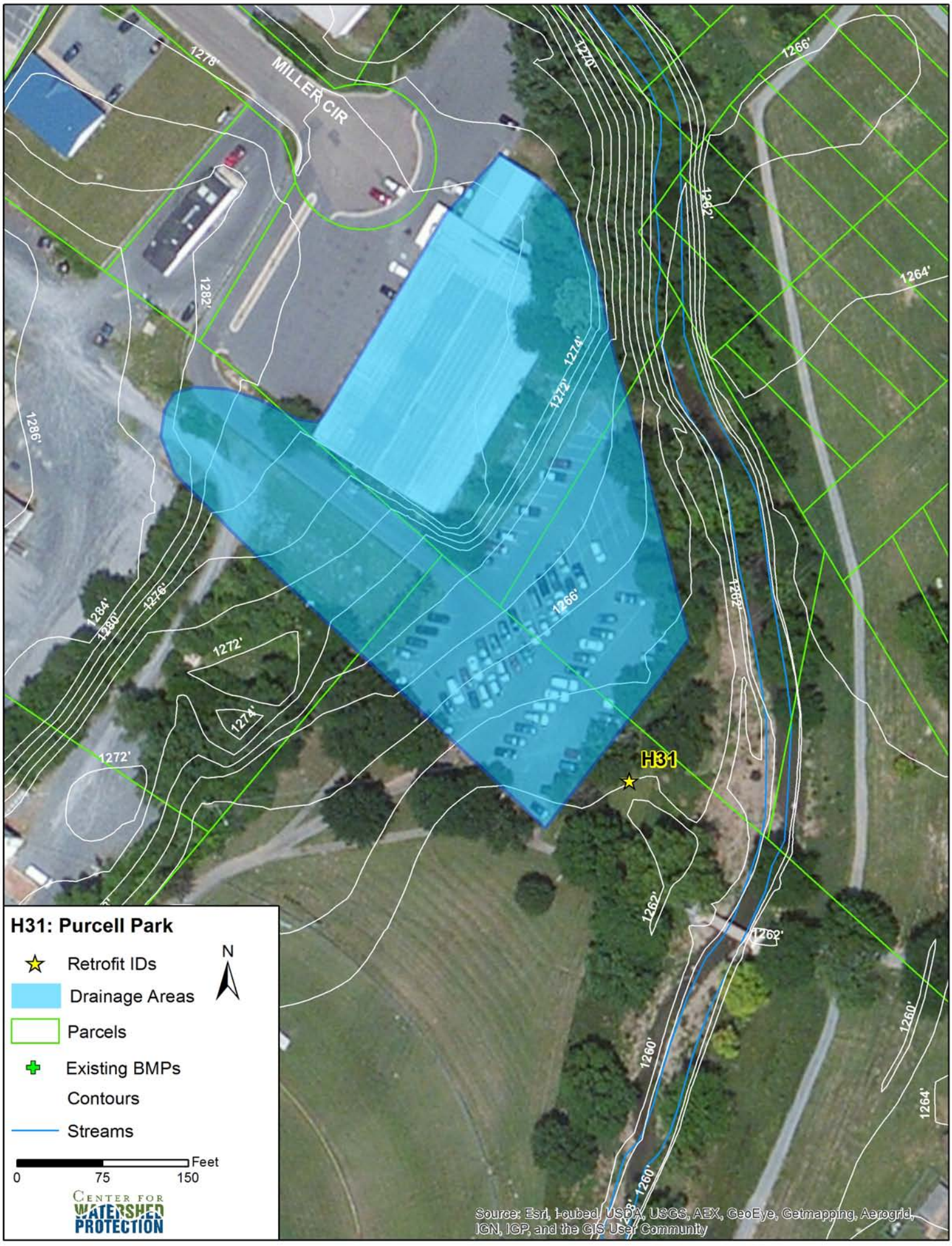
H31: Purcell Park


MILLER CIR
1278'
1270'
1266'
1262'
1264'
1282'
1274'
1272'
1286'
1284'
1280'
1276'
1266'
1262'
1272'
1274'
1272'
H31
1262'
1262'
1260'
1260'
1264'
1260'
H31: Purcell Park
Retrofit IDs
Drainage Areas
Parcels
Existing BMPs
Contours
Streams
N
Feet
0
75
150
Center for Watershed Protection
Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

H31: Purcell Park

Score: 41

Rank: 13

Investigators: Wes Runion, Jeremy Harold, Lisa Fraley-McNeal

Figure 1: *Convert this area to bioretention*

Figure 2: *Drainage through conservation easement*

Description: Approximately 2 acres of parking lot, building, and adjacent grass area drain across the parking lot to an entrance of Purcell Park. Runoff ponds at the park entrance (Figure 1) and then drains through a conservation easement and into the nearby stream. Some erosion is occurring through the conservation easement, as shown in Figure 2.

Proposed Retrofit: A bioretention practice is proposed for the area where runoff currently ponds at the park entrance. There is adequate space to build a 25' x 50' bioretention. The practice would overflow to the existing drainage pathway through the easement. A step-pool system is also proposed along the drainage pathway to prevent erosion. Alternatively, a level spreader could be installed at the overflow to disperse water through the conservation easement and prevent further degradation of the existing drainage pathway. Tree impacts and a light pole will need to be avoided and picnic tables may need to be relocated. The location at the park entrance would make this bioretention a good demonstration project.

RRI

WATERSHED:	SUBWATERSHED:	UNIQUE SITE ID: H31
DATE: 3-20-13	ASSESSED BY: Wes Jeremy	CAMERA ID:
PICTURES: 53-59		
GPS ID:	LMK ID:	LAT:
LONG:		

SITE DESCRIPTION

Name: Purcell Park
Address:

Ownership: ☒ Public ☐ Private ☐ Unknown
If Public, Government Jurisdiction: ☒ Local ☐ State ☐ DOT ☐ Other:

Corresponding USSR/USA Field Sheet? ☐ Yes ☐ No If yes, Unique Site ID:

Proposed Retrofit Location:

Storage
- ☐ Existing Pond
- ☐ Below Outfall
- ☐ In Road ROW
- ☐ Other:
- ☐ Above Roadway Culvert
- ☐ In Conveyance System
- ☐ Near Large Parking Lot

On-Site
- ☐ Hotspot Operation
- ☒ Small Parking Lot
- ☐ Individual Street
- ☐ Underground
- ☒ Individual Rooftop
- ☐ Small Impervious Area
- ☐ Landscape / Hardscape
- ☐ Other:

DRAINAGE AREA TO PROPOSED RETROFIT

Drainage Area ≈ 1.94 ac
Imperviousness ≈ 69.6 %
Impervious Area ≈ 1.35 ac

Notes:

Drainage Area Land Use:
- ☐ Residential
  - ☐ SFH (< 1 ac lots)
  - ☐ SFH (> 1 ac lots)
  - ☐ Townhouses
  - ☐ Multi-Family
- ☒ Commercial
- ☐ Institutional
- ☐ Industrial
- ☐ Transport-Related
- ☒ Park
- ☐ Undeveloped
- ☐ Other:

EXISTING STORMWATER MANAGEMENT

Existing Stormwater Practice: ☐ Yes ☒ No ☐ Possible
If Yes, Describe:

Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:
Existing Street Width (if applicable):

Parking lot drainage causing erosion at bottom through conservation easement into stream.

Existing Head Available:	Note where points are measured from: (i.e. street elevation to catch basin invert, manhole rim to catch basin invert, other)

PROPOSED RETROFIT

Purpose of Retrofit:
☒ Water Quality ☐ Recharge ☒ Channel Protection ☐ Flood Control
☒ Demonstration / Education ☐ Repair ☐ Other: _____

Retrofit Volume Computations - Target Storage:
5127 ft³

Retrofit Volume Computations - Available Storage:
1,307 ft³

Proposed Retrofit Practice: (Runoff Reduction)
☐ Disconnection ☒ Bioretention ☐ Bio Swale
☐ Expanded Tree Pit ☐ Infiltration ☐ Green Roof
☐ Permeable Pavement ☐ Rainwater Harvesting

Proposed Retrofit Practice: (Stormwater Treatment)
☐ Constructed Wetland ☐ Wet Swale ☐ Wet Pond
☐ Filtering Practice ☐ Proprietary: _____
☐ Other: _____

Retrofit Category (as defined by Chesapeake Bay Program):
☒ New BMP ☐ BMP Enhancement ☐ BMP Restoration ☐ BMP Conversion ☐ Not CBP-approved

Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance:
Create Bioretention site below parking lot to capture run off from building & Parking lot. Will overflow to existing Drainage Path, but will stabilize w/ step pool system.

Available Width:	25'
Available Length:	50'
Available Area:	~~1250 ft²~~ Need to determine available head - for preliminary calculation purposes, 4' head was assumed.
Ponding Depth:	6"
Soil Depth:	18"

SITE CONSTRAINTS

Adjacent Land Use:
☐ Residential ☐ Commercial ☐ Institutional
☐ Industrial ☐ Transport-Related ☒ Park
☐ Undeveloped ☐ Other: _____
Possible Conflicts Due to Adjacent Land Use? ☐ Yes ☒ No
If Yes, Describe:

Access:
☐ No Constraints
Constrained due to
☐ Slope ☐ Space
☒ Utilities ☒ Tree Impacts
☐ Structures ☐ Property
Ownership
☐ Other: _____

Conflicts with Existing Utilities:

	Yes	Possible/ Modifiable	No	Unknown
Sewer:	☐	☐	☒	☐
Water:	☐	☐	☒	☐
Gas:	☐	☐	☒	☐
Electric to Streetlights:	☐	☒	☐	☐
Other:	☐	☐	☐	☐

Potential Permitting Factors:

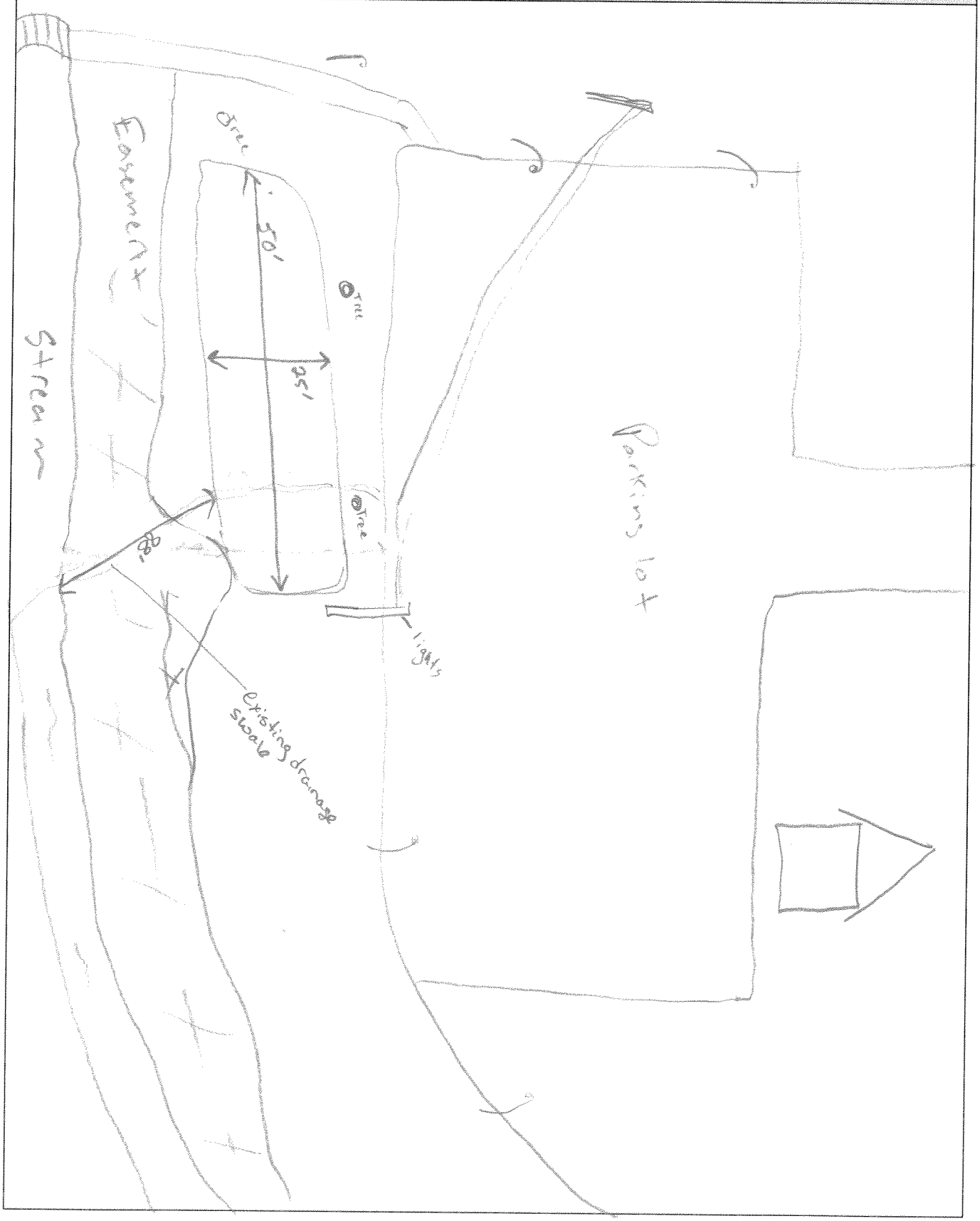
Dam Safety Permits Necessary	☐ Probable	☐ Not Probable
Impacts to Wetlands	☐ Probable	☐ Not Probable
Impacts to a Stream	☐ Probable	☐ Not Probable
Floodplain Fill	☐ Probable	☐ Not Probable
Impacts to Forests	☐ Probable	☐ Not Probable
Impacts to Specimen Trees	☒ Probable	☐ Not Probable

How many? 3
Approx. DBH 15"

Other factors: _____

Soils:
Soil auger test holes: ☐ Yes ☒ No
Evidence of poor infiltration (clays, fines): ☐ Yes ☒ No
Evidence of shallow bedrock: ☐ Yes ☒ No
Evidence of high water table (gleying, saturation): ☐ Yes ☒ No

SKETCH


Easement
Stream
Tree
Tree
Tree
20'
25'
20'
Parking lot
lights
existing drainage
swale

DESIGN OR DELIVERY NOTES

Will need to avoid tree impacts if possible.

FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT

- ☐ Confirm property ownership
- ☐ Confirm drainage area
- ☐ Confirm drainage area impervious cover
- ☐ Confirm volume computations
- ☐ Complete concept sketch
- ☐ Obtain existing stormwater practice as-builts
- ☐ Obtain site as-builts
- ☐ Obtain detailed topography
- ☐ Obtain utility mapping
- ☐ Confirm storm drain invert elevations
- ☐ Confirm soil types
- ☐ Other:_____

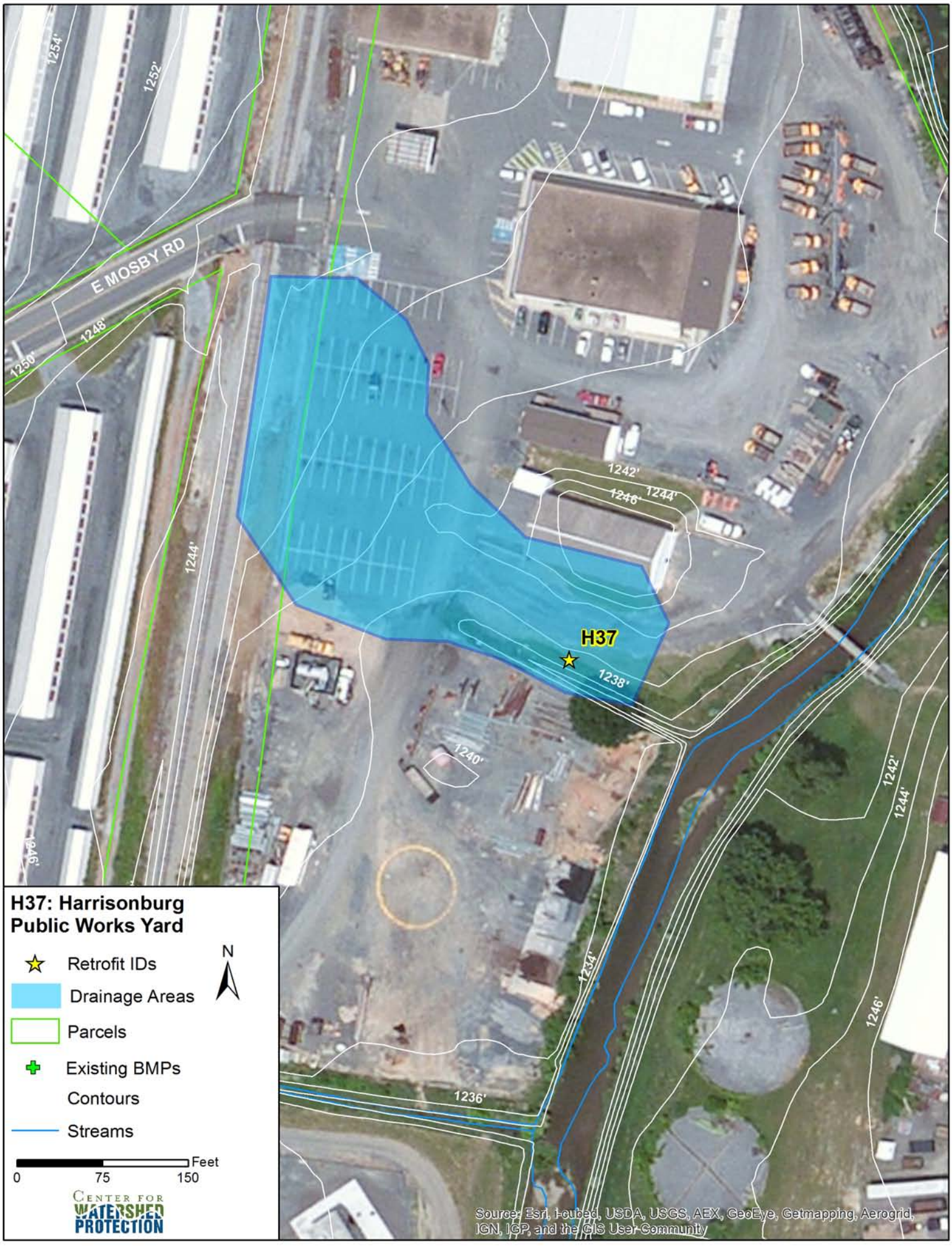
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS

Good demonstration project due to location.

SITE CANDIDATE FOR FURTHER INVESTIGATION:	☐ YES	☐ NO	☐ MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	☐ YES	☐ NO	☐ MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	☐ YES	☐ NO	☐ MAYBE

IF YES, TYPE(S):_____

H37: Harrisonburg Public Works Yard


H37
E MOSBY RD
1254'
1252'
1250'
1248'
1246'
1244'
1242'
1240'
1238'
1236'
1234'
H37: Harrisonburg Public Works Yard
Retrofit IDs
Drainage Areas
Parcels
Existing BMPs
Contours
Streams
N
Feet
0
75
150
Center for Watershed Protection
Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

H37: Harrisonburg Public Works Yard

Score: 42

Rank: 11

Investigators: Rick Altizer, Chris Swann

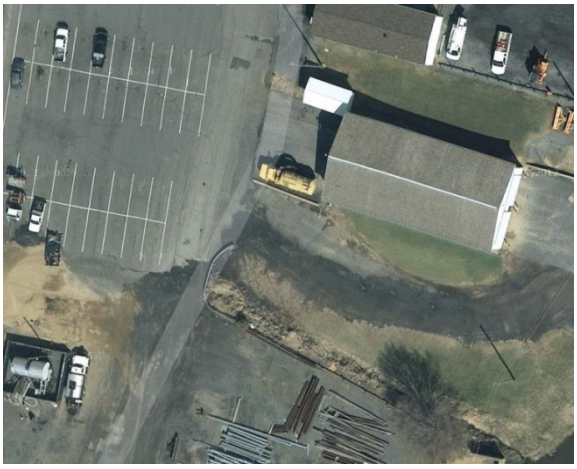


Figure 2: *Aerial view (Source: Google Maps)*

Figure 1: *Wet swale location*

Description: The site drains approximately one acre and is near a salt storage shed for the Harrisonburg Public Works department (Figure 1). It consists of buildings, asphalt parking lots, and gravel parking. A drainage channel carries runoff directly into Blacks Run and contains some cattails and other wetland plant indicators. A portion of the channel appears to remain filled with water for extended periods of time.

Proposed Retrofit: The concept is to treat the runoff from the impervious areas through conversion of the current channel to a 25' x 100'wet swale, which would provide water quality treatment in addition to conveyance (Figure 2). Due to proximity to the salt storage area, the plants used in the swale should be salt tolerant. A constructed wetland could be an alternate choice for the location, although the small drainage area to the site may make this choice less feasible. There is a sanitary sewer line near the stream that will need to be avoided.

There is also opportunity to replant floodplain areas on the site with trees, assuming that this area will not be used in future expansion. Tree planting would help enhance the stream buffer and provide filtering for the runoff.

H37-PP1: Harrisonburg Public Works Yard

Score: N/A
Rank: N/A
Investigators: Rick Altizer, Chris Swann

Figure 1: *Leaking sanitary sewer line*

Description: The investigators came across a sanitary sewer line with obvious signs of overflow (Figure 1). The sewer line is located on the banks of a channel that lead directly to Blacks Run. The overflow was reported directly to the Harrisonburg Water & Sewer Department in-person.

