

# Water Management Plan

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Completed	7/5/2018



#### Introduction

Thompson Rivers University is committed to minimizing water consumption by implementing best practices in the University's operations. Water management is a continuous process involving managing behavioural, organizational, and technical change to improve a building's water performance.

In 2018, SES Consulting conducted a Level 1 Water Audit at TRU. According to the associated report, a total of 150,301 m³ of water was used in 2017, costing approximately \$180,000. Reducing water consumption at TRU can be achieved by using low-flow fixtures, replacing grass with drought resistant landscaping, and installing efficient irrigation systems.

This document has been created as an implementation plan for the Water Conservation Measures (WCM) identified in TRU's 2018 Water Audit Report. Presented on a campus-wide basis, as well as for each of TRU's 23 buildings, water use targets have been set based on the potential savings achieved by implementing all of the associated WCMs. Total annual savings, should all actions be completed, would be approximately 42,866 m³, or \$43,295, a 29% reduction over 2017.

Each WCM lists the capital costs for completing the action, the simple payback period, and annual savings in cost, m³ of water, and in some cases GJ's of natural gas (a result of reduced water heating). Should the WCM be approved, a person(s) of interest (POI) will be listed, as well as anticipated timelines for project initiation, installation, commissioning, etc.

#### Notes:

- To meet BOMA requirements, a water assessment must be conducted on the building every five (5) years, and the Water Management Plan must be reviewed and updated every three (3) years to capture the most up to date data, evaluate progress, and reassess WCMs.
- In the case of BOMA Recertification, building managers are expected to demonstrate which WCMs listed in the previous Water Management Plan have been implemented since certification.

#### Campus-Wide

Description

The following measures were deemed to be best implemented campus-wide, as they apply to a subset of buildings or the building stock in general.



Action Simple Annual Savings				_				
Action	Cost	Return	\$	m³	GJ	Timeline	POI	Status
Waterless Urinals* Installing waterless urinals will significantly reduce consumption across campus	\$45,000 (89 units)	3.6	\$12,370	12,296		See individual building information		mation
Low Flow Toilets* Replacing large tank toilets with low-flow units will significantly reduce consumption across campus	\$89,000 (178 units)	6.6	\$13,531	13,399		See individual building information		mation
Irrigation Control Upgrade Install a 'smart' irrigation system to avoid unnecessary or ineffective operation	\$50,000	6.9	\$7,210	7,170		6 months	Warren Auschak	Y
Drought Resistant Landscaping Replace grassed areas with drought resistant plants to minimize irrigation water consumption	\$100,000	11.5	\$8,720	8,668		2 Years	Cameron Lindsay	Pending
Science Lab Water Conservation Install tap-flow aerators for all taps, Carry out autoclave water conservation	\$10,000 (342 sinks)	7.5	\$1,340	1,334	10	3 Years	Ben Wiebe	Pending
Faucet Aerators Test aerators to determine accurate flow- rates. Replace aerators as needed (see 'Fixture Specifications' tab for more details).	\$3 each (units TBD)	N/A	N/A	N/A	N/A	1 year	Ben Wiebe	Y

<sup>\*</sup>Note: This report further details these WCMs in each relevant building page. Water savings for these WCMs have been calculated on a perbuilding basis and will not match the overall campus savings identified in the Water Audit Report.

#### Campus-Wide

Description The following measures were found to be in place or deemed not effective from a cost perspective according to the 2018 Water Audit Report.

Action Reasoning

Kitchen and Refrigeration Equipment	Low use fixtures and refrigeration equipment is predominantly in use in commercial kitchens on site.
Rainwater Capture	Rainwater capture was evaluated as a potential conservation measure, and while it did not present a good economic opportunity, there is significant opportunity to capture water for on-site irrigation. As a sustainability initiative, it is recommended that this opportunity be evaluated in additional detail.
Laundry Equipment	No commercial laundry equipment was observed on site. The culinary arts kitchen and daycare have residential type washers, but it is not recommended to replace these for water conservation.

## Fixture Specifications

Description

This page is intended as a reference for choosing low-flow fixtures for upgrading. They can be employed across campus and are readily available from many manufacturers.

