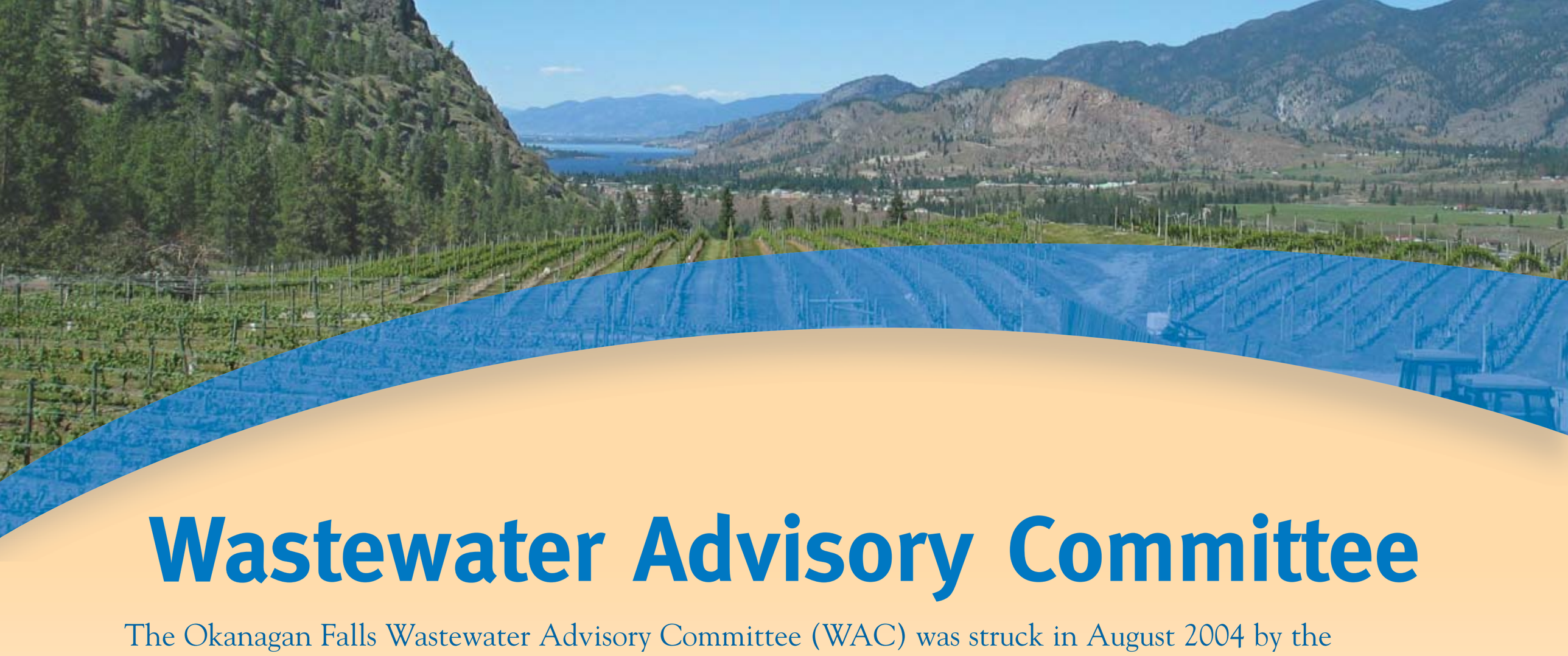
Welcome!

- The Regional District of Okanagan Similkameen (RDOS), the Okanagan Falls Wastewater Advisory Committee (WAC), and Area D director Bill Schwarz welcome you and thank you for participating.
- The intent of the open house is to inform you about proposed sewage treatment upgrades and to provide opportunities for input.
- Please review the display boards set up in the gymnasium. Representatives from RDOS, the WAC, and Earth Tech Canada are available to answer your questions.
- Presentations will be given at 5 PM, 6 PM, and 7 PM in the designated room. Resource people will be available to answer your questions.
- To help us better understand your wants and needs, please complete a survey and leave it in the box on the table.
- Thank you again for participating…



Wastewater Advisory Committee

The Okanagan Falls Wastewater Advisory Committee (WAC) was struck in August 2004 by the Regional District of Okanagan Similkameen (RDOS) to review and make recommendations for wastewater management upgrades within Electoral Area D, including but not limited to, Okanagan Falls, Kaleden, and Skaha Estates.

A select committee appointed by the RDOS, the nine-member WAC met seven times to review regional wastewater policies, programs, and services, and to identify technically, socially, environmentally, and financially viable solutions to current and future wastewater challenges.

In December 2004, the RDOS hired Earth Tech Canada to undertake a strategic assessment of current and future wastewater needs. After studying the resulting review of existing conditions and potential solutions, WAC members short-listed ten options for further consideration. Ultimately, the committee resolved to support Option #7 — construction of a BNR (biological nutrient removal) plant downstream of the existing plant — subject to senior government funding of two-thirds the cost. Option #6 — construction of a BNR plant at the existing site — was ranked second.