Proposed Retrofit: The concept is to repair the sewer stack and examine the line to ensure that there is not a blockage.

RRI

WATERSHED: HARRISONBURG P.W. FAC.	SUBWATERSHED:	UNIQUE SITE ID: H37	
DATE: 3-20-13	ASSESSED BY: CPS/JPH	CAMERA ID: OLYMPUS BLUE DOT	PICTURES: 55-62
GPS ID:	LMK ID:	LAT:	LONG:

SITE DESCRIPTION

Name: CITY OF HARRISONBURG PUBLIC WORKS
Address: 320 EAST MOSBY ROAD

Ownership: ☑ Public ☐ Private ☐ Unknown
If Public, Government Jurisdiction: ☑ Local ☐ State ☐ DOT ☐ Other:_____

Corresponding USSR/USA Field Sheet? ☐ Yes ☐ No If yes, Unique Site ID:_____

Proposed Retrofit Location:

Storage
- ☐ Existing Pond
- ☐ Below Outfall
- ☐ In Road ROW
- ☐ Other:_____
- ☐ Above Roadway Culvert
- ☐ In Conveyance System
- ☐ Near Large Parking Lot

On-Site
- ☐ Hotspot Operation
- ☑ Small Parking Lot
- ☐ Individual Street
- ☐ Underground
- ☐ Individual Rooftop
- ☐ Small Impervious Area
- ☐ Landscape / Hardscape
- ☐ Other:_____

DRAINAGE AREA TO PROPOSED RETROFIT

Drainage Area ≈ 1 ACRE
Imperviousness ≈ 90% %
Impervious Area ≈ .88

Notes:

Drainage Area Land Use:
- ☐ Residential
  - ☐ SFH (< 1 ac lots)
  - ☐ SFH (> 1 ac lots)
  - ☐ Townhouses
  - ☐ Multi-Family
- ☐ Commercial
- ☐ Institutional
- ☐ Industrial
- ☐ Transport-Related
- ☐ Park
- ☐ Undeveloped
- ☑ Other: DPW

EXISTING STORMWATER MANAGEMENT

Existing Stormwater Practice: ☐ Yes ☑ No ☐ Possible
If Yes, Describe:

Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:
Existing Street Width (if applicable):_____

DPW PARKING LOT, SALT & GRIT STORAGE BUILDING, GRAVEL STORAGE LOT OUTFALLING INTO BLACKS RUN

Existing Head Available:	Note where points are measured from: (i.e. street elevation to catch basin invert, manhole rim to catch basin invert, other)

PROPOSED RETROFIT

Purpose of Retrofit:
☒ Water Quality ☐ Recharge ☐ Channel Protection ☐ Flood Control
☐ Demonstration / Education ☐ Repair ☐ Other:_____

Retrofit Volume Computations - Target Storage:

Retrofit Volume Computations - Available Storage:

Proposed Retrofit Practice: (Runoff Reduction)
☐ Disconnection ☐ Bioretention ☒ Bio Swale
☐ Expanded Tree Pit ☐ Infiltration ☐ Green Roof
☐ Permeable Pavement ☐ Rainwater Harvesting

Proposed Retrofit Practice: (Stormwater Treatment)
☒ Constructed Wetland ☐ Wet Swale ☐ Wet Pond
☐ Filtering Practice ☐ Proprietary:_____
☐ Other: _____

Retrofit Category (as defined by Chesapeake Bay Program):
☒ New BMP ☐ BMP Enhancement ☐ BMP Restoration ☐ BMP Conversion ☐ Not CBP-approved

Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance:

PROPOSED CONSTRUCTED WETLAND ON DPW PROPERTY ADJACENT TO SALT STORAGE BUILDING.
IF NOT WETLAND
BIOSWALES

Available Width:	26'
Available Length:	130'
Available Area:	
Ponding Depth:	12"
Soil Depth:	

SITE CONSTRAINTS

Adjacent Land Use:
☐ Residential ☐ Commercial ☒ Institutional
☐ Industrial ☐ Transport-Related ☐ Park
☐ Undeveloped ☐ Other:_____
Possible Conflicts Due to Adjacent Land Use? ☐ Yes ☐ No
If Yes, Describe:

Access:
☒ No Constraints
Constrained due to
☐ Slope ☐ Space
☐ Utilities ☐ Tree Impacts
☐ Structures ☐ Property
Ownership
☐ Other:_____

Conflicts with Existing Utilities:

	Yes	Possible/ Modifiable	No	Unknown
Sewer:	☐	☒	☐	☐
Water:	☐	☐	☒	☐
Gas:	☐	☐	☒	☐
Electric to Streetlights:	☐	☐	☒	☐
Other:	☐	☐	☒	☐

_____

Potential Permitting Factors:

Dam Safety Permits Necessary	☐ Probable	☒ Not Probable
Impacts to Wetlands	☐ Probable	☒ Not Probable
Impacts to a Stream	☐ Probable	☒ Not Probable
Floodplain Fill	☐ Probable	☒ Not Probable
Impacts to Forests	☐ Probable	☒ Not Probable
Impacts to Specimen Trees	☐ Probable	☒ Not Probable

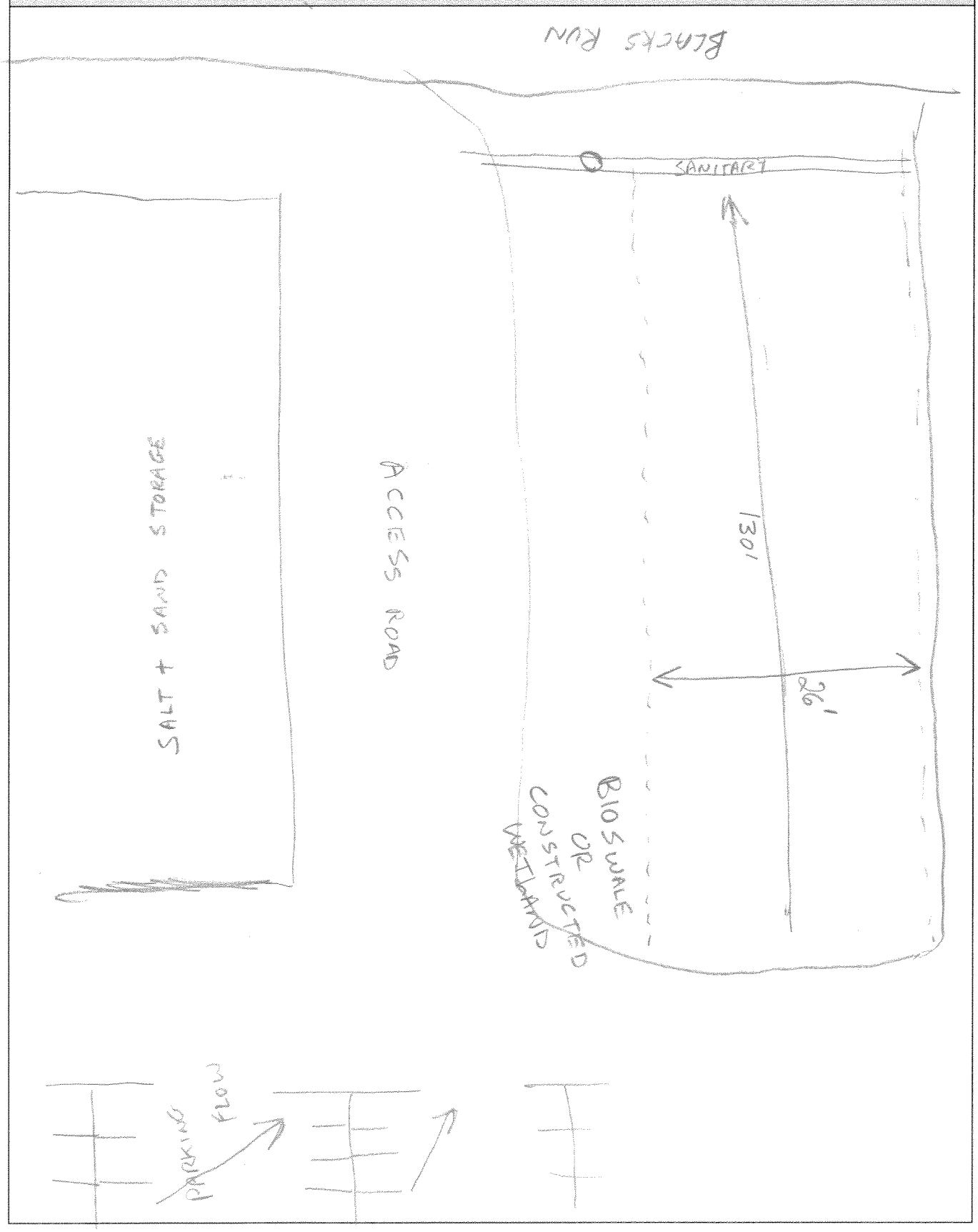
How many?_____
Approx. DBH_____

Other factors:_____
_____

Soils:

Soil auger test holes:	☐ Yes	☒ No
Evidence of poor infiltration (clays, fines):	☐ Yes	☒ No
Evidence of shallow bedrock:	☐ Yes	☒ No
Evidence of high water table (gleying, saturation):	☐ Yes	☒ No

SKETCH


Blacks Run
SANITARY
SALT + SAND STORAGE
ACCESS ROAD
130'
26'
BIOSWALE OR CONSTRUCTED WETLAND
FLOW
DRIVING

DESIGN OR DELIVERY NOTES

FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT

- ☐ Confirm property ownership
- ☒ Confirm drainage area
- ☐ Confirm drainage area impervious cover
- ☐ Confirm volume computations
- ☒ Complete concept sketch
- ☐ Obtain existing stormwater practice as-builts
- ☐ Obtain site as-builts
- ☐ Obtain detailed topography
- ☐ Obtain utility mapping
- ☐ Confirm storm drain invert elevations
- ☒ Confirm soil types
- ☐ Other: _____

INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS

SITE CANDIDATE FOR FURTHER INVESTIGATION:	☒ YES	☐ NO	☐ MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	☐ YES	☒ NO	☐ MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	☒ YES	☐ NO	☐ MAYBE

IF YES, TYPE(S): RIPARIAN REFORESTATION

Utility Impacts **UT**

WATERSHED/SUBSHED: HARRIS SCRUBS	**DATE:** 3/20/13	**ASSESSED BY:** RA, CPS
SURVEY REACH ID: H37-PP1	**TIME:** ___:___ AM/PM	**PHOTO ID:** (*Camera-Pic #*) OLYMPUS /#
SITE ID: (*Condition-#*) **UT-** H37	**LAT** ___° ___' ___" **LONG** ___° ___' ___" **LMK:** ___	**GPS:** (*Unit ID*)

TYPE:
- [x] Leaking sewer
- [ ] Exposed pipe
- [ ] Exposed manhole
- [ ] Other:

MATERIAL:
- [x] Concrete
- [ ] Corrugated metal
- [ ] Smooth metal
- [ ] PVC
- [ ] Other:

LOCATION:
- [ ] Floodplain
- [x] Stream bank
- [ ] Above stream
- [ ] Stream bottom
- [ ] Other:

POTENTIAL FISH BARRIER:
- [ ] Yes
- [x] No

PIPE DIMENSIONS:
Diameter: ___ in
Length exposed: ___ ft

CONDITION:
- [ ] Joint failure
- [ ] Pipe corrosion/cracking
- [ ] Protective covering broken
- [ ] Manhole cover absent
- [x] Other: STACK COLLAPSE

EVIDENCE OF DISCHARGE:

COLOR	[ ] None [ ] Clear [ ] Dark Brown [ ] Lt Brown [ ] Yellowish [ ] Greenish [ ] Other:
ODOR	[ ] None [x] Sewage [ ] Oily [ ] Sulfide [ ] Chlorine [ ] Other:
DEPOSITS	[ ] None [x] Tampons/Toilet Paper [ ] Lime [ ] Surface oils [ ] Stains [ ] Other:

POTENTIAL RESTORATION CANDIDATE [x] Structural repairs [ ] Pipe testing [ ] Citizen hotlines [ ] Dry weather sampling
[ ] no [ ] Fish barrier removal [ ] Other:

If yes to fish barrier, Water Drop: _____ (in)

UTILITY IMPACT SEVERITY: (*Circle #*)

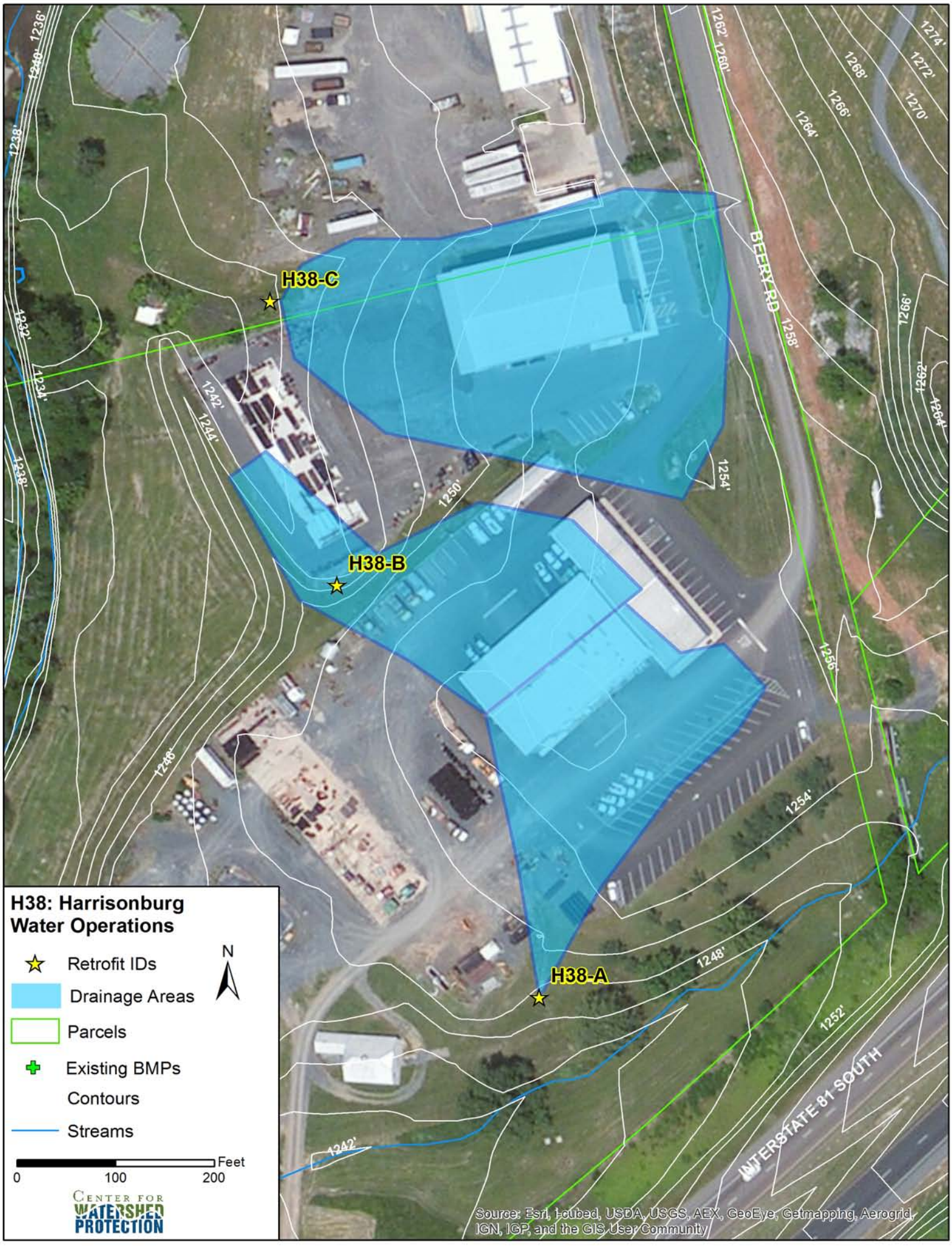
Leaking= [ ] 5

5	4	3	2	1
Section of pipe undermined by erosion and could collapse in the near future; a pipe running across the bed or suspended above the stream; a long section along the edge of the stream where nearly the entire side of the pipe is exposed; or a manhole stack that is located in the center of the stream channel and there is evidence of stack failure.	A moderately long section of pipe is partially exposed but there is no immediate threat that the pipe will be undermined and break in the immediate future. The primary concern is that the pipe may be punctured by large debris during a large storm event.			Small section of exposed pipe, stream bank near the pipe is stable; the pipe is across the bottom of the stream but only a small portion of the top of the pipe exposed; the pipe is exposed but is reinforced with concrete and it is not causing a blockage to upstream fish movement; a manhole stack that is at the edge of the stream and does not extend very far out into the active stream channel.

NOTES:
EVIDENCE OF SEWER OVERFLOW
SEWER STACK APPEARS DAMAGED

REPORTED TO LOCAL AUTHORITIES [ ] Yes [ ] No

H38: Harrisonburg Water Operations


H38-C
H38-B
H38-A
BEERY RD
INTERSTATE 81 SOUTH
1236'
1240'
1238'
1232'
1234'
1242'
1244'
1246'
1250'
1254'
1256'
1258'
1260'
1262'
1264'
1266'
1268'
1270'
1272'
1274'
1248'
1252'
H38: Harrisonburg Water Operations
Retrofit IDs
Drainage Areas
Parcels
Existing BMPs
Contours
Streams
N
Feet
0
100
200
CENTER FOR WATERSHED PROTECTION
Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

H38-A: Harrisonburg Water and Sewer Department

Score: 40

Rank: 16

Investigators: Rick Altizer, Chris Swann

Figure 2: *Aerial view (Source: Google Maps)*

Figure 1: *Bioretention location*

Description: This site consists of the Harrisonburg Water & Sewer offices and service building, an asphalt parking lot, and a gravel storage area (Figure 1). The 0.75 acre drainage area currently goes to a large grassy area and then eventually to a channel located near the tree in Figure 2. Conveyance from the parking lot is through sheet flow. Rooftop runoff is collected in a trench drain outside the building forebays and then carried to an outfall (indicated by the rocks in Figure 2) near the proposed retrofit site.

Proposed Retrofit: The concept is to treat the runoff from the rooftop and parking lot with a 30’ x 30’ bioretention system. The site has room for expansion if necessary and is located away from the storage areas so it will not interfere with daily operations.

H38-B: Harrisonburg Public Works Storage Yard

Score: 36

Rank: 26

Investigators: Rick Altizer, Chris Swann

Figure 1: *Aerial view (Source: Google Maps)*

Figure 2: *Bioretention location*

Description: This site consists of a Harrisonburg Public Works storage building, an asphalt parking lot, and a gravel storage area (Figure 1). The 0.70 drainage area currently goes to a grassy area (Figure 2) at the edge of the paved storage surface and follows the edge of the lot until it spills onto a large grassy area. Conveyance from the parking lot is through sheet flow. Rooftop runoff from the Water and Sewer Building is also conveyed to this location as indicated by the green pipe on the left side of Figure 2.

Proposed Retrofit: The concept is to treat the runoff from the rooftop and parking lot with a 15’ x 100’ linear bioretention system that can be sized longer if necessary. The width of the bioretention system is based on the location of a berm at the edge of the parking lot that helps direct the flow. It could not be determined if the berm was a natural feature or was created during site development.

H38-C: Harrisonburg Recycling Center

Score: 40

Rank: 15

Investigators: Rick Altizer, Chris Swann

Figure 1: *Aerial view (Source: Google Maps)*

Figure 2: *Bioretention location (Source: Google Maps)*

Description: This site consists of the Harrisonburg Recycling Center operations and a gravel storage area (Figure 1). The 1.6 acre drainage area currently goes to an outfall (Figure 2) located between the Recycling Center and the edge of the paved storage surface for the Public Works storage facility from site H38-B. Conveyance is through sheet flow for some of the site and through pipes for a portion of H38-A (the grassed area in front of the Water and Sewer Building) and H38-B (the inlet in front the building). The outfall contained a large amount of vegetation, including some cattails and small trees growing in the project location at the time of the site visit.

Proposed Retrofit: The concept is to treat the runoff with a bioretention system. The practice would be teardrop-shaped with a maximum width of 40', a minimum width near the outfall of 20', and an overall length of 70'. The practice will drain into a large grassy area downslope. One site constraint is a brick storage building located at the edge of the property that limits expansion lengthwise. There is also fencing between the parcels for the Recycling Center and the Public Words storage building that will need to be removed.