Fixture	<b>Specifications</b>	Approx. Cost	Notes
Aerator- Handwashing Sink	1.9 LPM (0.5 GPM) or 3.8 LPM (1.0 GPM)	\$3 ea.	Bulk purchasing may reduce costs
Aerator- Kitchen Sink	5.7 LPM (1.5 GPM)	\$3 ea.	Bulk purchasing may reduce costs
Toilets- Retrofit	Retrofit large tanks w/ pressurized insert (ex Eco-Flush)	\$150 ea.	https://wdiecoflush.com/
<b>Toilets-</b> Replacement	4.8 LPF (1.28 GPF) single/ auto- flush or 6.0/ 2.3 LPF (1.6/0.6 GPF) dual- flush	\$500 ea.	Look for EPA WaterSense label
Showerheads	Max 7.6 LPM (2.0 GPM)	\$60 ea.	Look for EPA WaterSense label
Pre-Rinse Spray Valve (Kitchen dishwashing)	5.7 LPM (1.5 GPM) w/ an angular blade	\$60-\$100 ea.	Look for EPA WaterSense label
<b>Dishwashers</b> (Industrial hood-type)	2.5 L/rack	\$2,000-\$5,000 ea.	Look for EnergyStar Label
<b>Dishwashers</b> (Domestic)	3.5 L/cycle	\$500-\$800 ea.	Look for EnergyStar Label
Waterless Urinals	0 LPF	\$500 ea.	

#### Animal & Health Technology

Building Description The Animal Health building is mostly comprised of classroom and lab facilities and also includes faculty offices. The building is home to the animal health technical program.

Built In 2002 Number of Storeys 1 Sq.ft 12,702

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
6	14	0	1	2	1



Action	Cost	Simple Return	Anr \$	nual Savi   m³	ngs GJ	Timeline	POI	Status
No actions recommended								Y/N
								Y/N
								Y/N
								Y/N

#### Arts & Education

The building is home to many Faculty of Arts classes and labs, as well as being home to teaching options like Early Building Description Childhood Education and Bachelor of Education (Elementary). There is a language lab, two computer labs, faculty and administrative offices. Built In 1991 Number of Storeys Sq ft

3

60,924

# Toilets # Handwashing Sinks # Urinals # Showers # Dishwashers # Kitchen Sinks 38 36 12 0 0



Action		Simple	Ann	ual Savir		:		
ACHOH	Cost	Return	\$	m³	GJ	<u> Timeline</u>	POI	Status
Waterless Urinals Replace urinals with waterless units.	\$6,067	6.9	\$882	874		Complete	Ben Wiebe	Y
Upgrade Toilets* Replace 36 large tank toilets with low-flow units.	\$18,000	15.8	\$1,142	1131		Complete	Ben Wiebe	Y
								Y/N
								Y/N

<sup>\*</sup>Note: This action was not identified in the 2018 Water Assessment Report

#### Campus Activity Center

Building Description Campus Activity Center (CAC). houses the student union, bookstore, classrooms, offices, a conference center, a pub, and a cafeteria.

Built In 1992 Number of Storeys 3 Sqft 75,789

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
51	50	21	0	2	13



Action	Cost	Simple Return	Ann \$	ual Savii   m³	ngs   GJ	] Timeline	POI	Status
Waterless Urinals Replace urinals with waterless units.	\$10,618	10.9	\$971	961		5 years	Ben Wiebe	Pending
								Y/N
								Y/N
								Y/N

## Clock Tower

Building Description	The clock tower is h Innovation and Gra	ome to Alumni Theatre lec Iduate Studies, Institutional	ture hall, Journalism Planning and Analy	labs, TRU senior administrat sis, and the office of Advar	ion, TRU Research acement
Built In	1989	Number of Storeys	4	Sqft	32,023

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
6	6	1	0	0	1



Action	Cost	Simple Return	Anr \$	nual Sav m³	ings GJ	Timeline	POI	Status
Waterless Urinals Replace urinals with waterless units.	\$506	2.4	\$210	207		4 months	Ben Wiebe	Y
								Y/N
								Y/N
								Y/N

