

# Seattle Regulatory Pathways to Net Zero Water

## PHASE 1 STATUS REPORT

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**PREPARED FOR:**

City of Seattle  
Department of Planning and Development  
City Green Building

**PREPARED BY:**

Cascadia Green Building Council

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# TABLE OF CONTENTS

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3	BACKGROUND
3	LIVING BUILDING CHALLENGE <sup>SM</sup> : WATER PETAL
5	FIGURE 1: CONVENTIONAL WATER SOURCE & TREATMENT
6	FIGURE 2: PATHWAYS TO NET ZERO WATER
7	CASE STUDY: CASCADIA CENTER FOR SUSTAINABLE DESIGN & CONSTRUCTION
8	FIGURE 3: CASCADIA CENTER NET ZERO WATER STRATEGIES
9	SEATTLE CODES AND REGULATIONS RELATED TO NET ZERO WATER
9	WATER REGULATIONS CHART
10	FIGURE 4: PATHWAYS TO NET ZERO WATER – REGULATORY OVERLAY
11	SUPPLY: WATER SOURCE
12	SUPPLY: TREATMENT WITHOUT THE USE OF CHLORINE
13	ONSITE GREYWATER REUSE AND RECLAIMED WATER
14	SEWER CONNECTION
15	SEWER FEES
16	ONSITE WASTEWATER TREATMENT
17	FUTURE RESEARCH
18	APPENDIX A: REGULATIONS RELATED TO NET ZERO WATER
23	APPENDIX B: MAY 11 WORKSHOP ATTENDEES

## BACKGROUND

The decline in the quality and quantity of fresh water available to meet the demands of a growing world population has precipitated a global crisis. Even the Pacific Northwest, with its perceived abundance of fresh water, faces serious challenges. The regional snowpack, which is relied upon for water storage to serve drier months, is shrinking with the warming climate; unsustainable water use behaviors and leakage waste millions of gallons per year; and surface and groundwater resources continue to be degraded by combined sewer overflows and other point and non-point pollution sources.

The Seattle/King County building and regulatory communities can advance a sustainable water future by addressing the more wasteful aspects of existing practices and developing new policies and standards to support water conservation and reuse. Conventional practices for designing and regulating water systems unnecessarily encourage potable water for all uses within buildings and for exterior irrigation, and rely almost exclusively upon connections to large-scale wastewater treatment facilities to manage all interior wastewater. In many neighborhoods, excess stormwater also is diverted to centralized wastewater treatment. Finally, residential, commercial and industrial water use behaviors are often wasteful and result in increased demands on publicly owned utilities for supply and treatment facilities.

The City of Seattle actively promotes green building practices and has developed policies and incentives that support water resource protection. For example, the City has adopted new stormwater codes that require low impact development techniques, provides permitting guidance for rainwater harvesting systems, and offers rebates for water conservation efforts. In December 2009, Seattle established a Living Building demonstration program to assist developers seeking to meet the advanced sustainability standards set by the International Living Building Institute's Living Building Challenge<sup>SM</sup>.

Despite these and other efforts, there remain a number of obstacles for Seattle projects that seek net zero water goals — that is, projects seeking to operate within the water budget of their sites by utilizing closed loop systems that meet human needs while respecting the surrounding ecosystem. As more and more Seattle-area projects pursue the Living Building Challenge, we need to clarify the codes and regulations around on-site water collection, use, reuse, storage, on-site treatment and release, and identify regulatory authority and possible obstacles or gaps in the approval process.

This report summarizes an on-going effort by the Cascadia Green Building Council and the City of Seattle to collaborate with regulatory agencies at multiple jurisdictional scales to establish policies and pathways for Seattle-based projects pursuing net zero water strategies. While the efforts of this project are specific to the City of Seattle, it is intended to serve as a model for other jurisdictions around the State.

## LIVING BUILDING CHALLENGE<sup>SM</sup>: WATER PETAL

The Living Building Challenge, launched in 2006 by the Cascadia Green Building Council, is a benchmarking standard and certification program that defines the most advanced measures of sustainability in the built environment available today. The Living Building Challenge applies to building and renovation projects at all scales, including infrastructure projects, and is intended as a tool for transforming the way the built environment is conceived, designed and constructed. Additionally, it serves as an advocacy tool, providing a platform for design teams and regulatory agencies to define codes and policies to support more sustainable development practices.

The Living Building Challenge is comprised of seven performance areas, or 'Petals': Site, Water, Energy, Health, Materials, Equity and Beauty. Petals are subdivided into a total of twenty Imperatives, or mandatory provisions.



The water petal from Living Building Challenge Version 2.0

The intent of the Water Petal is to realign how people value and use water in the built environment. There are two imperatives associated with the Living Building Challenge Water Petal:

**IMPERATIVE #5: NET ZERO WATER**

One hundred percent of occupants' water use must come from captured precipitation or closed loop water systems that account for downstream ecosystem impact and that are appropriately purified without the use of chemicals.

**IMPERATIVE #6: ECOLOGICAL WATER FLOW**

One hundred percent of stormwater and building water discharge must be managed onsite to feed the project's internal water demands or released onto adjacent sites for management through acceptable natural time-scale surface flow, groundwater recharge, agricultural use or adjacent building needs.

Building and development projects seeking to meet these imperatives are fundamentally different than conventional projects in their approach to sourcing water, using (and reusing) water in both interior and exterior applications, and treating water prior to outflow off the building site or into the environment. **FIGURE 1** (page 5) documents the pathway for conventional projects that rely solely on municipal water supply for all water uses and off-site centralized municipal facilities for treatment of all waste prior to discharging that water back into the environment.

In contrast, **FIGURE 2** (page 6) highlights possible pathways utilized by Living Building projects seeking net zero water goals. These projects seek to source their water through rooftop harvested precipitation, groundwater, surface water, storm water, on-site reclaimed and/or off-site reclaimed water sources. Municipally supplied water is allowed only for potable water supply to sinks, faucets and showers where local health regulations require it, and only if an appeal has first been filed to the appropriate agency. However, it is not permitted for all other uses including irrigation, toilet flushing and equipment uses.

Design teams often utilize two different methodologies in their approach to net zero water strategies, either a treatment and reuse route or a waterless/composting fixture route. The former utilizes storage and treatment systems to collect water from its point of use and to process it to a level of treatment appropriate for its reuse application or prior to discharge. The latter route seeks to minimize water demand and the need for onsite treatment by utilizing waterless and composting fixtures for toilets and urinals. This route provides opportunities to reclaim nutrients otherwise diluted by water and offers a variety of ways in which the remaining greywater can be reused with or without treatment. The most appropriate pathway for any Living Building project is contingent upon careful analysis and investigation of climate, site conditions, building occupancy and use.

