

BMP Long Term Maintenance



Presented at:

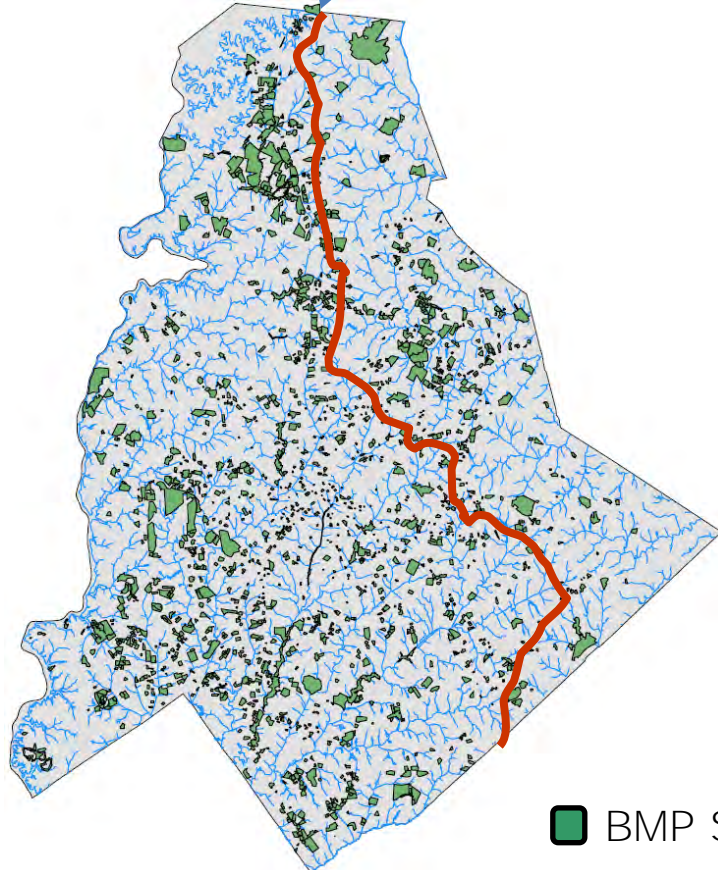
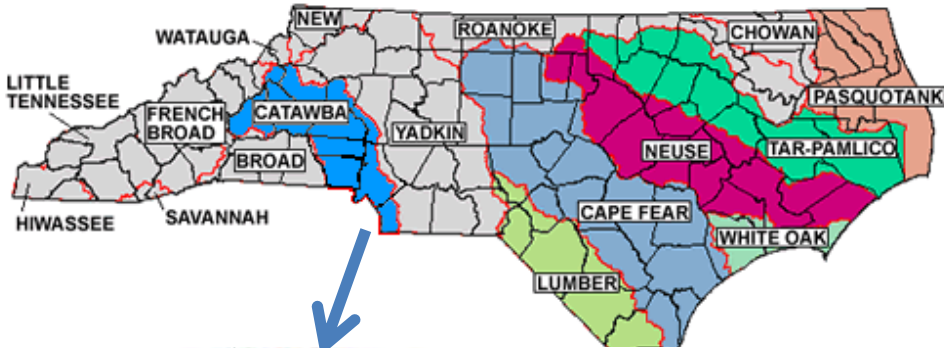
SESWA

Southeast Regional Stormwater Seminar

April 13, 2018

Don Ceccarelli
don.ceccarelli@mecklenburgcountync.gov

Mecklenburg County



- Population: 1.1 million (2.5X in 40 yrs)
- Phase I Community-Charlotte (840,000)
- Phase II Community- Six Towns & County (270,000)
- 3,452 square miles
- Over 3,000 miles of streams
- Over 200 miles of lake shoreline
- 3,065 Storm Water BMPs

■ BMP Sites

Overview:

- Establishing Responsibility
- Data Collection
- Data Management

BMP Maintenance Responsibility

- Detention Ordinance - Owner
- Watershed Ordinance - Owner
- Huntersville LID Ordinance- Owner
- Post-Const. Ordinance – Owner
&/or Municipality

BMP Maintenance Responsibility

Ordinance Requirements for Maintenance:

➤ Operation and Maintenance Agreement (OMA)

Required at plan approval – County

INSERT PROJECT NAME (must match plat title)

DECLARATION OF COVENANTS

For Maintenance of Water Quality and Water Quantity Control Structures

Town of **INSERT JURISDICTION**

Recorded at the Register of Deeds

THIS DECLARATION OF COVENANTS, made this _____ day of _____, 20____, by _____ hereinafter referred to as the "Owner" to and for the benefit of the Town of **INSERT JURISDICTION** and its successors and assigns.