## Culinary Arts

Building Description	Building Description  This building is hon kitchens, and dining Built In  1970/ 1983	e to the culinary arts program, as well as administration areas, the Scratch Café and Market g areas.						
Built In	1970/ 1983	Number of Storeys	2	Sqft	20,010			

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
11	14	Δ	1	1	11



Action	Cost	Simple Return	Anr \$	nual Savi m³	ings GJ	Timeline	POI	Status
Waterless Urinals Replace urinals with waterless units.	\$2,022	2.8	\$717	710		Building to be replaced	Bryce Parks	N
Upgrade Toilets* Replace 11 large tank toilets with low-flow units.	\$5,500	4.5	\$1,229	1217		Building to be replaced	Bryce Parks	N
								Y/N
								Y/N

\*Note: This action was not identified in the 2018 Water Assessment Report

## Daycare

Building Description	The daycare buildir	ng contains children's play (	areas, offices, and c	ı small kitchen	
Built In	1993	Number of Storeys	1	Sqft	4,756

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
5	8	0	0	1	1



Action	Cost	Simple Return	Anr \$	nual Savi   m³	ings GJ	Timeline	POI	Status
No actions recommended								Y/N
								Y/N
								Y/N
								Y/N

## Gymnasium

The Gymnasium has a multi-use gym, change rooms, an exercise area, squash and handball courts (no Building Description as storage), and offices. Following the opening of the Tournament Capital Centre in 2007, the Gymnas sees very little use. Facilities staff predict the building will be torn down within 10 years.					•	
	Built In	1976	Number of Storeys		Sqft	39,837

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
8	8	2	18	0	0



Action		Simple	Anr	nual Sav				
Action	Cost	Return	\$	m³	GJ	<u>  Timeline</u>	POI	Status
Waterless Urinals Replace urinals with waterless units.	\$1,011	14.7	\$69	68		1 year	Ben Wiebe	Y
Upgrade Toilets* Replace 8 large tank toilets with low-flow units.	\$4,000	40.6	\$98	98		1 year	Ben Wiebe	Y
								Y/N
								Y/N

\*Note: This action was not identified in the 2018 Water Assessment Report

# House 1- Faculty Association\*

Building Description	Building Description The Faculty Association contains a board room, offices, and a small kitchen.					
Built In	1945	Number of Storeys	2	Sqft	1,367	

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
2	2	0	0	0	1



A ation		Simple	Anr	nual Savi	ings			
Action	Cost	Return	\$	m³	GJ	Timeline	POI	Status
No actions recommended								Y/N
								Y/N
								Y/N
								Y/N

\*Note: Water usage potential savings were not identified in the 2018 Water Assessment

## House 10- Horticulture

Building Description	The Horticulture center consists of two buildings connected on the ground floor. On the main level there is a classroom and lunchroom with a kitchen. There are offices on the second floor. There are three greenhouses, two of which are heated.							
Built In	1945	Number of Storeys	2	Sqft	8,117			

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
3	3	0	1	0	1



Action	Cost	Simple Return	Anr \$	nual Savi   m³	ings GJ	Timeline	POI	Status
No actions recommended								Y/N
								Y/N
								Y/N
								Y/N

## House 4- Sustainability

В∪	ilding Description	House 4 is home to	ouse 4 is home to the sustainability offices.						
	Built In	1945	Number of Storeys	2	Sqft	1,442			

# Toilets	# Toilets # Handwashing Sinks #		# Showers	# Dishwashers	# Kitchen Sinks	
1	1	0	0	0	1	



Action	Cost	Simple Return	Anr \$	nual Savi   m³	ings GJ	Timeline	POI	Status
No actions recommended								Y/N
								Y/N
								Y/N
								Y/N

# House 5- Aboriginal Cultural Center

Building Description	Also known as the C area, and a gatheri	lso known as the Gathering House, this building houses offices, a small kitchen, computer labs, a common rea, and a gathering area.						
Built In	1945/ 2009	Number of Storeys	2	Sqft	2,777			

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
3	3	0	0	1	1



Action		Simple	Anr	nual Savi			D 0 :	0.1
Action	Cost	Return	\$	m³	GJ	<u>  Timeline</u>	POI	Status
Upgrade Toilets* Replace 3 large tank toilets with low-flow units.	\$1,500	10.2	\$147	146		Building to be replaced	Bryce Park	N
								Y/N
								Y/N
								Y/N