Figure 1: Conventional Water Source & Treatment

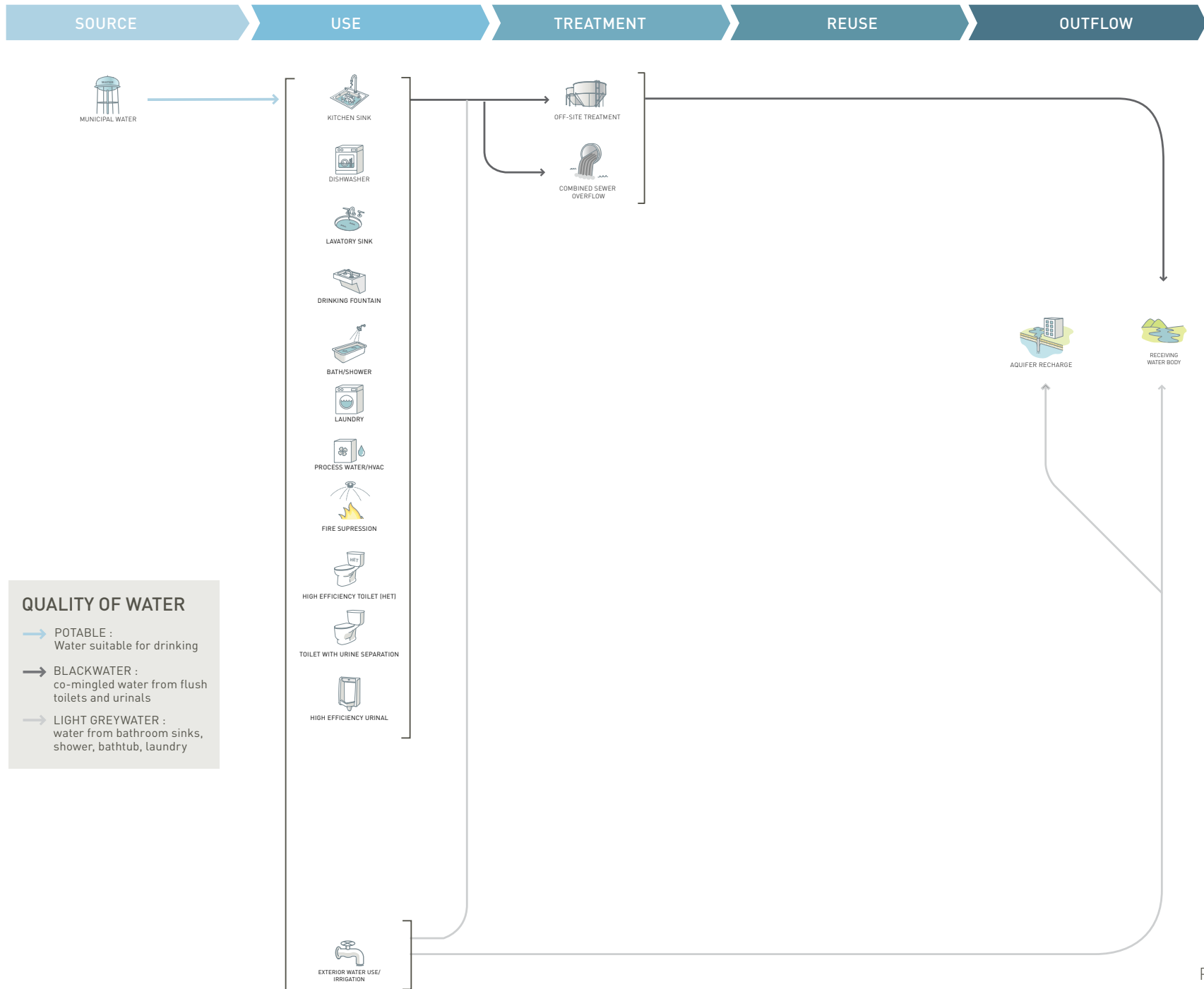
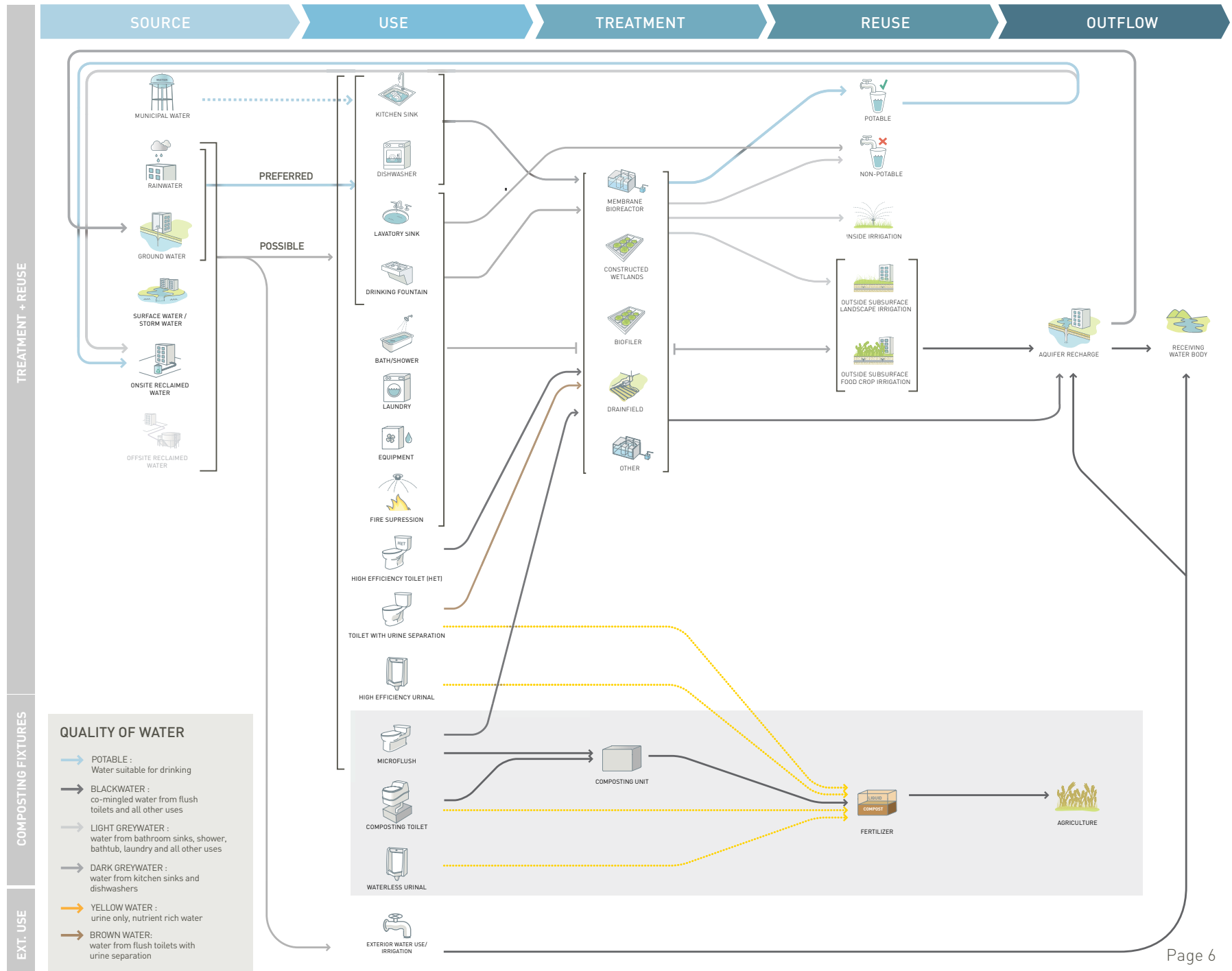