Exhibit "A"

BMP Maintenance Plan

Toast
Huntersville
26 August 2015

- I. **General BMP Information** [Complete this table with each BMP that is planned within the development. Use the same naming system used on the approved plans, ie. Birkdale Phase I Bioretention 1]

BMP ID Name	Street with Block Number	Parcel Tax ID
Sand Filter	12715 Conner Drive	01716523
Contact Information for Responsible Party		
Name:	Toastery of Huntersville, LLC	
Mailing Address:	230 South Main Street, 4 th Floor, Davidson, NC 28036	
Phone Number:	704.737.7742	

- II. **BMP Site Location Map** (attached) [Attach a small site plan map coinciding with the table above to show the general location of each BMP within the development.]

III. BMP Maintenance and Funding Requirements

Documentation that BMP maintenance activities have occurred shall be provided during the annual compliance inspection.

- For commercial properties under single ownership, the owner may provide maintenance reports, invoices for work performed, etc. as documentation. There are no specific maintenance funding requirements.
- For property owner associations (POAs or HOAs), the Owner shall establish an Escrow Account or other funding source as approved by the Storm Water

Sand Filter			
Maintenance and Schedule			
TASK		SCHEDULE	
Inspect banks and surrounding drainage areas for erosion and stabilize if necessary	Monthly		
Street sweep parking lot	Quarterly		
Trash removal	Monthly		
Inspect outlet for obstructions	Monthly		
Inspect for clogging	Monthly		
Inspect inlet grates	Monthly		
Skim sand media	Yearly		
Pump oil and grit from sedimentation chamber	Yearly or at 50% full		
Replace sand media	As needed (expect 3 years)		
Grassed Sand Filter Only			
Mow basin to recommended height in alternating patterns to prevent compaction and prevent weed growth. Bag clippings to prevent thatch built-up.	Weekly to bi-weekly during the growing season, as needed other seasons		
Light fertilizing to establish healthy roots	Only during the first 2 years		
Aerate and dethatch basin floor	Every 2 Years		
Budget for BMP Maintenance & Replacement			
Item	Description	Estimated Costs	Comments
1	BMP Installation Cost	\$21,406.95	
2	Surface Cover Cost (for underground BMPs)	\$0	
3	Total Initial BMP Construction Cost [Item 1 + Item 2]	\$21,406.95	
4	Down Payment [10% x Item 3]	\$2,140.69	
5	Replacement Cost [Item 3 – Item 4]	\$19,266.26	
6	Annual Replacement Budget [Item 5 / 10 years]	\$1,926.62	
7	Annual Inspection & Maintenance Budget [5.4753 x (Item1) ^{-0.0227}] x Item 1 / 100]	\$934.67	
8	Total Annual Budget [Item 6 + Item 7]	\$2,861.29	

BMP Maintenance Responsibility

- NPDES Permit Language

f. Provide a mechanism to require long-term operation and maintenance of structural BMPs.

The permittee shall implement or require owners to implement an operation and maintenance plan for the long-term operation of the structural BMPs required by

- Ordinance Language

DEDICATION OF BMPS, FACILITIES & IMPROVEMENTS

(A) Single Family Residential BMPs Accepted for Maintenance

Mecklenburg County shall accept maintenance responsibility (as specified in the Administrative Manual) of structural BMPs that are installed pursuant to this

