

Appendix F

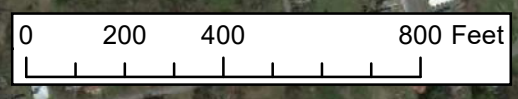


Legend

- MS4 Regulated Area
- ★ MS4 Outfall
- Stormwater Management Facility

Appomattox River

Fleet's Branch



**Virginia State University
MS4 Map
September 2021**

Stormwater Management Facilities

| ID | Type | Location | Latitude | Longitude | Total Acres Treated | Pervious Acres Treated | Impervious Acres Treated | Date Brought Online | 6th Order HUC | Owner | Operator | Part of TMDL Action Plan? | Maintenance Agreement? |
|----|---|---|-----------|------------|---------------------|------------------------|--------------------------|---------------------|---------------|-------|----------|---------------------------|------------------------|
| 01 | Filtrerra (Roof Inlet) | Gateway II Dorm Building | 37.242304 | -77.417352 | 0.07 | 0.0 | 0.07 | 06/2011 | JA40 | VSU | VSU | No | NA |
| 02 | Filtrerra (Roof Inlet) | Gateway II Dorm Building | 37.242166 | -77.417371 | 0.04 | 0.0 | 0.04 | 06/2011 | JA40 | VSU | VSU | No | NA |
| 03 | Filtrerra (Roof Inlet) | Gateway II Dorm Building | 37.242007 | -77.417094 | 0.07 | 0.0 | 0.07 | 06/2011 | JA40 | VSU | VSU | No | NA |
| 04 | Filtrerra (Roof Inlet) | Gateway II Dorm Building | 37.241731 | -77.417437 | 0.11 | 0.0 | 0.11 | 06/2011 | JA40 | VSU | VSU | No | NA |
| 05 | Filtrerra (Roof Inlet) | Gateway II Dorm Building | 37.241792 | -77.417129 | 0.05 | 0.0 | 0.05 | 06/2011 | JA40 | VSU | VSU | No | NA |
| 06 | Filtrerra (Roof Inlet) | Gateway II Dorm Building | 37.241562 | -77.417472 | 0.07 | 0.0 | 0.07 | 06/2011 | JA40 | VSU | VSU | No | NA |
| 07 | Filtrerra (Curb Inlet) | Gateway II Dorm Parking Lot #30M | 37.242022 | -77.416447 | 0.22 | 0.04 | 0.18 | 06/2011 | JA40 | VSU | VSU | No | NA |
| 08 | Filtrerra (Curb Inlet) | Gateway II Dorm Parking Lot #30M | 37.241666 | -77.416268 | 0.38 | 0.03 | 0.35 | 06/2011 | JA40 | VSU | VSU | No | NA |
| 09 | Filtrerra (Curb Inlet) | Gateway II Dorm Parking Lot #30M | 37.241321 | -77.416303 | 0.40 | 0.02 | 0.38 | 06/2011 | JA40 | VSU | VSU | No | NA |
| 10 | Filtrerra (Curb Inlet) | Gateway II Dorm Parking Lot #30M | 37.241038 | -77.416410 | 0.34 | 0.03 | 0.31 | 06/2011 | JA40 | VSU | VSU | No | NA |
| 11 | Filtrerra (Curb Inlet) | Gateway II Dorm Parking Lot #30M | 37.241020 | -77.416548 | 0.35 | 0.02 | 0.33 | 06/2011 | JA40 | VSU | VSU | No | NA |
| 12 | Filtrerra (Curb Inlet) | Gateway II Dorm Parking Lot #30M | 37.241493 | -77.416913 | 0.23 | 0.03 | 0.20 | 06/2011 | JA40 | VSU | VSU | No | NA |
| 13 | Filtrerra (Curb Inlet) | Gateway II Dorm Parking Lot #30M | 37.241327 | -77.416974 | 0.18 | 0.06 | 0.12 | 06/2011 | JA40 | VSU | VSU | No | NA |
| 15 | Underground Storage Vault | Gateway II Dorm Parking Lot #30M | 37.241286 | -77.416623 | NA | NA | NA | 06/2011 | JA40 | VSU | VSU | No | NA |
