**Onsite Water Reuse System Report Template (March 2024)**

**Instructions**

This template is intended to aid Applicants seeking a permit under City of Austin Code Chapter 15-13 in writing an Onsite Water Reuse System Engineering Report.

**Please delete these instructions and definitions pages prior to submittal.**

Submittal of this Engineering Report is a requirement under applicable City of Austin Codes; final or conditional approval of the report will be obtained prior to seeking a plumbing permit from the Development Services Department.

Project Applicants should complete all sections of the Engineering Report, including all applicable Tables.

Explanatory instructions are provided in *[this format]* throughout the template. These instructions should be deleted by the Applicant prior to submission of the report. Upon completion of the template, the table numbers can be updated by right clicking on any table number and selecting ‘Update Field’.

Please note that approval of this report does not supersede compliance with relevant aspects of the plumbing code.

**Definitions**[**1**](#_bookmark0)

**Blackwater:** Wastewater which originates primarily from kitchen, bathroom, and laundry sources, including waste from food preparation, dishwashing, garbage grinding, toilets, baths, showers, and sinks of a residential dwelling. Domestic wastewater may contain commercial wastewater contributions.

**Graywater:** Wastewater from showers, bathtubs, handwashing lavatories, sinks that are used for disposal of household or domestic products, sinks that are not used for food preparation or disposal, and clothes-washing machines. Graywater does not include wastewater from the washing of material, including diapers, soiled with human excreta, or wastewater that has come into contact with toilet waste.

**Foundation Drainage:** Groundwater that is extracted to maintain a building’s or facility’s structural integrity and would otherwise be discharged to the storm sewer. Foundation drain water does not include groundwater extracted for a beneficial use that is subject to City groundwater well regulations or to regulation by a groundwater district.

1 For a complete list of definitions, refer to City of Austin Code Chapter 15-13 Rules and Regulations

**Log Reduction:** The removal of a pathogen or surrogate in a unit process expressed in log units. A 1-log reduction equates to 90-percent removal, 2-log reduction to 99-percent removal, 3-log reduction to 99.9-percent removal, and so on.

**Log Reduction Credit:** The log reduction value (LRV) to a treatment technology based on the technology’s ability to remove or inactivate pathogens and proposed surrogate parameter for continuous monitoring.

**Log Reduction Target (LRT):** The log reduction target for the specified pathogen group (i.e., viruses, bacteria, or protozoa) to achieve the agreed level of risk to individuals (e.g., 10-4 infections per year).

**LRT Compliance Monitor**: Monitor that is required to demonstrate ongoing performance of a unit process receiving pathogen reduction credit in accordance with an accepted pathogen crediting framework.

**Project Applicant:** The person applying for an operating permit before installing an OWRS. The Project Applicant is responsible for applying for the permit, assuring that the OWRS is installed consistent with the approved Engineering Report, the Operations and Maintenance Manual, the regulations in City Code Chapter 15-13, and applicable state and local laws.

**Rainwater:** Precipitation or diffused surface water collected from roof surfaces or other above ground structures.

**Stormwater:** Precipitation or diffused surface water collected from surfaces at or below grade before it enters the bed and banks of a state watercourse or state water body.

**Water Quality Monitor:** Monitor that is not required to demonstrate LRT compliance, but are necessary for demonstration of compliance with water quality goals.

Onsite Water Reuse System Engineering Report

**<Insert Responsible Party>**

**<Insert Project Name>**

**<Insert Project Address>**

Prepared by:

<Insert Engineer Name>

**Insert TX Registered Professional Engineer Seal & Signature**

<Insert Company Name>

<Insert Company Address>

Submitted to: Austin Water

Date: <Insert Date>

Table of Contents

[1. General 3](#_Toc158199263)

[1.1. Facility Information 3](#_Toc158199264)

[1.2. Project Milestones and Timeline 4](#_Toc158199265)

[1.3. Vicinity Map (insert as Appendix A.1) 4](#_Toc158199266)

[1.4. Facility Map (insert as Appendix A.2) 4](#_Toc158199267)

