City of Kelowna

Landscape & Irrigation
Guide to Water Efficiency


STEP 1: **SMART DESIGN**


STEP 2: **SMART SOIL & PLANTINGS**


STEP 3: **SMART IRRIGATION**


STEP 4: **SMART MAINTENANCE**

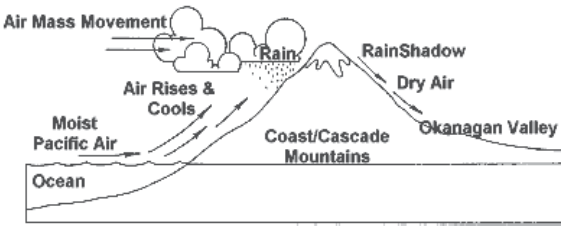
Landscape Water Use & the Environment

Why Reduce Landscape Water Use?

- Less than one per cent of the total water supply on earth is fresh water. Two thirds of it is groundwater and one third is surface water.
- Water use in Kelowna is, on average, more than four times greater in the summer months.
- Errors in design and operation of landscape installations often leads to inefficient water use.
- Residential water use far exceeds institutional, commercial and industrial use.
- Higher water consumption increases the demand for costly infrastructure. Water savings could allow the deferral of infrastructure investments.
- Using less water saves money.
- Better landscape techniques can reduce fertilizer and pesticide use and the need for maintenance.
- Reduced water use leaves more water in Okanagan Lake, aquifers and streams and supports the ecosystems that depend on it.

Our Natural Environment

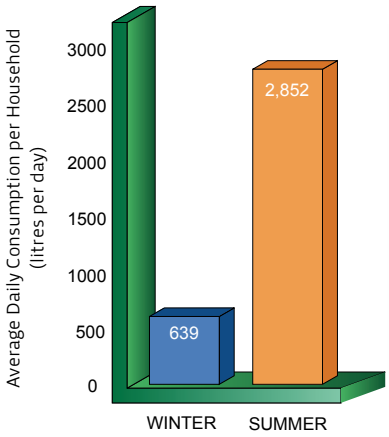
The Okanagan Valley lies in the rainshadow of the coastal mountains and receives minimal precipitation. Native plant communities in our region have evolved over thousands of years in response to the local climate, soils and terrain, and are well suited to very dry conditions. The best way to live within the means of Kelowna's local ecology is to mimic the low water demands of this native vegetation when designing, planting and maintaining a garden.



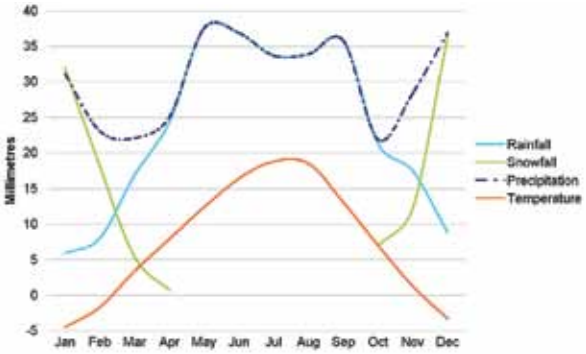
Climate Pattern & Irrigation Need

Kelowna's precipitation rates are low and consistent throughout the year. Much of the Okanagan Lake, stream and groundwater supply comes from spring snowmelt. Summer irrigation needs are driven mainly by higher temperatures.

Seasonal Water Use Per Household



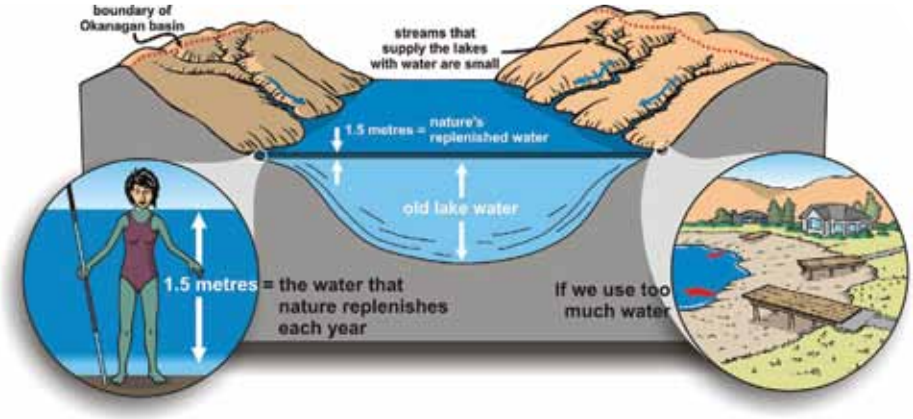
30 Year Average Climate Normals
(Environment Canada)



Winter water use in Kelowna is 639 litres per household, per day. In the summer, this more than quadruples to 2,852 litres per household, per day. Almost all of the increase is a result of outdoor landscape watering. It is estimated that as much as 50 per cent of outdoor water use is over and above that necessary to meet the objective of an attractive household yard.

