Agricultural Metering Program Review
And
Metered Rate Options

Internal Report

South East Kelowna Irrigation District
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Introduction

The South East Kelowna Irrigation District encompasses twenty-two percent of the area of the City of Kelowna. It is mainly rural agricultural with about 1,700 domestic connections and over four hundred irrigation connections. The annual average water consumption is around 9,600 acre feet, of which over eighty percent is used for agricultural purposes.

The financial advantages of an effective water conservation program for water utilities are well known. Lowering water demand can avoid, postpone or reduce the capital costs associated with upgrading pipeline infrastructure, sizing water treatment facilities and augmenting water supply capability. While there are many successful examples of water use efficiency programs for commercial, industrial and domestic use, the same is not true for agricultural water use.

In 1994 the Board of Trustees of the South East Kelowna Irrigation District embarked upon metering program for all irrigation connections in the district. The program was highly controversial among the agricultural community, largely due to the fear that metering would lead to higher water costs.

A number of factors contributed to the board's decision to proceed with metering. These included limited and expensive options to increase the water supply to the district (new reservoirs), the availability of senior government grants for the metering project and favorable results from a pilot metering program that had been initiated in 1990. To allay the fears of the agricultural community at the onset of the program in 1994, the trustees made the commitment to the landowners that no metered rate for water would be implemented for a minimum of five years, if at all – the meters would be used as a tool to measure, learn and educate landowners about agricultural water use.

This unique educational approach has proven highly effective for the majority of landowners with metered irrigation connections. Efforts to collect analyze and provide water use information and advice to landowners about their water use have resulted in the district realizing a ten percent savings in the overall annual water demand of the district. A small percentage of landowners continue to use a disproportionate amount of water, however, and the board has directed district staff to provide options for how a metered rate could be applied that would discourage excessive water use.

This report will provide a brief review of the metering program to date, look at the financial implications of the metering program and provide the board with options to consider for implementing a metered rate for excessive water use.

Metering Program Summary

Funding assistance for the metering program was received from the Canada-BC Green Plan for Agriculture. Technical assistance in irrigation scheduling, data collection/management and field day seminars was received from the staff at the Ministry of Agriculture (MOA). The Green Plan aspect of the program involved a five year cooperative commitment between staff from senior levels of government and SEKID.

Unless indicated otherwise, all quotes on program costs relate to the five year period of the formal Green Plan program from 1994 to 1998.

Implementation

Over 400 irrigation meters were installed in 1994 and 1995 on all properties in the district with separate irrigation water services. The total cost of installation including materials, equipment and labour amounted to $606,000.

Irrigation Scheduling

Considerable effort was put into educating growers to use irrigation water efficiently. Each property in the district that was metered was also provided with a set of two tensiometers. These are devices that indicate the soil moisture and help to determine the best time to irrigate. For many growers in the district irrigation scheduling was viewed as a function of convenience or scheduling labour and not as a water use efficiency process – the tensiometers were provided as a tool to help determine soil moisture levels and actual crop moisture requirements. Several field days were held over the course of the program to promote the use of tensiometers and other irrigation scheduling techniques.

Additionally, eight growers in the district participated in a pilot project managed by the Ministry of Agriculture designed to track water requirement versus actual water use. This program showed there was considerable opportunity for water savings during the spring and fall. Irrigation systems are designed to provide for water requirements during the peak season and many systems are operated at full capacity regardless of seasonal demand. This, of course, results in over watering.

The total costs of materials, equipment and labour for the irrigation scheduling from 1994 to 1998 amounted to $118,500.

Data Management

The basic data management aspect of the program was reading meters and tracking water use. This information was collected monthly and determined the irrigation water demand of the district.

Concurrent with this was a MOA initiative to determine the actual water use requirement of the district. This was done by collecting data from each property on crop, irrigated area, soil type and irrigation system. Climate information was collected from a weather station at the district yard. From all of this information the estimated water requirement of all the irrigated acreage in the district could be calculated for a given period of time.

Monthly water use reports were generated using the information described above. Each property in the district was provided with a report indicating the amount of water used, the estimated water use requirement (i.e. how much water should have been used) and the difference between the two (see Appendix 1). This information was intended to inform and educate the property owner to irrigate more effectively. In most cases water use was higher than the calculated requirement, but in some cases water use was lower than the

estimated requirement. These detailed water use reports were provided each year through to the end of the irrigation season in 2000.

The cost of collecting, analyzing and sending out water use reports was $60,000[1].

Project Cost Summary

The project cost summary for the period 1994 to 1998 was as follows:

1.	Meter Installation	$606,000
2.	Irrigation scheduling	118,500
3.	Data management	60,000
	Total:[2]	$784,000

Results

The metering program provided the district with the unique opportunity to do a detailed review and analysis of the water demand of the district. The year 1998 was the highest demand year on record and this provided the unique opportunity to determine the drought year water requirement of the district with a high degree of accuracy.

The drought year water requirement is critical in estimating the water supply requirements of the district during drought conditions. Water systems are designed to provide adequate water supply through all but the more severe and extended drought conditions. Water demand is expressed as a volume of water per unit of land area (i.e. acre-feet[3] of water per acre of land). The ability to service additional lands requires that adequate water supply is available to do so. This is determined by dividing the per acre demand of the service area into the long term dependable water supply sources of the district. The less water needed to service an acre of land, the more water is available to service additional lands.