[1.5. Plan/Layout of the Alternative Water Source System (insert as Appendix A.3) 4](#_Toc158199268)

[2. Basis of Design for Onsite Water Reuse System 5](#_Toc158199269)

[2.1. Outdoor Source Water Flow Rates and Water Quality 5](#_Toc158199270)

[2.2. Indoor Source Water Flow Rates and Water Quality 5](#_Toc158199271)

[3. Process Flow 6](#_Toc158199272)

[3.1. Control Narrative 6](#_Toc158199273)

[3.2. Treatment Train Process Flow Diagram (PFD) 6](#_Toc158199274)

[4. Treatment Train Design Criteria *[LRT Systems Only]* 8](#_Toc158199275)

[4.1. Pathogen Log Reduction Credit 8](#_Toc158199276)

[4.2. Treatment Train Flow Summary 9](#_Toc158199277)

[4.3. Unit Process Design Criteria 9](#_Toc158199278)

[4.4. Secondary Disinfection 13](#_Toc158199279)

[4.5. Chemical Use & Handling 14](#_Toc158199280)

[4.6. Solids Handling 14](#_Toc158199281)

[5. Monitoring, Alarms, and Reporting *[LRT Systems Only]* 15](#_Toc158199282)

[5.1. System control strategy 15](#_Toc158199283)

[5.2. Online monitoring 15](#_Toc158199284)

[5.3. Grab sampling 15](#_Toc158199285)

[5.4. Alarms and Diversions 16](#_Toc158199286)

[6. Supplemental Water Supply & Cross Connection Control 17](#_Toc158199287)

[7. Public Exposure and Impact 18](#_Toc158199288)

[9. Appendix B: Component Cut Sheets 20](#_Toc158199289)

[10. Appendix C: Log Reduction Evidence 21](#_Toc158199290)

*[Table of Contents should be updated by right clicking on the table and selecting “update fields”]*

# General

## Facility Information

#### Table 1. Facility information summary.

|  |  |
| --- | --- |
| Project Applicant | RESPONSIBLE PARTY NAME |
| Address | STREET NO. STREET NAME AUSTIN TX ZIP |
| Development Type | * Commercial * Residential * Mixed-Use |
| Total Square Footage | Commercial: square feet  Residential: square feet  Mixed: square feet  Total: square feet |
| Number of Buildings | buildings |
| Number of Floors | floors |
| Residential Units | units |
| Residents | residents |
| Non-Resident Employees | employees |
| Occupancy and Staffing | Hours building will be occupied  Hours building staff will be present on-site Days of week building will be occupied |
| Alternative Water Sources | * Rainwater * Condensate * Stormwater * Graywater * Foundation Drainage * Other: |
| Non-Potable Water End Uses (indoor) | * Toilet and Urinal Flushing for toilets, urinals * Clothes Washing * Decorative Fountains * Priming Drain Traps * Other:   If “other” use is selected, a variance procedure must be approved by AW. |
| Non-Potable Water End Uses (outdoor) | * Subsurface Irrigation * Drip or Other Surface Non-Spray Irrigation * Spray Irrigation * Decorative Fountains and Impoundments * Cooling Applications * Dust Control/Street Cleaning * Other:   If “other” use is selected, a variance procedure must be approved by AW. |
| Average Daily Distribution | gallons |
| Does the project has a cooling tower? | Yes;  No  If yes, a drift eliminator shall be used when the cooling system is in operation. |

## Project Milestones and Timeline

Estimated Date of Certificate of Occupancy (CO): Insert CO Date Here

#### Table 2. Onsite Water Reuse System estimated implementation timeline.

|  |  |  |
| --- | --- | --- |
| **Tasks for Implementing Onsite Water Reuse System1** | **Start** | **Finish** |
| Design Phase |  |  |
| Construction Phase |  |  |
| Development of Operations & Maintenance Manual |  |  |
| Start-Up and Commissioning |  |  |

1 This table is intended to provide estimated dates; projects will not be held to the dates in this table.

## Vicinity Map (insert as Appendix A.1)

Provide a vicinity map of the location of the development including neighboring properties.