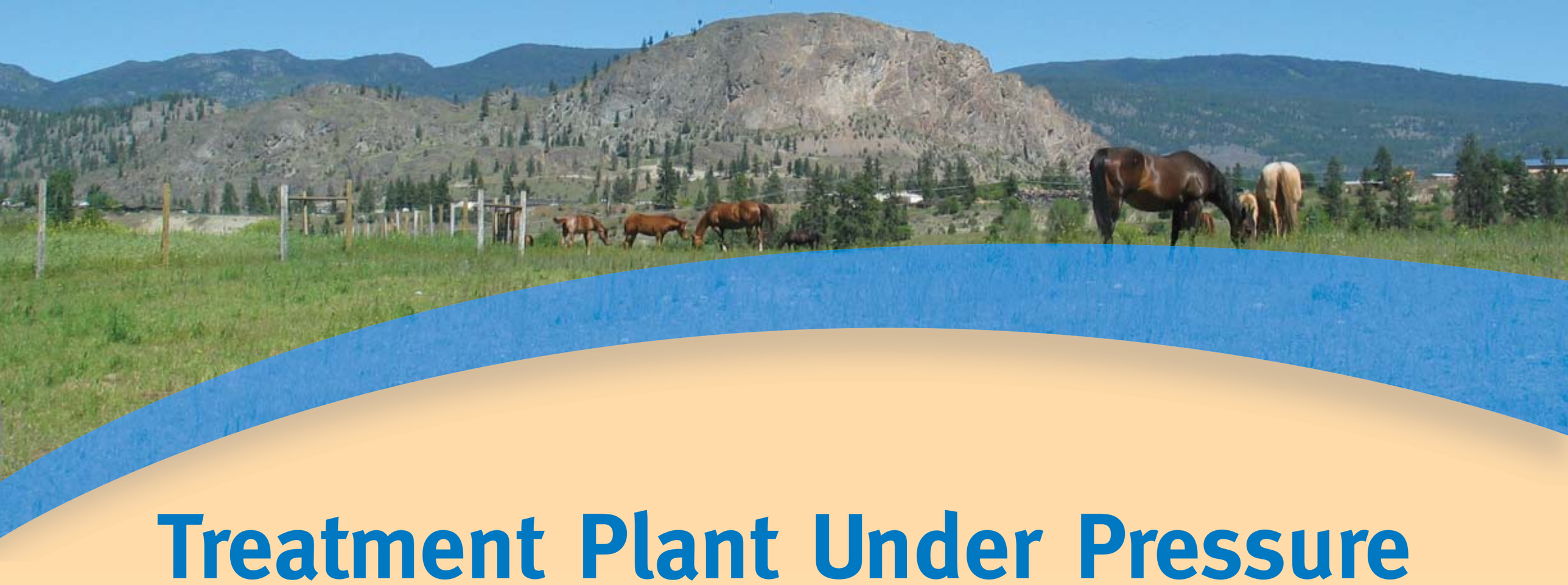
WAC members developed criteria and weightings to rank the ten short-listed options, #6 and #7 of which were selected for closer scrutiny.

Category	Decision Criteria
Technical	• Reliability • Future flexibility/expansion provision • Effluent quality • Water re-use potential • Operational ease (required staff) • Method for residuals disposal • Site access
Social	• Health risks • Odour levels • Noise levels • Potential for public conflicts (risk) • Economic diversification • Aesthetics • Compatibility with surroundings
Environmental	• Habitat impacts • Emissions
Financial	• Life-cycle costs

Okanagan Falls Wastewater Advisory Committee members include (from back row left): Don Albright (Skaha Estates), Souren Mukherjee (OK Falls), Les Clarke (Kaleden), and Alfred Hartviksen (OK Falls). The front row, from left, includes Eleanor Walker (OK Falls), RDOS Area D director Bill Schwarz (chair), and May Simpson (OK Falls). Missing are William Eddy and Gerry Hughes, both of whom represent Okanagan Falls, and project coordinator Tom Siddon.

While WAC members agreed that extending sewer service to outlying areas would be too costly at this time, they did recommend that the RDOS work with residents from Kaleden and Skaha Estates to develop sewage treatment plans for these communities. To help assess need in these areas, the committee recommends the RDOS seek funding from senior governments to undertake a comprehensive water quality monitoring program for Skaha Lake.

And to ensure future wastewater treatment plant capacity, the committee recommends the RDOS work with the Okanagan Falls Irrigation District to initiate a long-term water conservation strategy to reduce wastewater flows.



Treatment Plant Under Pressure

The existing treatment plant — located at the confluence of Shuttleworth Creek and Okanagan River — was built in the 1970s to process about 750 cubic metres of wastewater daily from residential and commercial connections within the Okanagan Falls Sewerage Service Area. Comprised of an oxidation ditch, a clarifier, sludge drying beds, and infiltration basins, the plant has served residents well for two decades.

In the early '90s, a multi-family housing complex was built next to the plant. As the original sludge management system was not designed for odour or noise control, the Regional District of Okanagan Similkameen (RDOS) began receiving complaints from nearby residents.

Then came capacity concerns. By the late '90s, wastewater flows had increased by about 25 percent, producing peak summer flows as high as 920 cubic metres per day. Today, development proposals for two subdivisions and a resort hotel aggravate concerns about current and future capacity. In addition to these 300 new connections, we can expect infill construction of at least 30 single-family homes. These units will increase the number of connections to more than 1,500 and boost the average daily flow to the treatment plant by 270 cubic metres. This will push required summer capacity to about 1,100 cubic metres per day by 2010. Looking beyond 2010, even with a modest annual growth rate of two percent, the required plant capacity will increase by 380 cubic metres per day, for a total of about 1,500 cubic metres per day by 2025.

Projected Population and Wastewater Flow Rates

Year	Projected Population			Projected Flow (cubic metres/day)			
				Okanagan Falls, Kaleden & Skaha Estates		Okanagan Falls	
	Okanagan Falls	Skaha Estates	Kaleden Lakeshore	Average Annual Daily Flow (m^3/day)	Maximum Day Flow (m^3/day)	Average Annual Daily Flow (m^3/day)	Maximum Day Flow (m^3/day)
2005	1,380	550	426	1,110	1,580	650	930
2010	1,715	578	447	1,290	1,840	810	1,150
2015	1,804	605	469	1,350	1,930	850	1,210
2020	1,893	634	491	1,420	2,030	890	1,270
2025	1,981	664	514	1,480	2,120	930	1,330
2030	2,070	693	537	1,550	2,220	970	1,390

Preferred Treatment Options

After studying the Earth Tech review, WAC members chose Option #7 as their preferred approach: Option #6 was ranked second. While these two options had higher overall costs, they rated highest in the social and environmental spheres — guaranteeing flexibility, reliability, and minimal public impacts.

	ADVANTAGES	DISADVANTAGES
OPTION #6 BNR (biological nutrient removal) at existing site	• No land acquisition required • No amendment to Liquid Waste Management Plan, Official Community Plan, or Operating Permit required • Can recycle treated effluent for agricultural irrigation • Slightly lower unit cost for new connections	• Not likely to be eligible for senior government funding • Close proximity to multi-family housing (e.g. odour, noise) • Traffic flow through residential area (e.g. sludge removal)
OPTION #7 BNR downstream of existing site	• No impacts on residential or commercial areas (e.g. odour, noise) • Greater long-term potential for capacity and service to outlying areas • Can recycle treated effluent for agricultural irrigation and/or habitat development (e.g. wetland) • Eligible for senior government funding	• Land acquisition required • Marginally higher capital costs in the absence of senior government funding • Amendments to Official Community Plan, Liquid Waste Management Plan, and Operating Permit required

Option #6 involves construction of a BNR (biological nutrient removal) plant at the existing location. Since the site is located near a housing complex and school, the plant would require advanced odour and noise control. The $4.6-million upgrade would have annual operating and maintenance costs of about $300,000.