| 16 | Filtrerra (Roof Inlet) | Howard Hall Quad II Building | 37.236886 | -77.422202 | 0.5 | 0.0 | 0.5 | 01/2012 | JA40 | VSU | VSU | No | NA |
| 17 | Filtrerra (Roof Inlet) | Howard Hall Quad II Building | 37.236580 | -77.422026 | 0.5 | 0.0 | 0.5 | 01/2012 | JA40 | VSU | VSU | No | NA |
| 18 | Filtrerra (Roof Inlet) | Howard Hall Quad II Building | 37.236638 | -77.421840 | 0.12 | 0.0 | 0.12 | 01/2012 | JA40 | VSU | VSU | No | NA |
| 19 | Filtrerra (Roof Inlet) | Howard Hall Quad II Building | 37.237131 | -77.421430 | 0.09 | 0.0 | 0.09 | 01/2012 | JA40 | VSU | VSU | No | NA |
| 20 | Filtrerra (Roof Inlet) | Howard Hall Quad II Building | 37.236981 | -77.421743 | 0.08 | 0.0 | 0.08 | 01/2012 | JA40 | VSU | VSU | No | NA |
| 21 | Filtrerra (Roof Inlet) | Howard Hall Quad II Building | 37.237152 | -77.421285 | 0.27 | 0.01 | 0.26 | 01/2012 | JA40 | VSU | VSU | No | NA |
| 22 | Contech Stormfilter | Howard Hall Quad II Courtyard | 37.236854 | -77.421296 | 0.14 | 0.02 | 0.12 | 01/2012 | JA40 | VSU | VSU | No | NA |
| 23 | Contech Stormfilter | Howard Hall Quad II Courtyard | 37.236752 | -77.421605 | 0.46 | 0.05 | 0.39 | 01/2012 | JA40 | VSU | VSU | No | NA |
| 24 | Underground Irrigation Storage (50,000 Gallons) | Howard Hall Quad II Courtyard | 37.236860 | -77.421690 | NA | NA | NA | 01/2012 | JA40 | VSU | VSU | No | NA |
| 25 | Underground CMP Detention | West Yard of Howard Hall Quad II | 37.236424 | -77.421959 | NA | NA | NA | 01/2012 | JA40 | VSU | VSU | No | NA |
| 26 | Underground CMP Detention | Howard Hall Quad II Courtyard | 37.236933 | -77.421531 | NA | NA | NA | 01/2012 | JA40 | VSU | VSU | No | NA |
| 27 | Underground Detention Chamber w/ Sand Filters | Howard Hall Quad I Courtyard | 37.236619 | -77.421166 | 1.90 | 1.07 | 0.83 | 04/2011 | JA40 | VSU | VSU | No | NA |
| 28 | Underground Irrigation Storage Vault | Howard Hall Quad I | 37.236466 | -77.421249 | 0.00 | 0.00 | 0.00 | 04/2011 | JA40 | VSU | VSU | No | NA |
| 29 | Extended Detention Basin | Physical Plant Building | 37.237497 | -77.414375 | 5.49 | 0.97 | 4.52 | 03/1994 | JA40 | VSU | VSU | No | NA |
| 30 | Retention Basin Type III | Behind Jesse R. Bolling (ROTC Building) | 37.239482 | -77.415527 | 21.07 | 9.22 | 11.85 | 03/2002 | JA40 | VSU | VSU | No | NA |
| 31 | Deleware Sand Filter | Cooperative Extension Agriculture/Wilder Building | 37.241139 | -77.417943 | 1.17 | 0.32 | 0.85 | 05/1994 | JA40 | VSU | VSU | No | NA |
| 32 | Sorbitive Filter 2C | Boisseau St. Parking Lot # 36 | 37.236994 | -77.422473 | 0.38 | 0.01 | 0.37 | 04/2011 | JA40 | VSU | VSU | No | NA |
| 33 | Sorbitive Filter 1C | Boisseau St. Parking Lot #37 | 37.236761 | -77.422861 | 0.39 | 0.03 | 0.36 | 04/2011 | JA40 | VSU | VSU | No | NA |