RRI

WATERSHED: Water & Sewer Dept	SUBWATERSHED:	UNIQUE SITE ID: H38-A

DATE: 3/20/13	ASSESSED BY:	CAMERA ID:	PICTURES: 63-64
GPS ID:	LMK ID:	LAT:	LONG:

SITE DESCRIPTION

Name: HARRISONBURG WATER & SEWER DEPT
Address: 2155 BERRY RD

Ownership: ☒ Public ☐ Private ☐ Unknown
If Public, Government Jurisdiction: ☒ Local ☐ State ☐ DOT ☐ Other:_____

Corresponding USSR/USA Field Sheet? ☐ Yes ☒ No If yes, Unique Site ID:_____

Proposed Retrofit Location:

Storage
- ☐ Existing Pond
- ☐ Below Outfall
- ☐ In Road ROW
- ☐ Above Roadway Culvert
- ☐ In Conveyance System
- ☐ Near Large Parking Lot
- ☐ Other:_____

On-Site
- ☐ Hotspot Operation
- ☒ Small Parking Lot
- ☐ Individual Street
- ☐ Underground
- ☒ Individual Rooftop
- ☐ Small Impervious Area
- ☐ Landscape / Hardscape
- ☐ Other:_____

DRAINAGE AREA TO PROPOSED RETROFIT

Drainage Area ≈ .75
Imperviousness ≈ 80 %
Impervious Area ≈ .60

Notes:

Drainage Area Land Use:
- ☐ Residential
  - ☐ SFH (< 1 ac lots)
  - ☐ SFH (> 1 ac lots)
  - ☐ Townhouses
  - ☐ Multi-Family
- ☐ Commercial
- ☒ Institutional
- ☐ Industrial
- ☐ Transport-Related
- ☐ Park
- ☐ Undeveloped
- ☐ Other:_____

EXISTING STORMWATER MANAGEMENT

Existing Stormwater Practice: ☐ Yes ☒ No ☐ Possible
If Yes, Describe:

Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:
Existing Street Width (if applicable):_____

TRENCH DRAIN FOR 1/2 OF BLDG ROOF - DISCHARGES TO GRASSY AREA
PARKING LOT ALSO DRAINS TO SAME AREA
CONVEYANCE BY SHEET FLOW TO SMALL INTERMITTENT STREAM

Existing Head Available:	Note where points are measured from: (i.e. street elevation to catch basin invert, manhole rim to catch basin invert, other)

PROPOSED RETROFIT

Purpose of Retrofit:
☒ Water Quality ☐ Recharge ☐ Channel Protection ☐ Flood Control
☐ Demonstration / Education ☐ Repair ☐ Other:_____

Retrofit Volume Computations - Target Storage:

Retrofit Volume Computations - Available Storage:

Proposed Retrofit Practice: (Runoff Reduction)
☐ Disconnection ☒ Bioretention ☐ Bio Swale
☐ Expanded Tree Pit ☐ Infiltration ☐ Green Roof
☐ Permeable Pavement ☐ Rainwater Harvesting

Proposed Retrofit Practice: (Stormwater Treatment)
☐ Constructed Wetland ☐ Wet Swale ☐ Wet Pond
☐ Filtering Practice ☐ Proprietary:_____
☐ Other: _____

Retrofit Category (as defined by Chesapeake Bay Program):
☒ New BMP ☐ BMP Enhancement ☐ BMP Restoration ☐ BMP Conversion ☐ Not CBP-approved

Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance:

BIORETENTION AREA
OR BIO SWALE

Available Width:	38'
Available Length:	38'
Available Area:	
Ponding Depth:	
Soil Depth:	

SITE CONSTRAINTS

Adjacent Land Use:
☐ Residential ☐ Commercial ☒ Institutional
☐ Industrial ☐ Transport-Related ☐ Park
☐ Undeveloped ☐ Other:_____
Possible Conflicts Due to Adjacent Land Use? ☐ Yes ☐ No
If Yes, Describe:

Access:
☒ No Constraints
Constrained due to
☐ Slope ☐ Space
☐ Utilities ☐ Tree Impacts
☐ Structures ☐ Property
Ownership
☐ Other:_____

Conflicts with Existing Utilities:

	Yes	Possible/ Modifiable	No	Unknown
Sewer:	☐	☐	☒	☐
Water:	☐	☐	☒	☐
Gas:	☐	☐	☒	☐
Electric to Streetlights:	☐	☐	☒	☐
Other:	☐	☐	☒	☐

_____

Potential Permitting Factors:

Dam Safety Permits Necessary	☐ Probable	☒ Not Probable
Impacts to Wetlands	☐ Probable	☒ Not Probable
Impacts to a Stream	☐ Probable	☒ Not Probable
Floodplain Fill	☐ Probable	☒ Not Probable
Impacts to Forests	☐ Probable	☒ Not Probable
Impacts to Specimen Trees	☐ Probable	☐ Not Probable

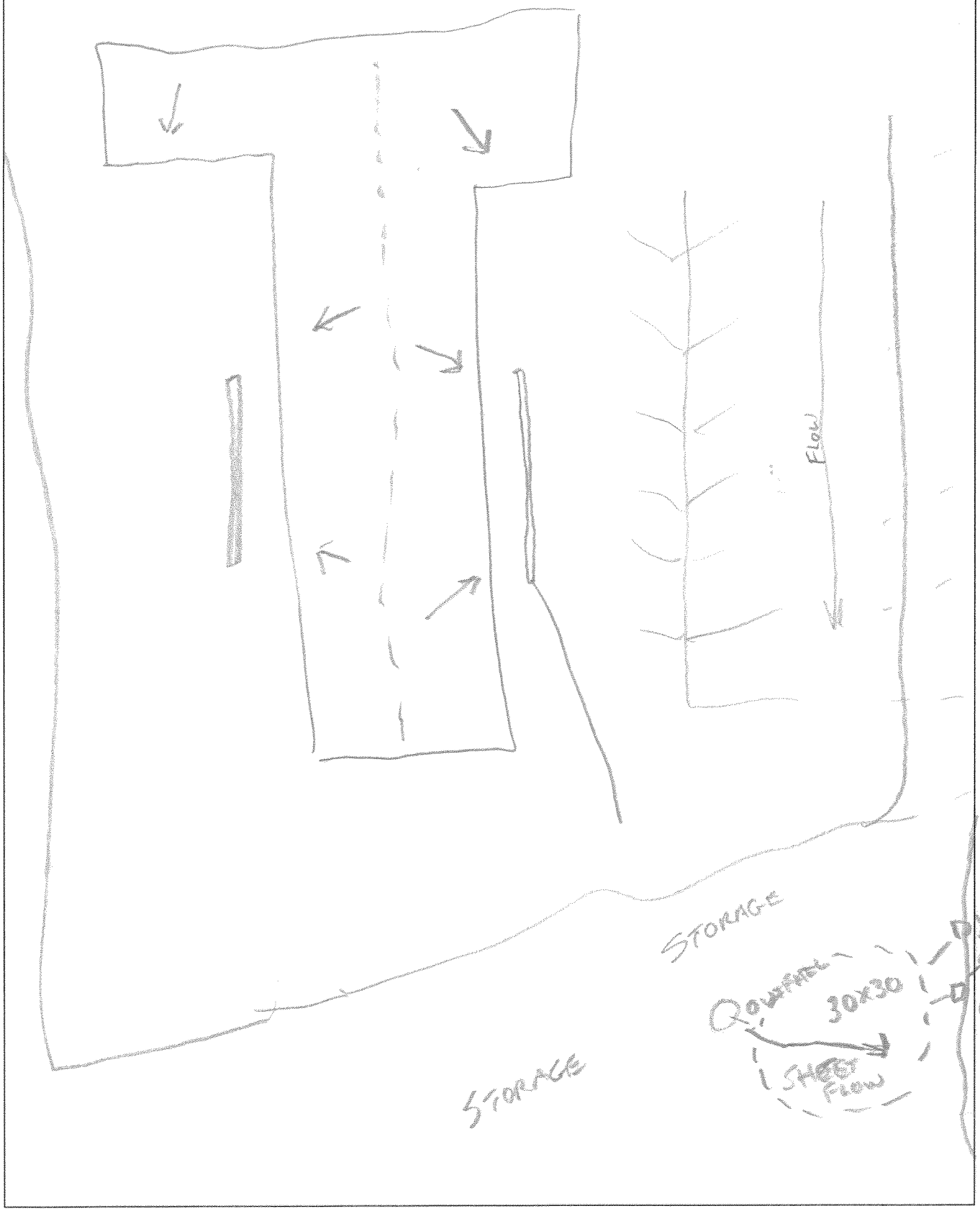
How many?_____
Approx. DBH_____

Other factors:_____
_____

Soils:

Soil auger test holes:	☐ Yes	☒ No
Evidence of poor infiltration (clays, fines):	☐ Yes	☒ No
Evidence of shallow bedrock:	☐ Yes	☒ No
Evidence of high water table (gleying, saturation):	☐ Yes	☒ No

SKETCH



DESIGN OR DELIVERY NOTES

FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT

- ☐ Confirm property ownership
- ☐ Confirm drainage area
- ☐ Confirm drainage area impervious cover
- ☐ Confirm volume computations
- ☐ Complete concept sketch
- ☐ Obtain existing stormwater practice as-builts
- ☐ Obtain site as-builts
- ☐ Obtain detailed topography
- ☐ Obtain utility mapping
- ☐ Confirm storm drain invert elevations
- ☐ Confirm soil types
- ☐ Other:_____

INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS

SITE CANDIDATE FOR FURTHER INVESTIGATION:	☐ YES	☐ NO	☐ MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	☐ YES	☐ NO	☐ MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	☐ YES	☐ NO	☐ MAYBE

IF YES, TYPE(S):_____

RRI

WATERSHED: HARRISONBURG	SUBWATERSHED: HARRISONBURG	UNIQUE SITE ID: H38-B	
DATE:	ASSESSED BY:	CAMERA ID:	PICTURES:
GPS ID:	LMK ID:	LAT:	LONG:

SITE DESCRIPTION

Name: HPW STORAGE FACILITY
Address: BERRY ROAD

Ownership: ☐ Public ☐ Private ☐ Unknown
If Public, Government Jurisdiction: ☐ Local ☐ State ☐ DOT ☐ Other:

Corresponding USSR/USA Field Sheet? ☐ Yes ☐ No If yes, Unique Site ID:

Proposed Retrofit Location:

Storage
- ☐ Existing Pond
- ☐ Below Outfall
- ☐ In Road ROW
- ☐ Other:
- ☐ Above Roadway Culvert
- ☐ In Conveyance System
- ☐ Near Large Parking Lot

On-Site
- ☐ Hotspot Operation
- ☑ Small Parking Lot
- ☐ Individual Street
- ☐ Underground
- ☑ Individual Rooftop
- ☐ Small Impervious Area
- ☐ Landscape / Hardscape
- ☐ Other:

DRAINAGE AREA TO PROPOSED RETROFIT

Drainage Area ≈ .70 acres
Imperviousness ≈ 90 %
Impervious Area ≈ .63

Notes:

Drainage Area Land Use:
- ☐ Residential
  - ☐ SFH (< 1 ac lots)
  - ☐ SFH (> 1 ac lots)
  - ☐ Townhouses
  - ☐ Multi-Family
- ☐ Commercial
- ☐ Institutional
- ☐ Industrial
- ☐ Transport-Related
- ☐ Park
- ☐ Undeveloped
- ☐ Other:

EXISTING STORMWATER MANAGEMENT

Existing Stormwater Practice: ☐ Yes ☑ No ☐ Possible
If Yes, Describe:

Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:
Existing Street Width (if applicable):

TRENCH DRAIN + ROOFTOP DRAIN COVERS ½ BLDG

Existing Head Available:	Note where points are measured from: (i.e. street elevation to catch basin invert, manhole rim to catch basin invert, other)

PROPOSED RETROFIT

Purpose of Retrofit:
☑ Water Quality ☐ Recharge ☐ Channel Protection ☐ Flood Control
☐ Demonstration / Education ☐ Repair ☐ Other:_____

Retrofit Volume Computations - Target Storage:

Retrofit Volume Computations - Available Storage:

Proposed Retrofit Practice: (Runoff Reduction)
☐ Disconnection ☐ Bioretention ☑ Bio Swale
☐ Expanded Tree Pit ☐ Infiltration ☐ Green Roof
☐ Permeable Pavement ☐ Rainwater Harvesting

Proposed Retrofit Practice: (Stormwater Treatment)
☐ Constructed Wetland ☐ Wet Swale ☐ Wet Pond
☐ Filtering Practice ☐ Proprietary:_____
☐ Other: _____

Retrofit Category (as defined by Chesapeake Bay Program):
☑ New BMP ☐ BMP Enhancement ☐ BMP Restoration ☐ BMP Conversion ☐ Not CBP-approved

Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance:

BIO SWALE RUNNING ALONG EDGE OF PARKING LOT DISCHARGE TO GRASSY AREA

Available Width:	15'
Available Length:	256'
Available Area:	
Ponding Depth:	
Soil Depth:	

SITE CONSTRAINTS

Adjacent Land Use:
☐ Residential ☐ Commercial ☐ Institutional
☐ Industrial ☐ Transport-Related ☐ Park
☐ Undeveloped ☑ Other: DPW

Possible Conflicts Due to Adjacent Land Use? ☐ Yes ☑ No
If Yes, Describe:

Access:
☑ No Constraints
Constrained due to
☐ Slope ☐ Space
☐ Utilities ☐ Tree Impacts
☐ Structures ☐ Property
Ownership
☐ Other:_____

Conflicts with Existing Utilities:

	Yes	Possible/ Modifiable	No	Unknown
Sewer:	☐	☐	☑	☐
Water:	☐	☐	☑	☐
Gas:	☐	☐	☑	☐
Electric to Streetlights:	☐	☐	☑	☐
Other:	☐	☐	☑	☐

_____

Potential Permitting Factors:

Dam Safety Permits Necessary	☐ Probable	☑ Not Probable
Impacts to Wetlands	☐ Probable	☑ Not Probable
Impacts to a Stream	☐ Probable	☑ Not Probable
Floodplain Fill	☐ Probable	☑ Not Probable
Impacts to Forests	☐ Probable	☑ Not Probable
Impacts to Specimen Trees	☐ Probable	☑ Not Probable

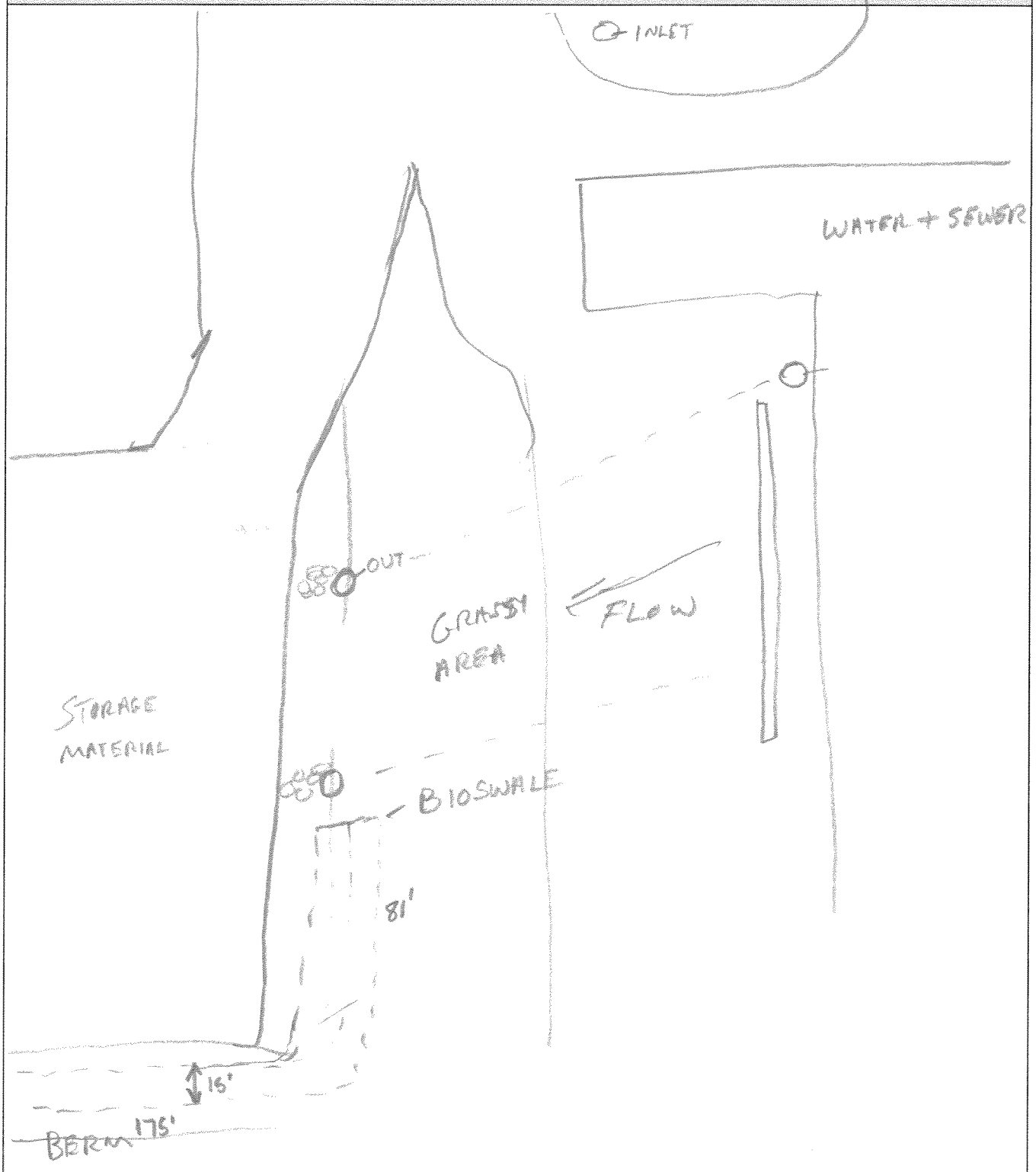
How many?_____
Approx. DBH_____

Other factors:_____
_____

Soils:

Soil auger test holes:	☐ Yes	☑ No
Evidence of poor infiltration (clays, fines):	☐ Yes	☑ No
Evidence of shallow bedrock:	☐ Yes	☑ No
Evidence of high water table (gleying, saturation):	☐ Yes	☑ No

SKETCH


INLET
WATER + SEWER
OUT
GRASSY AREA
FLOW
STORAGE MATERIAL
BIOSWALE
81'
15'
BERM 175'

DESIGN OR DELIVERY NOTES

FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT

- ☐ Confirm property ownership
- ☑ Confirm drainage area
- ☐ Confirm drainage area impervious cover
- ☐ Confirm volume computations
- ☑ Complete concept sketch
- ☐ Obtain existing stormwater practice as-builts
- ☐ Obtain site as-builts
- ☐ Obtain detailed topography
- ☐ Obtain utility mapping
- ☐ Confirm storm drain invert elevations
- ☐ Confirm soil types
- ☐ Other:_____

INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS

SITE CANDIDATE FOR FURTHER INVESTIGATION:	☐ YES	☐ NO	☐ MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	☐ YES	☐ NO	☐ MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	☐ YES	☐ NO	☐ MAYBE

IF YES, TYPE(S):_____

WATERSHED: HPW Recycling	SUBWATERSHED: HARRISONBURG	UNIQUE SITE ID: H38-C	
DATE: 3/20/13	ASSESSED BY: CPB/RA	CAMERA ID: OLYMPUS BLUE	PICTURES: Google
GPS ID:	LMK ID:	LAT:	LONG:

SITE DESCRIPTION

Name: HARRISONBURG RECYCLING CENTER
Address: 2065 BERRY ROAD

Ownership: ☑ Public ☐ Private ☐ Unknown
If Public, Government Jurisdiction: ☑ Local ☐ State ☐ DOT ☐ Other:

Corresponding USSR/USA Field Sheet? ☐ Yes ☐ No If yes, Unique Site ID:

Proposed Retrofit Location:

Storage
- ☐ Existing Pond
- ☐ Below Outfall
- ☐ In Road ROW
- ☐ Other:
- ☐ Above Roadway Culvert
- ☐ In Conveyance System
- ☐ Near Large Parking Lot

On-Site
- ☐ Hotspot Operation
- ☑ Small Parking Lot
- ☐ Individual Street
- ☐ Underground
- ☑ Individual Rooftop
- ☐ Small Impervious Area
- ☐ Landscape / Hardscape
- ☐ Other:

DRAINAGE AREA TO PROPOSED RETROFIT

Drainage Area ≈ 1.6 acres
Imperviousness ≈ 85% %
Impervious Area ≈ 1.36

Notes:

Drainage Area Land Use:
- ☐ Residential
  - ☐ SFH (< 1 ac lots)
  - ☐ SFH (> 1 ac lots)
  - ☐ Townhouses
  - ☐ Multi-Family
- ☐ Commercial
- ☐ Institutional
- ☐ Industrial
- ☐ Transport-Related
- ☐ Park
- ☐ Undeveloped
- ☑ Other: DPW STORAGE RECYCLING

EXISTING STORMWATER MANAGEMENT

Existing Stormwater Practice: ☐ Yes ☑ No ☐ Possible
If Yes, Describe:

Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:
Existing Street Width (if applicable):

OUTFALL LEADING TO DEPRESSIONAL AREA BERMED TO ACT AS TEMPORARY STORAGE AND TO PROTECT BLDG
CONVEYANCE IS BOTH SHEET FLOW AND DRAINAGE PIPE

Existing Head Available:	Note where points are measured from: (i.e. street elevation to catch basin invert, manhole rim to catch basin invert, other)
NONE	

PROPOSED RETROFIT

Purpose of Retrofit:
☑ Water Quality ☐ Recharge ☐ Channel Protection ☐ Flood Control
☐ Demonstration / Education ☐ Repair ☐ Other:_____

Retrofit Volume Computations - Target Storage:

Retrofit Volume Computations - Available Storage:

