of the water. Many Irrigation Districts also operate as sub-basin water management institutions in those situations where their roles and responsibilities are defined in relation to one particular watershed within the Okanagan basin. Sub-basin institutions of this type contribute to the effective management of the basin as a whole and their contribution is likely to increase in situations where basin-wide management strategies are being developed and implemented.	
<b>Methodology:</b> Some local governments have established water advisory committees that provide direction to council on water issues with respect to the agriculture sector. If Irrigation Districts are amalgamated into the municipal system there should be a requirement that when the "Letters Patent" is turned in that a water advisory committee be established and that fair agriculture representation is provided on the committee based on the volume of water supplied to the agriculture sector. Agriculture water and the governance of water for agriculture should be protected under the Water Act Modernization Process.	
<b>Required Action:</b> Keep as many Irrigation Districts operating as Irrigation Districts as possible by improving their access to provincial and federal government funding programs. Where Irrigation Districts are amalgamated into a local government ensure that a water advisory committee is established that has fair agricultural representation.	
<b>Other Stakeholders Roles:</b> Local governments to establish a process for formation of water advisory committees.	
<b>Constraints, Risks and Dependencies:</b> Reluctance from local governments to establish committees.	
<b>Resources (Human):</b>	<b>Resources (\$):</b>
<b>Resource (Other):</b>	
<b>Major Milestones, Tasks and Activities:</b> Irrigation Districts entrenched and remain as viable entity.	

# Agriculture Water Strategy

## Water Governance

Draft

**EXTREME**

<b>Issue Title:</b> <b>Transfer or Trading of Water Rights Remain within the Agriculture Sector</b>	<b>12</b>
<b>Issue:</b> The transfer or trading of water rights from agriculture to other sectors or industry is not sustainable.	
<b>Background:</b> Agriculture requires water to maintain productivity and the reliance on irrigation will likely increase due to an expected changing climate. The average population of producers is also getting older and there is a temptation to sell assets in order to be able to retire. Commercial, industrial and residential developments will always have the ability to pay or purchase agricultural water licenses if there is no other source of water to be found. This is already happening in the southern states where cities can only continue to expand if they can purchase water rights from farms adjacent to the city. Food self sufficiency can only be reached if the province can increase the irrigated area. As streams are becoming fully allocated in British Columbia it will be difficult for the agriculture sector to obtain additional water rights. However reallocation of water rights from farms that have a surplus to farms that are in need may be one method of increasing the irrigated acreage and food supply in British Columbia.	
<b>Methodology:</b> A review of water licenses in the province on a watershed by watershed basis is required to determine how much water has been allocated by licenses. Irrigation demand methodology (similar to the calculations in the Irrigation Water Demand Model) can be applied to determine if the water licences issued match the requirements of each farm. Farms that have a shortage of licensing can also be identified. A watershed management planning process can be used to establish fish and ecological requirements and the amount of water that is available for the reallocation of licensing to other farms. In extreme situations such as droughts, fires etc. it is acceptable to divert water from agriculture to other uses on a temporary basis. The diversion of use from agriculture should be considered on a year by year basis and cannot be made permanent.	
<b>Required Action:</b> Under the Water Act Modernization process, establish a policy that does not allow the transfer or trading of water rights from the agriculture sector to other users except for the supply of minimum fish flows or other ecological needs where agreed to under a watershed management planning process.	
<b>Other Stakeholders Roles:</b> MOE to develop a policy that will be implemented province wide. BCAC, BCCA and MAL to work with MOE on the development of policy that is acknowledged and adopted by all regions.	
<b>Constraints, Risks and Dependencies:</b> Owners of water licenses will see them as an asset and may want to benefit from the sale of the asset to the highest bidder.	
<b>Resources (Human):</b>	<b>Resources (\$):</b>
<b>Resource (Other):</b>	
<b>Major Milestones, Tasks and Activities:</b> The Water Act Modernization Process establishes a policy on water trading and the transfer of water rights that secures water to the agriculture sector by 2012.	

# Agriculture Water Strategy

Pricing

Draft

HIGH

<b>Issue Title:</b> Water Pricing will Consider Agriculture's Ability to Pay	<h1>13</h1>
<b>Issue:</b> Agriculture does not have the capacity to pay the same water rates as other sectors.	
<b>Background:</b> There are two separate charges that are made with respect to water costs for producers. The cost of infrastructure and the water licensing costs. Farmers that obtain their water from an irrigation district will pay an annual amount for water that is usually based on the area irrigated. The fee will include an allocation of water that is sufficient to grow a crop in 9 years out of 10. The fee includes the cost of licensing, capital for infrastructure and maintenance. The fee established for agricultural irrigation is much less on a volume basis than that for domestic use or other sectors. Since irrigation districts were established for the purpose of supplying water to the agriculture sector there often is not an issue with the disparity in rates. Irrigation districts are now being absorbed into municipal infrastructure. Also more farms are obtaining their water from municipal systems due to marketing concerns if they do not use potable water. In these situations water costs are often metered and there is fear that agricultural rates will increase dramatically. Licensing fees that are applied to irrigation districts and municipal systems are often quite small on an individual user basis because of the economies of scale. However farmers that obtain their own water from streams will pay for withdrawal licences, storage licences, easements and other fees. In these cases the cost of licences are very significant and can have an impact on to the bottom line of the farm operation. The commodity group that is impacted the most from licence fees is the beef sector.	
<b>Methodology:</b> Agriculture should be expected to pay the cost of infrastructure, maintenance and licence fees but only for the works that are required to supply irrigation water. Therefore for irrigation districts, the cost of treating water for potable use should not have to be paid from the agricultural rates but the domestic rates only. It should be noted that farmers are domestic users as well and would be paying their share of the infrastructure costs. The ability for agriculture to pay will vary from location to location and sector to sector. An assessment of the impact of water rate increases on the agriculture sector should be completed prior to any new proposed water rates by a purveyor or an increase in licence fees by the province are implemented.	
<b>Required Action:</b> Develop a template that can be used to assess water rates on the agriculture sector. Okanagan Basin Stewardship Council has a committee working on water pricing that will include the agriculture sector. See Note # 29 regarding funding for Irrigation Districts.	
<b>Other Stakeholders Roles:</b> BCAC and the commodity groups have input into the water pricing assessment tool.	
<b>Constraints, Risks and Dependencies:</b> Water purveyors need sufficient revenue to operate their systems. Where agriculture is a large component of the water demand it will be difficult to keep systems affordable, especially if irrigation districts are not eligible for funding assistance.	
<b>Resources (Human):</b>	<b>Resources (\$):</b>
<b>Resource (Other):</b>	
<b>Major Milestones, Tasks and Activities:</b> An assessment process established and piloted in a number of areas by 2012.	

