

**APPENDIX A:
EFC FACT SHEET &
STORMWATER PROGRAM
BUDGET**

STORMWATER IN THE CITY OF SCRANTON



What is stormwater runoff?

Stormwater runoff is generated when precipitation from rain and snowmelt events flows over land or impervious surfaces and does not percolate into the ground. As runoff flows over the land or impervious surfaces (paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment or other pollutants.

Why does stormwater matter?

Because rivers and streams matter.

- ✓ The City of Scranton is located within the Lackawanna River watershed, where all stormwater drains. Poorly managed stormwater pollutes the Lackawanna River, causing erosion and flooding and damaging property and habitats.
- ✓ The Lackawanna River is the largest tributary to the North Branch of the Susquehanna River in Northeastern Pennsylvania. Any pollution that occurs locally affects not only the local rivers and streams, but ultimately the Susquehanna River and Chesapeake Bay.

Stormwater systems require long-term management and maintenance.

- ✓ The City's aging infrastructure is in need of repair to mitigate heavy rainfall, manage runoff, and meet regulatory requirements.

Stormwater systems are overlooked.

- ✓ Neglecting stormwater systems can cost the City millions in damages and repairs if an emergency strikes or fines if regulations are not met.
- ✓ Stormwater in Scranton can create public health, safety, and economic concerns.

What's happening in the City to address stormwater?

Working with local and regional partners.

- ✓ Funded by the National Fish & Wildlife Foundation (NFWF), the City currently receives technical assistance from Lackawanna River Corridor Association (LRCA) to inventory the City's Storm Sewer System, Hatala Associates to conduct public outreach and education, McLane Associates to identify opportunities to better manage stormwater at a lower cost by incorporating "green" practices, and the Environmental Finance Center (EFC) at the University of Maryland to provide long-term financing recommendations to managing stormwater.

These partners are working closely with the City and the Scranton Sewer Authority (SSA) to determine the most sustainable, accountable, comprehensive, and fairest approach to managing stormwater.

Want to learn more or share your thoughts on stormwater in the City of Scranton?

CONTACT:

Lackawanna River Corridor Association, 570-347-6311

Sponsored by:



In partnership with:

Initial Stormwater Program Budget, Year 1

NOTE: This budget represents activities identified by the EFC Project Team that are needed to meet the City's existing regulations, which are being implemented across many partners. In the near term, the City and SSA will need to determine which entity is responsible for which activity. In the long term, the MS4 permit holder will need to incorporate personnel, capital improvement, and O&M costs associated with existing activities *in addition* to those identified in the initial budget below for a final program budget.

Activity	Year 1 Costs	Estimated # units	One-time/annual cost	Comments	Recommended Financing Source
Contractual services:					
Lackawanna River Corridor Association (LRCA)					
Outreach and engagement	\$63,880		Annual	Conduct all public outreach and engagement activities (MCMs 1 & 2)	Stormwater user fee
Mapping, inventory, and prioritize projects	\$32,000		Years 1-3	Help finish system map, inventory, and develop prioritized list of water quality improvement projects	Stormwater user fee
City of Scranton					
Engineer/Inspector			Annual	Construction inspections (in tandem with LCCD) & tracking all construction projects	General funds
Public Works			Annual	DPW staff (basin crew) to develop O&M schedule for BMPs and continue maintaining all publically-owned PCSM BMPs	General funds
McLane Associates					
GI projects	<i>Insert from report</i>		Will vary from year to year	Contract with McLane Associates to implement GI projects identified in study	Stormwater user fee/potential bond financing or grants
Personnel costs:					
Stormwater coordinator		1	Annual	Coordinate all components of MS4 permit + additional SW-related regulations; track all components, maintain plans	Stormwater user fee
Technical staff		2	Annual	SSA hire additional staff to fully handle all its LTCP and MS4 permit activities -- adding marginal work since already being done for LTCP; will at least need two street sweepers, unsure how many additional staff needed	Stormwater user fee
Administrative staff		1	Annual	These two hires are for SSA to consider - need to determine if they already have this capacity in-house	Stormwater user fee
GIS staff		1	Annual		Stormwater user fee

Activity	Year 1 Costs	Estimated # units	One-time/annual cost	Comments	Recommended Financing Source
Capital improvement costs:					
Outfall location identifiers		Need to determine	One-time	Purchase outfall location identifiers once all outfalls are identified to begin inspecting and tracking on schedule	Stormwater user fee
Water quality improvement projects			Will vary from year to year	Contract with local firm(s) to implement prioritized water quality improvement projects identified by project partners	Stormwater user fee/potential bond financing or grants
GI projects			Will vary from year to year	Contract with local firm(s) to design, construct, and maintain additional GI projects not identified in study/leverage existing projects through LTCP	Stormwater user fee/potential bond financing or grants
Street sweeping equipment		Need to determine	Annual reserve or every 20 years	Can purchase City's two old sweepers or new equipment	Stormwater user fee
Additional equipment		Need to determine	Annual reserve or every 20 years	Determine what additional equipment is needed and when it needs purchased; can purchase up front or set aside reserves each year and purchase in future	Stormwater user fee
Operations & maintenance costs:					
Management software		0.37	Annual	SSA has existing software to utilize - should pay for 37% of total cost for MS4 permit activities	Stormwater user fee
IDD&E testing materials			Annual or one-time?	Determine if additional materials are needed or if SSA already has in-house	Stormwater user fee
GIS software	\$18,500	0.37	Annual	ArcMap License to map system (total cost is \$50,000) - should pay for 37% of total cost for MS4 permit activities	Stormwater user fee
Conveyance system mapping			Until complete	SSA's costs to finish mapping system (likely personnel costs)	Stormwater user fee
Equipment maintenance		Need to determine	Annual	SSA must determine the existing equipment that it will utilize for MS4, and if additional new equipment will be purchased	Stormwater user fee

EFC's Recommended Budget to Contract with the LRCA

LRCA Costs of Annual Administrative Tasks

Task	Explanation	Cost
Written Public Education & Outreach Plan (PEOP)	2 hours @ \$80 per hour (annual maintenance)	\$160
Target Audience list	10 hours @ \$80 per hour	\$800
Material distribution	410 hours @ \$80 per hour	\$32,800
	Printing costs	\$5,000
Written Public Involvement & Participation Plan (PIPP)	24 hours @ \$80 per hour (annual maintenance)	\$1,920
Promote/sponsor events (stream clean up, tree planting, etc.)	\$3600 per event	\$3,600
	Event costs	\$1,000
Hold annual public meeting	Staff time to prep for event	\$3,600
Solicit public feedback	100 hours @ \$80 per hour	\$8,000
Track attendees, meetings, events	80 to 100 hours per year	\$7,000
Total costs for administrative tasks:		\$63,880

LRCA Costs of Annual Technical Tasks

Task	Explanation	Cost
System mapping	Finish system mapping and inventory	\$16,000
Water quality improvement project prioritization	200 additional hours @ \$80 per hour (years 1-3)	\$16,000
Total costs for technical tasks:		\$32,000



**APPENDIX B:
LRCA STREAMWALK
DATASHEETS**



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Draft

The purpose of this Standard Operating Procedure (SOP) is to explain how to operate and navigate through the SSA's Trimble Juno 3B data collectors and use them effectively in the field to collect outfall information, identify different types of stormwater structures (i.e., pipes or swales), note catch basins in close proximity to the receiving waterway, and appropriately enter the required information into the data collectors for use in the Municipal Separate Storm Sewer System (MS-4) program, being carried out by the LRCA, SSA, and McLane & Associates.

Equipment Overview

The SSA is currently implementing Trimble Juno 3B handheld data collectors for the use of collecting map grade latitude, longitude and information on all stormwater receiving structures and basins within the Scranton and Dunmore area.

Below is an overview of the Juno 3B basic controls.

Front View



Bottom View




Operation

1. → Power on Juno 3B


- a. → Hold the green power button at the top of the screen until the display lights up.
 - i. → The screen will dim after a period of inactivity. If this happens simply push and immediately release the power button to turn the display back on.
- Once the unit is powered on the Windows Mobile *home screen* will be displayed, see image below.

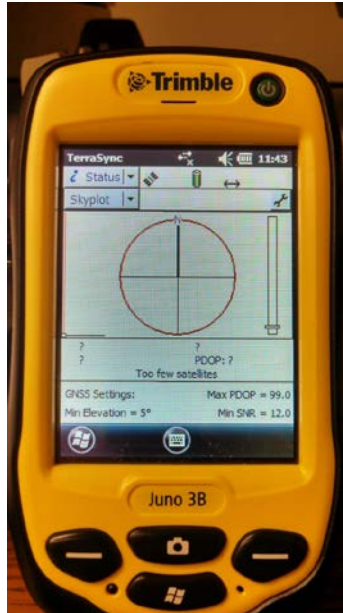


2.→ Click the **Start button**  to navigate to the **Start screen**, see image above.

3.→ Remove the tethered stylus (*looks like a pen*) from the bottom of the Juno and gently press it against the screen while dragging it up the screen until you see the TerraSync icon.



4.→ Click the TerraSync icon  with the stylus. It may take a few moments for TerraSync to open. Once the program is open you will see the screen below.



On this screen you should notice a few of the basic controls.

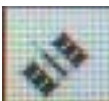
1. The Status drop down menu on the upper left corner of the screen



2. The green battery indicator at located at the upper middle of the screen



3. The satellite indicator located directly to the left of the battery indicator



4. The digital keyboard control located at the lower center of the screen



All controls can be activated through the use of the stylus.

Operating the TerraSync software for creating a new job

1.→ Using the stylus click the **Status** dropdown button. After clicking it you should see the screen below.



2.→ From the Status dropdown menu click on **Data** with the Stylus. Once Data is clicked you should see the screen below and be in the Create New Data File screen.



Take notice that the digital keyboard appeared, the file name was automatically created and there is now a Create button at the bottom of the screen.

3.→ From the Create New Data File screen using the stylus click the **Create** button at the bottom of the screen. After clicking Create you should see the screen below and be in the Confirm Antenna Height screen.



4.→ From the Confirm Antenna Height Screen, using the stylus click **ok**. After clicking ok you should see the Data Collection screen below.



Collecting field data

The focus of this project is to identify all outfall structures flowing into receiving waterways within the Scranton / Dunmore area. To help identify these structures, they have been broken down into six categories:

- 1.→ Outfall Pipe
- 2.→ Swale
- 3.→ Creek Bed
- 4.→ Basin
- 5.→ Unknown
- 6.→ Manhole


1. Selecting the MS4 Point button

- 1.→ Make sure Terrasync is open and you are in the Data Collection screen.
- 2.→ Stand approximately 1'-2' back from the structure.
- 3.→ Using the stylus click the MS4 Point button on the data collection screen
 - *Once the MS4 Point is clicked you must remain as still as possible. Once selected the data collector is recording data. Excess movement can shift the point.*
 - *You should always try to take the points/pictures looking upstream.*

2. Crew Information

- 1.→ Click on the Crew Information dropdown menu
- 2.→ Select your given crew name

3. Picture

- 1.→ Click on the button that looks like a camera on the screen. The camera screen may take a few moments to appear.
 - *If possible, take the picture looking upstream*
- 2.→ From the camera screen make sure that the entire structure is visible.
 - *Excessive movement will shift the points*
- 3.→ Once the entire structure is visible in the screen, **firmly** press the camera button located below the screen 
- 4.→ When the picture has been taken the program will automatically return to the MS4 Point screen.
 - *Notice that the picture field has been populated with a filename and time.*

4. Type of Asset

- 1.→ Click on the Type of Asset dropdown menu.
- 2.→ Select the type:
 - a. Outfall Pipe
 - b. Swale
 - c. Creek Bed
 - d. Basin
 - e. Unknown
 - f. Manhole

5. Receiving Waterway

- 1.→ Click on the Receiving Waterway dropdown menu.
- 2.→ Select the waterway:
 - a. GRE (Green Run)
 - b. KEY (Keyser Creek)
 - c. LAC (Lackawanna River)
 - d. LEA (Leach Creek)
 - e. LEG (Leggetts Creek)
 - f. LIN (Linde Creek)
 - g. LUC (Lucky Run)
 - h. MEA (Meadow Brook)
 - i. ROA (Roaring Brook)
 - j. SPR (Spring Brook)
 - k. STA (Stafford-Meadow Brook)

6. Pipe Moisture

- 1.→ Click on the Pipe dropdown menu.
- 2.→ Select Wet or Dry

7. Pipe Size

- 1.→ Using the stylus click the digital keyboard key located at the bottom of the screen.




- 2.→ Record the diameter of the inside of the pipe in inches.

8. Pipe Material

- 1.→ Click on the Pipe Material dropdown menu.
- 2.→ Select Pipe Material:
 - a. BR (brick)
 - b. CAS (cast iron)
 - c. CMP (corrugated metal)
 - d. CP (non-reinforced concrete)

- e. CSB (concrete segments)
- f. DIP (ductile iron)
- g. PVC (polyvinyl chloride)
- h. VCP (vitrified clay)
- i. WD (wood)
- j. XXX (not known)
- k. ZZZ (other – state in comments)

9. Comments

- Using the stylus click the digital keyboard key located at the bottom of the screen. 
 - Record anything unique about the structure, such as:
 - a. Side of the stream the structure is on
 - b. Maintenance that needs to be done (if pipe is caved in or needs to be cleaned out)
 - c. Degree of erosion, if any
 - d. Water characteristics (i.e., cloudy/clear, color, smell)
 - e. Right of way issues (i.e., gates, fences, dogs)
 - f. Possibility of a BMP

10. Using the stylus, click done at the bottom of the screen. Move to the next structure and repeat the process. When it returns to the Data Collection screen the observation is complete and you are ready to go to the next basin.

Types of Basins

Combination Inlet – Grate in the street along with an opening at the curb. Commonly has a manhole on the sidewalk.



Curb Opening – Open pipe at the curb and commonly has a manhole on the sidewalk.



Highway Grate – Grate in street. Either contributes to a basin or directly to the combined or separated system. May have a manhole on the sidewalk.



Curb Inlet – Opening in curb and commonly has a manhole on sidewalk.