Evaporation & Evapotranspiration

Although there may be a perception of water abundance because the vast Okanagan Lake is central to many views, the yearly resupply to our lake is minimal. It amounts only to the top 1.5 metres and much of this water evaporates during the hot summer months. Only 15 per cent of the total precipitation is available for human use. The rest of the water exits to the atmosphere through evaporation from the lake's surface and evapotranspiration from forests, grasses and crops. Any water that is used for agriculture or garden irrigation is quickly taken up by the plants and then by the surrounding air through transpiration. Minimal amounts of irrigation water infiltrates into the ground.



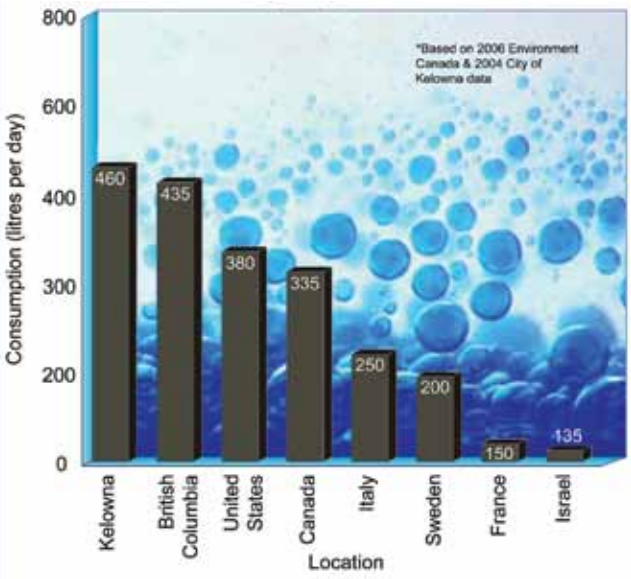
Aspect

Kelowna faces west and receives large amounts of sunlight from midday to early evening. Although preferable for picturesque sunsets and longer summer evenings, this western aspect increases evaporation and evapotranspiration losses.

Slopes & Soils

Kelowna has many uneven areas. Care must be taken when designing gardens and irrigation for sloped landscapes. A terraced design is preferred and irrigation zones with pressure regulation devices are needed to prevent downslope water losses. Soils in this region are well-drained and suited for agriculture and grazing. When designing gardens it's important to include a deep layer of absorbent soil with organic material that will help retain water for plants. Good soil texture with organic matter both in the soil and on the surface will provide erosion control.

Average Daily Domestic Water Use Per Person



The average daily water use per person in litres is 380 in the USA and only 135 in Israel. In Kelowna it is 460 litres per person, per day. Some European countries pay more than double for water what Canadians pay and use half as much.

Targets for Outdoor Water Conservation

In new developments, a 15 per cent to 30 per cent reduction in outdoor water use can easily be achieved by using the simple steps in this guide: Reaching this target is easy through a combination of good design, suitable soil and plants and appropriate irrigation and maintenance practices.

Image Credits:

- Derek Marcoux RPBio, Instructor, School of Renewable Resources, Selkirk College.
- 'Rainshadow' www.bcadventure.com/adventure/frontier/homestead/okan.htm
- 'ET' www.cimis.water.ca.gov/cimis/infoEtoOverviewPF.jsp

Landscape Design for Water Conservation

Step 1: Smart Design

The design of landscapes is the starting point to water conservation. Landscape design, whether generated by a landscape architect, contractor or homeowner, involves:

- **Site Analysis: Identify existing vegetation that could remain. Determine where slopes or drainage conditions will influence the site use and design. Be aware of the sun/shade exposure of different areas. Dig holes and analyze the native soil. Determine if you need to import growing medium – a mix of weed-free soil, compost and other additives.**
- **Site Schematic Concept: Prepare a diagram of proposed uses for your yard, such as driveways, decks, play areas, utility areas, existing vegetation areas and proposed planted areas. Identify required walkway connections. Be aware of underground utilities and required grading or terracing.**
- **Hydrozone, Planting and Soil Concept: Group planting areas into 'hydrozones' as you develop your plan. A simple diagram of yard zones with different watering needs is the key to effective outdoor water conservation.**

HYDROZONE LEGEND	
SYMBOL	CATEGORY
	HIGH WATER USE ZONE
	MEDIUM WATER USE ZONE
	LOW WATER USE ZONE
	UNIRRIGATED

Hydrozones

Hydrozoning divides a landscape into areas based on water needs: high, medium or low. Highly ornamental areas may warrant high water use. Areas of native plants may need no watering at all. When starting a landscape design, produce a sketch of the planned hydrozones. Group plants according to their water requirements, and sun and wind exposure. Once hydrozoning has been planned, watering systems can be designed to match.