Figure 2: Pathways to Net Zero Water



## CASE STUDY: CASCADIA CENTER FOR SUSTAINABLE DESIGN AND CONSTRUCTION

The Bullitt Foundation's Cascadia Center for Sustainable Design and Construction serves as a valuable case study for mapping the regulatory pathways to net zero water within the City of Seattle. The project, currently in the design phase, provides a real-life context for discussing net zero water design goals and the regulatory framework affecting the project.

The six-story, 42,000-sf building located at the intersection of the Central Area and Capitol Hill neighborhood at 15th & Madison will be one of the first to participate in the City of Seattle's Living Building Pilot Program. The Bullitt Foundation will occupy approximately half of one floor of the building, with the remainder occupied by various tenants whose mission is to provide education in the green building and sustainability fields, or are practitioners of green design and construction.

The Cascadia Center's net zero water schematic design features include rooftop rainwater harvesting system to meet 100% of the building's interior water needs, including potable water use (fire suppression systems will be supplied by a municipal water connection).

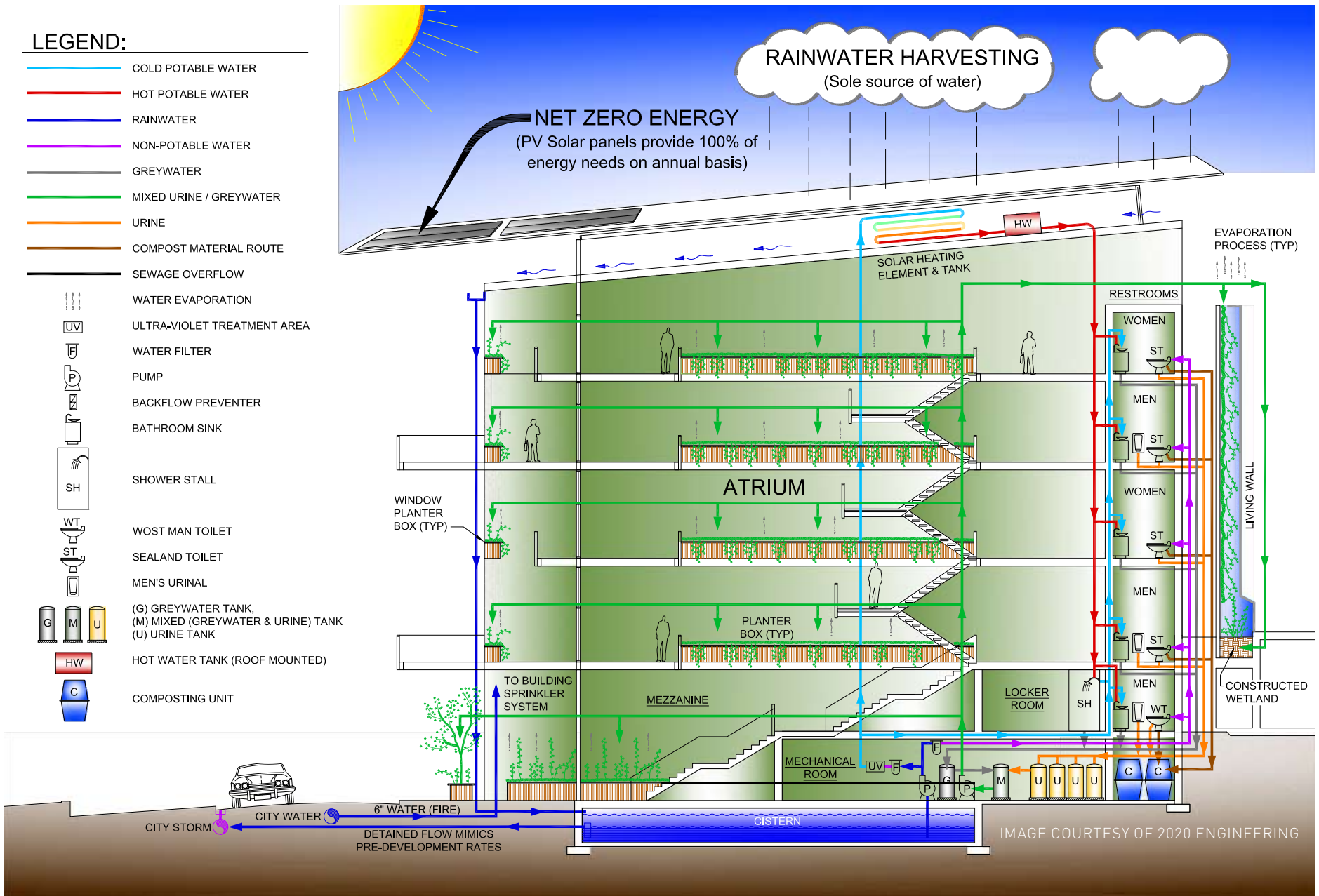
In addition, the following are being explored as possible strategies:

- A UV and carbon filter system used to treat rainwater to potable quality without the use of chemicals.
- A partially vegetated roof providing detention, evaporation, and evapotranspiration of excess rainwater and/or treatment of greywater.

- Composting units located in the basement of the building that compost all human waste from urine-diverting microflush toilets, eliminating the discharge of blackwater to the sanitary sewer system.
- Urine diversion systems that include a series of four tanks that stabilize urine over a period of 3 months before it is mixed with greywater (Ratio: 1 part urine: at least 8 parts grey water).
- Collection of bio-solids from composting units to be applied as fertilizer. Because there is not urine in the system, food scraps, worms and other organics can be added to the system to support the composting process and maximize nutrient capture.

