Water Balance Calculator

Information and Instructions for Filling Out the Water Balance Calculator

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Purpose of the Calculator Tool

This calculator is intended for the following types of developments:

- Multi-family residential (e.g. buildings containing 3 or more dwelling units)
- Commercial (e.g. office, hotel, retail, industrial, etc.)
- Mixed Use (e.g. a mix of residential and commercial uses within the same development)

Austin Water has developed this tool to help estimate a development project's specific water demands and supplies including:

- Total potential potable water demands (e.g. faucets, baths/showers, dishwashers)
- Total potential non-potable water demands (e.g. toilets/urinals, clothes washers, industrial process water)
- Total potential onsite non-potable water supplies (e.g. rainwater, stormwater, graywater, blackwater, condensate water and industrial process water)

The water balance calculator is intended to help generate initial estimates. Users should verify the assumptions provided when generating specific project demands and update assumptions as appropriate.

The calculator will be updated periodically as more user feedback is collected. Users may make adjustments to the calculator as appropriate to more accurately reflect onsite demands and supplies for building types that are not shown in the calculator or for building types that are shown but do not represent expected building demands and supplies. Users are encouraged to document and share these changes with Austin Water both to ensure transparency in calculations as well as to help inform future calculator updates.

How to Use the Calculator Tool

This calculator is set up to automatically calculate the building's water demands and supplies based on size of building space, occupancy rate, standard fixture flow rates, etc. However, each demand and supply calculation section also provides cell inputs for the user to provide an "override" or "manual entry" of supply and demand estimates. Using the overrides and manual entries is optional; they are included to provide more flexibility to the user.

1. Use the tabs at the bottom of the workbook to navigate from sheet to sheet.
2. The user is encouraged to review all of the calculations in the sheets and to update any calculator assumptions with known data if available.
3. Results of the calculator are summarized in the Water Balance and Project Summary sheets.
4. Each sheet of the calculator contains equations, assumptions, sources and backup data for the user to reference.

Layout of the Calculator

Calculator Sheets	Description	User Actions
Project Information	Enter project site plan information	Enter site plan information, building space areas, days of operation and occupancy rates
Indoor Demand	Calculate indoor water demands from fixtures	Enter fixture information, usage rates, etc. if not using defaults
Outdoor Demand	Calculate outdoor water demands for landscaping and amenities	Enter information about outdoor irrigation and water features if not using defaults
Indoor Supply	Calculate graywater, blackwater and condensate supplies	Enter information about HVAC size, graywater and blackwater generation, etc. if not using defaults
Outdoor Supply	Calculate rainwater and stormwater supplies	Enter information about collection volumes and runoff efficiency for rainwater and stormwater if not using defaults
Water Balance	Summary of the project water balance	No action needed - results are calculated from inputs on other sheets
Project Definition	User specifies non-potable demands and supplies for a reuse project	Select non-potable demands and onsite supplies that will be used in the design of an onsite water reuse system

COLOR CODING KEY:

User Input Value	Yellow cells are required input fields for the user
Derived from User Input	Green cells are linked from a user's previous input into another cell
Autogenerated Value	Blue cells are values based on calculations from other cells
Default Value	Gray cells are default values
Manual Override Value	Pink cells allow the user to manually override default values

<<< The cell colors to the left guide the user through the workbook steps. This color coding key is provided at the top of each workbook step for reference.

Calculator Use Assumptions

1. It is assumed that the main users of this calculator will be designated project team members (e.g. project engineer or manager) and Austin Water review staff; all users and reviewers need access to Microsoft Excel 2007 or later and basic proficiency in Excel.

2. The level of detail required for building information inputs into the calculator assumes that the project is at a schematic or design development phase.

3. The estimated level of effort for a user to enter information in this calculator is approximately 0.5-1 hour, depending on the complexity of the project. Note that this estimate does not include the time taken to consolidate relevant building information, or conduct external analysis of other specified demands or supplies not included in the default calculations provided in the calculator.

>>>Proceed to the Project Information Sheet to Start Using the Water Balance Calculator

Water Balance Calculator

Instructions/Notes

This sheet includes general project and site information as well as building use descriptions.
Please fill in all user input fields into yellow colored cells below. Most inputs can be found within the project site plan.
All occupancy calculations are shown beneath the relevant tables.

COLOR CODING KEY:

User Input Value
Derived from User Input
Autogenerated Value
Default Value
Manual Override Value

<<Site Plan case number to be added by AW reviewer

Project Information

Enter general project information related to the site and buildings in this section.

This message will appear until the Site Gross Floor Area equals the total project area in the Building Information section below.

PROJECT INFORMATION

Project Specifics	
Project Name	BOR
Project Address	All Buildings
Project Date	10/6/2021

Estimated project completion date (ready for occupancy)

Project Contact Name	MCB
Contact Phone Number	
Contact Email Address	

Project Type	Mixed Use

Building Specifics	
Number of Buildings in Project	9
Maximum Number of Building Stories	

Austin Energy Green Building Project	
Project Will Receive an AEGB Rating?	

Enter values, including 0 values, in each of the yellow cells in this section.

SITE COVERAGE

Site Area	
Site Area (square feet)	1,636,985
Site Gross Floor Area (square feet)	1,636,985

Gross Floor Area is the total enclosed area of all floors in a building measured to the outside surface of the exterior walls (excludes loading docks, porches, stoops, basements, attics, stories below grade plane, parking facilities, driveways).

Impervious Surfaces	
Building Roof Area (square feet)	585,011
Other Impervious Area (square feet)	315,331
Impervious Cover (%)	55%

Irrigated Landscape Areas	
Turfgrass (square feet)	209,500
Native/Adapted Beds (square feet)	
Non-native/Adapted Beds (square feet)	
Other Landscape (square feet)	57,060
Total Irrigated Landscaped Area (square feet)	266,560

Non-native/adapted plants are those not listed in the Preferred Plant List in Appendix N of the Environmental Criteria Manual.

WATER USE INFORMATION

Water Features	
Does the Project Have a Pool or Spa?	No
Does the Project Have a Water Feature?	No
Does the Project Have a Cooling Tower?	Yes

Access to Reclaimed Water	
Distance to a Reclaimed Water Main	>500 feet

Irrigation System	
Turfgrass Irrigation Type	Drip
Native/Adapted Beds Irrigation Type	Spray
Non-native/Adapted Beds Irrigation Type	N/A
Other Landscape Irrigation Type	N/A

Building Information

Enter site-specific information for all residential and commercial areas of the project in this section.

RESIDENTIAL AREA INFORMATION

Type of Use	Description of Use	Gross Floor Area (Square Feet)	Number of Dwelling Units	Total Number of Bedrooms	People per Dwelling Unit(1)		Number of Days Occupied per Year(2)		Number of Building Occupants
Multi-family Housing	Family/Individual Housing	1,494,147	1,537	2,766.60	1.8		365		2,767
Clubhouse	--		--	--	--	--	--	--	--
Maintenance Facility	--		--	--	--	--	--	--	--
Other			--	--	--	--	--	--	--
	Total	1,494,147	1,537	2,767					2766.6
	Number of Building Occupants = Number of Dwelling Units x People per Dwelling Unit								

Notes:
(1) Multi-family residential occupancy is the city-wide average in Austin Water's Dissagregated Demand Model. This value can be overridden by the user.
(2) Residential areas are assumed to be occupied 365 days per year, but this value can be overridden by the user if occupancy is less than year-round.

COMMERCIAL AREA INFORMATION

			Additional Occupancy Information		Occupancy Assumptions per Gross Square Footage (GSF)					Number of Occupants per Day			
Type of Use(1)	Description of Use	Gross Floor Area (square feet)	Beds/Seats/Rooms/Washers/Type	Number	Number of Days Occupied per Year(2)		GSF per All Occupants(3)	GSF per Employee(4)	Equivalent Occupied Days per Year	Employees		Visitors/Customers/Students/Patients/Guests	
Hospital			Number of Beds		365		108	350	-	0		-	
Office	Office Building	1,224,296	--	--	250		269	310	250	3950		600	
Retail	Retail Shop	111,093	--	--	206		103	630	206	177		907	
Eating & Drinking	Full Service Restaurant	30,000	Number of Seats	1	299		31	200	299	150		826	
Medical Office			--	--	250		135	490	-	0		-	
Grocery Store			--	--	299		103	290	-	0		-	
Assisted Living			Number of Beds		365		399	560	-	0		-	
Warehousing/Storage			--	--	126		718	1,020	-	0		-	
Lodging	Hotel/Motel	102,152	Number of Rooms	448	365		431	1,440	365	71		167	
Education			--	--	141		50	890	-	0		-	
Manufacturing/Light Industrial			--	--	234		431	570	-	0		-	
Places of Assembly			--	--	228		14	1,650	-	0		-	
Auto Service			--	--	206		72	430	-	0		-	
Personal Services			--	--	228		72	650	-	0		-	
Laundry & Sanitation			Number of Washers		365		54	690	-	0		-	
Car Wash			Type of Facility		206		54	1,020	-	0		-	
Other			--	--	--		--	--	-	--		--	-
	Total	1,467,541							Equivalent Total	4,348	-	2,500	-
	Number of Employees = Gross Floor Area (sq. ft.) / GSF per Employee				Number of Visitors/Customers/Students/Patients/Guests = Gross Floor Area (sq. ft.) / GSF per All Occupants - Number of Employees								

Notes:
(1) Commercial space categories are defined from the Water Research Foundation report "Methodology for Evaluating Water Use in the Commercial, Institutional, and Industrial Sectors" (Kiefer et. al., 2015). If you don't see your type of use in any of the drop-downs, use the 'Other' row.
(2) Default values for number of occupied days per year for each space use type are from COMNET Energy Modeling Software Manual, Appendix C Rev. 3 . These values can be overridden by the user.
(3) Commercial space occupancy is taken from the Autodesk Revit building information modeling software which bases occupancy assumptions on ASHRAE 90.1-2010, ASHRAE 90.2-2010, ASHRAE 62.1, CBES data, and other building surveys. These assumptions can be overridden by the user.
(4) City-wide average employment occupancy rates are from City of Austin (COA) and Environmental Systems Research Institute (ESRI) data used in Austin Water's Disaggregated Demand Model. These assumptions can be overridden by the user.

