

## **R317. Environmental Quality, Water Quality.**

### **R317-401. Graywater Systems.**

#### **R317-401-1. General.**

##### 1.1. Authorization.

This rule is administered by the Division authorized by Title 19 Chapter 5.

##### 1.2. Purpose.

The purpose of this rule is to protect public health and environment from potential adverse effects from graywater use while promoting water conservation by facilitating reuse of graywater for landscape irrigation within the boundaries of Utah.

##### 1.3. Scope.

This rule shall apply to the design, installation, modification, discharge, use and repair of graywater systems for subsurface landscape irrigation for residential and non-residential buildings.

##### 1.4. Jurisdiction.

Local health departments have jurisdiction to administer this rule. Nothing contained in this rule shall be construed to prevent a local health department from:

- (a) adopting stricter requirements than those contained in Rule R317-401;
- (b) prohibiting any graywater system within its jurisdiction;
- (c) assessing fees for administration of this rule;
- (d) receiving a request for a variance, conducting a review, and granting either an approval or denial; or
- (e) requiring graywater systems within its jurisdiction be placed under an umbrella of a:
  - (i) responsible management entity overseen by the local health department;
  - (ii) contract service provider overseen by the local health department; or
  - (iii) management district or body politic created by the county for the purpose of operation, maintenance and repairs of all graywater systems.

##### 1.5. Graywater System Administration.

(a) The local health department having jurisdiction shall obtain approval from the Director to administer a graywater systems program before permitting any graywater system.

(b) The local health department request for approval should include a description of its plan to properly manage graywater systems to protect public health. This plan should include:

##### (i) Documentation of:

(A) the adequacy of staff resources to manage the increased work load;

(B) the technical capability to administer the new program including any training plans that are needed;

(C) local board of health support for this request; and

(D) the county's or the health jurisdiction's legal authority to implement and enforce correction of any malfunctioning system and its commitment to exercise this authority.

##### (ii) An agreement to:

(A) advise the owner of the system of the type of system, and information concerning risk of failure, level of maintenance required, financial liability for repair, modification or replacement of a failed system and periodic monitoring requirements;

(B) advise the local building authority of the approved graywater system on the property;

(C) provide oversight of installed systems;

(D) record the existence of any graywater system on the deed of ownership for that property;

(E) implement a graywater system operating permit program consisting of:

(1) Tier 1 system operating permits may be issued at the discretion of the regulatory authority; and

(2) Tier 2 system operating permits issued with a renewal frequency not exceeding five years and inspection by the regulatory authority prior to renewal, or annual inspections by the regulatory authority consisting of the greater of 20 per cent of all installed systems or the minimum of ten installed systems;

(F) maintain records of all installed systems, failures, modifications, repairs and all inspections recording the condition of the system at the time of inspection such as overflow, surfacing, ponding and nuisance; and

(G) submit an annual report to the Division on or before September 1 for the previous State of Utah fiscal year's activities showing:

(1) the type and number of graywater systems approved, installed, modified, repaired, failed, and inspected;

(2) a summary of enforcement actions taken, pending, and resolved;

(3) number of variances granted or denied; and

(4) a summary of any water quality performance data collected.

#### **R317-401-2. Definitions.**

2.1 Definitions found in Rule R317-4 apply to graywater systems except where specifically replaced in Section R317-401-2:

"Aggregate" means regulatory authority approved clean porous material used to disperse graywater.

"Backflow" means the phenomena that occur when the customer's pressure is higher than the supply pressure. This could be caused by an unprotected cross connection between a drinking water supply and a pressurized irrigation system, a boiler, a pressurized industrial process, elevation differences, air or steam pressure, use of booster pumps or any other source of pressure.

"Bedroom" means any portion of a dwelling that is so designed as to furnish the minimum isolation necessary for use as a sleeping area. It may include a den, study, sewing room, or sleeping loft. Unfinished basements shall be counted as a minimum of one additional bedroom.