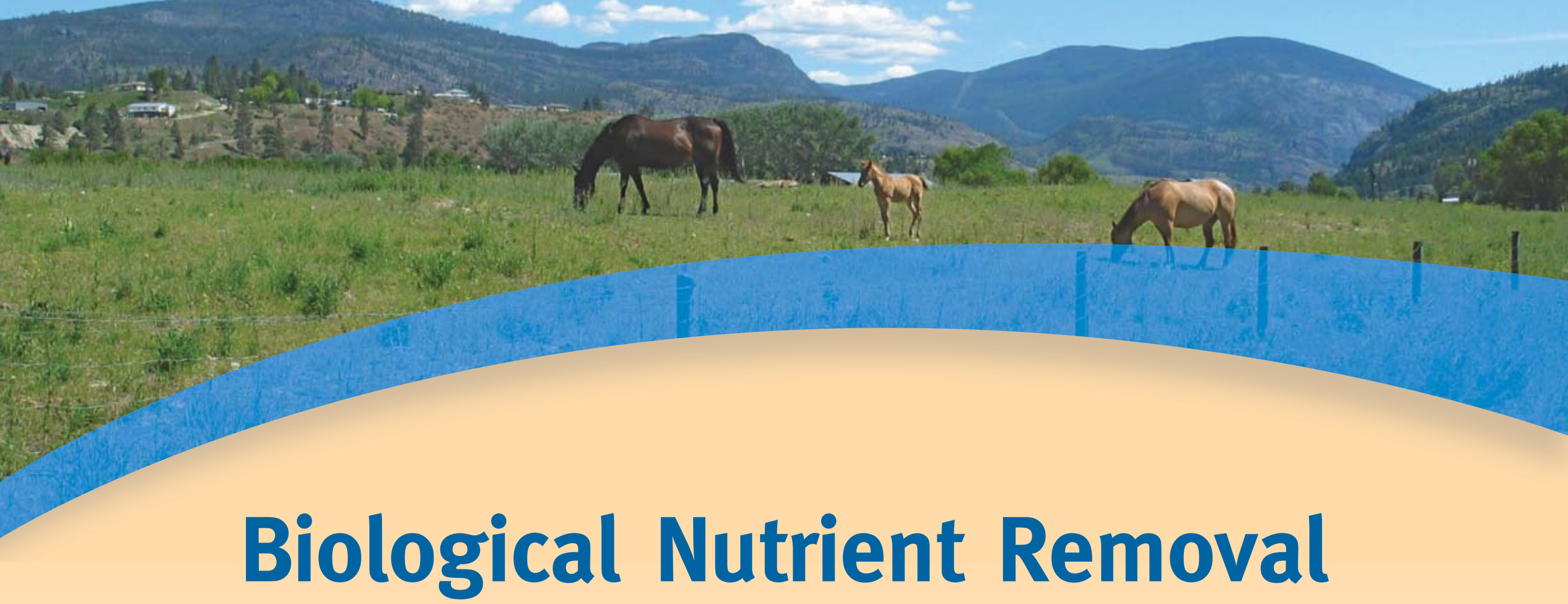
Option #7 provides for construction of a BNR plant at an appropriate location downstream of the existing site. Since the plant would be surrounded by an agricultural buffer, it would be less intrusive. An access road from Highway 97 would eliminate the impacts on Cedar Street and the nearby school. The new site would also offer greater potential for future capacity and expansion of service to outlying areas. This $5.2-million upgrade would have an annual operating and maintenance budget of about $300,000.

Comparing Options #6 and #7

Category	Decision Criteria	Option #6 BNR (Tertiary) at Existing STP	Option #7 BNR (Tertiary) D/S of Existing STP
Financial	Life-Cycle Costs	$9.1 million	$9.7 million
Technical	Reliability	99.999%	99.999%
	Future Flexibility/Expansion Provision	Very Good	Very Good
	Effluent Quality	Tertiary	Tertiary
	Water Re-Use Potential	Yes	Yes
	Operational Ease (Required Staff)	1 Full-time	1 Full-time
	Method for Residuals Disposal	Compost	Compost
	Site Access	Constrained	Good
Envirnonmental	Habitat Impacts	Neutral	Positive
	Emissions	Neutral	Positive
Social	Health Risks	Low	Low
	Odour Levels	Rare	Rare
	Potential for Public Conflicts (Risk)	High	Low
	Economic Diversification	Good	Good
	Noise Levels	Occasional	Occasional
	Compatibility with Surroundings	Neutral	Neutral
	Aesthetics	Neutral	Neutral
	RANK	**2**	**1**

Although Option #7 has higher capital costs than Option #6, it was ranked highest because of the long-term social and environmental advantages.

Construction of the new wastewater treatment plant would begin in 2008, provided appropriate land could be acquired at reasonable cost.