## Facility Map (insert as Appendix A.2)

Provide a facility map of the location of the Onsite Water Reuse System within the development.

## Plan/Layout of the Alternative Water Source System (insert as Appendix A.3)

Provide a general arrangement drawing (plan view) of the Onsite Water Reuse System:

* + - Unit treatment processes (location and dimensions)
    - Tanks (location and dimensions)
    - Pumps (location and dimensions of pad or skid)
    - Tie-point connections (inlet, outlet, drains, overflows, etc.)
    - Locations of egress (i.e., entry and exit doors, etc.)

# Basis of Design for Onsite Water Reuse System

## Outdoor Source Water Flow Rates and Water Quality

*[Fill out the following tables if outdoor sources, i.e. rainwater, condensate and stormwater, are being used. The total annual estimated supply for rainwater, condensate and stormwater should match the numbers that were provided in the water balance calculator.*

*Water quality values are intended as design guidelines. Project Applicant can change default values; if they are changed, please mark with a footnote and explain data source/rationale Project Applicant should delete rows corresponding to source waters that are not included in the proposed project.]*

#### Table 3A Summary of Alternative Water Source inflows for outdoor sources.

|  |  |
| --- | --- |
| **Type of Source Water** | **Total annual estimated supply (gal/yr)** |
| Rainwater |  |
| Stormwater |  |
| Condensate |  |
| Combined Rain/Storm/Condensate |  |
| Total |  |

**Table 3B Alternative Water Source outdoor source raw water quality summary.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Type of Source Water** | **Turbidity (NTU)** | **TSS**  **(mg/l)** | **pH** | **Total coliform**  **(CFU/100ml)** | **BOD (mg/l)** |
| Rainwater | 10 - 30 | 20 - 50 | 5 – 9 | 102 - 103 | <15 |
| Stormwater | -- | 100 - 500 | 6 – 9 | 102 - 105 | <40 |
| Condensate | -- | -- | 6 – 9 | -- | -- |

## Indoor Source Water Flow Rates and Water Quality

*[Provide estimates of the inflows of indoor source waters, if being used. Project Applicant should delete rows corresponding to source waters that are not included in the proposed project.]*

#### Table 3C Summary of Alternative Water Source inflows for indoor sources.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Average Daily Supply1 (gal)** | **Daily supply (if applicable)2 (gal)** | | | | | | |
| **Mon** | **Tue** | **Wed** | **Thu** | **Fri** | **Sat** | **Sun** |
| Foundation Drainage |  |  |  |  |  |  |  |  |
| Graywater |  |  |  |  |  |  |  |  |
| Blackwater |  |  |  |  |  |  |  |  |
| Other: |  |  |  |  |  |  |  |  |
| Total |  |  |  |  |  |  |  |  |

1 This value should match the numbers that were provided in water balance calculator.

2 For buildings with differences in occupancy on weekdays and weekends (i.e. commercial), please estimate breakdown of flows by day of the week.

*[Complete the table below if foundation drainage or other indoor source waters are being used. Project Applicant can change default values; if they are changed, please mark with a footnote and explain data source/rationale. Project Applicant should delete rows corresponding to source waters that are not included in the proposed project.]*

#### Table 3D. Alternative Water Source raw water quality for indoor sources.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Type of Source Water** | **Total Coliform (CFU/100ml)** | **BOD**  **(mg/l)** | **TSS**  **(mg/l)** | **Turbidity (NTU)** | **pH** | **Ammonia (mg/l as N)** |
| Graywater1 | 104 – 107 | 100 – 300 | 100 – 300 | 20 - 200 | 6 – 9 | 3 – 10 |
| Blackwater | 108 – 1010 | 700 – 1,000 | 300 – 600 | -- | 6 – 9 | 50 – 150 |
| Foundation Drainage2 |  |  |  |  |  |  |
| Other: |  |  |  |  |  |  |

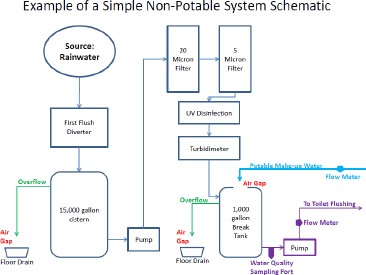
1 These values are assuming that laundry is not a significant component of graywater; values should be modified if there is significant laundry water contribution.