"Distribution zone" means any portion of a graywater irrigation system that discharges graywater to a specific area for irrigation purposes.

"Graywater" means wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines, or laundry tubs. Graywater does not include wastewater from toilets, kitchen sinks, photo lab sinks, dishwashers, water softeners, garage floor drains, or other sources that pose a public health hazard.

"Irrigation system" means any network of pipes, drip irrigation lines, or mulch shields used to distribute graywater in a manner suitable for subsurface landscape irrigation.

"Mulch Shield" means a perforated vessel into which graywater is discharged and is temporarily detained before draining into a mulch basin.

"Non-Residential" means a building that produces domestic wastewater, and is not a single-family dwelling.

"Regulatory Authority" means either the Utah Division of Water Quality or the local health department having jurisdiction.

"Residential" means a single-family or multi-family dwelling that produces domestic wastewater.

"Stub-out" means a plumbed connection located with fixtures in compliance with Rule R317-401 for diversion of graywater from wastewater plumbing. A stub-out shall be connected to an approved graywater collection system or capped for future connection.

"Surge Tank" means a water-tight tank used to equalize peaks in graywater pressure and flow so that graywater may be dispersed gradually over time. A surge tank is intended only for temporary storage of graywater during periods of peak flow.

"Three-way diverter valve" means a valve that allows the operator to send graywater to the graywater system or to the building sewer.

"Tier 1 system" means a gravity-fed graywater system that does not include any surge tank, pretreatment, or pressurized components. A Tier 1 system may be appropriate for retrofit situations. A Tier 1 system is intended to be simple to operate and can be easily disconnected during winter months or other periods when the system may not be in use.

"Tier 2 system" means a graywater system that employs a surge tank, pretreatment, drip line irrigation system, or pressurized components.

"Unapproved graywater system" means any graywater system that is deemed by the regulatory authority to have been installed, repaired, or altered without required regulatory oversight, permit, or inspection.

### **R317-401-3. Failure to Comply, Prohibitions, and Abandonment of Graywater Systems.**

#### **3.1. Failure to Comply with Rule.**

Any person failing to comply with this rule shall be subject to enforcement action as specified in Sections 19-5-115 and 26A-1-123.

#### **3.2. Prohibitions.**

It shall be unlawful for any person to construct, install, modify, or cause to be constructed, installed or modified any graywater system in a building or on a given lot without first obtaining a permit to do such work.

(a) Graywater may not be:

(i) discharged on the land surface;

(ii) applied to vegetable gardens except where graywater is not likely to have direct contact with the edible part, whether the fruit will be processed or not;

(iii) used in spray irrigation;

(iv) discharged directly into or reach any storm sewer system or any waters of the State; or

(v) allowed to surface, pond, or runoff.

(b) A graywater system shall be located on the same lot as the building served unless, when approved by the regulatory authority, a perpetual utility easement and right-of-way is established on an adjacent or nearby lot, which includes rights to ingress and egress necessary or convenient for the full or complete use, occupation, and enjoyment of the granted easement.

(c) A graywater system may not be approved as the sole source of water disposal. Connection to an approved sewer or onsite wastewater system is required.

(d) The capacity of any onsite wastewater system, including required future replacement areas, shall not be decreased by the existence or proposed installation of a graywater system servicing a given lot.

(e) A potable water connection may not be made to any graywater system.

(f) Graywater components within the building shall comply with the International Plumbing Code and local building code.

#### **3.3. Abandonment of Graywater Systems.**

(a) The regulatory authority shall be notified at least 30 days before the planned abandonment of any graywater system.

(b) Upon approval from the local health department having jurisdiction, the owner of the real property on which a graywater system is located shall have any existing surge tank:

(i) pumped out only in a manner approved by the regulatory authority within 30 days;

(ii) filled completely with earth, sand, or gravel within 30 days; or

(iii) removed within 30 days.

(c) Upon approval from the regulatory authority, the owner of the real property on which a graywater system is located shall disconnect the abandoned graywater system from any buildings served by the system.

### **R317-401-4. Feasibility Determination and Design Requirements.**

#### **4.1. General Criteria for Determining Graywater System Feasibility.**

The regulatory authority shall determine the feasibility of using a graywater system. The regulatory authority shall review required information for any existing or proposed system to determine graywater system feasibility. The required information shall be prepared at the owner's expense by, or under the supervision of, a qualified person approved by the regulatory authority. Required information shall include:

(a) name and address of the property owner and person requesting feasibility;

(b) the county recorder's plat and parcel ID and situs address if available;

(c) the location and distance to the nearest sewer, owner of sewer, whether property is located within the sewer service boundary, and size of sewer; and

(d) a statement of proposed use if other than a single-family dwelling.

#### **4.2. Soil and Site Evaluation.**

Soil and groundwater evaluations shall be conducted by professionals fulfilling the requirements of Rule R317-11.

(a) Soil classification and maximum ground water determination shall be:

(i) performed using a minimum of one test hole;

(ii) dug in close proximity to the proposed subsurface distribution zone;

(iii) be at least two feet below the bottom of the proposed subsurface distribution zone; and

(iv) evaluated and reported using the USDA Soil Texture Classification method.

(b) Soil sample test results may also be accepted from a qualified soil analysis lab at the discretion of the local health department.

#### **4.3. Plan Review and Permitting.**

Plans and specifications for the construction, alteration, extension, or change of use for any graywater system shall be submitted to the regulatory authority. The regulatory authority shall review said plans and specifications as to their adequacy of design for the intended purpose, and shall, if necessary, require such changes as are required by these rules. When the reviewing regulatory authority is satisfied that plans and specifications are adequate for the conditions under which a system is to be installed and used, a construction permit shall be issued to the property owner. Construction of any graywater system may not commence until the regulatory authority has issued a construction permit.

(a) System Designer Qualifications.

Graywater system design requirements are determined by the complexity of the system. Systems shall be permitted by tiers.

(i) a Tier 1 System designer shall be certified at a Level 2 as defined by R317-11.

(ii) a Tier 2 System designer shall be certified at a Level 3 as defined by R317-11.

(b) Information Required.

Plans submitted for review shall be drawn to scale, 1" = 10', 20' or 30', or other scale as approved by the regulatory authority. Plans shall be prepared in such a manner that the contractor can read and follow them in order to install the system properly. Depending on the individual site and circumstances, or as determined by the regulatory authority, required information may include:

(i) applicant information consisting of:

(A) the name, current address, and telephone number of the applicant;

(B) complete address, legal description of the property, or both to be served by the graywater system.

(ii) a graywater irrigation system site plan consisting of:

(A) submittal date of plan;

(B) North arrow;

(C) lot size and dimensions;

(D) ground surface contours, preferably at 2 foot intervals, of both the original and proposed final grades of the property, or relative elevations using an established bench mark;

(E) maximum number of bedrooms, including statement of whether a finished or unfinished basement will be provided, the number of fixtures proposed to be connected to graywater system, or if other than a single family dwelling, the number of occupants expected and the estimated gallons of wastewater generated per day;

(F) location and dimensions of paved and unpaved driveways, roadways and parking areas;

(G) proposed location and dimensions of the essential components of the graywater system;

(H) location of all soil exploration pits and all percolation test holes;

(I) location of any present or proposed retaining walls, drainage channels, or buildings;

(J) location of building sewer and water service line to serve the building;

(K) location of easements or drainage right-of-ways affecting the property;

(L) location of all intermittent or year-round streams, ditches, watercourses, ponds, subsurface drains, etc. within 100 feet of proposed graywater system;

(M) location, type, and depth of all existing and proposed non-public water supply sources within 200 feet of the graywater system, and of all existing or proposed public water supply sources within 1500 feet of the graywater system and associated source protection zones;

(N) distance to nearest public water main and size of main;

(O) distance to nearest public sewer, size of sewer, and whether accessible by gravity;

(P) location of any onsite wastewater system, any replacement area, and location of the proposed graywater system;

(iii) a statement with the site plan indicating the source of culinary water supply, whether a well, spring, non-public or public system, and its location and distance from any graywater systems within 200 feet. The regulatory authority may not approve a graywater irrigation system if:

(A) the applicant has a private culinary system; and

(B) lacks a water right with use type designated for irrigation by the Utah Division of Water Rights.

(iv) relative elevations, using an established bench mark, including:

(A) building drain outlet;

(B) the outlet of any graywater system components;

(C) the final ground surface over the graywater system.

(v) Details for the graywater system design site, plans, and specifications as listed in Section R317-401-5, including:

(A) schedule or grade, material, diameter, and minimum slope of graywater sewer and distribution pipes;

(B) surge tank capacity, design, cross sections, etc., materials, and dimensions, if applicable. If tank is commercially manufactured, the name and address of manufacturer shall be provided;

(C) subsurface graywater discharge system details, including:

(1) details of mulch shields and mulch shield basins, if provided;

(2) description and details for method of graywater dispersal, whether aggregate or chambers;

(3) length, slope, and spacing of each absorption system component;

(4) maximum slope across ground surface of absorption system area;

(5) distance of graywater discharge system from trees, cut banks, fills, or subsurface drains;

(6) cross section of graywater discharge system showing the:

(I) depth and width of graywater discharge system excavation;

(II) depth of distribution pipe;

(III) depth of aggregate;

(IV) barrier material, i.e. synthetic filter fabric, straw, etc., used to separate aggregate from cover; and

(V) depth of cover; and

(7) other pertinent information.

4.4. Plans Submitted.

(a) All applicants requesting plan approval for a graywater system shall submit a sufficient number of copies of required information to enable the regulatory authority to retain one copy as a permanent record.

(b) Applications may be rejected if proper information is not submitted.

**R317-401-5. Design of Graywater Systems.**

5.1. The basis of design for a graywater system shall be:

(a) according to Table 1 or Table 2 for residential usage;

TABLE 1

Design Flow, Entire Single Family Dwelling

Number of Bedrooms	Flow, gallons per day
Two Bedrooms (Minimum)	160
Three Bedrooms	240
Each Additional Bedroom	40

TABLE 2

Design Flow, Single Fixture

Fixture	Flow, gallons per day/bedroom
Washing Machine	30
Shower/Bath Tub	50
Hand Wash Basin	5
Other Sources	Shall be sized by a qualified designer

- (b) non-residential usage shall be sized by a certified designer and evaluated on a case-by-case basis by the regulatory authority;
- (c) all materials shall meet the requirements of the International Plumbing Code and local building code; and
- (d) no graywater system or any part thereof shall be located at any point having less than the minimum distances indicated in Table 3:

TABLE 3

Separation Distances

Minimum Horizontal Distance	Surge	Subsurface
From(ft)	Tank	Discharge
Building or Structures (a)	5 (b)	2
Property Line	5	5
Public Drinking Water Sources (c)	(d)	(d)
Non-public Drinking Water Sources		
Protected (grouted) Source	50	100
Unprotected (ungrouted) Source	50 (e)	200 (e)
Streams, Ditches, and Lakes (c)	25	100 (f)
Seepage Pits	5	10
Absorption System and	5	10
Replacement Area		
Septic Tank	5	5
Culinary Water Supply Line	10	10 (g)

Notes:

- (a) Including porches and steps, whether covered or uncovered, but does not include carports, covered walks, driveways and similar structures.
- (b) For above ground tanks the regulatory authority may allow less than five feet separation.
- (c) As defined in Rules R309-600 and R309-605.
- (d) Recommended separation distances will comply with the Source Water Protection requirements listed in Rules R309-600 and R309-605.
- (e) Recommended separation distance may increase at the discretion of the regulatory authority for the purpose of protecting public health.
- (f) Lining or enclosing watercourse or location above graywater discharge area may justify reduced separation distance(s) at the discretion of the regulatory authority.
- (g) As defined in Rule R309-550

5.2. Surge Tank

(a) a surge tank is required for a Tier 2 graywater system. Plans for a surge tank shall include dimensions, structural, bracing and connection details, and a certification of structural suitability for the intended installation from the manufacturer.

(b) a surge tank shall be:

- (i) a minimum of 250 gallons in volumetric capacity to provide settling of solids, accumulation of sludge and scum unless justified with a mass balance of inflow and outflow and type of distribution for graywater discharge;
- (ii) accessible to the surface with a locking, gasketed access opening, or approved equivalent, to allow for inspection and cleaning;
- (iii) constructed of structurally durable materials to withstand all expected physical forces, and not subject to excessive corrosion or decay;
- (iv) watertight;
- (v) anchored against overturning;
- (vi) installed below ground on dry, level, well-compacted soil or above ground on a level, four-inch thick concrete slab;
- (vii) permanently marked showing the rated capacity, and the words GRAYWATER IRRIGATION SYSTEM, DANGER - UNSAFE WATER on the unit;

(viii) provided with an overflow pipe:

- (A) of diameter at least equal to that of the inlet pipe diameter;
  - (B) connected permanently to the building sewer;
  - (C) equipped with a check valve or backwater valve, accessible for cleaning and maintenance, to prevent backflow from building sewer; and
  - (D) which may not include a shut-off valve.
- (ix) provided with a drain pipe of diameter at least equal to that of the inlet pipe diameter; and

(x) provided with a vent pipe in conformance with the requirements of the International Plumbing Code and local building code;

5.3. Valves and Piping.

(a) Graywater piping that discharges into a surge tank or has a direct connection to any sanitary drain or sewer piping shall be downstream of an approved water seal type trap. If no such trap exists, an approved vented running trap shall be installed upstream of the connection to protect the building from any possible waste or sewer gases.

(b) Vents, venting, and piping shall meet the requirements of the International Plumbing Code and local building code.

(c) All graywater piping shall be purple or shall have a continuous marking with the words DANGER - UNSAFE WATER.

(d) A graywater system shall have a 3-way diverter valve at any stub-out connection. A 3-way diverter valve shall be connected to a fixture or inlet, an approved graywater system, and building sewer.

(e) Any 3-way diverter valve shall be readily accessible and clearly marked to indicate directional flow to graywater system or building sewer.

**R317-401-6. Construction and Installation of Irrigation Systems.**

6.1. Each distribution zone shall have a minimum effective irrigation area for the soil characteristics and vegetation needs.

6.2. The area of a distribution zone shall be equal to the total length of the perforated pipe sections within the distribution zone multiplied by the width of the proposed trench. The required square footage shall be determined using Table 4 or Table 5.

TABLE 4

Subsurface Irrigation System Design

Soil Characteristics	Subsurface Irrigation System Area Loading, gallons of graywater per day per square foot
Coarse Sand or Gravel	5
Fine Sand	4
Sandy Loam	2.5
Sandy Clay Loam	1.6
Clay Loam	1.1
Clay with Sand or Gravel	0.8

TABLE 5

Drip Irrigation System Design

Soil Characteristics	Minimum Number of Emitters, per gallon per day	Maximum Emitter Discharge, gallons per day
Coarse Sand or Gravel	0.6	1.8
Fine Sand	0.7	1.4
Sandy Loam	0.9	1.2
Sandy Clay Loam	1.1	0.9
Clay Loam	1.6	0.6
Clay with Sand or Gravel	2.0	0.5

6.3. The lowest point of any distribution zone shall be at least two vertical feet above the maximum groundwater table. Applicant shall provide sufficient groundwater data to the regulatory authority. Subsection R317-4-4.1.B.4 may be used to determine maximum groundwater elevation.

6.4. Subsurface drip irrigation system.

Subsurface drip irrigation systems shall be constructed so that:

(a) A 140 mesh or 115 micron filter with a capacity of 25 gallons per minute minimum shall be used to prevent drip irrigation system clogging;

(b) The filter backwash and flush discharge shall be captured, contained, and discharged to the sewer system or approved onsite wastewater system;

(i) filter backwash water and flush water may not be used for any purpose;

(ii) sanitary procedures shall be followed when handling filter backwash and flush discharge of graywater;

(c) Emitters recommended by the manufacturer shall be resistant to root intrusion and suitable for subsurface and graywater dispersal;

(d) Each irrigation zone shall include the minimum number of emitters required to meet the daily graywater flows as defined in Table 5;

(e) Minimum spacing between emitters should be 12 inches in any direction, or as recommended by the manufacturer;

(f) The system shall provide user controls such as valves, switches, timers, and other controls as appropriate, to rotate the discharge of graywater between distribution zones;

(g) All drip irrigation force mains and manifolds shall:

(i) meet requirements of Table 7;

(ii) be connected with schedule 40 fittings;

(iii) be connected as per manufacturer's specifications, inspected and pressure tested at 40 pounds per square inch and shown to be drip tight for five minutes, before burial; and

(iv) be buried at a minimum depth of six inches;

(h) Lateral distribution lines may be PE or flexible PVC tubing and shall be covered to a minimum depth of six inches;

(i) Pressure at the emitter shall meet the manufacturer's recommendations; and

(j) Each distribution zone shall include a flush valve, and where applicable, an anti-siphon valve to prevent back siphonage of water and soil.

6.5. Subsurface Irrigation System.

Subsurface irrigation systems consisting of pipe and gravel or chambers may be used for dispersal of graywater.

(a) Perforated pipe sections shall be a minimum three-inch diameter and shall be constructed of perforated high-density polyethylene pipe, perforated ABS pipe, perforated PVC pipe, or other approved materials as required in Table 7, provided that sufficient openings are available for

distribution of the graywater in the trench area. Material, construction and perforation of the piping shall be in compliance with the requirements of the International Plumbing Code and local building code.

(b) A subsurface irrigation system shall be constructed in accordance with Table 6.

(c) Aggregate shall be placed in the trench to the depth and grade required by Table 6. The aggregate shall then be covered with barrier material to prevent closure of voids with backfill.

(d) Chamber systems shall be installed as per manufacturer's specifications. All chambers shall meet requirements listed in Rule R317-4.

(e) Backfill may not be placed over the barrier material or chambers prior to inspection and approval by the regulatory authority.

TABLE 6

Lateral Construction Details

Description	Minimum	Maximum
Number of drain lines per zone	1	---
Length of each perforated line, feet	---	150
Bottom width of trench, inches	6	36
Total depth of trench, inches	9	36
Spacing of lines, wall to wall, feet	4	---
Depth of backfill, inches	6	---
Depth of aggregate cover over lines, inches	2	---
Depth of aggregate beneath lines, inches	3	---
Grade of drain lines, inches per 100 feet	Level	4

TABLE 7

Minimum Standards for Graywater Sewer and Distribution Pipe Materials (a)

Acceptable Graywater Pipe Materials

Type of Pipe	Minimum Standard
Acrylonitrile-Butadiene	
Styrene (ABS)	ASTM (b), D-2680, D-2751, F-628
Polyvinyl Chloride (PVC)	ASTM D-2665, D-3033, D-3034

Acceptable Distribution Pipe Materials

Type of Pipe	Minimum Standard
ABS	ASTM D-2661, D-2751
Polyethylene (PE)	Smooth Wall ASTM D-3350
PVC	ASTM D-2665, D-3033, D-3034, D-2729(c)

Notes:

(a) Each length of graywater sewer and distribution pipe shall be stamped or marked.

(b) American Society for Testing and Materials.

(c) Although perforated PVC, ASTM D-2729 is approved for absorption system application, the solid-wall version of this pipe is not approved for any application.