Appliance Information	
Will Laundry Be Done Onsite?	No

Amenity Information	
Are There Showers for Employee Use?	No

>>> Proceed to the Indoor Demand Sheet to Review Calculations and Assumptions

Water Balance Calculator

Instructions/Notes

This sheet calculates the average daily and annual indoor potable and non-potable water demands for the project.
The calculations incorporate occupancy inputs from the Project Information sheet, as well as default values for water using fixtures/features in the project.
No user input is needed; however, the user should override default values using the pink cells to more accurately estimate project demands.
All demand calculations are shown beneath the relevant tables and summary calculations are found at the end of each section.

COLOR CODING KEY:
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- Autogenerated Value
- Default Value
- Manual Override Value

Indoor Fixture Demands

RESIDENTIAL WATER DEMAND

	Equivalent Occupants	Equivalent Occupied Days per Year
Residents	2,767	365

RESIDENT WATER USE

Fixture Type	Fixture Flow[1]			Fixture Uses per Person per Day[2]			Duration of Fixture Use[2]			Daily Building Usage (gallons per day)	Annual Building Usage (gallons per year)	Non-Potable Building Usage (gallons per year)
Showerhead	2.5		gallons per minute	0.69		showers	7.8		minutes per shower	37,225	13,586,980	N/A
Bathroom Faucet	2.2		gallons per minute	5		uses	0.5		minutes per use	15,216	5,553,950	N/A
Kitchen Faucet	2.2		gallons per minute	15		uses	0.5		minutes per use	45,649	16,661,849	N/A
Clothes Washer[2]	4.7	0	gallons per cubic foot	0.3		loads per day	4		cubic feet of capacity per load	-	-	-
Toilet	1.28	1	gallons per flush	5		flushes	1		1 flush per use	13,833	5,049,045	5,049,045
Dishwasher[2]	3.5		gallons per load	0.1		uses	1		load per use	968	353,433	N/A
Bath[2]	20.2		gallons per bath	0.07		baths	1		bath per use	3,912	1,427,870	N/A

Daily Building Usage = Fixture Flow x Fixture Uses x Duration of Fixture Use x Equivalent Occupants **Annual Building Usage = Daily Building Usage x Equivalent Occupied Days per Year**

Notes:
(1) Fixture flow rates for showerheads, bathroom faucets, kitchen faucets and toilets are based on maximum fixture flow rates from the City of Austin's adopted plumbing code (Uniform Plumbing Code).
(2) Fixture uses and durations as well as fixture flows for clothes washers, dishwashers and baths are based on the study Residential End Uses of Water, Version 2 (REU2016) (DeOreo et al. 2016).

COMMERCIAL WATER DEMAND

	Equivalent Occupants	Equivalent Occupied Days per Year	% Female Occupancy (To Separate Toilet & Urinal Use)	
Employees	4,348	252	50%	
Visitors	1,426	278	50%	
Customers	907	206	50%	
Students	-	-	50%	
Patients/Guests	167	365	50%	

EMPLOYEE WATER USE (ALL COMMERCIAL USES)

Fixture Type	Fixture Flow[1]			Fixture Uses per Person per Day[2]			Duration of Fixture Use[2]			Daily Building Usage (gallons per day)	Annual Building Usage (gallons per year)	Non-Potable Building Usage (gallons per year)
Showerhead	2.5		gallons per minute	0		uses	5		minutes per shower	-	-	N/A
Bathroom Faucet	0.5		gallons per minute	3		uses	0.5		minutes per use	3,261	821,045	N/A
Toilet (Male)	1.28	1	gallons per flush	1		flush	1		1 flush per use	2,174	547,364	547,364
Toilet (Female)	1.28	1	gallons per flush	3		flushes	1		1 flush per use	6,522	1,642,091	1,642,091
Urinal	0.5		gallons per flush	2		flushes	1		1 flush per use	2,174	547,364	547,364
Kitchen Faucet	2.2		gallons per minute	0.1		uses	0.25		minutes per use	239	60,210	N/A

Daily Building Usage = Fixture Flow x Fixture Uses x Duration of Fixture Use x Equivalent Occupants **Annual Building Usage = Daily Building Usage x Equivalent Occupied Days per Year**

VISITOR WATER USE (OFFICE, EATING & DRINKING, MEDICAL OFFICE, PLACES OF ASSEMBLY, AUTO SERVICE, LAUNDRY & SANITATION, OTHER)

Fixture Type	Fixture Flow[1]			Fixture Uses per Person per Day[2]			Duration of Fixture Use[2]			Daily Building Usage (gallons per day)	Annual Building Usage (gallons per year)	Non-Potable Building Usage (gallons per year)
Showerhead	2.5		gallons per minute	0		uses	5		minutes per shower	-	-	N/A
Bathroom Faucet	0.5		gallons per minute	0.5		uses	0.5		minutes per use	178	49,622	N/A
Toilet (Male)	1.28		gallons per flush	0.1		flush	1		1 flush per use	91	25,406	25,406
Toilet (Female)	1.28		gallons per flush	0.5		flushes	1		1 flush per use	456	127,032	127,032
Urinal	0.5		gallons per flush	0.4		flushes	1		1 flush per use	143	39,697	39,697
Kitchen Faucet (Eating & Drinking)	2.2		gallons per minute	1		uses	0.25		minutes per use	454	135,836	N/A

Daily Building Usage = Fixture Flow x Fixture Uses x Duration of Fixture Use x Equivalent Occupants **Annual Building Usage = Daily Building Usage x Equivalent Occupied Days per Year**

CUSTOMER WATER USE (RETAIL, GROCERY STORE, WAREHOUSING/STORAGE, MANUFACTURING/LIGHT INDUSTRIAL, PERSONAL SERVICES, CAR WASH)

Fixture Type	Fixture Flow[1]			Fixture Uses per Person per Day[2]			Duration of Fixture Use[2]			Daily Building Usage (gallons per day)	Annual Building Usage (gallons per year)	Non-Potable Building Usage (gallons per year)
Showerhead	2.5		gallons per minute	0		uses	5		minutes per shower	-	-	N/A
Bathroom Faucet	0.5		gallons per minute	0.2		uses	0.5		minutes per use	45	9,342	N/A
Toilet (Male)	1.28	1	gallons per flush	0.1		flush	1		1 flush per use	45	9,342	9,342
Toilet (Female)	1.28	1	gallons per flush	0.2		flushes	1		1 flush per use	91	18,684	18,684
Urinal	0.5		gallons per flush	0.1		flushes	1		1 flush per use	23	4,671	4,671
Kitchen Faucet	2.2		gallons per minute	0		uses	0.25		minutes per use	-	-	N/A

Daily Building Usage = Fixture Flow x Fixture Uses x Duration of Fixture Use x Equivalent Occupants **Annual Building Usage = Daily Building Usage x Equivalent Occupied Days per Year**

STUDENT WATER USE (EDUCATIONAL)

Fixture Type	Fixture Flow[1]			Fixture Uses per Person per Day[2]			Duration of Fixture Use[2]			Daily Building Usage (gallons per day)	Annual Building Usage (gallons per year)	Non-Potable Building Usage (gallons per year)
Showerhead	2.5		gallons per minute	0		uses	5		minutes per shower	-	-	N/A
Bathroom Faucet	0.5		gallons per minute	3		uses	0.5		minutes per use	-	-	N/A
Toilet (Male)	1.28	1	gallons per flush	1		flush	1		1 flush per use	-	-	-
Toilet (Female)	1.28	1	gallons per flush	3		flushes	1		1 flush per use	-	-	-
Urinal	0.5		gallons per flush	2		flushes	1		1 flush per use	-	-	-
Kitchen Faucet	2.2		gallons per minute	0		uses	0.25		minutes per use	-	-	N/A

Daily Building Usage = Fixture Flow x Fixture Uses x Duration of Fixture Use x Equivalent Occupants **Annual Building Usage = Daily Building Usage x Equivalent Occupied Days per Year**

PATIENT/GUEST WATER USE (HOSPITAL, ASSISTED LIVING, LODGING)

Fixture Type	Fixture Flow[1]			Fixture Uses per Person per Day[2]			Duration of Fixture Use[2]			Daily Building Usage (gallons per day)	Annual Building Usage (gallons per year)	Non-Potable Building Usage (gallons per year)
Showerhead	2.5		gallons per minute	1		uses	5		minutes per shower	2,088	761,938	N/A
Bathroom Faucet	0.5		gallons per minute	4		uses	0.5		minutes per use	167	60,955	N/A
Toilet (Male)	1.28	1	gallons per flush	5		flush	1		1 flush per use	418	152,388	152,388
Toilet (Female)	1.28	1	gallons per flush	5		flushes	1		1 flush per use	418	152,388	152,388
Urinal	0.5		gallons per flush	0		flushes	1		1 flush per use	-	-	-
Kitchen Faucet	2.2		gallons per minute	0		uses	0.25		minutes per use	-	-	N/A

Daily Building Usage = Fixture Flow x Fixture Uses x Duration of Fixture Use x Equivalent Occupants **Annual Building Usage = Daily Building Usage x Equivalent Occupied Days per Year**

ONSITE LAUNDRY

End Use	Fixture Performance[3]			Fixture Usage Rate			Utilization Rate[4]			Daily Building Usage (gallons per day)	Annual Building Usage (gallons per year)	Non-Potable Building Usage (gallons per year)
Patient/Guest Laundry	3.0		gallons per lb	0		patients/guests per day	4.75		lbs per patient/guest	-	-	-