\*Note: This action was not identified in the 2018 Water Assessment Report

#### House 6&7- Research Center

Building Descrip	The 2nd floor of the East and West sections of this building contain offices, and either a kitchen or washroom.  The 1st floors contain offices, lab rooms, a meeting room, and a central workspace. The basements each contain mechanical rooms, lab spaces, and offices. There is a new annex with has offices, a kitchen, meeting room, washrooms, and mechanical room.								
Buil	1945	Number of Storey	/5 2	Sqt	ft 6,886				
# Tailata	# Have also cooking as Circles	# History and	# Cla aa.va	# Dieles cords are	# Witala ara Ciralia				
# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks				



Simple Annual Savings								
Action	Cost	Return	\$	m³	GJ	Timeline	POI	Status
Upgrade Toilets* Replace 4 large tank toilets with low-flow units.	\$2,000	10.9	\$184	182		3 years	Ben Wiebe	Pending
								Y/N
								Y/N
								Y/N

\*Note: This action was not identified in the 2018 Water Assessment Report

## House 8- Radio Station

Building Description	The first floor of the house contains a meeting area, and offices. The upper level has two sealed recording studios. The basement contains the music library and mechanical systems.						
Built In	1945	Number of Storeys	2	Sqft	1,410		

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
1	1	0	0	0	1



Action	Cost	Simple Return	Anr \$	nual Savi   m³	ings GJ	Timeline	POI	Status
No actions recommended								Y/N
								Y/N
								Y/N
								Y/N

#### House 9- Welcome Center\*

Building Descrip	tion	The Welcome Cente kitchen.	e Welcome Center contains an open seating area, meeting room, computer room, offices, and a small chen.								
Buil	ln	1945	1945 Number of Storeys 2 Sqft			ft 2,937					
# Toilots	# 1	Handwashina Sinks	# Uringle	# Showers	# Dishwashors	# Kitchon Sinks					

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks



A ation		Simple	Anr	nual Savi	ings			
Action	Cost	Return	\$	m³	GJ	Timeline	POI	Status
No actions recommended								Y/N
								Y/N
								Y/N
								Y/N

\*Note: Wate usage potential savings were not identified in the 2018 Water Assesssment

# House of Learning

Building Description	The House of Learni	ng contains an auditorium	n, open study area, st	rudy rooms, offices, a cafe	é, and a loading bay.
Built In	2011	Number of Storeys	4	Sqft	74,179

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
24	25	4	0	1	1



Action	Cost	Simple Return	Anr \$	nual Sav m³	ings GJ	Timeline	POI	Status
Waterless Urinals Replace urinals with waterless units.	\$2,022	2.1	\$949	939		5 years	Ben Wiebe	Pending
								Y/N
								Y/N
								Y/N

## Human Resources

Building Description	This building contain offices. There is also	ns the human resources offi an open workspace, wash	ices, the safety man prooms, and a small	agement offices, media se staff kitchen.	rvices, and REACH
Built In	1972	Number of Storeys	1	Saft	5,683

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
5	5	2	0	1	2



Action	Cost	Simple Return	Anr \$	nual Sav m³	ings GJ	Timeline	POI	Status
Waterless Urinals Replace urinals with waterless units.	\$1,011	17.5	\$58	57		2 year	Ben Wiebe	Pending
								Y/N
								Y/N
								Y/N

#### International Building

Building Description The first three floors of this building house classrooms and offices, with a small observatory on the fourth floor. At the entrance there is an atrium type foyer, which serves as a general seating area.