Proposed Retrofit Practice: (Runoff Reduction)
☐ Disconnection ☑ Bioretention ☐ Bio Swale
☐ Expanded Tree Pit ☐ Infiltration ☐ Green Roof
☐ Permeable Pavement ☐ Rainwater Harvesting

Proposed Retrofit Practice: (Stormwater Treatment)
☐ Constructed Wetland ☐ Wet Swale ☐ Wet Pond
☐ Filtering Practice ☐ Proprietary:_____
☐ Other: _____

Retrofit Category (as defined by Chesapeake Bay Program):
☐ New BMP ☐ BMP Enhancement ☐ BMP Restoration ☐ BMP Conversion ☐ Not CBP-approved

Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance:

TEAR DROP SHAPED BIORETENTION

Available Width:	20' 40'
Available Length:	78
Available Area:	
Ponding Depth:	
Soil Depth:	

SITE CONSTRAINTS

Adjacent Land Use:
☐ Residential ☐ Commercial ☐ Institutional
☐ Industrial ☐ Transport-Related ☐ Park
☐ Undeveloped ☑ Other: DPW RECYCLING & STORAGE
Possible Conflicts Due to Adjacent Land Use? ☐ Yes ☑ No
If Yes, Describe:

Access:
☑ No Constraints
Constrained due to
☐ Slope ☐ Space
☐ Utilities ☐ Tree Impacts
☐ Structures ☐ Property
Ownership
☐ Other:_____

Conflicts with Existing Utilities:

	Yes	Possible/ Modifiable	No	Unknown
Sewer:	☐	☐	☑	☐
Water:	☐	☐	☑	☐
Gas:	☐	☐	☑	☐
Electric to Streetlights:	☐	☐	☑	☐
Other:	☐	☐	☑	☐

_____

Potential Permitting Factors:

Dam Safety Permits Necessary	☐ Probable	☑ Not Probable
Impacts to Wetlands	☐ Probable	☑ Not Probable
Impacts to a Stream	☐ Probable	☑ Not Probable
Floodplain Fill	☐ Probable	☑ Not Probable
Impacts to Forests	☐ Probable	☑ Not Probable
Impacts to Specimen Trees	☐ Probable	☑ Not Probable

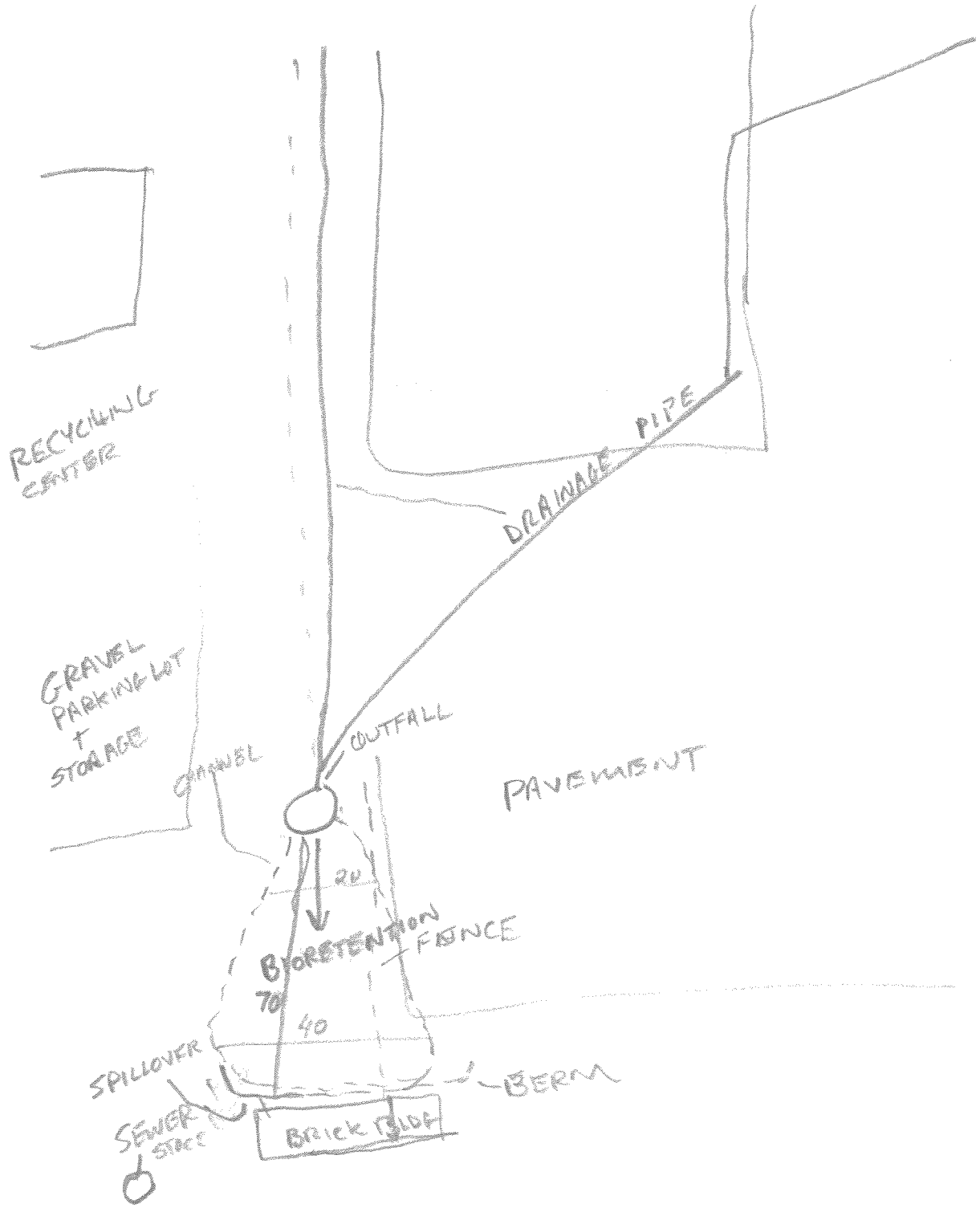
How many?_____
Approx. DBH_____

Other factors:_____
_____

Soils:

Soil auger test holes:	☐ Yes	☑ No
Evidence of poor infiltration (clays, fines):	☐ Yes	☑ No
Evidence of shallow bedrock:	☐ Yes	☑ No
Evidence of high water table (gleying, saturation):	☐ Yes	☑ No

SKETCH


RECYCLING CENTER
DRAINAGE PIPE
GRAVEL PARKING LOT + STORAGE
CHANNEL
OUTFALL
PAVEMENT
20'
BIORETENTION
FENCE
70'
40'
SPILLOVER
BERM
SEWER STUB
BRICK HEADWALL

DESIGN OR DELIVERY NOTES

- ALREADY SOME CATTAILS IN PLACE SO SOME WETLAND PLANTS CAN SURVIVE
- REMOVE FENCE FROM MIDDLE OF PRACTICE
- MORE ROOM (LENGTH) MAY BE AVAILABLE IF NECESSARY

FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT

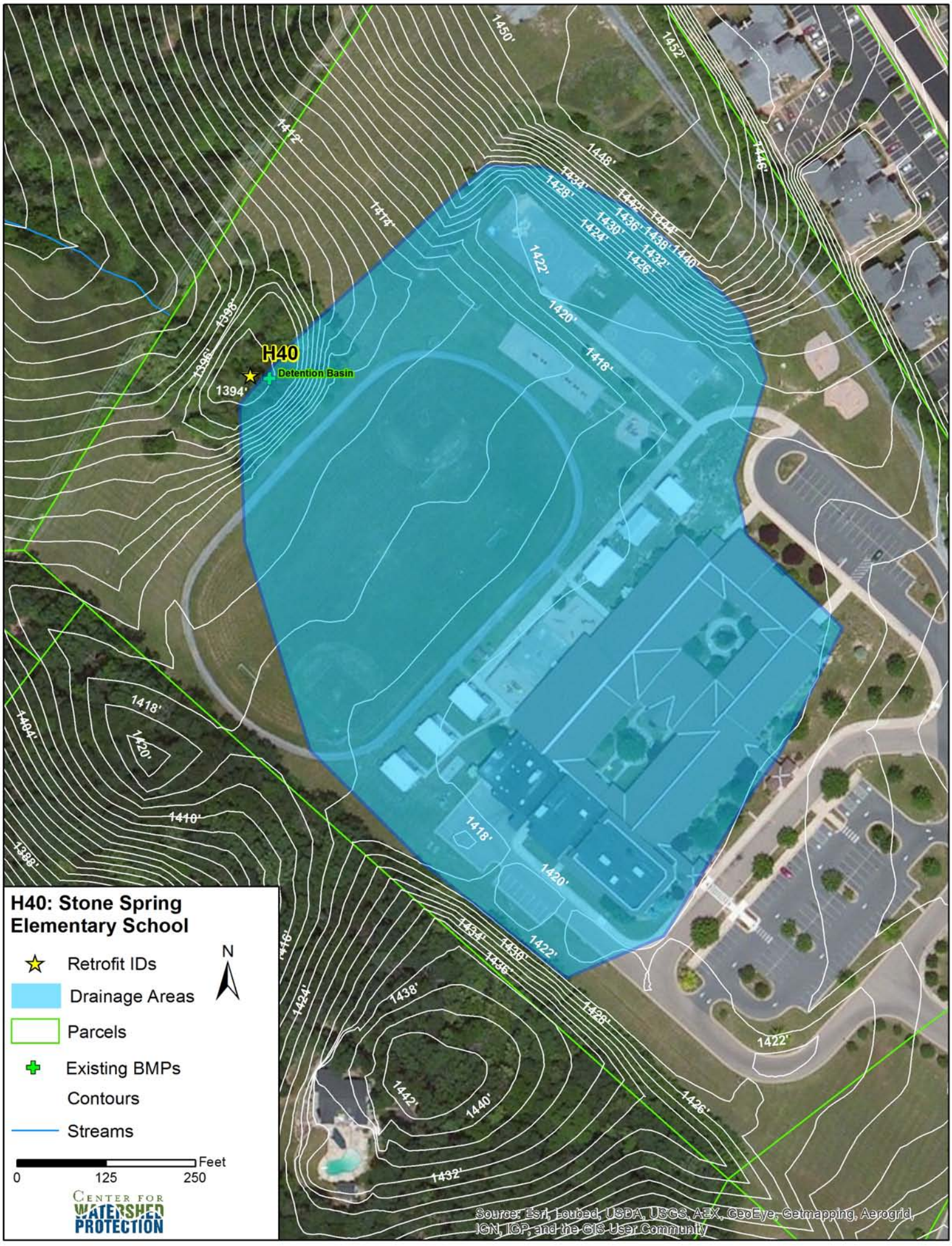
- ☐ Confirm property ownership
- ☒ Confirm drainage area
- ☐ Confirm drainage area impervious cover
- ☐ Confirm volume computations
- ☒ Complete concept sketch
- ☐ Obtain existing stormwater practice as-builts
- ☐ Obtain site as-builts
- ☐ Obtain detailed topography
- ☐ Obtain utility mapping
- ☐ Confirm storm drain invert elevations
- ☐ Confirm soil types
- ☐ Other:_____

INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS

SITE CANDIDATE FOR FURTHER INVESTIGATION:	☒ YES	☐ NO	☐ MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	☐ YES	☒ NO	☐ MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	☐ YES	☒ NO	☐ MAYBE

IF YES, TYPE(S):_____

H40: Stone Spring Elementary School


H40
Detention Basin
1394'
1450'
1452'
1412'
1448'
1446'
1414'
1434'
1428'
1442'
1430'
1436'
1424'
1438'
1432'
1440'
1426'
1422'
1420'
1418'
1396'
1398'
1418'
1420'
1410'
1404'
1388'
1434'
1438'
1436'
1422'
1424'
1438'
1428'
1422'
1442'
1440'
1426'
1432'
H40: Stone Spring Elementary School
Retrofit IDs
Drainage Areas
Parcels
Existing BMPs
Contours
Streams
N
Feet
0
125
250
Center for Watershed Protection
Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

H40: Stone Spring Elementary School

Score: N/A

Rank: N/A

Investigators: Rick Altizer, Chris Swann

Figure 1: *Detention Basin 1*

Figure 2: *Detention Basin 2*

Description: Two detention ponds provide treatment to the school. They each had a large amount of vegetation (Figures 1 and 2) that may be preventing them from treating the full storage volume as originally designed.

Proposed Retrofit: The concept is to perform pond maintenance on the two detention ponds. This would include checking elevations for sediment cleanout and clearing trees as necessary to increase storage volume.

Miscellaneous **MI**

WATERSHED/SUBSHED: HARRISONBURG	**DATE:** 3 / 20 / 13	**ASSESSED BY:** RA, CPS
SURVEY REACH ID: H40	**TIME:**___:___AM/PM	**PHOTO ID:** (*Camera-Pic #*) OLYMPUS#
SITE ID: (*Condition-#*) MI-H40	**LAT**___°___'___" **LONG** ___°___'___" **LMK:** ___	**GPS:** (*Unit ID*)

POTENTIAL RESTORATION CANDIDATE ☐ Storm water retrofit ☐ Stream restoration ☐ Riparian Management
☐ no ☐ Discharge Prevention ☒ Other: LANDSCAPE MAINTENANCE

DESCRIBE:
2 DETENTION PONDS IN NEED OF MAINTENANCE
TREES IN POND AND ON BANKS.

REPORTED TO LOCAL AUTHORITIES ☐ Yes ☐ No

WATERSHED/SUBSHED:	**DATE:** ___/___/___	**ASSESSED BY:**
SURVEY REACH ID:	**TIME:**___:___AM/PM	**PHOTO ID:** (*Camera-Pic #*) /#
SITE ID: (*Condition-#*) **MI-**___	**LAT**___°___'___" **LONG** ___°___'___" **LMK:** ___	**GPS:** (*Unit ID*)

POTENTIAL RESTORATION CANDIDATE ☐ Storm water retrofit ☐ Stream restoration ☐ Riparian Management
☐ no ☐ Discharge Prevention ☐ Other:

DESCRIBE:

REPORTED TO LOCAL AUTHORITIES ☐ Yes ☐ No

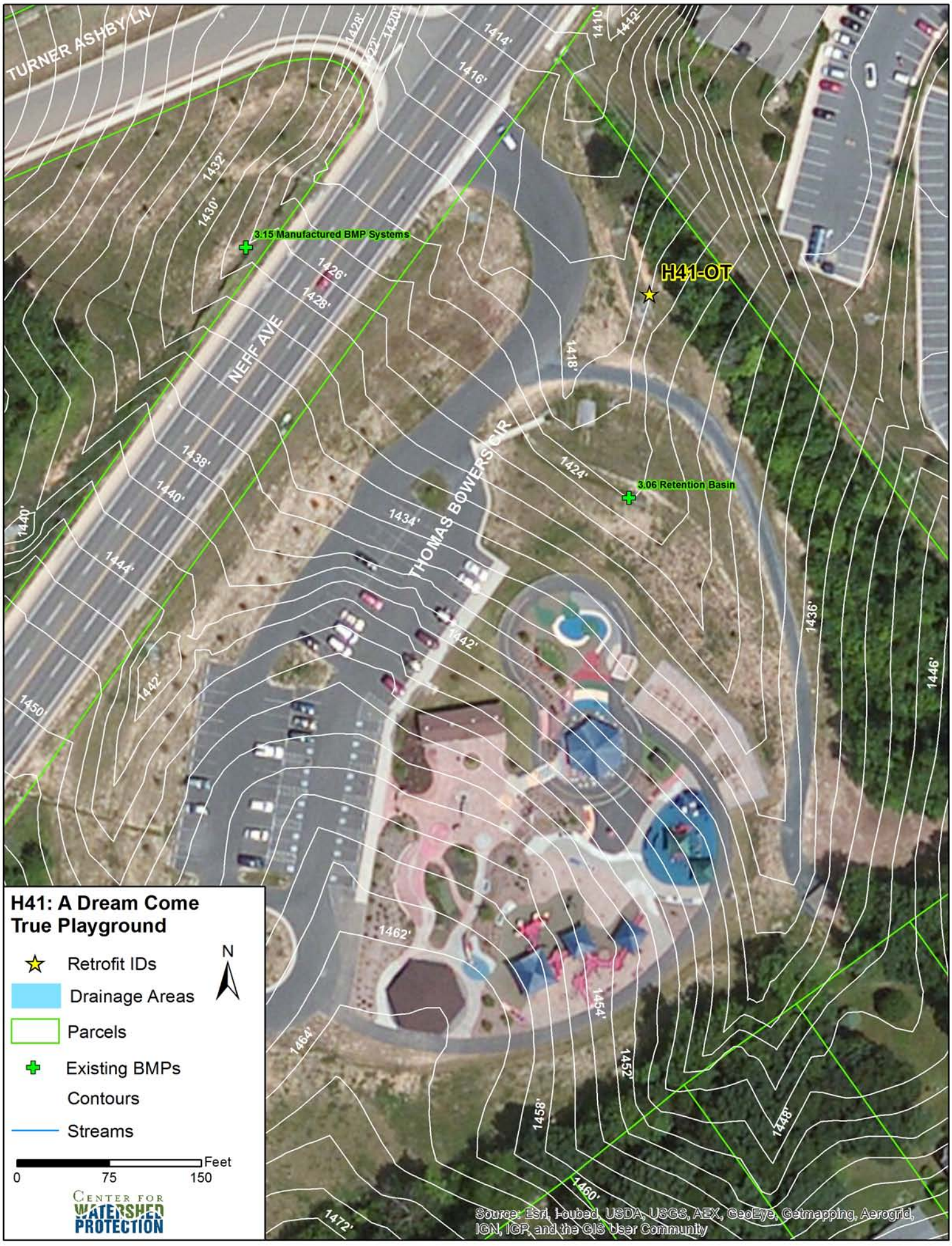
WATERSHED/SUBSHED:	**DATE:** ___/___/___	**ASSESSED BY:**
SURVEY REACH ID:	**TIME:**___:___AM/PM	**PHOTO ID:** (*Camera-Pic #*) /#
SITE ID: (*Condition-#*) **MI-**___	**LAT**___°___'___" **LONG** ___°___'___" **LMK:** ___	**GPS:** (*Unit ID*)

POTENTIAL RESTORATION CANDIDATE ☐ Storm water retrofit ☐ Stream restoration ☐ Riparian Management
☐ no ☐ Discharge Prevention ☐ Other:

DESCRIBE:

REPORTED TO LOCAL AUTHORITIES ☐ Yes ☐ No

H41: A Dream Come True Playground


TURNER ASHBY LN
NERF AVE
THOMAS BOWERS CIR
3.15 Manufactured BMP Systems
3.06 Retention Basin
H41-OT
1410'
1412'
1414'
1416'
1418'
1420'
1422'
1424'
1426'
1428'
1430'
1432'
1434'
1436'
1438'
1440'
1442'
1444'
1446'
1448'
1450'
1452'
1454'
1458'
1460'
1462'
1464'
1472'
H41: A Dream Come True Playground
Retrofit IDs
Drainage Areas
Parcels
Existing BMPs
Contours
Streams
N
Feet
0
75
150
CENTER FOR WATERSHED PROTECTION
Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

H41-OT: A Dream Come True Playground Outfall Erosion

Score: N/A

Rank: N/A

Investigators: Wes Runion, Jeremy Harold, Lisa Fraley-McNeal

Figure 1: *Erosion downstream of outfall*

Description: The outfall shown in Figure 1 conveys discharge from an adjacent retention basin treating runoff from the playground and a portion of the parking lot. The outfall also conveys runoff from residential land upslope of the playground. Stabilization has been attempted through rip-rap near the pipe opening and matting along the grass swale heading downhill from the outfall. However, erosion is still occurring in spite of these attempts.

Proposed Solutions: Secure banks below pipe outfall with erosion control matting and allow grass to grow tall. This will at least slow down the rate of erosion. A more advanced solution would be to create a step-pool system or regenerative stormwater conveyance to prevent erosion and provide water quality benefits.