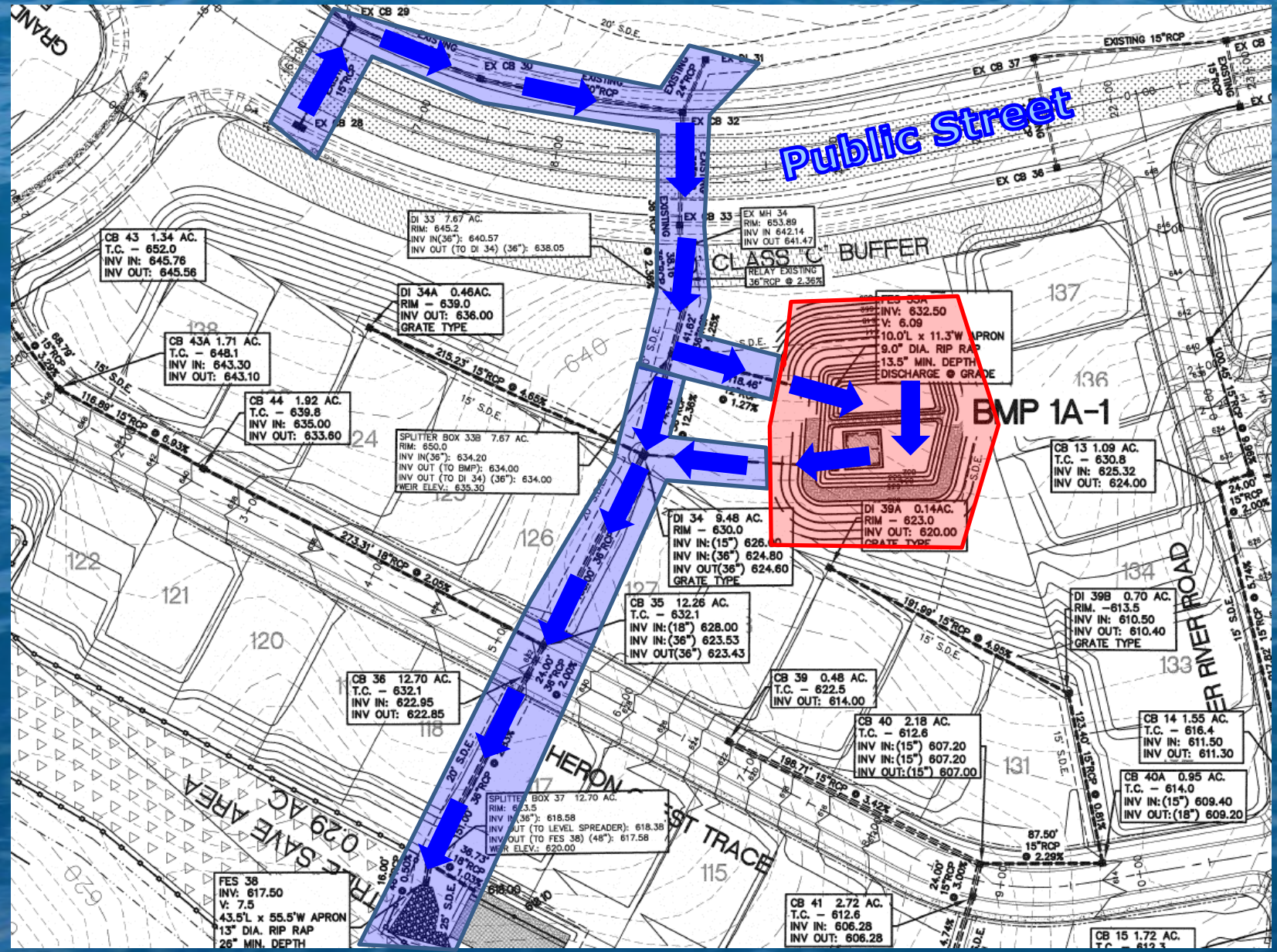
Why Accept BMP Maintenance?