2 Data should be obtained from monitoring program, if foundation drainage is being used.

# Process Flow

## Control Narrative

## Treatment Train Process Flow Diagram (PFD)

*[PFD should be a simplified block diagram including all tanks, treatment processes*[*2*](#_bookmark13)*, LRT compliance monitors*[*3*](#_bookmark14)*, water quality monitors*[*4*](#_bookmark15)*, waste streams, diversions, and potable makeup supply location] See example schematic below:*

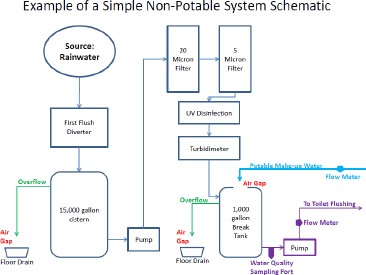
*[Please also complete the table below for all system components included in the PFD. Cut sheets for components described in this table should be provided in Appendix B.]*

*The process flow must show:*

1. *Flow meter(s): A flow meter dedicated to pipeline that provides make-up water to the system; and (if applicable), a flow meter for any component of a district-scale OWRS that is not the main OWRS and collects, treats, receives, or distributes water.*
2. Approved backwater valves are installed to direct graywater and condensate water to sanitary; and rainwater, stormwater, and foundation drain water to storm or other approved discharge locations.
3. *Containment Reduced Pressure Principle Backflow Prevention Device (RP) installed immediately downstream of the point of connection or water meter.*

#### Table 4. Summary of system components.

|  |  |  |  |
| --- | --- | --- | --- |
| **System Component** | **Function** | **Capacity/Size** | **LRT compliance**  **process or monitor? (Y/N)** |
|  |  |  |  |
|  |  |  |  |

*[PFD should be a simplified block diagram including all tanks, treatment processes*[*2*](#_bookmark13)*, LRT compliance monitors*[*3*](#_bookmark14)*, water quality monitors*[*4*](#_bookmark15)*, waste streams, diversions, and potable makeup supply location] See example schematic below:*

*[Please also complete the table below for all system components included in the PFD. Cut sheets for components described in this table should be provided in Appendix B.]*

#### Table 4. Summary of system components.

|  |  |  |  |
| --- | --- | --- | --- |
| **System Component** | **Function** | **Capacity/Size** | **LRT compliance**  **process or monitor? (Y/N)** |
|  |  |  |  |
|  |  |  |  |

*Note: System component must include a first flush diverter or debris excluder for rainwater systems; and a 100 micron filter (or smaller) for OWRS supplying non-potable water to toilets, urinals, trap primers, and drip irrigation systems.*

# Treatment Train Design Criteria *[LRT Systems Only]*

## Pathogen Log Reduction Credit

**Table 5. Log reduction credits for Critical Control Point unit processes in treatment train.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Unit Process** | **Proposed Virus Credit** | **Proposed Protozoa Credit** | **Proposed Bacteria Credit** | **Crediting Framework1** |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **TOTAL** |  |  |  |  |
| **REQUIRED2** |  |  |  |  |

1Please list approved crediting framework. If proposing a new crediting framework, list ‘other’ and attach explanatory text.