Pricing

# Agriculture Water Strategy

Pricing

Draft

HIGH

<b>Issue Title:</b> Industry Support Pricing Structures that Promote Beneficial Management Practices	<h2 style="margin: 0;">14</h2>
<b>Issue:</b> Pricing structures that promote Beneficial Management Practices that improve water efficiency and use are supported but funding practices that improve agricultural practices that are of a benefit to society should also be pursued.	
<b>Background:</b> The demands on all water sources are great. In many regions agriculture is the largest water user. Improving water use efficiency in the agriculture sector would therefore provide greater results than in any other sector. Pricing of water is one tool that can be used to improve efficiency in all sectors. Water pricing mechanisms that discourage poor practices and encourage good practices are supported. However farmers must be provided with a sufficient amount of water to grow an economical crop, using acceptable practices, at a reasonable price. A pricing structure that penalizes water consumption above an approved water allocation is supported.  Implementation of beneficial management practices that improve water use efficiency is often costly to a producer. Incentives from programs such as the Environmental Farm Plan or the National Water Supply Expansion Program for implementing beneficial management practices are encouraged where there is a direct benefit to society.	
<b>Methodology:</b> When a water pricing structure is implemented, a flat base rate should be established for a water allocation that allows the producer to grow an economical crop using acceptable irrigation practices. The water allocation would be based on the climate, soil and crop data. A grower staying within the allocated amount would pay the base rate. Growers that exceed the allocated amount would pay an increasing rate for the additional water used. Growers that install higher efficiency systems or beneficial management practices that reduce water use could be rewarded by lowering their water costs. For farmers on individual licences the costs of the annual licences could be reduced. For growers on an irrigation district the annual fee charged for supply could be reduced. However irrigation districts require a minimum revenue to keep the system operating, which may impact the ability to charge less.	
<b>Required Action:</b> Establish a water allocation for agricultural users where water purveyors are implementing a new water pricing structure. Investigate the provincial licensing process to determine if opportunities for a pricing structure make sense.  Investigate opportunities for funding programs that promote beneficial management practices. Ensure that the Environmental Farm Plan has adequate resources to continue over the long term.	
<b>Other Stakeholders Roles:</b> Water purveyors could promote beneficial practices and offer incentives to apply them.	
<b>Constraints, Risks and Dependencies:</b> For the provincial licensing system more staff would be required to confirm the lower water use and if the saving in licence fees is warranted. Water measurement system would be required and need maintenance.	
<b>Resources (Human):</b>	<b>Resources (\$):</b>
<b>Resource (Other):</b>	
<b>Major Milestones, Tasks and Activities:</b> Provincial state of the water resources report recognizes an increase in beneficial practices and improved water use efficiency.	

Pricing

# Agriculture Water Strategy

Pricing

Draft

LOW

<b>Issue Title: Societal Benefits of Agricultural Storage Facilities Recognized</b>		<b>15</b>
<p><b>Issue:</b> Dams built for agricultural water storage support many other activities such as fishing, camping and other recreational activities. The cost of maintaining the storage facility is the full responsibility of the licence holders and is currently not supported by other users.</p>		
<p><b>Background:</b> British Columbia has over 2500 dams licensed to store water for agricultural purposes. The cost of constructing the dams and the maintenance of these facilities is the responsibility of the licence holder which is usually the agricultural producer. For larger dams some funding came from agricultural infrastructure programs such as ARDSA in the 1970's and 1980's. Most dams are located on crown land which allows the public access to these facilities. Many reservoirs have now been stocked with fish and are used for fishing and other recreational activities. Fish use in the reservoirs has limited the ability to draw down the full reservoir potential when required by producers. The problem usually occurs in dry years when producers on smaller reservoirs need all of their stored licensed amounts and the fish had difficulty surviving.  The dams are also used as roadways to cross the streams with vehicles, ATV's, motorcycles and horses. Use of the dam as a roadway deteriorates the dam crest increasing maintenance costs. The Ministry of Environment Dam Safety Program monitors the condition of the dam and requires the licence holder to maintain the dam at an acceptable standard.  Society does not help pay for the maintenance cost or for the recreational opportunities that these reservoirs provide. The costs to ranchers are sometimes prohibitive, especially if the dam needs to be replaced.</p>		
<p><b>Methodology:</b> Public education is required to increase public awareness of the value of these reservoirs for agriculture and the ongoing need and cost of maintenance. Fish and wildlife agencies, recreational groups and others that use the reservoirs should be made aware of the ongoing costs and be canvassed to provide support for the ongoing safety of the facilities.</p>		
<p><b>Required Action:</b> Conduct presentations to lake shore property owners, and fish and wildlife clubs about agricultural storage facilities and their use. Information that is currently supplied to the public should recognize the value and contribution of agricultural water storage facilities to recreational activities.  Where appropriate alternate sources of financial assistance be sought to cover construction, operation and maintenance costs.</p>		
<p><b>Other Stakeholders Roles:</b> MOE to add information about agricultural storage facilities into annual fishing brochures and information provided to the public.</p>		
<p><b>Constraints, Risks and Dependencies:</b> Time and effort spent on this initiative may not be a priority with other agencies that see current benefits but no reason to change.</p>		
<b>Resources (Human):</b>	<b>Resources (\$):</b>	<b>Resource (Other):</b>
<p><b>Major Milestones, Tasks and Activities:</b> More users of these storage facilities are aware of their purpose and history.</p>		

Pricing

# Agriculture Water Strategy

Water Use

Draft

**MEDIUM**

**Issue Title:** Establish A Policy for Part Season Licensing

**16**

**Issue:**

Agricultural can make beneficial use of water during the spring and early summer when freshet flows are high and there is surplus water available in many of British Columbia's rivers and lakes.

**Background:**

Many of British Columbia's rivers and lakes are fully allocated or are very close to being fully allocated based on full season irrigation licences. Generally the flows during late summer and early fall dictate the inability of these watercourses to support additional licensing. However many of these streams and lakes have surplus flows that may be available to be licensed during the spring and early summer when freshet flows are occurring. The Ministry of Environment has not endorsed part season licensing for farms on the basis that these licences would be difficult to monitor to ensure water is not withdrawn during low flow periods. In addition there may be some concern that a part season licence could lead to crop failure and not be regarded as beneficial use.

However many forage crops and short season vegetable crops can attain beneficial use by allowing irrigation during freshet periods. Hay, alfalfa and corn crops will achieve increased yields even during a shortened irrigation season. In the case of hay or alfalfa the number of cuts may be reduced to one or two cuts. Farmers will have to determine the economic viability of investing in capital infrastructure that can only be used for part of the season.

**Methodology:**

Determine streams that have surplus flows available during spring freshet. Identify agricultural lands that are currently short of water and are growing crops suited to part season irrigation. Determine the flow regime at which time irrigation must cease, either by measuring flow in the watercourse or by establishing a pre determined date based on historical records. Irrigation systems must be designed by a Certified Irrigation Designer. Users must provide a report to MOE annually on water use and dates irrigation was used. Failure to comply with licence parameters will be result in forfeiture.

**Required Action:**

MOE and MAL establish a part season licensing protocol that must be followed by farmers using part season licences. The protocol will include allowed cropping, withdrawal and use guidelines, monitoring, reporting and enforcement. Part season licensing to be investigated as part of the Water Act Modernization Process.

**Other Stakeholders Roles:**

British Columbia Agriculture Council, Water Purveyors assistance in developing operating protocols and reporting requirements.

**Constraints, Risks and Dependencies:**

Risk that agriculture sector will not comply with part season aspect of licence.

**Resources (Human):**

**Resources (\$):**

**Resource (Other):**

**Major Milestones, Tasks and Activities:**

Protocol's developed by 2011.

Part season licensing available to farmers and ranchers 2011.

# Agriculture Water Strategy

Water Use

Draft

HIGH

**Issue Title:** Extend Irrigation Season Licences

**17**

**Issue:**

Current water licences allow farmers and ranchers to irrigate only until the end of September resulting in a higher demand from streams during critical fish flows.

**Background:**

Water licences currently allow farmers to extract water from streams until September 30th. Many water purveyors currently allow later use providing that the irrigation can be completed before system shut down requirements and that there is sufficient water in storage. This practice goes against current licensing regulations. There is a need for some producers to irrigate later in the season due to fumigation of soil for fruit crops. All farmers require sufficient moisture in the soil prior to winter to protect crop roots from cold damage. To comply with the water licence requirements farmers will therefore irrigate before the end of September when fish flows are at their lowest.