- Stakeholder Ordinance Negotiation

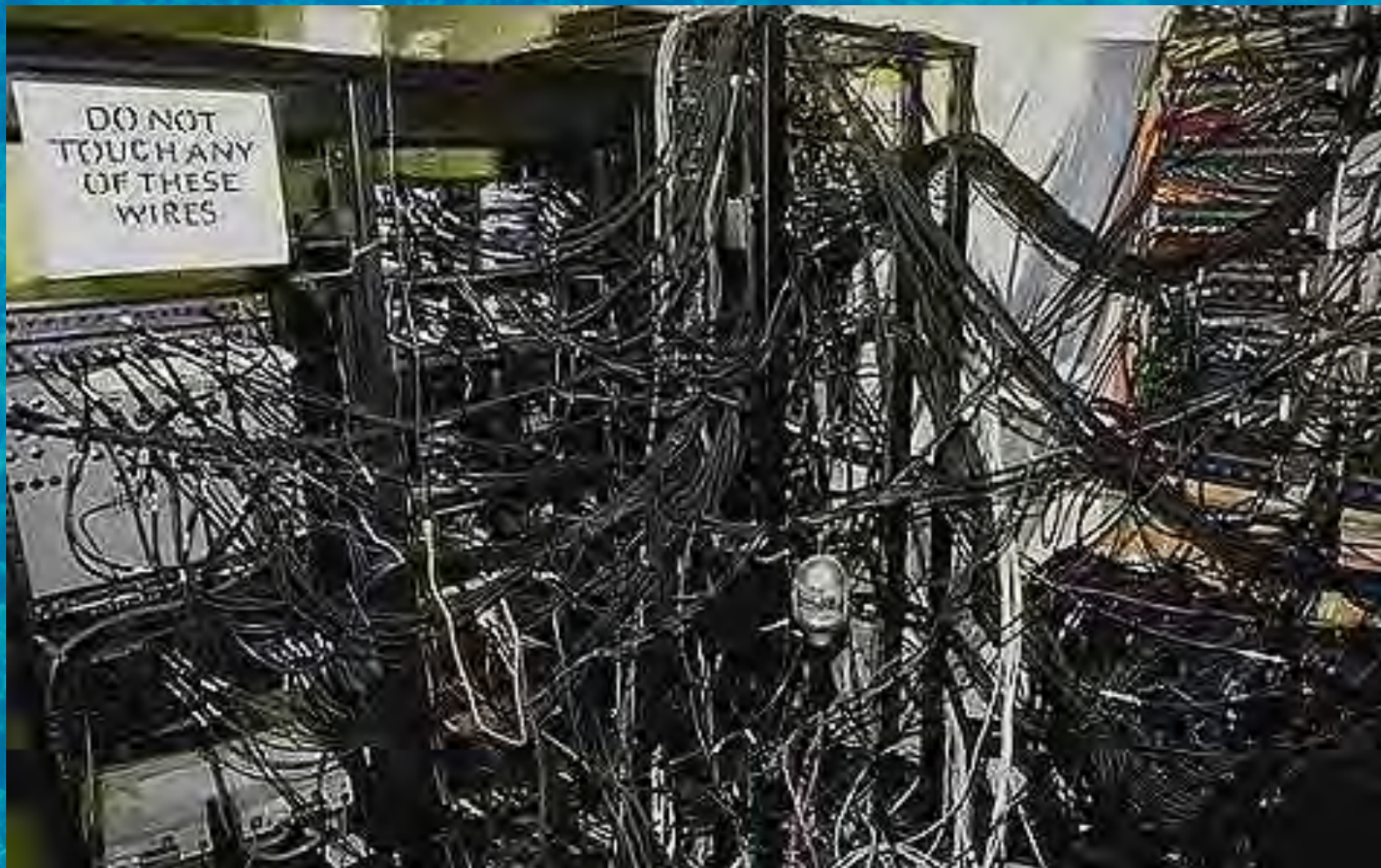
Developers/Engineers willing to go above the minimum to install BMPs IF..

- Community agrees to maintain residential BMPs rather than HOAs.
- Reason 1: HOAs are ill-equipped to manage BMP maintenance
- Reason 2: Waste of money to install BMPs if HOAs do not maintain

Why Accept BMP Maintenance?