High Water Use Areas

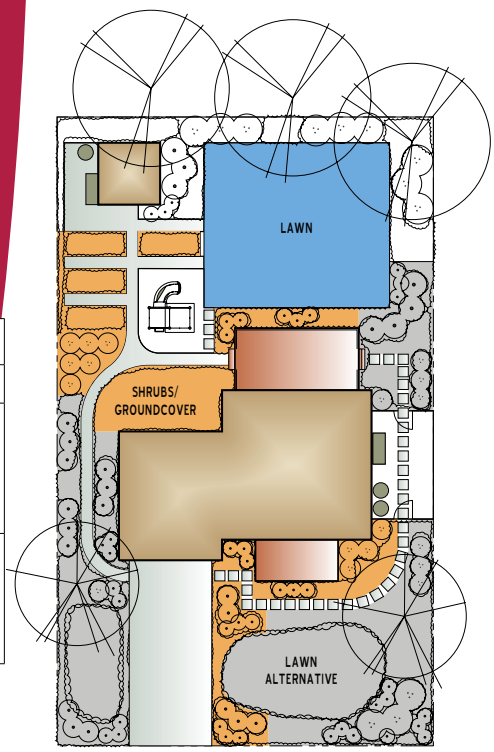
High water use areas include lawns and ornamental plants, perennials and annuals. These areas require more water and maintenance to keep them looking their best throughout the summer.

- Reserve highly visible areas for high-impact planting.
- Homeowners with children or pets may desire lawn to accommodate running and playing, but it is advisable to not over-plant lawn. Minimize manicured lawn areas and water use will fall dramatically.

Medium Water Use Areas

The plants in medium water use areas require less water in dry climates.

- Plants in these areas consist of shrubs or ground covers that require less water to keep them looking their best year round.
- This xeriscape landscaping can be attractive, both in the front yard and less visible areas.



- Only low water use irrigation is needed for these areas, such as low volume or drip.

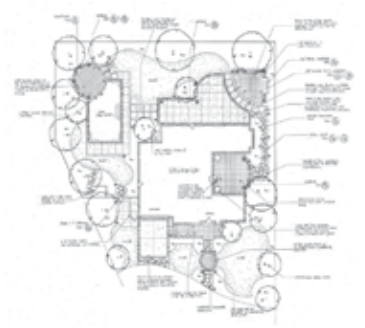
Low Water Use & Unirrigated Areas

These areas require little to no supplemental water once established. These include unplanted areas and places where native vegetation is established.

- Save areas of existing native vegetation.
- Preserve and protect natural features of the site like streams, natural drainage areas, riparian areas, landforms, rock outcroppings, hilltops, ridgelines and shorelines.
- Plant native vegetation or low-water need plants and water only for the first growing season until roots are established.
- Use permeable surfaces for driveways, walks, decks/patios and utility areas to allow natural seepage and filtration of surface water.
- Consider materials such as stone or organic mulch, pervious pavements or spaced wood deck, rather than plants requiring water.

Rather than large expanses of lawn, creative use of other hard and soft surfaces can create an appealing, Water Smart space.

A sloping site will have different drainage capacity than a flat surface.



By creating a landscape plan, you will be able to plan your garden use and water use at the same time.

Image Credits:

- 'Greenhill Propagation Nusery' by Vivid Design www.melbflowershow.com.au/highlights_2005_garden.asp
- 'South Hill Garden' www.myenglishgardener.com/tours
- 'Site Plan' by Arborealis arborealis.com/ConstructionDrawings/L1-Site-Plan.gif

Minimize turf areas

Lawn areas are the highest water user in the landscape and a manicured lawn requires far more time and effort to maintain than other forms of planting and ground cover. There are many alternatives to turf that can have an appealing appearance, reduced maintenance and require little or no watering. Consider the following lawn alternatives:

- ground cover planting
- meadowgrass / flowers
- cobble
- mulch
- crushed stone / gravel
- interlocking brick
- permeable unit paving
- decking

Slopes & Drainage conditions

The slope of the property will let a homeowner know where water will collect or run off. The tops of slopes are inherently drier than the bottom. Depending on the drainage of a site this may effect the landscape design and plant selection. Slopes also affect the exposure to the heat of the sun. Areas sloping to the north will be cooler and more shady than slopes facing south. Test the drainage of a site using the following steps:

- Dig a hole and fill it with water.
- If the water drains through immediately the soil is sandy.
- If the water remains in the hole overnight the soil is more clay based. Clay-based soils are more at risk of runoff if irrigation water is applied faster than it can soak in. Special irrigation heads that deliver water slowly are needed for clay soils.

Meeting a Water Conservation Target

To meet a target of 15 per cent to 30 per cent water use reduction compared to 'normal' outdoor practice, follow or combine these examples:

- Design 15 per cent to 30 per cent of the landscape area to not require watering (e.g. native landscape or non-plant mulch).
- Design to minimize turf areas – try less than 25 per cent of the landscape.
- Use large areas of low water use plants.
- Ensure growing medium depth and quality and provide mulch.
- Use high-efficiency irrigation and weather-based controllers.