Once the demand is known the status of the district water supplies can be analyzed to determine if they are adequate to provide for the demand requirements of the district. Of course, the benefit of water conservation is that it lowers the per unit demand for water and enables more land to be serviced with the same volume of water. The 1998 season provided the opportunity to compare actual water demand against the estimated demand of the system when it was originally engineered. If it could be demonstrated that the actual demand was lower than the original estimate, this would have the same effect as increasing the district supplies by developing new supply sources.

The original per unit design of the system was 2.50 acre-feet of water per acre of land. The 1998 analysis showed the actual demand figure was 2.25 acre-feet/acre – a savings of 10% from original design demand. The metering program was likely responsible for a large portion of this water savings. There is no question, however, that advances in

[1] This includes MOA costs of $37,265 to develop the Water Use Reporting and Land-use Database (WURLD) software.
[2] Total includes the Canada-BC Green Plan for Agriculture grant of $204,358.
[3] One acre-foot of water is the equivalent of one acre of water one foot deep, which is also equal to 325,854 U.S. gallons or 271,334.8 Imperial gallons, or about 1,027 cubic meters.

irrigation system efficiency, high density orchard plantings and other horticultural practices also contributed to greater water use efficiency.

In terms of the supply/demand equation of the district this 10% savings had the following effect on the district's calculation of surplus water supply:

Water Supply and Demand (1998)

	2.50 acre-feet/ acre (old)	2.25 acre-feet/ acre (new)
Dependable water supply[4]	13,324	13,324
Drought year water requirement (5,322 acres of land)[5]	13,305	11,975
Surplus/(deficit) acre-feet	19	1,349

Under the old demand figure the district had a surplus of 19 acre-feet of water, which would be adequate to provide water for an additional 7.6 acres of land (19 acre-feet/2.5 acre-feet per acre = 7.6 acres). Under the new demand figure the district had a surplus of 1,349 acre-feet of water, which is adequate to supply water to an additional 600 acres of land (1,349 acre-feet/2.25 acre-feet per acre = 600 acres).

Benefit/Cost Analysis

To get a better understanding of the financial implications of the metering program it is useful to look at both the cost of implementing the program compared to the value of the surplus water created and then provide a comparison to another project that could be developed to create surplus water supplies.

As referenced above, the total cost of the metering program amounted to $784,000. The volume of water saved through the metering program and other water use efficiencies totals 1,349 acre-feet. The per acre-foot cost to 'develop' this water is calculated by dividing the cost by the volume of water: $784,000/1,349 acre-feet = $581 per acre-foot.

To determine the value of the benefit of the water it must first be determined how many acres of land can be provided with water and then the revenue from the sale of water rights can be determined. As referenced above, one acre of land has a drought year water requirement of 2.25 acre-feet of water. To determine how many acres of land can be provided, the total water available must be divided by 2.25: 1,349 acre-feet of water/2.25 acre-feet per acre of land = 600 acres. In 1998 water rights for one acre of land could be purchased from the district for $2,000. The value of the surplus water is determined by multiplying 600 acres of water rights by $2,000 per acre for a gross benefit of $1,200,000. The net benefit is equal to $416,000 for a benefit to cost ratio of 1.5:1 ($1,200,000/$784,000).

[4] Source: Ministry of Environment hydrology report – this 1979 watershed analysis determined the watershed could reliably supply this volume of water through two consecutive one in ten year drought sequences, which has a 0.49 probability of happening once in thirty years. This figure also includes supply from groundwater.

[5] Water rights are required to use water on land in SEKID and this figure is the acreage of water rights outstanding in 1998 and represents the land area the district was committed to serving at that time.

The next most viable option the district has for augmenting water supply is the Turtle Lake Reservoir Project. The total capacity of the reservoir is 1,700 acre-feet, but, because of watershed limitations, the dependable supply is reduced to 680 acre-feet. The estimated cost to complete the project (1999) is $870,000. Using the same calculation as above, the per acre-foot cost to develop this water supply is: $870,000/680 acre-feet = $1,280 per acre-foot.

The value of the benefit created is calculated as above. The area of land that could be provided with water is 680 acre-feet/2.25 acre-feet per acre of land = 302 acres. The value of water rights for this land is 302 acres X $2,000 per acre = $604,000. The net benefit to the district is -$266,000, for a benefit/cost ratio of 0.69/1.

The following table summarizes the information presented above:

Description	Metering	Turtle Lake
Program Cost	$784,000	$870,000
Program Benefit (value of water rights)	$1,200,000	$604,000
Net Benefit	$416,000	-$266,000
Benefit/Cost Ratio	1.5:1	0.69/1
Cost per acre-foot	$581	$1,280

In this instance, the benefits of water conservation were greater than those of an alternative capital project that would increase water storage and supply capacity. Each water system is unique in terms of the options available for conserving water and the costs of augmenting water supply by other means. Clearly, in this instance, the benefit of water conservation had advantages over the other available option.

Metering Program Phase 2

The formal Canada-BC Green Plan for Agriculture metering program agreement concluded in 2000. A final report was prepared by the staff at the Ministry of Agriculture and there was general agreement that the program was a success. It was at this stage of the evolution of the metering program that a new approach or phase was begun.