**FIGURE 3** (page 8) highlights the project's net zero water design strategies.

Figure 3: Cascadia Center for Sustainable Design and Construction Net Zero Water Conceptual Design Strategies | May 11, 2010





# SEATTLE CODES AND REGULATIONS RELATED TO NET ZERO WATER



On May 11, 2010, Cascadia convened a workshop bringing together key staff from the City of Seattle Department of Planning and Development (DPD), Seattle Public Utilities (SPU), King County Wastewater Treatment Division (KC WTD), Seattle/King County Department of Public Health, Washington Department of Ecology (WA DOE) and Washington Department of Health (WA DOH). The workshop was limited to regulators, policy makers, and key members of the Cascadia Center’s project team.

The primary objective of the workshop was to identify the city, county and state water use, reuse and treatment regulations relevant to a commercial or mixed use project within the City of Seattle, and to use the Cascadia Center for Sustainable Design and Construction as the platform for the discussion.

The workshop was not intended as a forum for any one group to advocate their specific positions on or changes to existing codes and regulations. Rather, the intended outcome was a shared understanding by each agency of the regulations that exist at the various jurisdictional levels and where conflicts or gaps present potential barriers for net zero water projects.

As part of laying the groundwork for discussion, the group agreed on the following shared goals and assumptions:

- All parties are committed to protecting public safety and public health.
- All parties are committed to a sustainable future with respect to our water resources.
- The Cascadia Center for Sustainable Design and Construction project serves as an important model for sustainable development practices in Seattle.

A Net Zero Water diagram was presented highlighting the specific codes and regulations related to projects located within the City of Seattle, see **FIGURE 4** (page 10).

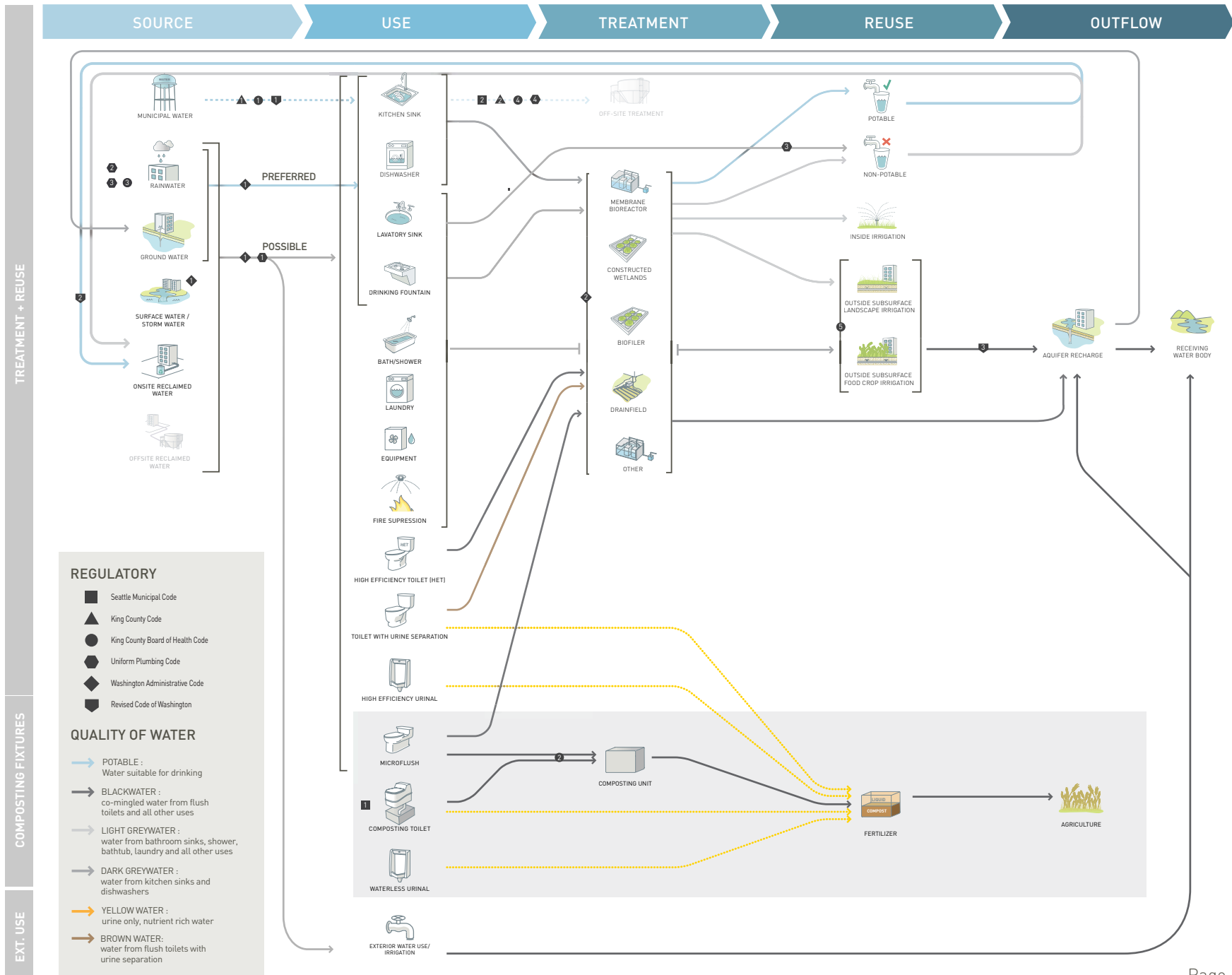
CODE		DESCRIPTION
■ Seattle Municipal Code		
1	22.206.050 E	Requires flush type toilets
2	21w.16.040 A	Wastewater side sewer connection
▲ King County Code		
1	13.24.140	Water facilities in urban areas
2	13.24.035 A	Public sewer service in the urban area
● Seattle/King County Board of Health Code		
1	12.32.010	Connection to an existing public water supply
2	13.52.020	Provisions for composting toilets
3	Health Doc. Code Method #07-001	Rainwater harvesting guidelines
4	13.04.050	Connection to public sewer
5	13.52.057	Subsurface drip systems
⬢ Uniform Plumbing Code		
1	601	Potable water supply required for fixtures
2	1101.1	Storm drainage connection required
3	Chapter 16	Nonpotable reuse water systems
4	305.1	Connection to sewer
◆ Washington Administrative Code		
1	246-290 & 246-291	Treatment regulations
2	246-272 A	Sewage technologies
▼ Revised Code of Washington		
1	19.27.097	Adequate water supply for building permit issuance
2	90.46	Reclaimed water
3	90.48	Water pollution control



The codes and regulations charted above, organized by supply, reuse and treatment, were identified through the May 11<sup>th</sup> workshop, follow-up conversations with regulatory agencies, and through a scrub of city, county and state codes. This list may not be comprehensive of all regulations related to water, but represents the authors’ best efforts at understanding and capturing those most applicable to net zero water projects with the City. Notice of errors or omissions in this report should be directed towards Cascadia Green Building Council in an effort to further refine the regulatory overlay on the Pathways to Net Zero Water diagram.