These ideas are detailed in the following pages.

Soil & Plants for Water Conservation

Step 2:
Smart Soil & Plantings

Group Plant by Growing Requirements

All plants have an ideal growing situation. Group plants together with similar soil, light and water requirements. This will result in more vigorous plant material that requires less maintenance and water.

Soil is the Secret

There is nothing more important to the success of a landscape than the soil. The combination of the mineral soil, soil organisms and organic matter– or 'growing medium' as the combination is called in the landscape trade – will determine almost entirely the performance of the lawn and plantings in terms of survival, health, rate of growth and water needs.

Good growing medium can double the rate of plant survival and growth, and cut the water need by 50 per cent. And yet growing medium is often one of the first things to be sacrificed to save money.

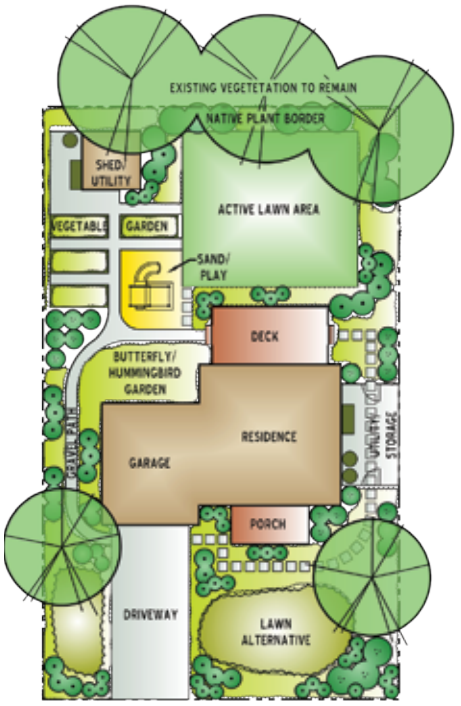
For more information, see the National Sustainable Agriculture Information Service of the National Center for Appropriate Technology website at:

www.attra.ncat.org/attra-pub/soilmgmt.html

Living Soil & Organic Matter

A Water Smart soil is a living soil. In a typical suburban lot, good quality living topsoil contains approximately 90 pounds of earthworms, 240 pounds of fungi, 150 pounds of bacteria, 13 pounds of protozoa and 89 pounds of arthropods and algae. This soil life and its foodweb cultivate and aerate the soil, improve its structure and increase the availability of water and nutrients for plants. If the organic matter in a growing medium is less than one per cent, all this life will die. Optimum amounts of organic matter in a living growing medium provide a garden soil that:

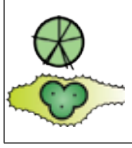
- feels soft and crumbles easily and has few clods and no hardpan
- drains well and warms up quickly in the spring and resists erosion and nutrient loss
- does not crust after planting and supports high populations of soil organisms
- soaks up heavy rains with little runoff and has a rich, earthy smell
- produces healthy, high-quality plants and does not require increasing fertilization
- stores moisture for drought periods



Topsoil & Organic Matter Quality

Growing medium is often a mix of topsoil and organic matter, and sometimes sand. Common problems to avoid when purchasing growing medium include:

- Topsoil that is too coarse (no silt or clay) or too heavy (no sand). A sandy loam is the optimum texture.
- Topsoil that is weed infested. Seeds can lay dormant in topsoil for years. Look for a topsoil source that is relatively weed free.
- Compost that is weed infested or compost that is not yet decomposed, which robs the soil of nitrogen. Livestock manure often has both these problems. Both weed seeds and decomposition problems can be avoided with a proper composting process.

LANDSCAPE LEGEND	
SYMBOL	CATEGORY
	TREE SHRUB/GROUND-COVER

Purchase growing medium from reliable suppliers and contractors who can certify that the products meet the specifications of the BC Landscape Standard and local bylaws.

Growing Medium Depth

Adequate soil depth plays an important role in storing and retaining water and nutrients for vigorous root growth. Provide a minimum of 150 mm (6”) for lawn areas and 300mm to 450 mm (12”-18”) for shrubs.

Plants

There are many plants available at nurseries that are drought tolerant. Native plants are accustomed to the local environment and often require less frequent watering. In some cases, these plant selections will not require any additional water once established.

Plant Selection Guide

The plants listed on the right, while not an exhaustive list of water conserving plants, offer a reliable starting point for homeowners.

Grass Species & Sod Mix

Where lawn is planned for functional purposes, there are varieties of grass that have been developed for drought resistance, high traffic and colour variations. In the summer, allowing the lawn to go dormant does not reduce the grass vigour. Summer dormancy mimics the grass natural cycle. Ask your contractor or grass supplier for seed or sod with low-water needs. Often these varieties will include a high per centage of tall fescue, sheep fescue, slender red fescue, creeping red fescue, and hard fescue. New drought-tolerant varieties of these and other species are increasingly available.