Basin – Manhole structure that receives flow from several of the above structures.



I-81 SWALE

General Notes	Watershed Area	4 Mi. ²
	Confluence	Lackawanna River at RM 15
	Order	1 st Order Tributary
	Date	21-Aug-13
	Survey Staff	Sean McCauley, Bernie McGurl, Bridgette Robinson
	Weather	
Field Walk Observations	Starting Point	<ul style="list-style-type: none"> Confluence with Lackawanna River at I-81 Bridge at exit 190. The confluence and lower open channel are accessible on gravel maintenance road adjacent to Boulevard Avenue near the Lackawanna County Recycling Center.
	Stream Bed & Banks	<ul style="list-style-type: none"> Dry stream bed A trapezoidal swale consists of rip-rap boulders on impervious geo-textile liner in stream bed near the confluence up through Boulevard Avenue and Olyphant Avenue to a point near the Marywood University athletic fields. From this point up to the I-81 junction, the watercourse consists of a large network of catch basins and culverts. Heavy sediment load Metals likely in sediment Shallow banks
	Riparian Area	<ul style="list-style-type: none"> Knotweed; goldenrod Black locust
	Adjacent Neighborhoods	<ul style="list-style-type: none"> Marywood University O'Neil Highway/Blakely Street Commercial Corridor Swinick residential subdivision Keystone Industrial Park Keystone Sanitary Landfill (KSL)
	Roads & Bridges	<ul style="list-style-type: none"> Reeves Street O'Neil Highway/Blakely Street I-81
	Impervious Surface	<ul style="list-style-type: none"> ~ 90% Low Density Residential
	Estimated # of Storm Water Detention Facilities	<ul style="list-style-type: none"> N/A
	#/Size of Pipes	<ul style="list-style-type: none"> N/A
	Debris	<ul style="list-style-type: none"> Measurable sediment load
	Trash	<ul style="list-style-type: none"> N/A
	Infrastructure	<ul style="list-style-type: none"> N/A
	Note:	<ul style="list-style-type: none"> This is under Penn DOT permit responsibility.



MINOOKA RUN

General Notes	Watershed Area	2 Mi. ²
	Confluence	Lackawanna River at RM 7.4
	Order	1 st Order Tributary
	Date	October 2 & 3, 2013
	Survey Staff	10/2 – Kelsey Biondo, Sean McCauley, Bernie McGurl, Bridgette Robinson; 10/3 – Kelsey Biondo, Sean McCauley, Bridgette Robinson
	Weather	60° F, Sunny
Field Walk Observations	Starting Point	<ul style="list-style-type: none"> Confluence along east bank of Lackawanna River along Pennsylvania Northeast Railroad Authority's Lackawanna Valley Line; about one half mile north of Davis Street Bridge.
	Stream Bed & Banks	<ul style="list-style-type: none"> Original stream channel through stone arch bridge under railway to the Lackawanna River is evident. Channel upgrade of railway has been blocked and diverted by mining and development activities (possibly circa 1930s). There is a 10 inch corrugated metal culvert, of unknown ownership and origin, emanating from fill-debris in channel blockage that needs to be identified. The blocked stream channel seems to have been rerouted to a point in the cliffside topography above the railroad about 800 ft up river from the original blocked channel location near the dead end of McCarthy Street.
	Riparian Area	<ul style="list-style-type: none"> Grassy swale (along residential properties and small park)
	Adjacent Neighborhoods	<ul style="list-style-type: none"> Residential (along Colliery Avenue, Cedar Avenue, Birney Avenue, and Pittston Avenue) Neighborhood commercial (at Davis Street, Birney Avenue, and Pittston Avenue)
	Roads & Bridges	<ul style="list-style-type: none"> Stone arch culvert bridge under railway circa 1890 Concrete culvert bridge at Cedar Avenue Unknown culverts at Burke Street and Cemetery Avenue Unknown culvert at Colliery Avenue Unknown culverts at Pittston Avenue and Hamm Court
	Impervious Surface	<ul style="list-style-type: none"> ~ 40% Neighborhood Commercial Low Density Residential Industrial
	Estimated # of Storm Water Detention Facilities	<ul style="list-style-type: none"> 7 Facilities (Zero Watershed) <ul style="list-style-type: none"> Scranton Health Care Center McCarthy Street Townhouses Laurel Woods CVS Pharmacy Canton Properties Waffle House Montage Motors Car Lot Expansion
	#/Size of Pipes	<ul style="list-style-type: none"> 1 pipe Size: 18 inches
	Debris	<ul style="list-style-type: none"> N/A
	Trash	<ul style="list-style-type: none"> Litter and yard waste
	Infrastructure	<ul style="list-style-type: none"> McCarthy Street trunk line to sewer plant is affected by washout of nearby channel diversion



MOUNT PLEASANT RUN

MOUNT PLEASANT RUN		
General Notes		
	Watershed	1 Mi. ²
	Confluence	Lackawanna River at RM 11
	Order	1 st Order Tributary
	Date	NA
	Survey Staff	NA
	Weather	NA
Field Walk Observations	Starting Point	<ul style="list-style-type: none"> · Confluence with Lackawanna River at Mulberry Street/North Scranton Expressway Bridge and Lackawanna River
	Stream Bed & Banks	<ul style="list-style-type: none"> · Confluence with the Lackawanna River through a flap-gate in flood control works adjacent to CSO #18 · Channel is rip-rapped swale · Adjacent storm water detention basin developed as part of the Expressway Bridge relocation covers ~ 2 acres
	Riparian Area	<ul style="list-style-type: none"> · Original stream channel and riparian area were eliminated by mining and urban development activities
	Adjacent Neighborhoods	<ul style="list-style-type: none"> · Mount Pleasant Business Park · The Shops at Linden Place · Scranton High School
	Roads & Bridges	<ul style="list-style-type: none"> · North Scranton Expressway · Seventh Avenue · Linden Street
	Impervious Surface	<ul style="list-style-type: none"> · ~ 50% · Neighborhood Commercial · Institutional Campus
	Estimated # of Storm Water Detention Facilities	<ul style="list-style-type: none"> · N/A
	#/Size of Pipes	<ul style="list-style-type: none"> · N/A
	Debris	<ul style="list-style-type: none"> · N/A
	Trash	<ul style="list-style-type: none"> · N/A
	Infrastructure	<ul style="list-style-type: none"> · N/A
	Note:	<ul style="list-style-type: none"> · No field work was conducted on this tributary; feasible to look into in the future.

CARTER CREEK

General Notes	Watershed Area	1.5 Mi. ²
	Confluence	Lackawanna River at RM 14.1
	Order	1 st Order Tributary
	Date	5-Apr-13
	Survey Staff	Kelsey Biondo, Kayleigh Cornell
	Weather	55° F, Sunny
Field Walk Observations	Starting Point	<ul style="list-style-type: none"> · Confluence with Lackawanna River behind Advanced Textile Composites Warehouse · Presently a stone culvert and CSO system; discharges into Lackawanna River through Raines St. CSO
	Stream Bed & Bank	<ul style="list-style-type: none"> · Dry stream bed · Shallow banks · Underground until headwall at Olyphant Avenue
	Riparian Area	<ul style="list-style-type: none"> · Wooded · Grassland
	Adjacent Neighborhoods	<ul style="list-style-type: none"> · Green Ridge Little League on Olyphant Avenue
	Roads & Bridges	<ul style="list-style-type: none"> · Follows East Parker Street to Olyphant Avenue · Ends at I-81
	Impervious Surface	<ul style="list-style-type: none"> · ~ 50% · Low Density Residential · Open Space
	Estimated # of Storm Water Detention Facilities	<ul style="list-style-type: none"> · 4 Facilities (Green Ridge Health Care Centers, Marywood University, Armed Forces Training Center, Stor-way Self Storage Facility)
	#/Size of Pipes	<ul style="list-style-type: none"> · 1 pipe, size = 3 inches
	Debris	<ul style="list-style-type: none"> · Headwaters blocked with debris
	Trash	<ul style="list-style-type: none"> · Residential litter and tires (Olyphant Avenue to I-81)
	Infrastructure	<ul style="list-style-type: none"> · Sheet flow to basements of residential areas (from Green Ridge Little League Field)



GREEN BUSH RUN

GREEN BUSH RUN		
General Notes	Watershed Area	1 Mi. ²
	Confluence	Lackawanna River at RM 14.6
	Order	1 st Order Tributary
	Date	4-Apr-13
	Survey Staff	Kelsey Biondo, Kayleigh Cornell, Sean McCauley, Bernie McGurl
	Weather	
Field Walk Observations	Starting Point	<ul style="list-style-type: none"> · Behind Johnny's Car Wash on Main Avenue
	Stream Bed & Banks	<ul style="list-style-type: none"> · Underground · Culverts
	Riparian Area	<ul style="list-style-type: none"> · Wooded
	Adjacent Neighborhoods	<ul style="list-style-type: none"> · Career Technology Center (Vo Tech)
	Roads & Bridges	<ul style="list-style-type: none"> · N. Main Avenue · Opens at Green Bush Street uphill from Mulley Avenue
	Impervious Surface	<ul style="list-style-type: none"> · ~ 30% · Low Density Residential <ul style="list-style-type: none"> o Wilbur Street resident's yard affected by new development runoff from across the street · Commercial
	Estimated # of Storm Water Detention Facilities	<ul style="list-style-type: none"> · 2 Facilities (Zero Watershed) <ul style="list-style-type: none"> o Johnson College Health Sciences o Toyota Scion of Scranton
	#/Size of Pipes	<ul style="list-style-type: none"> · 5 pipes · Sizes range from 6-36 inches
	Debris	<ul style="list-style-type: none"> · N/A
	Trash	<ul style="list-style-type: none"> · Residential trash in wooded area (behind Wilbur Street and Reese Street)
	Infrastructure	<ul style="list-style-type: none"> · Inlet clogged (Greenbush Street) · Grate is missing over basin (Greenbush Street) · Curb needs to be fixed (Greenbush Street) · Lack of storm water infrastructure (Wilbur Street after new construction)



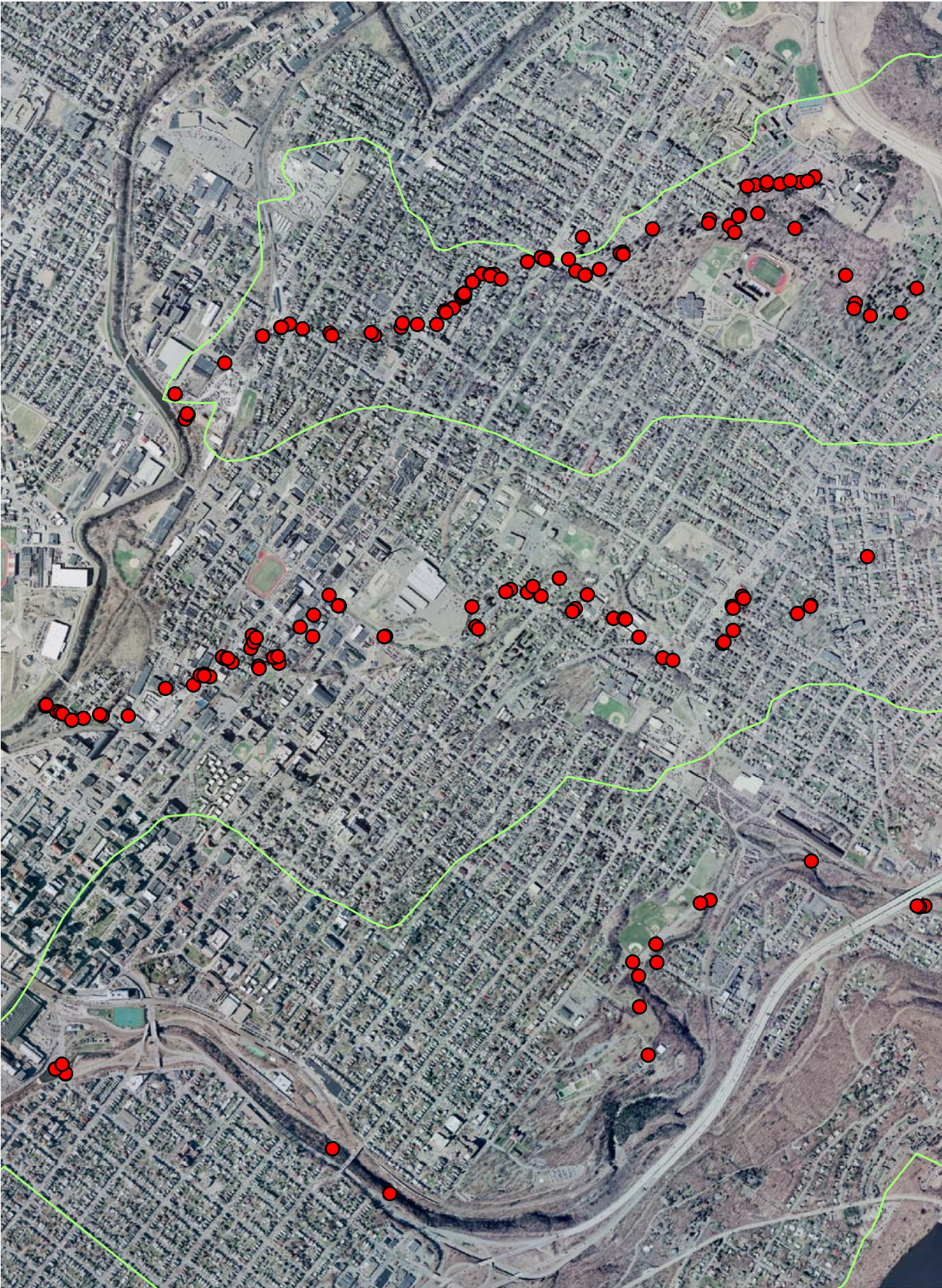
PHILO CREEK

PHILO CREEK		
General Notes	Watershed Area	2 Mi. ²
	Confluence	Lackawanna River at CSO #7 Philo Street Regulator
	Order	1 st Order Stream
	Date	4-Sep-13
	Survey Staff	Kelsey Biondo, Bernie McGurl, Bridgette Robinson
	Weather	78° F, Sunny
Field Walk Observations	Starting Point	<ul style="list-style-type: none"> Tripp Park storm water basin at Court Street and Euclid Avenue
	Stream Bed & Banks	<ul style="list-style-type: none"> Starts out as swales in Tripp Park residential development Drains through subdivision storm water basin to culvert and catch basins at Court Street under the Expressway Bridge Flows through culvert into open channel Opens up into severely degraded remnant of its original stream bed 400 ft upstream of Pierce Street dead end; channel flows through coal mine waste to invert at Peirce Street Steep banks ~ 6 ft During rain storm events, must have heavy flow from development, due to deep splash pool, which potentially leaches into mine pool Flows into catch basin of CSO system at dead end of Pierce Street From CSO, flows into Lackawanna River through Philo Street Regulator
	Riparian Area	<ul style="list-style-type: none"> Grassland Wooded
	Adjacent Neighborhoods	<ul style="list-style-type: none"> Bull's Head Tripp Park
	Roads & Bridges	<ul style="list-style-type: none"> Court Street · Pierce Scranton Expressway Overpass · Canadian Pacific Railway Overpass
	Impervious Surface	<ul style="list-style-type: none"> ~ 70% [Strip mining remnants, High density residential]
	Estimated # of Storm Water Detention Facilities	<ul style="list-style-type: none"> 1 facility (Zero Watershed) <ul style="list-style-type: none"> o 1 open basin for Tripp Park neighborhood (Court Street & Euclid Avenue)
	#/Size of Pipes	<ul style="list-style-type: none"> N/A
	Debris	<ul style="list-style-type: none"> Strip mining remnants (wooded area off Pierce Street)
	Trash	<ul style="list-style-type: none"> Tires, electronics, etc (wooded area off Pierce Street)
	Infrastructure	<ul style="list-style-type: none"> Inverts at Court Street catch basins 48 inch culvert from Court Street to open channel CSO line to Philo Street Regulator