**R317-401-7. Construction and Installation of Branched Drain Basin Systems.**

7.1. Branched Drain Basin Construction Details.

(a) Mulch shields shall be constructed of a durable material and should be placed for optimum effluent distribution.

(b) Aggregate shall be placed in the basin in a manner that will allow proper effluent distribution, prevent ponding, with a minimum depth of 6 inches over graywater flood level, and as required in Table 6.

(c) Backfill may not be placed over the mulch shields or flow splitters until after inspection and approval by the regulatory authority.

(d) Access to any flow splitter or mulch shield shall be within 6 inches of finished grade.

(e) Branched drain basins shall be constructed in accordance with Table 8 and Table 9.

TABLE 8

Mulch Basin Sizing

Soil Type	Mulch Basin Loading Rate, gallons of graywater per day per square foot	Maximum gallons per mulch shield per day(a)
Sand	5	60
Loam	3	40
Clay	1	20

(a) The number of gallons per mulch shield per day is sitespecific and the designer may need to decrease the number of gallons per mulch shield when appropriate or as required by the regulatory authority.

TABLE 9

Mulch Basin Construction Details

Description	Minimum	Maximum
Cleanouts	1	---
3-way Valve or similar (per stub out location)	1	---

Discharge Points (per stub-out location)	2	16
Double Ell Flow Splitter	1	---
Pipe Diameter	2 inch	4 inch
Pipe Slope	1/4 inch	---
	per foot	
Mulch Shield Volume	5 gallons	---
Air gap in mulch shield above highest perforation	6 inches	---

#### 7.2. Construction, Inspection and Testing.

- (a) Installation shall conform to the equipment and installation methods described in the approved plans.
- (b) Any surge tank shall be filled with water to the overflow line prior to and during construction inspection. All seams and joints shall be left exposed and the tank shall remain watertight.
- (c) The irrigation system shall be installed in the area which has soils similar to the soils which have been evaluated, and has an absorption rate corresponding to the given soil classification.
- (d) A graywater stub-out may be allowed for future construction, provided it is capped prior to connection to the installed irrigation lines and landscaping. Any stub-out shall be permanently marked: GRAYWATER STUB-OUT, DANGER UNSAFE WATER.
- (e) A flow test shall be performed throughout the system, from surge tank to the point of graywater discharge. All lines and components shall be watertight.
- (f) Written operation and maintenance procedures including checklist and maintenance instructions from the designer shall be provided to the owner prior to the regulatory authority issuing written approval or authorization.
- (g) The installed graywater system shall be operated only after receiving a written approval or authorization from the regulatory authority after the regulatory authority has made the final construction inspection.

### **R317-401-8. Variance to Design Requirements.**

#### 8.1. Request for a Variance.

A variance may not be approved unless an applicant demonstrates that:

- (a) A graywater system consistent with Rule R317-401 and local health department requirements cannot be constructed as determined by the regulatory authority;
- (b) Graywater from the proposed graywater system may not:
  - (i) contaminate groundwater or waters of the state;
  - (ii) migrate to the ground surface; or
  - (iii) move off site.
- (c) The proposed system will result in equal or greater protection of public health and the environment than is required by meeting the minimum standards and intent of this rule; and
- (d) Adjacent properties, including the current and reasonably anticipated uses of adjacent properties, will not be jeopardized if the proposed system is constructed, operated, and maintained.

#### 8.2. Procedure for Requesting a Variance.

- (a) A variance request shall include the information and documentation described in Subsection R317-401-6.
- (b) The regulatory authority shall review the variance request and prepare a written determination outlining the conditions of approval or denial of the request. The review shall identify the factors considered in the process and specify the basis for the determination.

#### 8.3. Application Requirements.

The variance application shall include all information and documentation necessary to evaluate proposal and ensure that public health and the environment are protected.

- (a) The regulatory authority shall require a detailed description of the proposed system, including a detailed explanation of wastewater treatment technologies allowed by this rule that have been considered for use, and that will provide the best available treatment.
- (b) The regulatory authority may require technical justification and appropriate engineering, geotechnical, hydrogeologic, and reliability information justifying the request for a variance.