Mulching

Use of mulch can reduce water loss through evapotranspiration. It cools plant root zones, which reduces the amount of water plants lose through evaporation. Mulch reduces weed growth and helps control erosion. It also adds a finished look to a garden while adding nutrients to plants. Apply mulches at a minimum thickness of 5 - 7.5 cm (2 - 3”). Inspect depth seasonally and add as required to maintain minimum depth.

Annual Supplemental Water Requirements

0” - 3” (7.5cm)	4” - 7” (10 -18cm)	8” - 11” (20 - 28cm)
Trees		
▸ Gymnocladus dioica Kentucy Coffee Tree ▸ Koelreuteria paniculata Golden-Rain Tree ▸ Pinus flexis ‘Vanderwolfe’ Vanderwolfe’s Limber Pine ▸ Pinus Ponderosa Ponderosa Pine* ▸ Prunus domestica Prune Plum ▸ Syringa reticulata ‘Ivory Silk’ Ivory Silk Lilac Tree	▸ Acer ginnala Amur Maple ▸ Crataegus crus-galli inermis Thornless Cockspur Hawthorn ▸ Ginkgo biloba Ginkgo ▸ Gleditsia tracanthos var. inermis Thornless Honey Locust ▸ Juniperus scopularum Rocky Mountain Juniper* ▸ Pinus nigra Austrian Pine	▸ Morus alba ‘Fruitless’ Fruitless White Mulberry ▸ Nyssa sylvatica Sour Gum ▸ Picea pungens Colorado Spruce ▸ Populus tremuloides Quaking Aspen* (i) ▸ Pyrus calleryana ‘Chanticleer’ Chanticleer Calleryana Pear ▸ Sophora japonica Japanese Pagoda Tree
Shrubs & Hedges		
▸ Amelanchier alnifolia Saskatoon* ▸ Ceanothus velutius Snowbrush* ▸ Chrysothamnus nauseosus Rabbitbrush* ▸ Holodiscus discolor Ocean Spray* ▸ Ligustrum vulgare European Privet ▸ Mahonia aquifolium Oregon Grape* ▸ Rhus ssp. Sumac (i)	▸ Berberis thunbergii Japanese Barberry ▸ Caryopteris x clandonensis Bluebeard, Blue Spirea ▸ Pinus mugo mugo Dwarf Mugo Pine ▸ Potentilla fruiticosa Cinquefoil ▸ Pyrecantha coccinea Scarlet Fire Thorn ▸ Syringa ssp. Lilac ▸ Viburnum lantana Wayfaring Tree	▸ Buddleia davidii Butterfly Bush ▸ Cotoneaster ssp. Cotoneaster ▸ Euonymous alata ‘Compacta’ Dwarf Burning Bush ▸ Physocarpos opulifolius Nine Bark ▸ Picea pungens ‘Glauca Globosa’ Blue Globe Spruce ▸ Rosa rugosa Rugosa Rose ▸ Taxus x media Yew (hedging varieties)
Groundcover/Perennials		
▸ Artemesia ssp. Wormwood (i) ▸ Achillea ssp. Yarrow ▸ Festuca ovina glauca Blue Fescue Grass ▸ Nepeta x faassenii Hybrid Catnip ▸ Perovskia atricipifolia Russian Sage ▸ Salvia officionalis var. Herbal Sage ▸ Santolina chamaecyparissus Lavender Cotton ▸ Thymus ssp. Thyme ▸ Yucca glauca Soapweed	▸ Coreopsis Veticillata ‘Golden Showers’ Threadleaf Coreopsis ▸ Arctostapholus uva-ursi Kinnickinnick* ▸ Gaillardia aristata Blanket Flower* ▸ Helictotrchon sempervirens Blue Oat Grass ▸ Juniperus horizontalis ‘Wiltonii’ Blue Rug Juniper ▸ Lavender angustifolia var. English Lavender ▸ Oenothera missouriensis Missouri Evening Primrose ▸ Sedum ssp. Stonecrop ▸ Sempervivum ssp. Hens & Chicks	▸ Aster frikartii Frikart’s Aster ▸ Calamagrostis ‘Karl Foerster’ Karl Foerster Feather Reed Grass ▸ Cotoneaster adpressus Creeping Cotoneaster ▸ Echinacea purpurea Purple Cone Flower ▸ Hemerocallis ssp. Daylilies ▸ Miscanthus sinensis ‘Gracillimus’ Maiden Grass ▸ Rosa rugosa ‘Meidiland’ var. Meidiland Rose ▸ Rudbeckia ’Goldsturm’ Goldsturm Gloriosa Daisy ▸ Saccharum ravennae Hardy Pampas Grass

* native species (i) spreading/ suckering roots

Irrigation Guidelines for Water Conservation

Step 3: Smart Irrigation

Audits of installed irrigation systems have revealed major problems with design and installation quality. Without proper design and maintenance, an irrigation system will waste water. With proper design, an irrigation system can be a water conservation device.