PINE BROOK

General Notes	Watershed Area	2.6 Mi. ²
	Confluence	Lackawanna River at RM 11.2
	Order	1 st Order Tributary
	Date	April 25 & 26, 2013
	Survey Staff	4/25 – Kelsey Biondo, Sean McCauley, Bernie McGurl; 4/26 – Kelsey Biondo, Bernie McGurl
	Weather	4/25 - 59° F; 4/26 - 60° F
Field Walk Observations	Starting Point	· Confluence with Lackawanna River off of railroad tracks near Olive Street Bridge
	Stream Bed & Banks	· All underground
	Riparian Area	· Non-existent
	Adjacent Neighborhoods	· Hill Section
	Roads & Bridges	· W. Olive Street · E. Gibson Street · Monroe Avenue · Quincy Avenue · Wyoming Avenue · New Street · Clay Avenue · N. Webster Avenue · N. Washington Avenue · Poplar Street · S. Blakely Street · Green Street · Second Street
	Impervious Surface	· ~ 95% · High Density Residential · Neighborhood Commercial
	Estimated # of Storm Water Detention Facilities	· 9 Facilities (Zero Watershed) o Overlook at Clay o Scranton Prep Arts and Sciences Center o Shiloh Baptist Church (TCMC Parking Lot) o Commonwealth Medical College o Normandy Holdings Mid-Rise Apartments o Tobyhanna Federal Credit Union o Penn's Furniture Parking and Sidewalk Improvements o COLTS Intermodal Facility o Dunkin' Donuts
	#/Size of Pipes	· N/A
	Debris	· N/A
	Trash	· N/A
Infrastructure	· Needs street sweeping throughout; many catch basin inlets are clogged with street litter and debris	



SCRANTON DICKSON CITY BASINS

SCRANTON DICKSON CITY BASINS		
General Notes	Watershed	1 Mi. ²
	Confluence	Lackawanna River
	Date	22-Aug-13
	Survey Staff	Sean McCauley, Bernie McGurl, Bridgette Robinson
	Weather	80° F, Rainy
Field Walk Observations	Starting Point	· Confluence with Lackawanna River downstream side of west bank pier footer of I-81 overpass
	Stream Bed & Banks	· N/A
	Riparian Area	· Grassland · Cattails
	Adjacent Neighborhoods	· Viewmont Mall · Various "Big Box" stores
	Roads & Bridges	· Commerce Boulevard · I-81
	Impervious Surface	· ~ 95% · Commercial
	Estimated # of Storm Water Detention Facilities	· N/A
	#/Size of Pipes	· 4 pipes · Sizes range from 12-36 inches
	Debris	· N/A
	Trash	· N/A
	Infrastructure	· N/A

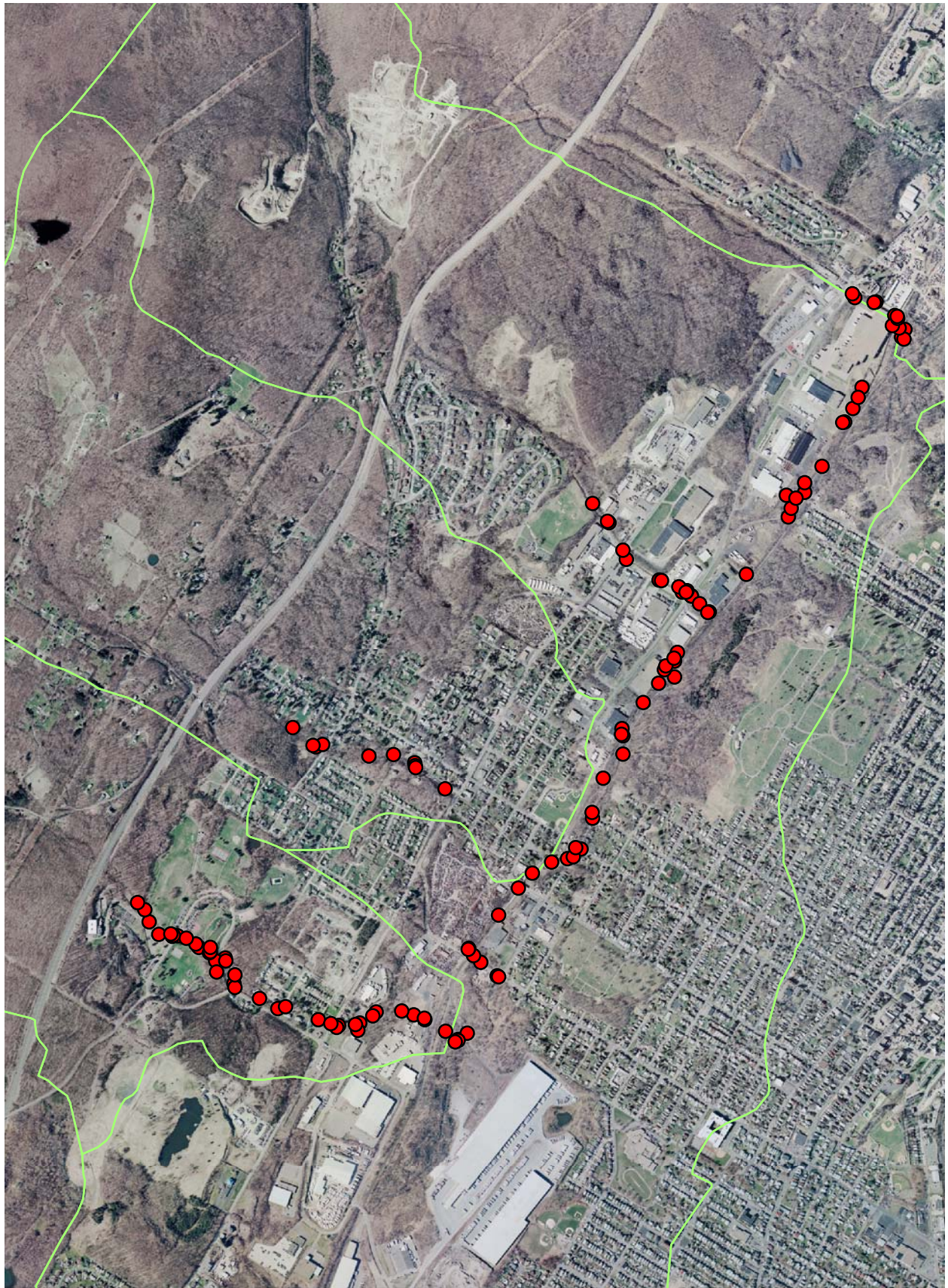
WALMART TRIBUTARY

General Notes	Watershed Area	1 Mi. ²
	Confluence	No confluence with Lackawanna River
	Order	1 st Order Tributary
	Date	28-Aug-13
	Survey Staff	Kelsey Biondo, Bernie McGurl, Bridgette Robinson
	Weather	82° F, Cloudy
Field Walk Observations	Starting Point	· Colan Court
	Stream Bed & Bank	· Dry stream bed · Steep banks · Portion of bank composed of red ash
	Riparian Area	· Covered in knotweed · Densely wooded
	Adjacent Neighborhoods	· Taylor · Wal-Mart
	Roads & Bridges	· Colan Court · Main Avenue
	Impervious Surface	· ~ 60% · Neighborhood Commercial · Industrial · Open Space
	Estimated # of Storm Water Detention Facilities	· 1 new open basin under construction on Wal-Mart site at the time of survey
	#/Size of Pipes	· 2 pipes · Sizes range from 24-36 inches
	Debris	· Heavy tree debris in multiple locations · Red ash boulders eroding stream bed
	Trash	· Tires (along Colan Court) · Culligan tank (entrance of wooded area) · Residential garbage (along Colan Court)
	Infrastructure	· Culvert running under railroad 85% blocked · Undercut berm on left bank near construction site



KEYSER CREEK

General Notes	Watershed Area	8.58 Mi. ²
	Confluence	Lackawanna River at RM 7.3
	Order	2 nd Order Tributary
	Date	May 9 & 16, 2013
	Survey Staff	Kelsey Biondo, Sean McCauley, Bridgette Robinson
	Weather	
Field Walk Observations	Starting Point	<ul style="list-style-type: none"> · Kane Trucking facility near Scranton/Taylor boundary (Stauffer Industrial Park)
	Stream Bed & Banks	<ul style="list-style-type: none"> · Rain the day before made active flow; otherwise dry streambed · Natural cobblestone downstream · Channeled where splits with Lindy Creek · Bank becomes steep near Luzerne Street · Natural downstream with shallow banks
	Riparian Area	<ul style="list-style-type: none"> · Wooded downstream with Silver maple, River birch, and Red maple · Understory covered in knotweed
	Adjacent Neighborhoods	<ul style="list-style-type: none"> · Fawnwood residential area · Stauffer & Hampton Industrial Parks · Keyser Ave – residential, commercial, industrial
	Roads & Bridges	<ul style="list-style-type: none"> · Keyser Avenue · Simplex Drive · Luzerne Street · Washburn Street · N. South Road · Sherman Avenue
	Impervious Surfaces	<ul style="list-style-type: none"> · ~ 75% · Industrial · Neighborhood Commercial
	Estimated # of Storm Water Detention Facilities	<ul style="list-style-type: none"> · 4 Facilities <ul style="list-style-type: none"> o Kane Properties o Isaac Tripp Elementary School o Colts o Compression Polymers (new owners)
	#/Size of Pipes	<ul style="list-style-type: none"> · 21 pipes · Sizes range from 3-36 inches
	Debris	<ul style="list-style-type: none"> · Sediment in concrete channel (near Washburn Street Bridge) · Dam, possibly animal-made (behind W Side Falcon Football Field) · Sediment in concrete channel (where Keyser Creek runs under Keyser Avenue, near Master Halco Fence Company) · Debris in concrete channel (near S. Sherman Ave) · Debris covering pipes (near Simplex Dr)
	Trash	<ul style="list-style-type: none"> · Downstream side of Washburn Street Bridge · End of Philo Street & Keyser Avenue · Rusty water coming from Master Halco warehouse (NPDES Industrial Discharge Permit holder) · Behind warehouses between railroad tracks · Tarp inside pipe (near building next to Erie Materials)
	Infrastructure	<ul style="list-style-type: none"> · Pipe partially buried (S. Sherman Street) · Pipe backflows, flooding parking lot of Erie Materials; pipe severely damaged · Pipe buried under pavement rubble, in need of bank stabilization (corner of Simplex Drive & N. South Road) · Point source pollution from Master Halco warehouse
Tributaries	<ul style="list-style-type: none"> · Lindy Creek flows into Keyser Creek [RM 2.5, < 10 mi.2 watershed] · Lucky Run flows into Keyser Creek [RM 2.0, < 10 mi.2 watershed] 	



LINDY CREEK

General Notes	Watershed Area	<10 Mi. ²
	Confluence	Keyser Creek at RM 2.5
	Order	1 st Order Tributary
	Date	9-May-13
	Survey Staff	Kelsey Biondo, Sean McCauley, Bridgette Robinson
	Weather	68° F, Cloudy
Field Walk Observations	Starting Point	<ul style="list-style-type: none"> · Confluence of Keyser Creek near Washburn Street Bridge
	Stream Bed & Banks	<ul style="list-style-type: none"> · Downstream channeled · Natural at Frink Street · Steep banks ~ 8 ft · Erosion at Frink Street
	Riparian Area	<ul style="list-style-type: none"> · Wooded
	Adjacent Neighborhoods	<ul style="list-style-type: none"> · Keyser Valley
	Roads & Bridges	<ul style="list-style-type: none"> · S. Keyser Avenue · S. Dewey Avenue Bridge · Frink Street
	Impervious Surface	<ul style="list-style-type: none"> · ~ 30% · Low Density Residential
	Estimated # of Storm Water	<ul style="list-style-type: none"> · N/A
	#/Size of Pipes	<ul style="list-style-type: none"> · 3 pipes · Sizes range from 3-12 inches
	Debris	<ul style="list-style-type: none"> · N/A
	Trash	<ul style="list-style-type: none"> · Residential trash on sediment in concrete channel
	Infrastructure	<ul style="list-style-type: none"> · Breached dam structures: remnants of abandoned water works circa 1890