Figure 4: Pathways to Net Zero Water in Seattle: Regulatory Overlay: Commercial & Multifamily



## SUPPLY: WATER SOURCE



### CURRENT CODES + REGULATIONS

Seattle Municipal Code (SMC) 21.04 through subtitle 21.12 Subtitle 1 requires connection to the municipal system for drinking water supply. Seattle Public Utilities has identified that “off-grid” approaches raise red flags. They have both installation and connection charges related to municipal supply. SPU representatives attending the May 11<sup>th</sup> workshop acknowledged that current laws around water supply connections were written in 1920s and that it would be good for municipalities and utilities to evaluate those laws based on modern technologies and designs.

Seattle/King County Board of Health Code (BOH) 12.32.010 requires connection to an existing public water supply. While currently there is no waiver to this code for rainwater catchment as a sole water supply source, Seattle/King County Public Health has developed Health Document Code No. Product/Method #07-001 defining guidelines for rainwater harvesting for use in nonpotable locations. Additionally, the 2009 Uniform Plumbing Code (UPC), which becomes effective statewide on July 1, 2010, includes both rainwater harvesting and other water reuse (such as greywater) for nonpotable uses – this includes both residential and non-residential buildings with design flows under 3,500 gallons per day. However, neither the current BOH guidelines nor the 2009 UPC address rainwater for potable water supply.

For nonpotable uses, Seattle/King County Public Health’s Rainwater Harvesting Guidelines will be modified to address only the administrative requirements for such systems, leaving the technical provisions to the UPC. Public Health is currently looking at some amendments to the guidelines for allowing rainwater to be treated for potable use in residential applications.

### FUTURE OPPORTUNITIES + RECOMMENDATIONS

Because state and local regulations around water override provisions outlined in the UPC, opportunities exist at both the state (WA DOH) and local levels (BOH) to define standards for rainwater harvesting for potable water use in multifamily and commercial buildings. Defining pathways for regulatory authority, oversight, and ongoing maintenance of such systems represents a major opportunity for state and local agencies. In addition to the Cascadia Center for Sustainable Design and Construction project in Seattle, the Lopez Island School District also has expressed interest in using harvested rainwater for potable use and it is anticipated that many more projects will likely follow.

## SUPPLY: TREATMENT WITHOUT THE USE OF CHLORINE



### CURRENT CODES + REGULATIONS

Washington Administrative Code (WAC) 246-290 and 246-291 define treatment regulations for group A and group B water systems. Currently, chlorine is required for treatment of potable water for group A systems regulated by the Washington State Department of Health (WA DOH).

Projects seeking to meet the Living Building Challenge through harvesting of rainwater for potable water use will be seeking alternative treatment methods because of chlorine's demonstrated environmental and human health impacts. While WA DOH has stated that 60% of water sources in the state are group B systems and therefore not chlorinated, larger projects such as the Cascadia Center are defined as a group A system, requiring the presence of chlorine residual.

According to WA DOH, the chlorine residual requirement for group A systems is mandated by the Federal Safe Drinking Water Act's surface water treatment rule which requires a disinfectant "residual" for human health protection and safety. The Cascadia Center project falls under this federal regulation as a non-transient/non-community system. Documented alternatives to chlorine such as ozone or UV disinfection do not produce measurable residuals and therefore are not currently allowed.

### FUTURE OPPORTUNITIES + RECOMMENDATIONS

WA DOH has classified various water sources to define treatment regulations such as ground water, surface water and (most recently added) seawater. Opportunities exist for the state to define a separate category for rooftop-harvested rainwater that would allow for treatment without the use of chlorine. Additionally, this issue could be addressed at the federal level with the U.S. EPA. In the interim, it is recommended that WA DOH define a variance process for alternative treatment techniques that meet the intent of the Safe Drinking Water Act without the use of chlorine.

## ONSITE GREYWATER REUSE AND RECLAIMED WATER

### CURRENT CODES + REGULATIONS

WA DOH is currently developing rules for reclaimed water, though the draft rules do not specifically address on-site technologies. From WA DOH's perspective, on-site technologies are viewed as treatment, storage and distribution facilities located at the site where the water is generated and will be reused. RCW 90.46, the current Standards for Water Reclamation and Reuse and the draft Water Reclamation Rules [WAC 173-219] limit the quality of water for specific uses (e.g. toilet flushing requires Class A reclaimed water) and to whom permits can be issued. The only entities that can be permitted under the statute are public entities, entities currently holding either an NDPES or state waste discharge permit or a private utility as defined in RCW 36.94.010.

WA DOH has noted that RCW 90.46 does not prohibit on-site reuse, and that beneficial reuse of greywater can be permitted by State Department of Health or the Local Health Officer. WA DOH has also noted that they are currently writing the rules that will be the basis for these permits.

Currently there are no regulatory provisions for greywater reuse inside commercial buildings. For outside applications, subsurface irrigation will be allowed during the dry season under a new draft rule: WAC Chapter 246-274.

At the local enforcement level, the Uniform Plumbing Code section 601 requires potable water to all plumbing fixtures. However, Seattle/King County Public Health uses the alternate methods and materials provisions in Chapter 3 to guide the use of nonpotable water for nonpotable uses. According to Seattle/King County Public Health, waterless urinals are already allowed in the UPC.

### FUTURE OPPORTUNITIES + RECOMMENDATIONS

A number of opportunities exist for greywater reuse in buildings and to develop codes and regulations that provide clear pathways for projects to pursue. Part of the challenge to date is the fact that there are multiple definitions of greywater and recognizing that there are various qualities of greywater depending on its source. WA DOH and the local health departments should clearly define greywater based on source and identify regulatory provisions for on-site greywater reuse inside commercial and residential buildings. In addition, these entities should develop clear provisions for how state and local regulations overlay UPC requirements.

## SEWER CONNECTION



### **CURRENT CODES + REGULATIONS**

Seattle Municipal Code 21.16.040 A subtitle 2 requires all projects within the City to have a side sewer connection. Likewise, King County Code 13.24.035 defines that public sewer service is required in urban areas.

King County Wastewater Treatment Division does not require a permit, rather they respond to a permit issuance by the City for a required sewer connection as the trigger for their capacity charges (see Sewer Fees below).

### **FUTURE OPPORTUNITIES + RECOMMENDATIONS**

The City of Seattle Department of Planning and Development (DPD) should work with King County to define a variance process establishing requirements for projects seeking to eliminate connection to sewers. Requirements should include clearly documented and engineered designs that meet the intent of current codes around health and safety, bonding or insurance, clearly defined management and inspection responsibilities for onsite wastewater systems, change of ownership, and how wastewater will be handled in the event of onsite system failure. Another option is to define standards that allow projects to be “sewer ready” meaning that they would provide a jacketed internal ‘easement’ so that a sewer connection could be added at a later date if necessary or desired.