**2**Required log reduction credits are specified in the Rules and Regulations of City Code Chapter 15-13

## Validation Report

*[Provide a narrative describing the evidence that the treatment unit processes can reliably and consistently achieve a specific log reduction value]. Ensure the following is met and described:*

* *Evidence of the treatment technology's ability to reliably and consistently achieve the log reduction value;*
* *Information about the required operating conditions and surrogate parameters that require continuous monitoring; and*
* *A letter showing a state public health official previously accepted the report (Show the letter as an Appendix).*

*2 Treatment processes should include any pre-treatment (e.g. pre-screens) and post-treatment (e.g. stabilization)*

*3 LRT compliance monitors are those that are required to demonstrate ongoing performance of a unit process receiving pathogen reduction credit, e.g. UVT for UV disinfection, free chlorine residual for*

*chlorine disinfection, pressure decay test for membrane filtration.*

*4 Water quality monitors are those that are not required to demonstrate LRT compliance, but are necessary for demonstration of compliance with water quality goals, e.g. turbidity.*

## Treatment Train Flow Summary

*[Complete the following flow summary table. Replace ‘unit process 1’, etc. with name of each unit process included in treatment train. If a process or tank is not receiving continuous flow (e.g. the first equalization tank), the hrs/day receiving flow should be less than 24. If there is not a constant demand for water at the end uses, e.g. toilet flushing in a commercial building, the hrs/day producing flow from the treated water storage tank should be less than 24. If unit processes do not receive a constant flow rate, a min/avg/max should be provided and the hrs/day receiving and producing flow should likely be less than 24.*

*This table should include all tanks and unit processes. The purpose of the table is to evaluate whether sufficient storage is being provided to handle variable influent flows, and whether flows in and out of tanks and unit processes are compatible.]*

#### Table 6. Unit process flow summary.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Influent Flow** | | **Effluent Flow** | |
|  | **Hrs/day receiving flow** | **Influent flow rate1 (gpm)** | **Hrs/day producing flow** | **Effluent flow rate1 (gpm)** |
| Equalization/storage tank |  |  |  |  |
| Unit process 1 |  |  |  |  |
| Unit process 2 |  |  |  |  |
| … |  |  |  |  |
| Treated water storage tank |  |  |  |  |

1 *If influent or effluent flows are not constant, please provide min/avg/max flow rates.*

## Unit Process Design Criteria

*[****Include only tables corresponding to unit processes in proposed treatment train; delete unused tables****. You may update the Table letters by right clicking and choosing “update field”. If using a process not included in any tables, please modify an existing table and include key design criteria. If relevant design criteria are not listed, please add them to tables. For chemical disinfection processes, please provide simple diagram of contactor configuration.]*

*Refer to § 15-13-40 (Table 4) for specific monitoring requirements per treatment process type.*

#### Table 7A. Membrane bioreactor design criteria.

|  |  |  |
| --- | --- | --- |
| **Membrane Bioreactor** | | |
| **Parameter** | **Units** | **Value** |
| System manufacturer | -- |  |
| Effluent flow rate | gpm |  |
| Nitrifying? | -- |  |
| Volume | gal |  |
| pH | pH units |  |
| Temperature | °C |  |
| Hydraulic retention time (HRT) | hr |  |
| Solids retention time (SRT) | days |  |

|  |  |  |
| --- | --- | --- |
| Mixed liquor suspended solids (MLSS) | mg/L |  |
| Dissolved oxygen | mg/L |  |
| Transmembrane pressure | kPa |  |
| Flux | gal/ft2/d |  |
| Effluent turbidity | NTU |  |
| Effluent ammonia | mg/L |  |
| Effluent BOD | mg/L |  |
| Basis for crediting (if applicable)1 | *[Describe the crediting framework or technology-specific validation approach for pathogen crediting]* | |

1 *Include any necessary documentation in Appendix C*

#### Table 7B. Biological treatment design criteria.

|  |  |  |
| --- | --- | --- |
| **Biological Treatment** | | |
| **Parameter** | **Units** | **Value** |
| Treatment type | -- |  |
| System manufacturer | -- |  |
| Effluent flow rate | gpm |  |
| Temperature | °C |  |
| Influent BOD | mg/L |  |
| Volume | gal |  |
| Hydraulic residence time | hr |  |
| Solids retention time | days |  |
| Dissolved oxygen | mg/L |  |
| Mixed liquor suspended solids | mg/L |  |
| Effluent ammonia | mg/L |  |
| Effluent BOD | mg/L |  |
| Basis for crediting (if applicable)1 | *[Describe the crediting framework or technology-specific validation approach for pathogen crediting]* | |