Daily Building Usage = Fixture Performance x Fixture Usage Rate x Utilization Rate **Annual Building Usage = Daily Building Usage x Equivalent Occupied Days per Year**

COMMERCIAL KITCHEN EQUIPMENT

End Use	Fixture Performance			Fixture Usage Rate			Utilization Rate			Daily Building Usage (gallons per day)	Annual Building Usage (gallons per year)	Non-Potable Building Usage (gallons per year)
Commercial Dishwasher[5]	1.31		gallons per rack	826		meals per day	0.5		racks per meal	541	161,768	N/A
Pre-rinse Spray Valve[1]	1.6		gallons per minute	826		uses	0.5		minutes per use	661	197,579	N/A
Ice Machine[3]	1		lbs of ice per meal	826		meals per day	0.72		gallons per pound of ice	595	177,821	N/A
Food Steamer[5]			gallons per hour	-		-			hours per day	-	-	N/A
Combination Oven[5]			gallons per hour	-		-			hours per day	-	-	N/A

Daily Building Usage = Fixture Performance x Fixture Usage Rate (Where Applicable) x Utilization Rate **Annual Building Usage = Daily Building Usage x Equivalent Occupied Days per Year**

OTHER USER DEFINED WATER DEMANDS

End Use	Fixture Performance			Fixture Usage Rate			Utilization Rate			Daily Building Usage	Annual Building Usage (gallons per year)	Non-Potable Building Usage (gallons per year)
Commercial Laundry[3]	30		gallons per wash	-		-	0		washes per day	-	-	-
Car Wash[6]	0		gallons per wash	-		-	0		washes per day	-	-	-
Industrial Process Water			gallons per minute			minutes per use			uses per day	-	-	N/A
Medical Equipment Process Water			gallons per minute			minutes per use			uses per day	-	-	N/A
Other Non-potable Fixture Use			gallons per use	-		-			uses per day	-	-	-
Other Potable Fixture Use			gallons per use	-		-			uses per day	-	-	N/A

Daily Building Usage = Fixture Performance x Fixture Usage Rate (Where Applicable) x Utilization Rate **Annual Building Usage = Daily Building Usage x Equivalent Occupied Days per Year**

INTERNAL WATER RECYCLING

End Use	Fixture Performance			Fixture Usage Rate			Utilization Rate			Daily Water Recycled	Annual Water Recycled (gallons per year)	Non-Potable Water Recycled (gallons per year)
Laundry Water Recycling			gallons per wash	-		-	0		washes per day	-	-	-
Car Wash Water Recycling			gallons per wash	-		-	0		washes per day	-	-	-
Industrial Water Recycling			gallons per minute			minutes per use			uses per day	-	-	-

Daily Water Recycled = Fixture Performance x Fixture Usage Rate (Where Applicable) x Utilization Rate **Annual Building Usage = Daily Building Usage x Equivalent Occupied Days per Year**

	Daily Building Usage	Annual Building Usage (gallons per year)	Non-Potable Building Usage (gallons per year)
Summary of Indoor Fixture Water Demands	**137,600**	**48,335,700**	**8,315,500**
	= SUM(Daily Building Usage) - SUM(Daily Water Recycled)	= SUM(Annual Building Usage) - SUM(Annual Water Recycled)	= SUM(Non-Potable Building Usage) - SUM(Non-Potable Water Recycled)

Notes:
(1) Fixture flow rates for showerheads, bathroom faucets, kitchen faucets and toilets are based on maximum fixture flow rates from the City of Austin's adopted plumbing code (Uniform Plumbing Code).
(2) Fixture utilization rates by occupant type and fixture use durations are taken from LEED v4 Criteria for Water Use Reduction Credits for commercial uses.
(3) Information on water using technologies is catalogued by the Arizonal Department of Water Resources: https://new.azwater.gov/conservation/technologies.
(4) Laundry assumptions are derived from Commercial Laundry Equipment, Inc. General Laundry Planning Calculation Methods: https://commerciallaundryequip.com/wp-content/uploads/2014/07/equipment-sizing-guide.pdf.
(5) Austin Water has published a commercial kitchen equipment brochure: http://www.austintexas.gov/sites/default/files/files/Water/Conservation/commercialrestaurantweb.pdf.
(6) Car wash efficiency standards are taken from Austin Water's Car Wash Efficiency Program criteria.

Indoor Pools/Spas and Decorative Water Feature Demands

POOLS/SPAS DEMANDS

Total surface area of the pools/spas in square feet: No Pool/Spa   Total volume of the pools/spas in gallons: No Pool/Spa   *<<<Defaults assume a 20' x 52' x 4' pool, enter actual area and volume of the pool in the pink cells*

Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Volume of Water Demand (gallons)	-	-	-	-	-	-	-	-	-	-	-	-	-
Manual Override Values>>>													

Water Loss from Evaporation + Initial Fill and Refill (Once Every Year) = (Total Surface Area, sq. ft.) x (0.36 ft./month) x (7.48 gallons/cu. ft.) + (Total Volume, gallons)/(12 months per year)

Note: Monthly evaporation is assumed to mimic April outdoor climatic conditions when gross pan evaporation is 0.36 feet. See Outdoor Demand sheet for more information.

DECORATIVE WATER FEATURE DEMANDS

Total surface area of the water features in square feet: No Feature   Total volume of the water features in gallons: No Feature   *<<<Defaults assume a 25' x 2' x 2' feature, enter actual area and volume of the feature in the pink cells*

Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Volume of Water Demand (gallons)	-	-	-	-	-	-	-	-	-	-	-	-	-
Manual Override Values>>>													

Water Loss from Evaporation + Initial Fill and Refill (Once Every Year) = (Total Surface Area, sq. ft.) x (0.36 ft./month) x (7.48 gallons/cu. ft.) + (Total Volume, gallons)/(12 months per year)

Note: Monthly evaporation is assumed to mimic April outdoor climatic conditions when gross pan evaporation is 0.36 feet. See Outdoor Demand sheet for more information.

POOL FILTER BACKWASH WATER DEMAND

Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Pool Filter Backwash Volume (gallons)	-	-	-	-	-	-	-	-	-	-	-	-	-
Manual Override Values>>>													

Pool Filter Backwash Volume = (15 gallons per minute / sq. ft. of filter area) x (6 sq. ft. of filter area) x (5 minute flush per week) x (52 weeks per year)/(12 months per year)

	Annual Usage (gallons per year)	Annual Potable Usage (gallons per year)	Non-Potable Usage (gallons per year)
Summary of Indoor Pools/Spas and Decorative Water Features	**-**	**-**	**-**
	= Pool/Spa Demand + Water Feature Demand + Filter Backwash Demand	= Pool/Spa Demand + Filter Backwash Demand	= Water Feature Demand

Note: The Model Aquatic Health Code (MAHC) recommends a backwash rate of at least 15 gpm/sq. ft., which is standard for most pools.

>>> Proceed to the Outdoor Demand Sheet to Review Calculations and Assumptions

Water Balance Calculator

Instructions/Notes

This sheet calculates the average monthly and annual outdoor potable and non-potable water demands for the project.
The calculations incorporate landscape and water use inputs from the Project Information sheet, as well as default values for water using features in the project.
No user input is needed; however, the user should override default values using the pink cells to more accurately estimate project demands.
All demand calculations are shown beneath the relevant tables and summary calculations are found at the end of each section.

COLOR CODING KEY:
- User Input Value
- Derived from User Input
- Autogenerated Value
- Default Value
- Manual Override Value

Outdoor Irrigation Demand

This section calculates typical irrigation demands using Austin Water's irrigation budget equation which is modeled after customer meter data. The equation assumes the total landscaped area, independent of plant categories, has a warm season turfgrass coefficient that varies by month, and that the quality factor for the landscape is high quality. The equation does not take into account inputs such as rainfall and irrigation efficiency. The outputs provide a representation of typical customer water use per square foot of active irrigation system, and not a recommendation for irrigation demands. The user may override monthly irrigation demand values with other calculated values.

Definitions

·**Landscaped Area (LA)** is the area of plants and vegetation with a dedicated irrigation system installed for watering.
·**Average Reference Evapotranspiration (ETo)** is an estimate of the water requirement of a reference plant type where it is grown under reference conditions.
·Research-based **Turfgrass Crop Coefficients (Kc)** have been established to adjust **ETo** data for different plant types. **Kc** is a dimensionless number.
·An **ETo** adjustment factor is known as a **Crop Coefficient (Kc)** when plants are expected to produce high performance, optimum growth, and/or maximum yield.
·**Quality Factors (QF)** indicate the level of performance and appearance of the plant and can be used to adjust the **Crop Coefficient (Kc)**. **QF** is a dimensionless number ranging from 0.4 to 1.0 with 0.4 indicating minimal performance and 1.0 indicating maximum performance.

Total Irrigated Landscaped Area	266,560

Comparison of Irrigation Demand Estimates:

Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Eto[1] Average Reference ET (inches/month)	2.27	2.72	4.34	5.27	6.39	7.15	7.22	7.25	5.57	4.38	2.74	2.21	
Kc, Average Turfgrass Coefficient	0.1	0.2	0.3	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.3	0.1	
QF, Quality Factor (0.8 = high quality)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
AW Typical Irrigation Demand (gallons)	30,158	72,272	172,975	420,083	509,360	569,942	575,521	577,913	443,996	349,139	109,206	29,361	**3,859,926**
Manual Override Values>>>													
	Irrigation Demand = (LA, square feet) x (Eto, inches per month) x Kc x QF x (1 foot/12 inches) x (7.48 gal/ cubic foot)												
Days in Month	31	28	31	30	31	30	31	31	30	31	30	31	
Daily Irrigation Demand (gpd)	973	2,581	5,580	14,003	16,431	18,998	18,565	18,642	14,800	11,263	3,640	947	

	Annual Usage (gallons per year)	Annual Potable Usage (gallons per year)	Non-Potable Usage (gallons per year)
Summary of Irrigation Demands	3,859,900	-	3,859,900
	= AW Typical Irrigation Demand or User Specified Irrigation Demand	= No Potable Demand	= Annual Irrigation Demand

Notes:
(1) Historic ET is from the Texas ET network: https://texaset.tamu.edu
(2) Monthly mean precipitation data are from the Texas Water Development Board's Water Data for Texas webpage: https://waterdatafortexas.org/lake-evaporation-rainfall. Precipitation data are from 1940 - 2018 for Quad 710.