Allowing an extension to the irrigation season will allow farmers to offset the irrigation in September to later in the fall. If sufficient rainfall has occurred this irrigation may be forgone altogether. Farmers having to apply irrigation for fumigation or other agronomic purposes can also be accommodated.

Extending the irrigation season may reduce irrigation water use if rainfall has occurred during the extension period negating the need for irrigation. It will also delay water extraction from the low flow conditions of late summer.

Climate change may also require farmers to irrigate earlier in the season as the growing season is extended. This is not expected to be an issue in the short term.

**Methodology:**

Farmers may apply to MOE for an extension to the irrigation dates on their licence to irrigate earlier or later depending on their individual circumstances. Unless fisheries have identified a concern with later season withdrawals extensions are granted without further assessment. Farmers must still adhere to the licensed amount of water that is stated on the licence. An increase in allocation can only be done on an assessment of stream flows.

**Required Action:**

MOE and MAL establish a policy to allow for the extension of the irrigation season with no increase in the allocated amount as stated by the licence. Irrigation season extension to be investigated as part of the Water Act Modernization Process.

**Other Stakeholders Roles:**

British Columbia Agriculture Council, Water Purveyors

**Constraints, Risks and Dependencies:**

Little risk as overall water use may go down and water withdrawals during low flow periods are reduced.

**Resources (Human):**

**Resources (\$):**

**Resource (Other):**

**Major Milestones, Tasks and Activities:**

Protocol's developed by 2010.

Irrigation season extension is acknowledged in 2010.

# Agriculture Water Strategy

Water Use

Draft

HIGH

**Issue Title:** Maximize Beneficial Acreage Supplied By Licence

**18**

**Issue:**

Current water licences state a specific lot legal description that is allowed to be irrigated by the water licence. In many instances irrigation can be made more beneficial by allowing farmers to apply water to more productive land.

**Background:**

Licences for agricultural irrigation water use usually contain the following clauses; the water source on which the rights are granted; the point of diversion where the water may be taken from the water course; the precedence date of the licence; the purpose for which the water may be used; the maximum quantity of water that be used or stored; the period of the year during which the water may be used; the authorized works to divert and convey the water; the land upon which the water is to be used and to which the licence is appurtenant; and in the cases of new licences a maximum withdrawal rate may be stated.

When licences were first issued producers often used the land that was closest to the withdrawal point as it was the easiest to irrigate. Overtime technology has allowed producers to convey water further and pump water to higher elevations. Quite often a farm may have other lands with better soils that have higher productivity. Applying water to these more productive soils will maximize the return on the water applied.

Technology has also allowed producers to become more efficient in the application of water. In some cases additional acreage could be irrigated without increasing the amount of water withdrawn. It may also be possible to irrigate additional lands when there is an abundant supply and then cut back on irrigation later in the season when stream flows are at a minimum.

**Methodology:**

Producers that wish to make a change to the lands to which the licence is appurtenant will need to inform the Ministry of Environment of the intended change and have the information stored with the licence. The addition of the irrigated lands must still belong to the farm or be leased to the farm for which the licence has been issued. The licence will still be appurtenant to the lands originally stated on the licence to prevent the trading of the water licence to other entities. The amount of water withdrawn and the peak irrigation withdrawal rates can not exceed what has been stated on the licence.

**Required Action:**

A system for allowing the alteration of irrigated acreage as stated on the licence to be developed by Ministry of Environment. Producers need to be informed on how the process would work and how to provide the required information. In addition a process for monitoring water withdrawals to ensure that additional water will not be taken should be outlined. Water Act Modernization Process to review licence appurtenance.

**Other Stakeholders Roles:**

Ministry of Environment and Ministry of Agriculture develop a process. British Columbia Agriculture Council review process and forward information to their members.

**Constraints, Risks and Dependencies:**

Perception that more water will be taken by agriculture than what is currently licensed. In some regions that are over committed environmental agencies may wish water withdrawals to be reduced.

**Resources (Human):**

**Resources (\$):**

**Resource (Other):**

**Major Milestones, Tasks and Activities:**

Protocol for altering irrigated lands be developed by 2010.

Water Use

# Agriculture Water Strategy

Water Use

Draft

**MEDIUM**

<p><b>Issue Title:</b> Monitor Water Use on Purveyed Systems and Large Users</p>	<p><b>19</b></p>
<p><b>Issue:</b> Agriculture is one of the largest water users in many basins in British Columbia. To ensure that agriculture is using water efficiently and taking only what is required water use should be monitored.</p>	
<p><b>Background:</b> It is estimated that agriculture uses up to 70% of the water in the Okanagan Basin and other basins in rural British Columbia. Water use by the agriculture sector will fluctuate from year to year depending on climate, cropping and changes to irrigation efficiency. A changing climate will require more effective monitoring of water use in regions of the province that have water shortages and high demand. Living Water Smart, the province's water plan has made a commitment to reserve water for agriculture and calls on the agriculture industry to become more efficient. Monitoring of use by large users is a component of the water plan.</p>	
<p><b>Methodology:</b> <b>Metering</b> - Metering has been implemented in the South East Kelowna Irrigation District (SEKID) in the late 90's. The success of the SEKID project has led six other Okanagan water purveyors: Glenmore-Ellison, Black Mountain, Summerland, Vernon, Westbank, and Lakeview to initiate metering programs with assistance from the Canada British Columbia National Water Supply Expansion Program from 2005 to 2009. A web-based tool called the Okanagan Irrigation Management (OKIM) is being developed for agricultural users in Vernon, Summerland and Glenmore-Ellison to link metered water use information with theoretical water use calculated by the Irrigation Water Demand Model using real time climate data. Monthly irrigation water use reports can be developed for growers. The meters, educational programs, and OKIM will assist water purveyors in planning water strategies and allocation to secure adequate supply for current and future use. <b>Monitoring</b> – The Environmental Farm Planning Program has developed a worksheet by which producers that pump their own water can determine their annual water use without using a meter. This process can be used to report to MOE as may be required under the Living Water Strategy.</p>	
<p><b>Required Action:</b> Support the use of water meters on agricultural connections where water purveyors are implementing a universal metering program. Demonstrate the effectiveness of OKIM to other water purveyors after the trial demonstration program is complete. Develop an online tool that uses the EFP process for farmers to be able to report water use as required under the Living Water Strategy.</p>	
<p><b>Other Stakeholders Roles:</b> Okanagan Basin Water Board (OBWB) takes lead on metering implementation in the Okanagan, Water Supply Association of BC, EFP Program continue with current activities on water use templates.</p>	
<p><b>Constraints, Risks and Dependencies:</b> Cost of meter purchase, maintenance, reading and reporting. Cost of establishing and operating a water use reporting system for the province. Follow up on users that do not report as required.</p>	
<p><b>Resources (Human):</b></p>	<p><b>Resources (\$):</b></p>
<p><b>Resource (Other):</b></p>	
<p><b>Major Milestones, Tasks and Activities:</b> Seven water purveyors have metering by 2009. The OKIM demonstration project completed in fall of Spring 2009. IWDM is operational for Okanagan, Similkameen, Nicola and Bonaparte in summer 2009. There are 50 irrigation scheduling sites that are used to monitor water use.</p>	

# Agriculture Water Strategy

Water Use

Draft

**EXTREME**

**Issue Title:** Promote Certified Agricultural Irrigation Designs

**20**

**Issue:**

Ensure efficient water use by the agriculture sector by requiring irrigation systems to be designed and installed correctly. There are many irrigation suppliers that design and install products but do not have adequate training.