1 *Include any necessary documentation in Appendix C*

#### Table 7C. Granular media filtration design criteria.

|  |  |  |
| --- | --- | --- |
| **Granular Media Filter** | | |
| **Parameter** | **Units** | **Value** |
| Type of filtration | -- |  |
| System manufacturer | -- |  |
| Effluent flow rate | gpm |  |
| Area | sf |  |
| Loading rate | gpm/sf |  |
| Media type(s) | -- |  |
| Media size(s) | mm |  |
| Media depth(s) | ft |  |

|  |  |  |
| --- | --- | --- |
| Backwash rate | gpm/sf |  |
| Air scour rate | scfm |  |
| Effluent turbidity | NTU |  |
| Basis for crediting (if applicable)1 | *[Describe the crediting framework or technology-specific validation approach for pathogen crediting]* | |

1 *Include any necessary documentation in Appendix C*

#### Table 7D. Membrane filtration design criteria.

|  |  |  |
| --- | --- | --- |
| **Membrane Filter** | | |
| **Parameter** | **Units** | **Value** |
| Manufacturer | -- |  |
| Net product flow | gpm |  |
| Nominal pore size | μm |  |
| Total membrane area | sf |  |
| Chemical cleaning frequency |  |  |
| Flux | gal/ft2/day |  |
| Pressure drop |  |  |
| Pressure decay test |  |  |
| Effluent turbidity | NTU |  |
| Basis for crediting (if applicable)1 | *[Describe the crediting framework or technology-specific validation approach for pathogen crediting]* | |

1 *Include any necessary documentation in Appendix C*

#### Table 7E. Reverse osmosis design criteria.

|  |  |  |
| --- | --- | --- |
| **Reverse Osmosis** | | |
| **Parameter** | **Units** | **Value** |
| Manufacturer | -- |  |
| Net product flow | gpm |  |
| Number of elements |  |  |
| Area per element | sf |  |
| Flux | gfd |  |
| Recovery | % |  |
| Chemical cleaning frequency |  |  |
| Basis for crediting (if applicable)1 | *[Describe the crediting framework or technology-specific validation approach for pathogen crediting]* | |

1 *Include any necessary documentation in Appendix C*

#### Table 7F. Filtration design criteria.

|  |  |  |
| --- | --- | --- |
| **Other Filter** | | |
| **Parameter** | **Units** | **Value** |
| Type of filtration | -- |  |
| System manufacturer | -- |  |
| Effluent flow rate | gpm |  |

|  |  |  |
| --- | --- | --- |
| Total area | sf |  |
| Loading rate | gpm/sf |  |
| Nominal pore size | µm |  |
| Effluent turbidity | NTU |  |
| Basis for crediting (if applicable)1 | *[Describe the crediting framework or technology-specific validation approach for pathogen crediting]* | |

1 *Include any necessary documentation in Appendix C*

#### Table 7G. UV design criteria.

|  |  |  |
| --- | --- | --- |
| **UV Disinfection** | | |
| **Parameter** | **Units** | **Value** |
| Number of reactors | -- |  |
| System manufacturer and model | -- |  |
| Effluent flow rate | gpm |  |
| UV Dose | mJ/cm2 |  |
| Influent UVT (expected) | % |  |
| Minimum validated UVT (if applicable) | % |  |
| UV Intensity | mW/cm2 |  |
| Validation Protocol (if applicable) |  |  |
| Basis for crediting (if applicable)1 | *[Describe the crediting framework or technology-specific validation approach for pathogen crediting]* | |

1 *Include any necessary documentation in Appendix C*

*[Include description and diagram of chlorine contact configuration]*

#### Table 7H. Chlorine disinfection design criteria.

|  |  |  |
| --- | --- | --- |
| **Chlorine Disinfection** | | |
| **Parameter** | **Units** | **Value** |
| System manufacturer (if applicable) | -- |  |
| Chlorine type |  |  |
| Effluent flow rate | gpm |  |
| Contactor volume | gallons |  |
| Hydraulic residence time | Min |  |
| Baffling factor | -- |  |
| CT | mg-min/L |  |
| Chlorine residual | mg/L |  |
| Influent ammonia | mg/L |  |
| Basis for crediting (if applicable)1 | *[Describe the crediting framework or technology-specific validation approach for pathogen crediting]* | |