LUCKY RUN

LUCKY RUN		
General Notes	Watershed Area	<10 Mi. ²
	Confluence	Keyser Creek at RM 2
	Order	1 st Order Tributary
	Date	3-May-13
	Survey Staff	Kelsey Biondo, Sean McCauley
	Weather	72° F, Partly Cloudy
Field Walk Observations	Starting Point	<ul style="list-style-type: none"> · Confluence with Keyser Creek at Stauffer Industrial Park
	Stream Bed & Banks	<ul style="list-style-type: none"> · Shallow banks · Covered in knotweed · Scattered tree cover · Stream bank restoration using concrete and stone
	Riparian Area	<ul style="list-style-type: none"> · Grassland · Wooded
	Adjacent Neighborhoods	<ul style="list-style-type: none"> · Park Edge Development · Keyser Terrace · McDade Park
	Roads & Bridges	<ul style="list-style-type: none"> · Keyser Avenue · Park Edge Lane
	Impervious Surface	<ul style="list-style-type: none"> · ~ 45% · Open Space · Industrial
	Estimated # of Storm Water Detention Facilities	<ul style="list-style-type: none"> · 1 Facility <ul style="list-style-type: none"> o Estes Express Lines
	#/Size of Pipes	<ul style="list-style-type: none"> · 10 pipes · Sizes range from 3-36 inches
	Debris	<ul style="list-style-type: none"> · Heavy tree debris rerouting stream, eroding right bank (behind Estes Express Lines)
	Trash	<ul style="list-style-type: none"> · N/A
	Infrastructure	<ul style="list-style-type: none"> · Culvert under Keyser Avenue undergoing replacement during 2013-14



STAFFORD-MEADOW BROOK

STAFFORD-MEADOW BROOK		
General Notes	Watershed Area	14.11 Mi. ²
	Confluence	Lackawanna River at RM 9.2
	Order	2 nd Order Tributary
	Date	24-Jul-13
	Survey Staff	Kelsey Biondo, Sean McCauley, Bernie McGurl, Bridgette Robinson
	Weather	74° F, Cloudy
Field Walk Observations	Starting Point	<ul style="list-style-type: none"> · Confluence with Lackawanna River at S. Washington Avenue Bridge
	Stream Bed & Banks	<ul style="list-style-type: none"> · Open concrete channel · Underground by Pittston Avenue
	Riparian Area	<ul style="list-style-type: none"> · N/A
	Adjacent Neighborhoods	<ul style="list-style-type: none"> · Meanders underground through high density residential area · Edges St. Mary's Cemetery
	Roads & Bridges	<ul style="list-style-type: none"> · Pittston Avenue · I-81
	Impervious Surface	<ul style="list-style-type: none"> · ~ 90% · Industrial · High Density Residential
	Estimated # of Storm Water Detention Facilities	<ul style="list-style-type: none"> · 4 Facilities <ul style="list-style-type: none"> o Autism Center at Friendship House o Friendship House o Mountain Lake Estates subdivision o Proposed 9-Hole USGA Golf Course
	#/Size of Pipes	<ul style="list-style-type: none"> · 1 pipe · Size: 24 inches
	Debris	<ul style="list-style-type: none"> · N/A
	Trash	<ul style="list-style-type: none"> · N/A
Infrastructure	<ul style="list-style-type: none"> · N/A 	



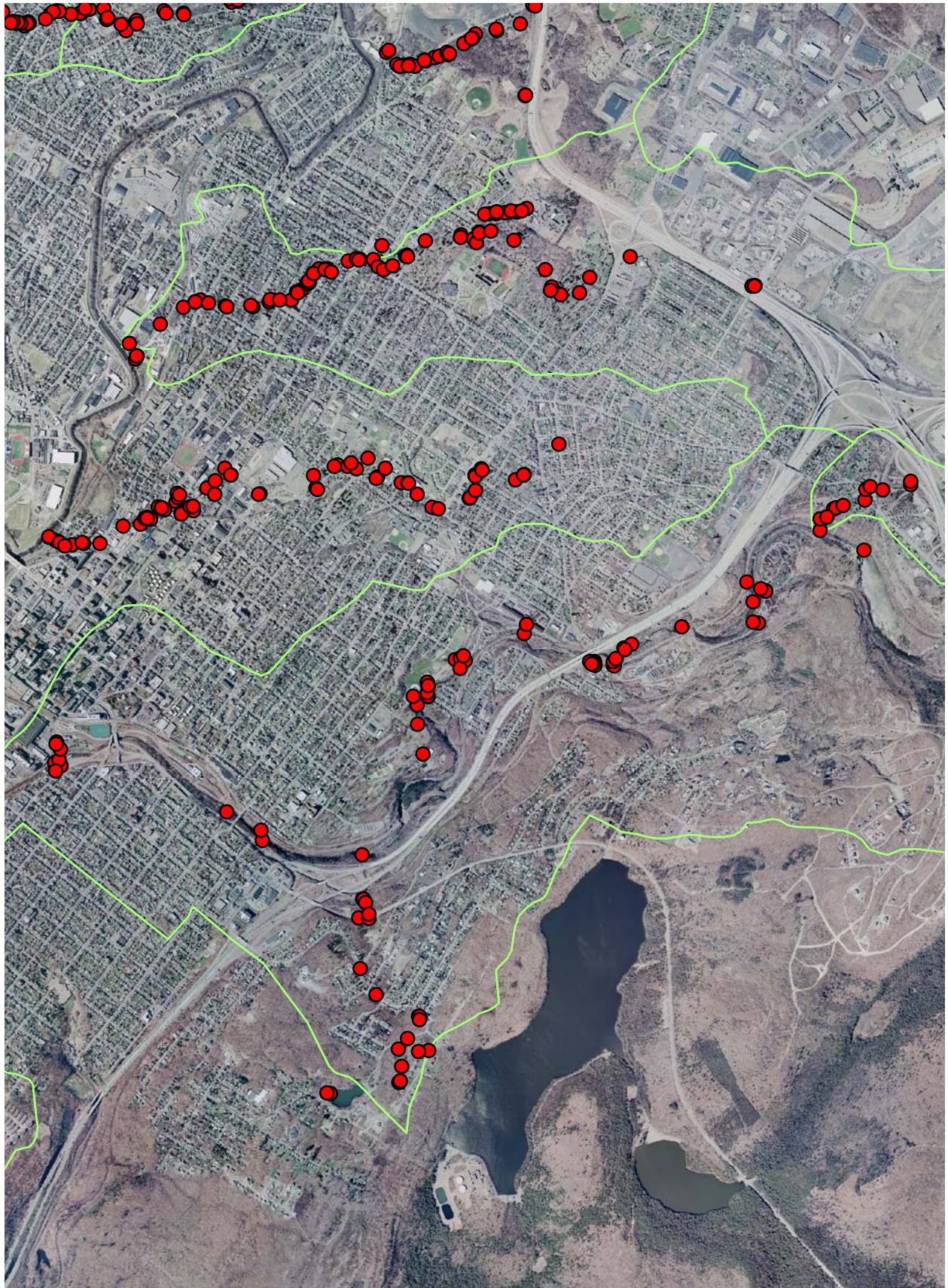
MOUNTAIN LAKE RUN

General Notes	Watershed Area	2 Mi. ²
	Confluence	Stafford-Meadow Brook
	Order	1 st Order Tributary
	Date	September 4 & 5, 2013
	Survey Staff	9/4 – Kelsey Biondo, Bernie McGurl, Bridgette Robinson; 9/5 – Kelsey Biondo, Sean McCauley, Bridgette Robinson
	Weather	9/4 - 78° F, Sunny; 9/5 - 72° F, Sunny
Field Walk Observations	Starting Point	<ul style="list-style-type: none"> · Mattes Community Center & Marine Corps League Museum on Wintermantle Avenue
	Stream Bed & Banks	<ul style="list-style-type: none"> · Natural 2 to 3 ft channel width · Shallow banks ~ 2 ft · Many rock ledges and splash pools
	Riparian Area	<ul style="list-style-type: none"> · Native plants (Red oak, Witch hazel, Mountain laurel) · Small meadow patches with Little bluestem and other native grasses/herbaceous plants
	Adjacent Neighborhoods	<ul style="list-style-type: none"> · Mountain Lake Estates · Robinson Park · Bolus subdivision
	Roads & Bridges	<ul style="list-style-type: none"> · Stream drops into a culvert system below Wintermantle Avenue
	Impervious Surface	<ul style="list-style-type: none"> · ~ 30% · Low Density Residential · Open Space
	Estimated # of Storm Water Detention Facilities	<ul style="list-style-type: none"> · 4 Facilities (Stafford-Meadow Brook Subwatershed) <ul style="list-style-type: none"> o Mountain Lake Estates subdivision o Proposed 9-Hole USGA Golf Course o Friendship House o Autism Center at Friendship House
	#/Size of Pipes	<ul style="list-style-type: none"> · N/A
	Debris	<ul style="list-style-type: none"> · N/A
	Trash	<ul style="list-style-type: none"> · N/A
	Infrastructure	<ul style="list-style-type: none"> · Impoundment structure at Mountain Lake · Historic WPA stone masonry walls and culverts at Mattes Community Center: Hopkins Falls circa 1938 · Culvert system under Wintermantle Avenue, Moltke Avenue, Erie & Wyoming Valley Railroad Corridor, and I-81 · Confluence with Stafford-Meadow Brook via culvert along I-81 median to cemetery bridges



ROARING BROOK

General Notes	Watershed Area	53.68 Mi. ²
	Confluence	Lackawanna River at RM 9.7
	Order	3 rd Order Tributary
	Date	May 2, 10, & 22, 2013
	Survey Staff	5/2 – Kelsey Biondo, Sean McCauley, Bernie McGurl, Bridgette Robinson; 5/10 – Sean McCauley, Bernie McGurl, Bridgette Robinson; 5/22 – Kelsey Biondo, Sean McCauley, Bridgette Robinson
	Weather	5/2 - 76° F, Sunny; 5/10 - 74° F, Cloudy; 5/22 - 89° F, Cloudy
Field Walk Observations	Starting Point	· Confluence with Lackawanna River near S. Washington Avenue & Birch Street Bridge
	Stream Bed & Bank	· Open concrete channel · Opens at University of Scranton/Ridge Row · Steep banks both natural & concrete channel · ~ 10 ft
	Riparian Area	· Upstream of Ridge Row wooded with rock outcrops · Nay Aug Gorge & Falls: National Geologic Landmark Registry · Upstream of Nay Aug: predominantly natural channel; 40-60 ft in width; mostly intact riparian canopy; some steep slopes and rock ledges; some influence of railroad embankments; abandoned mine land and outside auto salvage yard storage drainage impacts
	Adjacent Neighborhoods	· Central City Scranton · Hill Section · South Scranton/Nativity · University of Scranton · Oakmont · Dunmore · Bunker Hill · Denaples Auto & Salvage
	Roads & Bridges	· I-81 · Moosic Street/Stafford Ave · Central Scranton Expressway · Harrison Avenue Bridge · Cedar Ave · S. Washington Ave · 6 railroad bridges
	Impervious Surface	· ~ 60% · Downtown Commercial · High Density Residential · Abandoned Mine Land
	Estimated # of Storm Water Detention Facilities	· 12 facilities o Medallion Parking Garage o Brennan Hall/Kania School of Management o University of Scranton New Residence Hall o University of Scranton Parking Lot o University of Scranton Residence Hall (Condron Hall) o Wheeler Green o John G. Whittier Elementary School o CMC Parking Garage o Medical Suites o CVS Pharmacy o L.A. Bank (Wells Fargo) o Mountain Lake Estates
	#/Size of Pipes	· 30 pipes · Sizes range from 6-48 inches
	Debris	· Wide gravel & sand bar (under Cedar Avenue Bridge)
	Trash	· Dumped garbage (along railroad near step falls)
	Infrastructure	· Corroding pipe (near Harrison Avenue Bridge) · Corroding pipe (near Ash Street Bridge) · Sheet flow runoff (from parking lot of E Scranton Little League Field) · Dilapidated pipe (near Mill Street) · Potential pipe underneath concrete slab (near E Scranton Little League Field) · AMD (off of Park S on bank of Roaring Brook) · Inlet pipe needs to be cleaned (near Mill Street by railroad tracks)
	Tributaries	· East Mountain Run o 4 mi. ² watershed o RM 2 · Little Roaring Brook o < 10 mi. ² watershed o RM 4.5



LITTLE ROARING BROOK

General Notes	Watershed Area	8 Mi. ²
	Confluence	Roaring Brook at RM 4
	Order	2 nd Order Tributary
	Date	22-May-13
	Survey Staff	Kelsey Biondo, Sean McCauley, Bridgette Robinson
	Weather	89° F, Cloudy
Field Walk Observations	Starting Point	<ul style="list-style-type: none"> · Dunmore Reservoir No. 1
	Stream Bed & Bank	<ul style="list-style-type: none"> · Open concrete channel · Shallow banks <ul style="list-style-type: none"> o Natural o Bank repair
	Riparian Area	<ul style="list-style-type: none"> · Wooded
	Adjacent Neighborhoods	<ul style="list-style-type: none"> · Sport Hill: Low Density Residential · Drinker Street & Tigie Street
	Roads & Bridges	<ul style="list-style-type: none"> · I-84 · I-380 · I-81 · US-6
	Impervious Surface	<ul style="list-style-type: none"> · ~ 40% · Neighborhood Commercial
	Estimated # of Storm Water Detention Facilities	<ul style="list-style-type: none"> · 1 Facility (Roaring Brook Subwatershed) <ul style="list-style-type: none"> o PennDOT basin adjacent to Tigie Street exit & railroad corridor
	#/Size of Pipes	<ul style="list-style-type: none"> · 8 pipes · Sizes range from 6-24 inches
	Debris	<ul style="list-style-type: none"> · Heavy sediment load throughout
	Trash	<ul style="list-style-type: none"> · Some trash & debris along waterfalls between Lackawanna Railroad & Drinker Street
	Infrastructure	<ul style="list-style-type: none"> · N/A
	Tributaries	<ul style="list-style-type: none"> · 3 unnamed