#### 8.4. Variance Approvals.

- (a) A variance may not be approved unless the applicant demonstrates that all of the required conditions in Rule R317-401 are met.
- (b) The regulatory authority may not issue an approval or an operating permit for a graywater system that does not comply with this rule unless a variance has been approved.
- (c) Notice of the conditions shall be recorded in the chain of title for the property in the office of the county recorder. The notice shall include:
  - (i) the description of the system and variance conditions;
  - (ii) operation and maintenance requirements;
  - (iii) permission for the regulatory authority to access the property for the purpose of inspection and monitoring of the system; and
  - (iv) owner responsibilities to correct, repair, or replace the system at the direction of the regulatory authority.

### **R317-401-9. APPENDICES.**

#### APPENDIX A. RECOMMENDED BEST MANAGEMENT PRACTICES.

The use of plant friendly products is important when using graywater for irrigation. Products should be salt and borax free in addition to being biodegradable and non-toxic. Plant friendly products are key when reusing graywater. Chlorine bleach can be harmful to plants and should be diverted to your sewer system. Hydrogen peroxide based products can be used instead of bleach. The pH of your graywater also needs to be considered. Most soaps do not change the pH but some do. Liquid soaps typically do not change the pH of graywater. Bar soaps can make the water very basic. Choosing plants that are not affected by pH is best if you are not sure if the pH is being affected by the products you typically use. Graywater systems are not maintenance free and require consistent and frequent inspection by the owner to ensure proper functionality.

#### 7.1. Graywater Compatible Plants.

- (a) Trees and fruit trees;
- (b) Bushes, shrubs, and vines;
- (c) Larger perennials and annuals; and

(d) Food crops for which the graywater will not come into contact with the edible portion of the plant.

7.2. Graywater Incompatible Plants.

(a) Acidic soil-loving plants;

(b) Seedlings or young plants.

7.3. Graywater Irrigation Issues.

Graywater can clog drip systems without proper filtration and regular maintenance. Either remove solid particles from the water (by filtering or settlement) or increase the diameter of the holes in the irrigation pipe. It is recommended that drip irrigation hoses with small outlets not be used for graywater irrigation unless the solid particles have been removed.

7.4. Maintaining Graywater Irrigation Zones.

It may be necessary to replace mulch, flush soil with potable or fresh water periodically during extended periods of no rain in order to disperse minerals, such as salts from building up. Check for these issues and adjust graywater output accordingly:

(a) Unusual odors;

(b) Clumping of soil;

(c) Poor vegetation growth;

(d) Presence of damp or boggy ground after irrigation, or soil is excessively damp with signs of surface ponding and run-off;

(e) a fine sheet of clay covering the surface; or

(f) evidence of pests and diseases on plants.

APPENDIX B. INSPECTION AND MAINTENANCE SCHEDULE.

TABLE 10

Graywater System Inspection and Maintenance Frequency

Inspection and Maintenance Item	Frequency
Inspect and clean filters and screens, replacing where necessary	Every 3 months
Inspect and verify that disinfection, filters, and water quality treatment devices and systems are operational and maintaining minimum water quality requirements	In accordance with manufacturer's instructions and the regulatory authority
Inspect pumps and verify operation	After initial installation and every 12 months thereafter
Inspect valves and verify operation	After initial installation and every 12 months thereafter
Inspect pressure tanks and verify operation	After initial installation and every 12 months thereafter
Inspect and clear debris from storage tanks, locking devices, and verify operation	After initial installation and every 12 months thereafter
Inspect caution labels and markings	After initial installation and every 12 months thereafter
Inspect for cross-connections and test entire system	After initial installation and every 12 months thereafter
Inspect and maintain mulch basins	As needed to maintain mulch depth and prevent ponding and runoff

**KEY: wastewater, graywater, drip irrigation**

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