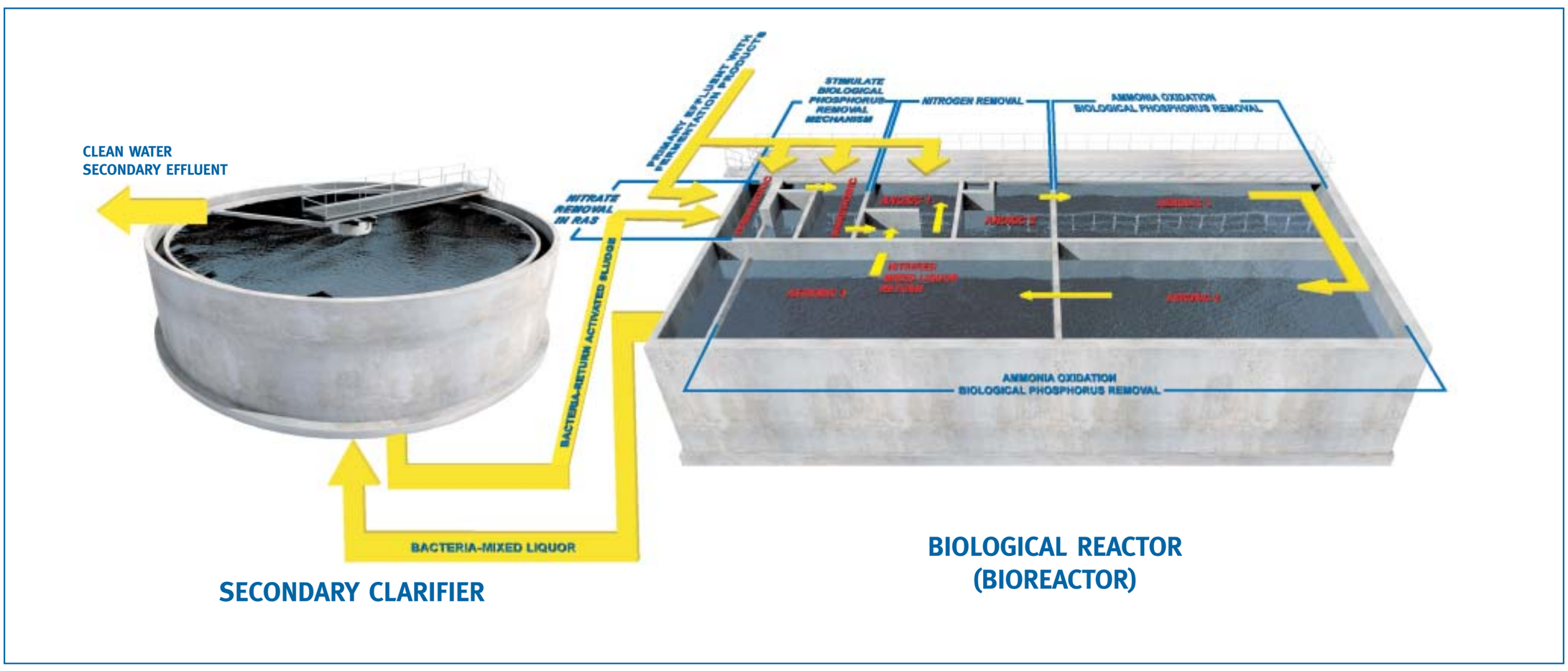


Biological Nutrient Removal

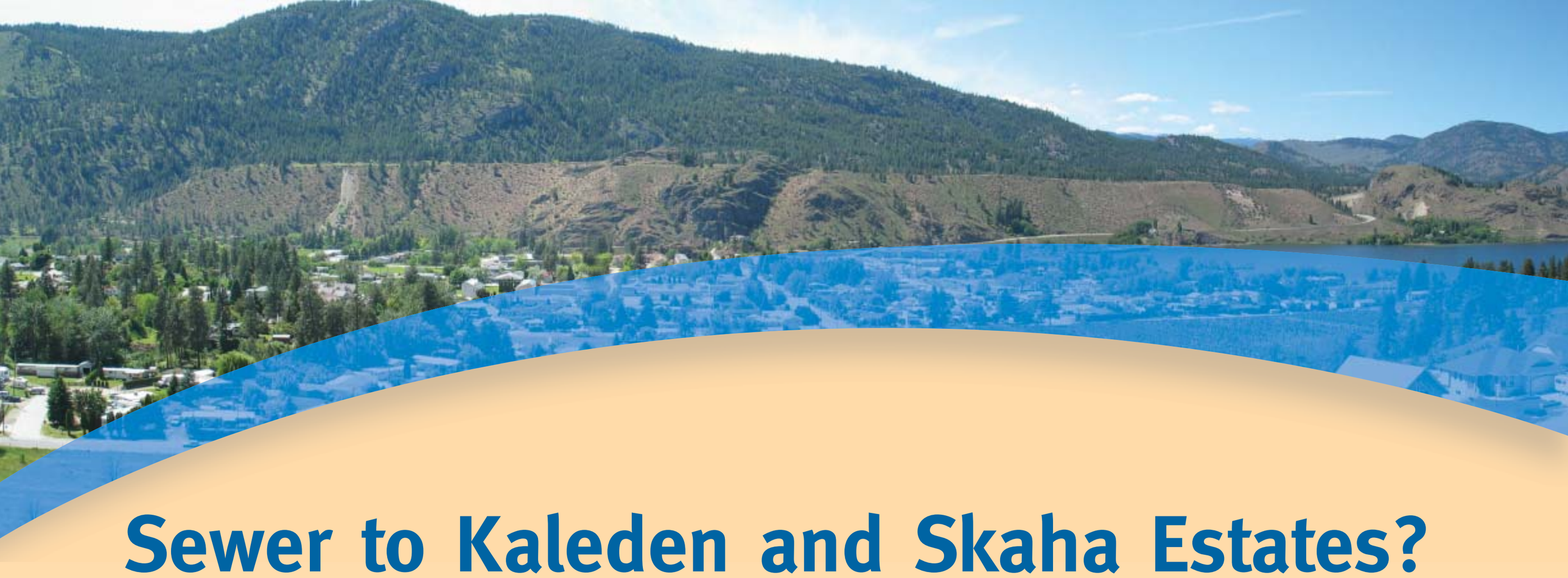
Historically, wastewater treatment plants used 'primary treatment' to remove only organic solids from wastewater before the resulting effluent was released into receiving waters such as rivers and lakes. Because wastewater effluent contains nitrogen and phosphorus at levels sometimes toxic to human and aquatic health, 'tertiary' or 'secondary treatment' is now recommended and often required as a condition of discharge to receiving waters.

Both Options #6 and #7 include a proven tertiary BNR (biological nutrient removal) process that is reliable, robust, operator-friendly, and extremely adaptable to changing flow and load conditions. The proposed treatment process is based on the "three-stage" Bardenpho" BNR process which removes carbonaceous material (BOD), phosphorus, and nitrogen. With filtration and disinfection, effluent from the BNR process is of a drinking water standard. The high quality effluent provides for a range of uses and disposal methods: It can be reused as irrigation water, discharged to a river or lake, or used to enhance habitat in wetland environments.

BNR technology was implemented in Canada in the late '70s when the first BNR plant was constructed in Kelowna to address nutrient impacts to Okanagan Lake. BNR plants in other Okanagan communities have proven successful, such as those in Summerland (above) and Lake Country.



BNR was originally developed when researchers noticed that virtually all of the phosphorus in wastewater was removed when the process air blowers in conventional BOD treatment plants were turned off for short periods of time. Gradually, researchers found the connection between fermentation and the benefit its byproducts have on the ability of bacteria to naturally remove phosphorus without the help of chemicals. Similarly, nitrogen can be removed from wastewater by providing different environmental conditions within the process.



Sewer to Kaleden and Skaha Estates?