Outdoor Pools/Spas and Decorative Water Feature Demands

POOLS/SPAS

Total surface area of the pools/spas in square feet: No Pool/Spa

Total volume of the pools/spas in gallons: No Pool/Spa *<<<Defaults assume a 20' x 52' x 4' pool, enter actual area and volume of the pool in the pink cells*

Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Gross Pan Evaporation (inches)[1][2]	2.16	2.45	3.68	4.39	4.62	6.11	7.14	6.96	5.35	4.31	2.98	2.19	**52.34**
Precipitation (inches)[1][2]	2.16	2.32	2.34	2.91	4.1	3.22	1.96	2.28	3.32	3.57	2.65	2.38	**33.21**
Net Evaporation (inches)	0.00	0.13	1.34	1.48	0.52	2.89	5.18	4.68	2.03	0.74	0.33	0.00	**19.13**
Volume of Water Use (gallons)	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Manual Override Values>>>													
	Water Loss from Evaporation + Initial Fill and Refill (Once Every Year) = (Total Surface Area, sq. ft.) x (Net Evaporation, ft./month) x (7.48 gallons/cu. ft.) + (Total Volume, gallons)/(12 months per year)												

Notes:
(1) Monthly mean evaporation and precipitation data are from the Texas Water Development Board's Water Data for Texas webpage: https://waterdatafortexas.org/lake-evaporation-rainfall.
(2) Precipitation data are from 1940 - 2018 while gross lake evaporation data are from 1954 - 2018 for Quad 710.

DECORATIVE WATER FEATURES

Total surface area of the water features in square feet: No Feature

Total volume of the water features in gallons: No Feature *<<<Defaults assume a 25' x 2' x 2' feature, enter actual area and volume of the feature in the pink cells*

Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Gross Pan Evaporation (inches)[1][2]	2.16	2.45	3.68	4.39	4.62	6.11	7.14	6.96	5.35	4.31	2.98	2.19	**52.34**
Precipitation (inches)[1][2]	2.16	2.32	2.34	2.91	4.1	3.22	1.96	2.28	3.32	3.57	2.65	2.38	**33.21**
Net Evaporation (inches)	0.00	0.13	1.34	1.48	0.52	2.89	5.18	4.68	2.03	0.74	0.33	0.00	**19.13**
Volume of Water Use (gallons)	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Manual Override Values>>>													
	Water Loss from Evaporation + Initial Fill and Refill (Once Every Year) = (Total Surface Area, sq. ft.) x (Net Evaporation, ft./month) x (7.48 gallons/cu. ft.) + (Total Volume, gallons)/(12 months per year)												

Notes:
(1) Monthly mean evaporation and precipitation data are from the Texas Water Development Board's Water Data for Texas webpage: https://waterdatafortexas.org/lake-evaporation-rainfall.
(2) Precipitation data are from 1940 - 2018 while gross lake evaporation data are from 1954 - 2018 for Quad 710.

OUTDOOR POOL FILTER BACKWASH WATER

Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Volume of Backwash (gallons)	-	-	-	-	-	-	-	-	-	-	-	-	-
Manual Override Values>>>													
	Pool Filter Backwash Volume = (15 gallons per minute / sq. ft. of filter area) x (6 sq. ft. of filter area) x (5 minute flush per week) x (52 weeks per year)/(12 months per year)												

	Annual Usage (gallons per year)	Annual Potable Usage (gallons per year)	Non-Potable Usage (gallons per year)
Summary of Outdoor Pools/Spas and Decorative Water Features	-	-	-
	= Pool/Spa Demand + Water Feature Demand + Filter Backwash Demand	= Pool/Spa Demand + Filter Backwash Demand	= Water Feature Demand

Note: The Model Aquatic Health Code (MAHC) recommends a backwash rate of at least 15 gpm/sq. ft., which is standard for most pools.

Cooling Tower Demand

Capacity of the evaporative cooling system in tons: 4,092 *<<<One ton of cooling per 400 square feet of conditioned area is typical for commercial buildings, but the user may enter actual cooling capacity in the pink cell if known*

Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Average Makeup Demand (gals./ton)	89.3	87.1	106.7	115.1	270.3	417.8	545.0	632.5	585.1	293.9	93.9	72.5	**3,309**
Volume of Makeup Water (gallons)	365,552	356,331	436,694	471,197	1,106,064	1,709,910	2,230,323	2,588,404	2,394,663	1,202,875	384,467	296,758	**13,543,238**
Manual Override Values>>>	2,090,562	1,989,686	2,079,554	2,037,583	2,330,983	2,662,405	2,756,297	2,827,054	2,271,752	2,145,559	1,914,864	2,086,768	**27,193,069**
	Makeup Water = Evaporation/Drift + Blowdown = (Cooling Capacity, tons) x (Average Monthly Makeup Demand, gallons/ton)												
Days in Month	31	28	31	30	31	30	31	31	30	31	30	31	
Daily Cooling Makeup Demand (gpd)	67,437	71,060	67,082	67,919	75,193	88,747	88,913	91,195	75,725	69,212	63,829	67,315	

	Annual Usage (gallons per year)	Annual Potable Usage (gallons per year)	Non-Potable Usage (gallons per year)
Summary of Cooling Tower Demands	27,193,100	-	27,193,100
	= Annual Cooling Tower Makeup Water	= No Potable Demand	= Annual Cooling Tower Makeup Water

Note: Average monthly makeup demands are based on historical data for cooling towers in the Austin, TX area.

Outdoor Dust Control/Street Cleaning Demands

Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Enter Monthly Values (gallons)>>>													

Note: There are no default assumptions or calculations for outdoor dust control/street sweeping volumes. These volumes will need to be estimated by the project applicant if applicable.

>>> The Following Indoor & Outdoor Supply Sheets Calculate Onsite Water Supplies & the User May Update the Calculations to More Accurately Reflect Available Project Water Supplies

Water Balance Calculator

Instructions/Notes

This sheet calculates the average daily and annual indoor supplies of water that can be captured onsite for the project.
The calculations incorporate occupancy inputs from the Project Information sheet, as well as default values for water using fixtures/features in the project.
No user input is needed; however, the user should override default values using the pink cells to more accurately estimate project water supplies.
All supply calculations are shown beneath the relevant tables and summary calculations are found at the end of each section.

COLOR CODING KEY:

(light yellow)	User Input Value
(green)	Derived from User Input
(light blue)	Autogenerated Value
(gray)	Default Value
(pink)	Manual Override Value

Indoor Graywater and Blackwater Supplies

RESIDENTIAL WATER SUPPLY

Graywater Supplies

Fixture Type	Total Indoor Supply (gpy)	Total Annual Graywater Supply (gpy)	% Graywater Supply Available		Graywater Available for Reuse (gpy)
Showerhead	13,586,980	13,586,980	90%		12,228,282
Bathroom Faucet	5,553,950	5,553,950	90%		4,998,555
Kitchen Faucet	16,661,849	N/A	N/A	N/A	N/A
Clothes Washer	0	0	90%		0
Toilet	5,049,045	N/A	N/A	N/A	N/A
Dishwasher	353,433	N/A	N/A	N/A	N/A
Bath	1,427,870	1,427,870	90%		1,285,083

Graywater Available for Reuse = (Total Annual Graywater Supply, gallons) x (% Supply Available)

Graywater & Blackwater Supplies

Fixture Type	Total Indoor Supply (gpy)	Total Annual Graywater & Blackwater Supply (gpy)	% Graywater & Blackwater Supply Available		Graywater & Blackwater Available for Reuse (gpy)
Showerhead	13,586,980	13,586,980	90%		12,228,282
Bathroom Faucet	5,553,950	5,553,950	90%		4,998,555
Kitchen Faucet	16,661,849	16,661,849	90%		14,995,664
Clothes Washer	0	0	90%		0
Toilet	5,049,045	5,049,045	90%		4,544,141
Dishwasher	353,433	353,433	90%		318,090
Bath	1,427,870	1,427,870	90%		1,285,083

Graywater + Blackwater Available for Reuse = (Total Annual Graywater & Blackwater Supply, gallons) x (% Supply Available)

COMMERCIAL WATER SUPPLY

Graywater Supplies

Fixture Type	Total Indoor Supply (gpy)	Total Annual Graywater Supply (gpy)	% Graywater Supply Available		Graywater Available for Reuse (gpy)
Showerhead	761,938	761,938	90%		685,744
Bathroom Faucet	940,964	940,964	90%		846,868
Toilet (Male)	734,499	N/A	N/A	N/A	N/A
Toilet (Female)	1,940,194	N/A	N/A	N/A	N/A
Urinal	591,732	N/A	N/A	N/A	N/A
Kitchen Faucet	196,046	N/A	N/A	N/A	N/A
Patient/Guest Laundry	0	0	90%		0
Commercial Dishwasher	161,768	N/A	N/A	N/A	N/A
Pre-rinse Spray Valve	197,579	N/A	N/A	N/A	N/A
Ice Machine	N/A	N/A	N/A	N/A	N/A
Food Steamer	N/A	N/A	N/A	N/A	N/A
Combination Oven	N/A	N/A	N/A	N/A	N/A
Commercial Laundry	0	0	90%		0
Car Wash	0	N/A	N/A	N/A	N/A
Industrial Process Water	0	N/A	N/A	N/A	N/A
Medical Equipment Process Water	0	N/A	N/A	N/A	N/A
Other Non-potable Fixture Use	0	N/A	N/A	N/A	N/A
Other Potable Fixture Use	0	N/A	N/A	N/A	N/A