1 *Include any necessary documentation in Appendix C*

*[Include description and diagram of ozone contact configuration]*

#### Table 7I. Ozone disinfection design criteria.

|  |  |  |
| --- | --- | --- |
| **Ozone Disinfection** | | |
| **Parameter** | **Units** | **Value** |
| Effluent flow rate | Gpm |  |
| Contactor volume | Gallons |  |
| Hydraulic residence time | Min |  |
| Baffling factor | -- |  |
| CT | mg-min/L |  |
| Ozone residual(s) | mg/L |  |
| System manufacturer | -- |  |
| Oxygen source | -- |  |
| Ozone generation method | -- |  |
| Basis for crediting (if applicable)1 | *[Describe the crediting framework or technology-specific validation approach for pathogen crediting]* | |

1 *Include any necessary documentation in Appendix C*

*[Include description and diagram of disinfection contact configuration]*

#### Table 7J. Disinfection design criteria.

|  |  |  |
| --- | --- | --- |
| **Other Disinfectant [specify]** | | |
| **Parameter** | **Units** | **Value** |
| Effluent flow rate | Gpm |  |
| Contactor volume | Gallons |  |
| Hydraulic residence time | Min |  |
| Baffling factor | -- |  |
| CT | mg-min/L |  |
| Disinfectant residual(s) | mg/L |  |
| System manufacturer | -- |  |
| Basis for crediting (if applicable)1 | *[Describe the crediting framework or technology-specific validation approach for pathogen crediting]* | |

1 *Include any necessary documentation in Appendix C*

## Secondary Disinfection

*[The Rules and Regulations specify a requirement for chlorine residual at the* ***point of entry*** *to an indoor distribution system (0.5 – 2.5 mg/L). Systems should* ***also*** *maintain a residual throughout the indoor distribution system, such that the farthest use location has a residual. Please describe strategy for maintaining secondary disinfectant residual in indoor distribution system. Respond to the bullets below.]*

* + - Secondary disinfectant residual: free chlorine, chloramine, other?
    - Minimum residual concentration target at farthest use location in the building (e.g. top- floor toilet)?
    - How will this residual be ensured and verified?

## Chemical Use & Handling

*[Fill out the table below for all chemicals used in the Onsite Water Reuse System]*

#### Table 8. Summary of chemical handing.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name and CAS Number** | **Storage and Handling Facilities** | **Point of Application** | **Dosages** | **Method and Degree of Mixing** |
|  |  |  |  |  |
|  |  |  |  |  |

## Solids Handling

*[Provide description of how the treatment residuals will be handled, if applicable]*

## Vector and Odor Control

*Provide description of how the following prevention measures will be met:*

* *Each drain, vent, and other conduit that leads to the system reservoir will be screened with a durable fine mesh that is no greater than one sixteenth of an inch.*
* *Mesh has no Gaps around.*
* *All annular gaps around pipes that feed the reservoir will be sealed with a durable, waterproof, and non-porous material.*
* *Any doors opening to the reservoir gas has durable gasket and no gaps.*

# Monitoring, Alarms, and Reporting *[LRT Systems Only]*

This section is intended to provide an overview of the system monitoring and alarms. Note that in the event of any event that is likely to result in environmental harm or increased public risk, the notification procedure outlined in City Code Chapter 15-13 must be followed.