BMP Data Collection

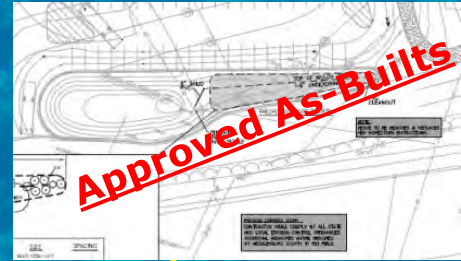


- So what did Version 1.0 look like....

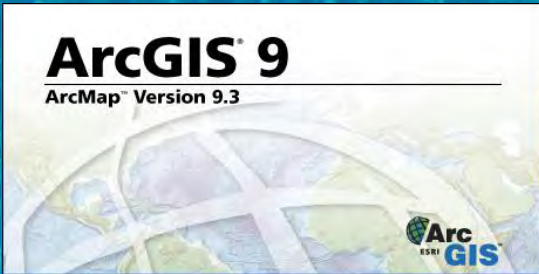
BMP Data Collection



City System



County & Town System



Inspection / Maintenance Guidelines

Maintenance Item	Frequency (Months)	Corrective Action Required	Comments/Actions Required
Debris Cleanout	1	Clear of trash and debris	Open
Vegetation Management	1	Vegetation (including grass) less than 1.0m	Last Bank seeds mowed

Annual Reports

DECLARATION OF COVENANTS
For Maintenance of Water Quality Control Structures

THIS DECLARATION OF COVENANTS, made this 20th day of November, 2009, by Easy Eddie's hereinafter referred to as the "Covenanter" to and for the benefit of the Town of Huntersville and its successors and assigns:

WITNESSETH:

WHEREAS, the Town of Huntersville is authorized to prevent surface water quality degradation from development or redevelopment activities within its jurisdiction in accordance with Chapter 8.17 of the Huntersville Zoning Ordinance; and

WHEREAS, Covenanter(s) is (are) the owner(s) of a certain tract or parcel of land more particularly described as:

Tract 1, 7.178 Acres PID#01720101 at 12125 Statesville Road

Maintenance Covenant

BMP Data Management

BMP Database (Cityworks)

Overall Condition

Site

Satisfactory
 Erosion in drainage area / insufficient ground cover
 Erosion in off-site drainage area

Attachments
 Not required
 Not accessible
 Satisfactory
 Damaged
 Insufficient / displaced / excessive rip-rap
 Excess sediment / debris / trash

Not accessible
 Satisfactory
 Nuisance vegetation
 Erosion on banks / in ground cover

Attachments

Not required
 Not accessible
 Satisfactory
 Damaged
 Diverter box not functioning per approved plan
 Excess sediment / debris / trash
 Excess vegetation
 Erosion

Storm water collection

Satisfactory

Media Cell

Grass within basin

Not required
 Not accessible
 Satisfactory
 Aerate / thatch
 Grass height does not meet design standard
 Dead / diseased / stressed

Inlet dissipator

Not required
 Not accessible
 Satisfactory
 Damaged
 Insufficient / displaced / excessive rip-rap
 Excess sediment / debris / trash

Attachments

Not accessible
 Satisfactory
 Nuisance vegetation
 Erosion on banks / in ground cover

Attachments

Not required
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 Diverter box not functioning per approved plan
 Excess sediment / debris / trash
 Excess vegetation
 Erosion

Media Cell

Grass within basin

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Attachments

	Photo 1.jpg Attached by DAVIS, HEATHER	126.20 KB 10/5/2017 1:25 PM	<input type="button" value="Remove"/>
	Photo 2.jpg Attached by DAVIS, HEATHER	129.65 KB 10/5/2017 1:25 PM	<input type="button" value="Remove"/>
	Photo 3.jpg Attached by DAVIS, HEATHER	150.73 KB 10/5/2017 1:25 PM	<input type="button" value="Remove"/>

BMP Data Management

Inspection
 Details

Id: 31990

Location Name:

Location/Address: Beckett Phase 1 - Rensse Lane

Related Work Activities

Request:

Work Order:

Create Work Order:



[View all attachments](#)