Graywater Available for Reuse = (Total Annual Graywater Supply, gallons) x (% Supply Available)

Graywater & Blackwater Supplies

Fixture Type	Total Indoor Supply (gpy)	Total Annual Graywater & Blackwater Supply (gpy)	% Graywater & Blackwater Supply Available		Graywater & Blackwater Available for Reuse (gpy)
Showerhead	761,938	761,938	90%		685,744
Bathroom Faucet	940,964	940,964	90%		846,868
Toilet (Male)	734,499	734,499	90%		661,049
Toilet (Female)	1,940,194	1,940,194	90%		1,746,174
Urinal	591,732	591,732	90%		532,559
Kitchen Faucet	196,046	196,046	90%		176,441
Patient/Guest Laundry	0	0	90%		0
Commercial Dishwasher	161,768	161,768	90%		145,591
Pre-rinse Spray Valve	197,579	197,579	90%		177,821
Ice Machine	N/A	N/A	N/A	N/A	N/A
Food Steamer	N/A	N/A	N/A	N/A	N/A
Combination Oven	N/A	N/A	N/A	N/A	N/A
Commercial Laundry	0	0	90%		0
Car Wash	0	0	90%		0
Industrial Process Water	0	0	90%		0
Medical Equipment Process Water	0	0	90%		0
Other Non-potable Fixture Use	0	0	90%		0
Other Potable Fixture Use	0	0	90%		0

Graywater + Blackwater Available for Reuse = (Total Annual Graywater & Blackwater Supply, gallons) x (% Supply Available)

	Annual Building Supply (gallons per year)	Annual Graywater Supply (gallons per year)	Annual Graywater Supply Available for Reuse (gallons per year)
Summary of Graywater Supplies	**48,157,800**	**22,271,700**	**20,044,500**
	= SUM(Total Indoor Supply)	=SUM(Annual Graywater Supply)	= SUM(Graywater Available for Reuse)

	Annual Building Supply (gallons per year)	Annual Cooling Tower Blowdown (gallons per year)	Annual Graywater & Blackwater Supply Available for Reuse (gallons per year)
Summary of Graywater and Blackwater Supplies	**48,157,800**	**4,894,800**	**48,236,900**
	= SUM(Total Indoor Supply)	=Annual Cooling Tower Blowdown from Below	= SUM(Graywater & Blackwater Available for Reuse) +Annual Cooling Tower Blowdown

Note: Average graywater and blackwater treatment losses are assumed to be 10%, but the user may enter data specific to a particular treatment technology if available.

Foundation Drainage Supply

Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Enter Monthly Values (gallons)>>>													

Note: There are no default assumptions or calculations for foundation drainage volumes. These volumes require a hydrologic assessment of the project site.

Cooling Tower Blowdown Supply

Cooling tower indicated in Project Information Sheet? Yes

Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Monthly Makeup Volume (gallons)	2,090,562	1,989,686	2,079,554	2,037,583	2,330,983	2,662,405	2,756,297	2,827,054	2,271,752	2,145,559	1,914,864	2,086,768	**27,193,069**
Monthly Blowdown Supply (gallons)	376,301	358,144	374,320	366,765	419,577	479,233	496,133	508,870	408,915	386,201	344,676	375,618	**4,894,752**
Manual Override Values>>>													

Blowdown = [(Evaporation/Drift) / (Cycles of Concentration - 1) = 0.8 x (Volume of Makeup Water, gallons) /(5 Cycles of Concentration -1)] x 90% available after treatment losses

>>> Proceed to the Outdoor Supply Sheet to Review Calculations and Specify Collection Volumes and Runoff Efficiencies

Water Balance Calculator

Instructions/Notes

This sheet calculates the average monthly and annual outdoor supplies of water that can be captured onsite for the project.
The calculations incorporate site information and water use inputs from the Project Information sheet, as well as default values for collection volume and runoff coefficients..
The user should override default values using the pink cells to more accurately estimate project water supplies that can be collected from impervious surfaces or the HVAC system.
If the project will combine collection of rainwater, stormwater or HVAC condensate into a common cistern, then the user should define the source waters, drainage areas and cistern size in the yellow cells in the Combined Source Cistern Supply section at the end of the sheet.
All supply calculations are shown beneath the relevant tables.

COLOR CODING KEY:

User Input Value
Derived from User Input
Autogenerated Value
Default Value
Manual Override Value

Rainwater and Stormwater Supplies (Runoff from Impervious Surfaces)

RAINWATER RUNOFF

Impervious Surface	Total Area (square feet)	Area Draining to Collection Tank (square feet)	% of Roof Area Draining to Collection	Default Runoff Coefficient (%)	User-Defined Runoff Coefficient (%)	Recommended Active Collection Volume (gallons)	User-Defined Active Collection Volume (gallons)
Building Roof Surfaces	585,011		100%	85%		309,792	
Recommended Active Collection Volume = (Roof Area Draining to Collection, sq. ft.) x (1 inch of rainfall) x (0.623 gallons/inch of rainfall /sq. ft.) x (Runoff Coefficient, %)							

<------------------

STORMWATER RUNOFF

Impervious Surface	Total Area (square feet)	Area Draining to Collection Tank (square feet)	% of Roof Area Draining to Collection	Default Runoff Coefficient (%)	User-Defined Runoff Coefficient (%)	Recommended Active Collection Volume (gallons)	User-Defined Active Collection Volume (gallons)
Non-Roof Impervious Surfaces	315,331		100%	85%		166,983	
Recommended Active Collection Volume = (Non-Roof Area Draining to Collection, sq. ft.) x (1 inch of rainfall) x (0.623 gallons/inch of rainfall /sq. ft.) x (Runoff Coefficient, %)							

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These calculations and the monthly supply summary assume rainwater runoff and stormwater runoff will be collected in separate cisterns. If the project will combine collection of rainwater, stormwater or HVAC condensate into a common cistern, then the user should define the source waters, drainage areas and cistern size in the Combined Source Cistern Supply section below.

Monthly Supply Summary (gallons per month)

Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Rainwater Supply	693,927	484,270	824,799	637,890	902,931	725,267	784,457	332,746	831,848	805,004	571,550	427,826	**8,022,514**
Stormwater Supply	423,258	258,071	495,600	357,343	540,229	441,201	443,305	180,773	536,968	457,956	354,512	242,992	**4,732,208**

Note: The monthly supply of rainwater/stormwater is a function of a 10-year simulation of daily rainfall values based on historic data, the drainage areas and runoff coefficients, the active collection volume available for storage, and the daily demand for the supply.

HVAC Condensate Supply

Capacity of the HV/AC system in tons: 4092 *<<<One ton of cooling per 400 square feet of conditioned area is typical for commercial buildings, but the user may enter actual cooling capacity if known*

Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Condensate production (gallons/ton)	12	19	49	113	174	233	259	228	166	134	57	26	**1,470**
Monthly Supply of Condensate (gallons)	49,346	75,846	201,784	464,212	710,928	954,492	1,059,418	935,044	679,173	546,397	232,822	105,008	**6,014,470**
Manual Override Values>>>													
	Condensate Production = (HVAC Cooling Demand, tons of refrigeration/month) x (AC Condensate Production, gallons/tons of refrigeration)												
Days in Month	31	28	31	30	31	30	31	31	30	31	30	31	
Daily Condensate Supply (gpd)	1,592	2,709	6,509	15,474	22,933	31,816	34,175	30,163	22,639	17,626	7,761	3,387	

Note: Monthly A/C Condensate production rates are based on the estimation method outlined in the SAWS A/C Condensate Collection and Use Manual for Commercial Buildings while using Austin, TX meteorological data.

Combined Source Cistern Supply (Any Combination of Rainwater, Stormwater and HVAC Condensate in a Single Cistern)

	Source Waters Collected in Cistern		Impervious Surfaces	Area Draining to Collection Tank (square feet)	Runoff Coefficient (%)
Rainwater Runoff	Yes	------->	Building Roof Surfaces		
Stormwater Runoff	Yes	------->	Non-Roof Impervious Surfaces		
HVAC Condensate	Yes				

Active Cistern Collection Volume (gallons)
500,000

Monthly Supply Summary (gallons per month)

Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Combined Rain/Storm/Condensate Supply	49,346	76,658	201,784	464,212	710,928	954,492	1,059,418	935,044	679,173	546,397	232,822	105,347	**6,015,621**

Note: The monthly supply of combined rainwater/stormwater/condensate is a function of a 10-year simulation of daily rainfall values based on historic data, the drainage areas and runoff coefficients, the active collection volume available for storage, and the daily demand for the supply.

>>> Proceed to the Water Balance Sheet to Compare Water Demands to Water Supplies Available for Your Project

Water Balance Calculator

Instructions/Notes

This sheet summarizes the water balance of potable and non-potable demands and onsite alternative water supplies for the project. The user can incorporate this information into the planning and design of an Onsite Water Reuse System or into the planning and design of a connection to the City of Austin's reclaimed water distribution network. Onsite alternative water supplies and reclaimed water can be used for non-potable water demands within a development project. The next sheet in this calculator tool allows the user to select individual non-potable water demands and onsite alternative water supplies to be incorporated into a reuse project.