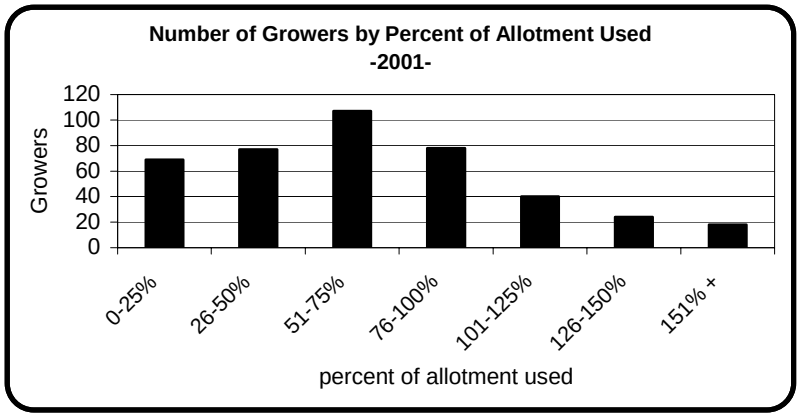
From SEKID's point of view, in addition to saving water, the meters provided many side benefits. These include the ability to detect leaks in private irrigation systems, fairly allot water during water shortages and insure individuals stay within the flow allotment for their property[6]. There was general agreement among board members that the benefits of water conservation combined with these additional benefits made it worthwhile to continue the metering program. The wisdom of this decision became apparent in the following 2001 irrigation season, which provided the district with a new focus for the metering program.

[6] Each property is allowed a maximum flow rate that is calculated using soil type and area of water rights.

Metered Irrigation Service Allotments

The snow pack, stream flows and groundwater levels in the spring of 2001 were at or below record levels. It was soon apparent the district could be facing water shortages for the coming season. In April the board proactively implemented water restrictions on all irrigation and domestic connections in the district. Domestic connections had sprinkling restrictions imposed and irrigation connections were provided with an allotment of water that was 80% of the drought year requirement of 2.25 acre-feet per acre, or 1.8 acre-feet per acre. Notices of the restrictions were mailed to all landowners in the district and the spring newsletter featured extensive coverage of the issue (see Appendix 2). In June of 2001 the district's main reservoir did not fill for the first time in over thirty years. The district wells were operated to supplement the surface water supply.

Fortunately, 2001 proved to be a low demand year with considerable rainfall over the summer months. By early August the surface water supplies had returned to normal levels and the watering restrictions on irrigation services was lifted. Despite lifting the restrictions more than two months before the end of the irrigation season, almost eighty percent of those who used irrigation water used less than their allotment. The following graph shows a breakdown of water users by percent of allotment used.

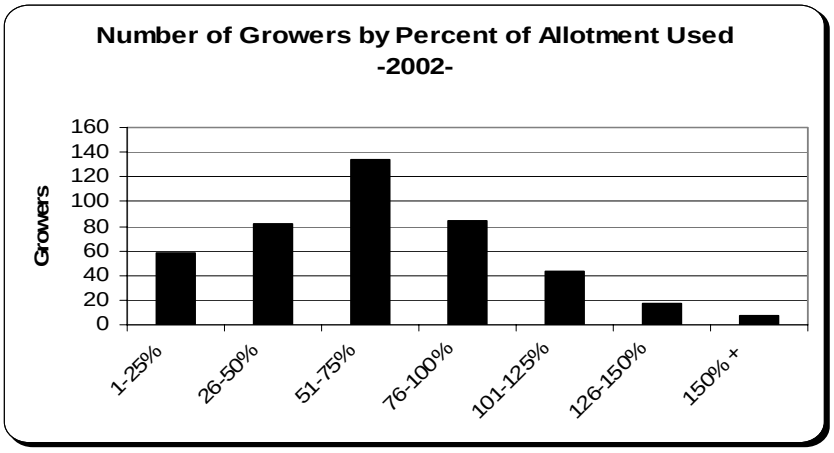


Clearly the majority of growers had adopted the concept of efficient water use. For some however, particularly those using over 150% of their allotment, it was apparent the message was not getting through. The highest ten water users were contacted the following fall and winter by mail and telephone to discuss water use and solicit agreement from them to practice efficient water use.

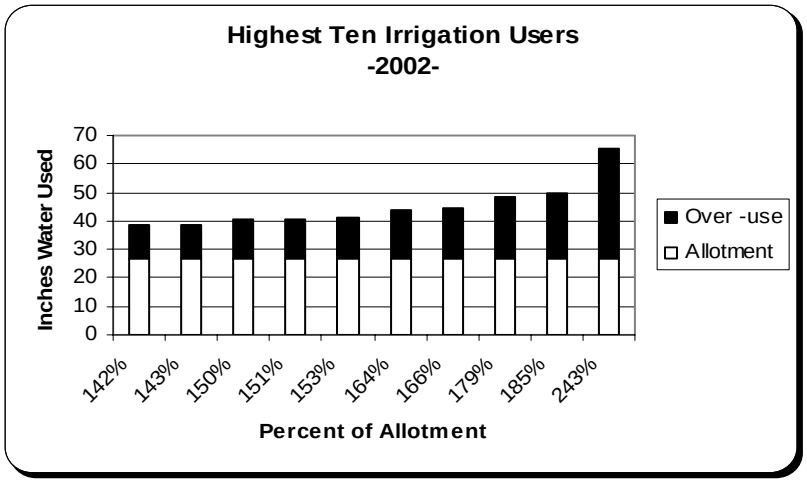
The fall and winter of 2001/2002 provided ample precipitation to replenish surface water supplies. It was apparent no water shortages would be forthcoming for the irrigation season and the board determined the normal drought year requirement of 2.25 acre-feet per acre of water rights would be a suitable allotment for the coming year. Notices of the restrictions were again mailed to each landowner and the spring newsletter featured similar coverage to the previous year. Landowners were also advised it was a violation of district bylaws to exceed the allotment and to do so could result in an interruption of service and fine.