Many problems are due to lack of experience when homeowners or under-qualified contractors work without supervision.

For these reasons, approval authorities are moving to require permits for irrigation installation. These permits are easy to get, and inexpensive. They are intended to help make sure that all irrigation installations meet basic industry standards and encourage the use of current best practices for water conservation.

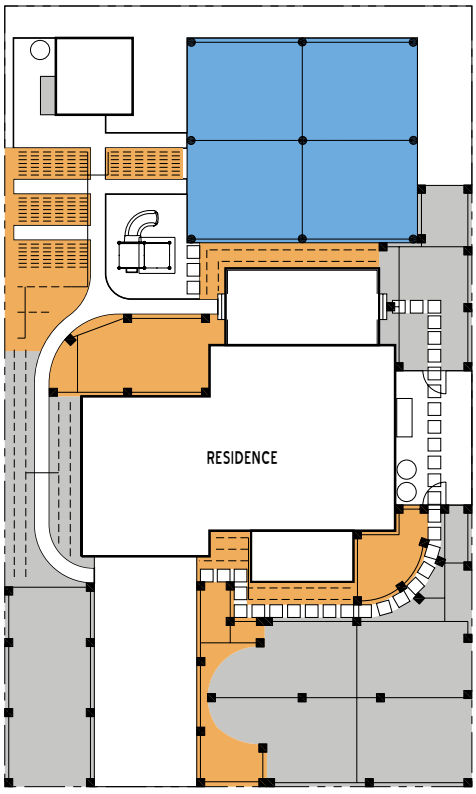
It is possible for a homeowner to design and install their own irrigation system, but the level of expertise involved, for design in particular, is usually better left to someone with professional training. Look for Certified Irrigation Designers under the Irrigation Industry Association of BC.

Hydrozones

Turf zones and shrub planting beds should never be irrigated on the same zone. Water requirements for turf exceed the requirements of most shrubs or groundcovers. If both share a zone, water is being wasted on plants that do not need it. In addition to saving water, designing by hydrozones will result in healthier, more vigorous plant material. Although it will require more zones initially, a hydrozone approach will save water in the long run.

Head-to-Head Coverage

For even, efficient watering, each sprinkler's spray should reach the next sprinkler head. Under-spray results in dry spots or overwatering in attempt to keep the driest areas green, while over-spray wastes water.



IRRIGATION LEGEND	
SYMBOL	CATEGORY
●	ROTOR
■	MPR SPRAY
------	LOW VOLUME/DRIP

Precipitation Rates

Irrigation manufacturers offer spray heads with matched precipitation rates, providing the flexibility of mixing and matching throw and radius. Rotors, spray and drip should never share a zone as timeclock settings vary between these forms of water application. Use nozzles that apply water evenly to save up to 30 per cent in water usage. Use drip or low-volume nozzles wherever possible to reduce water flow rates.

Site Contours

Avoiding extreme elevation changes in a zone ensures even pressure and watering. It prevents water flowing down to the lowest head and draining out, causing puddling, erosion and wasted water. If elevation changes in a zone cannot be avoided, 'check' valves should be installed to trap the water in the lateral line to prevent water from draining out the lowest head.

Over-Spray

Irrigation should not over-spray onto adjacent structures, paving and properties. Careful head installation and nozzle orientation will ensure that water is spraying where it is intended.

Watts 007 Double Check Valve Assembly

RSD Rain Sensor

Rainbird PGA-PRS-D Valve

Watts N45B-EZ Pressure Regulator

Hunter ICC Controller

Rainbird ET Manager

Backflow-Prevention Devices

Every system should have backflow prevention to help ensure there is no contamination into the municipal water system by fertilizers or pesticides used within the yard.

Pressure-Regulating Devices

Excess pressure through spray heads and rotors results in misting and fogging. These fine droplets are easily blown away by even the lightest winds, resulting in inadequate coverage and loss of water. This inefficient watering leads to increasing the run time for the zone, which only increases the loss of water. There are a number of pressure regulating devices on the market, including: pressure-regulating valves installed at the backflow preventer, pressure-regulating spray heads, pressure-reducing valves and pressure-regulating modules installed on valves. Every 5 psi reduction in water pressure reduces water use by 6–8 per cent.

Automatic Shut-Off Devices

Adding an automatic shut-off device can result in 15-20 per cent in water savings. Devices like rain and moisture sensors automatically shut off controllers when it is raining or when sufficient soil moisture has been reached.