**Background:**

The Irrigation Industry Association of British Columbia (IIABC) was formed in 1979 by companies, suppliers and contractors. This partnership worked in cooperation to share information and develop standards guidelines to be used by the irrigation industry. The IIABC also established a certification program in 1988. The Certified Irrigation Designer program was started for the agricultural industry to support the Ministry of Agriculture's low interest loan program that required approved plans to be submitted prior to financing irrigation systems. To date there are 11 individuals certified in Agriculture - Trickle and 13 individuals certified in the Agriculture - Sprinkler disciplines. There are however an estimated 30 other individuals that do not have certification in the agriculture disciplines.

Since 1989 the IIABC has also established certification for turf and landscape designers. There are currently 61 Turf – Residential designers, 25 Turf – Commercial designers, 6 Turf Golf Course designers and 3 Landscape – Drip designers. The IIABC also has 66 Certified Irrigation Auditors through an affiliation with the International Irrigation Association (IA).

In 2005 the IIABC started a Certified Irrigation Technician Program for landscape installers. To date there are 278 CIT level 1 and 76 CIT level 2 individuals certified.

A list of designers and program details can be found at [www.irrigationbc.com](http://www.irrigationbc.com).

A Certified Irrigation Designer is required to design an irrigation system that applies the correct amount of water at the correct time. They must consider climate, soil, topography and crop type. A properly designed system has minimal run off and higher application efficiencies.

**Methodology:**

The Living Water Smart Plan promote the need for Certified Designers and Technicians and promote the IIABC program to local governments, water purveyors and water managers. Increase the number of certified irrigation designers in the agriculture sector by linking all funding for irrigation projects to a certified plan.

**Required Action:**

Provide support for the IIABC program in the Living Water Smart implementation plan. Investigate local governments providing rebates for systems that have a certified plan. .

**Other Stakeholders Roles:**

Irrigation Industry Association of BC, Ministry of Environment Water Smart Plan, British Columbia Agriculture Council Environmental Farm Plan.

**Constraints, Risks and Dependencies:**

Sufficient resources for the IIABC to provide the required training if there is a large uptake of the program in a short period of time. There is a risk that some industry personnel may not be able to get certified or get certified quickly enough.

**Resources (Human):**

**Resources (\$):**

**Resource (Other):**

**Major Milestones, Tasks and Activities:**

Certification program is currently operational. City of Kelowna is establishing bylaws that will implement Certified Designers in 2009, 2010. EFP program only finances BMP's that have a Certified Plan attached.

Water Use

# Agriculture Water Strategy

Water Use

Draft

**EXTREME**

<b>Issue Title:</b> Encourage Irrigation Scheduling to Improve Efficiency	<h2>21</h2>
<b>Issue:</b> Living Water Smart, British Columbia's Water Plan has made a commitment that by 2020 all user will be 33 per cent more efficient. Water saved by the agriculture sector to remain allocated to the agriculture sector.	
<b>Background:</b> To increase irrigation system efficiency producers must select the right equipment, have a proper irrigation design done for this equipment and then manage it correctly. Certified Irrigation Designers are trained to select the correct equipment and to develop an irrigation system plan that follows the design requirements in the BC Sprinkler Irrigation Manual and the BC Trickle Irrigation Design Manual. Proper irrigation system design ensures that enough water is applied to keep the crop healthy and producing during peak water demand conditions. While systems are designed for peak conditions during non peak conditions in the spring and fall systems must be managed and operated to apply less water for the crop and climate conditions that exist. Irrigation scheduling is the term used to adjust irrigation application rates during non peak times using primarily soil moisture or climate data.	
<b>Methodology:</b> As part of the metering projects that are being implemented in the Okanagan Valley there are 40 irrigation scheduling demonstration sites that are operating to show how soil moisture and climate data can be used to schedule an irrigation system. Irrigation scheduling information is also provided in factsheets provided by the Ministry of Agriculture and Lands, the Irrigation Management Guide distributed by the Irrigation Industry Association of BC (IIABC) and the Irrigation Assessment Guide document that is part of the Environmental Farm Planning program. The Farmwest website ( <a href="http://www.farmwest.com">www.farmwest.com</a> ) provides real time climate data that can be used to schedule an irrigation system. The IIABC and the Ministry of Agriculture and Lands have developed an on line irrigation scheduling calculator that uses the real time climate data from the Farmwest website to assist irrigators in determining an irrigation schedule. ( <a href="http://www.irrigationbc.com">www.irrigationbc.com</a> ) The calculator can determine an irrigation schedule for all crops or irrigation systems for agriculture and landscape.	
<b>Required Action:</b> Complete the Irrigation Scheduling Calculator by 2009 and have it available on the IIABC website. Add additional weather stations to the Farmwest Evapotranspiration site and fund site to make it sustainable. Provide training to EFP planners, Certified Technicians on how to use the calculator.	
<b>Other Stakeholders Roles:</b> IIABC provide the web site and provide on going technical support to the calculator. Farmwest website be enhanced and secured to provide climate data.	
<b>Constraints, Risks and Dependencies:</b> The Farmwest site and climate station network is not adequately supported. Funding is required to ensure that the climate station network is sustainable. Internet access required for users to access the calculator or the Farmwest site.	
<b>Resources (Human):</b>	<b>Resources (\$):</b>
<b>Resource (Other):</b>	
<b>Major Milestones, Tasks and Activities:</b> Scheduling calculator is operational by January 2009. Farmwest website is currently operational but needs funding to be sustainable. New BC Sprinkler Irrigation Manual to be completed by December 2009.	

# Agriculture Water Strategy

Water Use

Draft

HIGH

<b>Issue Title:</b> <b>Develop Equitable Drought Management Planning Process</b>		<b>22</b>
<b>Issue:</b> Development of Drought Management Plans must ensure that water is allocated equitably, not first in time as indicated on licences.		
<b>Background:</b> Agricultural production is severely impacted with the onset of drought conditions. The current licensing system in British Columbia is established on a first in time, first in right system. Licence holders with an earlier priority date have first use and are allowed their entire water allocation prior to the second priority having access to their water. While this method may be easier to administer it does not take into account a fair and equitable allocation of water resources. Producers that rely on their water rights to irrigate crops do so to keep their farms economically viable. Allowing some licences full use of their water resources while curtailing the use of others is not equitable.		
<b>Methodology:</b> Develop drought management plans for drought prone watersheds. The plan should take into account measures for managing a drought as well as a fair and equitable system for water allocation. Measures that can be taken should include: managing crops for drought conditions or planting alternative crops that require less water or are less prone to droughts; making irrigation application decisions on the farm so that crops that receive maximum benefit will have highest priority; irrigate only perennial crops to keep them alive; trade water rights between users so that high value crops can be maintained in exchange for lower value crops; and manage tillage and residues to conserve soil moisture. The province of BC has a drought management page that provides useful tips on how to manage through a drought. The Ministry of Agriculture and Lands has developed a series of Drought Management Fact Sheets that can assist producers in managing their farms during drought conditions. See Ag and Water at <a href="http://www.waterbucket.ca">www.waterbucket.ca</a> .		
<b>Required Action:</b> Drought management plans should be developed with a watershed approach to infrastructure development and action plans that can be implemented with the watershed to minimize potential impacts of drought. The plans should be shared with all users so that priority use of water and measures to be taken under a drought is understood by all. Develop a drought management planning template that includes methodology for implementing water use restrictions equitably to all users in the watershed based on needs and impacts. Agricultural producers would have reductions of use imposed depending on the type of crop grown, where lower valued crops may have higher reductions than perennial crops. One option may be to compensate producers for crop losses that have a higher water use reduction imposed. Investigate drought management strategies that have been implemented in other areas such as Australia to see what works, what doesn't work and how the strategies can be implemented. Work with the Interagency Drought Working Group to implement drought strategies throughout the province.		
<b>Other Stakeholders Roles:</b> BCAC, MOE and DFO have input into a drought management strategy that is accepted by all parties.		
<b>Constraints, Risks and Dependencies:</b> Having all licence holders and resource agencies buy into a drought management process where some sectors may have greater benefits than others.		
<b>Resources (Human):</b>	<b>Resources (\$):</b>	<b>Resource (Other):</b>
<b>Major Milestones, Tasks and Activities:</b> Drought management planning template is developed and piloted in an affected watershed by December 2010.		