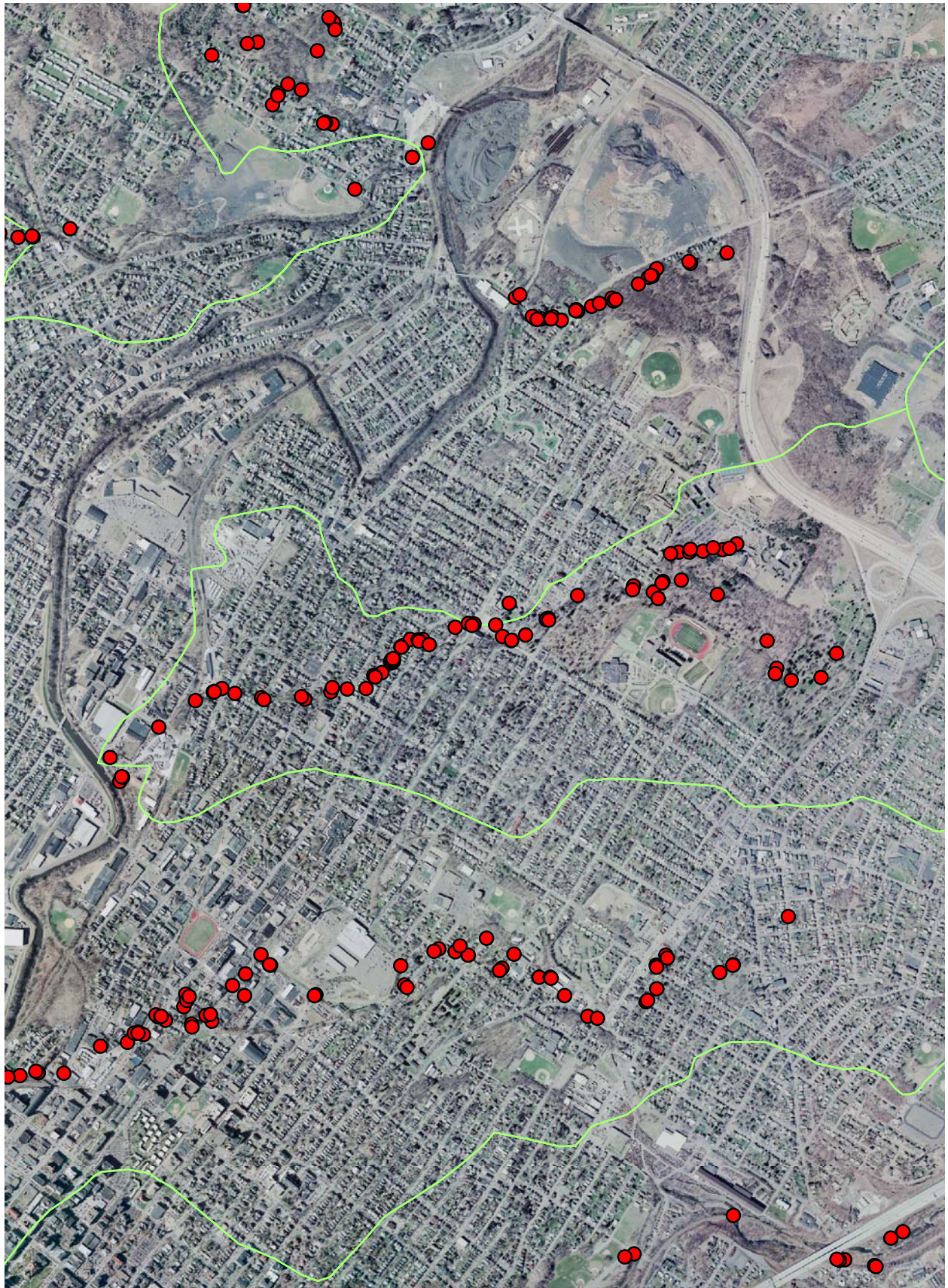
EAST MOUNTAIN RUN

EAST MOUNTAIN RUN		
General Notes	Watershed Area	4 Mi. ²
	Confluence	Roaring Brook at RM 2
	Order	1 st Order Tributary
	Date	May 23 & July 24, 2013
	Survey Staff	5/23 - Kelsey Biondo, Sean McCauley, Bernie McGurl; 7/24 – Sean McCauley
	Weather	76° F, Cloudy
Field Walk Observations	Starting Point	<ul style="list-style-type: none"> · Confluence with Roaring Brook
	Stream Bed & Banks	<ul style="list-style-type: none"> · Natural · Steep banks · Rock wall channel (Lilac Lane & East Mountain Road) · Detention pond within Mountain Lake Estates
	Riparian Area	<ul style="list-style-type: none"> · Heavily wooded
	Adjacent Neighborhoods	<ul style="list-style-type: none"> · East Mountain Road residential · Robinson Park · Mountain Lake Estates
	Roads & Bridges	<ul style="list-style-type: none"> · PA Route 307 · East Mountain Road · Decommissioned railroad bridges (Erie & Wyoming Valley/Pocono Northeast Railroad) · I-81 culverts
	Impervious Surface	<ul style="list-style-type: none"> · ~ 35% · Low Density Residential · Open Space
	Estimated # of Storm Water Detention Facilities	<ul style="list-style-type: none"> · 1 Facility (Roaring Brook Subwatershed) <ul style="list-style-type: none"> o Mountain Lake Estates subdivision
	#/Size of Pipes	<ul style="list-style-type: none"> · 2 pipes · Sizes: 24, 36 inches
	Debris	<ul style="list-style-type: none"> · N/A
	Trash	<ul style="list-style-type: none"> · N/A
	Infrastructure	<ul style="list-style-type: none"> · N/A



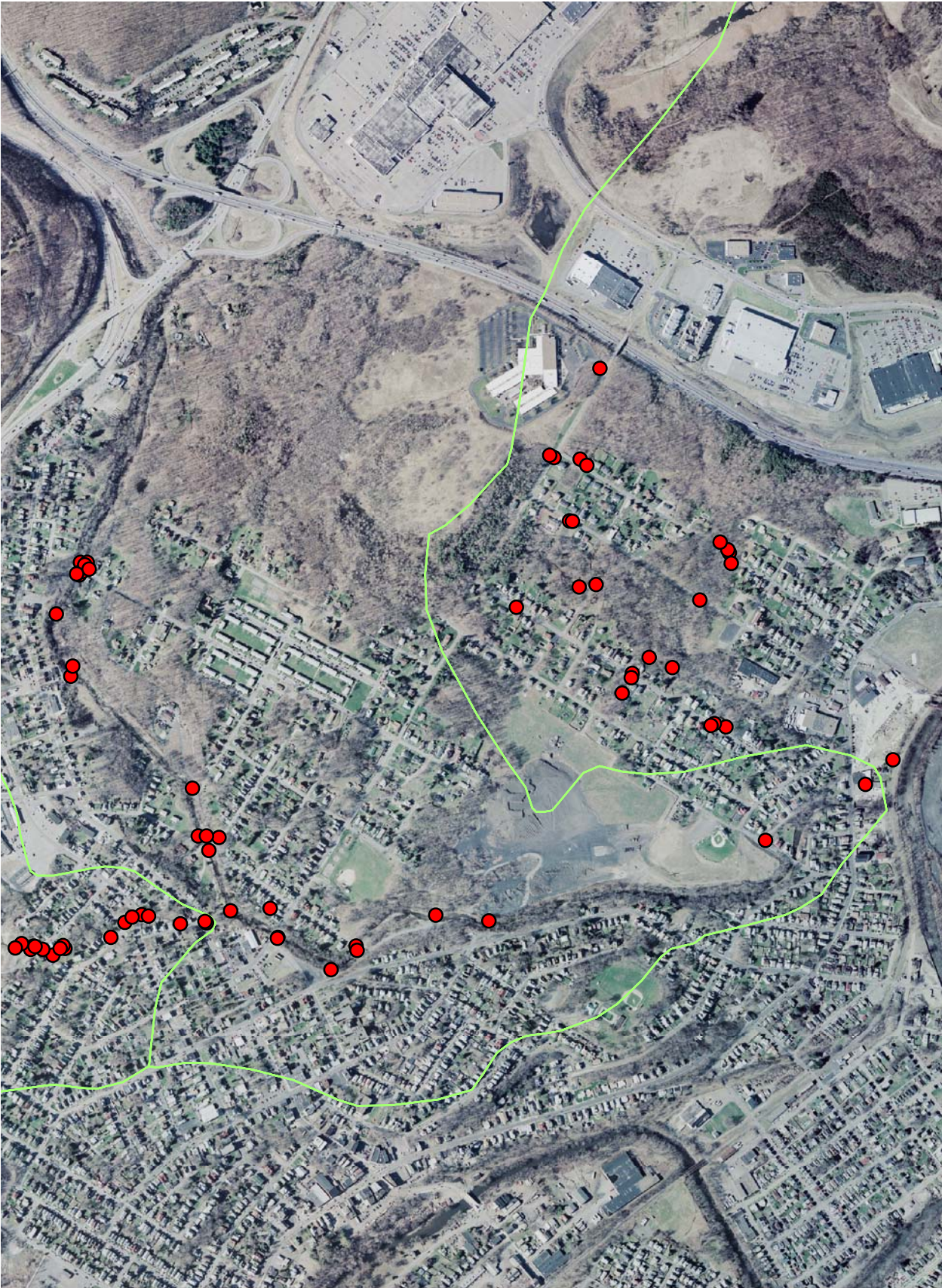
MEADOW BROOK

General Notes	Watershed Area	2.45 Mi. ²
	Confluence	Lackawanna River at RM 12
	Order	1 st Order Tributary
	Date	April 11 & 18, 2013
	Survey Staff	4/11 - Kelsey Biondo, Sean McCauley, Bernie McGurl; 4/18 – Kelsey Biondo, Sean McCauley
	Weather	4/11 - 54° F; 4/18 - 59° F
Field Walk Observations	Starting Point	<ul style="list-style-type: none"> Confluence with Lackawanna River near Glenn Street
	Stream Bed & Banks	<ul style="list-style-type: none"> Mostly underground in culverts Surfaces as open concrete channel Becomes natural in south campus on Marywood University until Dunmore Cemetery Dry stream bed
	Riparian Area	<ul style="list-style-type: none"> Wooded Mountain laurel
	Adjacent Neighborhoods	<ul style="list-style-type: none"> Hollywood & Green Ridge Forest Hill Cemetery Marywood University Dunmore Cemetery
	Roads & Bridges	<ul style="list-style-type: none"> Culvert under roadway in Dunmore Cemetery to Blakely Street Stone arch bridges in Forest Hill Cemetery Extensive culvert system from Electric Street through Washington Avenue, Sturges Park, Wyoming Avenue, Delaware Street, Penn Avenue, Green Ridge Street, Capouse Avenue, Monsey Avenue, Marion Street, Sanderson Avenue, Glenn Street to confluence with Lackawanna River Madison Avenue Jefferson Avenue Bridge
	Impervious Surface	<ul style="list-style-type: none"> ~ 70% High Density Residential Industrial Open Space
	Estimated # Storm Water Detention Facilities	<ul style="list-style-type: none"> 1 Facility <ul style="list-style-type: none"> Swift Fence Company
	#/Size of Pipes	<ul style="list-style-type: none"> 7 pipes Sizes range from 3-24 inches
	Debris	<ul style="list-style-type: none"> Tree debris (top of Woodlawn Street & Madison Avenue) Deposition of floral waste and landscape waste (Forest Hill Cemetery) Tree & large woody debris in creek bed (between Forest Hill Cemetery & Dunmore Cemetery)
	Trash	<ul style="list-style-type: none"> Creek bed full of debris (behind former Scranton School for the Deaf) Debris-filled stream bed (behind Marywood Science Building)
Infrastructure	<ul style="list-style-type: none"> Bank stabilization (behind abandoned home near Green Ridge Club) Culvertized creek caving (metal plate cover near Ryerson Ave) Jefferson Avenue Bridge at risk of collapsing; creek full of rubble Pipe crushed & clogged (near Jefferson Avenue Bridge) Collapsed deck of bridge (near Jefferson Avenue Bridge) Sheet flow runoff (from Madison Avenue) Large sediment deposits (near Jefferson Ave) Clogged vitrified clay pipe (near Jefferson Ave) 	