## SEWER FEES



### **CURRENT CODES + REGULATIONS**

King County assesses capacity charges to building projects hooking up to public sewerage. King County Code 28.84.050 and 28.86.160, and RCW 35.52.570 and 36.94.140 determine annual sewer rates and capacity charges. While a project without a sewer connection would not encounter any fees from King County, there is no variance process or alternative fee/rate structure from the County's capacity charges for projects seeking to install onsite wastewater treatment systems that rely on the County connection solely as a backup emergency connection.

Capacity charges are established based on the number of plumbing fixtures and are collected to finance the cost of the County's wastewater capital improvements. King County suggests that reduced fees for a project with a backup emergency connection would defer the financial burden of the capacity charges onto other customers. Capacity charges are evaluated annually by the County Council.

### **FUTURE OPPORTUNITIES + RECOMMENDATIONS**

King County should work with the State to develop a fee structure that incentivizes reduced wastewater capacity and assesses connection fees that reflect only the need for a backup or emergency connection. King County may look for guidance towards municipalities that have instituted innovative fee structures, such as the City of Portland's, which allow for emergency-only connections but charge large use fees in the event that the utility connection is needed.

## ON-SITE WASTEWATER TREATMENT



### CURRENT CODES + REGULATIONS

Seattle Municipal Code 22.206.050 requires the use of flush-type toilets. At the May 11<sup>th</sup> workshop, DPD and Public Health staff were unaware that this language existed in the SMC. DPD stated that they defer to UPC requirements.

Seattle/King County Board of Health Codes Title 13 outlines provisions for on-site systems and Seattle/King County Dept. of Public Health regulates on-site wastewater systems of volumes less than 3500 gallons/day. Above this threshold, WA DOH provides the permitting and regulatory oversight for projects with wastewater flows of 3,500-100,000 gallons/day, and WA DOE provides permitting and regulatory oversight for projects over 100,000 gallons/day.

Currently there are no provisions for large on-site systems within sewer areas. According to 2020 ENGINEERING, most requests for waivers to install on-site systems in sewer areas in King County have been denied.

Because the Cascadia Center building is located in a sewer area and is larger than 3500 gallons/day, regulatory purview falls at the state level to allow for an on-site treatment system.

### FUTURE OPPORTUNITIES + RECOMMENDATIONS

Seattle/King County Dept. of Public Health and WA DOH should define a variance process and regulatory provisions for projects seeking approval for on-site wastewater treatment systems in areas with sewer service. As noted under "Sewer Connections" earlier, requirements should include clearly documented and engineered designs that meet the intent of current codes around health and safety, bonding or insurance, clearly defined management and inspection responsibilities for onsite wastewater systems, change of ownership, and how wastewater will be handled in the event of onsite system failure.



## FUTURE RESEARCH

At the May 11<sup>th</sup> workshop, attendees expressed interest in continuing the conversation about regulatory pathways for net zero water projects. As a follow-up to the meeting, each agency was asked to address the question: **What can your organization do to support net zero water goals?**

Based on limited responses, Cascadia has proposed to host a series of targeted follow-up meetings with the agencies to further refine what can or needs to be done to define possible pathways for approval of net zero water strategies and who has the authority to propose/approve changes within each agency.

Targeted meetings on each topics area — specifically supply, reuse, and onsite treatment — could help streamline conversations and identify champions to assist with creating pathways for approval of net zero water projects. The following outline has been recommended for follow-up meetings:

### 1. WATER SUPPLY

- Requirements re: connection to public water supply  
AGENCY: SEATTLE PUBLIC UTILITIES
- Using rainwater for potable water supply  
AGENCY: SEATTLE/KING COUNTY PUBLIC HEALTH
- Chlorine requirements for potable water treatment  
AGENCY: WA DOH

### 2. GREYWATER REUSE

- Provisions for reuse inside buildings  
AGENCY: SEATTLE/KING COUNTY PUBLIC HEALTH & WA DOH

### 3. WASTEWATER TREATMENT

- Onsite treatment  
AGENCY: SEATTLE/KING COUNTY PUBLIC HEALTH & WA DOH

- Composting toilets  
AGENCY: SEATTLE/KING COUNTY PUBLIC HEALTH & WA DOH
- Sewer capacity charges.  
AGENCY: KING COUNTY WTD

In addition, a number of important topics were raised during the May 11<sup>th</sup> workshop that require ongoing research and further discussion, including:

- **Risks to Public Health and Safety.** Current codes and regulations exist to safeguard human health and welfare and to ensure access and availability of clean water supply and wastewater treatment to all people. Alternative strategies to conventional supply and treatment, and specifically those not currently support by regulations, lack the same level of institutional consideration for their impacts on safety and welfare. Opportunities exist for regulatory agencies at all levels to evaluate risks to public health and safety beyond what is currently mandated by codes, including risks associated with climate change, resource depletion, and pollution prevention, and to look towards more integrated water management systems to improve the resiliency and economic sustainability of their systems.
- **Issues of revenue generation for public utility services versus maintaining public health.** These are two separate issues that need to be addressed but it's possible that the solutions to each are independent of one another.
- **Occupant behavior around water use** and how this is addressed on an on-going basis in the permitting of Living Building projects.
- **Quality and level of wastewater treatment in municipal systems versus on-site systems** and addressing public health risks such as contamination and pollution at both scales.

## APPENDIX A: REGULATIONS RELATED TO NET ZERO WATER

DESCRIPTION		CODE LANGUAGE	SUPPORTING CODES/NOTES
SMC 21.16.040 A	Connection or abandonment of side sewers	A. Wastewater Side Sewer Connections. The owner or occupant of any lands, premises or habitable structures shall connect all buildings, habitable structures, sanitary plumbing outlets, and other sources of polluted water located thereon, unless exempt under subsection C of this section, with the nearest accessible sanitary sewer or combined sewer, whenever such sewer is located within three hundred feet (300') of the closest point of the building, habitable structure, sanitary plumbing outlet, or source of polluted water.	SMC 21.16.130 Permit fees. Fees for side sewer permits shall be as prescribed by Chapter 21.24 of the Seattle Municipal Code.
SMC 21.16.040 C	Connection or abandonment of side sewers	C. Exemptions from Connection. In conjunction with activity requiring a development permit, the Director of Planning and Development, after consulting with the Director of Seattle Public Utilities, may exempt any otherwise accessible developed property from connecting to the public sewer system; and except in conjunction with activity requiring a development permit the Director of Seattle Public Utilities may exempt any otherwise accessible developed property from connecting to the public sewer system; provided, in all cases, that the following conditions are met:  1. The owner or occupant has agreed to pay to the City a charge in an amount equal to the charge that would be made for sewer service if the property were connected to the sewer system, which amount shall be paid and collected at the times and in the manner provided by ordinance for the payment and collection of sewer service charges; and  2. The Director of Health has waived the requirement as provided in subsection A of this section that properties within three hundred feet (300') of a sanitary sewer or combined sewer must connect to that sewer; and  3. The property has a currently functioning on-site sewage disposal system as determined by the Director of Health. The exemption will remain in effect until the on-site sewer system fails, or the property is sold or otherwise transferred, or the owner or occupant fails to timely pay the charges referred to in subsection C1, whichever occurs first, at which time the property shall be connected to the public sewer system as required in subsection A herein.	
SMC 21.33.030	Drainage service charges and drainage rates	Establishes rates for discharge. Has credits for rainwater harvesting and also lower discharge fees based on impervious surface coverage.	SMC 21.33.020 Charge system established—charges imposed.
SMC 22.800	Stormwater Code	See SMC code language	
SMC 22.206.050 E	Sanitation	E. Fixtures. All plumbing fixtures shall be trapped and vented and connected to an approved sanitary sewer or to an approved private sewage disposal system. All toilets shall be flush type and in good working order. Every discharge opening of the spout of a water supply outflow (faucet) shall be not less than one inch (one”) above the flood rim of the fixture into which it discharges.	