The summer and fall of 2002 was above average for demand. Despite the hot and dry conditions, the majority of landowners again were able to stay within their allotment and most of those who could not, did not use considerably more than their allotment. A handful of growers continued to ignore the allotment, however, and made little if any

effort to practice efficient water use. The following graph shows a breakdown of water users by percent of allotment used.



A total of 65 landowners exceeded their allotment. As the graph illustrates, a breakdown of this group shows the majority of those who exceeded their allotment, forty-three, were in the range of 101-125%; 17 were between 126-150%, and; eight were over 150% of their allotment. The water use allotments were based on 2.25 acre-feet of water per acre of water rights, which is the equivalent of 27 inches of water over the irrigated area. The following graph presents a breakdown of the highest ten irrigation users and the percent of their allotment used for the 2002 irrigation season.

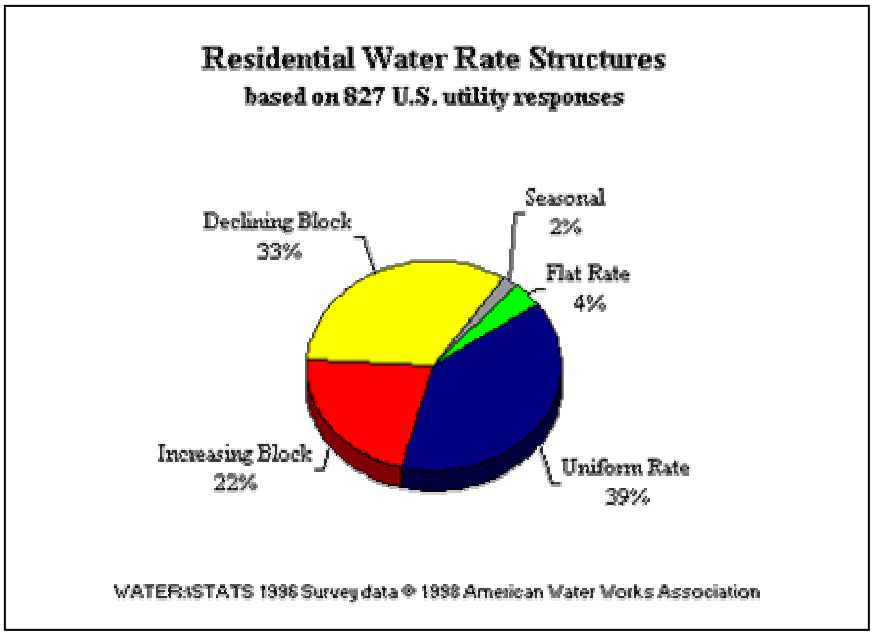


The prescribed penalty under the district's irrigation bylaw is shutting off the water service and requiring payment of a one hundred dollar fee to turn the water back on. This was done to all services that exceeded their allotment. The fairness of this system came under scrutiny by the board because it applies the same penalty regardless of whether the over use is one gallon or one million gallons. In light of this inequity, the board requested staff to provide options for applying a metered rate for water use in excess of the allotment.

Metered Rate Structure Options

In establishing and making recommendations about options for water rates for excessive agricultural water use, it is natural to look for guidance at what other jurisdictions have done. The SEKID irrigation metering program, however, is one of very few metering programs for agricultural water use in Canada. It may, in fact be the only such program in the country.

The options for approaching the rate issue can be demonstrated by the following graphic, which looks at the type of rate structures in use in the U.S. for domestic water. Only 2% of the utilities in this survey imposed seasonally adjusted rates and 4% charged a flat rate. 39% charged a uniform rate no matter how much water was used, while 33% charged a declining block rate and 22% charged an increasing block rate. Increasing and declining block rates break down the rate charged for water into blocks or volumes of water for which the unit rate either increases or decreases as consumption increases. For example, an inclined block rate might charge $5.00 per cubic meter for the first ten cubic meters and $6.00 per cubic meter for the next ten cubic meters.



Recommendation for rate structure

The recommendation for a rate structure is the increasing block rate structure. The purpose of charging a metered rate is to deter excessive water use. An increasing block rate will act as a deterrent by increasing the unit rate for water incrementally with increased water use. There would be no charge for the initial allotment[7] and a metered rate would only be calculated and charged for properties exceeding their allotment.

Rate Options

Rate options are clearly discretionary and the options presented are intended as a guide for the board to use in determining an appropriate rate. The underlying assumption in presenting these rates is an understanding that in high demand years it is inevitable that some properties may exceed their allotment despite their best efforts to conserve water. In view of this, consideration could be given to an increasing block rate that is minimal for those who just exceed their allotment and increases with each successive block.

Three options are presented to provide an array of examples of the type of rates that can be applied. The options are endless and these examples are provided to illustrate the impact of this rate structure. The blocks for which each rate applies are arbitrarily divided into increments of 10% of the allotment – these increments can also be changed. Ten

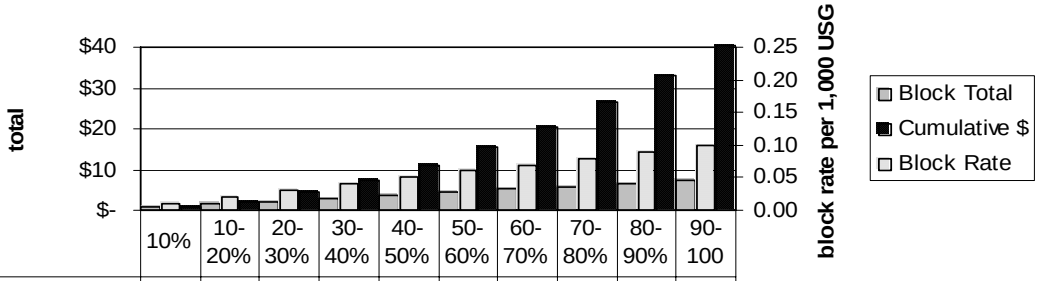
[7] Other than the normal tax rate assessed on the property for water rights, which simply allows water use and is separate from any allotment the board is entitled to determine from time to time.

percent increments were used because it provides a reasonable degree of flexibility in dealing with the range of over use we have experienced in the metering program in recent years. The rates are expressed in terms of $/1,000 USG (U.S. Gallons). These units were chosen because the district currently uses this ratio for commercial metered charges and because the irrigation meters measure USG. The rates used are:

	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Option 1 (rate per 1,000 USG)	**$0.01**	**$0.02**	**$0.03**	**$0.04**	**$0.05**	**$0.06**	**$0.07**	**$0.08**	**$0.09**	**$0.10**
Option 2 (rate per 1,000 USG)	**$0.10**	**$0.12**	**$0.14**	**$0.16**	**$0.18**	**$0.20**	**$0.22**	**$0.24**	**$0.26**	**$0.28**
Option 3 (rate per 1,000 USG)	**$0.10**	**$0.13**	**$0.16**	**$0.20**	**$0.25**	**$0.31**	**$0.38**	**$0.46**	**$0.55**	**$0.65**

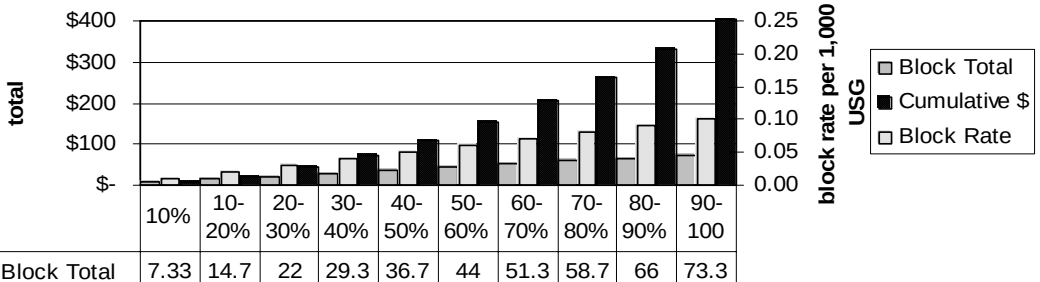
Two graph examples are provided for each rate. The first graph shows the rate applied on a per acre basis and the second graph provides the rate as it would apply to ten acres. The ten acre rate provides an example of the levy a typical mid-size orchard would receive under the different options. The data displayed on each graph includes the "block total", which is the fee for the block, the "cumulative $", which is a running total of the block charges and the "block rate", which is the rate per 1,000 USG presented in the table above. The allotment used is 2.25 AF per acre (about 733,000 USG).

Option 1 - per acre:
rate increases in 10% increments



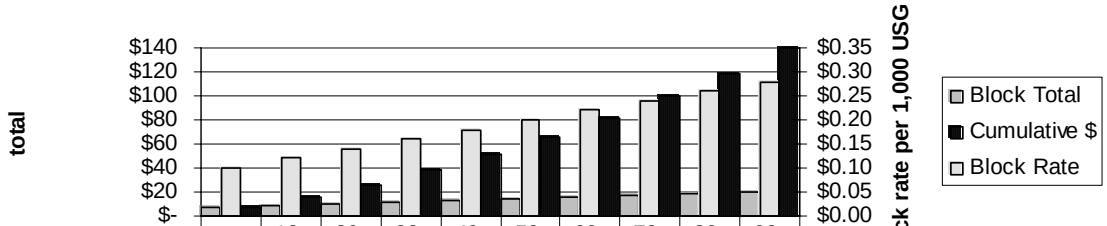
	10%	10-20%	20-30%	30-40%	40-50%	50-60%	60-70%	70-80%	80-90%	90-100
Block Total	0.73	1.47	2.2	2.93	3.67	4.4	5.13	5.87	6.6	7.33
Cumulative $	0.73	2.2	4.4	7.33	11	15.4	20.5	26.4	33	40.3
Block Rate	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10

Option 1 - 10 acres:
rate increases in 10% increments



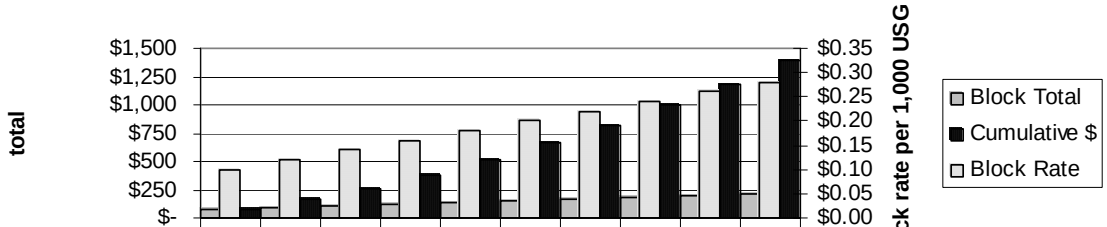
	10%	10-20%	20-30%	30-40%	40-50%	50-60%	60-70%	70-80%	80-90%	90-100
Block Total	7.33	14.7	22	29.3	36.7	44	51.3	58.7	66	73.3
Cumulative $	7.33	22	44	73.3	110	154	205	264	330	403
Block Rate	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10