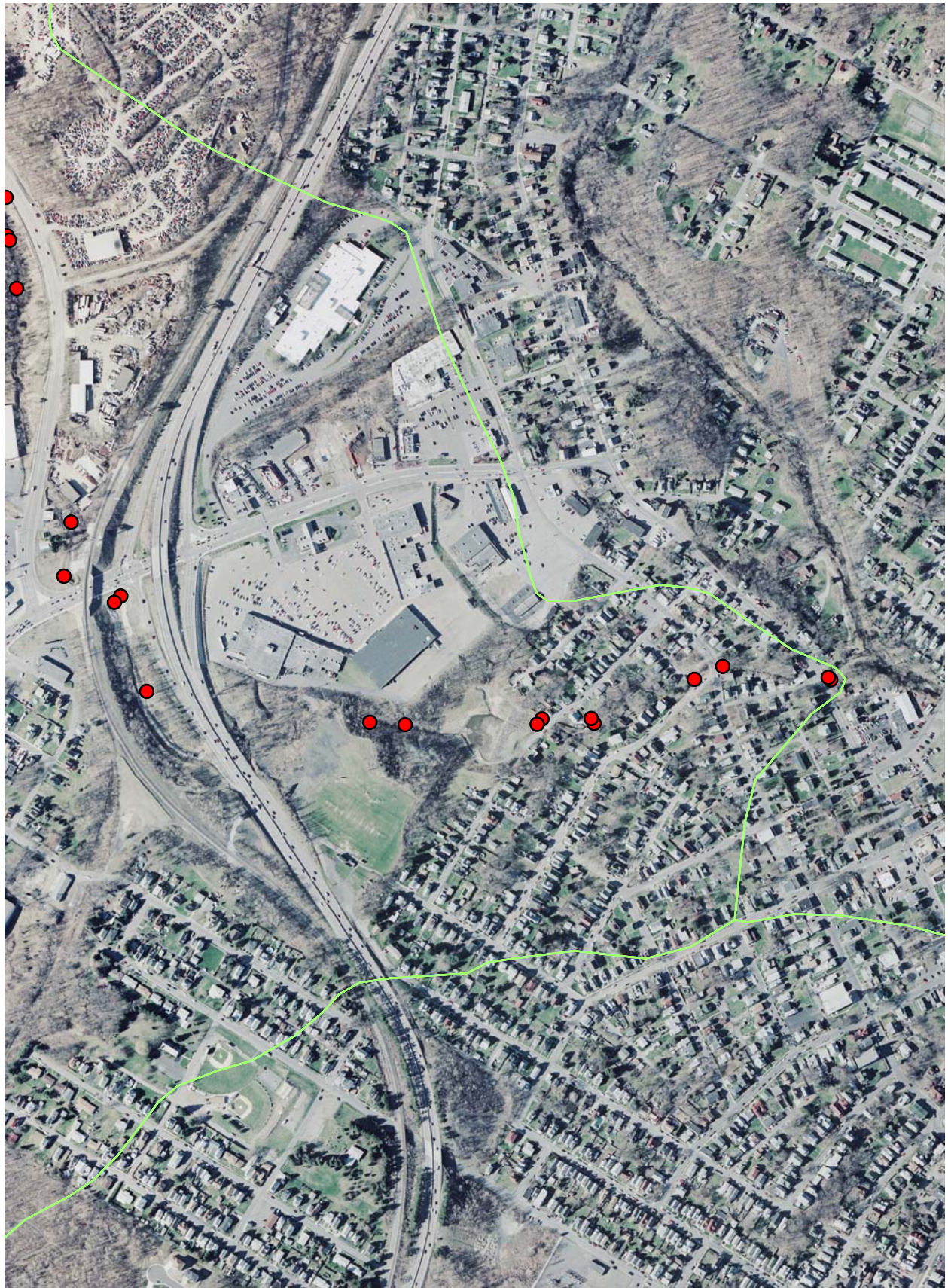
LEGGETTS CREEK

General Notes	Watershed Area	18.46 Mi. ²
	Confluence	Lackawanna River at RM 14.5
	Order	3 rd Order Tributary
	Date	7-Mar-13
	Survey Staff	Kelsey Biondo, Sean McCauley
	Weather	42° F, Windy
Field Walk Observations	Starting Point	<ul style="list-style-type: none"> · Confluence with Lackawanna River at N. Main Avenue
	Stream Bed & Banks	<ul style="list-style-type: none"> · Gradual slopes · Natural creek bed
	Riparian Area	<ul style="list-style-type: none"> · Grassland · Wooded
	Adjacent Neighborhoods	<ul style="list-style-type: none"> · Historic residential neighborhoods dating from 1870s through 1920 · Reclaimed coal mine lands (Leggett's Creek Estates proposed residential subdivision)
	Roads & Bridges	<ul style="list-style-type: none"> · NEPA Rail Authority steel girder bridge at confluence · N. Main Avenue stone arch bridge · Scranton/Carbondale Highway concrete arch culvert · Rockwell Avenue stone arch bridge (due for removal & replacement) · Mary Street/Neary Place steel beam grinder with concrete deck · I-81 & regional arterial roadways · Wells Street concrete box culvert bridge · Northern Boulevard concrete box culvert
	Impervious Surfaces	<ul style="list-style-type: none"> · ~ 50% · Neighborhood Commercial · Open Space · High Density Residential
	Estimated # of Storm Water Detention Facilities	<ul style="list-style-type: none"> · 1 Facility <ul style="list-style-type: none"> o Leggett's Creek Estates (400 ft upstream of Welles Street)
	#/Size of Pipes	<ul style="list-style-type: none"> · 51 pipes · Sizes range from 3-36 inches
	Debris	<ul style="list-style-type: none"> · Tree debris on left bank (adjacent to Neary Place)
	Trash	<ul style="list-style-type: none"> · Extensive trash, tires, and litter dumping adjacent to Leggett Street off of Brick Avenue along City of Scranton-owned · Extensive dumping along City of Scranton-owned property upstream of Mary Street Bridge · Construction signs in creek (Rockwell Avenue Bridge)
	Infrastructure	<ul style="list-style-type: none"> · Basin obstructed (Mary Street Bridge) · Pipe obstructed (end of Leggett's Street)
	Tributaries	<ul style="list-style-type: none"> · Leach Creek flows into Leggett's Creek <ul style="list-style-type: none"> o 2.55 mi.² watershed o RM 1



LEACH CREEK

General Notes	Watershed Area	2.55 Mi. ²
	Confluence	Leggett's Creek at RM 1
	Order	2 nd Order Tributary
	Date	March 14 & April 4, 2013
	Survey Staff	3/14 – Kayleigh Cornell, Sean McCauley; 4/4 – Kelsey Biondo, Kayleigh Cornell, Sean McCauley
	Weather	3/14 - 38° F, Windy; 4/4 - 54° F
Field Walk Observations	Starting Point	<ul style="list-style-type: none"> Market Street & Yard Avenue
	Stream Bed & Banks	<ul style="list-style-type: none"> Steep banks near confluence Urbanized stream; a building straddles the stream at Yard Avenue and W. Market Street Evidence of channelization along many reaches between the Morgan Highway and the confluence
	Riparian Area	<ul style="list-style-type: none"> Single line of trees Very little green space near confluence
	Adjacent Neighborhoods	<ul style="list-style-type: none"> Morgan Manor Allied Services Keyser Oak Plaza
	Roads & Bridges	<ul style="list-style-type: none"> Market Street Yard Avenue Bloom Avenue Morgan Manor Drive Morgan Highway North Scranton Expressway Moffat Drive Keyser Avenue McDonough Avenue
	Impervious Surface	<ul style="list-style-type: none"> ~ 60% Low Density Residential Industrial Commercial
	Estimated # of Storm Water Detention Facilities	<ul style="list-style-type: none"> 2 Facilities: Oakwood Estates, Morgan Manor Apartments
	#/Size of Pipes	<ul style="list-style-type: none"> 49 pipes Sizes range from 3-60 inches
	Debris	<ul style="list-style-type: none"> Right bank – sediment fill half-blocking pipe (near ramp onto Expressway from Keyser Avenue toward downtown Scranton)
	Trash	<ul style="list-style-type: none"> Base of Morgan Highway Behind Keyser Oak Plaza (needs major clean-up)
	Infrastructure	<ul style="list-style-type: none"> There is a 3 to 4 acre flood control basin and detention structure located adjacent to Bloom Avenue and to the rear of the There is an 8 ft wide x 16 ft high x 150 ft long stone arch culvert that carries Leach Creek under the North Scranton Vikings Junior Football Field, adjacent to the Keyser Oak Plaza. This site is a former AML, the Cayuga Colliery of the Glen Alden Coal Company. The stone arch culvert carried the service rail road trackage to the coal pockets at the Cayuga Breaker once located on the Keyser Oak Plaza site. Right bank – pipe obstructed with debris (Morgan Manor Drive) 1 pipe failing, 1 pipe obstructed (100 ft from the above pipe) Pipe submerged and dispensing rust-colored residue (across from Rock Church Worship Center)



CLOVER HILL CREEK

CLOVER HILL CREEK		
General Notes	Watershed Area	2 Mi. ²
	Confluence	Leggett's Creek at RM 2
	Order	1 st Order Tributary
	Date	4-Sep-13
	Survey Staff	Kelsey Biondo, Bernie McGurl, Bridgette Robinson
	Weather	
Field Walk Observations	Starting Point	<ul style="list-style-type: none"> · Confluence with Leggett's Creek, near the Hollow Avenue Bridge off of W. Market Street, adjacent to the Scranton/Carbondale Highway
	Stream Bed & Banks	<ul style="list-style-type: none"> · Begins as open natural stream from Bell Mountain in Dickson City · Channeled into culvert when crossing beneath the Scranton/Carbondale Highway at the Viewmont Mall entrance · Becomes rip-rap channel on the Viewmont Mall side of the Scranton/Carbondale Highway heading toward the I-81 interchange with Business Route 6, Scranton/Carbondale Highway <ul style="list-style-type: none"> o At time of survey, the stream was undergoing re-channelization and the culverts through the I-81 interchange were being relined and grouted
	Riparian Area	<ul style="list-style-type: none"> · Headwaters (outside of Scranton) are found in forested and low density residential · From Viewmont Mall to I-81 interchange to confluence, herbaceous vegetation and meadow grasses in the interchange cloverleaf
	Adjacent Neighborhoods	<ul style="list-style-type: none"> · Viewmont Mall
	Roads & Bridges	<ul style="list-style-type: none"> · Entrance to Viewmont Mall · I-81 · Scranton/Carbondale Highway
	Impervious Surface	<ul style="list-style-type: none"> · ~ 70% · Highway Commercial
	Estimated # of Storm Water Detention Facilities	<ul style="list-style-type: none"> · N/A
	#/Size of Pipes	<ul style="list-style-type: none"> · 2 pipes · Size: 12 inches
	Debris	<ul style="list-style-type: none"> · N/A
	Trash	<ul style="list-style-type: none"> · N/A
	Infrastructure	<ul style="list-style-type: none"> · N/A



EDDY CREEK

EDDY CREEK		
General Notes	Watershed Area	7.5 Mi. ²
	Confluence	Lackawanna River at RM 16.75
	Order	2 nd Order Tributary
	Date	3-Oct-13
	Survey Staff	Kelsey Biondo, Bernie McGurl, Bridgette Robinson
	Weather	68° F, Partly Cloudy
Field Walk Observations	Starting Point	<ul style="list-style-type: none"> No Stream walk was conducted; only a site visit to the outfall of the Keystone Sanitary Landfill (KSL) storm water discharge site along the remnant channel of Eddy Creek, adjacent to a stone arch that carried the Winton Branch of the Erie and Wyoming Valley Railroad over Eddy Creek, approximately 800 ft northeast of the former railroad grade crossing on <u>Marshwood Road</u>
	Stream Bed & Banks	<ul style="list-style-type: none"> Dry stream bed: Stream loses flow approximately one mile east near the Marshwood Road intersection with US Route 6 Steep banks with rip-rap and concrete headwalls of outfall structure Stream channel has been destroyed by mining activity and only short portions of the natural channel are evident
	Riparian Area	<ul style="list-style-type: none"> Covered in woody herbaceous vegetation Strip mine overburden piles with forest cover
	Adjacent Neighborhoods	<ul style="list-style-type: none"> Keystone Industrial Park and KSL LaCapra Stone & Supply
	Roads & Bridges	<ul style="list-style-type: none"> Marshwood Road Stone arch railroad culvert
	Impervious Surface	<ul style="list-style-type: none"> ~ 20% Industrial Open Space
	Estimated # of Storm Water Detention Facilities	<ul style="list-style-type: none"> 1 Facility KSL
	#/Size of Pipes	<ul style="list-style-type: none"> 1 pipe Size: 84 inches
	Debris	<ul style="list-style-type: none"> N/A
	Trash	<ul style="list-style-type: none"> Empty industrial paint canister in stream bed near outfall
	Infrastructure	<ul style="list-style-type: none"> Culvert, running under railroad, half-filled with concrete and sediment



Document Name	Date	Address	Project Area (sq ft)	Type of Detention	Discharge
Erosion and Sedimentation Control Plan and Storm Drainage for L.A. Bank (Wells-Fargo)	4/1/1998	330 Meadow Avenue			
Soil Erosion and Sedimentation Control Narrative and Calculations and Stormwater Management Narrative and Calculations for Scranton Housing Authority - Garage Addition	12/1/1998	107 S Ninth Avenue	3,905	closed	
Stormwater Management Report Scranton Retail	12/10/1998	3 West Olive Street		closed	
Soil Erosion and Sediment Control Plan and Drainage Report for Brennan Hall/Kania School of Management	3/25/1999	320 Madison Avenue	67,340	closed; 6 on-site catch basins	Into storm sanitary sewer system
Roadway Drainage Report Scranton Retail	4/12/1999	3 West Olive Street	75,851	closed	
Engineering Report for the T6 Warehouse for Kane Properties	5/6/1999	Stauffer Industrial Park (Meridian Avenue)	360,400	closed	Keyser Creek
The Executive Golf and Country Club at Mountain Laurel Summit Stormwater Calculations for Proposed 9 Hole USGA Golf Course	6/1/1999	Between East Elm Street & Birch Street	2,178,000	open	
Stormwater Management Calculations for Mountain Lake Estates Subdivision of Lands of Grambo Realty INC.	8/1/1999	Lakeview Drive	215,622	open; outflow structure	Lackawanna River
Engineering Report for a Warehouse for P.J.L.	8/17/1999	572 Seventh Avenue	12,000		
Stormwater Management Narrative for Proposed Rite Aid Pharmacy Minooka Site (CVS)	8/20/1999	509 Davis Street	11,180	closed	
Engineering Report for Lackawanna County Performing Arts Amphitheater for Lackawanna County Performing Arts Authority	9/23/1999	Montage Mountain	116,500	closed	
Stormwater Narrative for Proposed Development CVS Pharmacy	7/20/2000	1101 Moosic Street	63,597	closed	Directly into existing inlet
Soil Erosion and Sedimentation Control Plan and Drainage Report for Community Medical Center Parking Garage and Auxiliary Parking Lot	5/23/2001	324 Colfax Avenue	21,780	closed; catch basin	Combined stormwater system
Soil Erosion and Sedimentation Control Plan and Drainage Report for University of Scranton New Residence Hall	7/17/2002	387 Madison Avenue	23,086	closed	Combined stormwater system
Mountain Lake Estates Stormwater Management Calculations for Proposed Subdivision	10/1/2002	Lakeview Drive	415,126,000	open	
Stormwater Calculations for Proposed Ice Rink	12/4/2002	3 West Olive Street	91,600		Directly into Lackawanna River; large area discharges to city storm system
Wetlands Presence/Absence Determination and Waterways Evaluation for Estes Trucking Site	5/1/2003	777 South Keyser Avenue	+/- 34,840	open; 2 storm swales	Lucky Run
Stormwater Management and Erosion and Sediment Pollution Control Report For Estes Express Lines	5/1/2003	777 South Keyser Avenue	196,020	closed	Lucky Run
Erosion and Sedimentation Control Plan Narrative and Storm Drainage Designs for Moosic Street Medical Suites	7/3/2003	21 Meadow Avenue		closed	Roaring Brook