# Agriculture Water Strategy

Water Use

Draft

HIGH

**Issue Title:** Improve Irrigation System Efficiencies

**23**

**Issue:**

To comply with British Columbia's Water Plan. Living Water Smart, the agriculture industry must become 33 per cent more efficient by 2020. Water saved by improving efficiency remain with the agriculture sector.

**Background:**

To improve the efficiency of agricultural irrigation systems producers must select the right equipment, have a proper irrigation design done for this equipment and then manage and operate the equipment correctly. Fact sheet 20 provides information on the use of Certified Designers to improve irrigation system design and fact sheet 21 provides information on encouraging irrigation scheduling and the use of scheduling tools.

To improve the efficiency of irrigation systems is costly and often requires the conversion of one system type to another, for example a sprinkler system converted to a drip irrigation system. The maximum increase in efficiency that can be obtained from system conversion alone would be approximately 20% in most cases. The additional 13% will have to be obtained from improved design and operation, which may be achievable if irrigation scheduling techniques are followed.

A producer will only make an irrigation system conversion if the existing system is worn out, crops are being changed that makes the existing system difficult to manage or there is another agronomic need.

Irrigation efficiency can also be increased by converting to a crop that has a lower water use, such as converting from alfalfa to a low water use hybrid corn or from apples to grapes.

Irrigation efficiency can also be increase by improving the water delivery infrastructure. In many regions of British Columbia water is delivered to farms via ditches or canals. In the interior the water loss from these systems can be as high as 50%. Lining the ditches or converting to piping systems can greatly improve the delivery efficiency.

**Methodology:**

Financial programs can be used to assist the conversion to more efficient irrigation systems. The Environmental Farm Plan included a Beneficial Management Practice that allowed irrigation system modification or improvement to increase water or nutrient use efficiency. The program provided a 30% cost share to a maximum of \$10,000 in funding.

The National Water Supply Expansion Program provided funding for improving irrigation delivery systems from streams and reservoirs that were off the farm to the farm gate. The amount of funding provided was 1/3 to a maximum of \$5,000. While useful the funding was very limited for larger projects and it did not help for on farm projects.

**Required Action:**

Province and partners continue to seek partnerships to provide incentives to producers to improve irrigation system efficiencies.

**Other Stakeholders Roles:**

Federal funding from Growing Forward be considered for improving water management.

**Constraints, Risks and Dependencies:**

Provincial and Federal programs are shying away from programs that provide direct benefits to the farm and are looking for projects that directly improve the environment or farm business management.

**Resources (Human):**

**Resources (\$):**

**Resource (Other):**

**Major Milestones, Tasks and Activities:**

New funding program for irrigation efficiency improvements established.

# Agriculture Water Strategy

Water Quality

Draft

**MEDIUM**

Issue Title: Water Conservation Incentives

**24**

**Issue:**

Review opportunities to reward agricultural producers in BC that conserve or enhance water resources.

**Background:**

Many agricultural producers in BC conserve or enhance water resources. These practices result in a variety of benefits to the environment, including greenhouse gas reduction. Many of these practices also assist producers with climate change adaptation. The cost of pursuing these practices is not always reflected in the price that agricultural producers receive for their products.

Existing tools that incent water resource conservation or enhancement include various environmental protection regulations and the Environmental Farm Plan program, which provides cost sharing for certain beneficial management practices. However, these tools leave out many water-related practices and are difficult to alter and update.

Carbon offset markets may provide an additional opportunity to incent certain water-related practices. However, these markets are unlikely to incent more than a handful of practices and regulations for such markets are often set at the international level.

Potential practices for inclusion in the proposed incentive program:

- riparian buffer establishment and maintenance
- irrigation meter installation
- water storage upgrading

**Methodology:**

Identify water-related practices that are not incented for all BC agricultural producers through existing regulations and programs. Then, review methods of distributing funding to producers for these practices. Finally, investigate provincial sources for a new incentive program that rewards producers for adopting these practices.

**Required Action:**

Phase 1: Work with MAL, BCAC, and AAFC staff to identify practices in need of incentives.

**Other Stakeholders Roles:**

- The Climate Action Initiative Committee (CAIC) should be notified about this effort, as assisting agricultural producers with climate-related activities is part of their mandate.
- Request that the BCAC and partners at the AAFC review the list of practices in need of incentives. Both of these stakeholders are likely to have useful feedback.
- The IAF may be able to provide funding for a portion of this program.

**Constraints, Risks and Dependencies:**

- The most recent agreement with the federal government has not yet been signed, meaning that the components of the Environmental Farm Plan program have not yet been determined.
- It may be challenging to secure enough long-term funding for this type of program.
- Incentives do not all have to be financial in nature. They could include award recognition or provide additional water to the proponent. Challenge is to have proponents recognize other incentives as being valuable.

Resources (Human):

Resources (\$):

Resource (Other):

**Major Milestones, Tasks and Activities:**

Identify practices by April 2009 and review them with partners by August 2009.

# Agriculture Water Strategy

Water Quality

Draft

LOW

Issue Title: Water Use Related Carbon Offsets

25

**Issue:**

Establish agriculture carbon offsets for purchase by the Pacific Carbon Trust.

**Background:**

Production of fresh fruit, vegetable and dairy products require an ample supply of fresh water. However, if applied excessively or at the wrong time, soils may become waterlogged. Waterlogged soils can provide ideal conditions for methanogenesis and denitrification, both of which result in Greenhouse Gases (methane and nitrous oxide) being released into the atmosphere. Furthermore, when fossil-fuel energies are used to transport this water, carbon dioxide is also released into the atmosphere.

The BC Government has committed to a carbon neutral public sector by 2010. To achieve this, the Pacific Carbon Trust (PCT) has started buying carbon offsets generated from BC-based projects. An offset represents the reduction / removal of a tonne of carbon dioxide equivalent (tCO<sub>2</sub>e) from the atmosphere through various types of projects. By 2010, estimates are that the PCT will need to acquire 600,000 – 900,000 offsets / year and has publicly stated that it will favour agricultural and forestry based offsets.

Fresh fruit, vegetable and dairy products are grown in different areas of BC, and as such rates of methane and nitrous oxide emission from waterlogged soils will vary greatly. Furthermore, differences in average temperature, water depth and the length of time the soil is waterlogged will also impact emission levels. It is because of these variations, and the high costs associated with measurements, validation and verification of offset projects, that it is highly unlikely these projects will be able to sell offsets to the PCT. Instead, work should focus on reductions in fossil-fuel use from alternate water use technologies.

**Methodology:**

Determine where fossil-fuel energy is being used to pump water for irrigation of fresh agricultural crops in BC. Information from BC Hydro and other Hydro companies can be used to determine the amount of land that is irrigated using electric power. Since an estimate of the total land being irrigated in BC is known, the areas being irrigated without hydro or gravity feed would be using gas, diesel, propane or natural gas. Once these numbers are available, an analysis can be undertaken to determine the feasibility of developing a proposal for submission to the PCT.

**Required Action:**

Establish whether there is value and obtaining the data in order to prepare a submission to PCT.

**Other Stakeholders Roles:**

BC Hydro and other Hydro companies need to provide an estimate of area irrigated by electricity.

**Constraints, Risks and Dependencies:**

This will only be feasible if enough people are using fossil-fuel energies for irrigation are prepared to switch to more efficient / cleaner or renewable energy technologies. The availability of hydro power is usually a constraint for the conversion to cleaner and renewable energy sources.

Resources (Human):

Resources (\$):

Resource (Other):

**Major Milestones, Tasks and Activities:**

Conduct initial analysis by March 2009. If feasible, analysis and potential application to PCT by October 2009.

Water Use

# Agriculture Water Strategy

## Water Quality

Draft

**MEDIUM**

**Issue Title:** Agriculture has Suitable Water Quality for Use

**26**

**Issue:**

A safe and secure food supply requires good irrigation water quality to be available.

**Background:**

Good water quality is available for agricultural use in most of British Columbia. In many instances farms have access to water that is also used as potable water. Most streams in British Columbia provide good water quality for agricultural use, both for irrigation and stock watering. However irrigation water that is taken from channels and ditches is often of poor quality and should be used with caution on crops that are eaten raw. Most of the crops that are eaten raw in the Lower Mainland are irrigated with water from ditches.

The provincial water quality guideline for crops eaten raw is <77 cfu/100 ml of E.coli or < 200 cfu/100 ml of fecal coliforms. For general irrigation of other crops the water quality guideline is < 1000cfu / 100ml of E.coli and < 1000 cfu/ 10 ml of fecal coliforms. The standard for crop washing is 0 cfu / 100 ml for both E.coli and fecal coliforms. Water quality standards for livestock can be found in Factsheet 590.301-1 "Livestock Watering Requirements, Quantity and Quality."

Water that is of poor quality can be treated prior to use. For irrigation of crops eaten raw and crop washing ultraviolet units can be used to treat fecal coliforms and E.coli. However the cost of treating irrigation water is very expensive. If irrigation water cannot be treated and is being applied to crops eaten raw it is recommended that irrigation be stopped 14 days prior to harvest, allowing sufficient time for sunlight to reduce the pathogen count.

**Methodology:**

Producers should test their water source if there is any concern about the quality prior to use. In ditches and other areas where pathogen counts are high the sources of the pathogens should be investigated wherever possible. Remedial steps can then be taken to eliminate the sources of pathogens if at all possible. The usual culprits are septic fields, manure spreading, leaky manure storage facilities and urban runoff. Fertilizer storages and fertilizer spreading practices may also impact water quality by adding nutrients.

**Required Action:**

An Environmental Farm Plan should be conducted by farms that suspect they may be contributing to the degradation of water quality. See issue #27. Local governments should look at the option of providing sewer service in areas where septic fields are a concern. Many commodities have food safety plans or audits that evaluate water quality.

**Other Stakeholders Roles:**

BCAC leads in the implementation of the Environmental Farm Plan program. Local governments investigate septic field problems and look for solutions to improve the performance of fields or implement sewers as an option.

**Constraints, Risks and Dependencies:**

The cost of improving water quality in ditches is prohibitive and the time factor too long. Treatment may be the only option, but may also be too costly.

**Resources (Human):**

**Resources (\$):**

**Resource (Other):**

**Major Milestones, Tasks and Activities:**

Farmers are monitoring water quality and taking appropriate steps to protect food safety.

# Agriculture Water Strategy

## Water Quality

Draft

HIGH

**Issue Title:** Reduce Agriculture's Impact on Water Quality

**27**

**Issue:**

Farm practices including spraying, tillage, manure spreading and handling and other activities may have an impact on stream health and water quality.

**Background:**

Agricultural lands are often located in valley bottoms adjacent to streams, lakes and other water sources. Therefore many different types of horticultural and animal production operations are located near watercourses. Farm activities such as pesticide, fertilizer and manure storage and use, tillage, and other activities may impact stream health and water quality.

Grazing of animals on pastures and range tenures may also impact water quality. Traditionally livestock have been allowed to drink directly from the water source. This of course introduces in stream disturbances, sedimentation, and fecal matter in the water. Often these watercourses supply downstream users and in some case their drinking water. Issues with changing this practice have already been discussed in Item #5.

The Farm Practices Reference Guide outlines acceptable farm practices that should be followed by growers. The Environmental Farm Planning Program provides a process for assessing farm practices to ensure that environmental laws are followed and that sound practices are implemented.

**Methodology:**

Continue to support the Environmental Farm Planning process and the information that is provided in the Reference Guide and companion documents. An Environmental Farm Planner works with producers to assess the farm operation and the farm's impact on air, water and soil resources. The planner ensures that Provincial and Federal legislation is followed and recommends improvements to the producer. Depending on the type of improvements required different levels of funding may be available to the producer. The Environmental Farm Plan identifies action items that must be taken before the plan can be considered complete.

**Required Action:**

Continue to promote the Canada – British Columbia Environmental Farm Plan program (EFP) to producers. Secure future funding to continue the program. Educate the producers on water quality issues and solutions.

**Other Stakeholders Roles:**

Partnering organizations such as Agriculture and Agri-Food Canada, Ministry of Environment, Ministry of Health, and Department of Fish and Oceans are all needed to support the EFP program.

**Constraints, Risks and Dependencies:**

In some instances the costs of changing farm practices and moving facilities is prohibitive for many producers. For some changes to be economically viable, a longer time frame may be required for implementation.

**Resources (Human):**

**Resources (\$):**

**Resource (Other):**

**Major Milestones, Tasks and Activities:**

In the first five years a total of 5376 farmers have participated in the EFP program with 2638 farms having a statement of completion. A 10% increase in these numbers should be achieved each year.

# Agriculture Water Strategy

Water Quality

Draft

**MEDIUM**

**Issue Title: Balance Fish and Agriculture's Needs**

**28**

**Issue:**

Agriculture and fisheries are in direct competition for fresh water supplies.

**Background:**

Agriculture uses water from streams and wells to irrigate crops. Agricultural use is consumptive as the water taken from the stream or well is not returned but rather transpired by the crops into the atmosphere. Fish use is instream and is not consumptive. The critical fish flows are in late summer when fish are migrating to spawn. This is also the time of year when the flows in the stream are at the lowest which coincides with the low rainfall periods of summer.

Agricultural water use in August and early September can still be quite high when forage and tree fruit crops are approaching harvest. The challenge is to balance the water requirements of both sectors so that both resources can be maximized without impeding the other significantly.

**Methodology:**

Summerland was faced with a water supply issue during the hot dry summer of 2003. A Water Use Plan was established for the Summerland reservoirs that allowed for use by both sectors. An agreed upon rule curve was established based on the amount of water left in the reservoirs. This rule curve established the amount of water that could be used by the community and agriculture sector and the flows that needed to be released for fish.

In regions where producers pump their own water, fishery officers are often not available to monitor stream flows. DFO and MOE need to work with producers to make them aware of where fish are resident in the streams and to determine the minimum flow that needs to be maintained to support the fish population.

However agriculture should not have to artificially augment stream flows that are above naturalized flows to sustain fish. Where additional flows are provided compensation should be provided to producers.

**Required Action:**

Initiate water use plans on major streams and watersheds in the province where consumptive uses and significant fish populations exist. Develop an online mapping system that can be used by producers to determine where fish populations are significant. Establish a methodology that makes it easier for producers to determine if sufficient flows exist in the stream to be with draw irrigation water.

Maintaining aquatic ecosystem health should also be considered. Factsheet 34 identifies riparian initiatives that are related to this overall goal.

**Other Stakeholders Roles:**

DFO and MOE to assist in developing mapping systems that identify resident fish species. Local governments and water purveyors develop water use plans.

**Constraints, Risks and Dependencies:**

The cost and time to develop a mapping system that is useful to agencies and producers.

**Resources (Human):**

**Resources (\$):**

**Resource (Other):**

**Major Milestones, Tasks and Activities:**

Water Use Plan in Mission Creek completed in 2009. Okanagan Basin Water Accounting Model completed in March 2010.

# Agriculture Water Strategy

## Water Quality

Draft

HIGH

**Issue Title:** Funding Infrastructure for Irrigation Districts

**29**

**Issue:**

Irrigation Districts are currently not eligible for infrastructure funding from Ministry of Community Development.

**Background:**

Irrigation Districts have historically delivered water for use by the agriculture sector. The Agriculture Rural Development Agreement program funded jointly by the federal and provincial governments in the 1960's, 1970's and 1980's provided funding of up to 75% for irrigation districts to construct their infrastructure. This program ended in 1989. Growth in the Okanagan has led to many domestic connections being added to the irrigation districts to the point where urban users now out number the farm use, even though the water volume used for agricultural irrigation is much higher. Interior Health has requested that irrigation districts (ID) provide treatment for the domestic water supply to an acceptable level as required under the province's Drinking Water Action Plan. The intent is to reduce the number of boil water advisories. The irrigation and domestic water supply are delivered in the same pipeline. The cost of treating all of the water supplied by the districts is prohibitive, especially since the irrigation component does not need treatment. Separating the lines so that only the domestic component is treated is still very expensive.

Irrigation districts are currently not eligible for infrastructure funding from the Ministry of Community Development. Some municipalities have incorporated the irrigation district into the municipal infrastructure so funding can be obtained. Lake Country, Oliver and Osoyoos are a few examples. Incorporating into a municipality often results in less control of the agricultural water by the farm community. Irrigation districts are governed by a board of trustees which often are comprised of members from the farm community while a municipality is governed by a mayor and councilors that are usually members from the urban community. Citizens that reside in irrigation districts want to be treated the same as other citizens and have access to Provincial funding for treatment of their water supplies.

**Methodology:**

There are more than 3300 water systems covered by the act of which 96 systems serve 90% of the population in British Columbia. Most of these are municipal systems and have access to infrastructure funding. There are an estimated 50 irrigation districts and hundreds of other smaller water purveyors that may require financial assistance to comply with IHA standards. Larger Irrigation Districts that demonstrate that they have a good governance and operating structure be made eligible for funding from the province.

**Required Action:**

Ministry of Community Development (MCD) investigate opportunities on how to provide funding where water treatment issues are a concern to public health.

**Other Stakeholders Roles:**

Water Supply Association help identify the parameters that must be in place before ID are eligible for funding.

**Constraints, Risks and Dependencies:**

Provincial funding is limited and there may not be enough resources available

**Resources (Human):**

**Resources (\$):**

**Resource (Other):**

**Major Milestones, Tasks and Activities:**

Program that addresses funding for Irrigation Districts is developed.

# Agriculture Water Strategy

## Flood and Drainage

Draft

EXTREME

<b>Issue Title:</b> Master Drainage Plans Consider Agriculture		<b>30</b>
<p><b>Issue:</b> Local Governments conducting Master Drainage Plans should consider agriculture's needs with respect to drainage infrastructure.</p>		
<p><b>Background:</b> Some of British Columbia's most productive agricultural lands are in the floodplains of British Columbia's rivers, predominantly in the Fraser Valley but also in many other regions of the province. The province has invested millions of dollars in infrastructure to protect not only the agricultural lands from flooding but also communities, transportation and service corridors. Upland development continues to increase rainwater and stormwater flows to low lying agricultural lands. Master Drainage Plans will require updating to take these increased flows into account as well as investigate climate change impacts such as increased storm intensity and a rise in sea levels that will affect drainage outlets. ARDSA drainage design criteria have been established by the Ministry of Agriculture and Lands to provide an acceptable level of protection for low lying agricultural lands. The standards can be found in the fact sheet "Agriculture Drainage Criteria – 535.100-2".</p>		
<p><b>Methodology:</b> The Ministry of Agricultural and Lands ARDSA drainage design criteria need to be integrated into local Governments Master Drainage Plans. A template for Integrated Stormwater Management Planning has been developed by Metro Vancouver which outlines various levels of effort that could be incorporated. As a minimum effort the master plan should utilize existing ALR drainage criteria and a level of protection that has been previously accepted by producers. Minimum deliverables would include a map showing agricultural land use and documentation of Agricultural Land's Drainage Criteria and an accepted level of protection. A maximum level of effort would include; identify agricultural and/or ALR lands within the watershed; review/utilize agriculture land use inventory information available from MAL; identify and summarize drainage, flood and erosion related issues; discuss water management issues with landowners, municipality and MAL staff; determine appropriate ARDSA drainage criteria and level of protection required; ensure that agricultural drainage system and structures are obtained in the drainage system inventory (channel cross sections, dykes, flood boxes, pump stations, water control structures, culverts, detention facilities etc.)</p>		
<p><b>Required Action:</b> Ensure that all Master Drainage Plans investigate and use Agricultural Drainage Criteria where agricultural lands are present and suggest that the Integrated Stormwater Management Planning Template process is followed.</p>		
<p><b>Other Stakeholders Roles:</b> Local governments, MOE, DFO</p>		
<p><b>Constraints, Risks and Dependencies:</b> Funding to collect the site information required to conduct an adequate assessment of the agricultural area drainage needs.</p>		
<b>Resources (Human):</b>	<b>Resources (\$):</b>	<b>Resource (Other):</b>
<p><b>Major Milestones, Tasks and Activities:</b> Master Drainage Plans ensure that the agricultural assessments are completed as plans are updated.</p>		

# Agriculture Water Strategy

## Flood and Drainage

Draft

HIGH

**Issue Title:** Farmland Not Used for Stormwater Retention

**31**

**Issue:**

Local Governments often identify agriculture lands as possible stormwater detention areas as a low cost alternative when implementing a stormwater management plan.

**Background:**

Some of British Columbia's most productive agricultural lands are in the floodplains of British Columbia's rivers, predominantly in the Fraser Valley but also in many other regions of the province. The province has invested millions of dollars in infrastructure to protect not only the agricultural lands from flooding but also communities, transportation and service corridors.

Upland development continues to increase rainwater and stormwater flows to low lying agricultural lands. Often the least cost alternative to reducing the impacts of stormwater flows is to purchase agricultural low lands as stormwater detention areas rather than invest in the infrastructure required to protect the agricultural land and make it more productive.

**Methodology:**

Stormwater management plans need to be established that provide an assessment of the agriculture needs and what can be accomplished in both the short and long term.

As a minimum effort local governments should document extent of flooding and duration for all lowlands for minor and major storm events, document channel maintenance works that have been completed or needed and monitor drainage infrastructure such as dykes, control gates, culverts and pumping stations.