## System control strategy

*[Complete the following table.]*

#### Table 9. Summary of system control strategy.

|  |  |
| --- | --- |
| Type of automated control | * PLC * SCADA * Other: |
| Remote monitoring? | * YES ☐ NO |
| Indicate what system features will allow a controlled and non-hazardous automatic shutdown of the process in the event of malfunctioning. |  |

## Online monitoring

*[Complete the following table with all LRT compliance and water quality online monitors, as well as flow meters. The order in which monitors are listed should correspond to the order in which they appear in the PFD. Values shown in the table are examples and should be replaced with system-specific information. If a membrane filter pressure decay test is being used, that should be included here.]*

#### Table 10. Summary of online LRT compliance and water quality monitoring.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Location** | **Parameter** | **LRT compliance monitor? (Y/N)** | **Water Quality Requirements (if applicable)** | **Manufacturer and Model** |
| MF Effluent | Turbidity | Y | 95% <0.2 NTU  Always <0.5 NTU |  |
| Storage tank | Chlorine | N | 24-hr avg 0.5 – 2.5 mg/L |  |
|  |  |  |  |  |

## Grab sampling

*[Complete the following table with all grab sample types (e.g. total coliform, BOD, TSS, etc.). Values shown in the table are examples and should be replaced with system-specific information. Refer to § 15-13-40 (Table 4) for specific monitoring requirements per treatment process type.]*

#### Table 11. Summary of grab sample monitoring.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Location** | **Frequency** | **Water Quality Requirement** | **Reporting Parameter** |
| Total coliform | Treated water storage  tank | Daily | < 2.2 MPN/100 mL | Daily value |
|  |  |  |  |  |
|  |  |  |  |  |

## Alarms and Diversions

*[Complete the following table with all alarm-triggering conditions, such as turbidity, UVT, chlorine residual etc. Where applicable, specify both ‘alert level’ and ‘critical level’ alarm criteria. Values shown in the table are examples and should be replaced with system-specific information.]*

#### Table 12. Summary of alarm conditions and corrective actions.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Location** | **Alarm Criteria** | | **Corrective Actions** |
| **Alert Level1** | **Critical Level2** |
| Turbidity | MF Effluent | 0.4 NTU | 0.5 NTU | Immediate shutdown and diversion |
|  |  |  |  |  |

1 *Alert level alarm criteria are intended to provide operators with an indication that process performance is changing but has not yet reached a critical level.*

2 *Critical level alarm criteria indicate that process performance is no longer sufficient to achieve compliance with LRT and/or water quality requirements.*

# Supplemental Water Supply & Cross Connection Control

*[Complete all fields in the following tables]*

#### Table 13. Makeup water supply description.

|  |  |
| --- | --- |
| Description |  |
| Quantity available |  |
| Anticipated circumstances when make- up water will be used |  |
| Anticipated average daily volume of make-up water (gal) |  |

**Table 14. Cross connection and backflow prevention measures summary.**

|  |  |  |
| --- | --- | --- |
| Responsible party for cross-connection control and control of access to plumbing |  | |
| Alternative water source plumbing design and proximity to potable water plumbing |  | |
| Backflow prevention devices and assemblies |  | |
| Does project have approved air gap? | * YES | * NO |
| Does project have approved backflow devices in other system locations as appropriate? | * YES | * NO |
| Will initial cross connection test be scheduled prior to system startup? | * YES | * NO |

# Public Exposure and Impact

**Table 15. Summary of public exposure.**

|  |  |
| --- | --- |
| **Public Exposure** | |
| Description of use area with potential public contact |  |
| Strategies to minimize public exposure |  |
| **Food Facilities** | |
| Will the development include food facilities with service to the public? | * YES ☐ NO |
| If yes (above): list features located within food facilities which will receive non- potable water |  |
| If yes (above): list precautions which will be in place to prevent contact with non- potable water |  |

**Table 16. Required signage.**

|  |  |
| --- | --- |
| **Indoor Signage** | |
| Location: | Signage content: |
|  |  |
|  |  |
| **Outdoor Signage** | |
| Location: | Signage content: |
|  |  |
|  |  |

1. **Appendix A: Drawings**

A.1: Vicinity Map A.2: Facility Map

A.3: Plan/Layout of Alternative Water Source System

# Appendix B: Component Cut Sheets

[Include only components described in Section 4.1 Components Summary Table]

# Appendix C: Log Reduction Evidence *[LRT System Only]*