Automatic Controllers with Water-Conserving Functions

The objective of efficient irrigation is to provide only enough water to keep the plant healthy. Years of research and technology development have resulted in controllers that can be programmed to ensure the best use of water. Water-efficient features include:

- Water Budget Features - Allows the user to change the applied water through the season by changing the watering time by a per centage. For example, setting a watering program for the driest condition (July) would overwater in spring and fall. Programming the controller for varying seasons ensures efficient water use year round.
- 365 Day Clock - Allow settings to vary by day, week or month.
- Multiple Start Times Per Day - Water must not be applied more rapidly than the soil can absorb it. By programming for multiple start times, saturation and runoff is avoided by allowing the water to soak in between watering times.
- Weather or ET (evapotranspiration) Based Programming - These timeclocks use weather data to adjust their settings automatically to meet the needs of the plants.

Watering during early morning or evening reduces the loss of water to evaporation. Plants are best watered in the morning to avoid disease caused by water sitting on plant leaves overnight.

Maintenance for Water Conservation

Step 4: Smart Maintenance

A large portion of unnecessary water use is related to improper settings for the irrigation timeclock. Turfgrass generally requires 25 mm (1") of water per week during the driest part of the year. Natural rainfall should be included as a part of this allowance. The water requirement in spring and fall months is much less than is required in July.

New weather-based irrigation timeclocks are available that automatically adjust time settings to correspond to historic or current real weather conditions. Installing weather based controllers provides long-term savings.

If using a non weather-based controller, set the watering time for each irrigation circuit for the driest month (July), and then adjust the time each month using the Water Budget feature or manual adjustments.

Irrigation leaks are another water waster. Ensure your system passes 'hydrostatic pressure tests' when it is installed or if it is affected by digging. To manually check for leaky irrigation lines, turn off all indoor water appliances and monitor your meter to see if it is still running – this could indicate an irrigation leak.

Irrigation Timeclock Settings for the City of Kelowna

	Apr	May	June	July	Aug	Sept	Other
Rotors - Lawn (precipitation rate assumed at 0.47 in/hr, actual will vary)*							
Watering (minutes/week)	73	92	119	132	112	73	Off
Water Budget (%)	55%	70%	90%	100%	85%	55%	
Sprays - Lawn (precipitation rate assumed at 1.75 in/hr, actual will vary)*							
Watering (minutes/week)	22	27	36	36	27	22	Off
Water Budget (%)	60%	75%	100%	100%	75%	60%	
Low Volume Sprays - Lawn (precipitation rate assumed at 0.43 in/hr, actual will vary)*							
Watering (minutes/week)	79	108	130	144	122	79	Off
Water Budget (%)	55%	75%	90%	100%	85%	55%	
Dripline - Shrubs (p rate assumed at 0.58 in/hr based on 0.9GPH, 18"x18" spacing; actual will vary)*							
Watering (minutes/week)	35	63	98	105	91	35	Off
Water Budget (%)	33%	60%	93%	100%	86%	33%	
Sprays - Shrubs (precipitation rate assumed at 1.75 in/hr, actual will vary)*							
Watering (minutes/week)	18	27	32	36	32	18	Off
Water Budget (%)	50%	75%	90%	100%	90%	50%	
Low Volume Sprays - Shrubs (precipitation rate assumed at 0.43 in/hr, actual will vary)*							
Watering (minutes/week)	74	95	122	135	122	74	Off
Water Budget (%)	55%	70%	90%	100%	90%	55%	

Irrigation Winterization

In freezing climates, irrigation systems are 'blown out' each year so expansion of freezing water in the pipes or heads does not damage the system. Ensure that an experienced contractor provides winterization and they guarantee that they will not damage the system. Be wary of blow-out pressures that are higher than the system design pressure (usually 30 – 50 psi) that can burst pipes or damage heads.

Spring Checklist for Irrigation Start-up

- Wait until threat of frost has passed and dry weather has begun.
- Moisture in good quality soil will carry most plants well into the spring without supplemental irrigation. If your lawn is browning during early spring, check that your soil depth and quality is adequate and supplement with organics, if necessary.
- Check that your backflow-prevention device is working. Test it if required.
- Shut off all other water use in the house prior to opening the irrigation master valve. Slowly open the valve and let the main irrigation line pressurize. Watch your water meter to see if it stops running once the mainline is full. If it does not, have a contractor check the mainline for leaks.
- Check and clean or replace your filters, particularly on drip systems.
- Test run each irrigation circuit. Adjust head rotation to avoid overspray. Replace broken heads.
- Check and readjust your timeclock – at startup and at least once per month to adjust for the varied water requirements over the season.

Irrigation Trouble-Shooting Tips

Local Dry Spots or Local Wet Spots:

- Consider the local terrain, soils, tree cover and sun exposure. Differences may lead to different watering needs.
- Check for head-to-head spacing and matched precipitation rates of nozzles. Adjust head spacing or nozzles if necessary. One way to do this is to replace heads with matched precipitation rate, variable-radius nozzles like the MPR Rotator. Adjust the radius as required.