Stormwater Management and Drainage Report for CVS Pharmacy	7/22/2003	Pittson Avenue	11,970	closed	
Erosion and Sediment Control Plan Narrative and Storm Drainage Designs for University of Scranton Proposed Parking Lot	8/1/2003	Mulberry Street & Monroe Avenue			
Erosion and Sedimentation Control Plan Narrative and Storm Drainage Designs for Green Ridge Tract	9/12/2003	111 Green Ridge Street		closed	Lackawanna River
Erosion and Sediment Pollution Control Plan Narrative and Storm Drainage Designs for Friendship House Proposed Building Addition	2/1/2004	1615 East Elm Street		closed	system ?
Post Construction Stormwater management Plan Scranton Heath Care Center	3/26/2004	2933 McCarthy Sreet	23,000	closed	
Erosion and Sediment Pollution Control Plan Narrative and Storm Drainage Designs for Proposed Scranton Preparatory Arts and Sciences Addition	4/1/2004	1000 Wyoming Avenue		closed	combined sewer system
City of Scranton Police Headquarters Stormwater Narritive	4/21/2004	340 North Washington Avenue		closed	combined
Erosion and Sedimentation Pollution Control and Stormwater Drainage Report for O.S.C. Company Professional Office Building	4/23/2004	Olive Street and Love Road	2,000	closed	
City of Scranton Police Headquarters Stormwater Narrative	6/10/2004	340 North Washington Avenue		closed	separate stormwater collection; and combined flow
Soil and Erosion and Sedimentation Control Plan and Drainage Report for Scranton Parking Authority Medallion Parking Facility	9/8/2004	140 Adams Avenue	7,768	closed	combined
Stormwater Management Plan for Green Ridge Health Care Center, LLC	11/4/2004	2741 Boulevard Avenue	93,654		existing drainage swale; Lackawanna River
Post Construction Stormwater Management Plan for Green Ridge Health Care Center, LLC	11/4/2004	2741 Boulevard Avenue	93,654		existing drainage swale; Lackawanna River
Stormwater Management Narrative and Calculations for EOTC Building Renovation	2/1/2005	431 North Seventh Avenue		closed	
Erosion and Sedimentation Control Plan Narrative and Storm Drainage Designs for Swift Fence Storage Facility	6/16/2005	1646 Penn Avenue		closed	
Stormwater Narrative and Calculations for Waffle House	6/16/2005	708 Davis Street	56,628		stormwater easement & basin
Amended Stormwater and Engineering Report for Warehouse No. 7 and Warehouse No. 6 South Addition Kane Properties-1, LP	10/1/2005	Stauffer Industrial Park (Meridian Park)	324,000		
Stormwater Management Report for the Shiloh Baptist Church (TCMC Parking Lot)	10/1/2005	915 North Washington Avenue	17,000	closed	combined sewer system
Stormwater Management Report for Shiloh Baptist Church	10/1/2005	915 North Washington Avenue	17,000	closed	combined sewer system
Sanitary Sewer Calculations for Shiloh Baptist Church	11/26/2005	915 North Washington Avenue			

Erosion and Sedimentation Control Stormwater Management Narrative Colts Intermodal Facility	2/1/2006	Corner of Lackawanna Avenue & South Bridge Avenue	163,350	closed	combined
Erosion and Sediment Pollution Control Plan Narrative and Storm Drainage Designs for Holecko Self Storage Facility (Stor-way)	6/1/2006	2735 Olyphant Avenue		closed	stormwater system
Stormwater Management Report for Overlook at Clay	6/27/2006	Corner of Clay Avenue & Poplar Street	23,958	closed	combined
Post Construction Stormwater Management Narrative for Saginaw Street Residential Development	7/10/2006	600 Block Saginaw Street	202,554	closed	combined
Post Construction Stormwater Management Report for Mount Pleasant Corporate Center	8/15/2006	521 Mount Pleasant Drive	1,023,660	closed	adjacent to PENNDot drainage system
Advance Auto Parts Stormwater Management Control Plan and Narrative	8/19/2006	780 Luzerne Street	37,461	closed	
Project Narrative for Mount Pleasant Corporate Center	9/1/2006	521 Mount Pleasant Drive	1,023,660	closed; open from runoff wetland from Scranton Expressway	adjacent PENNDot drainage system
Stormwater Management Control Plan and Narrative for Wheeler Green	9/8/2006	Rear 1207 Wheeler Avenue	32,670	closed	combined
Keyser Village Center Stormwater Report	10/26/2006	1739 North Keyser Avenue	132,858	closed	combined
Keyser Village Center Post Construction Stormwater Report	11/1/2006	1739 North Keyser Avenue	132,858	closed	combined
Post Construction Stormwater Management Report Mount Pleasant Corporate Center	11/13/2006	521 Mount Pleasant Drive	1,023,660	closed	adjacent PENNDot drainage system
Soil Erosion and Sediment Control Plan and Drainage Report for Toyota Scion of Scranton	3/1/2007	3400 North Main Avenue	53,074	open	Lackawanna River
Post Construction Stormwater Management Narrative for Toyota Scion of Scranton	3/1/2007	3400 North Main Avenue	53,074	open	Lackawanna River
Stormwater Management Analysis and Erosion and Sedimentation Pollution Control Narrative for McCarthy Street Townhouses	4/1/2007	2944 McCarthy Street	30,492	closed	combined
Soil Erosion and Sedimentation Control Plan and Drainage Report for University of Scranton Residence Hall	5/29/2007	1129 Linden Street	17,547	closed	combined
Erosion and Sediment Pollution Control Plan Narrative and Storm Drainage Designs for Morgan Manor Apartments Proposed Apartments Land Development	6/1/2007	117 Mountain View Way	17,017	closed	
Post Construction Stormwater Management Plan for Compression Polymers	8/1/2007	North South Road	1,350,360	open	evaporation or infiltration
Stormwater Management Narrative and Calculations for John G. Whittier Elementary School Scranton School District	9/1/2007	700 Orchard Street		closed	combined
Stormwater Management Narrative and Calculations Isaac Tripp Elementary School Scranton School District	11/1/2007	James Robeson Way		open; closed	combined

Soil Erosion and Sediment Control Plan and Drainage Report for Scranton Parking Authority Parking Facility	11/7/2007	140 Adams Avenue	3,700	closed	sanitary & stormwater system
Soil Erosion and Sedimentation Control Plan and Drainage Report for Normandy Holdings, LLC Mid-Rise Apartments	1/2/2008	346 Oakford Court	7,300	closed	combined
Dunkin Donuts Commercial Development Stormwater Management and Erosion Control Report	6/9/2008	100 Mulberry Street	23,958		
HydroLogic and Hydraulic Study for the Keyser Creek Watershed	7/1/2008	800 North South Road	239,193,240		Keyser Creek
Stormwater Management Narrative and Calculations for John G. Whittier Elementary School Scranton School District	8/1/2008	700 Orchard Street	41,382	closed	combined sewer
Drainage Control Report 25 Year Design Storm Storage Building Addition	9/1/2008	405 Gilligan Street	7,000	open; lawn area	
Soil Erosion and Sedimentation Control Narrative and Calculations for the Commonwealth Medical Education Corporation Proposed Medical College	11/1/2008	525 Pine Street	51,000	closed	combined
Post Construction Stormwater Management Narrative and Calculations for The Commonwealth Medical Education Corporation proposed Medical College	11/1/2008	525 Pine Street	51,000	closed	combined
Roadway Drainage Report For the Proposed Roadway Improvements Associated with Mount Pleasant Corporate Center	12/1/2008	521 Mount Pleasant Drive		closed	stormwater system
Autism Center at the Friendship House Stormwater Management Report	3/1/2009	1509 Maple Street			
Final Drainer Report for The Montage Car Lot Expansion	9/18/2009	2649 Pittston Avenue	27,007	closed	combined sewer system
Final Drainage Report for the Montage Motors Car Lot Expansion	10/26/2009	2649 Pittston Avenue	27,007	closed	combined sewer system
Erosion and Sediment Pollution Control Plan Narrative and Storm Drainage Designs for Oakwood Estates Phase 2	12/1/2009	2 Oakwood Drive	44,866	closed	combined
Erosion and Sediment Control Report Stormwater Management Report Tobyhanna Army Depot Federal Credit Union	2/1/2010	315 Franklin Avenue			
Soil Erosion and Sedimentation Control and Stormwater Management Narrative and Calculations for EH Real Estate Self Storage	3/1/2010	Across from 2741 Boulevard Avenue	76,230	closed	city storm system
Erosion and Sediment Pollution Control Plan Narrative and Storm Drainage Designs for Oakwood Estates Phase II	4/1/2010	2 Oakwood Drive	368,953	closed	existing swale
Stormwater Management Narrative and Calculations for Penn Furniture Parking Lot and Sidewalk Improvements	5/1/2010	97-99 Lackawanna Avenue		closed	
Kanton Property Erosion and Sediment Pollution Control/ Stormwater Management Narrative	6/1/2010	618 Davis Street	1,500	closed	
Stormwater Management Report and Erosion and Sediment Control Plan Integrated Marketing Solutions Proposed Sonic Restaurant	10/1/2010	4 West Olive Street	1,818	closed	combined

Stormwater Narrative and Calculations for Turkey Hill	1/10/2011	Providence Road	91,600	none	Lackawanna River
Stormwater Management Narrtive and Calculations Marywood University Nazareth Hall Loading Docks	3/1/2011	Coner of Adams Avenue & University Avenue		closed	combined
Post Construction Stormwater Management Report for Johnson College Health Sciences Technology Center Land Development	4/1/2011	3427 North Main Avenue	208,216	closed	stormwater system
Proposed Constrution Stormwater Managemnet Report for Johnson College Heath Sciences Technology Center	4/1/2011	3427 North Main Avenue	208,216	closed	stormwater system
Post Construction Stormwater Management Plan for Green Ridge Health Care Center 31 Bed Addition	9/7/2011	2741 Boulevard Avenue	11,748	closed	
Post Construction Stormwater Management Plan for Green Ridge Health Care Center 31 Bed Addition	10/10/2011	2741 Boulevard Avenue	11,748	closed	
Post Construction Stormwater Management Plan Laurel Woods	2/3/2012	205 Davis Street			
Stormwater Management Plan and Narrative for Rossi Rooter Development	3/1/2012	2015 Cedar Avenue			
Erosion and Sediment Pollution Control/ Stormwater management Narrative for EOTC Site Improvements	7/1/2012	431 North Seventh Avenue		closed	combined system
Post Constrution Stormwater Management Narrative for Learning and Memorial Commons	9/1/2012	2300 Adams Avenue	21,868	closed; vegetated roof	combined system
Geisinger Heathcare: Scranton Medical Office Land Development and Stormwater Management Report	10/1/2012	521 Mount Pleasant Drive	556,000		



**APPENDIX C:
GREEN INFRASTRUCTURE
INVENTORY**

Parcel #	Parcel Name & Type	Location	Sub-Watershed	Notes	Opportunities for Green Infrastructure
22	Woodland	N I-476	Keyser	Natural woodland adjacent to I-476	Preserve Woodland
41	Vacant Lot	Perry Ave. & Laurel St.	Keyser	Vacant mowed lot	Bio-retention, Raingarden
156	Wooded Lot	Hudson Ave.	Keyser	Overgrown lot adjacent to commercial properties	Bio-retention
163	Wooded Lot	Swetland St.	Keyser	Woodland	Conservation
173	Gravel Lot	Hudson Ave.	Keyser	Gravel lot	Bioswale
176	Woodland	Byron Ln.	Keyser	Woodland	Conservation
188	Open Space	N. Keyser Ave.	Keyser	Slightly depressed mowed area next to car sales lot	Bioswale
190	Wooded Lot	Price St.	Keyser	Overgrown buffer between two residential lots on a slope	Conservation, Bio-retention
195	Woodland	Byron Ln.	Keyser	Woodland	Conservation
196	Recreation Space	S. Dewey Ave & Robinson Ave.	Keyser	Baseball / Football fields adjacent to railroad, Steep slope with rock along Price St.	Bio-retention, Raingarden
208	Open Space	20th Ave. & Oliver Pl.	Keyser	Mowed areas with gravel parking on Fire Dept. building	Bioswale, Raingarden
217	Streambank	N. Sherman Ave.	Keyser	Wooded slope from Sherman Ave. down to creek	Streambank Stabilization, Riparian Buffer
218	Streambank	Robinson St.	Keyser	Wooded slope down to creek	Streambank Stabilization, Riparian Buffer
237	Open Space	13th Ave. & Hampton St.	Keyser	Steep mowed slope from Hampton St. plateaus at top at 13th Ave.	Bioswale, Bio-retention
179-224	Channel Creek	N. Keyser Ave. & Frink St.	Keyser	Follows creek, Open space amongst residential properties	Conservation, Bio-retention, Infiltration
215/216	Jackson Terrace	N. Keyser Ave. & Jackson St.	Keyser	Steep wooded slope from Jackson St., Dirt drive behind building, Woodland surrounding building	Conservation, Raingarden, Pervious Pavers, Downspout Planters, Rain Barrels
142	Dunmore High School	W. Warren St. & N. Webster Ave.	Meadow Brook	School property, Open space, Sports fields, Paved parking lots	Raingardens, Bioswales, Pervious Pavers, Downspout Planters, Open Space, Rain Barrels
180	Wooded Lot	Monsey Ave.	Meadow Brook	Overgrown lot adjacent to railroad with gravel parking lot and steep slope up to residential property	Bio-retention
189	Wooded Berm	Glen St.	Meadow Brook	Bermed area over creek through Keystone Building Block	Bioswale, Infiltration
185/186/198	Casey Athletic Complex	Capouse Ave.	Meadow Brook	Public pool with little open space and wooded buffers and old asphalt parking lot	Pervious Pavers, Infiltration, Downspout Planters, Rain Barrels