115.64 KB
 11/30/2017 12:58 AM

133.08 KB
 11/30/2017 12:58 AM

Grassed	
	25
	25
	2

BMP Insp. Data – Bioretention Gardens

Observations	ACTFINYR							
Inspection Questions	2011	2012	2013	2014	2015	2016	2017	Grand Total
Condition of mulch	20	291	147	124	154	183	125	1,044
Bioretention	20	291	147	124	154	183	125	1,044
Insufficient mulch	17	88	44	29	57	107	89	431
Decomposed mulch		111	48	66	45	45	21	336
Sediment on mulch	3	61	34	25	38	12	6	179
Other		27	20	2	9	16	7	81
Excess mulch		4	1	2	5	3	2	17
Condition of plants	23	150	94	103	125	127	66	688
Bioretention	23	150	94	103	125	127	66	688
Missing plants	16	93	36	45	71	60	30	351
Overgrown plants	2	10	40	32	30	40	27	181
Dead plants	5	43	17	16	24	25	9	139
Other		4	1	10		2		17
Nuisance vegetation	11	144	97	61	98	76	51	538
P-index test for soil media	35	19	12	19	32	23		140
Underdrain/clean out	3	38	11	19	19	13	4	107
Outlet dissipators	3	11	3	5	9	18	32	81
Storm water collection (runoff)	6	16	12	6	14	18	4	76
Forebay		13	6	6	23	23		71
Standing water	2	18	12	14	4	11	2	63
BMP accessibility		3	4	9	10	10	18	54
Berm/dam		11	6	6	9	20	1	53
Grand Total	123	1,380	703	663	867	849	528	5,113

BMP Insp. Data – Dry Ponds

Observations	ACTFINYR ▼								
Inspection Questions	IT	2011	2012	2013	2014	2015	2016	2017	Grand Total
⊖ Grass height (bank and surrounding areas)		11	58	79	157	200	174	176	855
⊖ Dry Pond		11	58	79	157	200	174	176	855
Greater than 6"		6	45	66	114	149	124	100	604
Insufficient grass		3	11	7	24	30	33	70	178
Other		2		3	11	9	10	2	37
Less than 3"			2	3	8	12	7	4	36
⊖ Inlet structure (pipe/swale/box)		7	23	26	153	210	214	132	765
⊖ Dry Pond		7	23	26	153	210	214	132	765
Sediment in pipe/swale		3	6	8	83	119	166	97	482
Woody vegetation		1	9	6	44	29	30	25	144
Other		2	8	11	25	60	17	9	132
Damaged pipe		1		1	1	2	1	1	7
⊕ Nuisance vegetation		9	47	70	151	185	164	132	758
⊕ Outlet dissipators		12	22	26	139	212	186	106	703
⊕ Outlet structure (drop box/overflow spillway)		5	39	58	113	124	99	46	484
⊕ Inlet dissipators		19	27	40	104	120	106	57	473
⊕ Berm/dam		6	35	34	65	156	100	56	452
⊕ Standing water		3	12	27	90	82	79	79	372
⊕ Sedimentation		6	17	22	98	83	58	30	314
⊕ Forebay		2		5	35	98	49		300
⊕ Storm water collection (runoff)		3		5	18	30	22	6	84
Grand Total		119	411	566	1,667	2,123	1,791	1,231	7,908

BMP Insp. Data – Wet Ponds

Inspection Questions	2011	2012	2013	2014	2015	2016	2017	Grand Total
⊕ Nuisance vegetation	13	67	69	83	82	113	82	509
⊖ Condition of plants/littoral shelf	13	52	53	100	64	96	53	431
⊖ Wet Pond	13	52	53	100	64	96	53	431
Missing plants	8	36	40	49	20	40	31	224
Other	4	15	8	50	41	56	21	195
Dead plants	1	1	5	1	3		1	12
⊕ Grass height (bank and surrounding areas)	6	47	64	65	71	82	72	407
⊖ Permanent pool elevation	10	55	53	78	59	40	20	315
⊖ Wet Pond	10	55	53	78	59	40	20	315
Low water level	6	45	27	36	32	26	11	183
High water level	2	9	23	34	23	8	7	106
Other	2	1	3	8	4	6	2	26
⊖ Forebay berm	1	30	42	78	55	66	34	306
⊖ Wet Pond	1	30	42	78	55	66	34	306
Other	1	7	14	44	40	54	23	183
Woody vegetation		21	21	20	12	12	9	95
Breached berm		2	6	14			2	24
Holes in berm					3			3
Leaks in berm			1					1
⊕ Sedimentation in permanent pool	1	6	4	30	18	28	3	90
⊕ Storm water collection (runoff)	1	5	4	9	2	9		30
Grand Total	106	600	641	1,159	958	1,076	600	5,140