Maximum effort would include obtaining recent channel survey information; conduct an agriculture land use survey to identify crops, irrigation systems, buildings and other infrastructure; build a hydraulic model to undertake an analysis including area-elevation curves for flood spill areas, assess flooding depths and duration, and identify where ARDSA criteria will be met or where a lower level of protection is provided; identify impacts of both existing and future land use conditions; evaluate drainage system conveyance capacity, existing pump station capacity, floodboxes and flood spill areas; develop a channel maintenance plan; identify irrigation requirements; and assess dykes.

**Required Action:**

Ensure that local governments conduct a proper assessment of agricultural areas prior to implementing a stormwater management plan.

**Other Stakeholders Roles:**

Local governments, MOE, DFO

**Constraints, Risks and Dependencies:**

Funding to collect the required information to properly conduct an adequate assessment of the agricultural area drainage needs.

**Resources (Human):**

**Resources (\$):**

**Resource (Other):**

**Major Milestones, Tasks and Activities:**

Metro Vancouver Template for Integrated Stormwater Planning is adopted by local governments.

# Agriculture Water Strategy

## Flood and Drainage

Draft

HIGH

<b>Issue Title:</b> Urban Developments Increase Flooding of Agricultural Lowlands		<h1>32</h1>
<b>Issue:</b> Urban developments result in increased stormwater flows that impact agricultural lowlands.		
<b>Background:</b> <p>Some of British Columbia's most productive agricultural lands are in the floodplains of British Columbia's rivers, predominantly in the Fraser Valley but also in many other regions of the province. The province has invested millions of dollars in infrastructure to protect not only the agricultural lands from flooding but also communities, transportation and service corridors. The ARDSA program of the 1970's and 1980's funded many rural drainage projects that constructed drainage channels and pumping systems to remove water from the lowlands during storm events. The province has also invested in dyking networks and has recommitted funds to improve the dyke systems in the province.</p> <p>Since many of the lowlands are in the Agriculture Land Reserve urban developments are usually occurring in the lands situated above the agricultural lands. Developments create impervious areas that increase runoff from the site which end up on the agricultural lowlands. Stormwater retention and detention ponds reduce peak runoff flows but do not reduce the volume of water that eventually enters lowland areas.</p> <p>The drainage infrastructure that is currently in place was not designed to accommodate the increase in urban development that has occurred over the past 20 years. It is not always the large storm events that are the problem but the many smaller storms that create runoff resulting in poor soil drainage and making it difficult for producers to conduct farming activities.</p>		
<b>Methodology:</b> <p>Most of the annual rainfall occurs in many frequent small storm events. These small storm events can be captured at the site level through the implementation of source controls that return the water to ground, rather than running off the impervious surfaces found on developed sites. Urban areas should be developed so that the amount of rainfall that runs off a developed site mimics the natural condition. Reducing runoff from the site will reduce stormwater flows, reduce stream scour and improve stream health, reduce flooding on agricultural lands and improve stream flows during the drier summer months when stream flows rely on groundwater recharge. The cost of improving regional infrastructure will also be reduced.</p> <p>The Ministry of Environment has developed a Stormwater Planning Guidebook that provides information on how to achieve integrated stormwater planning. Metro Vancouver has developed the methodology in their "Template for Integrated Stormwater Planning". The Intergovernmental Partnership has also developed an online assessment tool in the Water Balance Model that allows planner and developers to assess how well source controls will function.</p>		
<b>Required Action:</b> Implement training with the development community to ensure rainwater source controls are implemented.		
<b>Other Stakeholders Roles:</b> Local governments, Urban Development Institute, BCWWA and other partners initiate bylaws and develop training for the development community to ensure changes are made on the ground.		
<b>Constraints, Risks and Dependencies:</b> Practitioners need to be educated to understand the concepts in order to buy into the process.		
<b>Resources (Human):</b>	<b>Resources (\$):</b>	<b>Resource (Other):</b>
<b>Major Milestones, Tasks and Activities:</b> Water Balance Model is currently operational but will need continued support and upgrading. Source control documentation is available. Training is underway but additional resources needed.		

# Agriculture Water Strategy

## Flood and Drainage

Draft

EXTREME

Issue Title: Obtain Funding for Drainage Infrastructure

33

**Issue:**

Funding for drainage infrastructure is not keeping up with the increased number of storms and their impacts on agricultural production.

**Background:**

One of the primary impediments to crop growth in the Fraser Valley is poor drainage. Over the past 30 years the Federal and Provincial governments, local governments and farmers have invested millions of dollars in infrastructure to improve drainage conditions on agricultural lands. However climate change, upland developments and aging infrastructure has resulted in the need for additional capital to bring systems up to capacity to ensure continued productive farming on lowlands.

The Federal Government has made funding available for water supply infrastructure in the past few years but has not supported the need for drainage infrastructure. Primarily the reason has been the protection of wildlife and biodiversity values that have hindered the funding of drainage works. Drainage is seen as having an impact on fisheries and ecosystems and is therefore not supported in principle.

Many water management projects in the Fraser Valley have integrated drainage and water supply systems. The improvement required for drainage facilities are for agricultural lands that are currently being farmed and are in the agriculture land reserve.

**Methodology:**

New infrastructure programs must support integrated water management goals for the agriculture sector. New infrastructure programs that are being developed should consider the overall needs and goals for the agriculture sector in British Columbia, which are quite different from other regions of Canada.

**Required Action:**

Implement a water management infrastructure program for agriculture that recognizes the needs for each region of the province.

**Other Stakeholders Roles:**

AAFC to lead on the development of a new infrastructure program.

**Constraints, Risks and Dependencies:**

Current economic climate however funding infrastructure during this time will be good value.

**Resources (Human):**

**Resources (\$):**

**Resource (Other):**

**Major Milestones, Tasks and Activities:**

New infrastructure program developed for 2009.

# Agriculture Water Strategy

Extension

Draft

HIGH

Issue Title: Educate Public on Agriculture and Water Issues

34

**Issue:**

Resolving agricultural water issues is difficult to achieve if the public is not well informed.

**Background:**

There are many issues with respect to agriculture and water that have an impact on the public or require the public to be supportive in order for the initiative to be implemented. For example reserving water for agriculture will require acceptance by the public that water for their food lands may be more important than water for the lawns or washing their driveways. Even though agriculture may be 70% of the consumptive use all users will still be required to become more efficient, regardless of how small the user is.

**Methodology:**

Provide documentation that clear defines objectives for major basins and the roles for the various sectors. The Living Water Smart document and the Okanagan Sustainable Water Strategy are two documents that provide clear directives on what needs to be done and who is going to do it.

The [www.waterbucket.ca](http://www.waterbucket.ca) website has an agriculture community of interest that provides a resource for information on agriculture and water related topics.

Community events and conferences can be a venue where issues can be outreached to the public and agriculture industry.

**Required Action:**

Provide relevant information to the agriculture industry, the public and other stakeholders to help achieve a common understanding on the provincial water strategy and the agricultural components of the strategy.

**Other Stakeholders Roles:**

BCAC help coordinate activities with commodity partners. MOE continue to deliver on the implementation of the Living Water Smart strategy. Okanagan Basin Water Board develop and deliver on the implementation plan on the Okanagan Sustainable Water Strategy.

**Constraints, Risks and Dependencies:**

Outreach to all required stakeholders is difficult to achieve.

**Resources (Human):**

**Resources (\$):**

**Resource (Other):**

**Major Milestones, Tasks and Activities:**

Implementation plans for the various strategies are developed along with an effective communication plan.