Option 2 - per acre:
rate increases in 10% increments



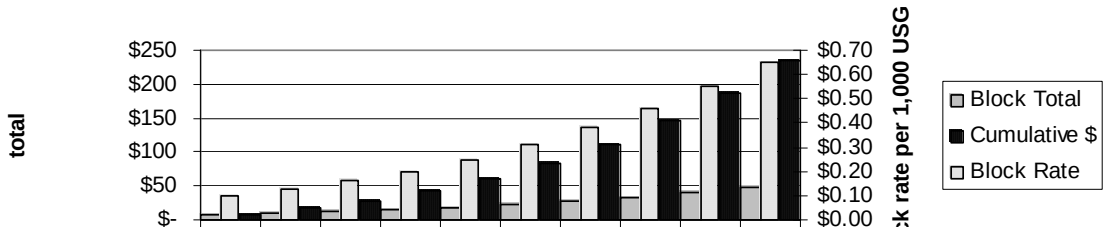
	10%	10-20%	20-30%	30-40%	40-50%	50-60%	60-70%	70-80%	80-90%	90-100
Block Total	7.33	8.8	10.3	11.7	13.2	14.7	16.1	17.6	19.1	20.5
Cumulative $	7.33	16.1	26.4	38.1	51.3	66	82.1	99.7	119	139
Block Rate	$0.10	$0.12	$0.14	$0.16	$0.18	$0.20	$0.22	$0.24	$0.26	$0.28

Option 2 - 10 acres:
rate increases in 10% increments

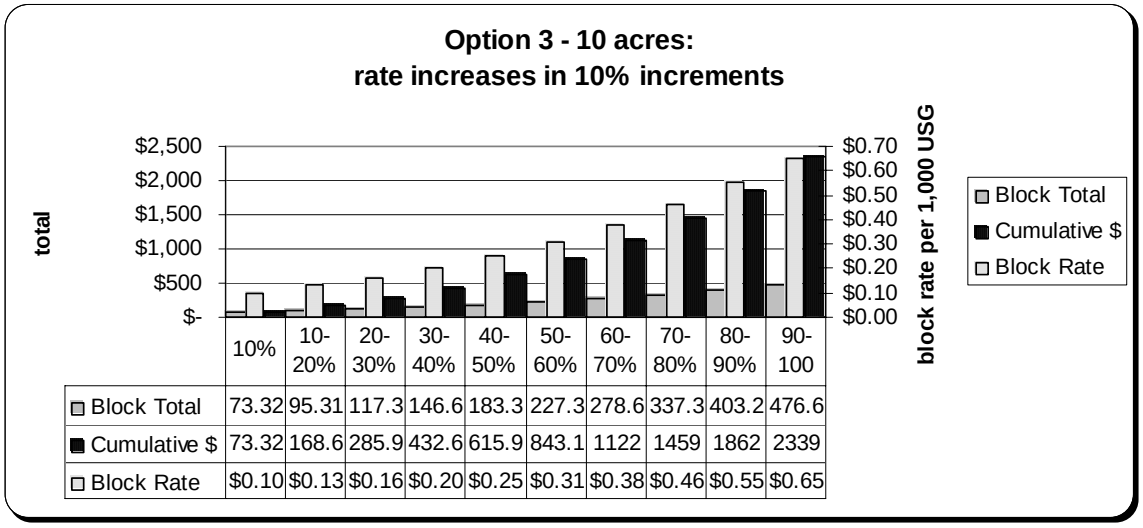


	10%	10-20%	20-30%	30-40%	40-50%	50-60%	60-70%	70-80%	80-90%	90-100
Block Total	73.32	87.98	102.6	117.3	132	146.6	161.3	176	190.6	205.3
Cumulative $	73.32	161.3	263.9	381.2	513.2	659.8	821.1	997.1	1188	1393
Block Rate	$0.10	$0.12	$0.14	$0.16	$0.18	$0.20	$0.22	$0.24	$0.26	$0.28

Option 3 - per acre:
rate increase in 10% increments



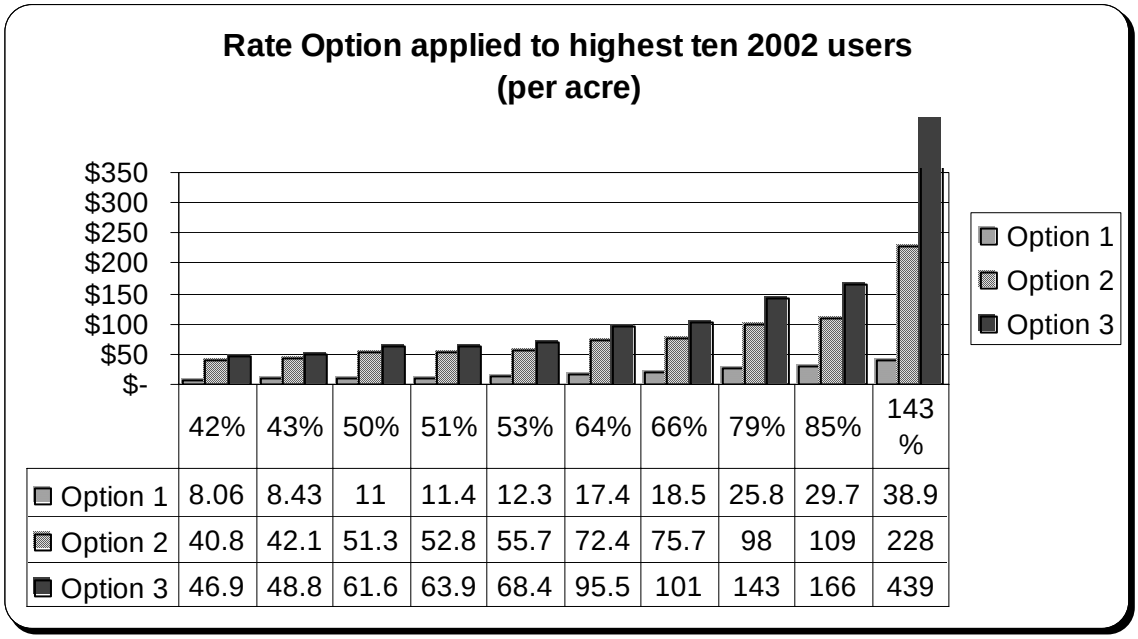
	10%	10-20%	20-30%	30-40%	40-50%	50-60%	60-70%	70-80%	80-90%	90-100
Block Total	7.332	9.531	11.73	14.66	18.33	22.73	27.86	33.73	40.32	47.66
Cumulative $	7.332	16.86	28.59	43.26	61.59	84.31	112.2	145.9	186.2	233.9
Block Rate	$0.10	$0.13	$0.16	$0.20	$0.25	$0.31	$0.38	$0.46	$0.55	$0.65