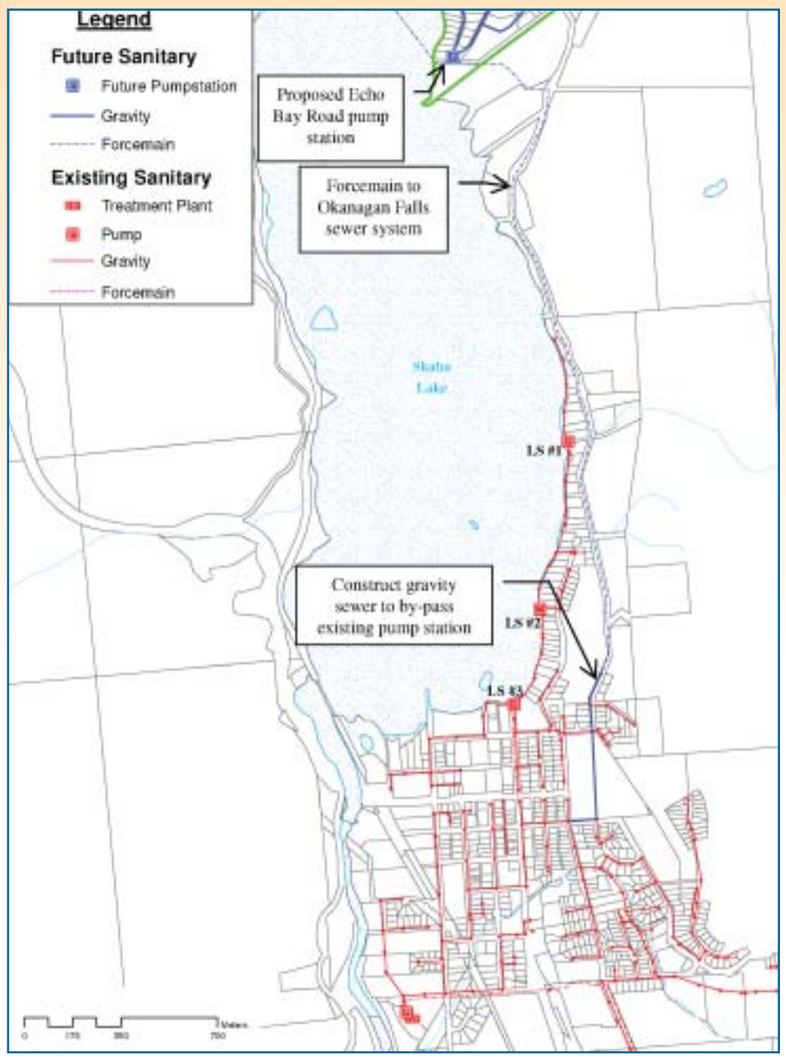
As part of its mandate, the Wastewater Advisory Committee (WAC) reviewed information prepared by Earth Tech regarding possible sewer extension from Okanagan Falls to Kaleden and Skaha Estates.

Capital costs were estimated for construction of a sewer collection system to service 142 lots in the 32-hectare Kaleden lakeshore area. Parcel costs of $22,250 would contribute to the $3.1-million price tag. The cost to provide sewer service to the Kaleden bench area — which encompasses 438 lots on 349 hectares — would be $11.9 million, or about $27,000 per parcel. If the lakeshore and bench areas were combined in a single sewer service area, the total capital cost of sewering Kaleden would be about $15 million.

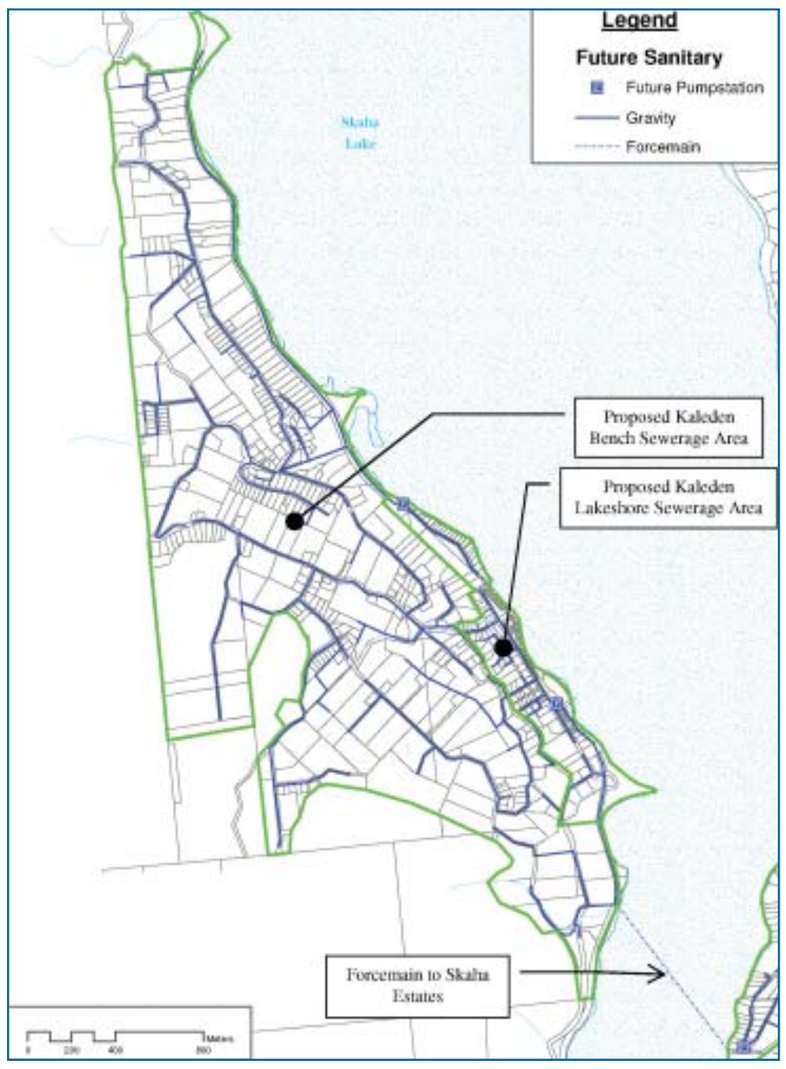
Capital costs were also estimated for constructing a sewer collection system in Skaha Estates to service 183 lots in the 54 hectares along Skaha Lake. The $3.1-million cost breaks out to about $17,000 per parcel, before senior government funding.