DESCRIPTION		CODE LANGUAGE	SUPPORTING CODES/NOTES
KCC 13.24.035 A	Public sewer service	All development within the urban growth area shall be served by public sewer service except on-site sewage systems may be allowed temporarily in some parts of the urban growth area in accordance with K.C.C. 13.24.136	
KCC 13.24.120	Certificates of water availability	The issuance of a certificate of water availability by a water utility is required to document that adequate water service is available to proposed development projects within King County. Certificates of water availability shall document that the water utility's service capability is adequate for the proposed development consistent with criteria or standards of the Department of Health, Department of Ecology, and the Seattle-King Health Department, as appropriate to the development. King County shall not accept a certificate of water availability if information provided on the certificate is not complete or not consistent with the intent of K.C.C. Title 13 or K.C.C. Title 6.	
KCC 13.24.140	Water facilities in urban areas— interim alternative water service	A. All new development in the Urban Growth Area shall be served by: 1. An adequate public or private water supply system, as required by K.C.C. 21A.28.040; and 2. The appropriate existing Group A water purveyor, unless service cannot be provided in a timely and reasonable manner as provided in RCW 43.20.260 and 70.116.060 or with reasonable economy and efficiency as provided in RCW 19.27.097.	
BOH 12.20.030	Additional requirements for surface water sources	A. The following information shall be provided when a surface water source is developed as a source of supply or when an existing system is expanding: 1. The source must meet all the criteria specified in WAC Chapter 246-290 for surface sources including adequate watershed control (WAC 246-290-450), water treatment design (WAC 246-290-250), water quality (WAC 246-290-310), monitoring requirements (WAC 246-290-300), and report (WAC 246-290-110)	
BOH 12.32.010	Required connection to an existing public water supply	A. The owner or occupant of lands or premises undertaking new construction or other new development for which an approved public water source shall be required must connect to an approved public water system when all of the following conditions are met: 1. Any part of the lands or premises are located within either: a. The boundaries of an existing public water system as described in an approved Water Comprehensive Plan as required by King County Code 13.24; or b. A service area as described by an adopted Coordinated Water System Plan for those systems which are not required to prepare a Comprehensive Plan by King County Code 13.24. 2. The public water system must meet the water quality requirements of WAC 246-290-300 through 246-290-330. 3. The purveyor of the existing public water supply is able and willing to provide service in a timely and reasonable manner, as per WAC 246-293-190, including the latest revisions or amendments thereof.	BOH 12.36.010 Conditions for a waiver. The health officer may, in his/her discretion, waive parts of this title on an individual case basis. A waiver shall be based on the following: A. No public health hazard will result; B. The safety or health of persons using the public water supply will be protected; C. The waiver is consistent with the intent of this title; and D. The waiver will not be in conflict with the requirements of WAC Chapter 246-290 and the Federal Safe Drinking Water Act. (R&R 80 §25, 3-23-92; R&R 53 §1(part), 12-1-89).

DESCRIPTION	CODE LANGUAGE	SUPPORTING CODES/NOTES
BOH 13.04.050	<p>Connection to public sewer</p> <p>A. The owner or occupant of lands or premises located within the Urban Growth Area, as defined in the King County Comprehensive Plan, undertaking new residential or nonresidential construction, short subdivision or subdivision from which sewage will originate shall connect the construction to a public sewer if the sewer utility permits such connection. Within unincorporated King County such connection shall be in accordance with King County Code Section 13.24.136. Within incorporated cities such connection shall be in accordance with the policies of that city or the local sewer utility. The connection shall be made by connecting the building drain with an approved side sewer, and the side sewer to the public sewer.</p>	
BOH 13.52.020	<p>Composting and incineration toilets</p> <p>A. There shall be an adequate system as defined by the health officer for treatment and disposal of gray water. Anticipated water use shall be specified.</p> <p>B. Composting toilets and incineration toilets shall be designed, installed, operated and maintained in accordance with the Recommended Standards and Guidance for Performance, Application, Design, and Operation &amp; Maintenance, Water Conserving On-site Wastewater Treatment Systems, July 2007, Washington State Department of Health, or as amended and with the registered list.</p> <p>C. Removal and disposal of composted materials shall be done in a manner which complies with Recommended Standards and Guidance for Performance, Application, Design, and Operation &amp; Maintenance, Water Conserving On-site Wastewater Treatment Systems, July 2007, Washington State Department of Health. The method for disposal shall be specified for each installation.</p> <p>D. Sufficient area shall be available for a one hundred percent primary and reserve area. The department may grant a reduction of up to fifty percent in septic tank size, and up to forty percent in installed drainfield size if the compost or incineration system is consistent with this title. In no case, however, shall the tank size be less than seven hundred fifty gallons. Further, there shall be recorded and filed a restrictive covenant running forever with the land, on the title of the affected property, and binding upon and benefiting all parties having any right, interest, or title in the property or any part thereof, and their heirs, successors and assigns. The covenant shall include the following:</p> <ol style="list-style-type: none"> <li>1. A description of the waterless toilet installed and the alteration that would be necessary to convert to a water carried toilet system.</li> <li>2. A covenant of agreement to maintain such system in proper working order.</li> <li>3. A covenant of agreement that any alteration, change or modification to the OSS will not be undertaken without a new site application and approval by the health officer.</li> </ol> <p>E. Monitoring and maintenance shall be performed in accordance with BOH 13.60.010</p>	