| 34 | Sorbitive Filter 10C | Lee St. Parking Lot #21 | 37.236190 | -77.422153 | 0.44 | 0.02 | 0.42 | 04/2011 | JA40 | VSU | VSU | No | NA |
| 35 | Contech Stormfilter | University Bookstore | 37.237440 | -77.418709 | 0.10 | .01 | .09 | 04/2014 | JA40 | VSU | VSU | No | NA |
| 36 | Underground Storage Vault | University Bookstore | 37.237507 | -77.418556 | NA | NA | NA | 04/2014 | JA40 | VSU | VSU | No | NA |
| 37 | Underground Storage Vault | Lee St. Parking Lot #21 | 37.236097 | -77.422090 | NA | NA | NA | 04/2011 | JA40 | VSU | VSU | No | NA |
| 38 | Underground Storage Vault | Boisseau St. Parking Lot #36 | 37.236943 | -77.422522 | NA | NA | NA | 04/2011 | JA40 | VSU | VSU | No | NA |
| 39 | Underground Storage Vault | Boisseau St. Parkign Lot #37 | 37.236699 | -77.422896 | NA | NA | NA | 04/2011 | JA40 | VSU | VSU | No | NA |
| 40 | Underground Storage Vault | Dupuy Avenue Parking Lot | 37.242507 | -77.416410 | NA | NA | NA | 01/04/2016 | JA40 | VSU | VSU | No | NA |
| 41 | Filtrerra (Curb Inlet) | Dupuy Avenue Parking Lot | 37.242727 | -77.416434 | 0.53 | 0.08 | 0.45 | 01/04/2016 | JA40 | VSU | VSU | No | NA |
| 42 | Filtrerra (Curb Inlet) | Dupuy Avenue Parking Lot | 37.242737 | -77.416673 | 0.47 | 0.15 | 0.32 | 01/04/2016 | JA40 | VSU | VSU | No | NA |
| 43 | Filtrerra (Curb Inlet) | Dupuy Avenue Parking Lot | 37.242310 | -77.416422 | 0.47 | 0.03 | 0.44 | 01/04/2016 | JA40 | VSU | VSU | No | NA |
| 44 | Filtrerra (Curb Inlet) | Dupuy Avenue Parking Lot | 37.241859 | -77.416157 | 0.28 | 0.04 | 0.24 | 01/04/2016 | JA40 | VSU | VSU | No | NA |
| 45 | Extended Detention Pond | North side of River Rd., next to Fleets Branch | 37.244275 | -77.420233 | 12.30 | | | 06/01/2016 | JA40 | VSU | VDOT | No | NA |
| 46 | Extended Detention Pond | Next to Multi Purpose Center, along 3rd Ave. | 37.239210 | -77.422700 | 32.00 | 11.56 | 20.44 | 06/01/2016 | JA40 | VSU | VSU | No | NA |
| 47 | Contech Stormfilter | College Ave. Parking Lot #28 | 37.241705 | -77.419085 | 2.59 | 1.52 | 1.07 | 06/01/2016 | JA40 | VSU | VSU | No | NA |
| 48 | Contech Stormfilter | Dining & Events Center | 37.242029 | -77.417852 | 2.48 | 0.91 | 1.57 | 06/01/2016 | JA40 | VSU | VSU | No | NA |
| 49 | Contech Stormfilter | Dining & Events Center | 37.242093 | -77.418481 | 4.45 | 1.66 | 2.79 | 06/01/2016 | JA40 | VSU | VSU | No | NA |
| 50 | Contech Underground Storage Vault | Dining & Events Center | 37.241974 | -77.418139 | NA | NA | NA | 06/01/2016 | JA40 | VSU | VSU | No | NA |
| 51 | Fleets Branch Stream Restoration Phase1 | Fleets Branch | 37.242590 | -77.419278 | 477.55 | NA | 148.91 | 09/18/2020 | JA40 | VSU | VSU | Yes | NA |