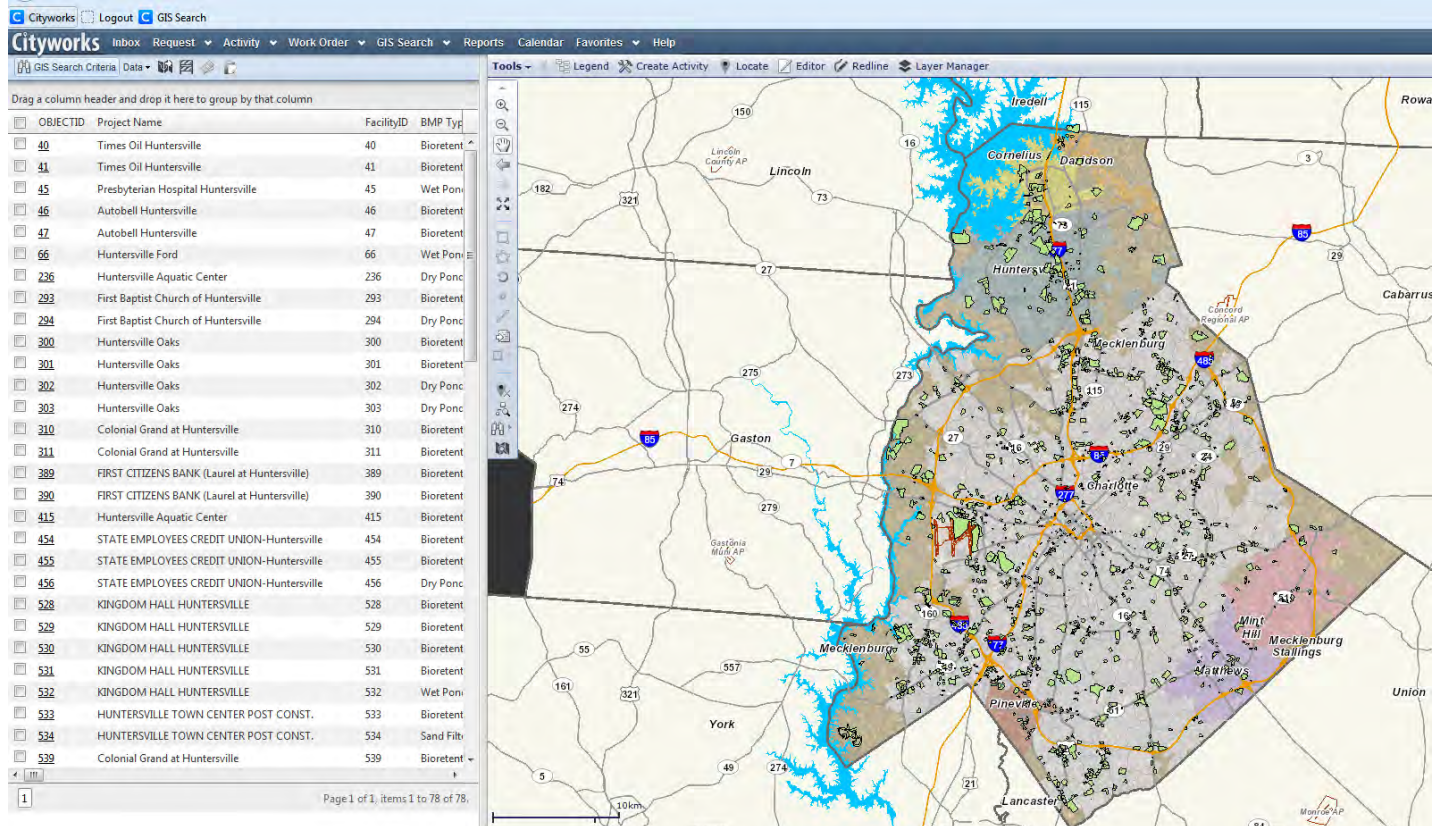
BMP Insp. Data – Sand Filters

Observations	ACTFINYR							
Inspection Questions	2011	2012	2013	2014	2015	2016	2017	Grand Total
Media/cell	4	3	5	13	13	21	15	74
Sand Filter	4	3	5	13	13	21	15	74
Sediment in media/cell		1	3	6	7	14	9	40
Other	3		2	7	4	6	6	28
Settling of media/cell	1	2			2	1		6
Soil erosion on banks or drainage areas	4	3	1	12	12	14	21	67
Sand Filter	4	3	1	12	12	14	21	67
Erosion in drainage area	4	1	1	7	8	12	14	47
Other		2		5	4	2	7	20
Forebay/grit chamber	4	1	3	10	11	15	14	58
Sand Filter	4	1	3	10	11	15	14	58
Other	3	1	2	9	8	9	5	37
Trash/debris present	1		1	1	1	4	9	17
Sediment level > 50%					2	2		4
Inlet dissipators	2		1	4	14	8		39
Outlet dissipators	3	1	1	4	6	12	6	33
Standing water	1			4	7	9	11	32
Berm/dam	1			6	7	12	5	31
BMP accessibility			1	2	2	2		9
Storm water collection (runoff)		2		1	1			5
Grand Total	25	13	18	76	92	149	487	

BMP Database Future

BMP Database (CityWorks)

- Pilot-tested 3rd party Inspectors using Database - 2017
- Available to 3rd Party Inspectors/owners - Spring 2018



The screenshot displays the CityWorks GIS application. On the left, a table lists BMP data with columns for OBJECTID, Project Name, FacilityID, and BMP Type. The main area shows a map of the Huntersville region with various colored overlays representing different BMP types. The interface includes a menu bar, a toolbar, and a status bar at the bottom.