While WAC members agree these prices are prohibitive considering there is no pressing need at this time, they also concur that public consultation specific to Kaleden and Skaha Estates should be undertaken before any long-term decisions are made. WAC also supports an Earth Tech recommendation that the RDOS seek funding from appropriate government agencies to undertake comprehensive monitoring of Skaha Lake to determine the impact of septic systems on water quality and aquatic habitat.

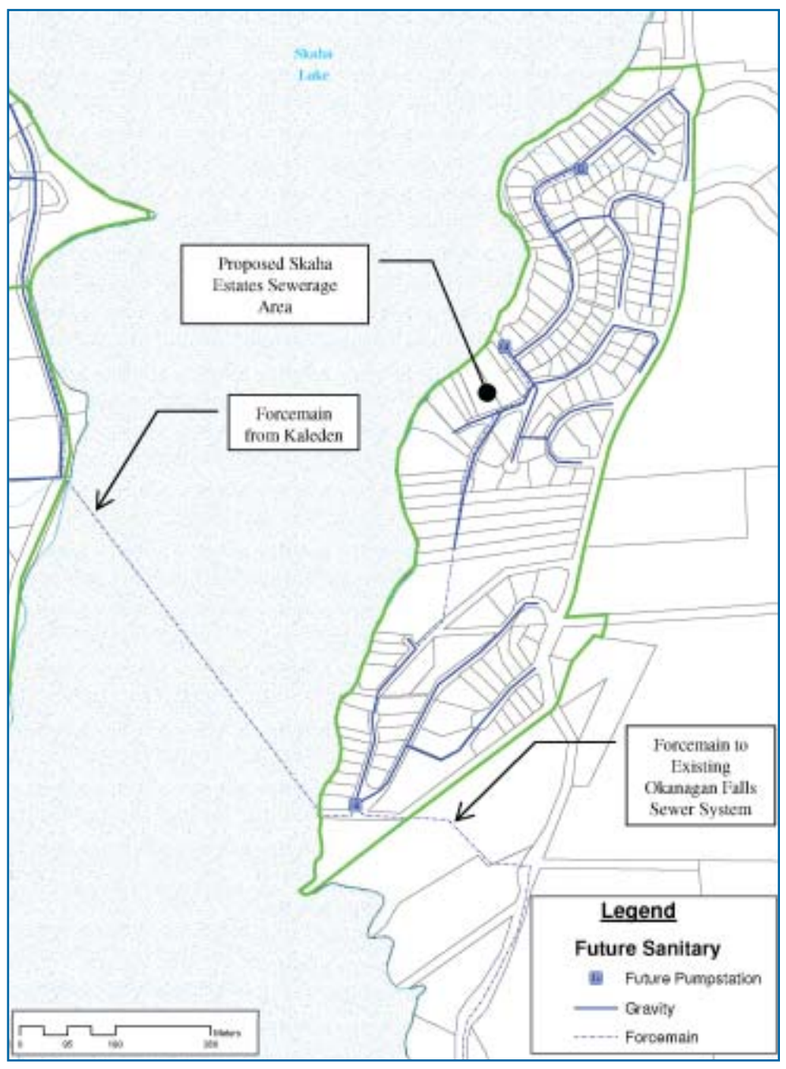
Existing sewer service to Okanagan Falls and possible service expansion to Kaleden and Skaha Estates

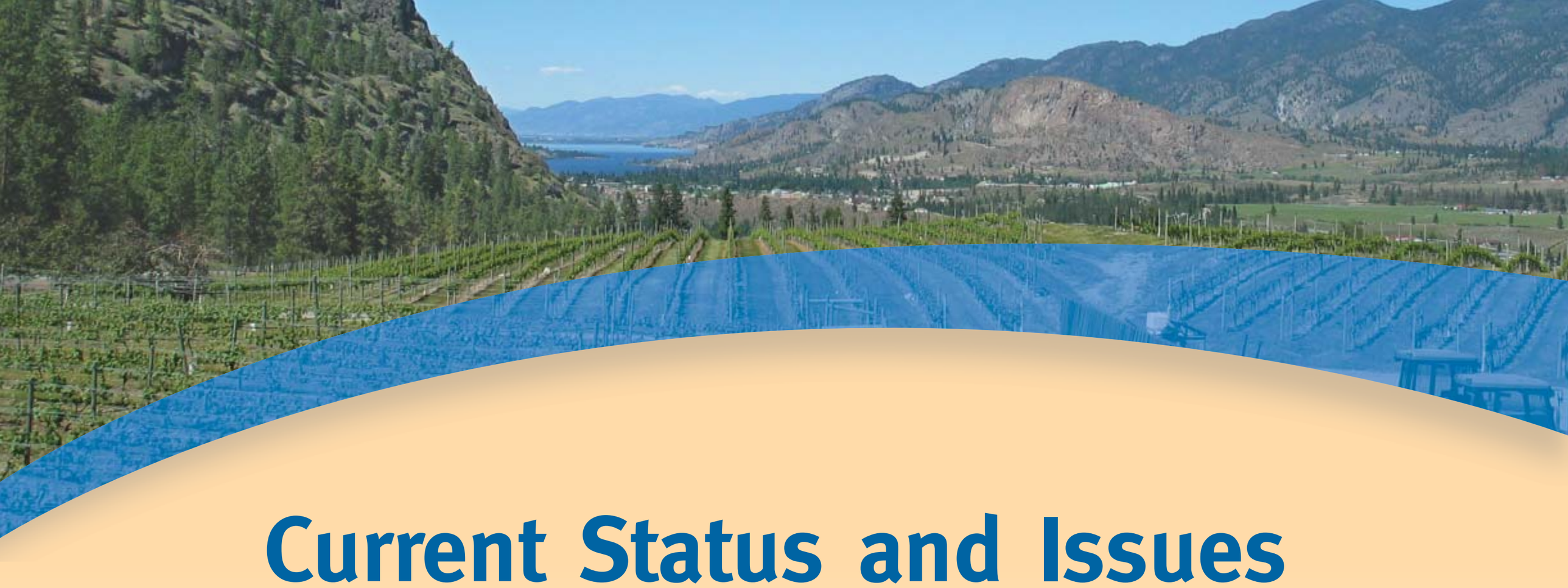


Proposed future Kaleden sewerage system



Proposed future Skaha Estates sewerage system





Current Status and Issues

Administrative

- The RDOS has no bylaws that will control development within the Okanagan Falls Sewerage Service Area
- The region's Official Community Plan and Liquid Waste Management Plan, and the wastewater treatment plant's operating certificate require updating to reflect current and future needs