Virginia State University

BMP Inspection & Maintenance Checklists



TIMMONS GROUP

YOUR VISION ACHIEVED THROUGH OURS.



Detention, Retention, & Impoundment BMPs

Inspection & Maintenance Checklist

| Inspector Name: | | | Type of BMP: | |
|---------------------------------------|-----|----|--------------|----------|
| BMP ID #: | | | Date/Time: | |
| Component | Yes | No | N/A | Comments |
| I. Embankment | | | | |
| A. Top | | | | |
| 1. Visual settlement | | | | |
| 2. Misalignment | | | | |
| 3. Cracking | | | | |
| B. Upstream Slope | | | | |
| 1. Erosion | | | | |
| 2. Adequate groundcover | | | | |
| 3. Trees, shrubs, or other vegetation | | | | |
| 4. Cracks, settlements, or bulges | | | | |
| 5. Rodent holes | | | | |
| C. Downstream Slope | | | | |
| 1. Erosion | | | | |
| 2. Adequate groundcover | | | | |
| 3. Trees, shrubs, or other vegetation | | | | |
| 4. Cracks, settlements, or bulges | | | | |
| 5. Rodent holes | | | | |
| E. Drainage/seepage control | | | | |
| 1. Internal drains flowing | | | | |
| 2. Seepage at toe | | | | |
| II. Emergency Spillway | | | | |
| 1. Eroding or backcutting | | | | |
| 2. Obstruction | | | | |
| 3. Leaking | | | | |
| 4. Operational | | | | |



| BMP ID #: | | | Date/Time: | |
|---|-----|----|------------|----------|
| Component | Yes | No | N/A | Comments |
| III. Principal Spillway Barrel | | | | |
| 1. Seepage into pipe | | | | |
| 2. Debris present | | | | |
| 3. Displaced or offset joints | | | | |
| IV. Outlet Protection/Stilling Basin | | | | |
| 1. Obstruction | | | | |
| 2. Adequate riprap | | | | |
| 3. Undercutting at the outlet | | | | |
| 4. Outlet channel scour | | | | |
| V. Internal Basin Area | | | | |
| A. Low Flow Channel* | | | | |
| 1. Erosion | | | | |
| 2. Adequate vegetation | | | | |
| 3. Obstruction | | | | |
| B. Basin Bottom & Side Slopes | | | | |
| 1. Erosion | | | | |
| 2. Adequate stabilization | | | | |
| 3. Sediment accumulation | | | | |
| 4. Floating debris | | | | |
| 5. High water marks | | | | |
| 6. Shoreline protection | | | | |
| C. Inflow Channels/Pipes | | | | |
| 1. Erosion | | | | |
| 2. Adequate stabilization | | | | |
| 3. Undercutting | | | | |
| 4. Obstruction | | | | |
| D. Sediment Forebay | | | | |
| 1. Sediment accumulation | | | | |
| 2. Stable overflow into basin | | | | |
| E. Upland Landscaping | | | | |
| F. Aquatic Landscaping | | | | |

*Only applies to Extended Detention Facilities



| | | | | |
|------------------|------------|-----------|-------------------|-----------------|
| BMP ID #: | | | Date/Time: | |
| Component | Yes | No | N/A | Comments |
| Notes: | | | | |