OBJECTID	Project Name	FacilityID	BMP Type
40	Times Oil Huntersville	40	Bioretent
41	Times Oil Huntersville	41	Bioretent
45	Presbyterian Hospital Huntersville	45	Wet Pon
46	Autobell Huntersville	46	Bioretent
47	Autobell Huntersville	47	Bioretent
66	Huntersville Ford	66	Wet Pon
236	Huntersville Aquatic Center	236	Dry Ponc
293	First Baptist Church of Huntersville	293	Bioretent
294	First Baptist Church of Huntersville	294	Dry Ponc
300	Huntersville Oaks	300	Bioretent
301	Huntersville Oaks	301	Bioretent
302	Huntersville Oaks	302	Dry Ponc
303	Huntersville Oaks	303	Dry Ponc
310	Colonial Grand at Huntersville	310	Bioretent
311	Colonial Grand at Huntersville	311	Bioretent
389	FIRST CITIZENS BANK (Laurel at Huntersville)	389	Bioretent
390	FIRST CITIZENS BANK (Laurel at Huntersville)	390	Bioretent
415	Huntersville Aquatic Center	415	Bioretent
454	STATE EMPLOYEES CREDIT UNION-Huntersville	454	Bioretent
455	STATE EMPLOYEES CREDIT UNION-Huntersville	455	Bioretent
456	STATE EMPLOYEES CREDIT UNION-Huntersville	456	Dry Ponc
528	KINGDOM HALL HUNTERSVILLE	528	Bioretent
529	KINGDOM HALL HUNTERSVILLE	529	Bioretent
530	KINGDOM HALL HUNTERSVILLE	530	Bioretent
531	KINGDOM HALL HUNTERSVILLE	531	Bioretent
532	KINGDOM HALL HUNTERSVILLE	532	Wet Pon
533	HUNTSVILLE TOWN CENTER POST CONST.	533	Bioretent
534	HUNTSVILLE TOWN CENTER POST CONST.	534	Sand Filtr
539	Colonial Grand at Huntersville	539	Bioretent

Page 1 of 1, items 1 to 78 of 78.