Built In 2005 Number of Storeys 4 Sqft 49,288

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
24	25	8	0	1	1



Action	Cost	Simple Return	Ann \$	iual Savii   m³	ngs I GJ	Timeline	POI	Status
Waterless Urinals Replace urinals with waterless units.	\$4,045	4.6	\$882	874		5 years	Ben Wiebe	Pending
								Y/N
								Y/N
								Y/N

# Library

Ві	uilding Description	The library houses vo	e library houses various types of study areas and offices.						
	Built In	1975	1975 Number of Storeys 2						

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
14	12	4	0	0	2

973
Water Target (m³/ yr)

Action	Cost	Simple Return	Anr \$	nual Savii m³	ngs GJ	Timeline	POI	Status
Waterless Urinals Replace urinals with waterless units.	\$2,022	4.4	\$454	450		Building to be replaced	Ben Wiebe	N
								Y/N
								Y/N
								Y/N

## Materials Distribution Center

<b>Building Description</b>			l a shipping area. Shipping try, mechanical/ electrical	•
Built In	2006/2013	Number of Storeys	Sqft	21,431

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
5	5	0	0	1	1



Action	Cost	Simple Return	Anr \$	nual Savi   m³	ings GJ	Timeline	POI	Status
No actions recommended								Y/N
								Y/N
								Y/N
								Y/N

#### Old Main

Building Description The building is divided into three blocks. Block A houses the law department, classrooms and offices. Block B houses classrooms and offices. Block C houses art classrooms, food court, and a theatre.

Built In 1970/2014 Number of Storeys 4/2/1 Sqft 270,948

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
65	60	19	1	8	7



Action	Cost	Simple	Ann	ual Savii		l Timolino	POI	C+ cı+ı ıc
/ (CHOI)	COSI	Return	Ψ	m³	GJ	<u>Timeline</u>	ГОІ	Status
Waterless Urinals Replace urinals with waterless units	\$9,607	2.3	\$4,133	4092		3 years	Ben Wiebe	Y
Upgrade Toilets* Replace 65 large tank toilets with low-flow units.	\$32,500	5.5	\$5,905	5846		3 years	Ben Wiebe	Y
								Y/N
								Y/N

<sup>\*</sup>Note: This action was not identified in the 2018 Water Assessment Report

# BC Center for Open Learning

Building Description	This building houses	his building houses a data center on the first floor, and offices and common staff kitchen spaces on each level.						
Built In	2007	Number of Storeys	4	Sqft	41,301			

# Toilets	s # Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
16	12	0	0	0	4



Action	Cost	Simple Return	Anr \$	nual Savi   m³	ings GJ	Timeline	POI	Status
No actions recommended								Y/N
								Y/N
								Y/N
								Y/N

#### Sciences & Health Sciences

Building Description The building incorporates two computer labs, study spaces, lecture and lab classrooms, lecture halls, faculty offices, research labs, and a coffee/ snack shop.

 Built In
 1980
 Number of Storeys
 3
 Sqft
 111,137

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
28	22	8	0	0	1



Action		Simple	Annual Savings					
Action	Cost	Return	\$	m³	GJ	<u>Timeline</u>	POI	Status
Waterless Urinals Replace urinals with waterless units.	\$4,045	1.8	\$2,198	2176		3 years	Ben Wiebe	Y
Aerators Install tap-flow aerators on all 342 taps in the science labs.	\$10,000	7.5	\$1,340	1334	10	3 years	Ben Wiebe	Y
Upgrade Toilets* Replace 28 large tank toilets with low-flow units.	\$14,000	4.5	\$3,139	3108		3 years	Ben Wiebe	Y
								Y/N

<sup>\*</sup>Note: This action was not identified in the 2018 Water Assessment Report

#### Trades & Technology Center

Building Description This building houses workshops, various trades classrooms, common rooms, a café, and offices. Workshops include automotive, carpentry, electrical, and welding.

Built In 1997 Number of Storeys 2 Sqft 109,878

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
23	20	4	2	0	0



Action		Simple	Annual Savings		T' 1'	DOI	Clala	
ACTION	Cost	Return	\$	m³	GJ	<u>  Timeline</u>	POI	Status
Waterless Urinals Replace urinals with waterless units.	\$2,022	2.1	\$984	975		5 years	Ben Wiebe	Pending
Upgrade Toilets* Replace 23 large tank toilets with low-flow units.	\$11,500	6.8	\$1,687	1671		5 years	Ben Wiebe	Pending
								Y/N
								Y/N

<sup>\*</sup>Note: This action was not identified in the 2018 Water Assessment Report