Filterra BMPs

Inspection & Maintenance Checklist

| | | | | | |
|---|-----------------------|---------------------------|---------------------|--------------|--------------|
| Inspector Name: | | Type: Inlet / Roof | | Size: | |
| BMP ID #: | | Date/Time: | | | |
| Component | (Circle Y/N) | | Comments | | |
| Initial Observations | | | | | |
| Standing Water? | Y | N | | | |
| Damage to Box Structure? | Y | N | | | |
| Damage to Grate? | Y | N | | | |
| Is Bypass Clear? | Y | N | | | |
| Waste | | | | | |
| Silt/Clay? | Y | N | | | |
| Cups/Bags/Trash? | Y | N | | | |
| Leaves? | Y | N | | | |
| Other? | Y | N | | | |
| Erosion Control | | | | | |
| Netting in Need of Replacement? | Y | N | NA | | |
| Stones in Need of Replacement? | Y | N | NA | | |
| Mulch | | | | | |
| Depth from Top of Slab to Surface of Mulch | Inlet Filterra | Roof Filterra | Comments | | |
| Measured (in.): | | | | | |
| Allowed range (in.): | 16" - 18" | 23" - 25" | | | |
| <p>Notes: If measured depth exceeds the allowed range, add mulch until the allowed range is achieved. If there is evidence of ponding water, remove and replace all mulch. Remove any accumulated silt that may also be clogging the filter media. Do not overfill unit with mulch; for inlet units, mulch should not exceed bottom of inlet throat, and for roof units, mulch should not impede bypass piping or splash blocks.</p> | | | | | |
| Amount of Mulch to be Added or Replaced: | | | | | |
| Type of Mulch to be Added or Replaced: | | | | | |
| Date Mulch Added or Replaced: | | | | | |
| Plantings | | | | | |
| Note: Column #1 is the plant to the left when facing the throat of the inlet and column #2 is the plant to the right when facing the throat of the inlet. | | | | | |
| Plant Information | #1 | #2 | | #1 | #2 |
| Height Above Grate (ft.): | | | Health of plant(s) | Alive / Dead | Alive / Dead |
| Stem Diameter/Caliper (in.): | | | Damage to plant(s)? | Y / N | Y / N |
| Width at Widest Point (ft.): | | | Plant(s) replaced? | Y / N | Y / N |



| | |
|-----------|------------|
| BMP ID #: | Date/Time: |
|-----------|------------|

Notes:



Intermittent Sand Filter

Inspection & Maintenance Checklist

| Inspector Name: | | | Type of BMP: | | |
|---|-----|----|---------------------|----------|--|
| BMP ID #: | | | Date/Time: | | |
| Component | Yes | No | N/A | Comments | |
| I. Debris Cleanout | | | | | |
| A. Contributing areas clean of debris | | | | | |
| B. Filtration Facility clean of debris | | | | | |
| C. Inlets and outlets clear of debris | | | | | |
| II. Vegetation in Contributing Drainage Area | | | | | |
| A. Stabilized | | | | | |
| B. Active evidence of erosion | | | | | |
| C. Area mowed and clippings removed | | | | | |
| III. Oil & Grease | | | | | |
| A. Evidence of filter surface clogging | | | | | |
| B. Activities in drainage area to minimize oil & grease entry | | | | | |
| IV. Water retention where required | | | | | |
| A. Water holding chambers at normal pool | | | | | |
| B. Evidence of leakage | | | | | |
| V. Sediment Deposition | | | | | |
| A. Filtration chambers clean of sediment | | | | | |
| B. Water chambers not more than ½ full of sediment | | | | | |
| VI. Structural Components | | | | | |
| A. Evidence of structural deterioration | | | | | |
| B. Grates are in good condition | | | | | |
| C. Evidence of spalling or cracking of structural parts | | | | | |



| | | | | |
|---|------------|-----------|-------------------|-----------------|
| BMP ID #: | | | Date/Time: | |
| Component | Yes | No | N/A | Comments |
| VII. Outlets/Overflow Spillway | | | | |
| A. Obstruction | | | | |
| B. Adequate riprap (If applicable) | | | | |
| C. Undercutting at the outlet | | | | |
| D. Outlet channel scour | | | | |
| VIII. Overall Function of Facility | | | | |
| A. Evidence of flow | | | | |
| B. Noticeable odors | | | | |

Notes:



Sorbitive Filter BMP

Inspection & Maintenance Checklist

| | | | | | | |
|---|------------|-----------|--|------------------------------|-----------|------------------|
| Inspector Name: | | | | Type of BMP: | | |
| BMP ID #: | | | | Date/Time: | | |
| | | | | Maintenance required? | | |
| Component: | Yes | No | Conditions When Maintenance is Needed | Yes | No | Comments: |
| The access manhole or access doors are functioning properly and are structurally sound | | | | | | |
| Sediment and oil are present (provide depths) | | | | | | |
| Floatable pollutant accumulation is present in the Pre-treatment Bay | | | | | | |
| The Cartridge Bay is visually inspected for sediment depth (provide depth)*(If sediment depth is greater than 6 inches, maintenance is required | | | | | | |
| Proper draindown is occurring in the Cartridge Bay *(If at least 40 hours of dry weather have elapsed, since the most recent runoff event and the Bay contains more than 3 inches of water above the sediment layer, the Sorbtive BRICKs required cleaning or replacement | | | | | | |
| The internal components show no signs of damage | | | | | | |



| | |
|-----------|------------|
| BMP ID #: | Date/Time: |
|-----------|------------|