Summary of the Water Balance

Project Water Demands

POTABLE WATER DEMANDS

Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Indoor Fixtures (gallons)	3,399,000	3,070,000	3,399,000	3,289,300	3,399,000	3,289,300	3,399,000	3,399,000	3,289,300	3,399,000	3,289,300	3,399,000	**40,020,200**
Pools/Spas (gallons)	-	-	-	-	-	-	-	-	-	-	-	-	**-**
TOTAL POTABLE DEMAND (gallons)	**3,399,000**	**3,070,000**	**3,399,000**	**3,289,300**	**3,399,000**	**3,289,300**	**3,399,000**	**3,399,000**	**3,289,300**	**3,399,000**	**3,289,300**	**3,399,000**	40,020,200

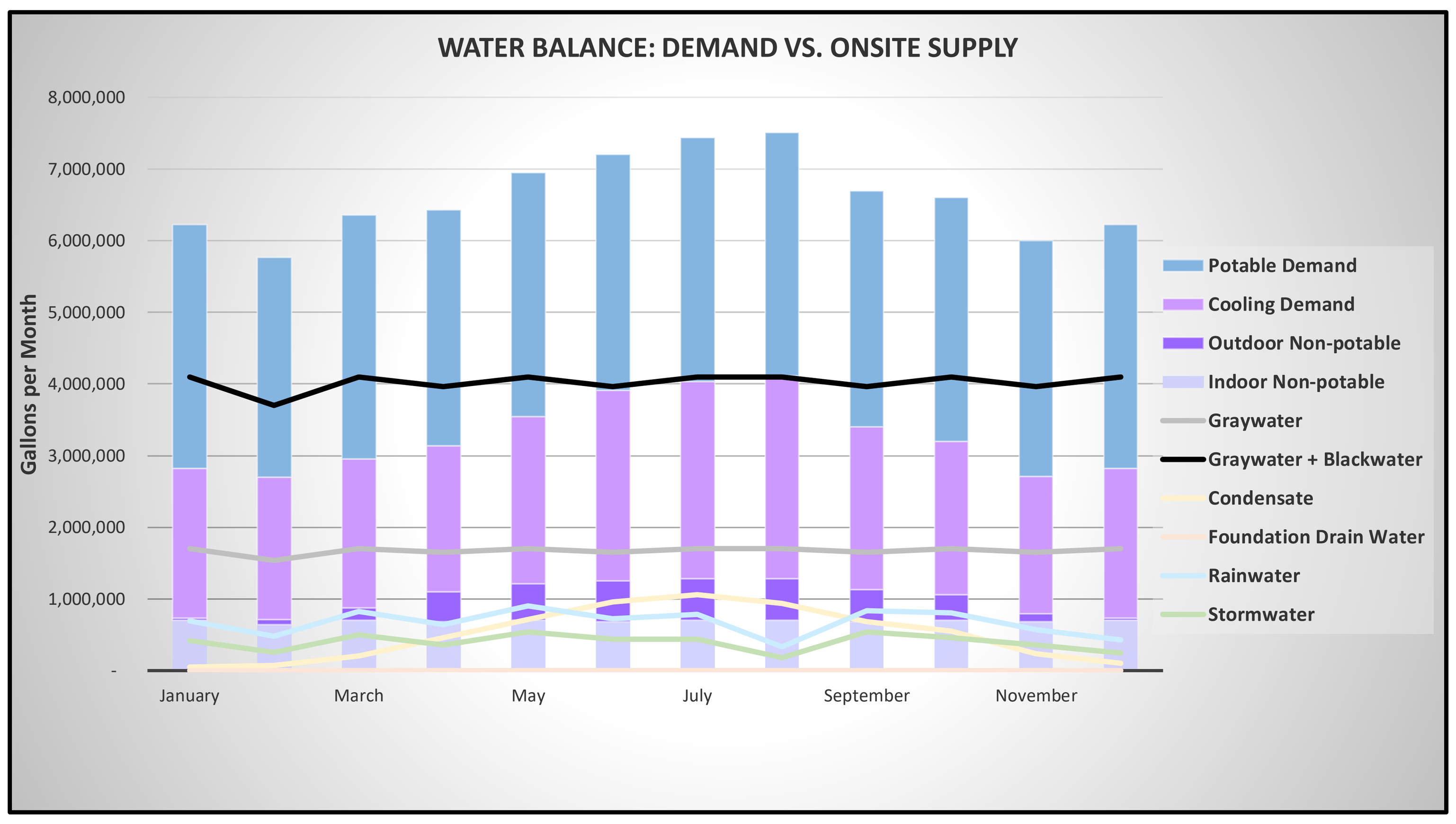
NON-POTABLE WATER DEMANDS

Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Toilet/Urinal Flushing (gallons)	706,200	637,900	706,200	683,500	706,200	683,500	706,200	706,200	683,500	706,200	683,500	706,200	**8,315,300**
Other Indoor Demands (gallons)	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Subtotal Indoor Fixtures/Features (gallons)	706,200	637,900	706,200	683,500	706,200	683,500	706,200	706,200	683,500	706,200	683,500	706,200	**8,315,300**
Outdoor Irrigation (gallons)	30,200	72,300	173,000	420,100	509,400	569,900	575,500	577,900	444,000	349,100	109,200	29,400	**3,860,000**
Other Outdoor Demands (gallons)	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Subtotal Outdoor Fixtures/Features (gallons)	30,200	72,300	173,000	420,100	509,400	569,900	575,500	577,900	444,000	349,100	109,200	29,400	**3,860,000**
Cooling Tower Makeup Water (gallons)	2,090,600	1,989,700	2,079,600	2,037,600	2,331,000	2,662,400	2,756,300	2,827,100	2,271,800	2,145,600	1,914,900	2,086,800	**27,193,400**
TOTAL NON-POTABLE DEMAND (gallons)	**2,827,000**	**2,699,900**	**2,958,800**	**3,141,200**	**3,546,600**	**3,915,800**	**4,038,000**	**4,111,200**	**3,399,300**	**3,200,900**	**2,707,600**	**2,822,400**	39,368,700

Project Water Supplies

ONSITE ALTERNATIVE WATER SUPPLIES

Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Graywater (gallons)	1,702,400	1,537,700	1,702,400	1,647,500	1,702,400	1,647,500	1,702,400	1,702,400	1,647,500	1,702,400	1,647,500	1,702,400	**20,044,500**
Graywater + Blackwater (gallons)	4,096,800	3,700,400	4,096,800	3,964,700	4,096,800	3,964,700	4,096,800	4,096,800	3,964,700	4,096,800	3,964,700	4,096,800	**48,236,800**
Condensate water (gallons)	49,300	75,800	201,800	464,200	710,900	954,500	1,059,400	935,000	679,200	546,400	232,800	105,000	**6,014,300**
Foundation Drain Water (gallons)	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Rainwater (gallons)	693,900	484,300	824,800	637,900	902,900	725,300	784,500	332,700	831,800	805,000	571,600	427,800	**8,022,500**
Stormwater (gallons)	423,300	258,100	495,600	357,300	540,200	441,200	443,300	180,800	537,000	458,000	354,500	243,000	**4,732,300**
TOTAL ONSITE WATER SUPPLY (gallons)	**5,263,300**	**4,518,600**	**5,619,000**	**5,424,100**	**6,250,800**	**6,085,700**	**6,384,000**	**5,545,300**	**6,012,700**	**5,906,200**	**5,123,600**	**4,872,600**	67,005,900



PROJECT SUMMARY

DEMANDS

GPD = gallons per day
GPY = gallons per year

POTABLE DEMANDS:

POTABLE FIXTURES/FEATURES
109,600 GPD
40,020,200 GPY

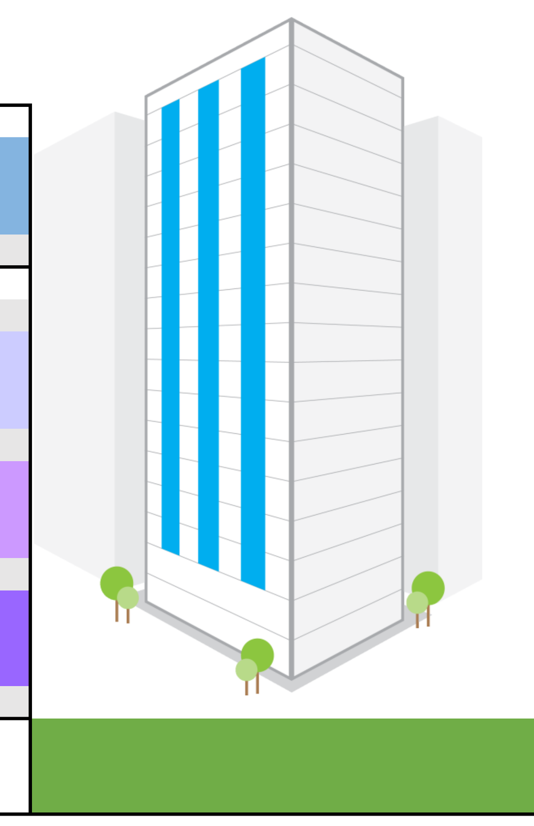
NON-POTABLE DEMANDS:

INDOOR FIXTURES/FEATURES
22,800 GPD
8,315,300 GPY

COOLING
74,500 GPD
27,193,400 GPY

OUTDOOR IRRIGATION/FEATURES
10,600 GPD
3,860,000 GPY

TOTAL NON-POTABLE DEMAND
108,000 GPD
39,368,700 GPY



SUPPLIES

GPD = gallons per day
GPY = gallons per year

GRAYWATER
54,900 GPD
20,044,500 GPY

GRAYWATER + BLACKWATER
132,200 GPD
48,236,800 GPY

CONDENSATE WATER
16,500 GPD
6,014,300 GPY

FOUNDATION DRAIN WATER
- GPD
- GPY

RAINWATER
22,000 GPD
8,022,500 GPY

STORMWATER
13,000 GPD
4,732,300 GPY

TOTAL ONSITE SUPPLIES
184,000 GPD
67,006,000 GPY

>>> Proceed to the Project Definition Sheet to Select Non-potable Water Demands to be met with Alternative Water Supplies in Your Project

Water Balance Calculator

Instructions/Notes

This sheet defines the non-potable demands for the reuse project as well as the onsite supplies to be used to meet the demands.
The user is required to select each demand and supply from the sections below.

REMINDER: This calculator is **NOT A DESIGN TOOL or OPTIMIZATION TOOL**

COLOR CODING KEY:
- User Input Value
- Derived from User Input
- Autogenerated Value
- Default Value
- Manual Override Value

Project Definition of Non-potable Demands

User-defined Demands for Project			Project Totals			Monthly Non-potable Water Demands (gallons/month)											
Demands Met with Non-potable Water	Will non-potable water be used to meet this demand?	Annual Water Demand (gpy)	Average Daily NP Demand (gpd)	Maximum Daily NP Demand (gpd)	Annual Non-potable Demand (gpy)	January	February	March	April	May	June	July	August	September	October	November	December
INDOOR DEMAND TOTALS	**YES**	**8,315,470**	**22,782**	**26,387**	**8,315,470**	**692,956**	**692,956**	**692,956**	**692,956**	**692,956**	**692,956**	**692,956**	**692,956**	**692,956**	**692,956**	**692,956**	**692,956**
INDOOR FIXTURES - Residential			**13,833**	**13,833**	**5,049,045**	**420,754**	**420,754**	**420,754**	**420,754**	**420,754**	**420,754**	**420,754**	**420,754**	**420,754**	**420,754**	**420,754**	**420,754**
Clothes Washer	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Toilet	Yes	5,049,045	13,833	13,833	5,049,045	420,754	420,754	420,754	420,754	420,754	420,754	420,754	420,754	420,754	420,754	420,754	420,754
INDOOR FIXTURES - Commercial			**8,949**	**12,554**	**3,266,425**	**272,202**	**272,202**	**272,202**	**272,202**	**272,202**	**272,202**	**272,202**	**272,202**	**272,202**	**272,202**	**272,202**	**272,202**
Toilet	Yes	2,674,693	7,328	10,215	2,674,693	222,891	222,891	222,891	222,891	222,891	222,891	222,891	222,891	222,891	222,891	222,891	222,891
Urinal	Yes	591,732	1,621	2,339	591,732	49,311	49,311	49,311	49,311	49,311	49,311	49,311	49,311	49,311	49,311	49,311	49,311
OTHER INDOOR DEMANDS			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Water Features	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Commercial Laundry	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Commercial Car Wash	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Non-potable Demand	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OUTDOOR DEMAND TOTALS	**YES**	**31,053,000**	**85,077**	**110,193**	**31,053,000**	**2,120,720**	**2,061,959**	**2,252,529**	**2,457,666**	**2,840,344**	**3,232,346**	**3,331,818**	**3,404,967**	**2,715,749**	**2,494,698**	**2,024,070**	**2,116,129**
IRRIGATION DEMANDS			**10,575**	**18,998**	**3,859,900**	**30,158**	**72,272**	**172,975**	**420,083**	**509,360**	**569,942**	**575,521**	**577,913**	**443,996**	**349,139**	**109,206**	**29,361**
Landscape Irrigation	Yes	3,859,900	10,575	18,998	3,859,900	30,158	72,272	172,975	420,083	509,360	569,942	575,521	577,913	443,996	349,139	109,206	29,361
HVAC/COOLING			**74,502**	**91,195**	**27,193,100**	**2,090,562**	**1,989,686**	**2,079,554**	**2,037,583**	**2,330,983**	**2,662,405**	**2,756,297**	**2,827,054**	**2,271,752**	**2,145,559**	**1,914,864**	**2,086,768**
Cooling Tower Makeup Water	Yes	27,193,100	74,502	91,195	27,193,100	2,090,562	1,989,686	2,079,554	2,037,583	2,330,983	2,662,405	2,756,297	2,827,054	2,271,752	2,145,559	1,914,864	2,086,768
OTHER OUTDOOR DEMANDS			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Water Features	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Non-potable Demand	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SELECTED DEMAND GRAND TOTAL		**39,368,470**	**107,859**	**136,580**	**39,368,470**	**2,813,676**	**2,754,914**	**2,945,485**	**3,150,621**	**3,533,300**	**3,925,302**	**4,024,774**	**4,097,923**	**3,408,705**	**3,187,654**	**2,717,026**	**2,809,085**

Project Definition of Onsite Supplies

User-defined Supplies for Project			Project Totals			Monthly Onsite Supplies (gallons/month)											
Onsite Supplies Available	Will this onsite supply be used?	Annual Onsite Supply (gpy)	Average Daily Onsite Supply (gpd)	Maximum Daily Onsite Supply (gpd)	Annual Onsite Supply (gpy)	January	February	March	April	May	June	July	August	September	October	November	December
INDOOR SUPPLY TOTAL	**YES**	**48,236,814**	**132,156**	**139,976**	**48,236,814**	**3,988,140**	**3,969,982**	**3,986,158**	**3,978,603**	**4,031,415**	**4,091,071**	**4,107,972**	**4,120,708**	**4,020,754**	**3,998,039**	**3,956,514**	**3,987,457**
INDOOR FIXTURES - Residential Graywater Sources			**50,718**	**50,718**	**18,511,920**	**1,542,660**	**1,542,660**	**1,542,660**	**1,542,660**	**1,542,660**	**1,542,660**	**1,542,660**	**1,542,660**	**1,542,660**	**1,542,660**	**1,542,660**	**1,542,660**
Showerhead	Yes	12,228,282	33,502	33,502	12,228,282	1,019,024	1,019,024	1,019,024	1,019,024	1,019,024	1,019,024	1,019,024	1,019,024	1,019,024	1,019,024	1,019,024	1,019,024
Bathroom Faucet	Yes	4,998,555	13,695	13,695	4,998,555	416,546	416,546	416,546	416,546	416,546	416,546	416,546	416,546	416,546	416,546	416,546	416,546
Clothes Washer	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bath	Yes	1,285,083	3,521	3,521	1,285,083	107,090	107,090	107,090	107,090	107,090	107,090	107,090	107,090	107,090	107,090	107,090	107,090
INDOOR FIXTURES - Residential Blackwater Sources			**54,405**	**54,405**	**19,857,894**	**1,654,824**	**1,654,824**	**1,654,824**	**1,654,824**	**1,654,824**	**1,654,824**	**1,654,824**	**1,654,824**	**1,654,824**	**1,654,824**	**1,654,824**	**1,654,824**
Kitchen Faucet	Yes	14,995,664	41,084	41,084	14,995,664	1,249,639	1,249,639	1,249,639	1,249,639	1,249,639	1,249,639	1,249,639	1,249,639	1,249,639	1,249,639	1,249,639	1,249,639
Toilet	Yes	4,544,141	12,450	12,450	4,544,141	378,678	378,678	378,678	378,678	378,678	378,678	378,678	378,678	378,678	378,678	378,678	378,678
Dishwasher	Yes	318,090	871	871	318,090	26,507	26,507	26,507	26,507	26,507	26,507	26,507	26,507	26,507	26,507	26,507	26,507
INDOOR FIXTURES - Commercial Graywater Sources			**4,199**	**5,165**	**1,532,611**	**127,718**	**127,718**	**127,718**	**127,718**	**127,718**	**127,718**	**127,718**	**127,718**	**127,718**	**127,718**	**127,718**	**127,718**
Showerhead	Yes	685,744	1,879	1,879	685,744	57,145	57,145	57,145	57,145	57,145	57,145	57,145	57,145	57,145	57,145	57,145	57,145
Bathroom Faucet	Yes	846,868	2,320	3,286	846,868	70,572	70,572	70,572	70,572	70,572	70,572	70,572	70,572	70,572	70,572	70,572	70,572
Commercial Laundry	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INDOOR FIXTURES - Commercial Blackwater Sources			**9,424**	**13,004**	**3,439,636**	**286,636**	**286,636**	**286,636**	**286,636**	**286,636**	**286,636**	**286,636**	**286,636**	**286,636**	**286,636**	**286,636**	**286,636**
Toilet	Yes	2,407,224	6,595	9,193	2,407,224	200,602	200,602	200,602	200,602	200,602	200,602	200,602	200,602	200,602	200,602	200,602	200,602
Urinal	Yes	532,559	1,459	2,105	532,559	44,380	44,380	44,380	44,380	44,380	44,380	44,380	44,380	44,380	44,380	44,380	44,380
Kitchen Faucet	Yes	176,441	483	624	176,441	14,703	14,703	14,703	14,703	14,703	14,703	14,703	14,703	14,703	14,703	14,703	14,703
Commercial Kitchen	Yes	323,412	886	1,082	323,412	26,951	26,951	26,951	26,951	26,951	26,951	26,951	26,951	26,951	26,951	26,951	26,951
OTHER INDOOR SUPPLIES			**13,410**	**16,684**	**4,894,752**	**376,301**	**358,144**	**374,320**	**366,765**	**419,577**	**479,233**	**496,133**	**508,870**	**408,915**	**386,201**	**344,676**	**375,618**
Industrial or Other Sources	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Foundation Drainage	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cooling Tower Blowdown	Yes	4,894,752	13,410	16,684	4,894,752	376,301	358,144	374,320	366,765	419,577	479,233	496,133	508,870	408,915	386,201	344,676	375,618
OUTDOOR SUPPLY TOTAL	**YES**	**24,784,813**	**67,904**	**116,227**	**24,784,813**	**1,215,877**	**894,845**	**1,723,967**	**1,923,658**	**2,865,016**	**3,075,452**	**3,346,598**	**2,383,607**	**2,727,161**	**2,355,754**	**1,391,705**	**881,173**
RUNOFF FROM IMPERVIOUS SURFACES			**34,944**	**47,317**	**12,754,722**	**1,117,184**	**742,341**	**1,320,399**	**995,233**	**1,443,159**	**1,166,468**	**1,227,762**	**513,519**	**1,368,816**	**1,262,960**	**926,062**	**670,818**
Rainwater	Yes	8,022,514	21,979	29,604	8,022,514	693,927	484,270	824,799	637,890	902,931	725,267	784,457	332,746	831,848	805,004	571,550	427,826
Stormwater	Yes	4,732,208	12,965	17,712	4,732,208	423,258	258,071	495,600	357,343	540,229	441,201	443,305	180,773	536,968	457,956	354,512	242,992
HVAC COOLING			**16,478**	**34,175**	**6,014,470**	**49,346**	**75,846**	**201,784**	**464,212**	**710,928**	**954,492**	**1,059,418**	**935,044**	**679,173**	**546,397**	**232,822**	**105,008**
HVAC Condensate	Yes	6,014,470	16,478	34,175	6,014,470	49,346	75,846	201,784	464,212	710,928	954,492	1,059,418	935,044	679,173	546,397	232,822	105,008
COMBINED COLLECTION OF OUTDOOR SOURCES			**16,481**	**34,735**	**6,015,621**	**49,346**	**76,658**	**201,784**	**464,212**	**710,928**	**954,492**	**1,059,418**	**935,044**	**679,173**	**546,397**	**232,822**	**105,347**
Combined Rain/Storm/Condensate	Yes	6,015,621	16,481	34,735	6,015,621	49,346	76,658	201,784	464,212	710,928	954,492	1,059,418	935,044	679,173	546,397	232,822	105,347
SELECTED SUPPLY GRAND TOTAL		**73,021,626**	**200,059**	**256,203**	**73,021,626**	**5,204,017**	**4,864,827**	**5,710,125**	**5,902,261**	**6,896,431**	**7,166,523**	**7,454,570**	**6,504,315**	**6,747,915**	**6,353,793**	**5,348,219**	**4,868,630**

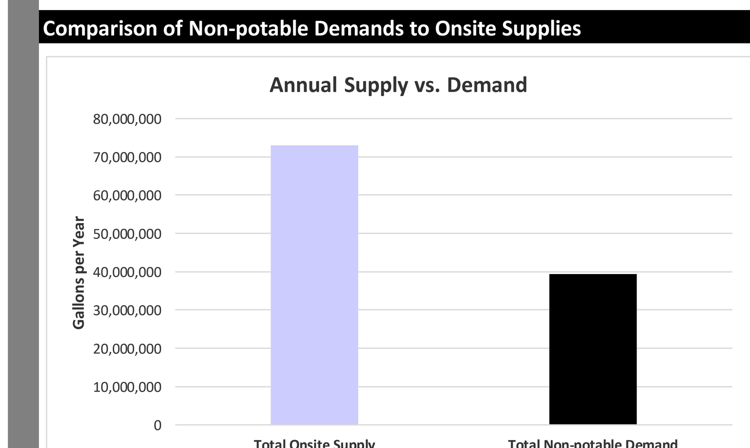
Makeup Water Supply Based on Selected Supplies, Demands and Non-potable Offset Potential

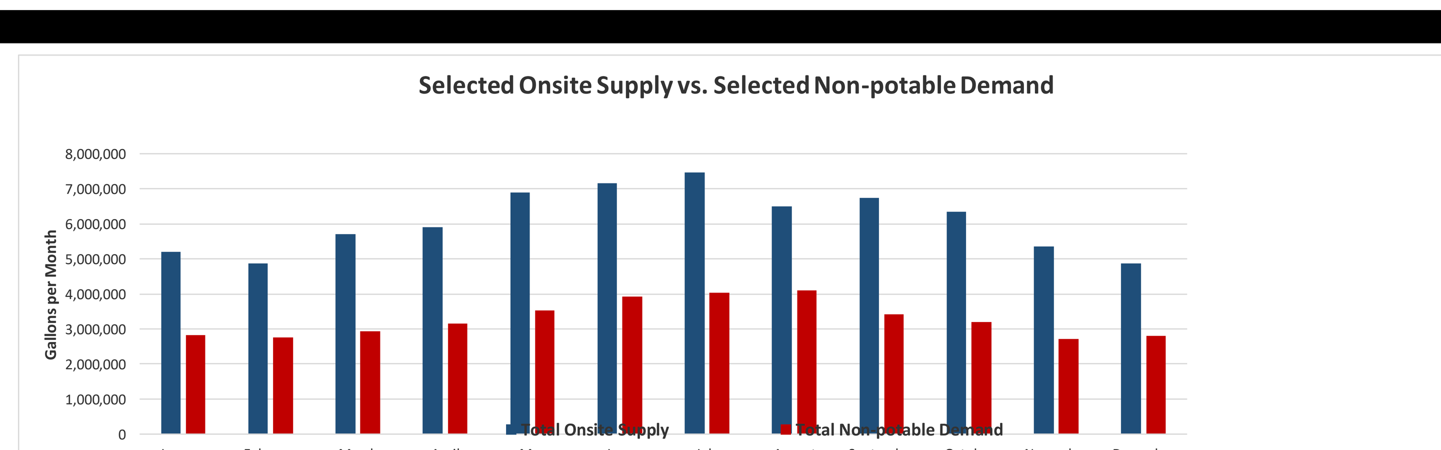
Project Totals		Monthly Onsite Supplies (gallons/month)											
Summary of Selected Onsite Supplies	Annual Supply (gpy)	January	February	March	April	May	June	July	August	September	October	November	December
Total Indoor Supplies	**48,236,814**	**3,988,140**	**3,969,982**	**3,986,158**	**3,978,603**	**4,031,415**	**4,091,071**	**4,107,972**	**4,120,708**	**4,020,754**	**3,998,039**	**3,956,514**	**3,987,457**
Graywater	20,044,531	1,670,378	1,670,378	1,670,378	1,670,378	1,670,378	1,670,378	1,670,378	1,670,378	1,670,378	1,670,378	1,670,378	1,670,378
Additional Blackwater	23,297,530	1,941,461	1,941,461	1,941,461	1,941,461	1,941,461	1,941,461	1,941,461	1,941,461	1,941,461	1,941,461	1,941,461	1,941,461
Foundation Drainage	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Indoor Sources	4,894,752	376,301	358,144	374,320	366,765	419,577	479,233	496,133	508,870	408,915	386,201	344,676	375,618
Total Outdoor Supplies	**24,784,813**	**1,215,877**	**894,845**	**1,723,967**	**1,923,658**	**2,865,016**	**3,075,452**	**3,346,598**	**2,383,607**	**2,727,161**	**2,355,754**	**1,391,705**	**881,173**
Rainwater	8,022,514	693,927	484,270	824,799	637,890	902,931	725,267	784,457	332,746	831,848	805,004	571,550	427,826
Stormwater	4,732,208	423,258	258,071	495,600	357,343	540,229	441,201	443,305	180,773	536,968	457,956	354,512	242,992
HVAC Condensate	6,014,470	49,346	75,846	201,784	464,212	710,928	954,492	1,059,418	935,044	679,173	546,397	232,822	105,008
Combined Rain/Storm/Condensate	6,015,621	49,346	76,658	201,784	464,212	710,928	954,492	1,059,418	935,044	679,173	546,397	232,822	105,347

<<-- Make sure either combined rain/storm/condensate or separate sources are selected

Total Project Non-Potable Water Balance	Annual Volume (gpy)	Monthly Volume (gal/mo)											
		January	February	March	April	May	June	July	August	September	October	November	December
Total Onsite Supply	**73,021,626**	**5,204,017**	**4,864,827**	**5,710,125**	**5,902,261**	**6,896,431**	**7,166,523**	**7,454,570**	**6,504,315**	**6,747,915**	**6,353,793**	**5,348,219**	**4,868,630**
Total Non-potable Demand	**39,368,465**	**2,813,676**	**2,754,914**	**2,945,485**	**3,150,621**	**3,533,300**	**3,925,302**	**4,024,774**	**4,097,923**	**3,408,705**	**3,187,654**	**2,717,026**	**2,809,085**
Estimated Demands Met by Onsite Supply	**39,368,465**	**2,813,676**	**2,754,914**	**2,945,485**	**3,150,621**	**3,533,300**	**3,925,302**	**4,024,774**	**4,097,923**	**3,408,705**	**3,187,654**	**2,717,026**	**2,809,085**
Estimated Makeup Water	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Comparison of Non-potable Demands to Onsite Supplies





>>> A Project Summary is Available on the Next Sheet.

Water Balance Calculator

Project Summary Sheet

Project Contact:	MCB
	0
	0
Estimated Project Completion Date:	Oct-21

Demands and Supplies Summary

Project Demands Met by Non-Potable Supply (gpy):	**39,368,465**	*50%*
Project Total Annual Water Demand (gpy):	**79,388,900**	
Potable Make-Up Water Needed (gallons/year):	**0**	

Development Information Summary

Development Project / Building Name:	BOR
Project Address:	All Buildings
Site Plan Number:	0
Number of Buildings in Development:	9
Number of Stories in Development:	0

Development Type:	Mixed Use
Total Building(s) Size (GSF):	1,636,985
Total Lot Size (ft^2):	1,636,985
Number of Residential Units:	1,537
Building Roof Area (ft^2):	585,011
Other Impervious Area (ft^2):	315,331
Irrigated Landscaped Area (ft^2):	266,560

Summary of Non-Potable Demands and Supplies for the Project

Non-Potable Supply Estimates

Onsite Alternate Water Sources	Annual Supply (gpy)
Rainwater:	8,022,514
Stormwater:	4,732,208
Condensate:	6,014,470
Combined Rain/Storm/Condensate:	6,015,621
Graywater:	20,044,531
Blackwater:	23,297,530
Foundation Drainage	0
Other Indoor Supplies:	4,894,752
TOTAL:	**73,021,626**

Non-Potable Demand Estimates

Project Non-Potable Demands	Annual Demand (gpy)
Toilets/Urinals:	8,315,470
Clothes Washing/Laundry:	0
Water Features:	0
Irrigation:	3,859,900
Cooling Tower:	27,193,100
Other Demands:	0
TOTAL:	**39,368,470**