WATERSHED/SUBSHED: | **DATE:** 3/20/13 | **ASSESSED BY:** Lisa, Wes

SURVEY REACH ID: 44 | **TIME:** ___:___ AM/PM | **PHOTO ID:** (*Camera-Pic #*) See Olympus #66, 67

SITE ID (*Condition-#*): OT-41 | **LAT** ___° ___' ___" **LONG** ___° ___' ___" **LMK** ___ | **GPS:** (*Unit ID*)

A Dream Come True Playground

BANK: ☐ LT ☐ RT ☐ Head

FLOW: ☒ None ☐ Trickle ☐ Moderate ☐ Substantial ☐ Other:

TYPE: ☒ Closed pipe ☐ Open channel

MATERIAL: ☒ Concrete ☐ Metal ☐ PVC/Plastic ☐ Brick ☐ Other: ☐ Concrete ☐ Earthen ☐ Other:

SHAPE: ☒ Single ☐ Double ☒ Circular ☐ Elliptical ☐ Triple ☐ Other: ☐ Trapezoid ☐ Parabolic ☐ Other:

DIMENSIONS: Diameter: 1½' (est.) Depth: ___ (in) Width (Top): ___ (in) " (Bottom): ___ (in) NOT APPLICABLE

SUBMERGED: ☒ No ☐ Partially ☐ Fully

CONDITION: ☒ None ☐ Chip/Cracked ☐ Peeling Paint ☐ Corrosion ☐ Other:

ODOR: ☒ No ☐ Gas ☐ Sewage ☐ Rancid/Sour ☐ Sulfide ☐ Other:

DEPOSITS/STAINS: ☒ None ☐ Oily ☐ Flow Line ☐ Paint ☐ Other:

VEGGIE DENSITY: ☒ None ☐ Normal ☐ Inhibited ☐ Excessive ☐ Other:

PIPE BENTHIC GROWTH: ☒ None ☐ Brown ☐ Orange ☐ Green ☐ Other:

POOL QUALITY: ☐ No pool ☐ Good ☐ Odors ☐ Colors ☐ Oils ☐ Suds ☐ Algae ☐ Floatables ☐ Other:

FOR FLOWING ONLY

COLOR: ☐ Clear ☐ Brown ☐ Grey ☐ Yellow ☐ Green ☐ Orange ☐ Red ☐ Other:

TURBIDITY: ☐ None ☐ Slight Cloudiness ☐ Cloudy ☐ Opaque

FLOATABLES: ☐ None ☐ Sewage (toilet paper, etc.) ☐ Petroleum (oil sheen) ☐ Other:

OTHER CONCERNS: ☐ Excess Trash (paper/plastic bags) ☐ Dumping (bulk) ☐ Excessive Sedimentation ☐ Needs Regular Maintenance ☒ Bank Erosion ☐ Other:

POTENTIAL RESTORATION CANDIDATE ☐ no ☐ Discharge investigation ☐ Storm water retrofit ☐ Stream daylighting ☐ Other: ☒ Local stream repair/outfall stabilization

If yes for daylighting:

Length of vegetative cover from outfall: ___ ft Type of existing vegetation: ___ Slope: ___°

If yes for stormwater:

Is stormwater currently controlled? ☐ Yes ☐ No ☐ Not investigated

Land Use description: ___

Area available:

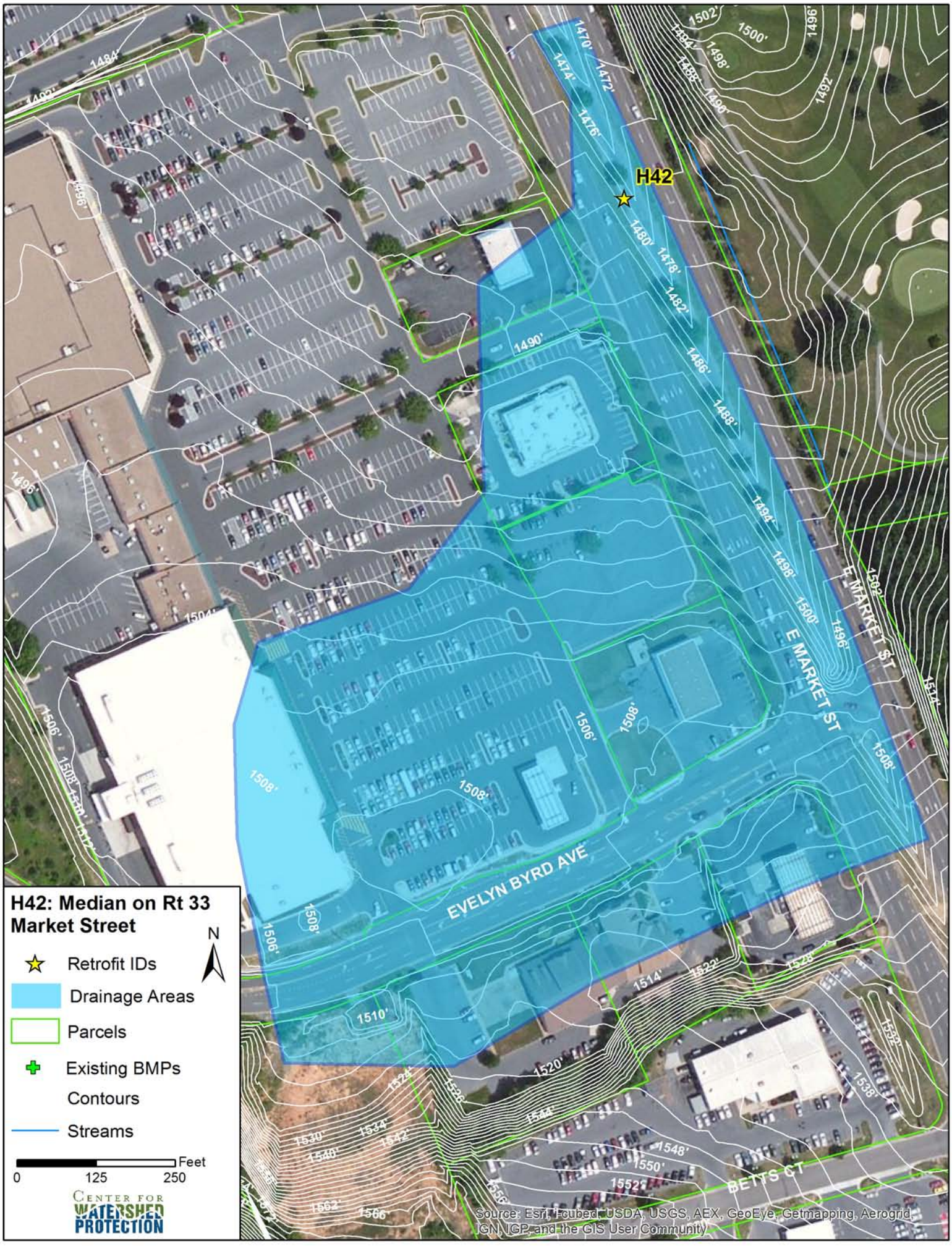
OUTFALL SEVERITY: (*circle #*)	Heavy discharge with a distinct color and/or a strong smell. The amount of discharge is significant compared to the amount of normal flow in receiving stream; discharge appears to be having a significant impact downstream.		Small discharge; flow mostly clear and odorless. If the discharge has a color and/or odor, the amount of discharge is very small compared to the stream's base flow and any impact appears to be minor / localized.		Outfall does not have dry weather discharge; staining; or appearance of causing any erosion problems.
	5	4	3	2	1

SKETCH/NOTES:

Regenerative Stormwater conveyance or a simple step pool system. Existing downstream channel is eroded.

REPORTED TO AUTHORITIES: ☐ YES ☒ NO

H42: Median on Rt 33 Market Street


H42
E MARKET ST
EVELYN BYRD AVE
BETTS CT
H42: Median on Rt 33
Market Street
N
Retrofit IDs
Drainage Areas
Parcels
Existing BMPs
Contours
Streams
Feet
0
125
250
Center for Watershed Protection
Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

H42: Median on Route 33 Market Street

Score: 76
Rank: 11
Investigators: Rick Altizer, Chris Swann

Figure 1: *Rock-lined conveyance channel*

Figure 2: *Median with final outfall*

Description: This site has a large drainage area of approximately 88.5 acres that includes several commercial establishments with large amounts of imperviousness. The Route 33 median contains a rip-rap channel to convey road drainage and runoff from several parking lots, as well as some residential runoff (Figure 1). After passing through this part of the median, water is carried under a road crossing into another rock-lined area (Figure 2) and then through an outfall to eventually be discharged into Siebert Creek.

Proposed Retrofit: The concept here is to develop a regenerative stormwater conveyance system (RSC) to provide treatment. The estimated space available is roughly 20' X 1,000' in the portion of the median from the intersection with Evelyn Byrd Avenue downhill to the first road crossing to enter the Skyline Village shopping center. Due to the steep slope and the amount of drainage to the system, this practice might provide the best opportunity to convey runoff while protecting the median sidewalls from erosion and improving the aesthetic look of the median.

The large amount of drainage to this location may call for additional measures to reduce the volume and velocity of the runoff. RSC systems can be used for large drainage areas, but may require larger stone, which could create a public safety hazard in the median. A second RSC system installed in the next median uphill can provide additional treatment and reduce velocity in the downhill slope. Onsite retrofit practices on some of the commercial parking lots may also help to reduce the intensity of the runoff and prevent the RSC from being overwhelmed in large storms.

WATERSHED: HARRISONBURG	SUBWATERSHED: HARRISONBURG	UNIQUE SITE ID: H42	
DATE: 3/20/13	ASSESSED BY: CPS/RA	CAMERA ID: OLYMPUS BLUE DOT	PICTURES: 73-74
GPS ID:	LMK ID:	LAT:	LONG:

SITE DESCRIPTION

Name: RTE 33 MEDIAN
Address:

Ownership: ☒ Public ☐ Private ☐ Unknown
If Public, Government Jurisdiction: ☒ Local ☐ State ☐ DOT ☐ Other:

Corresponding USSR/USA Field Sheet? ☐ Yes ☒ No If yes, Unique Site ID:

Proposed Retrofit Location:

Storage
- ☐ Existing Pond
- ☐ Below Outfall
- ☒ In Road ROW
- ☐ Other:
- ☐ Above Roadway Culvert
- ☒ In Conveyance System
- ☐ Near Large Parking Lot

On-Site
- ☐ Hotspot Operation
- ☐ Small Parking Lot
- ☐ Individual Street
- ☐ Underground
- ☐ Individual Rooftop
- ☐ Small Impervious Area
- ☐ Landscape / Hardscape
- ☐ Other:

DRAINAGE AREA TO PROPOSED RETROFIT

Drainage Area ≈ 88.5
Imperviousness ≈ 57.4 %
Impervious Area ≈ 50.8

Notes:

Drainage Area Land Use:
- ☐ Residential
  - ☐ SFH (< 1 ac lots)
  - ☐ SFH (> 1 ac lots)
  - ☐ Townhouses
  - ☐ Multi-Family
- ☒ Commercial
- ☐ Institutional
- ☐ Industrial
- ☒ Transport-Related
- ☐ Park
- ☐ Undeveloped
- ☐ Other:

EXISTING STORMWATER MANAGEMENT

Existing Stormwater Practice: ☐ Yes ☒ No ☐ Possible
If Yes, Describe:

Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:
Existing Street Width (if applicable):

ROAD MEDIAN - ROCK WRAPPED CHANNEL
2 OUTFALLS IN MEDIAN

Existing Head Available:	Note where points are measured from: (i.e. street elevation to catch basin invert, manhole rim to catch basin invert, other)

PROPOSED RETROFIT

Purpose of Retrofit:
☒ Water Quality ☐ Recharge ☐ Channel Protection ☐ Flood Control
☐ Demonstration / Education ☐ Repair ☐ Other:_____

Retrofit Volume Computations - Target Storage:

Retrofit Volume Computations - Available Storage:

Proposed Retrofit Practice: (Runoff Reduction)
☐ Disconnection ☒ Bioretention ☐ Bio Swale
☐ Expanded Tree Pit ☐ Infiltration ☐ Green Roof
☐ Permeable Pavement ☐ Rainwater Harvesting

Proposed Retrofit Practice: (Stormwater Treatment)
☐ Constructed Wetland ☐ Wet Swale ☐ Wet Pond
☐ Filtering Practice ☐ Proprietary:_____
☐ Other: _____

Retrofit Category (as defined by Chesapeake Bay Program):
☒ New BMP ☐ BMP Enhancement ☐ BMP Restoration ☐ BMP Conversion ☐ Not CBP-approved

Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance:

RSCS SYSTEM IN ROAD CONVEYANCE SYSTEM
SLOPE IN 4 - 6% RANGE
BIOSWALE MAY WORK WITH CHECKDAMS

Available Width:	20'
Available Length:	1000'
Available Area:	
Ponding Depth:	
Soil Depth:	

SITE CONSTRAINTS

Adjacent Land Use:
☐ Residential ☐ Commercial ☐ Institutional
☐ Industrial ☒ Transport-Related ☐ Park
☐ Undeveloped ☐ Other:_____
Possible Conflicts Due to Adjacent Land Use? ☐ Yes ☒ No
If Yes, Describe:

Access:
☒ No Constraints
Constrained due to
☐ Slope ☐ Space
☐ Utilities ☐ Tree Impacts
☐ Structures ☐ Property
Ownership
☐ Other:_____

Conflicts with Existing Utilities:

	Yes	Possible/ Modifiable	No	Unknown
Sewer:	☐	☒	☐	☐
Water:	☐	☐	☒	☐
Gas:	☐	☐	☒	☐
Electric to Streetlights:	☐	☐	☒	☐
Other:	☐	☐	☒	☐

_____

Potential Permitting Factors:

Dam Safety Permits Necessary	☐ Probable	☒ Not Probable
Impacts to Wetlands	☐ Probable	☒ Not Probable
Impacts to a Stream	☐ Probable	☒ Not Probable
Floodplain Fill	☐ Probable	☒ Not Probable
Impacts to Forests	☐ Probable	☒ Not Probable
Impacts to Specimen Trees	☐ Probable	☒ Not Probable

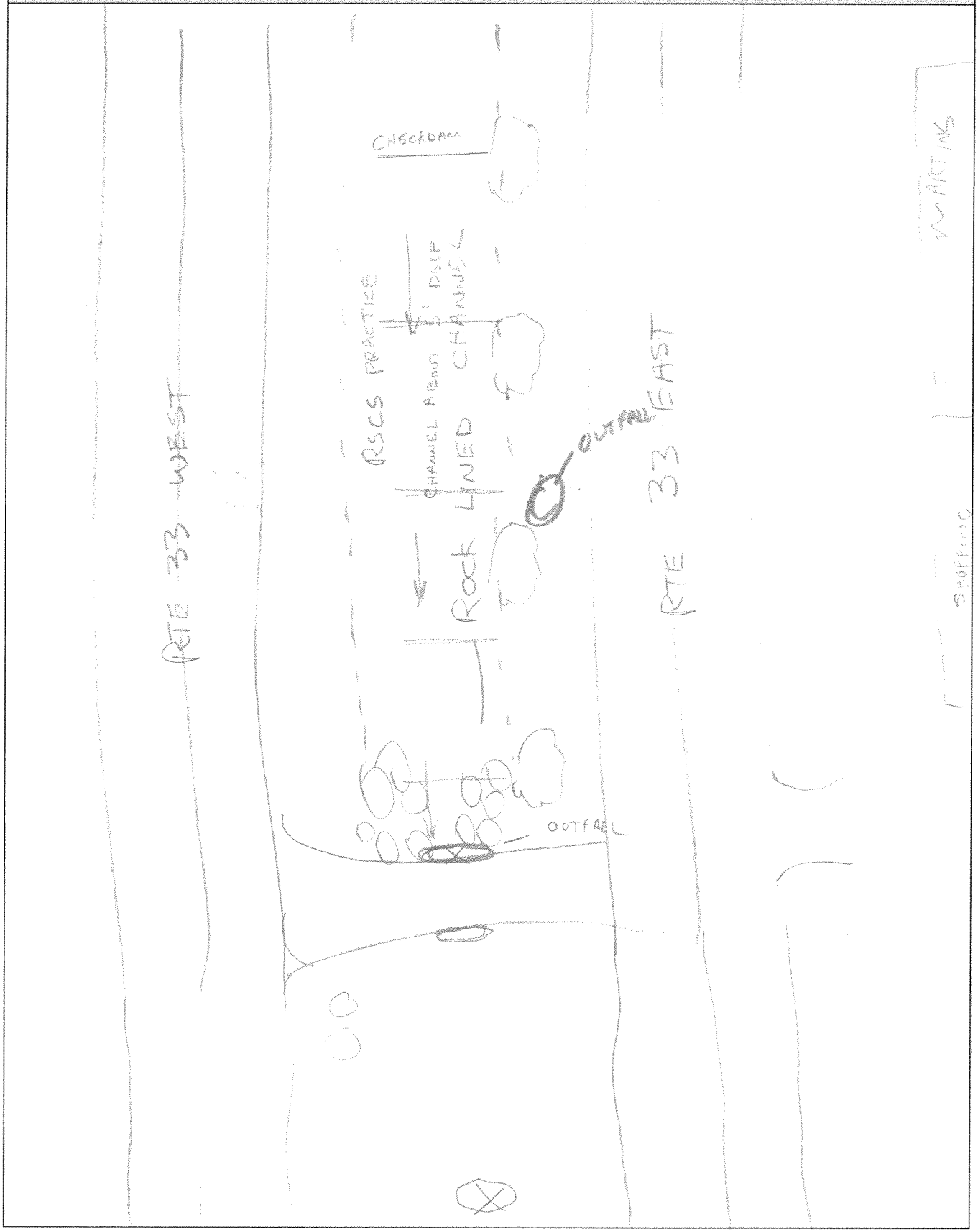
How many?_____
Approx. DBH_____

Other factors:_____
_____

Soils:

Soil auger test holes:	☐ Yes	☒ No
Evidence of poor infiltration (clays, fines):	☐ Yes	☒ No
Evidence of shallow bedrock:	☐ Yes	☒ No
Evidence of high water table (gleying, saturation):	☐ Yes	☒ No

SKETCH


CHECKDAM
RSCS PRACTICE
DRIP
CHANNEL FLOW
ROCK LINED
OUTFALL
RTE 33 WEST
RTE 33 EAST
MART INC
SHOPPING
OUTFALL

DESIGN OR DELIVERY NOTES

- MAY NEED TO CREATE POOL NEAR OUTFALL AT LOWER END OF MEDIAN - APPEARS TO PICK UP LARGE DRAINAGE AREA
- COULD PUT MORE RSCS IN NEXT MEDIAN BEYOND INTERSECTION OF 33 + EVELYN BIRD AVENUE
- SOME ONSITE TREATMENT PRACTICES MAY BE NECESSARY IN UPPER DRAINAGE AREA TO REDUCE VOLUME + VELOCITY

FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT

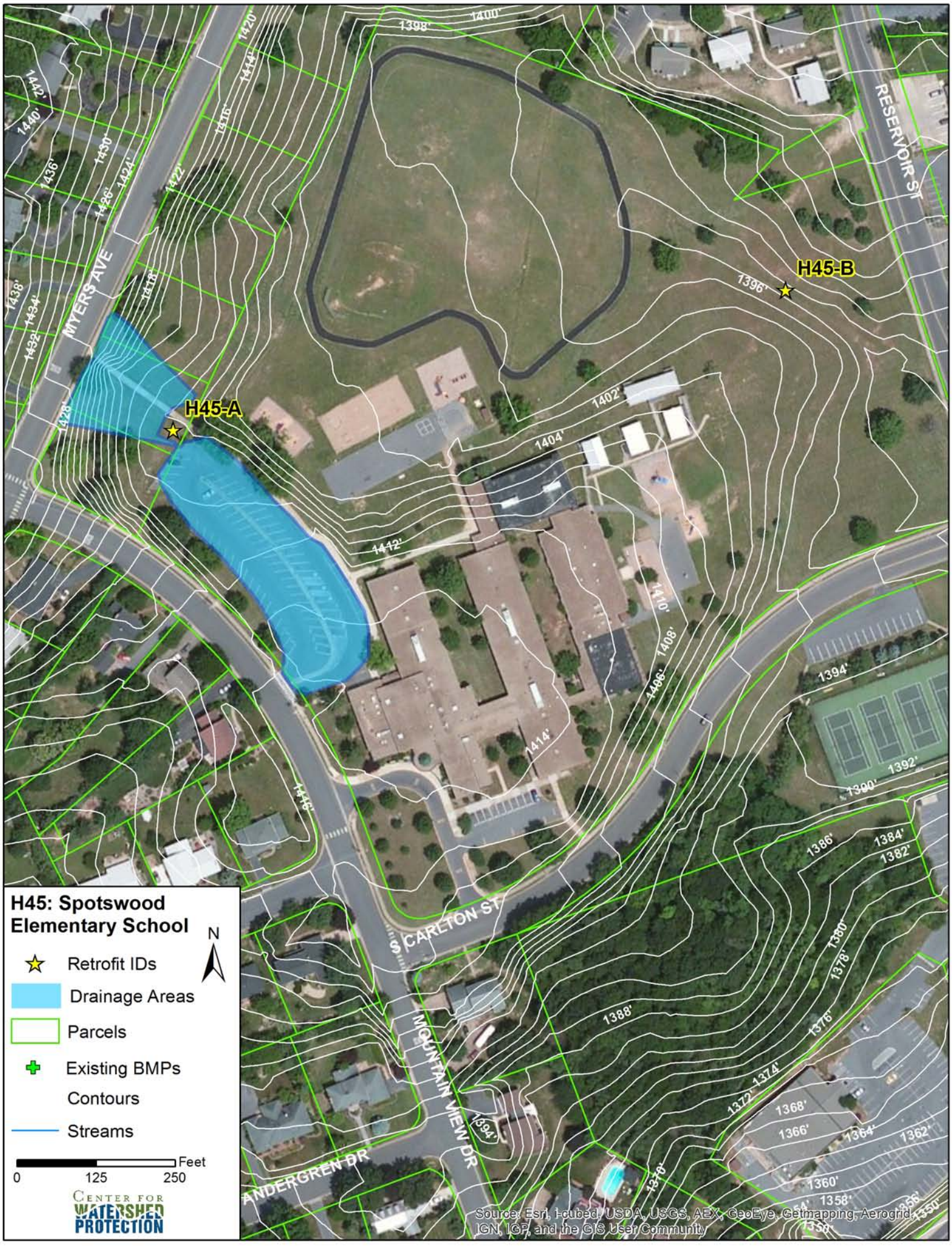
- [ ] Confirm property ownership
- [x] Confirm drainage area
- [ ] Confirm drainage area impervious cover
- [ ] Confirm volume computations
- [x] Complete concept sketch
- [ ] Obtain existing stormwater practice as-builts
- [ ] Obtain site as-builts
- [x] Obtain detailed topography
- [ ] Obtain utility mapping
- [ ] Confirm storm drain invert elevations
- [ ] Confirm soil types
- [ ] Other: _____

INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS

SITE CANDIDATE FOR FURTHER INVESTIGATION:	[x] YES	[ ] NO	[ ] MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	[ ] YES	[x] NO	[ ] MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	[ ] YES	[ ] NO	[ ] MAYBE

IF YES, TYPE(S): _____

H45: Spotswood Elementary School


H45-A
H45-B
MYERS AVE
RESERVOIR ST
S CARLTON ST
MOUNTAIN VIEW DR
ANDERGREN DR
1442'
1440'
1438'
1436'
1434'
1432'
1430'
1428'
1426'
1424'
1422'
1420'
1418'
1416'
1414'
1412'
1410'
1408'
1406'
1404'
1402'
1400'
1398'
1396'
1394'
1392'
1390'
1388'
1386'
1384'
1382'
1380'
1378'
1376'
1374'
1372'
1370'
1368'
1366'
1364'
1362'
1360'
1358'
1356'
1354'
1350'
H45: Spotswood Elementary School
N
Retrofit IDs
Drainage Areas
Parcels
Existing BMPs
Contours
Streams
Feet
0
125
250
Center for Watershed Protection
Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

H45-A: Spotswood Elementary, Bioretention

Score: 38

Rank: 20

Investigators: Megan O'Gorek, Laurel Woodworth

Figure 1: *Small rain garden filled with grit and dirt*

Figure 2: *Opposite view of rain garden and lot*

Description: Runoff from 1.14 acres of the parking lot and adjacent hillside behind Spotswood Elementary School drains to one corner of the lot into a small rain garden. Unfortunately, the rain garden is under-sized and has been overwhelmed by fine gravel and sediment coming off the asphalt (Figure 1).

Proposed Retrofit: A retrofit of the existing rain garden is proposed to replace it with a more expansive and engineered bioretention practice with a surface area of approximately 42' x 48'. The practice would extend out from the location of the current rain garden and go under the concrete sidewalk in Figure 2. A culvert or trench drain could connect flow between the two sides of the bioretention. There is a small grass ditch downhill from the rain garden into which an underdrain pipe and overflow could be directed. Having the walkway cross over/through the bioretention area will serve as an attractive feature on the landscape.

Since children are in the vicinity, the ponding depth should be kept to no more than 6".

H45-B: Spotswood Elementary, Turf Retrofit

Score: N/A

Rank: N/A

Investigators: Megan O'Gorek, Laurel Woodworth

Figure 1: *Mowed turf at Reservoir & Carlton St.*

Figure 2: *Mowed turf along Reservoir Street*

Description: Many acres of the Spotswood Elementary School campus are maintained as mowed turf grass (Figures 1 &2). Although some of this area is used for recreation and other uses, a large portion of it is not. Keeping lawns mowed regularly is a big investment in time, labor, and fossil fuels.

Proposed Solutions: For portions of the campus that are not used, especially along Reservoir Street and S. Carlton Street, consider changing the landscape maintenance style. These areas can be planted with trees, converted to forest area, and/or converted to wildflower and native grass meadows. Each of these types of ground cover do a better job of reducing runoff than does mowed turf.

An example of a turf hillside at James Madison University converted in 2012 to a meadow of native plants is shown in Figure 3 below.

Figure 3: *Turf converted to meadow at JMU (Photo: Bobby Whitescarver)*

RRI

WATERSHED:	SUBWATERSHED:	UNIQUE SITE ID: H45-A

DATE: 3/19/13	ASSESSED BY: LW	CAMERA ID:	PICTURES: 3156-3158
GPS ID:	LMK ID:	LAT:	LONG:

SITE DESCRIPTION

Name: Spotswood Elementary School
Address: _____

Ownership: ☑ Public ☐ Private ☐ Unknown
If Public, Government Jurisdiction: ☑ Local ☐ State ☐ DOT ☐ Other: _____

Corresponding USSR/USA Field Sheet? ☐ Yes ☑ No If yes, Unique Site ID: _____

Proposed Retrofit Location:

Storage
- ☐ Existing Pond
- ☐ Below Outfall
- ☐ In Road ROW
- ☐ Other: _____
- ☐ Above Roadway Culvert
- ☐ In Conveyance System
- ☐ Near Large Parking Lot

On-Site
- ☐ Hotspot Operation
- ☑ Small Parking Lot
- ☐ Individual Street
- ☐ Underground
- ☐ Individual Rooftop
- ☐ Small Impervious Area
- ☐ Landscape / Hardscape
- ☐ Other: _____

DRAINAGE AREA TO PROPOSED RETROFIT

Drainage Area ≈ 1.14 ac
Imperviousness ≈ 72.8 %
Impervious Area ≈ 0.83

Notes:

Drainage Area Land Use:
- ☐ Residential
  - ☐ SFH (< 1 ac lots)
  - ☐ SFH (> 1 ac lots)
  - ☐ Townhouses
  - ☐ Multi-Family
- ☐ Commercial
- ☑ Institutional
- ☐ Industrial
- ☐ Transport-Related
- ☐ Park
- ☐ Undeveloped
- ☐ Other: _____

EXISTING STORMWATER MANAGEMENT

Existing Stormwater Practice: ☒ Yes ☐ No ☐ Possible
If Yes, Describe:

- Undersized rain garden, overwhelmed by parking lot dirt to fines (back parking lot)

Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:
Existing Street Width (if applicable): _____

Back parking lot drains to ~~bottom~~ corner to existing small rain garden

Existing Head Available:

4.5'

Note where points are measured from: (i.e. street elevation to catch basin invert, manhole rim to catch basin invert, other)

~ rain garden + ditch near playground surface

PROPOSED RETROFIT

Purpose of Retrofit:
☑ Water Quality ☐ Recharge ☐ Channel Protection ☐ Flood Control
☑ Demonstration / Education ☑ Repair (enlargen) ☐ Other:_____

Retrofit Volume Computations - Target Storage:
3108cf

Retrofit Volume Computations - Available Storage:

Proposed Retrofit Practice: (Runoff Reduction)
☐ Disconnection ☑ Bioretention ☐ Bio Swale
☐ Expanded Tree Pit ☐ Infiltration ☐ Green Roof
☐ Permeable Pavement ☐ Rainwater Harvesting

Proposed Retrofit Practice: (Stormwater Treatment)
☐ Constructed Wetland ☐ Wet Swale ☐ Wet Pond
☐ Filtering Practice ☐ Proprietary:_____
☐ Other: _____

Retrofit Category (as defined by Chesapeake Bay Program):
☐ New BMP ☐ BMP Enhancement ☐ BMP Restoration ☑ BMP Conversion ☐ Not CBP-approved

Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance:
- Expand existing rain garden into a larger bioretention
- Expand into grass area on both sides of sidewalk
- run ponding area under the sidewalk, using culvert
- Tie underdrain to existing ditch

Available Width:	48'
Available Length:	48'
Available Area:	
Ponding Depth:	~0.5'
Soil Depth:	

SITE CONSTRAINTS

Adjacent Land Use:
☑ Residential ☐ Commercial ☑ Institutional
☐ Industrial ☐ Transport-Related ☐ Park
☐ Undeveloped ☐ Other:_____
Possible Conflicts Due to Adjacent Land Use? ☐ Yes ☐ No
If Yes, Describe:

Access:
☑ No Constraints
Constrained due to
☐ Slope ☐ Space
☐ Utilities ☐ Tree Impacts
☐ Structures ☐ Property
Ownership
☐ Other:_____

Conflicts with Existing Utilities:

	Yes	Possible/ Modifiable	No	Unknown
Sewer:	☐	☐	☑	☐
Water:	☐	☐	☑	☐
Gas:	☐	☐	☑	☐
Electric to Streetlights:	☐	☐	☑	☐
Other:	☐	☐	☐	☐

Potential Permitting Factors:

Dam Safety Permits Necessary	☐ Probable	☑ Not Probable
Impacts to Wetlands	☐ Probable	☑ Not Probable
Impacts to a Stream	☐ Probable	☑ Not Probable
Floodplain Fill	☐ Probable	☑ Not Probable
Impacts to Forests	☐ Probable	☑ Not Probable
Impacts to Specimen Trees	☐ Probable	☑ Not Probable

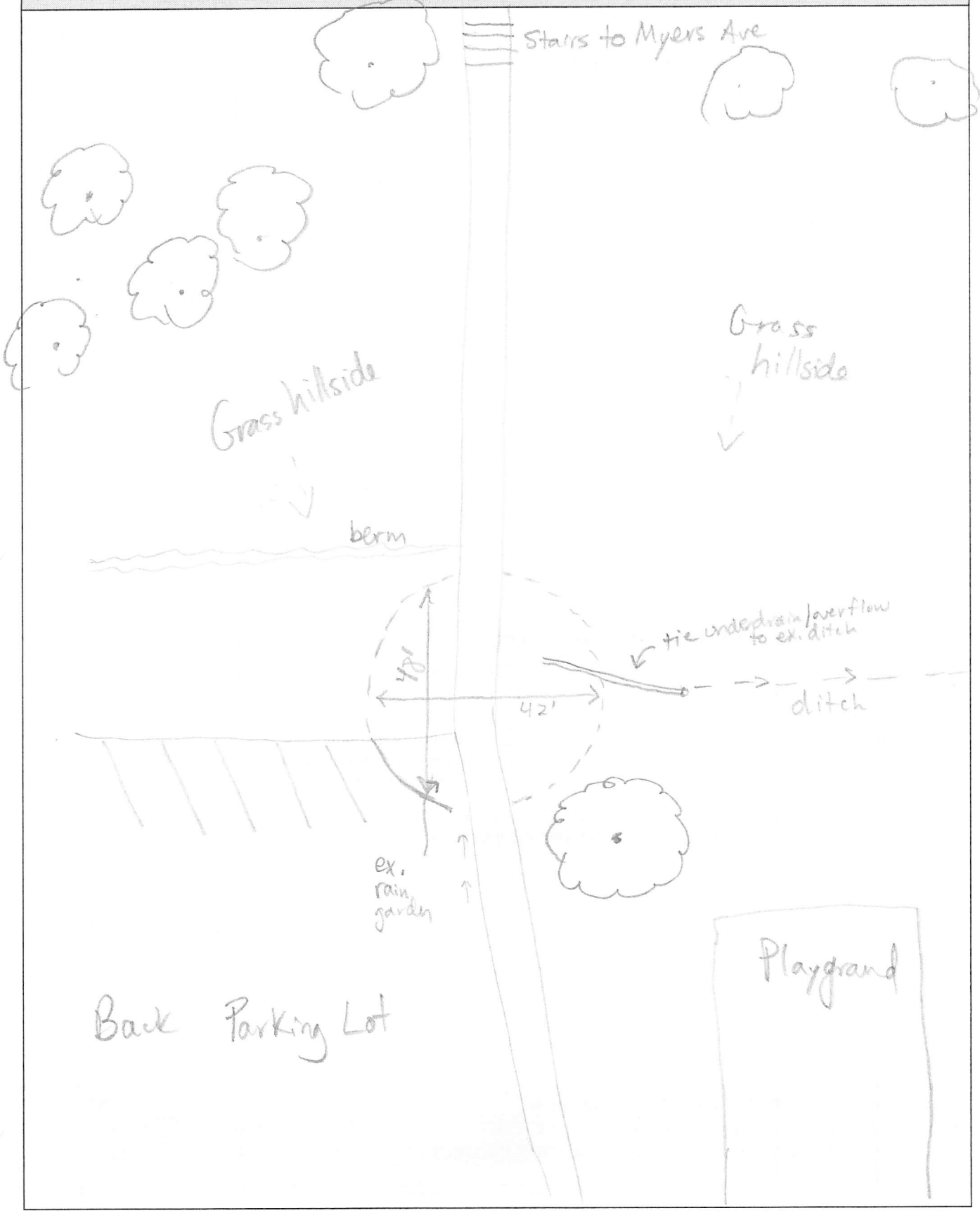
How many?_____
Approx. DBH_____

Other factors: Stay clear of large tree

Soils:

Soil auger test holes:	☐ Yes ☐ No
Evidence of poor infiltration (clays, fines):	☐ Yes ☐ No
Evidence of shallow bedrock:	☐ Yes ☐ No
Evidence of high water table (gleying, saturation):	☐ Yes ☐ No

SKETCH


Stairs to Myers Ave
Grass hillside
Grass hillside
berm
tie underdrain/overflow to ex. ditch
42'
ditch
ex. rain garden
Back Parking Lot
Playground

DESIGN OR DELIVERY NOTES

- Keep ponding level to a minimum
- Stay away from tree dripline during excavation

FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT

- ☐ Confirm property ownership
- ☐ Confirm drainage area
- ☐ Confirm drainage area impervious cover
- ☑ Confirm volume computations
- ☐ Complete concept sketch
- ☐ Obtain existing stormwater practice as-builts
- ☐ Obtain site as-builts
- ☐ Obtain detailed topography
- ☐ Obtain utility mapping
- ☐ Confirm storm drain invert elevations
- ☑ Confirm soil types
- ☐ Other:_____

INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS

SITE CANDIDATE FOR FURTHER INVESTIGATION:	☐ YES	☐ NO	☐ MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	☐ YES	☐ NO	☐ MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	☐ YES	☐ NO	☐ MAYBE

IF YES, TYPE(S):_____

WATERSHED:	SUBWATERSHED:	UNIQUE SITE ID: H45-B

DATE: 3/19/13	ASSESSED BY: LW	CAMERA ID:	PICTURES: 3153-3155 59-61
GPS ID:	LMK ID:	LAT:	LONG:

SITE DESCRIPTION

Name: Spotswood Elementary School
Address: _____

Ownership: ☑ Public ☐ Private ☐ Unknown
If Public, Government Jurisdiction: ☑ Local ☐ State ☐ DOT ☐ Other: _____

Corresponding USSR/USA Field Sheet? ☐ Yes ☑ No If yes, Unique Site ID: _____

Proposed Retrofit Location:

Storage
- ☐ Existing Pond
- ☐ Below Outfall
- ☐ In Road ROW
- ☐ Other: _____
- ☐ Above Roadway Culvert
- ☐ In Conveyance System
- ☐ Near Large Parking Lot

On-Site
- ☐ Hotspot Operation
- ☐ Small Parking Lot
- ☐ Individual Street
- ☐ Underground
- ☐ Individual Rooftop
- ☐ Small Impervious Area
- ☑ Landscape / Hardscape
- ☐ Other: _____

DRAINAGE AREA TO PROPOSED RETROFIT

Drainage Area ≈ _____
Imperviousness ≈ _____ %
Impervious Area ≈ _____

Notes:

Drainage Area Land Use:
- ☐ Residential
  - ☐ SFH (< 1 ac lots)
  - ☐ SFH (> 1 ac lots)
  - ☐ Townhouses
  - ☐ Multi-Family
- ☐ Commercial
- ☐ Institutional
- ☐ Industrial
- ☐ Transport-Related
- ☐ Park
- ☐ Undeveloped
- ☐ Other: _____

EXISTING STORMWATER MANAGEMENT

Existing Stormwater Practice: ☐ Yes ☑ No ☐ Possible
If Yes, Describe:

Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:
Existing Street Width (if applicable): _____

Turf

Existing Head Available:	**Note where points are measured from: (i.e. street elevation to catch basin invert, manhole rim to catch basin invert, other)**

PROPOSED RETROFIT

Purpose of Retrofit:
☐ Water Quality ☐ Recharge ☐ Channel Protection ☐ Flood Control
☐ Demonstration / Education ☐ Repair ☐ Other:_____

Retrofit Volume Computations - Target Storage:

Retrofit Volume Computations - Available Storage:

Proposed Retrofit Practice: (Runoff Reduction)
☐ Disconnection ☐ Bioretention ☐ Bio Swale
☐ Expanded Tree Pit ☐ Infiltration ☐ Green Roof
☐ Permeable Pavement ☐ Rainwater Harvesting

Proposed Retrofit Practice: (Stormwater Treatment)
☐ Constructed Wetland ☐ Wet Swale ☐ Wet Pond
☐ Filtering Practice ☐ Proprietary:_____
☐ Other: _____

Retrofit Category (as defined by Chesapeake Bay Program):
☐ New BMP ☐ BMP Enhancement ☐ BMP Restoration ☐ BMP Conversion ☐ Not CBP-approved

Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance:

← Reservoir St.

- Plant trees on hillsides along Myers Ave. and anywhere else on property that is not utilized
- Wildflower meadow along Reservoir St. side

Available Width:	
Available Length:	
Available Area:	
Ponding Depth:	
Soil Depth:	

SITE CONSTRAINTS

Adjacent Land Use:
☐ Residential ☐ Commercial ☐ Institutional
☐ Industrial ☐ Transport-Related ☐ Park
☐ Undeveloped ☐ Other:_____
Possible Conflicts Due to Adjacent Land Use? ☐ Yes ☐ No
If Yes, Describe:

Access:
☐ No Constraints
Constrained due to
☐ Slope ☐ Space
☐ Utilities ☐ Tree Impacts
☐ Structures ☐ Property
Ownership
☐ Other:_____

Conflicts with Existing Utilities:

	Yes	Possible/ Modifiable	No	Unknown
Sewer:	☐	☐	☐	☐
Water:	☐	☐	☐	☐
Gas:	☐	☐	☐	☐
Electric to Streetlights:	☐	☐	☐	☐
Other:	☐	☐	☐	☐

_____

Potential Permitting Factors:

Dam Safety Permits Necessary	☐ Probable	☐ Not Probable
Impacts to Wetlands	☐ Probable	☐ Not Probable
Impacts to a Stream	☐ Probable	☐ Not Probable
Floodplain Fill	☐ Probable	☐ Not Probable
Impacts to Forests	☐ Probable	☐ Not Probable
Impacts to Specimen Trees	☐ Probable	☐ Not Probable

How many?_____
Approx. DBH_____

Other factors:_____
_____

Soils:

Soil auger test holes:	☐ Yes	☐ No
Evidence of poor infiltration (clays, fines):	☐ Yes	☐ No
Evidence of shallow bedrock:	☐ Yes	☐ No
Evidence of high water table (gleying, saturation):	☐ Yes	☐ No

SKETCH

DESIGN OR DELIVERY NOTES

FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT

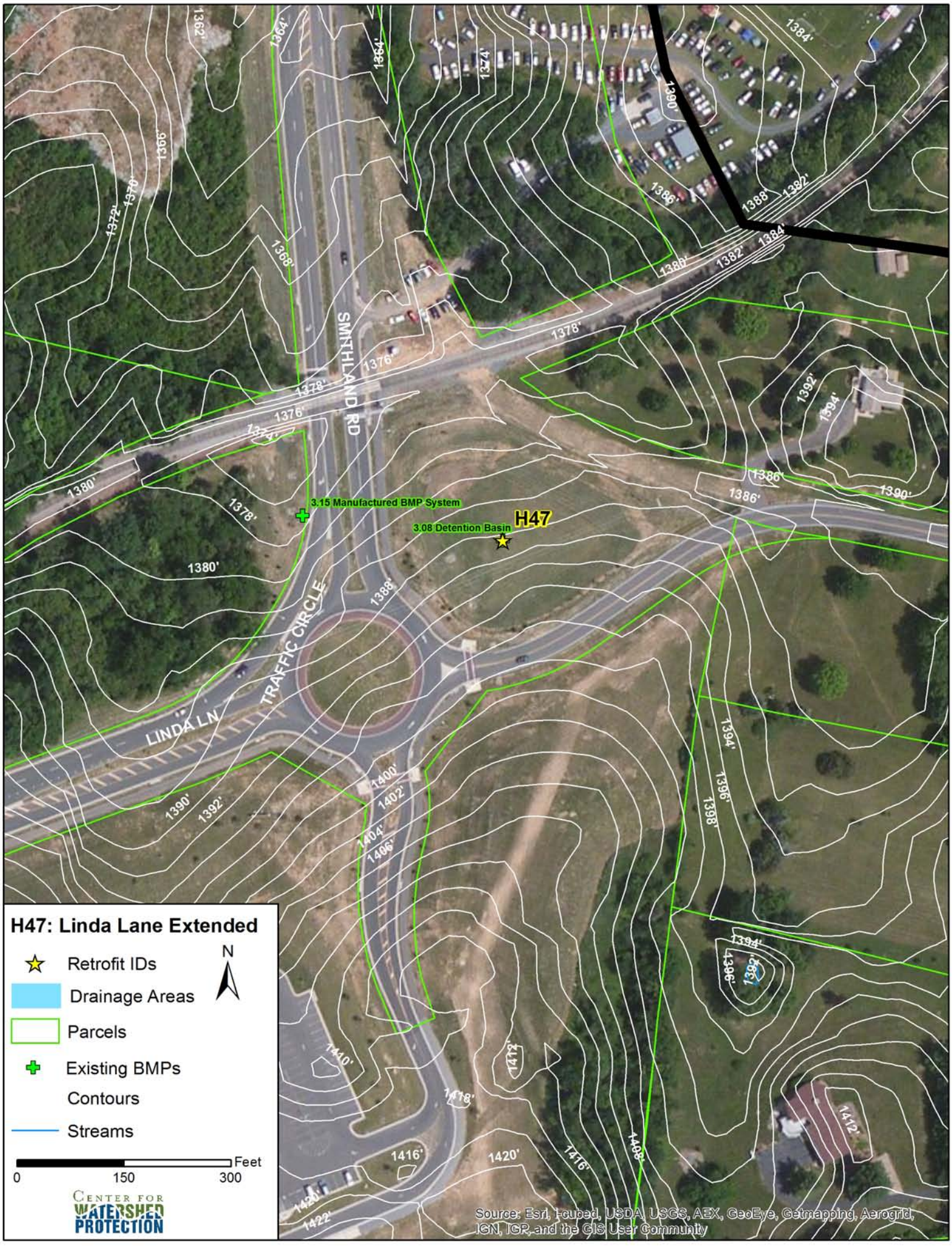
- ☐ Confirm property ownership
- ☐ Confirm drainage area
- ☐ Confirm drainage area impervious cover
- ☐ Confirm volume computations
- ☐ Complete concept sketch
- ☐ Obtain existing stormwater practice as-builts
- ☐ Obtain site as-builts
- ☐ Obtain detailed topography
- ☐ Obtain utility mapping
- ☐ Confirm storm drain invert elevations
- ☐ Confirm soil types
- ☐ Other:_____

INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS

SITE CANDIDATE FOR FURTHER INVESTIGATION:	☐ YES	☐ NO	☐ MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	☐ YES	☐ NO	☐ MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	☐ YES	☐ NO	☐ MAYBE

IF YES, TYPE(S):_____

H47: Linda Lane Extended


H47: Linda Lane Extended
Retrofit IDs
Drainage Areas
Parcels
Existing BMPs
Contours
Streams
N
0
150
300
Feet
Center for Watershed Protection
3.15 Manufactured BMP System
3.08 Detention Basin
H47
SMITHLAND RD
LINDA LN
TRAFFIC CIRCLE
Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

H47: Linda Lane Extended

Score: 60
Rank: 3
Investigators: Joe Battiata

Figure 1: *View of riser structure and standing water*

Figure 2: *Close-up view of extended detention orifice and trash rack (water surface at the invert of the orifice)*

Description: Linda Lane Extended includes several different stormwater quality BMPs. This basin was designed as an extended detention basin in accordance with the VA SWM Handbook (Blue Book). As shown in Figures 1 & 2, the basin has been "over-excavated" such that there is ponding water below the elevation of the outlet. The City indicated that the basin may have been built with excess storage volume.

Proposed Retrofit: Either the extended detention volume can be converted to a wetland cell, or the basin can be excavated. Minor modifications to the riser structure will be required. In order to "convert" this basin, the storage volume needed to maintain compliance with the channel and flood protection requirements must be assessed against what was actually built (and may require a survey to verify the current volume). It may also be worth assessing the basin to determine if it meets the new stormwater requirements.

H50: Old South High St


H50
S HIGH ST
S HIGH ST
OLD SOUTH HIGH ST
CANTRELL AVE
1324'
1322'
1318'
1316'
1312'
1310'
1308'
1306'
1304'
1302'
1300'
1298'
1296'
1294'
1292'
1290'
1314'
H50: Old South High St
Retrofit IDs
Drainage Areas
Parcels
Existing BMPs
Contours
Streams
N
Feet
0
50
100
Center for Watershed Protection
Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

H50: Old South High St

Score: 39
Rank: 17
Investigators: Joe Battiata, Thanh Dang

Figure 1: *Dead end of Old South High Street. Block drainage inlets to force runoff towards camera.*

Figure 2: *Area of proposed bioretention retrofit between Old South High Street and South High Street. Picture taken from culvert opening under Cantrell Ave.*

Description: The Old South High Street was cut by the construction of the new intersection of Cantrell Ave and South High Street. The resulting dead end at the Cantrell Ave embankment (Figure 1) is served by two drainage inlets that connect to a drainage system that serves the new roadway alignment. A culvert under Cantrell Ave was also installed to capture the surface drainage from the green space between the new South High Street and Old South High Street (Figure 2). This culvert can serve as the overflow for the proposed retrofit located in the green space (Figure 2).

Proposed Retrofit: The proposed retrofit will capture runoff from approximately 1.5 acres of Old South High Street and portions of the adjacent lots (57% impervious). A diversion berm of asphalt is required to drain the runoff from the dead end street and bypass the existing inlets while also preserving access to the existing driveway (Figure 1). The bioretention underdrain can be connected into the existing curb inlet shown in Figure 1 (with an upturned elbow if needed), and the overflow can be directed to the existing culvert under Cantrell Ave.

These improvements can be incorporated into improving pedestrian movement from Old South High Street towards the intersection of South High Street and Cantrell Ave. The steps shown in the background of Figure 1 are adequate for those travelling west on Cantrell Ave; however, any pedestrians travelling towards the JMU Campus cut across the cul-de-sac and the grass area to the intersection (observed numerous times during the site assessment).

WATERSHED:	SUBWATERSHED:	UNIQUE SITE ID: H50	
DATE: 3/20/13	ASSESSED BY:	CAMERA ID:	PICTURES:
GPS ID:	LMK ID:	LAT:	LONG:

SITE DESCRIPTION

Name: OLD SOUTH HIGH STREET
Address: OLD SOUTH HIGH STREET AT CANTRELL AVE DEAD END

Ownership: ☒ Public ☐ Private ☐ Unknown
If Public, Government Jurisdiction: ☐ Local ☐ State ☐ DOT ☐ Other:

Corresponding USSR/USA Field Sheet? ☐ Yes ☒ No If yes, Unique Site ID: H50

Proposed Retrofit Location:

Storage
- ☐ Existing Pond
- ☐ Below Outfall
- ☒ In Road ROW
- ☐ Other:
- ☒ Above Roadway Culvert
- ☐ In Conveyance System
- ☐ Near Large Parking Lot

On-Site
- ☐ Hotspot Operation
- ☐ Small Parking Lot
- ☒ Individual Street
- ☐ Underground
- ☐ Individual Rooftop
- ☐ Small Impervious Area
- ☐ Landscape / Hardscape
- ☐ Other:

DRAINAGE AREA TO PROPOSED RETROFIT

Drainage Area ≈ 1.59 Ac
Imperviousness ≈ 57 %
Impervious Area ≈ 0.91

Notes:

Drainage Area Land Use:
- ☒ Residential
  - ☒ SFH (< 1 ac lots)
  - ☐ SFH (> 1 ac lots)
  - ☐ Townhouses
  - ☐ Multi-Family
- ☐ Commercial
- ☐ Institutional
- ☐ Industrial
- ☐ Transport-Related
- ☐ Park
- ☐ Undeveloped
- ☐ Other:

EXISTING STORMWATER MANAGEMENT

Existing Stormwater Practice: ☐ Yes ☒ No ☐ Possible
If Yes, Describe:

Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:
Existing Street Width (if applicable):

OLDER HOMES - SET CLOSE TO ROAD, NARROW RESIDENTIAL STREET W/ SIDEWALK BOTH SIDES.

Existing Head Available:
4 ft Less depth of BIORETENTION SURFACE AREA

Note where points are measured from: (i.e. street elevation to catch basin invert, manhole rim to catch basin invert, other)

PROPOSED RETROFIT

Purpose of Retrofit:
☒ Water Quality ☐ Recharge ☐ Channel Protection ☐ Flood Control
☒ Demonstration / Education ☐ Repair ☐ Other:_____

Retrofit Volume Computations - Target Storage:

Retrofit Volume Computations - Available Storage:

SOME EXCAVATION REQ'D

Proposed Retrofit Practice: (Runoff Reduction)
☐ Disconnection ☒ Bioretention ☐ Bio Swale
☐ Expanded Tree Pit ☐ Infiltration ☐ Green Roof
☐ Permeable Pavement ☐ Rainwater Harvesting

Proposed Retrofit Practice: (Stormwater Treatment)
☐ Constructed Wetland ☐ Wet Swale ☐ Wet Pond
☐ Filtering Practice ☐ Proprietary:_____
☐ Other: _____

Retrofit Category (as defined by Chesapeake Bay Program):
☒ New BMP ☐ BMP Enhancement ☐ BMP Restoration ☐ BMP Conversion ☐ Not CBP-approved

Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance:

Available Width:	*
Available Length:	*
Available Area:	2,300 ft
Ponding Depth:	12"
Soil Depth:	18"

VARIABLE

SITE CONSTRAINTS

Adjacent Land Use:
☒ Residential ☐ Commercial ☐ Institutional
☐ Industrial ☐ Transport-Related ☐ Park
☐ Undeveloped ☐ Other:_____
Possible Conflicts Due to Adjacent Land Use? ☐ Yes ☐ No
If Yes, Describe:

Access:
☒ No Constraints
Constrained due to
☐ Slope ☐ Space
☐ Utilities ☐ Tree Impacts
☐ Structures ☐ Property
Ownership
☐ Other:_____

Conflicts with Existing Utilities:

	Yes	Possible/ Modifiable	No	Unknown
Sewer:	☐	☐	☒	☐
Water:	☐	☐	☒	☐
Gas:	☐	☐	☒	☐
Electric to Streetlights:	☐	☐	☒	☐
Other:	☐	☐	☒	☐

Potential Permitting Factors:

Dam Safety Permits Necessary	☐ Probable	☒ Not Probable
Impacts to Wetlands	☐ Probable	☒ Not Probable
Impacts to a Stream	☐ Probable	☒ Not Probable
Floodplain Fill	☐ Probable	☒ Not Probable
Impacts to Forests	☐ Probable	☒ Not Probable
Impacts to Specimen Trees	☐ Probable	☒ Not Probable

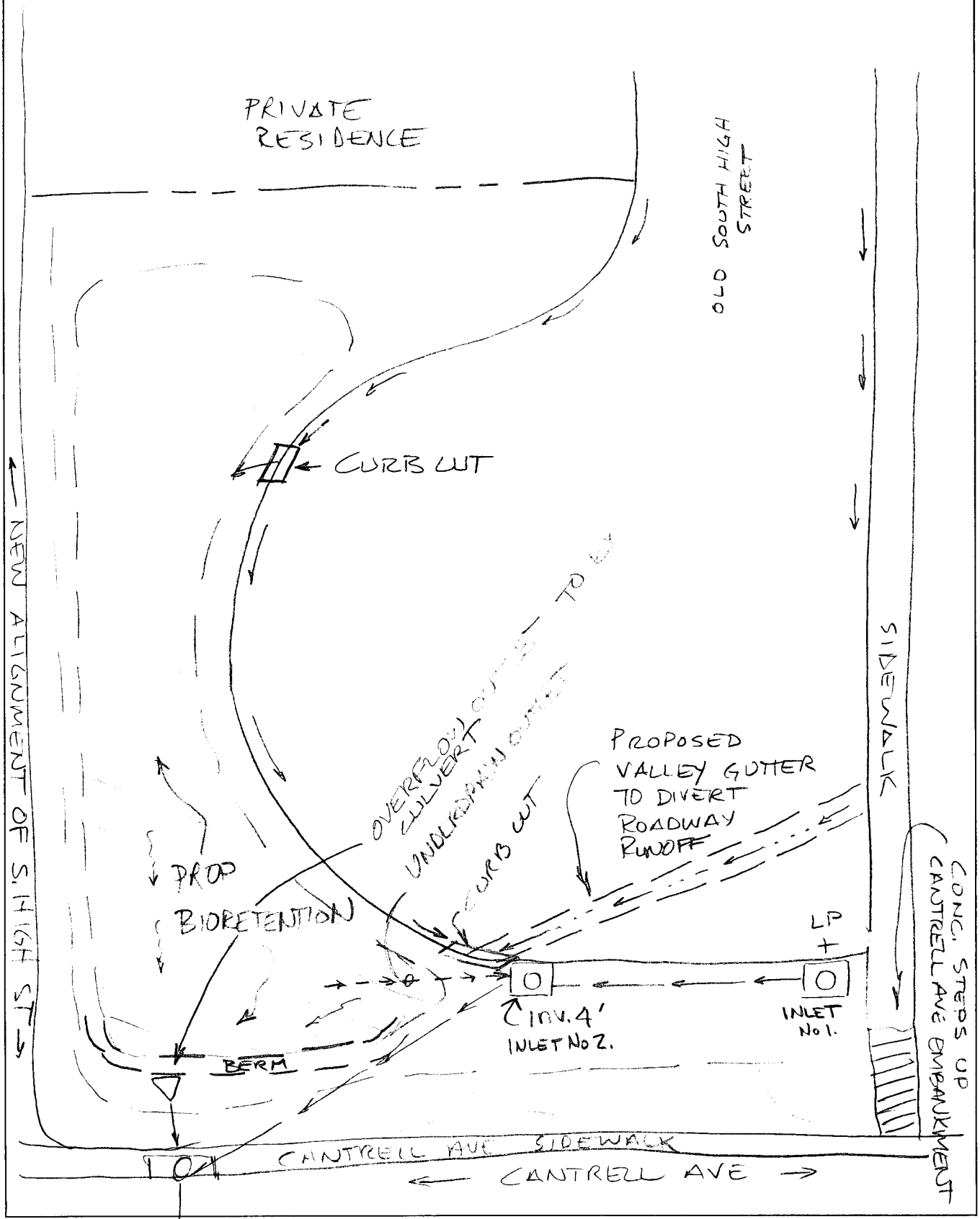
How many?_____
Approx. DBH_____

Other factors:_____

Soils:

Soil auger test holes:	☐ Yes	☒ No
Evidence of poor infiltration (clays, fines):	☐ Yes	☒ No
Evidence of shallow bedrock:	☐ Yes	☒ No
Evidence of high water table (gleying, saturation):	☐ Yes	☒ No

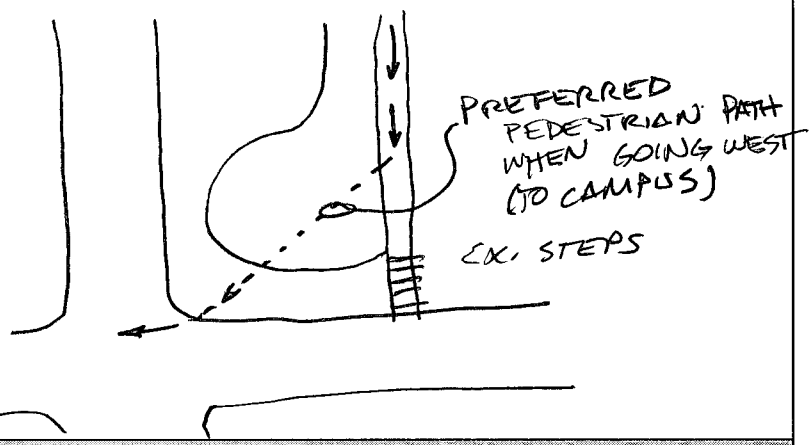
SKETCH


PRIVATE RESIDENCE
OLD SOUTH HIGH STREET
CURB CUT
NEW ALIGNMENT OF S. HIGH ST
OVERFLOW CULVERT
UNDERDRAIN OUTLET
TO
PROPOSED VALLEY GUTTER TO DIVERT ROADWAY RUNOFF
CURB CUT
SIDEWALK
PROP BIORETENTION
LP
INV. 4'
INLET No 2.
INLET No 1.
CONC. STEPS UP CANTRELL AVE EMBANKMENT
BERM
CANTRELL AVE SIDEWALK
CANTRELL AVE

DESIGN OR DELIVERY NOTES

- VALLEY GUTTER TO BE CUT INTO EX. PAVMT TO DIVERT RUNOFF TO OTHER SIDE OF CIRCLE (BYPASS BOTH CURB INLETS)

- PEDESTRIAN PATTERN - PEOPLE GO DIRECTLY TO INTERSECTION OF CANTRELL & SO. MAIN (AND DONT USE EX STEPS) DESIGN CAN INCLUDE PEDESTRIAN PATH OVER/THRU BIORETENTION AREA



FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT

- ☐ Confirm property ownership
- ☐ Confirm drainage area
- ☐ Confirm drainage area impervious cover
- ☐ Confirm volume computations
- ☐ Complete concept sketch
- ☐ Obtain existing stormwater practice as-builts
- ☐ Obtain site as-builts
- ☒ Obtain detailed topography
- ☐ Obtain utility mapping
- ☒ Confirm storm drain invert elevations
- ☒ Confirm soil types
- ☐ Other: _____

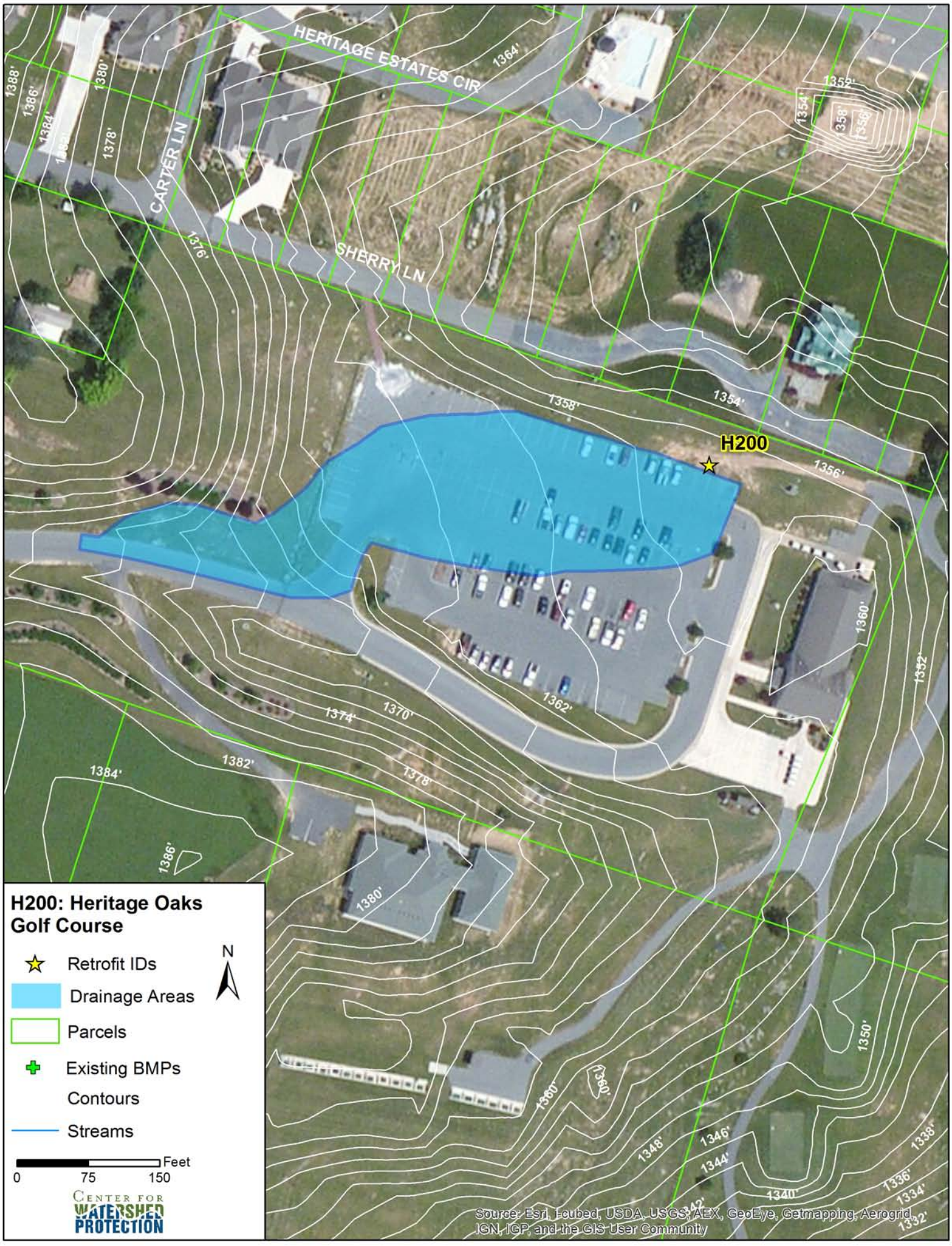
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS

- INLET No.1 + 2 CAN REMAIN AS STREET OVERFLOW.
- VALLEY GUTTER REDIRECTS FLOW TO NEW CURB CUT
-

SITE CANDIDATE FOR FURTHER INVESTIGATION:	☒ YES	☐ NO	☐ MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	☒ YES	☐ NO	☐ MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	☐ YES	☐ NO	☐ MAYBE

IF YES, TYPE(S): _____

H200: Heritage Oaks Golf Course


HERITAGE ESTATES CIR
CARTER LN
SHERRY LN
H200
1388'
1386'
1384'
1380'
1378'
1376'
1364'
1359'
1354'
1358'
1356'
1360'
1352'
1362'
1374'
1370'
1382'
1384'
1378'
1386'
1380'
1350'
1360'
1348'
1346'
1344'
1342'
1340'
1338'
1336'
1334'
1332'
H200: Heritage Oaks Golf Course
Retrofit IDs
Drainage Areas
Parcels
Existing BMPs
Contours
Streams
N
Feet
0
75
150
Center for Watershed Protection
Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

H200: Heritage Oaks Golf Course

Score: 37
Rank: 21
Investigators: Thanh Dang, David Hirschman

NO IMAGE AVAILABLE

Description: The approximately 1-acre parking lot drains to 3 inlets at the east end of the parking lot, closest to the clubhouse building. There is a grass area between the parking lot and fence on the property boundary.

Proposed Retrofit: Much of the runoff flows to the inlet at the northeast corner of the parking lot (closest to the grass area). This runoff can be diverted to a bioretention area constructed in the grass area. There is adequate space to build a 40' by 80' bioretention, but only 40' by 55' is needed to capture runoff from 1" of rainfall. The underdrain can be tied into the existing inlet.

H200-Alt: Heritage Oaks Golf Course Regenerative Conveyance

Score: 100

Rank: Outlier – top rank

Investigators: Thanh Dang, David Hirschman

Figure 1: *Eroded ditch below existing outfall in golf course*

Description: The parking lot and some of the golf course drain to an existing drainage swale south of the parking lot and clubhouse (Figure 1). There is some existing erosion within the swale, and there are many large limestone boulders lining the swale.

Proposed Retrofit: This retrofit is an alternative to H200, which is a bioretention area that would treat only the parking lot. This concept has a much larger drainage area (approximately 100 acres compared to just over 1 acre for H200) and would treat runoff from the golf course in addition to the parking lot and clubhouse. The retrofit concept is a "Regenerative Stormwater Conveyance" (RSC) system. This system uses boulder weirs, riffles, and an underlying bed of sand and woodchips to treat and infiltrate runoff as it moves down the swale. The RSC could be made to look much like the existing swale (without the erosion) and could likely reuse some of the existing boulders.

Retrofit Reconnaissance Investigation **RRI**
Updated: 3/13/2013

WATERSHED:	SUBWATERSHED:	UNIQUE SITE ID: H200	
DATE: 3/21/13	ASSESSED BY: DJH LFM	CAMERA ID:	PICTURES: 97-100 RSC Site
GPS ID:	LMK ID:	LAT:	LONG:

SITE DESCRIPTION

Name: Heritage Oaks Golfcourse
Address: Gaithers Church Rd

Ownership: ☑ Public ☐ Private ☐ Unknown
If Public, Government Jurisdiction: ☑ Local ☐ State ☐ DOT ☐ Other:

Corresponding USSR/USA Field Sheet? ☐ Yes ☐ No If yes, Unique Site ID:

Proposed Retrofit Location:

Storage
- ☐ Existing Pond
- ☐ Below Outfall
- ☐ In Road ROW
- ☐ Other:
- ☐ Above Roadway Culvert
- ☐ In Conveyance System
- ☐ Near Large Parking Lot

On-Site
- ☐ Hotspot Operation
- ☒ Small Parking Lot
- ☐ Individual Street
- ☐ Underground
- ☐ Individual Rooftop
- ☐ Small Impervious Area
- ☐ Landscape / Hardscape
- ☐ Other:

DRAINAGE AREA TO PROPOSED RETROFIT

Drainage Area ≈ 1.08
Imperviousness ≈ 82 %
Impervious Area ≈ 0.89

Notes:

Drainage Area Land Use:
- ☐ Residential
  - ☐ SFH (< 1 ac lots)
  - ☐ SFH (> 1 ac lots)
  - ☐ Townhouses
  - ☐ Multi-Family
- ☐ Commercial
- ☒ Institutional
- ☐ Industrial
- ☐ Transport-Related
- ☐ Park
- ☐ Undeveloped
- ☐ Other:

EXISTING STORMWATER MANAGEMENT

Existing Stormwater Practice: ☐ Yes ☒ No ☐ Possible
If Yes, Describe:

Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:
Existing Street Width (if applicable):

parking lot drains to 3 inlets
sheet flow to northside of lot where proposed bioretention

Existing Head Available:
3.54 ft

Note where points are measured from: (i.e. street elevation to catch basin invert, manhole rim to catch basin invert, other)
~~Manhole rim to invert~~ INVERT TO PAVEMENT SURFACE → Use 4.0 in Arlington Table

PROPOSED RETROFIT

Purpose of Retrofit:
☒ Water Quality ☐ Recharge ☐ Channel Protection ☐ Flood Control
☒ Demonstration / Education ☐ Repair ☐ Other:_____

Retrofit Volume Computations - Target Storage:

Retrofit Volume Computations - Available Storage:

Proposed Retrofit Practice: (Runoff Reduction)
☐ Disconnection ☒ Bioretention ☐ Bio Swale
☐ Expanded Tree Pit ☐ Infiltration ☐ Green Roof
☐ Permeable Pavement ☐ Rainwater Harvesting

Proposed Retrofit Practice: (Stormwater Treatment)
☐ Constructed Wetland ☐ Wet Swale ☐ Wet Pond
☐ Filtering Practice ☐ Proprietary:_____
☐ Other: _____

Retrofit Category (as defined by Chesapeake Bay Program):
☒ New BMP ☐ BMP Enhancement ☐ BMP Restoration ☐ BMP Conversion ☐ Not CBP-approved

Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance:

INSTALL BIORENTENTION IN EXISTING GRASSY AREA NEXT TO PARKING LOT. UNDERDRAIN TO TIE INTO EXISTING INLET

Available Width:	40'
Available Length:	80'
Available Area:	
Ponding Depth:	
Soil Depth:	

→ Note from spread sheet – Only need 40'x55' to capture 1.0", so spreadsheet uses that dimension. It could be oversized if desirable.

SITE CONSTRAINTS

Adjacent Land Use:
☐ Residential ☐ Commercial ☐ Institutional
☐ Industrial ☐ Transport-Related ☐ Park
☐ Undeveloped ☐ Other:_____
Possible Conflicts Due to Adjacent Land Use? ☑ Yes ☐ No
If Yes, Describe:
NEED TO RELOCATE DRIVE AREA

Access:
☒ No Constraints
Constrained due to
☐ Slope ☐ Space
☐ Utilities ☐ Tree Impacts
☐ Structures ☐ Property
Ownership
☐ Other:_____

Conflicts with Existing Utilities:

	Yes	Possible/ Modifiable	No	Unknown
Sewer:	☐	☐	☒	☐
Water:	☐	☐	☒	☐
Gas:	☐	☐	☒	☐
Electric to Streetlights:	☐	☐	☒	☐
Other:	☐	☐	☒	☐

_____

Potential Permitting Factors:

Dam Safety Permits Necessary	☐ Probable	☒ Not Probable
Impacts to Wetlands	☐ Probable	☒ Not Probable
Impacts to a Stream	☐ Probable	☒ Not Probable
Floodplain Fill	☐ Probable	☒ Not Probable
Impacts to Forests	☐ Probable	☒ Not Probable
Impacts to Specimen Trees	☐ Probable	☒ Not Probable

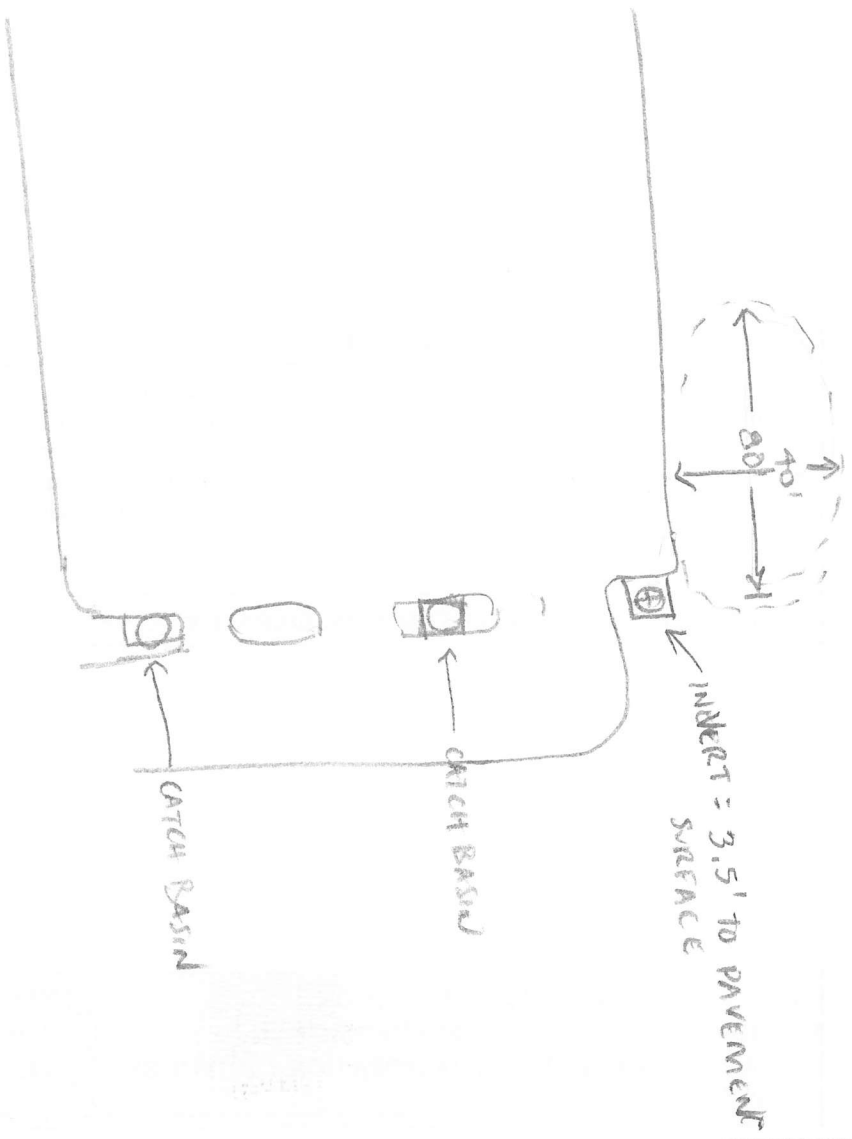
How many?_____
Approx. DBH_____

Other factors:_____
_____

Soils:

Soil auger test holes:	☐ Yes	☒ No
Evidence of poor infiltration (clays, fines):	☐ Yes	☒ No
Evidence of shallow bedrock:	☐ Yes	☒ No
Evidence of high water table (gleying, saturation):	☐ Yes	☒ No

SKETCH



DESIGN OR DELIVERY NOTES

FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT

- ☐ Confirm property ownership
- ☐ Confirm drainage area
- ☐ Confirm drainage area impervious cover
- ☐ Confirm volume computations
- ☐ Complete concept sketch
- ☐ Obtain existing stormwater practice as-builts
- ☐ Obtain site as-builts
- ☐ Obtain detailed topography
- ☐ Obtain utility mapping
- ☐ Confirm storm drain invert elevations
- ☐ Confirm soil types
- ☐ Other:_____

INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS

SITE CANDIDATE FOR FURTHER INVESTIGATION:	☐ YES	☐ NO	☐ MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	☐ YES	☐ NO	☐ MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	☐ YES	☐ NO	☐ MAYBE

IF YES, TYPE(S):_____

H201: Fire Station #3


1476'
1474'
1474'
1472'
1478'
1482'
1486'
1488'
1480'
1486'
1486'
H201
1476'
DEYERLE AVE
LUCY DR
1480'
1480'
H201: Fire Station #3
Retrofit IDs
Drainage Areas
Parcels
Existing BMPs
Contours
Streams
N
Feet
0
50
100
CENTER FOR WATERSHED PROTECTION
Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

H201: Fire Station #3

Score: 41

Rank: 14

Investigators: Thanh Dang, David Hirschman, Lisa Fraley-McNeal

Figure 1: *Existing inlet at edge of parking lot*

Description: The parking lot and building drain to the existing inlet in a depressed grassy area (Figure 1).

Proposed Retrofit: The inlet can be raised and the existing depression converted to a triangle-shaped bioretention area. The underdrain can go into the existing structure. The bioretention area would be approximately 35’ long and range in width from 9’ at the tip of the triangle (closest to the building) and 12’ at the wide end (closest to the road).

RRI

WATERSHED:	SUBWATERSHED:	UNIQUE SITE ID: H-201	
DATE: 3/21/13	ASSESSED BY:	CAMERA ID:	PICTURES: 106-108
GPS ID:	LMK ID:	LAT:	LONG:

SITE DESCRIPTION

Name: FIRE STATION #3
Address: LUCY DRIVE

Ownership: ☑ Public ☐ Private ☐ Unknown
If Public, Government Jurisdiction: ☑ Local ☐ State ☐ DOT ☐ Other:_____

Corresponding USSR/USA Field Sheet? ☐ Yes ☐ No If yes, Unique Site ID:_____

Proposed Retrofit Location:

Storage
- ☐ Existing Pond
- ☐ Below Outfall
- ☐ In Road ROW
- ☐ Other:_____
- ☐ Above Roadway Culvert
- ☐ In Conveyance System
- ☐ Near Large Parking Lot

On-Site
- ☐ Hotspot Operation
- ☑ Small Parking Lot
- ☐ Individual Street
- ☐ Underground
- ☐ Individual Rooftop
- ☐ Small Impervious Area
- ☐ Landscape / Hardscape
- ☐ Other:_____

DRAINAGE AREA TO PROPOSED RETROFIT

Drainage Area ≈ 0.45
Imperviousness ≈ 75 %
Impervious Area ≈ 0.28

Notes:

Drainage Area Land Use:
- ☐ Residential
  - ☐ SFH (< 1 ac lots)
  - ☐ SFH (> 1 ac lots)
  - ☐ Townhouses
  - ☐ Multi-Family
- ☐ Commercial
- ☒ Institutional
- ☐ Industrial
- ☐ Transport-Related
- ☐ Park
- ☐ Undeveloped
- ☐ Other:_____

EXISTING STORMWATER MANAGEMENT

Existing Stormwater Practice: ☐ Yes ☒ No ☐ Possible
If Yes, Describe:

Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:
Existing Street Width (if applicable):_____

PARKING LOT "SHEET FLOW" TO INLET IN GRASSY AREA

FIRE DEPT VEHICLE WASHWATER

Existing Head Available:	Note where points are measured from: (i.e. street elevation to catch basin invert, manhole rim to catch basin invert, other)
3.9'	FROM TOP OF INLET TO GROUND SURFACE

PROPOSED RETROFIT

Purpose of Retrofit:
☒ Water Quality ☐ Recharge ☐ Channel Protection ☐ Flood Control
☐ Demonstration / Education ☐ Repair ☐ Other:_____

Retrofit Volume Computations - Target Storage:

Retrofit Volume Computations - Available Storage:

Proposed Retrofit Practice: (Runoff Reduction)
☐ Disconnection ☒ Bioretention ☐ Bio Swale
☐ Expanded Tree Pit ☐ Infiltration ☐ Green Roof
☐ Permeable Pavement ☐ Rainwater Harvesting

Proposed Retrofit Practice: (Stormwater Treatment)
☐ Constructed Wetland ☐ Wet Swale ☐ Wet Pond
☐ Filtering Practice ☐ Proprietary:_____
☐ Other: _____

Retrofit Category (as defined by Chesapeake Bay Program):
☒ New BMP ☐ BMP Enhancement ☐ BMP Restoration ☐ BMP Conversion ☐ Not CBP-approved

Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance:

Available Width:	9
Available Length:	34
Available Area:	
Ponding Depth:	12"
Soil Depth:	24"

SITE CONSTRAINTS

Adjacent Land Use:
☐ Residential ☒ Commercial ☒ Institutional
☐ Industrial ☐ Transport-Related ☐ Park
☐ Undeveloped ☐ Other:_____
Possible Conflicts Due to Adjacent Land Use? ☐ Yes ☒ No
If Yes, Describe:

Access:
☒ No Constraints
Constrained due to
☐ Slope ☐ Space
☐ Utilities ☐ Tree Impacts
☐ Structures ☐ Property
Ownership
☐ Other:_____

Conflicts with Existing Utilities:

	Yes	Possible/ Modifiable	No	Unknown
Sewer:	☐	☐	☒	☐
Water:	☐	☒	☐	☐
Gas:	☐	☐	☐	☒
Electric to Streetlights:	☐	☐	☐	☐
Other:	☐	☐	☒	☐

_____

Potential Permitting Factors:

Dam Safety Permits Necessary	☐ Probable	☒ Not Probable
Impacts to Wetlands	☐ Probable	☒ Not Probable
Impacts to a Stream	☐ Probable	☒ Not Probable
Floodplain Fill	☐ Probable	☒ Not Probable
Impacts to Forests	☐ Probable	☒ Not Probable
Impacts to Specimen Trees	☐ Probable	☒ Not Probable

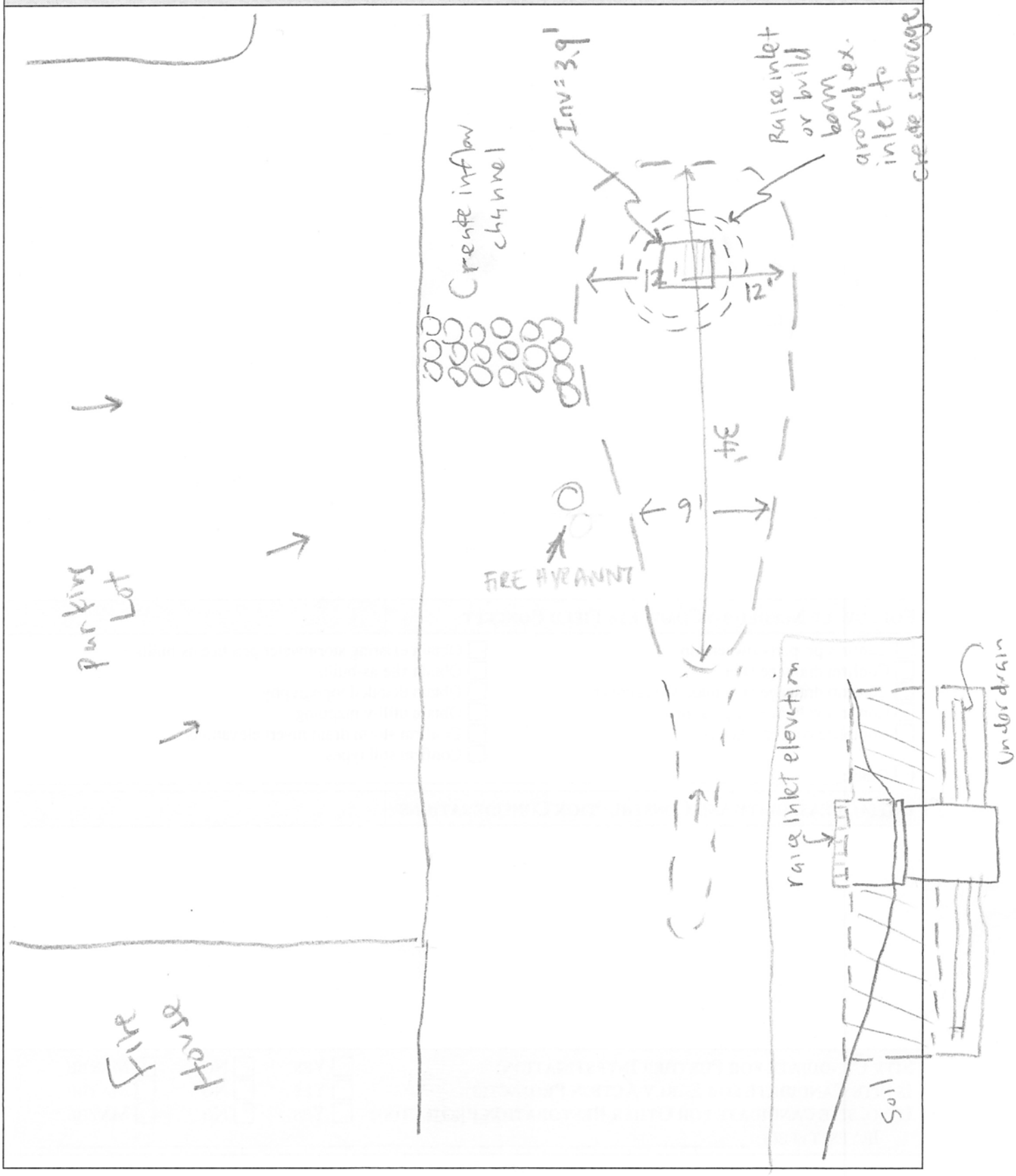
How many?_____
Approx. DBH_____

Other factors:_____
_____

Soils:

Soil auger test holes:	☐ Yes	☒ No
Evidence of poor infiltration (clays, fines):	☐ Yes	☒ No
Evidence of shallow bedrock:	☐ Yes	☐ No
Evidence of high water table (gleying, saturation):	☐ Yes	☒ No

SKETCH


Inv=39'
Raise inlet or build berm around ex. inlet to create storage
Create inflow channel
12'
12'
37'
9'
FIRE HYDRANT
Parking Lot
Tree line
Raise inlet elevation
Underdrain
Soil

DESIGN OR DELIVERY NOTES

FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT

- ☐ Confirm property ownership
- ☐ Confirm drainage area
- ☐ Confirm drainage area impervious cover
- ☐ Confirm volume computations
- ☐ Complete concept sketch
- ☐ Obtain existing stormwater practice as-builts
- ☐ Obtain site as-builts
- ☐ Obtain detailed topography
- ☐ Obtain utility mapping
- ☐ Confirm storm drain invert elevations
- ☐ Confirm soil types
- ☐ Other:_____

INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS

SITE CANDIDATE FOR FURTHER INVESTIGATION:	☐ YES	☐ NO	☐ MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	☐ YES	☐ NO	☐ MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	☐ YES	☐ NO	☐ MAYBE

IF YES, TYPE(S):_____