DESCRIPTION		CODE LANGUAGE	SUPPORTING CODES/NOTES
BOH 13.52.057	Subsurface drip systems (SDS)	<p>A. No subsurface drip system shall be installed unless it is included on the registered list. All subsurface drip systems shall be designed, installed and maintained in accordance with this title, with the registered list, and the specifications contained in Recommended Standards and Guidance for Subsurface Drip Systems, July 1, 2007, Washington State Department of Health, as amended, and with the manufacturer’s directions.</p> <p>B. Any subsurface drip system shall be used with the addition of a treatment level B system.</p> <p>C. Timed dosing is required.</p> <p>D. The dripline must be installed a minimum of six inches into original, undisturbed soil.</p> <p>E. Two-foot spacing between driplines is the minimum allowed, unless otherwise waived by the health officer.</p> <p>F. A subsurface drip system may be used wherever this title requires pressure distribution.</p> <p>G. Soil dispersal components having daily design flows greater than one thousand gallons of sewage per day may:</p> <ol style="list-style-type: none"> <li>1. Be located only in soil types 1 through 5; and</li> <li>2. Be located only on slopes of less than thirty percent, or seventeen degrees.</li> </ol>	<p>13.52.060 Product development permits.</p> <p>A. No person may install and test or use any proprietary OSS technology not currently approved or listed by the Washington state Department of Health without first obtaining from the health officer a valid annual product development permit in accordance with WAC 246-272A-0170.</p> <p>B. All costs for performance and data monitoring and reporting to the health officer shall be the responsibility of the owner. The health officer may charge for such additional costs involved in monitoring and reporting on each proprietary component or sequence installed as is necessary to recover reasonable expenses. 13.52.058 State-approved new on-site sewage system technologies. No on-site sewage system technology submitted to the health officer for design approval after the effective date of this title will be approved for installation or installed unless it is included on the registered list and has standards for its use detailed in either WAC 246-271A-0100 or in recommended standards and guidance documents issued by the Washington state Department of Health, or is subject to a valid product development permit issued by the health officer. The health officer is authorized to adopt rules, policies or procedures not inconsistent with the provisions of this title to restrict or limit the use of new on-site sewage system technologies or to approve, deny or limit the use of new on-site sewage system technologies for new construction or repairs.</p>
Seattle/KC Public Health Document Code No. Product/Method #07-001 REVISED: 04/01/2007	Rainwater Harvesting and Connection to Plumbing Fixtures	5.1 This policy applies to systems intended to capture and store rainwater from roof surfaces for supply to non-potable plumbing fixtures. Such systems may be used in both residential and non-residential occupancies.	
WAC 246-290 and 246-291	Group A and Group B treatment requirements	See WAC code language	

DESCRIPTION	CODE LANGUAGE	SUPPORTING CODES/NOTES	
WAC 246-272A-0100	<p>Sewage technologies</p>	<p>(1) The department may develop recommended standards and guidance to assist local health officers in permitting different types of sewage treatment and distribution technologies including the following four broad categories:</p> <p>(a) Public domain treatment technologies (e.g., sand filters);</p> <p>(b) Proprietary treatment products (e.g., aerobic treatment systems and packed bed filters);</p> <p>(c) Public domain distribution technologies (e.g., gravel or generic gravel substitutes, gravity and pressure distribution methods and materials);</p> <p>(d) Proprietary distribution products (e.g., subsurface dripline products or gravelless distribution products).</p> <p>(2) All types of sewage technologies must have either standards for use described in this chapter or departmental recommended standards and guidance before the local health officer may permit them. Recommended standards and guidance may include information and detail such as:</p> <p>(a) Application;</p> <p>(b) Design;</p> <p>(c) Installation;</p> <p>(d) Operation, monitoring and maintenance;</p> <p>(e) Performance expectations; and</p> <p>(f) Sources of information</p>	<p>WAC 246-272A-0420 Waiver of state regulations.</p> <p>(1) The local health officer may grant a waiver from specific requirements of this chapter if:(a) The waiver request is evaluated by the local health officer on an individual, site-by-site basis; (b) The local health officer determines that the waiver is consistent with the standards in, and the intent of, these rules; (c) The local health officer submits quarterly reports to the department regarding any waivers approved or denied; and (d) Based on review of the quarterly reports, if the department finds that the waivers previously granted have not been consistent with the standards in, and the intent of these rules, the department shall provide technical assistance to the local health officer to correct the inconsistency, and may notify the local and state boards of health of the department's concerns. If upon further review of the quarterly reports, the department finds that the inconsistency between the waivers granted and the state board of health standards has not been corrected, the department may suspend the authority of the local health officer to grant waivers under this section until such inconsistencies have been corrected. (2) The department shall develop guidance to assist local health officers in the application of waivers</p>
UPC Chapter 16	Nonpotable reuse water systems	Standards for reclaimed water and rainwater harvesting.	
UPC 305.1	Sewer Connection	Every building in which plumbing fixtures are installed shall have a connection to a public or private sewer except as provided in section 305.2.	
RCW 90.46	Reclaimed water use		
RCW 90.48	Water pollution control		
RCW 19.27.097	Building permit application — Evidence of adequate water supply — Applicability — Exemption	<p>(1) Each applicant for a building permit of a building necessitating potable water shall provide evidence of an adequate water supply for the intended use of the building. Evidence may be in the form of a water right permit from the department of ecology, a letter from an approved water purveyor stating the ability to provide water, or another form sufficient to verify the existence of an adequate water supply. In addition to other authorities, the county or city may impose conditions on building permits requiring connection to an existing public water system where the existing system is willing and able to provide safe and reliable potable water to the applicant with reasonable economy and efficiency. An application for a water right shall not be sufficient proof of an adequate water supply.</p>	

## APPENDIX B: MAY 11 WORKSHOP ATTENDEES

### CASCADIA GREEN BUILDING COUNCIL

Joel Sisolak, Katie Spataro, Marin Bjork

### CASCADIA CENTER FOR SUSTAINABLE DESIGN AND CONSTRUCTION PROJECT TEAM

#### **2020 Engineering:**

Mark Buehrer, Colleen Mitchell

#### **Point 32:**

Chris Rogers

#### **Miller Hull Partnership:**

Scott Wolf, Margaret Sprug

### REGULATORY AGENCIES

#### **City of Seattle, Department of Planning and Development:**

Peter Dobrovolny, Kathleen Petrie

#### **City of Seattle, Seattle Public Utilities:**

Joel Banslaben, Mike Brennan, Keith Hinman

#### **Seattle-King County Public Health:**

Larry Fay, Dave Cantrell

#### **King County, Wastewater Treatment Division:**

Sharman Herrin

#### **WA State Department of Ecology:**

Kurt Unger

#### **WA State Department of Health, Drinking Water:**

Ginny Stern, Steve Deem

#### **WA State Department of Health, Reclaimed Water:**

Craig Riley