Technical

- During the summer, the Okanagan Falls wastewater treatment plant operates at or above its theoretical capacity (850 cubic metres/day)
- Effluent from the oxidation ditch is pumped to infiltration basins which have a recommended maximum loading rate of 800 cubic metres/day
- Even with upgrades, the capacity of the infiltration basins to accommodate future growth is uncertain given that a small pond has formed at a low-point near the site
- Development proposals within the Okanagan Falls Sewerage Service Area for two subdivisions and a resort hotel could add up to 300 new connections by 2008, further stressing the treatment plant

Social

- The plant does not have an odour control system nor is enclosed in a building, therefore neighbouring residents often complain about the smell and noise
- The plant must regularly dispose of residuals, requiring large trucks to pass through residential areas

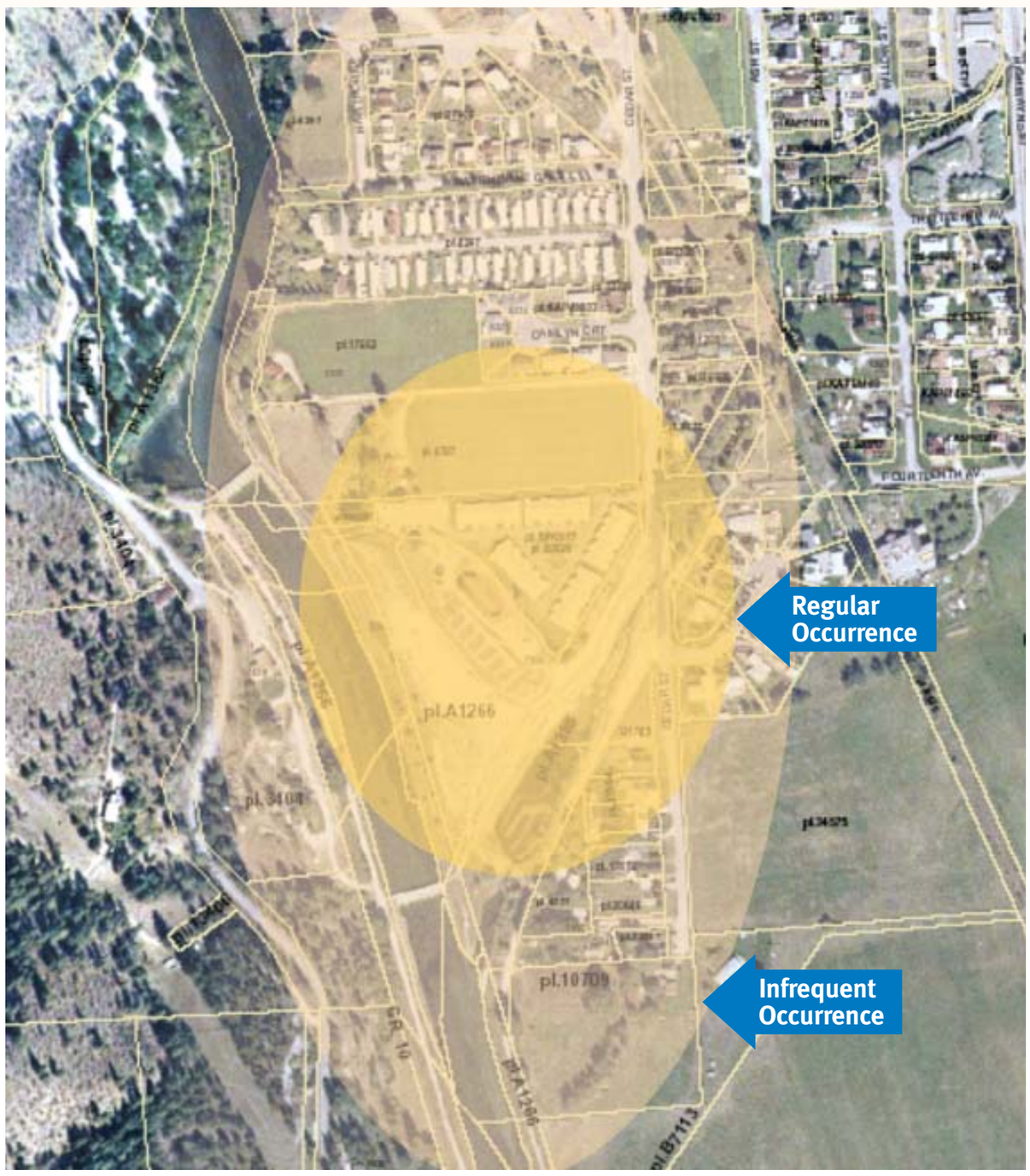
Environmental

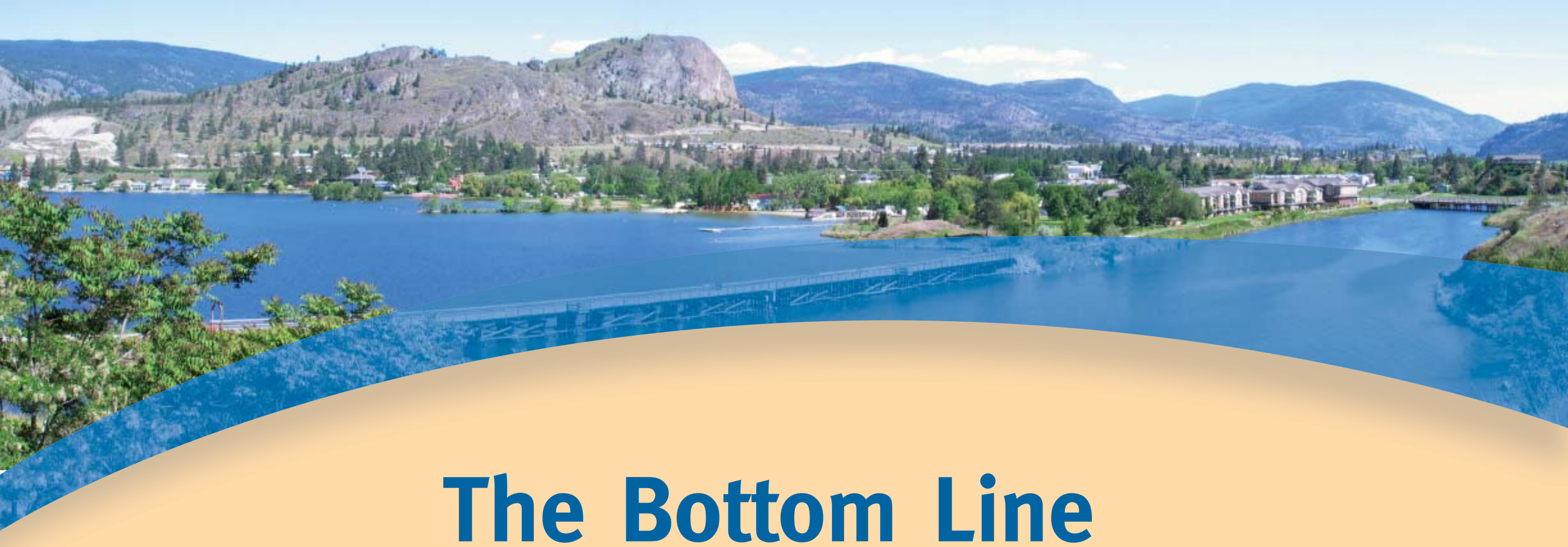
- Researchers predict that climate change will result in a drier Okanagan Valley and less access to water - the current treatment system has no provision to reuse wastewater effluent and offset water demand

Financial

- The RDOS has limited funds ($267,000) in reserves to contribute toward any upgrade of the wastewater treatment plant
- The RDOS does not currently collect taxes that contribute to a capital reserve
- The RDOS does not have a long-term capital plan or a Development Cost Charge Bylaw that allows it to obtain capital contributions from developers

Areas Occasionally Affected by Odour





The Bottom Line

Life-Cycle Costs for Options #6 and #7

Option	Capital Cost (2005 $)	Annualized O&M Cost (2005 $)	Life-Cycle Cost (2005 $)	Life-Cycle Cost Rank
Option 1: Oxidation Ditch at Existing STP	3,530,000	304,000	7,870,00	10
Option 2: Oxidation Ditch at RI Site	3,880.000	304,000	8,180,000	9
Option 3: Activated Slude at Existing STP	4,040,000	371,000	9,340,000	6
Option 4: Activated Sludge at RI Site	4,380,000	372,000	9,720,000	4
Option 5: Activated Sludge Nr Weyerhauser	4,730,000	372,000	10,020,000	3
Option 6: BNR (Tertiary) Plat at Existing STP	4,620,000	384,000	10,130,000	2
Option 7: BNR (Tertiary) D/S of Existing STP	5,230,000	384,000	10,650,000	1
Option 8: Fixed Film (RBC) at RI Site	4,350,000	306,000	8,610,000	8
Option 9: Fixed Film (RBC) Nr. Weyerhauser	4,570,000	306,000	8,790,000	7
Option 10: Primary at Existing STP & Secondary at RI Site	3,980,000	374,000	9,420,000	5

Life-cycle costs are the cumulative capital and operating costs of the treatment plant throughout its design life.

User Fees

A financial model was created by Earth Tech to calculate user fees for Options #6 and #7 under two funding scenarios: 1) with two-thirds funding from senior governments; and 2) with no funding from senior governments. The calculations assume that development cost charges for new connections would finance about 30 percent of capital costs, and that capital costs would be financed over 20 years at the current Municipal Finance Authority interest rate of five percent.

The fee increases are based on distributing costs over the current population. However, significant development is expected over the next three years, which will result in an increased population and, therefore, lower annual fees.

	For average single-family home		
	Existing annual fees	Annual increases	Annual totals with increases
Option #6 without government funding	$285	$312	$597
Option #7 with 2/3 government funding	$285	$82	$367
Option #7 without government funding	$285	$345	$630
Do nothing but build capital reserves	$285	$150	$435

Frequently Asked Questions

What follows are answers to questions you may have about the proposed wastewater treatment upgrade. For more information please contact RDOS Engineering Services at (250) 490-4135.

What is wrong with the existing wastewater treatment plant?

The existing plant has reached, and often exceeds, its intended capacity of 750 cubic metres per day Current and future development planned for the next five years is expected to generate an additional 400 cubic metres per day. Even a modest annual growth rate of two percent would increase required capacity to 1,500 cubic metres per day by 2025.

Why should the wastewater treatment plant be moved?

In the short term, to minimize nuisance complaints about odour, noise, and traffic. In the long term, to provide expanded capacity for growth in Okanagan Falls and surrounding areas (e.g. Skaha Estates and Kaleden).

Why is Option #7 preferred over Option #6, even though it's more expensive?

Option #6 — which involves construction of a BNR (biological nutrient removal) plant at the existing site —doesn't address nearby residents' concerns about odour, noise, and traffic. Option #7 — which comprises a BNR plant downstream of the existing site — addresses residents' concerns and provides for greater capacity over the long term and expansion to outlying areas such as Skaha Estates and Kaleden. Option #7 is also a better choice environmentally, as effluent can be discharged into man-made wetlands that will enhance treatment and provide wildlife habitat.

Who will decide which option is chosen?

The Wastewater Advisory Committee will make a recommendation to the RDOS Board after receiving input from residents at the open house June 22nd and from the enclosed survey. The RDOS Board will then decide how to proceed.

Who will pay for the wastewater treatment upgrade?

Because of its environmental benefits, Option #7 is more likely to be eligible for senior government funding than Option #6. If Option #7 is the preferred option — as indicated by residents at the open house and from the survey — the RDOS will apply for an infrastructure grant from the federal and provincial governments. If funding is secured, two-thirds of the $5.2-million capital costs would be covered by the grant. Developers would fund the remaining one-third of capital costs through DCCs (development cost charges) on new connections. Existing users would fund increased operations and maintenance costs through their sewer fees. With funding, the average annual increase would be about $82 per residential connection. Without funding, the average annual increase in parcel taxes and user fees would be about $345 per residential connection.

Why must we wait until 2008 to proceed with Option #7?

Before commencing with the upgrade, the RDOS must identify the most appropriate site; hire an engineering firm to prepare final designs and specifications; and amend its land-use designations, Liquid Waste Management Plan, and Operating Permit. The RDOS must also create a development cost charge bylaw to help cover the upgrade's capital costs.

Could an upgrade be staged to spread the costs out over a longer period?

In the absence of adequate capital funding from senior governments, a lower-cost fallback option could be considered. Existing infrastructure could be enlarged or replaced in a step-wise fashion, as funds permit. As this approach may not be eligible for senior government funding, the ultimate cost to residential connections may be somewhat higher than either Option #6 or Option #7.