	10%	10-20%	20-30%	30-40%	40-50%	50-60%	60-70%	70-80%	80-90%	90-100
Block Total	73.32	95.31	117.3	146.6	183.3	227.3	278.6	337.3	403.2	476.6
Cumulative $	73.32	168.6	285.9	432.6	615.9	843.1	1122	1459	1862	2339
Block Rate	$0.10	$0.13	$0.16	$0.20	$0.25	$0.31	$0.38	$0.46	$0.55	$0.65

Option 1 presents a conservative rate. Someone exceeding their allotment by 50% would be charged $11.00 per acre, or $110.00 for a ten acre orchard. Option 2 presents a more aggressive rate and the comparable figures would be $51.30 per acre or $513.20 for ten acres. Option 3 provides a more aggressive rate still and instead of a linear increase with each block, the rate increases elliptically. A 50% overuse levy would amount to $61.59 per acre or $615.90 for ten.

The following graph applies these three rate options to the ten highest irrigation users from the 2002 season:



	42%	43%	50%	51%	53%	64%	66%	79%	85%	143%
Option 1	8.06	8.43	11	11.4	12.3	17.4	18.5	25.8	29.7	38.9
Option 2	40.8	42.1	51.3	52.8	55.7	72.4	75.7	98	109	228
Option 3	46.9	48.8	61.6	63.9	68.4	95.5	101	143	166	439

The data represented is for a single acre of water rights and the actual levy charged would be multiplied by the number of acres of water rights of each property.

Bylaw considerations

If the board should decide to bring a metered rate into effect it will be necessary to amend the district's *Irrigation Water Distribution and Regulation Bylaw.*

Section 6 of that bylaw currently reads:

> 6. (a) No person shall apply irrigation water to the land of any single parcel, or multi-parcel irrigation unit, at a rate in excess of the flow rate established for that land.
>
> (b) The Trustees may require the installation of a flow control device or devices on any irrigation water service or private irrigation system to ensure that water is not applied in excess of the established flow rate and the cost of such device or devices shall by paid by the owner of the irrigation system affected.
>
> (c) No person shall apply irrigation water to the land of any single parcel, or multi-parcel irrigation unit, in excess of the volume established for that land on the current Assessment Roll of the District. The Trustees shall cause the service connection to the land to be shut off when the volume established for that land on the current Assessment Roll of the district has been used.
>
> (d) Notwithstanding 6. (c), the Trustees may at any time introduce regulations restricting the use of water for irrigation or any other purpose. Upon receiving due notice of such restriction, no person shall use water for the purpose forbidden by, or in excess of the limits imposed by, such restriction. Due notice of restrictions shall be given either by publication in a newspaper circulating within the District, by broadcast on local radio stations or by mail.

The above section should be amended to clearly allow the board to impose allotments on land serviced with irrigation connections and grant the ability to charge a metered rate on excess water use. The rates adopted by the board could be appended to the bylaw as a schedule and, if necessary the schedule could be amended in future without necessarily amending the main body of the bylaw. There are also several other minor revisions and updates to this bylaw that could be done at the same time.

Conclusion

Many would agree that a look back at the agricultural metering program shows the initially contentious and controversial program has proven to be very useful and beneficial. It has contributed to the conservation of our most valuable resource and was found to be a useful operational tool for a number of applications, several of which were

not envisioned at the onset of the program. The program has also proven to have been a worthwhile investment of the district's resources and has provided not only a good financial return, but, more importantly, has enhanced the district's water resources.

Whether to charge a metered rate for excessive water use will be a difficult decision for the board to make. We are now entering our ninth year of the program and there are very few other tools available to discourage excess use that have not already been used.

The district's on going educational effort to promote efficient irrigation practices and provide information about water use has been highly effective. Water use data indicates the majority of landowners appear to understand and appreciate the benefits of efficient water use and are willing to practice water conservation. This may become increasingly important in the event of any disruption to our water supply through regulation, climate change, or other unforeseen causes. While no apparent threat is imminent, the metering program could prove to be an invaluable tool should such an event occur.

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Appendix 1: Water Use Report (1997)

South East Kelowna Irrigation District

Irrigation Monitoring Program
Water Use Report

Water use report for the month of: _____, 199_.