Notes:



StormFilter BMP
Inspection & Maintenance Checklist

| | | | | | | |
|--|------------|-----------|--|------------------------------|-----------|------------------|
| Inspector Name: | | | | Type of BMP: | | |
| BMP ID #: | | | | Date/Time: | | |
| | | | | Maintenance required? | | |
| Component: | Yes | No | Conditions When Maintenance is Needed | Yes | No | Comments: |
| I. Below Ground Vault | | | | | | |
| Sediment accumulation top of cartridge | | | Sediment depth exceeds 0.25 inches | | | |
| Sediment accumulation in vault | | | Sediment depth exceeds 4 inches in the first chamber | | | |
| Submerged cartridges | | | More than 4" of static water in the cartridge bay 24 hours after last rainfall event | | | |
| Trash/debris accumulation | | | Trash and debris accumulated on compost filter bed | | | |
| Sediment in drain pipes or cleanouts | | | Drain pipes and/or clean outs are full of sediment and/or debris | | | |
| Damaged pipes | | | Any part of any pipe crushed or damaged due to corrosion and/or settlement | | | |
| Access cover damaged/not working | | | Cover cannot be opened; one person cannot open the cover using normal lifting pressure; corrosion/deformation of cover | | | |
| Vault structure includes cracks in wall or bottom; damage to the frame and/or top slab | | | Cracks wider than ½ inch or evidence of soil particles entering the structure through cracks; determination that the vault is not structurally sound | | | |
| | | | Cracks wider than ½ inch at the joint of any inlet/outlet pipe or evidence of soil particles entering through the cracks | | | |
| Baffles | | | Baffles corroding, cracking, warping, and/or showing signs of failure | | | |
| Access ladder damaged | | | Ladder is corroded or deteriorated, not functioning properly, not securely secured to the structure wall and/or missing rungs; cracks; misalignment | | | |



| BMP ID #: | | | | Date/Time: | | |
|--|-----|----|--|-----------------------|----|-----------|
| | | | | Maintenance required? | | |
| Component: | Yes | No | Conditions When Maintenance is Needed | Yes | No | Comments: |
| II. Below Ground Cartridge Type | | | | | | |
| Filter Media | | | Drawdown of water through the media takes longer than one hour and/or overflow occurs frequently | | | |
| Short Circuiting | | | Flows do not properly enter filter cartridges | | | |

Notes:



Underground Detention Systems (Water Quantity)

Inspection & Maintenance Checklist

| | | | |
|---|------------|---------------------------------|---------------------|
| Inspector Name: | | | Type of BMP: |
| BMP ID #: | | | Date/Time: |
| Inspection Finding | Y/N | Maintenance Required Y/N | Comments |
| I. Internal Storage Area | | | |
| A. Sediment present? | | | |
| B. Trash/debris present? | | | |
| C. Separation of joints, cracks, breaks, or deterioration of structure? | | | |
| D. Algal growth present? | | | |
| E. Evidence of seepage, leakage, or rust? | | | |
| F. Evidence of pollutants? | | | |
| Inlet & Outlet Piping | | | |
| A. Inspection manhole functioning properly? | | | |
| B. Clogging of inflow pipes? | | | |



| BMP ID #: | | | Date/Time: |
|-------------------------------------|-----|--------------------------|------------|
| Inspection Finding | Y/N | Maintenance Required Y/N | Comments |
| C. Clogging of outflow pipes? | | | |
| D. Obstruction? | | | |
| E. Adequate riprap (If applicable)? | | | |
| F. Undercutting at the outlet? | | | |
| G. Outlet channel scour? | | | |

Notes: