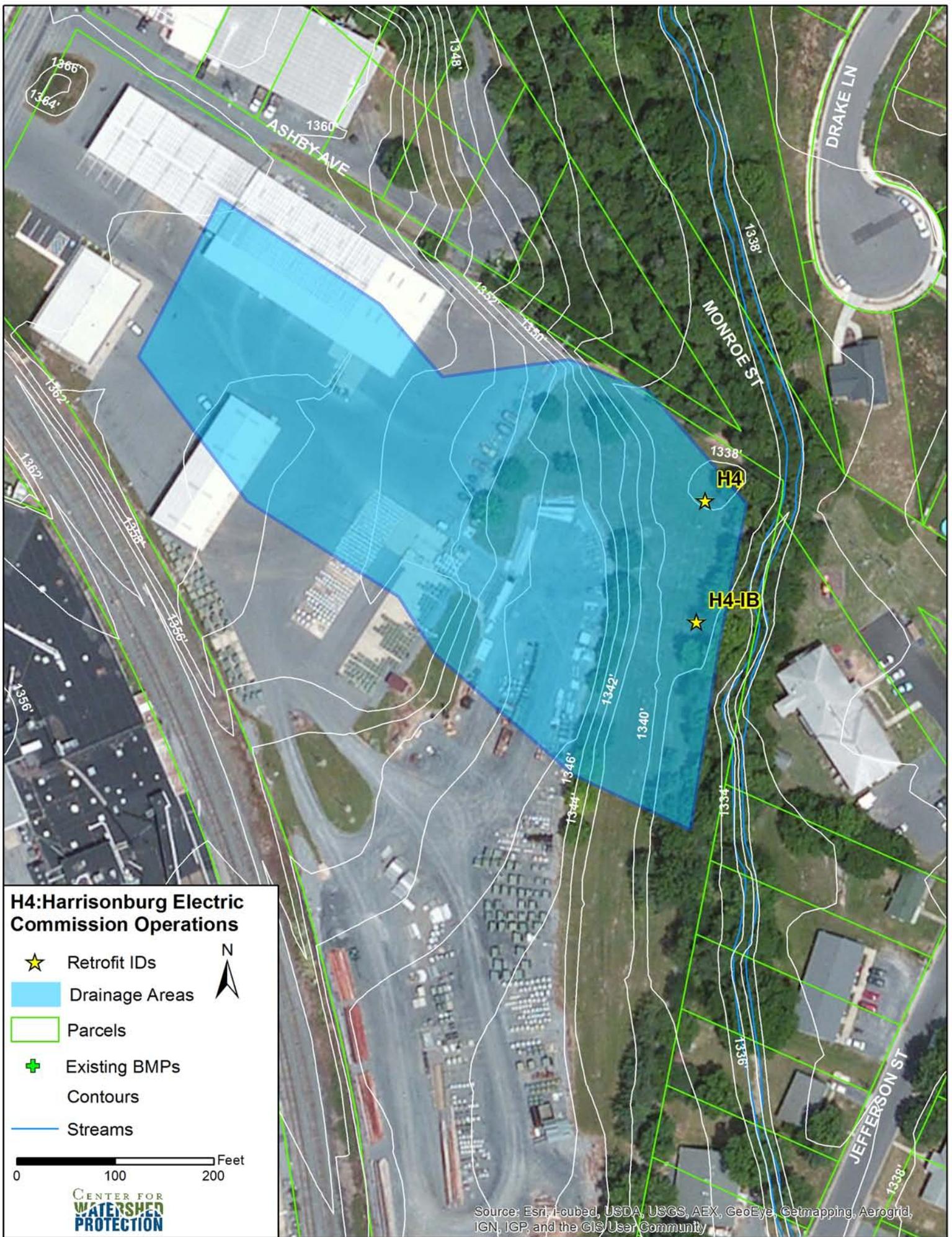
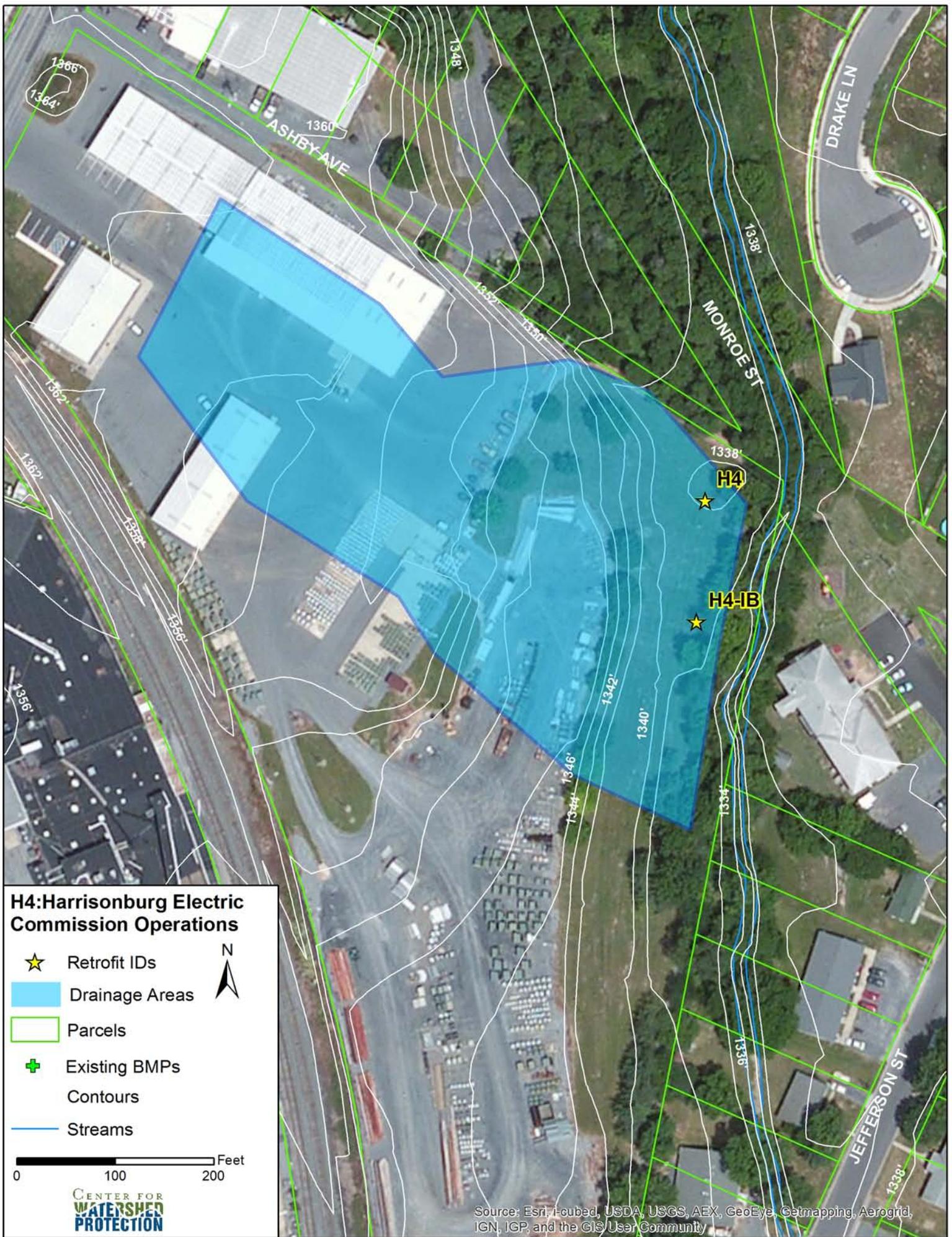


## **APPENDIX D: RETROFIT MAPS, SUMMARIES, AND FIELD FORMS**

This appendix includes the maps, summaries, and field forms for the retrofit concepts.

# **H4: Harrisonburg Electric Commission Operations**



## H4: Harrisonburg Electric Commission Operations

Score: 48

Rank: 8

Investigators: Rick Altizer, Chris Swann



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



**Figure 1:** Bioretention area

**Description:** This site is approximately 2.6 acres and is the location for storage and operations for the Harrisonburg Electric Commission (Figure 1). It consists of buildings, asphalt parking lots, and gravel parking and storage areas. A large area near the edge of the property is currently maintained in a mowed grass state with some trees. This area is in the 100-year floodplain of Blacks Run.

**Proposed Retrofit:** The concept is to treat the runoff from the impervious area through a combination of projects. The first is through enhancing the tree cover on the site. Trees can be replanted in the floodplain area along the fence line, 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.

The second project would be developing a 30' x 30' bioretention system to be located at the base of the grassy slope (Figure 2). The practice would discharge into the stream buffer after treatment. There is also an opportunity to provide pretreatment by placing a swale with some checkdams along the side fence of the property prior to runoff entering the larger bioretention system at the base of the hill.



<b>WATERSHED/SUBSHED:</b> HARRISONBURG		<b>DATE:</b> 2/22/13	<b>ASSESSED BY:</b> CPS/PA				
<b>SURVEY REACH:</b>		<b>TIME:</b> ____:____ AM/PM	<b>PHOTO ID: (Camera-Pic #)</b> #				
<b>SITE ID: (Condition-#)</b>	<b>START</b> LAT ____ ° ____ ' ____ " LONG ____ ° ____ ' ____ " LMK ____	<b>GPS: (Unit ID)</b>					
<b>IB- H4-1B-1</b>	<b>END</b> LAT ____ ° ____ ' ____ " LONG ____ ° ____ ' ____ " LMK ____						
<b>IMPACTED BANK:</b> <input type="checkbox"/> LT <input checked="" type="checkbox"/> RT <input type="checkbox"/> Both	<b>REASON INADEQUATE:</b> <input type="checkbox"/> Lack of vegetation <input checked="" type="checkbox"/> Too narrow <input type="checkbox"/> Widespread invasive plants <input type="checkbox"/> Recently planted <input type="checkbox"/> Other:						
<b>LAND USE:</b> (Facing downstream) LT Bank	Private <input type="checkbox"/>	Institutional <input type="checkbox"/>	Golf Course <input type="checkbox"/>	Park <input type="checkbox"/>	Other Public <input type="checkbox"/>		
RT Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<b>DOMINANT LAND COVER:</b>	Paved <input type="checkbox"/>	Bare ground <input type="checkbox"/>	Turf/lawn <input type="checkbox"/>	Tall grass <input type="checkbox"/>	Shrub/scrub <input type="checkbox"/>	Trees <input type="checkbox"/>	Other <input type="checkbox"/>
LT Bank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RT Bank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>INVASIVE PLANTS:</b>	<input checked="" type="checkbox"/> None <input type="checkbox"/> Rare <input type="checkbox"/> Partial coverage <input type="checkbox"/> Extensive coverage <input type="checkbox"/> unknown						
<b>STREAM SHADE PROVIDED?</b>	<input checked="" type="checkbox"/> None <input type="checkbox"/> Partial <input type="checkbox"/> Full			<b>WETLANDS PRESENT?</b> <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Unknown			
<b>POTENTIAL RESTORATION CANDIDATE</b> <input checked="" type="checkbox"/> Active reforestation <input type="checkbox"/> Greenway design <input type="checkbox"/> Natural regeneration <input type="checkbox"/> Invasives removal <input type="checkbox"/> no <input type="checkbox"/> Other:							
<b>RESTORABLE AREA</b>		<b>REFORESTATION POTENTIAL:</b> (Circle #)	Impacted area on public land where the riparian area does not appear to be used for any specific purpose; plenty of area available for planting	Impacted area on either public or private land that is presently used for a specific purpose; available area for planting adequate	Impacted area on private land where road; building encroachment or other feature significantly limits available area for planting	4 3 2 1	
Length (ft):	LT BANK <u>0</u> RT <u>300</u>						
Width (ft):	<u>0</u> <u>40</u>	(5)					
<b>POTENTIAL CONFLICTS WITH REFORESTATION</b> <input type="checkbox"/> Widespread invasive plants <input type="checkbox"/> Potential contamination <input type="checkbox"/> Lack of sun <input type="checkbox"/> Poor/unsafe access to site <input type="checkbox"/> Existing impervious cover <input type="checkbox"/> Severe animal impacts (deer, beaver) <input type="checkbox"/> Other:							

**NOTES:**

PLANTING INSIDE FENCE ON  
 HARRISONBURG ELECTRIC COMMISSION SITE  
 AREA IS FLOODPLAIN  
 NO CONFLICTS WITH CURRENT USE



WATERSHED/SUBSHED: \_\_\_\_\_ DATE: \_\_\_/\_\_\_/\_\_\_ ASSESSED BY: \_\_\_\_\_

SURVEY REACH: \_\_\_\_\_ TIME: \_\_\_:\_\_\_ AM/PM PHOTO ID: (Camera-Pic #) \_\_\_\_\_ /#

SITE ID: (Condition-#) IB-_____	START	LAT	°	'	"	LONG	°	'	"	LMK	GPS: (Unit ID)
	END	LAT	°	'	"	LONG	°	'	"	LMK	

IMPACTED BANK:  LT  RT  Both REASON INADEQUATE:  Lack of vegetation  Too narrow  Widespread invasive plants  
 Recently planted  Other:

LAND USE: Private Institutional Golf Course Park Other Public  
 (Facing downstream) LT Bank     :  
 RT Bank     :

DOMINANT LAND COVER: Paved Bare ground Turf/lawn Tall grass Shrub/scrub Trees Other  
 LT Bank       :  
 RT Bank       :

INVASIVE PLANTS:  None  Rare  Partial coverage  Extensive coverage  unknown

STREAM SHADE PROVIDED?  None  Partial  Full WETLANDS PRESENT?  No  Yes  Unknown

POTENTIAL RESTORATION CANDIDATE  Active reforestation  Greenway design  Natural regeneration  Invasives removal  
 no  Other:

RESTORABLE AREA	REFORESTATION POTENTIAL: (Circle #)	Impacted area on public land where the riparian area does not appear to be used for any specific purpose; plenty of area available for planting	Impacted area on either public or private land that is presently used for a specific purpose; available area for planting adequate	Impacted area on private land where road; building encroachment or other feature significantly limits available area for planting
		5	4	3

LT BANK RT  
 Length (ft): \_\_\_\_\_  
 Width (ft): \_\_\_\_\_

POTENTIAL CONFLICTS WITH REFORESTATION  Widespread invasive plants  Potential contamination  Lack of sun  
 Poor/unsafe access to site  Existing impervious cover  Severe animal impacts (deer, beaver)  Other:

NOTES:



WATERSHED: <u>HARRISONBURG</u>		SUBWATERSHED: <u>HARRISONBURG</u>		UNIQUE SITE ID: <u>H4</u>	
DATE: <u>3/20/13</u>		ASSESSED BY: <u>CPS RA</u>		CAMERA ID: <u>OLYMPUS BLVE DAT</u>	
GPS ID:		LMK ID:		LONG:	
<b>SITE DESCRIPTION</b>					
Name: <u>HARRISONBURG ELECTRIC COMMISSION OPERATIONS</u>					
Address: <u>SULLIVAN TRACT 868N LIBERTY STREET</u>					
Ownership: <input checked="" type="checkbox"/> Public <input type="checkbox"/> Private <input type="checkbox"/> Unknown					
If Public, Government Jurisdiction: <input checked="" type="checkbox"/> Local <input type="checkbox"/> State <input type="checkbox"/> DOT <input type="checkbox"/> Other: _____					
Corresponding USSR/USA Field Sheet? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, Unique Site ID: _____					
<b>Proposed Retrofit Location:</b>					
<b>Storage</b>			<b>On-Site</b>		
<input type="checkbox"/> Existing Pond <input type="checkbox"/> Above Roadway Culvert			<input type="checkbox"/> Hotspot Operation <input type="checkbox"/> Individual Rooftop		
<input type="checkbox"/> Below Outfall <input type="checkbox"/> In Conveyance System			<input type="checkbox"/> Small Parking Lot <input type="checkbox"/> Small Impervious Area		
<input type="checkbox"/> In Road ROW <input type="checkbox"/> Near Large Parking Lot			<input type="checkbox"/> Individual Street <input type="checkbox"/> Landscape / Hardscape		
<input type="checkbox"/> Other: _____			<input checked="" type="checkbox"/> Other: <u>ALONG STREAM</u>		
<b>DRAINAGE AREA TO PROPOSED RETROFIT</b>					
Drainage Area ≈ <u>2.6</u>			<b>Drainage Area Land Use:</b>		
Imperviousness ≈ _____ %			<input type="checkbox"/> Residential <input checked="" type="checkbox"/> Institutional		
Impervious Area ≈ <u>1.74</u>			<input type="checkbox"/> SFH (< 1 ac lots) <input type="checkbox"/> Industrial		
Notes:			<input type="checkbox"/> SFH (> 1 ac lots) <input type="checkbox"/> Transport-Related		
			<input type="checkbox"/> Townhouses <input type="checkbox"/> Park		
			<input type="checkbox"/> Multi-Family <input type="checkbox"/> Undeveloped		
			<input type="checkbox"/> Commercial <input type="checkbox"/> Other: _____		
<b>EXISTING STORMWATER MANAGEMENT</b>					
Existing Stormwater Practice: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Possible					
If Yes, Describe:					
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance: Existing Street Width (if applicable): _____ <u>LARGE PARKING LOT AND STORAGE BLDGS</u> <u>SHEET FLOW TO GRASSY AREA</u>					
Existing Head Available:			Note where points are measured from: (i.e. street elevation to catch basin invert, manhole rim to catch basin invert, other)		
<u>N/A</u>					

**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:**

1. RIPARIAN REPLANTING ALONG FENCE AREA - SEE IB FORM  
 2. BIORETENTION AREA  
 3. GRASS SWALE

Available Width:	30	9
Available Length:	30	70
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:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Water:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Gas:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Electric to Streetlights:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Potential Permitting Factors:**

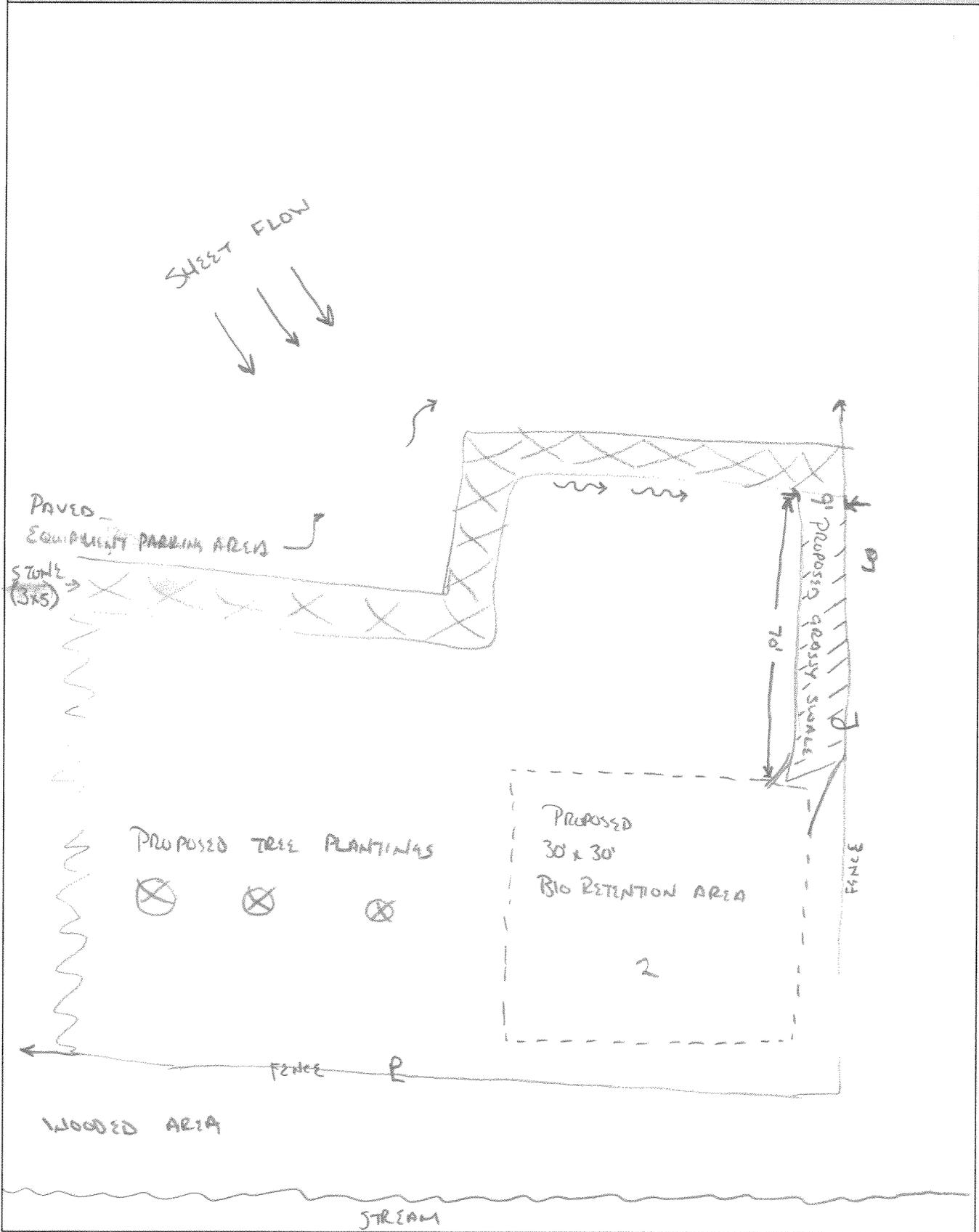
- Dam Safety Permits Necessary     Probable     Not Probable  
 Impacts to Wetlands     Probable     Not Probable  
 Impacts to a Stream     Probable     Not Probable  
 Floodplain Fill     Probable     Not Probable  
 Impacts to Forests     Probable     Not Probable  
 Impacts to Specimen Trees    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

- |   |  |
|---|--|
| <input type="checkbox"/> Confirm property ownership             | <input type="checkbox"/> Obtain existing stormwater practice as-builts |
| <input type="checkbox"/> Confirm drainage area                  | <input type="checkbox"/> Obtain site as-builts                         |
| <input type="checkbox"/> Confirm drainage area impervious cover | <input type="checkbox"/> Obtain detailed topography                    |
| <input type="checkbox"/> Confirm volume computations            | <input type="checkbox"/> Obtain utility mapping                        |
| <input checked="" type="checkbox"/> Complete concept sketch     | <input type="checkbox"/> Confirm storm drain invert elevations         |
|   | <input checked="" type="checkbox"/> Confirm soil types                 |
| <input type="checkbox"/> Other: _____                           |  |

**INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS**

- |  |   |  |                                |
|--|---|--|--------------------------------|
| <b>SITE CANDIDATE FOR FURTHER INVESTIGATION:</b>               | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO            | <input type="checkbox"/> MAYBE |
| <b>IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):</b>          | <input type="checkbox"/> YES            | <input checked="" type="checkbox"/> NO | <input type="checkbox"/> MAYBE |
| <b>IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):</b> | <input type="checkbox"/> YES            | <input checked="" type="checkbox"/> NO | <input type="checkbox"/> MAYBE |
| IF YES, TYPE(S): _____   |   |  |                                |

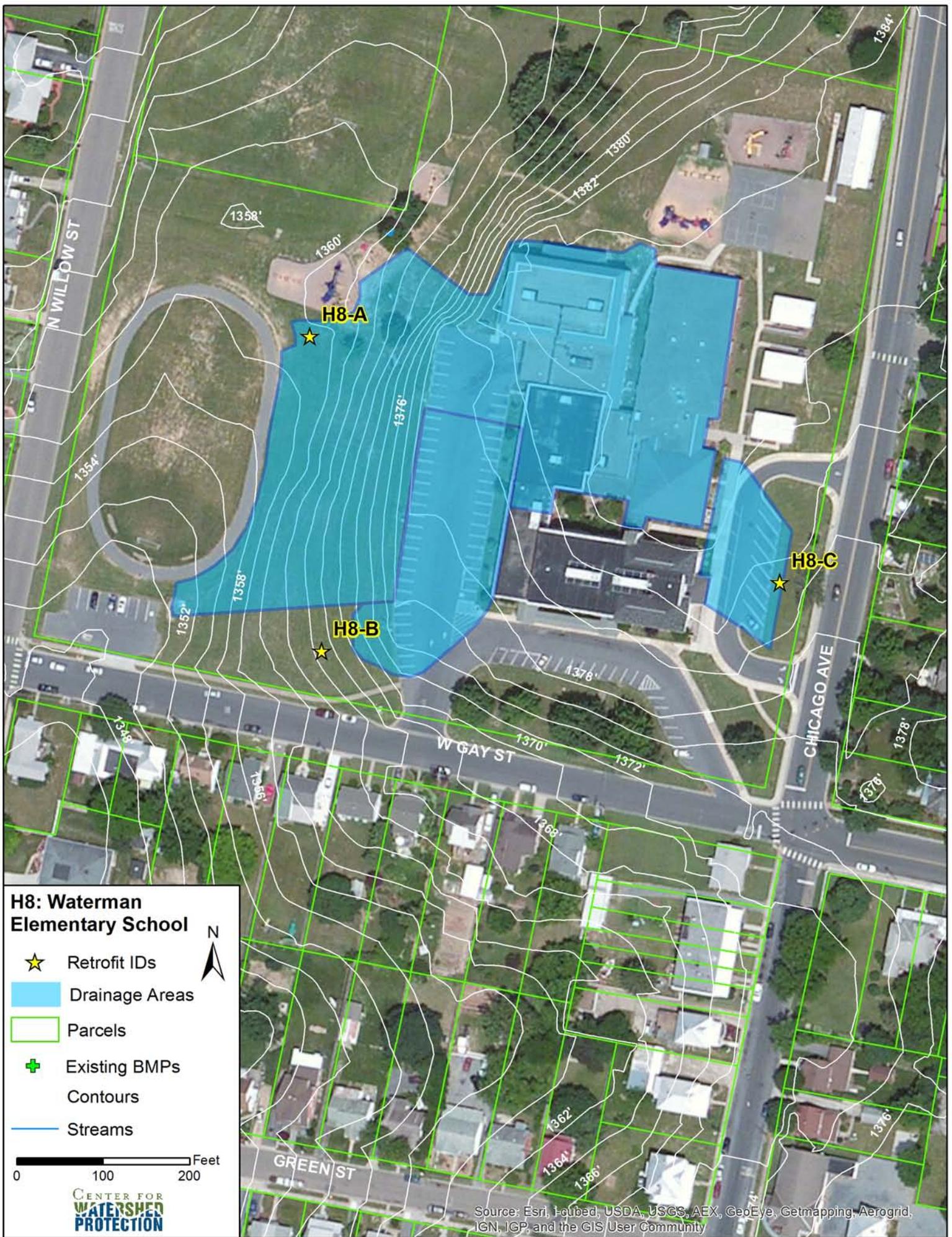


WATERSHED/SUBSHED: <u>HARRISONBURG</u>		DATE: <u>2/20/13</u>	ASSESSED BY: <u>SPS/PA</u>				
SURVEY REACH:		TIME: ___:___ AM/PM	PHOTO ID: (Camera-Pic #) <u>        </u> I# <u>        </u>				
SITE ID: (Condition-#) <u>IB-H4-1B-1</u>	START LAT <u>    </u> ° <u>    </u> ' <u>    </u> " LONG <u>    </u> ° <u>    </u> ' <u>    </u> " LMK <u>        </u>	GPS: (Unit ID)					
	END LAT <u>    </u> ° <u>    </u> ' <u>    </u> " LONG <u>    </u> ° <u>    </u> ' <u>    </u> " LMK <u>        </u>						
IMPACTED BANK: <input type="checkbox"/> LT <input checked="" type="checkbox"/> RT <input type="checkbox"/> Both	REASON INADEQUATE: <input type="checkbox"/> Lack of vegetation <input checked="" type="checkbox"/> Too narrow <input type="checkbox"/> Widespread invasive plants <input type="checkbox"/> Recently planted <input type="checkbox"/> Other:						
LAND USE: (Facing downstream) LT Bank	Private <input type="checkbox"/>	Institutional <input type="checkbox"/>	Golf Course <input type="checkbox"/>	Park <input type="checkbox"/>	Other Public <input type="checkbox"/>		
RT Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
DOMINANT LAND COVER:	Paved <input type="checkbox"/>	Bare ground <input type="checkbox"/>	Turf/lawn <input type="checkbox"/>	Tall grass <input type="checkbox"/>	Shrub/scrub <input type="checkbox"/>	Trees <input type="checkbox"/>	Other <input type="checkbox"/>
LT Bank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RT Bank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
INVASIVE PLANTS:	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Rare	<input type="checkbox"/> Partial coverage	<input type="checkbox"/> Extensive coverage	<input type="checkbox"/> unknown		
STREAM SHADE PROVIDED?	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Partial	<input type="checkbox"/> Full	WETLANDS PRESENT? <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Unknown			
POTENTIAL RESTORATION CANDIDATE	<input checked="" type="checkbox"/> Active reforestation <input type="checkbox"/> Greenway design <input type="checkbox"/> Natural regeneration <input type="checkbox"/> Invasives removal						
<input type="checkbox"/> no <input type="checkbox"/> Other:							
RESTORABLE AREA		REFORESTATION POTENTIAL: (Circle #)	Impacted area on public land where the riparian area does not appear to be used for any specific purpose; plenty of area available for planting	Impacted area on either public or private land that is presently used for a specific purpose; available area for planting adequate	Impacted area on private land where road; building encroachment or other feature significantly limits available area for planting		
Length (ft):	LT BANK <u>0</u> RT <u>300</u>					(5)	4
Width (ft):	<u>0</u> <u>40</u>						
POTENTIAL CONFLICTS WITH REFORESTATION <input type="checkbox"/> Widespread invasive plants <input type="checkbox"/> Potential contamination <input type="checkbox"/> Lack of sun <input type="checkbox"/> Poor/unsafe access to site <input type="checkbox"/> Existing impervious cover <input type="checkbox"/> Severe animal impacts (deer, beaver) <input type="checkbox"/> Other:							

NOTES:

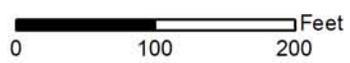
PLANTING INSIDE FENCE ON  
 HARRISONBURG ELECTRIC COMMISSION SITE  
 AREA IS FLOODPLAIN  
 NO CONFLICTS WITH CURRENT USE

## **H8: Waterman Elementary School**



**H8: Waterman Elementary School**

- ★ Retrofit IDs
- Drainage Areas
- Parcels
- ⊕ Existing BMPs
- Contours
- Streams



Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

## H8-A: Waterman Elementary School Parking & Building

Score: 36

Rank: 24

Investigators: David Hirschman, CJ Mitchem, Danny DeLong



**Figure 1:** Area near the playground where existing runoff pools. Note the standing water.

**Description:** The western end of the parking lot and about half of the school building drain down to the track and adjacent playground through two pipes that outlet on the slope as well as some sheet flow. There is an existing ditch along the track that drains to an inlet in the small parking area along W. Gay St. At the time of the site visit (had recently snowed), there was standing water sitting right next to the playground.

**Proposed Retrofit:** The retrofit involves installing a bioretention area adjacent to the playground combined with a bioswale in the existing ditch line along the track. An underdrain could outlet to daylight or be tied into the existing inlet at the W. Gay St. parking area. Ponding depths should be kept shallow (6" or less) because of the setting near a playground and track.

## H8-B: Waterman Elementary School Parking (2)

Score: 30

Rank: 30

Investigators: David Hirschman, CJ Mitchem, Danny DeLong



*Figure 1: Slope below parking lot.*

**Description:** About  $\frac{3}{4}$  of the parking lot (at the eastern end) has a curb and runoff goes directly to the street.

**Proposed Retrofit:** A curb cut and swale could be created just above the sidewalk to direct runoff down the slope. Along the slope, there is slight "plateau" that could be used for a bioretention area. Some grading or terracing would be needed to create the bioretention. An underdrain could tie into the existing inlet on the W. Gay St. side.

### H8-C: Waterman Elementary School Parking (3)

Score: 37

Rank: 22

Investigators: David Hirschman, CJ Mitchem, Danny DeLong



**Figure 1:** Parking and adjacent grass area on the Chicago Ave. side.

**Description:** A couple of roof drains and a small parking area sheet flow to a grassy area along Chicago Avenue.

**Proposed Retrofit:** This would be a fairly simple retrofit, since there is already sheet flow. A bioswale could be constructed in the grassy area, likely closer to the edge of parking. This could also be as simple as adding soil amendments and some plantings. Underdrains may be difficult, as it is uncertain where they would outlet. Given the very public location, ponding depth should be kept shallow at approximately 6".



<b>WATERSHED:</b>		<b>SUBWATERSHED:</b>		<b>UNIQUE SITE ID:</b> H-8A	
<b>DATE:</b> 03/19/13		<b>ASSESSED BY:</b> DJH, CEM DJJ		<b>CAMERA ID:</b>	
<b>GPS ID:</b>		<b>LMK ID:</b>		<b>LAT:</b>	
				<b>PICTURES:</b> 1-7	
				<b>LONG:</b>	
<b>SITE DESCRIPTION</b>					
Name: <u>Waterman E.S.</u>					
Address: _____					
Ownership: <input checked="" type="checkbox"/> Public <input type="checkbox"/> Private <input type="checkbox"/> Unknown					
If Public, Government Jurisdiction: <input type="checkbox"/> Local <input type="checkbox"/> State <input type="checkbox"/> DOT <input type="checkbox"/> Other: _____					
Corresponding USSR/USA Field Sheet? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, Unique Site ID: _____					
<b>Proposed Retrofit Location:</b>					
<b>Storage</b>			<b>On-Site</b>		
<input type="checkbox"/> Existing Pond	<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Hotspot Operation	<input checked="" type="checkbox"/> Individual Rooftop		
<input type="checkbox"/> Below Outfall	<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Small Parking Lot	<input type="checkbox"/> Small Impervious Area		
<input type="checkbox"/> In Road ROW	<input type="checkbox"/> Near Large Parking Lot	<input type="checkbox"/> Individual Street	<input type="checkbox"/> Landscape / Hardscape		
<input type="checkbox"/> Other: _____		<input type="checkbox"/> Underground	<input type="checkbox"/> Other: _____		
<b>DRAINAGE AREA TO PROPOSED RETROFIT</b>					
Drainage Area ≈ <u>2.18</u>			<b>Drainage Area Land Use:</b>		
Imperviousness ≈ _____ %			<input type="checkbox"/> Residential	<input checked="" type="checkbox"/> Institutional	
Impervious Area ≈ <u>1.87</u>			<input type="checkbox"/> SFH (< 1 ac lots)	<input type="checkbox"/> Industrial	
<b>Notes:</b>			<input type="checkbox"/> SFH (> 1 ac lots)	<input type="checkbox"/> Transport-Related	
			<input type="checkbox"/> Townhouses	<input type="checkbox"/> Park	
			<input type="checkbox"/> Multi-Family	<input type="checkbox"/> Undeveloped	
			<input type="checkbox"/> Commercial	<input type="checkbox"/> Other: _____	
			<b>EXISTING STORMWATER MANAGEMENT</b>		
Existing Stormwater Practice: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Possible					
If Yes, Describe:					
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:					
Existing Street Width (if applicable): _____					
Roof drain, all connected to drainage system. Outfall on steep bank leading down to track. Some erosion, drainage. Drainage ditch next to track.					
Existing Head Available:			Note where points are measured from: (i.e. street elevation to catch basin invert, manhole rim to catch basin invert, other)		
4-5'			playground to downstream ditch along track		



**PROPOSED RETROFIT**

**Purpose of Retrofit:**  
 Water Quality       Recharge       Channel Protection       Flood Control  
 Demonstration / Education       Repair       Other: fix drainage issue

**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: \_\_\_\_\_  
 Available Length: \_\_\_\_\_  
 Available Area: \_\_\_\_\_  
 Ponding Depth: 6"  
 Soil Depth: 2-3' depending on getting w.d. to daylight

**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:**  
immediately adjacent to playground

**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:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Water:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Gas:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Electric to Streetlights:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Potential Permitting Factors:**

Dam Safety Permits Necessary	<input type="checkbox"/> Probable	<input checked="" type="checkbox"/> Not Probable
Impacts to Wetlands	<input type="checkbox"/> Probable	<input checked="" type="checkbox"/> Not Probable
Impacts to a Stream	<input type="checkbox"/> Probable	<input checked="" type="checkbox"/> Not Probable
Floodplain Fill	<input type="checkbox"/> Probable	<input checked="" type="checkbox"/> Not Probable
Impacts to Forests	<input type="checkbox"/> Probable	<input checked="" type="checkbox"/> Not Probable
Impacts to Specimen Trees	<input type="checkbox"/> Probable	<input checked="" type="checkbox"/> Not Probable

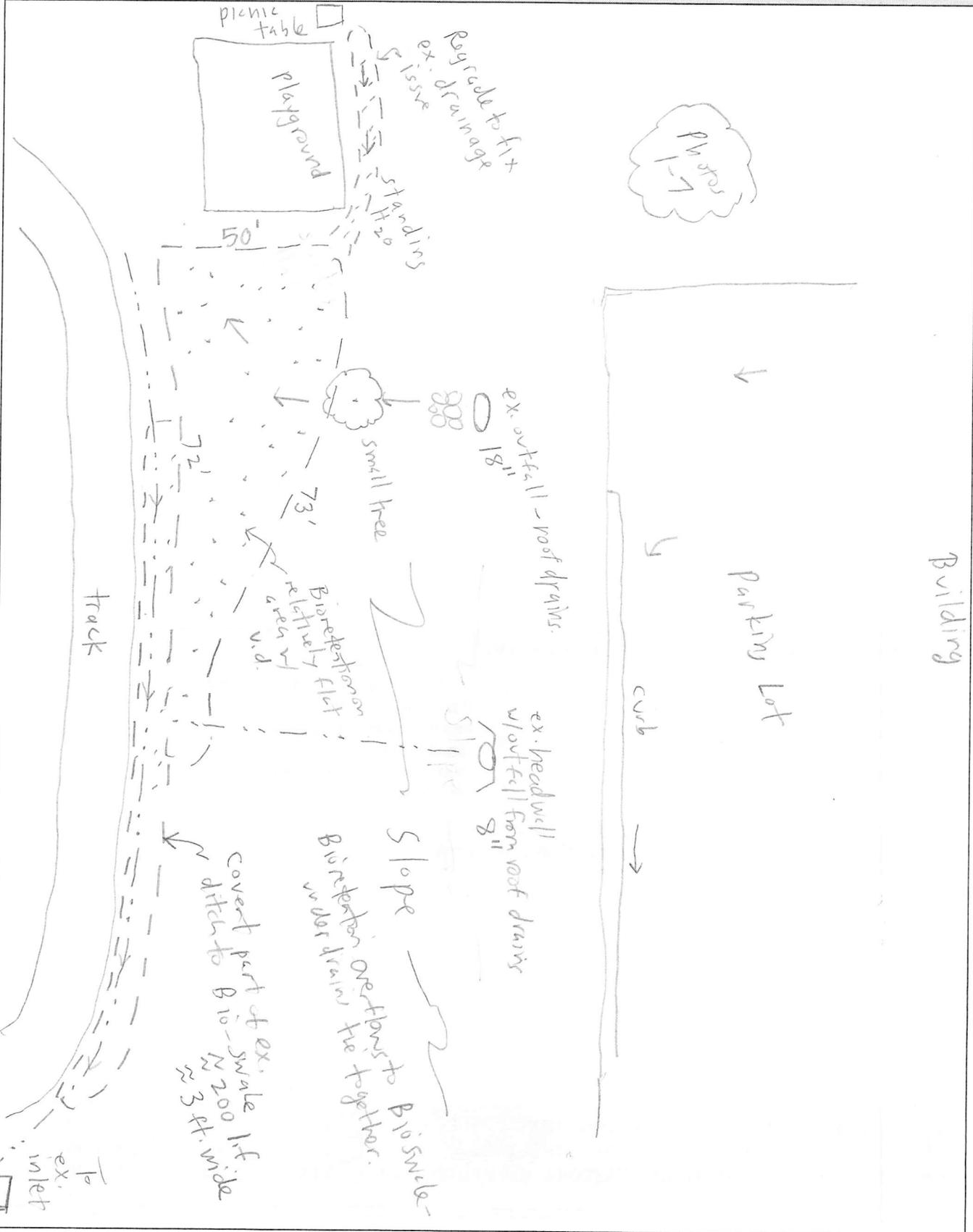
How many? \_\_\_\_\_  
 Approx. DBH \_\_\_\_\_

**Other factors:** small tree may have to be removed

**Soils:**

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

SKETCH



To ex. inlet  
3.7' from top

**DESIGN OR DELIVERY NOTES**

- Better topo to figure out underdrain  
- Work w/ school on playground/ standing water

**FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT**

- |  |  |
|--|--|
| <input type="checkbox"/> Confirm property ownership                        | <input type="checkbox"/> Obtain existing stormwater practice as-builts |
| <input checked="" type="checkbox"/> Confirm drainage area                  | <input type="checkbox"/> Obtain site as-builts                         |
| <input checked="" type="checkbox"/> Confirm drainage area impervious cover | <input checked="" type="checkbox"/> Obtain detailed topography         |
| <input checked="" type="checkbox"/> Confirm volume computations            | <input checked="" type="checkbox"/> Obtain utility mapping             |
| <input checked="" type="checkbox"/> Complete concept sketch                | <input type="checkbox"/> Confirm storm drain invert elevations         |
| <input type="checkbox"/> Other: _____                                      | <input checked="" type="checkbox"/> Confirm soil types                 |

**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): \_\_\_\_\_

<b>WATERSHED:</b>		<b>SUBWATERSHED:</b>		<b>UNIQUE SITE ID:</b> H8-B	
<b>DATE:</b> 03/19/13		<b>ASSESSED BY:</b> DJH, JSM, DJD		<b>CAMERA ID:</b>	
<b>GPS ID:</b>		<b>LMK ID:</b>		<b>LAT:</b>	
<b>GPS ID:</b>		<b>LMK ID:</b>		<b>LONG:</b>	
<b>SITE DESCRIPTION</b>					
Name: <u>Waterman E.S.</u>					
Address: _____					
Ownership: <input checked="" type="checkbox"/> Public <input type="checkbox"/> Private <input type="checkbox"/> Unknown					
If Public, Government Jurisdiction: <input type="checkbox"/> Local <input type="checkbox"/> State <input type="checkbox"/> DOT <input type="checkbox"/> Other: _____					
Corresponding USSR/USA Field Sheet? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, Unique Site ID: _____					
<b>Proposed Retrofit Location:</b>					
<b>Storage</b>			<b>On-Site</b>		
<input type="checkbox"/> Existing Pond <input type="checkbox"/> Above Roadway Culvert			<input type="checkbox"/> Hotspot Operation <input type="checkbox"/> Individual Rooftop		
<input type="checkbox"/> Below Outfall <input type="checkbox"/> In Conveyance System			<input checked="" type="checkbox"/> Small Parking Lot <input type="checkbox"/> Small Impervious Area		
<input type="checkbox"/> In Road ROW <input type="checkbox"/> Near Large Parking Lot			<input type="checkbox"/> Individual Street <input type="checkbox"/> Landscape / Hardscape		
<input type="checkbox"/> Other: _____			<input type="checkbox"/> Underground <input type="checkbox"/> Other: _____		
<b>DRAINAGE AREA TO PROPOSED RETROFIT</b>					
Drainage Area ≈ <u>0.49</u>			<b>Drainage Area Land Use:</b>		
Imperviousness ≈ _____ %			<input type="checkbox"/> Residential <input checked="" type="checkbox"/> Institutional		
Impervious Area ≈ <u>0.43</u>			<input type="checkbox"/> SFH (< 1 ac lots) <input type="checkbox"/> Industrial		
<b>Notes:</b>			<input type="checkbox"/> SFH (> 1 ac lots) <input type="checkbox"/> Transport-Related		
			<input type="checkbox"/> Townhouses <input type="checkbox"/> Park		
			<input type="checkbox"/> Multi-Family <input type="checkbox"/> Undeveloped		
			<input type="checkbox"/> Commercial <input type="checkbox"/> Other: _____		
<b>EXISTING STORMWATER MANAGEMENT</b>					
Existing Stormwater Practice: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Possible					
If Yes, Describe:					
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance: Existing Street Width (if applicable): _____ <u>parking lot w/ curb - all water currently goes to street</u>					
Existing Head Available: <u>Lots</u> <u>pretty good slope</u>			Note where points are measured from: (i.e. street elevation to catch basin invert, manhole rim to catch basin invert, other) <u>parking</u>		

**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:**

*Area is small plateau along slope - would have to be terraced, but could get it in.*

Available Width:	<u>47</u>
Available Length:	<u>70</u>
Available Area:	
Ponding Depth:	<u>6"</u>
Soil Depth:	<u>3'</u>

**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 *some*     Space  
 Utilities     Tree Impacts  
 Structures     Property  
 Ownership  
 Other: \_\_\_\_\_

**Conflicts with Existing Utilities:**

*SS along sidewalk*

	Yes	Possible/Modifiable	No	Unknown
Sewer:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Gas:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Electric to Streetlights:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**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 \_\_\_\_\_

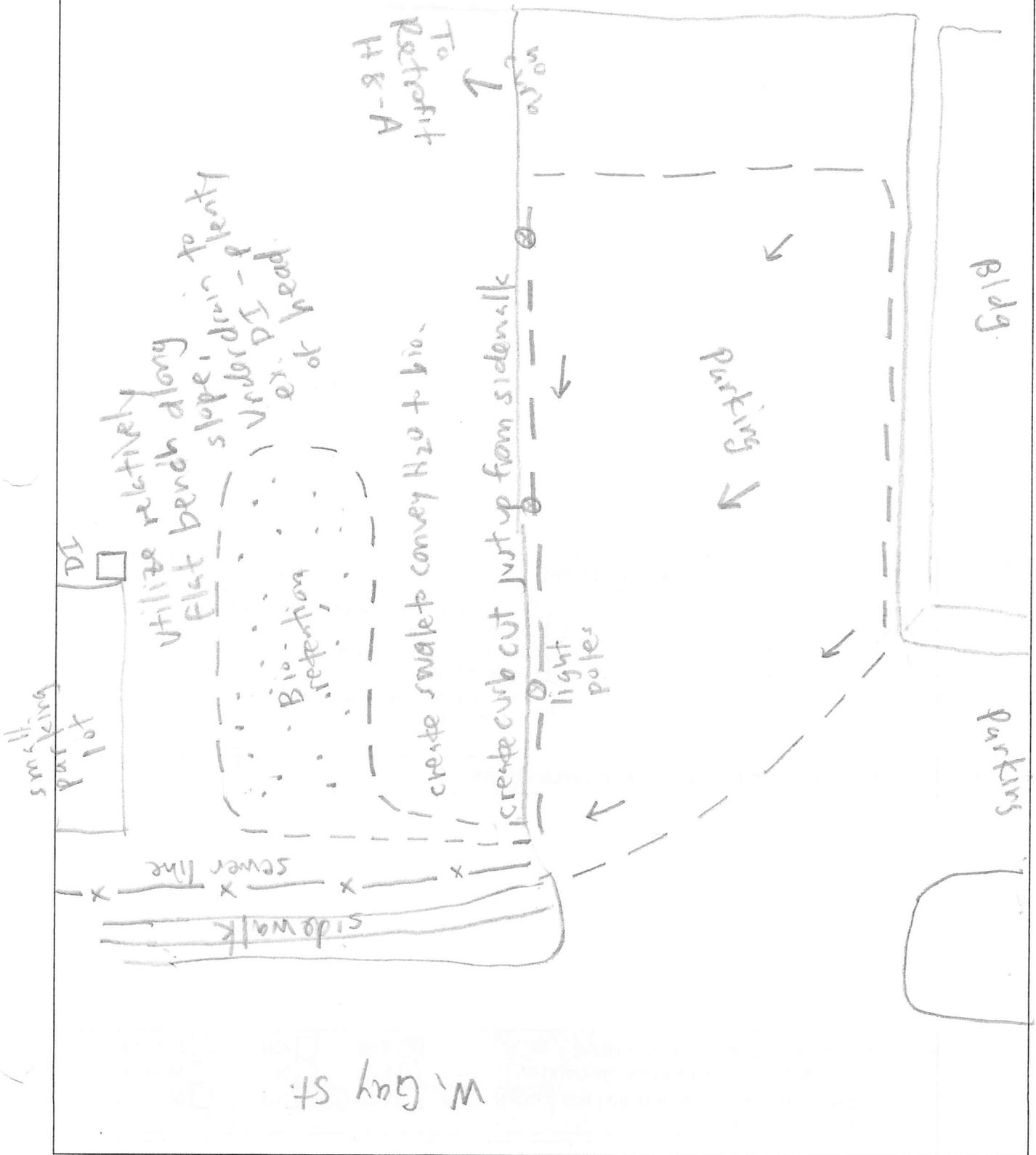
Other factors: \_\_\_\_\_

**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

*clay*

SKETCH



**DESIGN OR DELIVERY NOTES**

- Confer w/ School.  
Not a heavily-used area.

**FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT**

- |   |  |
|---|--|
| <input type="checkbox"/> Confirm property ownership                                       | <input type="checkbox"/> Obtain existing stormwater practice as-builts |
| <input checked="" type="checkbox"/> Confirm drainage area                                 | <input type="checkbox"/> Obtain site as-builts                         |
| <input checked="" type="checkbox"/> Confirm drainage area impervious cover <i>100% IC</i> | <input checked="" type="checkbox"/> Obtain detailed topography         |
| <input checked="" type="checkbox"/> Confirm volume computations                           | <input checked="" type="checkbox"/> Obtain utility mapping             |
| <input checked="" type="checkbox"/> Complete concept sketch                               | <input type="checkbox"/> Confirm storm drain invert elevations         |
|   | <input checked="" type="checkbox"/> 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): \_\_\_\_\_

<b>WATERSHED:</b>		<b>SUBWATERSHED:</b>		<b>UNIQUE SITE ID:</b> H-8C	
<b>DATE:</b> 3/19/13		<b>ASSESSED BY:</b> DSD, OTH, CJM		<b>CAMERA ID:</b>	
<b>GPS ID:</b>		<b>LMK ID:</b>		<b>PICTURES:</b> 12-14	
<b>LAT:</b>		<b>LONG:</b>			
<b>SITE DESCRIPTION</b>					
Name: <u>Waterman Elementary School</u>					
Address: _____					
Ownership: <input checked="" type="checkbox"/> Public <input type="checkbox"/> Private <input type="checkbox"/> Unknown					
If Public, Government Jurisdiction: <input type="checkbox"/> Local <input type="checkbox"/> State <input type="checkbox"/> DOT <input type="checkbox"/> Other: _____					
Corresponding USSR/USA Field Sheet? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, Unique Site ID: _____					
<b>Proposed Retrofit Location:</b>					
<b>Storage</b>			<b>On-Site</b>		
<input type="checkbox"/> Existing Pond			<input type="checkbox"/> Hotspot Operation		
<input type="checkbox"/> Below Outfall			<input checked="" type="checkbox"/> Small Parking Lot		
<input type="checkbox"/> In Road ROW			<input type="checkbox"/> Individual Street		
<input type="checkbox"/> Above Roadway Culvert			<input checked="" type="checkbox"/> Individual Rooftop		
<input type="checkbox"/> In Conveyance System			<input type="checkbox"/> Small Impervious Area		
<input type="checkbox"/> Near Large Parking Lot			<input type="checkbox"/> Landscape / Hardscape		
<input type="checkbox"/> Other: _____			<input type="checkbox"/> Underground		
<input type="checkbox"/> Other: _____			<input type="checkbox"/> Other: _____		
<b>DRAINAGE AREA TO PROPOSED RETROFIT</b>					
Drainage Area ≈ <u>0.21</u>			<b>Drainage Area Land Use:</b>		
Imperviousness ≈ _____ %			<input type="checkbox"/> Residential		
Impervious Area ≈ <u>0.21</u>			<input checked="" type="checkbox"/> Institutional		
<b>Notes:</b>			<input type="checkbox"/> SFH (< 1 ac lots)		
			<input type="checkbox"/> SFH (> 1 ac lots)		
			<input type="checkbox"/> Townhouses		
			<input type="checkbox"/> Multi-Family		
			<input type="checkbox"/> Commercial		
			<input type="checkbox"/> Industrial		
			<input type="checkbox"/> Transport-Related		
			<input type="checkbox"/> Park		
			<input type="checkbox"/> Undeveloped		
			<input type="checkbox"/> Other: _____		
<b>EXISTING STORMWATER MANAGEMENT</b>					
Existing Stormwater Practice: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Possible					
If Yes, Describe:					
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:					
Existing Street Width (if applicable): _____					
<u>Roof drains outfalling to small parking lot which the sheet flows to grass area</u>					
<b>Existing Head Available:</b>			<b>Note where points are measured from: (i.e. street elevation to catch basin invert, manhole rim to catch basin invert, other)</b>		
<u>good slope on lot</u>					

**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:	28'
Available Length:	100'
Available Area:	
Ponding Depth:	6"
Soil Depth:	2'-3'

**SITE CONSTRAINTS**

**Adjacent Land Use:**  
 Residential     Commercial     Institutional  
 Industrial     Transport-Related     Park  
 Undeveloped     Other: \_\_\_\_\_

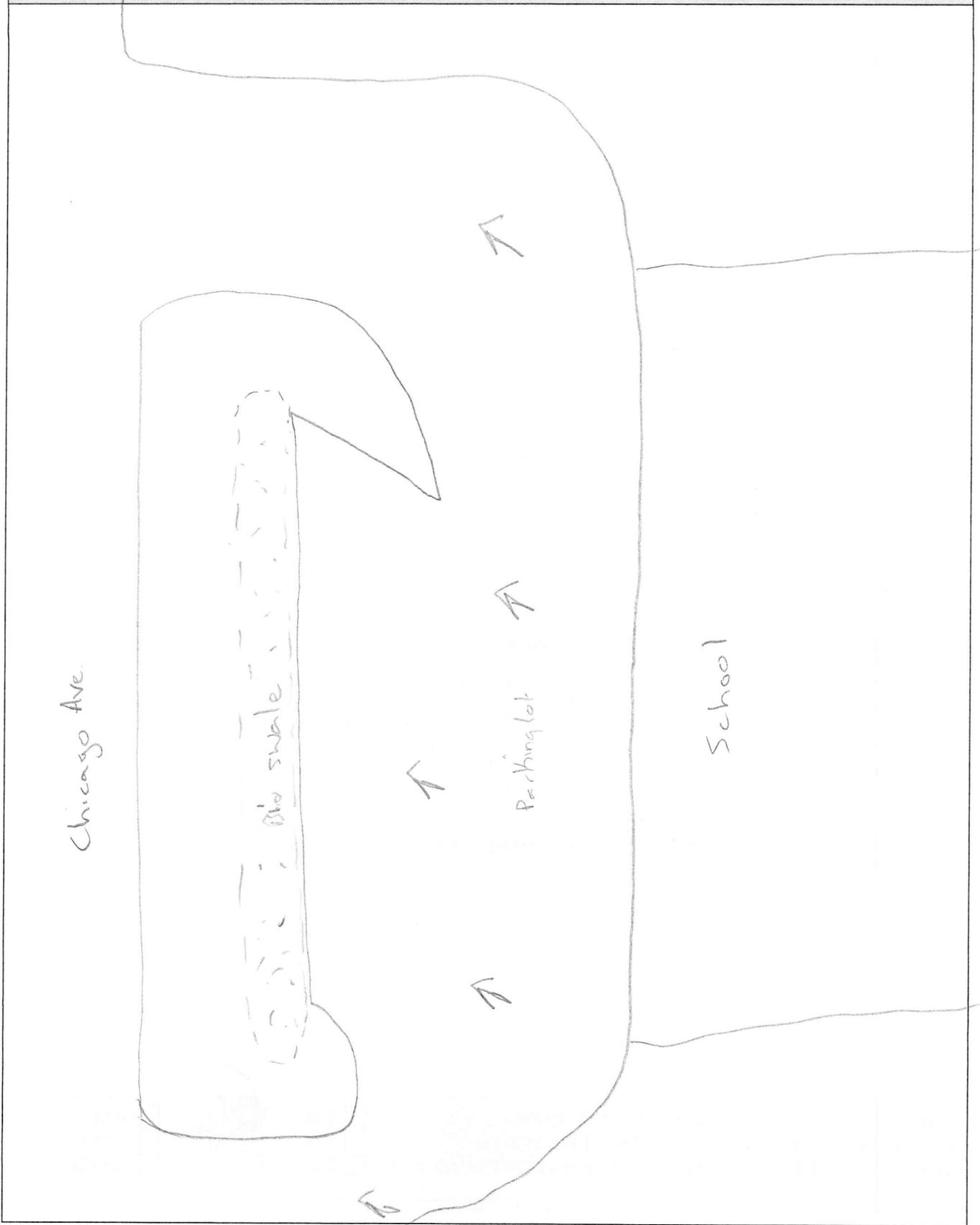
**Possible Conflicts Due to Adjacent Land Use?**     Yes     No  
**If Yes, Describe:** \_\_\_\_\_

**Access:**  
 No Constraints  
 Constrained due to  
 Slope     Space  
 Utilities     Tree Impacts  
 Structures     Property  
 Ownership  
 Other: \_\_\_\_\_

Conflicts with Existing Utilities:					Potential Permitting Factors:
	Yes	Possible/Modifiable	No	Unknown	
Sewer:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Dam Safety Permits Necessary <input type="checkbox"/> Probable <input checked="" type="checkbox"/> Not Probable
Water:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Impacts to Wetlands <input type="checkbox"/> Probable <input checked="" type="checkbox"/> Not Probable
Gas:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Impacts to a Stream <input type="checkbox"/> Probable <input checked="" type="checkbox"/> Not Probable
Electric to Streetlights:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Floodplain Fill <input type="checkbox"/> Probable <input checked="" type="checkbox"/> Not Probable
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Impacts to Forests <input type="checkbox"/> Probable <input checked="" type="checkbox"/> Not Probable
					Impacts to Specimen Trees <input type="checkbox"/> Probable <input checked="" type="checkbox"/> Not Probable
					How many? _____
					Approx. DBH _____
					<b>Other factors:</b> _____

**Soils:**  
 Soil auger test holes:     Yes     No    *Clay*  
 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**

- Confer w/ school  
Not a heavily used area

**FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT**

- |  |  |
|--|--|
| <input type="checkbox"/> Confirm property ownership                        | <input type="checkbox"/> Obtain existing stormwater practice as-builts |
| <input checked="" type="checkbox"/> Confirm drainage area                  | <input type="checkbox"/> Obtain site as-builts                         |
| <input checked="" type="checkbox"/> Confirm drainage area impervious cover | <input checked="" type="checkbox"/> Obtain detailed topography         |
| <input checked="" type="checkbox"/> Confirm volume computations            | <input type="checkbox"/> Obtain utility mapping                        |
| <input checked="" type="checkbox"/> Complete concept sketch                | <input type="checkbox"/> Confirm storm drain invert elevations         |
| <input type="checkbox"/> Other: _____                                      | <input type="checkbox"/> Confirm soil types                            |

**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): \_\_\_\_\_

## **H9: Rockingham County Admin Building**



**H9: Rockingham County Admin Building**

- ★ Retrofit IDs
- Drainage Areas
- Parcels
- ⊕ Existing BMPs
- Contours
- Streams



0 55 110 Feet



Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

## H9: Rockingham County Administration Building

Score: 31

Rank: 29

Investigators: David Hirschman, CJ Mitchem, Danny DeLong



**Figure 1:** Existing parking island that could be expanded and modified for bioretention

**Description:** This is a very large parking lot with 2 existing drain inlets. There are several narrow vegetated islands in the parking lot.

**Proposed Retrofit:** The best retrofit potential is one of the islands situated so that it could collect runoff from northern section of the parking lot. Converting this into a larger bioretention would require taking out parking stalls furthest from the building. Six to nine parking stalls would be needed to expand the island to an adequate size. The top soil layer of the island would have to be lowered from curb-height to about 6" below the asphalt, and an underdrain could be tied into one of the existing inlets, although this would have to be a shallow system, since the inlet is only 2.5' deep.

<b>WATERSHED:</b>		<b>SUBWATERSHED:</b>		<b>UNIQUE SITE ID:</b> H19	
<b>DATE:</b> 2/19/2013		<b>ASSESSED BY:</b> DJH, DJI, CEM		<b>CAMERA ID:</b>	
<b>GPS ID:</b>		<b>LMK ID:</b>		<b>LAT:</b>	
<b>GPS ID:</b>		<b>LMK ID:</b>		<b>LONG:</b>	
<b>SITE DESCRIPTION</b>					
Name: Rockingham Co. Admin. Bldg.					
Address: Int. of Mason St. & Gag St.					
Ownership:		<input checked="" type="checkbox"/> Public	<input type="checkbox"/> Private	<input type="checkbox"/> Unknown	
If Public, Government Jurisdiction:		<input checked="" type="checkbox"/> Local	<input type="checkbox"/> State	<input type="checkbox"/> DOT	<input type="checkbox"/> Other: _____
Corresponding USSR/USA Field Sheet?		<input type="checkbox"/> Yes	<input type="checkbox"/> No	If yes, Unique Site ID: _____	
<b>Proposed Retrofit Location:</b>					
<b>Storage</b>			<b>On-Site</b>		
<input type="checkbox"/> Existing Pond	<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Individual Rooftop		
<input type="checkbox"/> Below Outfall	<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Small Parking Lot	<input type="checkbox"/> Small Impervious Area		
<input type="checkbox"/> In Road ROW	<input type="checkbox"/> Near Large Parking Lot	<input type="checkbox"/> Individual Street	<input type="checkbox"/> Landscape / Hardscape		
<input type="checkbox"/> Other: _____		<input type="checkbox"/> Underground	<input checked="" type="checkbox"/> Other: large parking lot		
<b>DRAINAGE AREA TO PROPOSED RETROFIT</b>					
Drainage Area ≈ _____			<b>Drainage Area Land Use:</b>		
Imperviousness ≈ _____ %			<input type="checkbox"/> Residential	<input checked="" type="checkbox"/> Institutional	
Impervious Area ≈ _____			<input type="checkbox"/> SFH (< 1 ac lots)	<input type="checkbox"/> Industrial	
Notes:			<input type="checkbox"/> SFH (> 1 ac lots)	<input type="checkbox"/> Transport-Related	
			<input type="checkbox"/> Townhouses	<input type="checkbox"/> Park	
			<input type="checkbox"/> Multi-Family	<input type="checkbox"/> Undeveloped	
			<input type="checkbox"/> Commercial	<input type="checkbox"/> Other: _____	
<b>EXISTING STORMWATER MANAGEMENT</b>					
Existing Stormwater Practice:		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Possible	
If Yes, Describe:					
No structures at site. There is a DI down gradient of site.					
<b>Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:</b>					
Existing Street Width (if applicable): _____					
Large parking lot with 2 D.I.s. Sheet flow concentrates @ proposed BMA location, which was selected to impact minimal, low quality parking spaces. Size may be adjusted to minimize spaces impact.					
<b>Existing Head Available:</b>			<b>Note where points are measured from: (i.e. street elevation to catch basin invert, manhole rim to catch basin invert, other)</b>		
≈ 0.8' of fall to from island to DI + 2.5' to INV of DI TUF ≈ 3.3'			Proposed BMA site to DI		

6" = ponding  
12" = gravel

3.3  
1.5  
1.8

**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:**

*Propose bio retention with under drain in parking lot. Under drain to day light in existing DI structure. As proposed, biofilter would impact 9 parking spaces located away from building*

Available Width:	<u>38'</u>
Available Length:	<u>86'</u>
Available Area:	<u>3268</u>
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:** *County offices parking lot - consider*

**Access:**

- No Constraints  
 Constrained due to  
 Slope     Space  
 Utilities     Tree Impacts  
 Structures     Property  
 Ownership  
 Other: *Agreement*

**Conflicts with Existing Utilities:**

	Yes	Possible/ Modifiable	No	Unknown
Sewer:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Water:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Gas:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Electric to Streetlights:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**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 \_\_\_\_\_

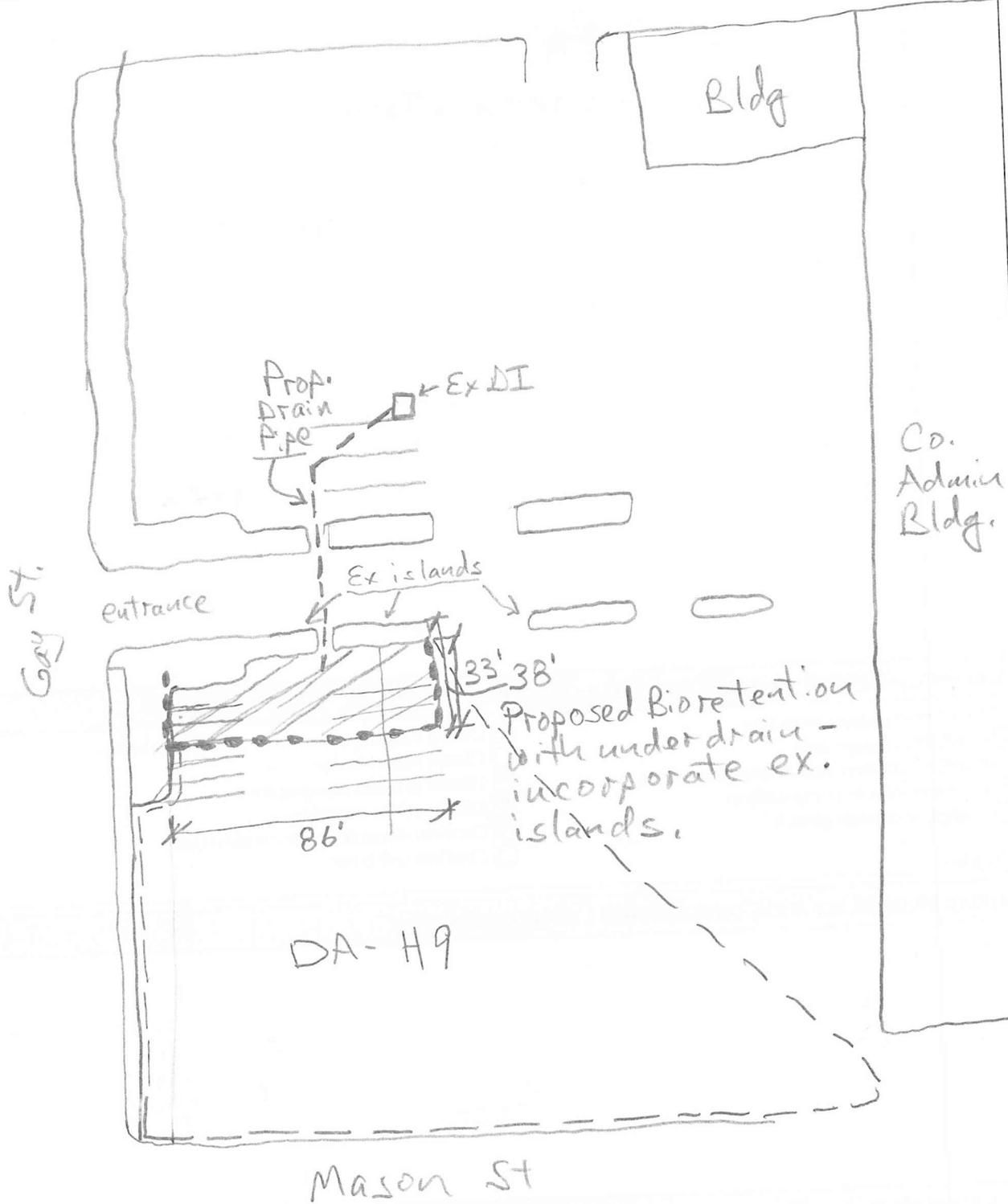
**Other factors:** \_\_\_\_\_

**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

*Parking Lot - paved*

SKETCH



**DESIGN OR DELIVERY NOTES**

Confirm DA.  
Work w/ County staff

**FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT**

- |   |   |
|---|---|
| <input type="checkbox"/> Confirm property ownership             | <input type="checkbox"/> Obtain existing stormwater practice as-builts    |
| <input checked="" type="checkbox"/> Confirm drainage area       | <input type="checkbox"/> Obtain site as-builts                            |
| <input type="checkbox"/> Confirm drainage area impervious cover | <input checked="" type="checkbox"/> Obtain detailed topography            |
| <input checked="" type="checkbox"/> Confirm volume computations | <input checked="" type="checkbox"/> Obtain utility mapping                |
| <input checked="" type="checkbox"/> Complete concept sketch     | <input checked="" type="checkbox"/> Confirm storm drain invert elevations |
|   | <input type="checkbox"/> Confirm soil types                               |

Other: \_\_\_\_\_

**INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS**

**SITE CANDIDATE FOR FURTHER INVESTIGATION:**

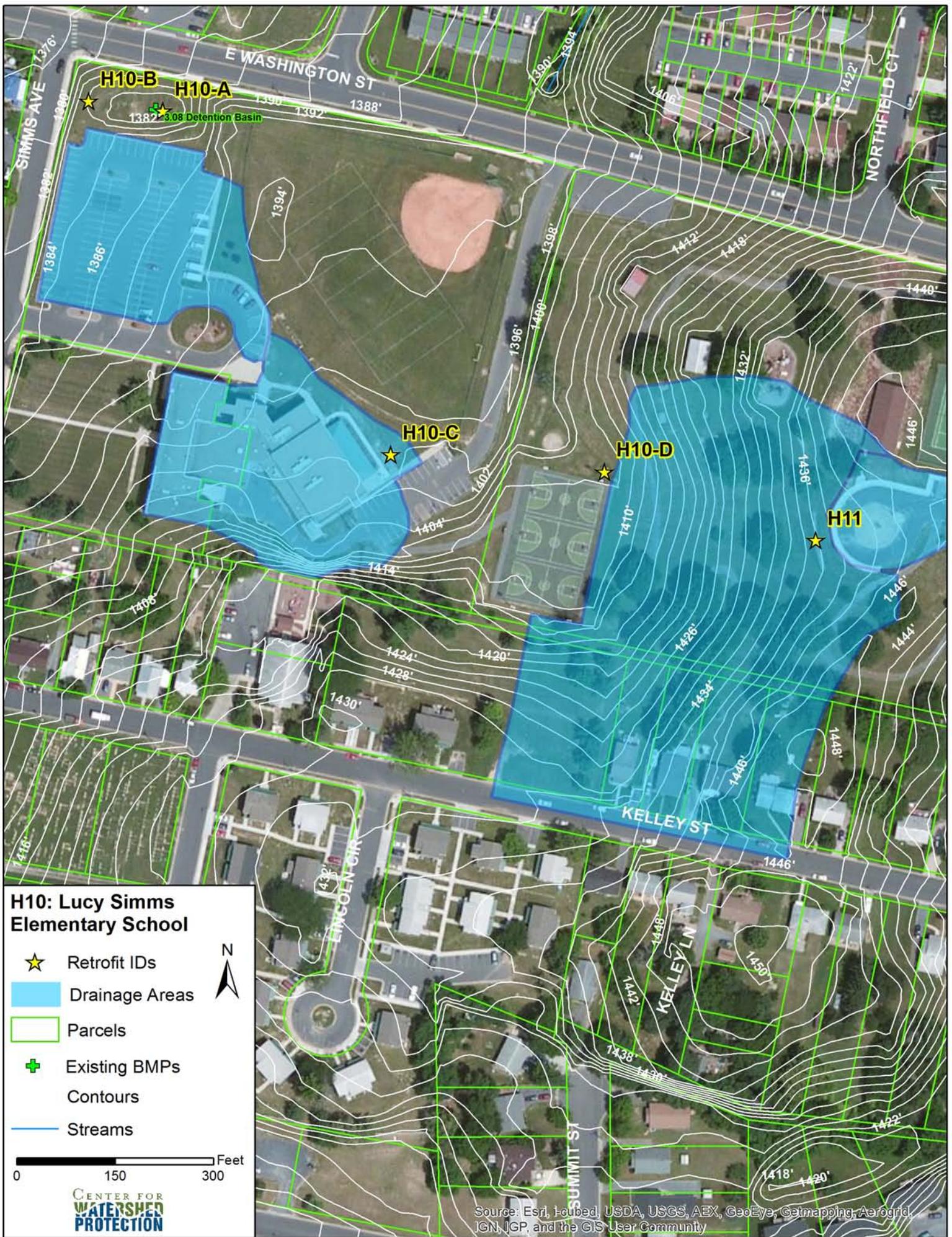
**IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):**

**IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):**

- |   |                             |                                |
|---|-----------------------------|--------------------------------|
| <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO | <input type="checkbox"/> MAYBE |
| <input type="checkbox"/> YES            | <input type="checkbox"/> NO | <input type="checkbox"/> MAYBE |
| <input type="checkbox"/> YES            | <input type="checkbox"/> NO | <input type="checkbox"/> MAYBE |

IF YES, TYPE(S): \_\_\_\_\_

## **H10: Lucy Simms Elementary School**



## H10-A: Lucy Simms School Basin

Score: 49

Rank: 6

Investigators: David Hirschman, Tom Hartman



**Figure 1:** Existing basin in front of Lucy Simms Center

**Description:** The existing basin has about 1' of sediment built up in the bottom, and this is blocking one of the outlets. In addition, outlet protection at the inlets has deteriorated and the trash rack appears to be gone.

**Proposed Retrofit:** This would be a basin restoration project, to include removing the accumulated sediment, repairing the low-flow orifice and trash rack, and adding outlet protection to the two pipes. It may also be possible to add some water quality enhancement to the basin, such as lengthening the flow path or adding wetland cells. However, the available basin floor area is quite limited for these enhancements.

## H10-B: Lucy Simms School Parking Lot

Score: 36

Rank: 23

Investigators: David Hirschman, Tom Hartman



**Figure 1:** Looking from the parking lot inlet to the adjacent grassy area

**Description:** The large parking lot in front of Lucy Simms Community Center has one inlet in the northwest corner. The inlet goes directly to the basin, discussed with H10-A. There is a grassy area north of the parking lot inlet along Simms Ave (Figure 1).

**Proposed Retrofit:** The grassy area could be used for a bioretention area that would function as a sort of pre-treatment (or additional water quality treatment) before stormwater goes to the existing basin. This would be a good practice since the basin seems undersized for its substantial drainage area. This concept would treat only the parking lot, but that would be the most important part of the drainage area for water quality purposes.

Water could be diverted to the bioretention area by using curb cuts on either side of the existing inlet, or possibly a paired inlet (shallow upgradient inlet that goes directly to bioretention). Once the bioretention filled up, water could spill over a weir into the existing basin.

## H10-C: Lucy Simms School Building

Score: 45

Rank: 9

Investigators: David Hirschman, Tom Hartman, Lisa Fraley McNeal



*Figure 1: Drainage structures surround the Lucy Simms building, and there is an adjacent ballfield*

**Description:** The Lucy Simms building is ringed by storm inlets that eventually go to the existing basin (H10-A). There is a baseball field in front of the community center. It is unknown whether this field is currently being irrigated.

**Proposed Retrofit:** One of the existing inlets at the northeast corner of the building would be a good place to install a rainwater harvesting system. This one inlet appears to collect water from much of the existing storm drain system collecting roof runoff. Collected water could be used to irrigate the field, and possibly for other uses inside or outside the building. An underground cistern system would likely be the most appropriate configuration, but other underground or above-ground configurations could be explored.

## H10-D: Ralph Sampson Park Basketball Court

Score: 57

Rank: 4

Investigators: David Hirschman, Tom Hartman



**Figure 1:** Existing inlet adjacent to basketball courts

**Description:** Ralph Sampson Park consists largely of maintained turf with stone dust trails. Some of the trails and grass areas show evidence of rill erosion, due to the slopes and amount of runoff conveying through the area. There is an existing inlet adjacent to the basketball courts at the part of the park closest to Lucy Simms (low part of the park) – see Figure 1. There is also a shallow swale adjacent to the basketball court.

**Proposed Retrofit:** The existing inlet can be raised and a bioretention area constructed around the inlet in a triangle shape. Some grading would be necessary to create a flat bioretention surface. This would be a relatively shallow system, since the invert of the existing drain would constrain the depth of the underdrain.

<b>WATERSHED:</b>		<b>SUBWATERSHED:</b>		<b>UNIQUE SITE ID:</b> H10A	
<b>DATE:</b> 3/19/13		<b>ASSESSED BY:</b> DSM/TAH		<b>CAMERA ID:</b>	
<b>PICTURES:</b> 31-33		<b>LAT:</b>		<b>LONG:</b>	
<b>GPS ID:</b>		<b>LMK ID:</b>		<b>LONG:</b>	
<b>SITE DESCRIPTION</b>					
Name: <u>Lucy Sims School</u>					
Address: _____					
Ownership: <input checked="" type="checkbox"/> Public <input type="checkbox"/> Private <input type="checkbox"/> Unknown					
If Public, Government Jurisdiction: <input checked="" type="checkbox"/> Local <input type="checkbox"/> State <input type="checkbox"/> DOT <input type="checkbox"/> Other: _____					
Corresponding USSR/USA Field Sheet? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, Unique Site ID: _____					
<b>Proposed Retrofit Location:</b>					
<b>Storage</b>			<b>On-Site</b>		
<input checked="" type="checkbox"/> Existing Pond <input type="checkbox"/> Above Roadway Culvert			<input type="checkbox"/> Hotspot Operation <input type="checkbox"/> Individual Rooftop		
<input type="checkbox"/> Below Outfall <input type="checkbox"/> In Conveyance System			<input type="checkbox"/> Small Parking Lot <input type="checkbox"/> Small Impervious Area		
<input type="checkbox"/> In Road ROW <input type="checkbox"/> Near Large Parking Lot			<input type="checkbox"/> Individual Street <input type="checkbox"/> Landscape / Hardscape		
<input type="checkbox"/> Other: _____			<input type="checkbox"/> Underground <input type="checkbox"/> Other: _____		
<b>DRAINAGE AREA TO PROPOSED RETROFIT</b>					
Drainage Area ≈ <u>20.16</u> From file comps			<b>Drainage Area Land Use:</b>		
Imperviousness ≈ _____ %			<input type="checkbox"/> Residential <input type="checkbox"/> Institutional		
Impervious Area ≈ <u>5.73</u> From file comps			<input type="checkbox"/> SFH (< 1 ac lots) <input type="checkbox"/> Industrial		
<b>Notes:</b>			<input type="checkbox"/> SFH (> 1 ac lots) <input type="checkbox"/> Transport-Related		
			<input type="checkbox"/> Townhouses <input type="checkbox"/> Park		
			<input type="checkbox"/> Multi-Family <input type="checkbox"/> Undeveloped		
			<input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Other: <u>SCHOOL</u>		
<b>EXISTING STORMWATER MANAGEMENT</b>					
Existing Stormwater Practice: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Possible					
If Yes, Describe: <u>EXISTING EXTENDED DETENTION FACILITY</u>					
<b>Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:</b>					
Existing Street Width (if applicable): _____					
- EXISTING ED APPEARS TO HAVE APPROX 1' OF SEDIMENT BUILT UP IN THE BOTTOM.					
- EXISTING OP AT EACH PIPE IS LOW					
- TRASH BACK APPEARS TO BE SHIFTED OFF.					
<b>Existing Head Available:</b>			<b>Note where points are measured from: (i.e. street elevation to catch basin invert, manhole rim to catch basin invert, other)</b>		

**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: REPAIR

**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:	<u>27'</u>
Available Length:	<u>97'</u>
Available Area:	<u>~3000 sq ft</u>
Ponding Depth:	<u>N/A</u>
Soil Depth:	

**SITE CONSTRAINTS**

**Adjacent Land Use:**

- Residential     Commercial     Institutional  
 Industrial     Transport-Related     Park  
 Undeveloped     Other: SCHOOL

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:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Water:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Gas:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Electric to Streetlights:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Potential Permitting Factors:**

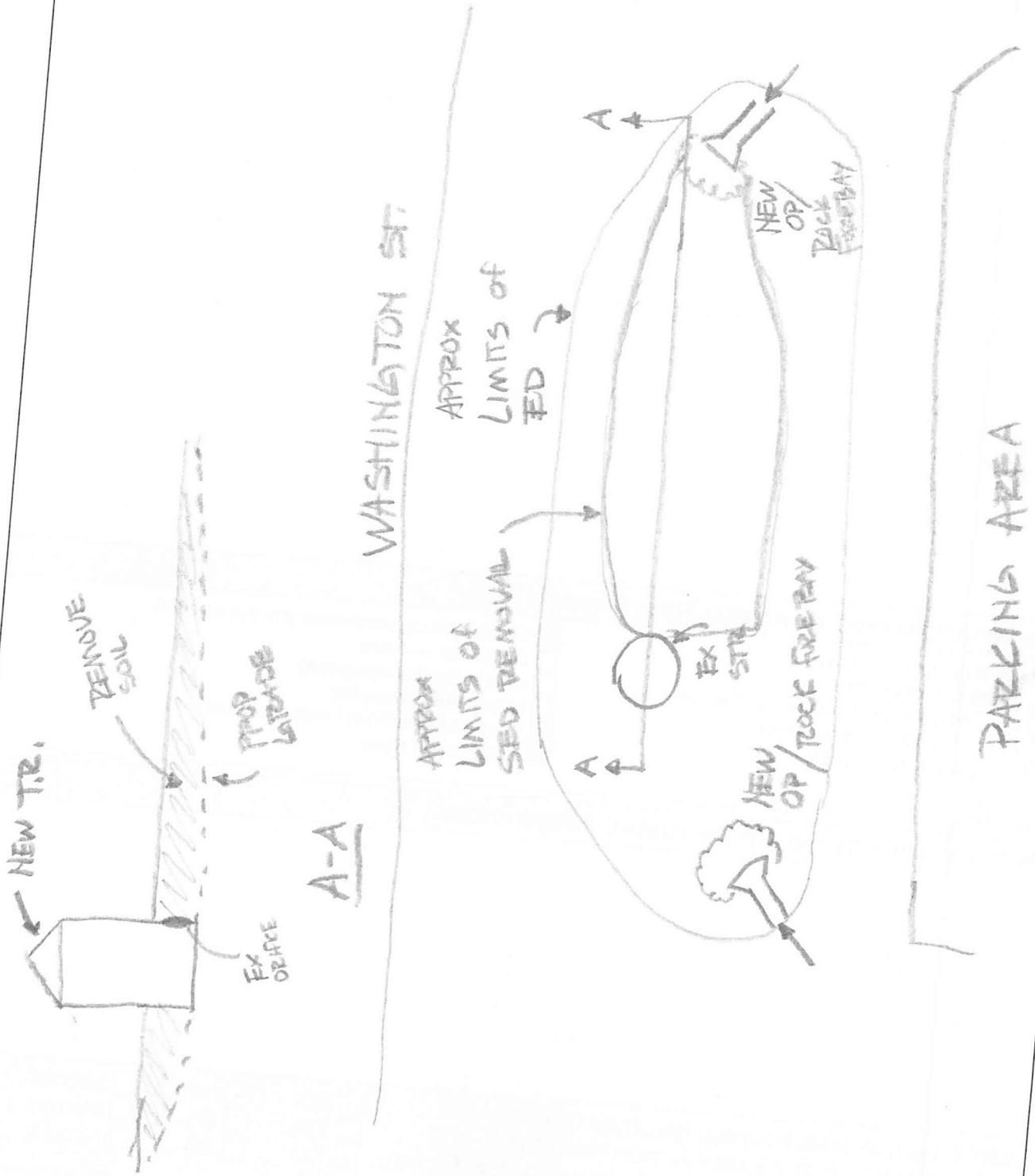
- Dam Safety Permits Necessary     Probable     Not Probable  
 Impacts to Wetlands     Probable     Not Probable  
 Impacts to a Stream     Probable     Not Probable  
 Floodplain Fill     Probable     Not Probable  
 Impacts to Forests     Probable     Not Probable  
 Impacts to Specimen Trees    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

Empty space for 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
- Other: \_\_\_\_\_
- Obtain existing stormwater practice as-builts
- Obtain site as-builts
- Obtain detailed topography
- Obtain utility mapping
- Confirm storm drain invert elevations
- Confirm soil types

**INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS**

Empty space for 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): \_\_\_\_\_



<b>WATERSHED:</b>		<b>SUBWATERSHED:</b>		<b>UNIQUE SITE ID:</b> H10-B	
<b>DATE:</b> 03/19/13		<b>ASSESSED BY:</b>		<b>CAMERA ID:</b>	
<b>GPS ID:</b>		<b>LMK ID:</b>		<b>LAT:</b>	
<b>GPS ID:</b>		<b>LMK ID:</b>		<b>LONG:</b>	
<b>SITE DESCRIPTION</b>					
Name: <u>Lucy Simms Community Ctr</u>					
Address: _____					
Ownership: <input checked="" type="checkbox"/> Public <input type="checkbox"/> Private <input type="checkbox"/> Unknown					
If Public, Government Jurisdiction: <input type="checkbox"/> Local <input type="checkbox"/> State <input type="checkbox"/> DOT <input type="checkbox"/> Other: _____					
Corresponding USSR/USA Field Sheet? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, Unique Site ID: _____					
<b>Proposed Retrofit Location:</b>					
<b>Storage</b>			<b>On-Site</b>		
<input type="checkbox"/> Existing Pond <input type="checkbox"/> Above Roadway Culvert			<input type="checkbox"/> Hotspot Operation <input type="checkbox"/> Individual Rooftop		
<input type="checkbox"/> Below Outfall <input type="checkbox"/> In Conveyance System			<input checked="" type="checkbox"/> Small Parking Lot <input type="checkbox"/> Small Impervious Area		
<input type="checkbox"/> In Road ROW <input type="checkbox"/> Near Large Parking Lot			<input type="checkbox"/> Individual Street <input type="checkbox"/> Landscape / Hardscape		
<input type="checkbox"/> Other: _____			<input type="checkbox"/> Underground <input type="checkbox"/> Other: _____		
<b>DRAINAGE AREA TO PROPOSED RETROFIT</b>					
Drainage Area ≈ <u>1.35</u>			<b>Drainage Area Land Use:</b>		
Imperviousness ≈ _____ %					
Impervious Area ≈ <u>1.27</u>					
Notes:			<input checked="" type="checkbox"/> Residential <input type="checkbox"/> Institutional <input checked="" type="checkbox"/> SFH (< 1 ac lots) <input type="checkbox"/> Industrial <input type="checkbox"/> SFH (> 1 ac lots) <input type="checkbox"/> Transport-Related <input type="checkbox"/> Townhouses <input checked="" type="checkbox"/> Park <input type="checkbox"/> Multi-Family <input type="checkbox"/> Undeveloped <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Other: _____		
<b>EXISTING STORMWATER MANAGEMENT</b>					
Existing Stormwater Practice: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Possible					
If Yes, Describe:					
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:					
Existing Street Width (if applicable): _____					
Large parking lot currently drains to 1 inlet in corner.					
Existing Head Available:			Note where points are measured from: (i.e. street elevation to catch basin invert, manhole rim to catch basin invert, other)		
≈ 5' from ex. ground to invert of adjacent dry pond					



**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:**

*Put in curb cuts around existing inlet to divert runoff to bio, which would then "spill over" to ex. dry pond. In this way, bio would serve as additional treatment*

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:** \_\_\_\_\_

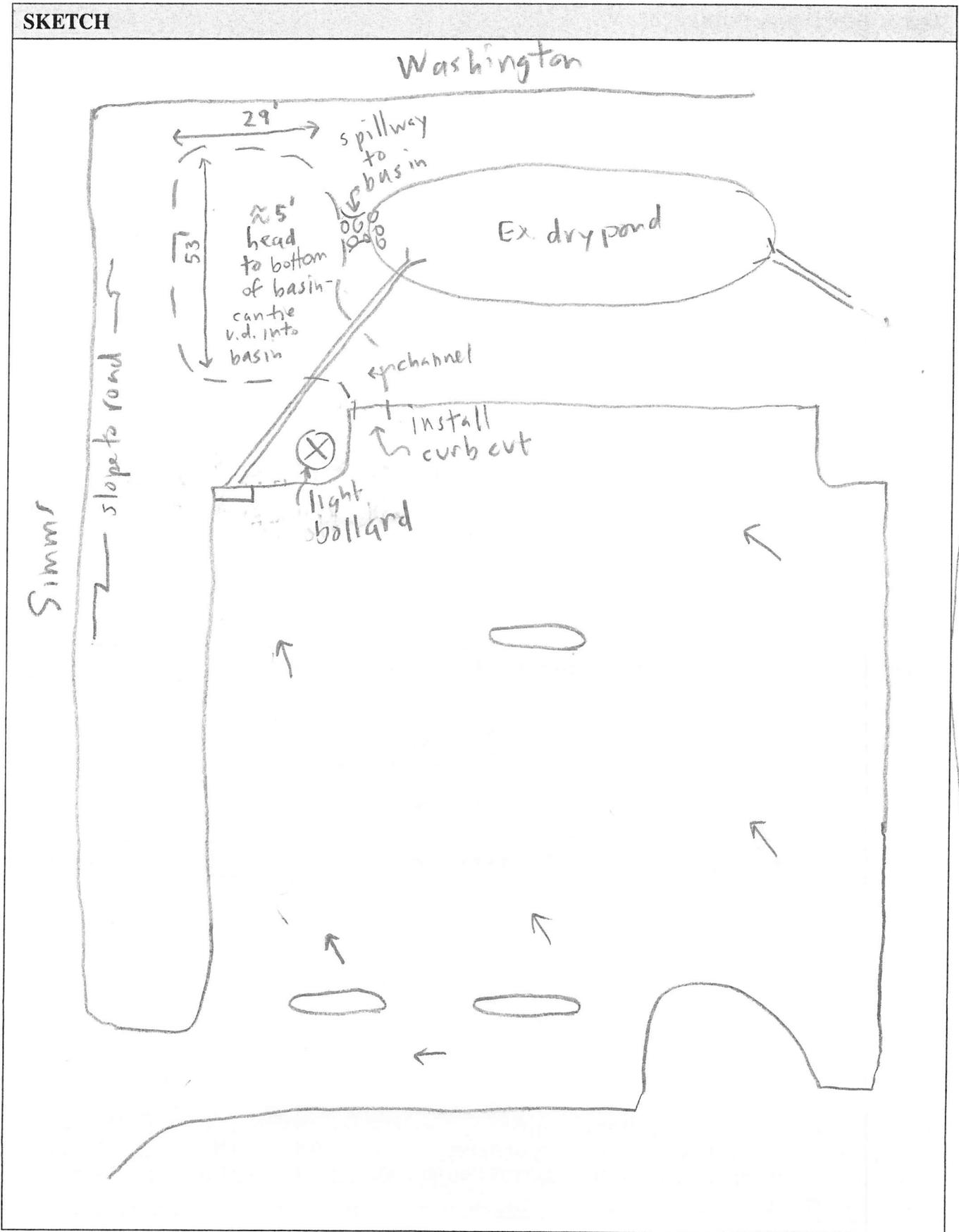
**Access:**  
 No Constraints  
 Constrained due to  
 Slope     Space  
 Utilities     Tree Impacts  
 Structures     Property  
 Ownership  
 Other: \_\_\_\_\_

<p><b>Conflicts with Existing Utilities:</b></p> <table border="1" style="width: 100%;"> <thead> <tr> <th></th> <th>Yes</th> <th>Possible/Modifiable</th> <th>No</th> <th>Unknown</th> </tr> </thead> <tbody> <tr> <td>Sewer:</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Water:</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Gas:</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Electric to Streetlights:</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Other:</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table>		Yes	Possible/Modifiable	No	Unknown	Sewer:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Water:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Gas:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Electric to Streetlights:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p><b>Potential Permitting Factors:</b></p> <table border="1" style="width: 100%;"> <tbody> <tr> <td>Dam Safety Permits Necessary</td> <td><input type="checkbox"/> Probable</td> <td><input checked="" type="checkbox"/> Not Probable</td> </tr> <tr> <td>Impacts to Wetlands</td> <td><input type="checkbox"/> Probable</td> <td><input checked="" type="checkbox"/> Not Probable</td> </tr> <tr> <td>Impacts to a Stream</td> <td><input type="checkbox"/> Probable</td> <td><input checked="" type="checkbox"/> Not Probable</td> </tr> <tr> <td>Floodplain Fill</td> <td><input type="checkbox"/> Probable</td> <td><input checked="" type="checkbox"/> Not Probable</td> </tr> <tr> <td>Impacts to Forests</td> <td><input type="checkbox"/> Probable</td> <td><input checked="" type="checkbox"/> Not Probable</td> </tr> <tr> <td>Impacts to Specimen Trees</td> <td><input type="checkbox"/> Probable</td> <td><input checked="" type="checkbox"/> Not Probable</td> </tr> </tbody> </table> <p>How many? _____          Approx. DBH _____</p> <p><b>Other factors:</b> _____</p>	Dam Safety Permits Necessary	<input type="checkbox"/> Probable	<input checked="" type="checkbox"/> Not Probable	Impacts to Wetlands	<input type="checkbox"/> Probable	<input checked="" type="checkbox"/> Not Probable	Impacts to a Stream	<input type="checkbox"/> Probable	<input checked="" type="checkbox"/> Not Probable	Floodplain Fill	<input type="checkbox"/> Probable	<input checked="" type="checkbox"/> Not Probable	Impacts to Forests	<input type="checkbox"/> Probable	<input checked="" type="checkbox"/> Not Probable	Impacts to Specimen Trees	<input type="checkbox"/> Probable	<input checked="" type="checkbox"/> Not Probable
	Yes	Possible/Modifiable	No	Unknown																																													
Sewer:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																																													
Water:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																																													
Gas:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																																													
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Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																													
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Impacts to Specimen Trees	<input type="checkbox"/> Probable	<input checked="" type="checkbox"/> Not Probable																																															

**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**

[Empty area for design or delivery notes]

**FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT**

- |  |  |
|--|--|
| <input type="checkbox"/> Confirm property ownership                        | <input type="checkbox"/> Obtain existing stormwater practice as-builts |
| <input checked="" type="checkbox"/> Confirm drainage area                  | <input type="checkbox"/> Obtain site as-builts                         |
| <input checked="" type="checkbox"/> Confirm drainage area impervious cover | <input checked="" type="checkbox"/> Obtain detailed topography         |
| <input checked="" type="checkbox"/> Confirm volume computations            | <input type="checkbox"/> Obtain utility mapping                        |
| <input type="checkbox"/> Complete concept sketch                           | <input type="checkbox"/> Confirm storm drain invert elevations         |
|  | <input type="checkbox"/> Confirm soil types                            |
- Other: \_\_\_\_\_

**INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS**

[Empty area for 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): \_\_\_\_\_

<b>WATERSHED:</b>		<b>SUBWATERSHED:</b>		<b>UNIQUE SITE ID:</b> H10-C	
<b>DATE:</b> 3/19/13		<b>ASSESSED BY:</b> LFM DJH Tom		<b>CAMERA ID:</b> Lisa's old	
<b>GPS ID:</b>		<b>LMK ID:</b>		<b>LAT:</b>	
<b>GPID:</b>		<b>LONG:</b>		<b>PICTURES:</b> 26,27	
<b>SITE DESCRIPTION</b>					
Name: <u>Lucy Simon</u>					
Address: _____					
Ownership: <input checked="" type="checkbox"/> Public <input type="checkbox"/> Private <input type="checkbox"/> Unknown					
If Public, Government Jurisdiction: <input type="checkbox"/> Local <input type="checkbox"/> State <input type="checkbox"/> DOT <input type="checkbox"/> Other: _____					
Corresponding USSR/USA Field Sheet? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, Unique Site ID: _____					
<b>Proposed Retrofit Location:</b>					
<b>Storage</b>			<b>On-Site</b>		
<input type="checkbox"/> Existing Pond			<input type="checkbox"/> Hotspot Operation		
<input type="checkbox"/> Below Outfall			<input checked="" type="checkbox"/> Small Parking Lot		
<input type="checkbox"/> In Road ROW			<input type="checkbox"/> Individual Street		
<input type="checkbox"/> Other: _____			<input type="checkbox"/> Underground		
<input type="checkbox"/> Above Roadway Culvert			<input checked="" type="checkbox"/> Individual Rooftop		
<input type="checkbox"/> In Conveyance System			<input type="checkbox"/> Small Impervious Area		
<input type="checkbox"/> Near Large Parking Lot			<input type="checkbox"/> Landscape / Hardscape		
			<input checked="" type="checkbox"/> Other: _____		
<b>DRAINAGE AREA TO PROPOSED RETROFIT</b>					
Drainage Area ≈ <u>1.39</u>			<b>Drainage Area Land Use:</b>		
Imperviousness ≈ _____ %			<input type="checkbox"/> Residential		
Impervious Area ≈ <u>1.29</u>			<input type="checkbox"/> Institutional		
Notes:			<input type="checkbox"/> SFH (< 1 ac lots)		
			<input type="checkbox"/> SFH (> 1 ac lots)		
			<input type="checkbox"/> Townhouses		
			<input type="checkbox"/> Multi-Family		
			<input type="checkbox"/> Commercial		
			<input checked="" type="checkbox"/> Other: <u>School</u>		
<b>EXISTING STORMWATER MANAGEMENT</b>					
Existing Stormwater Practice: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Possible					
If Yes, Describe:					
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:					
Existing Street Width (if applicable): _____					
School rooftop and parking lot drainage to storm drain network around school. Space available between school and adjacent football fields.					
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: Rainwater Harvesting

**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:**  
Vault underground that would receive water from two adjacent storm drain inlets. The water would be used to irrigate the adjacent football field.

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

**SITE CONSTRAINTS**

**Adjacent Land Use:**  
 Residential     Commercial     Institutional  
 Industrial     Transport-Related     Park  
 Undeveloped     Other: School

**Possible Conflicts Due to Adjacent Land Use?**     Yes     No  
**If Yes, Describe:** \_\_\_\_\_

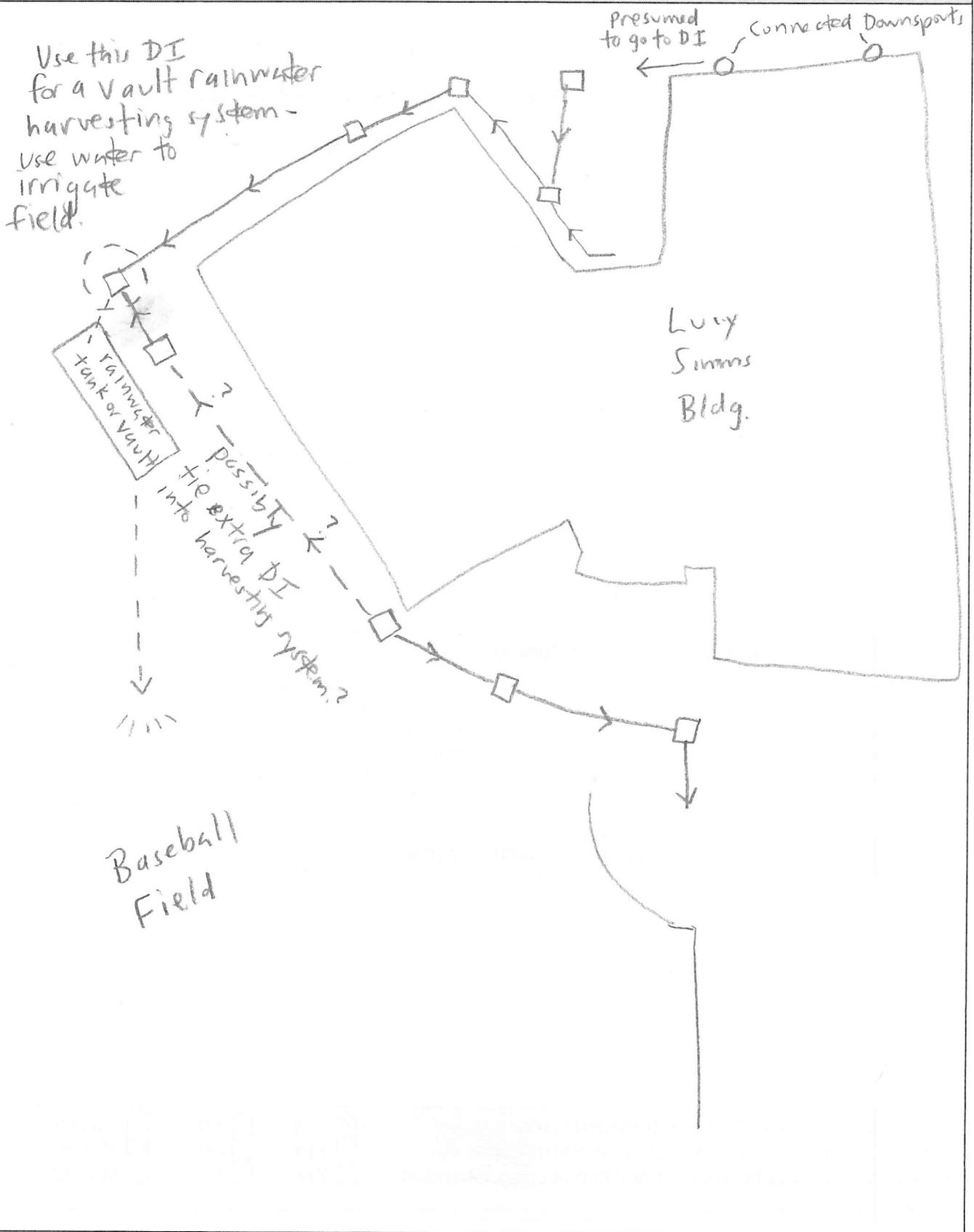
**Access:**  
 No Constraints  
 Constrained due to  
 Slope     Space  
 Utilities     Tree Impacts  
 Structures     Property  
 Ownership  
 Other: \_\_\_\_\_

Conflicts with Existing Utilities:	Yes	Possible/ Modifiable	No	Unknown	Potential Permitting Factors:
Sewer:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dam Safety Permits Necessary: <input type="checkbox"/> Probable <input checked="" type="checkbox"/> Not Probable
Water:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Impacts to Wetlands: <input type="checkbox"/> Probable <input checked="" type="checkbox"/> Not Probable
Gas:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Impacts to a Stream: <input type="checkbox"/> Probable <input checked="" type="checkbox"/> Not Probable
Electric to Streetlights:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Floodplain Fill: <input type="checkbox"/> Probable <input checked="" type="checkbox"/> Not Probable
Other:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Impacts to Forests: <input type="checkbox"/> Probable <input checked="" type="checkbox"/> Not Probable
<u>Underground Utilities</u>					Impacts to Specimen Trees: <input type="checkbox"/> Probable <input checked="" type="checkbox"/> Not Probable
					How many? _____ Approx. DBH _____
<b>Other factors:</b> _____					

**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**

- Check w/ Parks Dept about irrigation needs at field or in park in general.  
- Think about grant funding for system

**FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT**

- |   |  |
|---|--|
| <input type="checkbox"/> Confirm property ownership             | <input type="checkbox"/> Obtain existing stormwater practice as-builts |
| <input checked="" type="checkbox"/> Confirm drainage area       | <input type="checkbox"/> Obtain site as-builts                         |
| <input type="checkbox"/> Confirm drainage area impervious cover | <input type="checkbox"/> Obtain detailed topography                    |
| <input checked="" type="checkbox"/> Confirm volume computations | <input checked="" type="checkbox"/> Obtain utility mapping             |
| <input type="checkbox"/> Complete concept sketch                | <input type="checkbox"/> Confirm storm drain invert elevations         |
| <input type="checkbox"/> Other: _____                           | <input type="checkbox"/> Confirm soil types                            |

**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): \_\_\_\_\_

<b>WATERSHED:</b>		<b>SUBWATERSHED:</b>		<b>UNIQUE SITE ID:</b> H10D	
<b>DATE:</b> 3/19/13		<b>ASSESSED BY:</b> DJH/TAH		<b>CAMERA ID:</b>	
<b>GPS ID:</b>		<b>LMK ID:</b>		<b>LAT:</b>	
<b>GPS ID:</b>		<b>LMK ID:</b>		<b>LONG:</b>	
<b>SITE DESCRIPTION</b>					
Name: <u>RALPH SAMPSON PARK</u>					
Address: _____					
Ownership: <input checked="" type="checkbox"/> Public <input type="checkbox"/> Private <input type="checkbox"/> Unknown If Public, Government Jurisdiction: <input checked="" type="checkbox"/> Local <input type="checkbox"/> State <input type="checkbox"/> DOT <input type="checkbox"/> Other: _____					
Corresponding USSR/USA Field Sheet? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, Unique Site ID: _____					
<b>Proposed Retrofit Location:</b>					
<b>Storage</b>			<b>On-Site</b>		
<input type="checkbox"/> Existing Pond <input type="checkbox"/> Above Roadway Culvert			<input type="checkbox"/> Hotspot Operation <input type="checkbox"/> Individual Rooftop		
<input type="checkbox"/> Below Outfall <input type="checkbox"/> In Conveyance System			<input type="checkbox"/> Small Parking Lot <input type="checkbox"/> Small Impervious Area		
<input type="checkbox"/> In Road ROW <input type="checkbox"/> Near Large Parking Lot			<input type="checkbox"/> Individual Street <input type="checkbox"/> Landscape / Hardscape		
<input type="checkbox"/> Other: _____			<input type="checkbox"/> Underground <input checked="" type="checkbox"/> Other: <u>PARK</u>		
<b>DRAINAGE AREA TO PROPOSED RETROFIT</b>					
Drainage Area ≈ _____ Imperviousness ≈ _____ % Impervious Area ≈ _____			<b>Drainage Area Land Use:</b>		
Notes:			<input type="checkbox"/> Residential <input type="checkbox"/> Institutional		
			<input type="checkbox"/> SFH (< 1 ac lots) <input type="checkbox"/> Industrial		
			<input type="checkbox"/> SFH (> 1 ac lots) <input type="checkbox"/> Transport-Related		
			<input type="checkbox"/> Townhouses <input checked="" type="checkbox"/> Park		
			<input type="checkbox"/> Multi-Family <input type="checkbox"/> Undeveloped		
			<input type="checkbox"/> Commercial <input type="checkbox"/> Other: _____		
<b>EXISTING STORMWATER MANAGEMENT</b>					
Existing Stormwater Practice: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Possible					
If Yes, Describe:					
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance: Existing Street Width (if applicable): _____ - EXISTING PARK AREA W/ MAINTAINED GRASS AREAS, AND STONE TRAILS. - STONE TRAILS SHOW SIGNS OF TRAIL EROSION DUE TO + 10% GRADES - WIDE SHALLOW DITCH CONVEYS WATER TO INLET.					
Existing Head Available:  LOTS ABOVE STR. @ STR 3.3 FROM PROP SILE TO DI INVERT			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)**

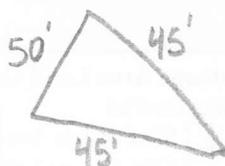
- Constructed Wetland     Wet Swale     Wet Pond  
 Filtering Practice     Proprietary: \_\_\_\_\_  
 Other: \_\_\_\_\_

**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:**

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



6.5'  
 5.4'  
 4.0'  
 2.31' (INVERT)  
 + raise +/- 2.0' - 1.0' pond  
 Tot Head ≈ 4.3'

**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:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Water:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Gas:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Electric to Streetlights:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**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 \_\_\_\_\_

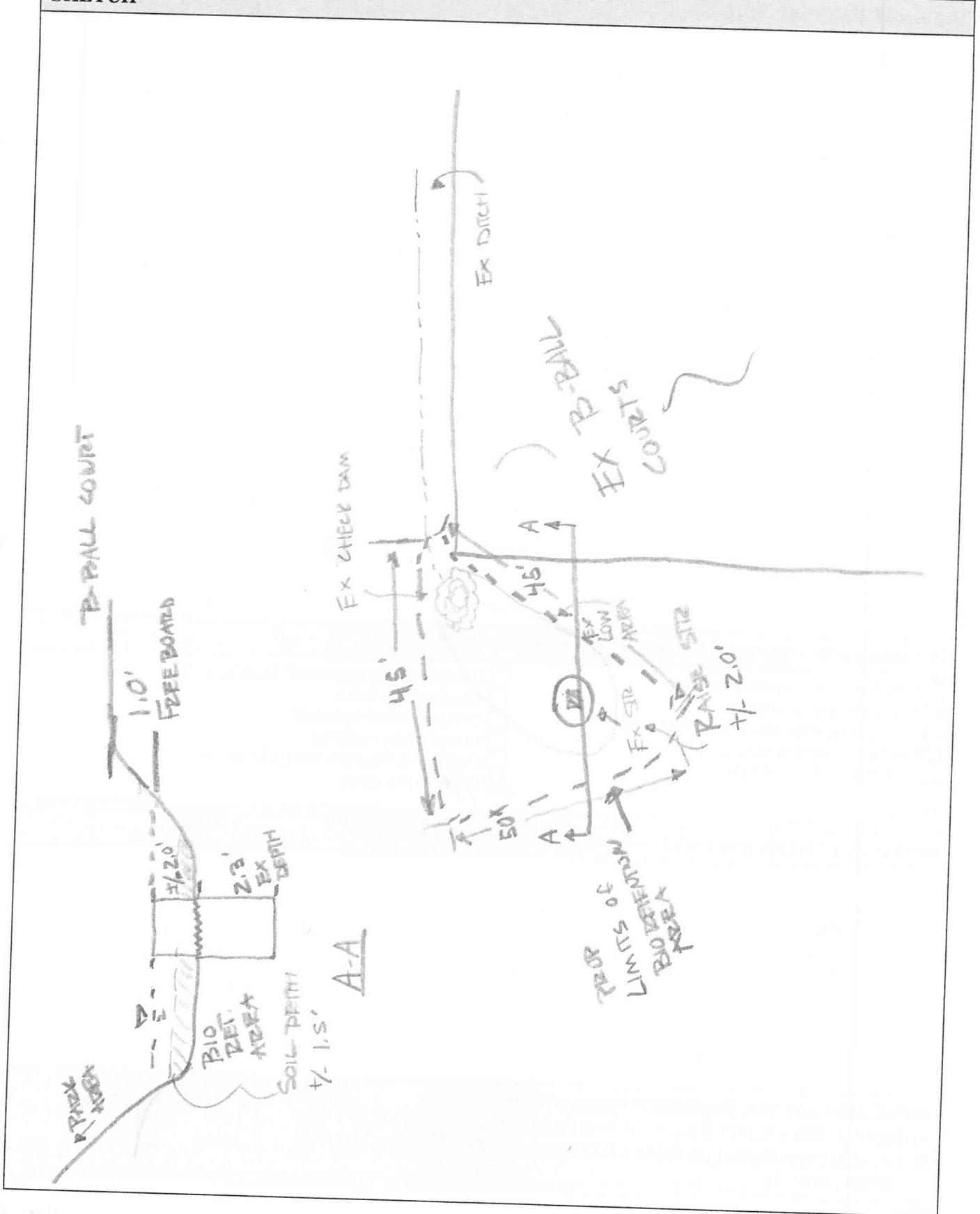
**Other factors:** \_\_\_\_\_

**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

CLAY w/ PIECES of GRAVEL

SKETCH



**DESIGN OR DELIVERY NOTES**

**FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT**

- |  |  |
|--|--|
| <input type="checkbox"/> Confirm property ownership                        | <input type="checkbox"/> Obtain existing stormwater practice as-builts |
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| <input checked="" type="checkbox"/> Confirm volume computations            | <input type="checkbox"/> Obtain utility mapping                        |
| <input checked="" type="checkbox"/> Complete concept sketch                | <input type="checkbox"/> Confirm storm drain invert elevations         |
| <input type="checkbox"/> Other: _____                                      | <input checked="" type="checkbox"/> Confirm soil types                 |

**INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS**

- |  |                              |                             |                                |
|--|------------------------------|-----------------------------|--------------------------------|
| <b>SITE CANDIDATE FOR FURTHER INVESTIGATION:</b>               | <input type="checkbox"/> YES | <input type="checkbox"/> NO | <input type="checkbox"/> MAYBE |
| <b>IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):</b>          | <input type="checkbox"/> YES | <input type="checkbox"/> NO | <input type="checkbox"/> MAYBE |
| <b>IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):</b> | <input type="checkbox"/> YES | <input type="checkbox"/> NO | <input type="checkbox"/> MAYBE |
- IF YES, TYPE(S): \_\_\_\_\_