The South East Kelowna Irrigation District is monitoring water use on all irrigated lands in the district. This water use report is intended as a guide to assist you in evaluating your irrigation practices. The report provides you with three key pieces of information:

1. Your water use for both the month and year to date.
2. The district's estimate on what your water requirements were for the month and year to date. (This estimate is based on crop type(s), irrigation system(s), soil(s) and weather.)
3. The average water use for the month and year to date of a peer group with similar crops, irrigation systems and soils to your own.

Our records show the following information for your property. If this information needs to be updated, please contact the district office (861-4200).

Property Owner: _____
Property description: _____
Irrigated area in acres/hectares: _____
Primary land use: _____
Primary irrigation system: _____
Primary soil type: _____
Estimated drought year water requirement: _____

Water Use:

	Your water use: volume		Water use: depth	
	US gallons	cubic meters	inches	mm
Current Month				
Year to Date				

Water Use Compared To Estimated Requirement:

	Your actual water use		Estimated water req.		Over/Under estimate	
	inches	mm	inches	mm	inches	mm
Current Month						
Year to Date						

Water Use Compared To Peer Group Use:

Number of irrigation users in your group: ____

	Your actual water use		Peer group average		Over/Under peers	
	inches	mm	inches	mm	inches	mm
Current Month						
Year to Date						

Appendix 2: Public Information Samples (2001)

South East Kelowna Irrigation District

Water Use Restrictions In Effect

The Board of Trustees of the South East Kelowna Irrigation District has determined that water use restrictions will be implemented immediately throughout the district and remain in effect until further notice. The restrictions are necessary due to a potential water supply shortage resulting from an abnormally low snow-pack this past winter.

The restrictions affect all irrigation, domestic and commercial water connections in the district as follows:

Metered Irrigation Services:

Metered irrigation services are entitled to 1.8 acre-feet (586,530 US gallons) per acre of Grade A, B or D water rights. The district will provide notice by mail to each landowner with a metered irrigation service as to what the allotment for their property is.

Landowners are encouraged to monitor their own water use by monitoring the water meter at the irrigation connection for their property. The meter is a tool that the grower can use to prioritize water use. The district will monitor water use and service will be discontinued once the allotment has been supplied.

Domestic and Commercial Services

The irrigation of grounds from a domestic or commercial water service is restricted as follows:

1) That odd numbered street addresses are restricted to watering on Tuesdays, Thursdays and Saturdays,
2) That even numbered street addresses are restricted to watering on Wednesdays, Fridays and Sundays,
3) That watering from in-ground automatic sprinkler systems is only allowed on watering days between the hours of 12:00 midnight to 6:00 AM,
4) That watering by hose is only allowed on watering days between the hours of 6:00 AM and 10:00 AM and between 7:00 PM and 10:00 PM.
5) Swimming pools must be filled prior to May 1, 2001.

P.O. Box 28064, RPO East Kelowna, 3235 Gulley Road, Kelowna B.C. V1W 4A6
Phone: (250) 861-4200, Fax (250) 861-4213

Frequently Asked Questions

1) Why are water use restrictions necessary?

   A number of key indicators are currently at or near record lows for this time of year including: snow pack, groundwater levels and base stream flows. Unless precipitation is considerably above average and or water restrictions are put in place, there will be water shortages. If this year is followed by another dry year, then water shortages will be extreme.

2) Why is the allotment for metered irrigation services 1.8 acre-feet per acre?

   The 1998 irrigation season was the highest demand season the district has had. The water use averaged 2.25 acre-feet per acre for the year. The amount of 1.8 acre-feet per acre was chosen because it is 80% of this "drought" year figure. This amount will be an adequate conservation target if the district has an average water demand year. Water supplies will be monitored carefully and additional conservation measures taken if required.

3) How can I cut back on water use in my orchard?

   1) An irrigation scheduling pilot program in the district showed that about 25% of spring irrigation is not needed. 2) Check for leaks in your irrigation system and avoid watering roads and when it is too windy. 3) By carefully monitoring soil moisture levels throughout the year additional water savings can be realized. All growers in the district received irrometers to measure soil moisture – please contact the district if you need help installing your irrometers. 4) Consider shortening set times – for example, reducing set times from 12 to 8 hours will result in a 30% water savings.

4) How can I determine how much water I have used from my metered irrigation service?

   To determine how much water is used read the water meter before you start irrigation and then again at the end of irrigation. Subtract the start reading from the end reading to determine how much water was used. The district will also be sending out periodic water use reports.

5) Why is watering from domestic and commercial services being restricted?

   Research shows that about 80% of water use in the summer is outside of the home. Restricting domestic and commercial landscape irrigation can save a tremendous amount of water.

6) I have an automatic in-ground system. What do I have to do to comply with the watering restrictions?

   You have to set the clock or timing device for your irrigation system so that it will only come on between the hours of 12:00 midnight to 6:00 AM on those days you are permitted to water. Timers must be set for a maximum of 30 minutes per zone.

7) How else can I save water outside the home?

   1) Sweep driveways and sidewalks instead of hosing them off. 2) Shut off your automatic irrigation system if it's raining. 3) Use a spring loaded, auto-shutoff nozzle on your hose to limit water waste when washing your car or hand watering shrubs and trees. 4) Check your in-ground irrigation system for leaks and repair immediately. 5) Make sure that sprinkler heads are not watering pavement or sidewalks 6) Do not over-water lawns and shrubs. 7) Use mulch in flowerbeds and around shrubs and trees to help retain soil moisture