Water Bill Too High:

- Have your irrigation system checked for leaks.
- Reduce your timeclock settings using the Typical Timeclock Settings described earlier in the brochure. If your yard survives at the new setting, drop the water budget a further 10 per cent and watch for plant response. Keep lowering the settings until some plant stress shows, and then raise them slightly.
- If local dry spots appear, follow the tips above.
- Check the depth and quality of your soil. If there is less than 150 mm (6”) for lawn and 300 mm (12”) for shrubs/ veggies, try adding compost or a compost soil mix to increase water retention and root growth.
- Reduce the area of lawn or the area watered. Increase areas of your site that are low to no-use hydrozones.
- Replace circuits of your irrigation system with low volume or drip components.

Topdressing & Mulching

Dig a test hole in typical areas of your yard. If the depth of good black crumbly soil is less than 150 mm (6”) under lawn and 300 mm to 450 mm (12” – 18”) for shrubs, you are likely using more water than you should. Rather than starting over with new plantings, it is possible to gradually add to your soil depth by topdressing with thin layers of growing medium and wellcomposted organic matter.

For grass areas:

- Topdressing should not exceed 6mm (1/4”) depth at a time.
- Once grass is established, stop removing the grass clippings from the surface. Mow regularly, and allow the clippings to decay into the soil, where they will recycle the organic matter and nutrients back into the soil organisms and the grass.

For shrub and groundcover areas:

- The maximum depth per topdress application or growing medium / organic matter could be as much as 75 mm (3”).
- For on-going maintenance once adequate soil depth is in place, use organic mulches, like bark mulch, to reduce soil evaporation, minimize weed germination and to provide a long-term supply of organic matter.
- Allow leaf drop to remain as this builds up a ‘natural duff’ like in the forest, that builds the soil, soil life, and recycles nutrients.

Compost Tea & Fertility

Growing medium with organic matter that meets the BC Landscape Standard will require less water, less fertilizer and will grow plants almost twice as fast as those in poor soils. The resulting plants will also be much healthier, with fewer weeds and little need for pesticides.

Supplemental fertilization, when necessary, should be done sparingly and always with slow-release fertilizers. Never use a fertilizer with added herbicide – fertilize and let the grass outcompete the weeds, hand pull if there are only a few weeds and use a spray herbicide only as a last resort. For more information about the City of Kelowna’s pesticide bylaw and managing weeds and other pests naturally, visit the Pesticide pages at kelowna.ca/environment.

As an effective alternate to chemical fertilizers, ask your garden centre or landscaper about ‘compost tea’. This liquid extract from active compost is extremely effective at increasing nutrients in soils and plants – it’s also a natural de-thatcher on lawns.

Web Links

City of Kelowna Water Smart Program
kelowna.ca/watersmart

Waterbucket
www.waterbucket.ca

CRD Water Services
www.crd.bc.ca/water

Saving Water Partership - Seattle and Participating Water Utilities
www.savingwater.org/docs/PlantList.pdf

Native Plant Society of British Columbia
www.npsbc.org

Durham Region - Ontario
www.region.durham.on.ca/waterefficiency

Oregon State University Plant Database
oregonstate.edu/dept/ldplants

Irrigation Industry Association of British Columbia
www.irrigationbc.com

Okanagan Xeriscape Association
www.okanaganxeriscape.org

Colorado Water Wise Council:
www.xeriscape.org

Revised 2010
1000 Copies

To find qualified help for landscape or irrigation design and construction supervision, look for the appropriate membership and training from the organizations below:

Irrigation Industry Association of BC (IIABC)
'Certified Irrigation Designer' from the IIABC is a key qualification for irrigation design. They and 'Certified Irrigation Technician II' are qualified to supervise irrigation construction.

IIABC Office
2330 Woodstock Drive
Abbotsford, BC V3G 2E5
TEL 604 859-8222
www.irrigationbc.com

BC Landscape and Nursery Association (BCLNA)
'Certified Horticultural Technicians' are qualified to supervise landscape construction, and often offer landscape design-build services for single family homes.

BCLNA Office
Suite #102, 5783 - 176A Street
Surrey, BC V3S 6S6
TEL 800 421-7963
www.bclna.com

BC Society of Landscape Architects (BCSLA)
'Landscape Architects' are qualified in design and construction supervision of all landscape installations, but should also have qualifications as an IIABC Certified Irrigation Designer if their scope is irrigation design/supervision.

BCSLA Office
Suite #110, 355 Burrard Street
Vancouver, BC V6C 2G8
TEL 604 682-5610
www.bcsla.org

City of Kelowna

Water Smart
1435 Water Street
Kelowna, BC V1Y 1J4
TEL 250 469-8502
watersmart@kelowna.ca

kelowna.ca