Parcel #	Parcel Name & Type	Location	Sub-Watershed	Notes	Opportunities for Green Infrastructure
7	Streambank	McDonough Ave. & Block St.	Leggetts	Wooded growth next to creek	Streambank Stabilization, Riparian Buffer
8	Woodland	Rockwell Ave. & Kirkland St.	Leggetts	Steeply sloped woodland	Conservation
9	Wooded Lot	Wales St. & Durkin Ave.	Leggetts	Wooded lot with sale sign	Conservation
10	Woodland	Rockwell Ave. & Kirkland St.	Leggetts	Steeply sloped woodland	Conservation
18	Weston Park	Stanley Pl. & Belmont Terrace	Leggetts	Heavily used park with community room, Outdoor pool, Playground and nice views	Bioswale, Raingarden, Infiltration
25	Streambank	McDonough Ave.	Leggetts	Steeply wooded slope to creek	Streambank Stabilization, Riparian Buffer
28	Vacant Lot	Leggett St.	Leggetts	Vacant lot adjacent to creek	Bio-retention, Riparian Buffer
30	Streambank	McDonough Ave. & Oak St.	Leggetts	Steeply wooded slope to creek	Streambank Stabilization, Riparian Buffer
31	Meadow / Woodland	Cayuga St. & Bloom Ave.	Leggetts	Meadow-like open space leading to uphill sloping woodland on culm banks	Conservation, Bio-retention
54	Wooded Lot	W. Market St. & Leggett St.	Leggetts	Wooded slope	Conservation, Bio-retention
87	Dutch Martin	Wells St.	Leggetts	Steeply sloped scrubland with dirt trails along creek	Riparian Buffer, Bioswale
297	Streambank	Mary St.	Leggetts	Densely overgrown riparian buffer	Streambank Stabilization, Riparian Buffer
12-15	Streambank	Mary St.	Leggetts	Steep wooded slope	Preserve Woodland
16/17	Weston Park	Loop Ave.	Leggetts	Heavily used park with community room, outdoor pool, playground, and nice views	Bioswale, Raingarden, Infiltration, Pervious Pavers
20/86	McClain Park	W. Parker St.	Leggetts	Small park with baseball field, open space, and basketball courts	Open Space, Bioswale, Raingarden
264	Vacant Lot	Morgan Ct. & E. Elm St.	Stafford Meadow	Slope adjacent to school grounds	Conservation, Bio-retention
265	Marine Corps Museum	Blucher Ave. & Willow St.	Stafford Meadow	Open space surrounded by woodland	Raingarden, Conservation, Bio-retention, Rain Barrels, Downspout Planters
271	Wooded Lot	Wintermantle Ave. & E. Elm St.	Stafford Meadow	Natural woodland	Conservation
274	Wooded Lot	McGuinness Ct. & Healy Pl.	Stafford Meadow	Wooded lot	Conservation
276	Wooded Lot	Stafford Ave. & Palm St.	Stafford Meadow	Wooded lot with well-used informal trails	Conservation
277	Lake	Mountain Lake Rd. & Birch St.	Stafford Meadow	Mountain Lake, Wooded buffer	Conserve Lake Buffer Zones
328	Vacant Lot	Donnelly Ct. & E. Elm St.	Stafford Meadow	Steeply sloped overgrown vacant lot	Bio-retention
269/270 275/279	Wooded Lots	McGuinness Ct. & Fig St.	Stafford Meadow	Wooded lots	Conservation

Parcel #	Parcel Name & Type	Location	Sub-Watershed	Notes	Opportunities for Green Infrastructure
232	Vacant Lot	Union Ave. & William St.	Roaring Brook	Mowed lot near homes, downspouts appear to be disconnected	Bioswale
242	Streambank	Myrtle St.	Roaring Brook	Wooded streambank	Streambank Stabilization, Riparian Buffer
243	Nay Aug	Arthur Ave. & Roselynn St.	Roaring Brook	Open space, Swimming pools, Trails, Paved parking lots	Raingarden, Conservation, Pervious Pavers, Bioswales, Rain Barrels, Downspout Planters
245	Woodland	Matthew Ave.	Roaring Brook	Woodland	Conservation
254	Connor's Park	Orchard St. & Hamm Ct.	Roaring Brook	Park with open space, Community garden, Playground	Curb Cut Outs, Raingarden, Bio-retention
258	Wooded Lot	Moosic St. & Roosevelt St.	Roaring Brook	Wooded slope, Defined channel that carries run off	Conservation
262	Wooded Lot	Moosic St. & Lynnwood Ave.	Roaring Brook	Wooded lot	Conservation
263	Stormwater Basin	Lynnwood Ave.	Roaring Brook	Stormwater basin that handles runoff along utility row	Conservation, Bio-retention
267	Woodland	Cobb Ave. & Grand Ave.	Roaring Brook	Woodland	Conservation
268	Stormwater Basin	Lakeview Dr. & E. Mountain Rd.	Roaring Brook	Stormwater basin	Conservation, Bio-retention
312	Oakmont Playground	Debbie Dr.	Roaring Brook	Under-utilized park with large amount of asphalt	Bioswales, Pervious Pavers, Raingarden
313	Woodland	Lynnwood Ave. & Silkman Ave.	Roaring Brook	Harold Watres parcel to Nay Aug Park, Natural woodland	Conservation
317	Robinson Park	Mountain Lake Rd. & Yesu Dr.	Roaring Brook	Natural woodland	Conservation
239/295	Wooded Lots	Olive St. & Kelum Ct.	Roaring Brook	Wooded lots	Conservation, Maintenance
256/257	Duffy Park	Moosic Street	Roaring Brook	Open space, Small woodland	Raingarden, Bioswales
259/266	Wooded Lot	Florida Ave. & Snook St.	Roaring Brook	Wooded slope, Rip rap swale to pipe	Infiltration Berms, Step Pools
260/261	Scranton Lookout	Moosic St. & Lynnwood Ave.	Roaring Brook	Historic pull off area, Overlooks city of Scranton	Raingarden, Pervious Pavers, French Drain

Parcel #	Parcel Name & Type	Location	Sub-Watershed	Notes	Opportunities for Green Infrastructure
2	Street	Nay Aug Ave.	Lackawanna	Mowed sidewalk with curbing	Stormwater planter
3-89	Vacant Lots	E. Parker St.	Lackawanna	3/5/27/32/33/34/35/37/89 Overgrown vacant lots	Bio-retention, Conservation
6	Vacant Lot	Grace St.	Lackawanna	Mowed vacant lot	Bio-retention, Open Space
11	Vacant Lot	E. Parker St. & Boulevard Ave	Lackawanna	Vacant lot adjacent to culm bank	Bio-retention
19-335	River Buffer	E. Parker St. to Sanderson Ave.	Lackawanna	19/36/38/40/43/47/50/51/53 55/59/60/62/63/64/65/66/67 68/69/70/71/76/79/97/103 104/105/106/118/120/122 123/125/127/136/137/138 139/283/284/288/300/308 316/335 Lackawanna River Corridor	Streambank Stabilization, Riparian Buffer, Floodplain
29	River Buffer	Throop St.	Lackawanna	Mowed bank adjacent to railroad	Streambank Stabilization, Riparian Buffer, Floodplain
39	Vacant Lot	E. Parker St. & Boulevard Ave	Lackawanna	Vacant lot adjacent to culm bank	Bio-retention
42	Wooded Bank	Hollister Ave.	Lackawanna	Wooded bank	Bio-retention
44	Vacant Lot	E. Parker St.	Lackawanna	Overgrown vacant lot with abandoned house	Bio-retention
45	Park	Grace St.	Lackawanna	Small park with pavement	Raingarden
46	Woodland	Lemon St.	Lackawanna	Woodland	Conservation
48	Overground Lot	Spring St. & Belmont Terrace	Lackawanna	Overground parcel with good visibility, Lower lot is wooded and steep	Infiltration
49	Vacant Lot	Alden Pl.	Lackawanna	Mowed vacant lot	Bio-retention, Open Space
56	Powderly Park	N. Main Ave. & School St.	Lackawanna	Very steep, narrow area alongside road	Raingarden
57	Gravel Lot	W. Market St.	Lackawanna	Gravel lot abutting restaurant	Infiltration, Dry Well, Cistern
61	River Bank	E. Market St. & Nay Aug Ave.	Lackawanna	Mowed river bank	Streambank Stabilization, Riparian Buffer, Floodplain
72	Parking Lot	Bundy St.	Lackawanna	Paved parking lot	Pervious Pavers
77	Open Space	Nay Aug Ave.	Lackawanna	Small open space between buildings	Rain Barrels, Downspout Planters / Disconnect
82	Open Space	E. Market St. & Nay Aug St.	Lackawanna	Moderately sized mowed open space	Raingarden, Street Trees, Bioswale, Curb Cut Outs
88	Vacant Lot	Hollister Ave. & E. Parker	Lackawanna	Grass growing on gravel lot	Bio-retention, Open Space
95	Vacant Lot	Electric St.	Lackawanna	Mowed vacant lot	Bio-retention
96	Vacant Lot	Ross Ave. & Electric St.	Lackawanna	Narrow mowed strip between commercial property fence and residential property	Bio-retention
99	Wooded Buffer	Clearview St.	Lackawanna	Wooded buffer separating neighborhood from railroad	Conservation, Bio-retention
107	Vacant Lot	Whitetail Dr. & Deerfield Rd.	Lackawanna	Wooded vacant lot	Bio-retention
119	North Scranton Mini Park	Wayne Ave. & Jabez Pl.	Lackawanna	Open space adjacent to Fire Station, Needs maintenance	Raingarden, Soakaway Garden, Bioswale

Parcel #	Parcel Name & Type	Location	Sub-Watershed	Notes	Opportunities for Green Infrastructure
126	Wooded Buffer	E. Market St.	Lackawanna	Wooded buffer along river with dirt road access	Bio-retention, Conservation, Riparian Buffer
132	Open Space	Nay Aug Ave.	Lackawanna	Mowed open space	Raingarden, Street Trees, Bioswale, Curb Cut Outs
140	Reddington Field	Silver Ave. & Wood St.	Lackawanna	Baseball field with gravel parking lot and woodland	Open Space, Recreation, Pervious Pavers, Raingarden, Conservation
152	Tripp Park	N. Filmore Ave. & Dorothy St.	Lackawanna	Playground with paved parking lot, basketball / tennis courts	Pervious Pavers, Raingarden, Curb Cut Outs, Bio-retention
158	Fellow's Park	N. Main Ave.	Lackawanna	Fire Dept. building	Rain Barrels, Downspout Disconnect / Planters, Pervious Pavers
166	River Bank	Albright Ave. & Court St.	Lackawanna	Mowed bank with rip rap material	Streambank Stabilization, Riparian Buffer
177	Weston Field	Foster St. & Meade Ave.	Lackawanna	Large park complex, Indoor / Outdoor pools, Offices, Gym, Playground, Fields	Raingarden, Soakaway Garden, Open Space, Recreation, Bio-retention
178	Utility ROW	Foster St.	Lackawanna	Overgrown slope on utility ROW	Stormwater Planter
181	Public Works	7th Ave. & W. Poplar St.	Lackawanna	Public Works parcel with mowed lawn and paved parking adjacent to River	Rain Barrels, Downspout Planters / Disconnects, Bioswales, Pervious Pavers
183	Public Works	7th Ave. & Grove St.	Lackawanna	Road Works salt storage lot with mowed strips, asphalt lot	Bioswale
184	Open Space	7th Ave. & Grove St.	Lackawanna	Sidewalk with mowed grass	Pervious Pavers, Curb Cut Outs, Bump Outs
193	River Buffer	7th Ave. & Middle St.	Lackawanna	Small flat open area with dirt and gravel base adjacent to River and trucking facility	Riparian Buffer
194	Vacant Lot	Calvin St.	Lackawanna	Vacant lot with Free Masons building	Raingarden, Rain Barrel, Downspout Planters
200	Utility ROW	Webster Dr.	Lackawanna	Mowed strip of land, Catch basin present	Raingarden, Cistern, Dry Well
203	Vacant Lot	Mears Pl.	Lackawanna	Mowed vacant lot with historical sign	Bioswale, Raingarden
210	Dunmore Fire Station	W. Pine St. & Legion Dr.	Lackawanna	Houses Borough building and fire / police departments	Raingarden, Rain Barrel, Downspout Planters
219	Vacant Lot	S. Blakely St.	Lackawanna	Vacant lot adjacent to La Cucina	Cistern, Dry Well
220	Tank Memorial	Cherry St. & N. Blakely St.	Lackawanna	Highly visible, Gravel base	Soakaway Garden, Raingarden
222	Commercial Lot	Providence Rd. & Gilligan St.	Lackawanna	Commercial property with trucking depot, Gravel/dirt base, adjacent to River	Infiltration, Bio-retention
225	Park	N. Bromley Ave & Robinson St.	Lackawanna	Elevated park with asphalt courts, Container gardens	Pervious Pavers, Bioswale, Curb Cut Outs
229	Planting Strip	N. Washington Ave. & Lackawanna Ave.	Lackawanna	Small planting strip between Dix Ct. and parking lot	Curb Cut Outs, Bio-retention

Parcel #	Parcel Name & Type	Location	Sub-Watershed	Notes	Opportunities for Green Infrastructure
230	Parking Lot	N. St. Francis Cabrini Ave.	Lackawanna	Paved parking lot with street trees	Curb Cut Outs, Bio-retention, Pervious Pavers
231	Sidewalk	Mifflin Ave.	Lackawanna	Small strip between Mifflin Ave. and railroad with grass and benches	Curb Cut Outs, Bioswale
233	Crawley Field	Meridian Ave. & Oxford St.	Lackawanna	Baseball fields	Bioswale, Raingarden, Bio-retention
234	Bellvue Center	Coar Pl.	Lackawanna	Mowed lawn in front with playground on side and asphalt parking in back	Raingarden, Curb Cut Outs, Pervious Pavers
235	Westside Senior Center	N. St. Francis Cabrini Ave. & Robinson St.	Lackawanna	Brick building with downspout planter and street parking	Rain Barrel
241	Park	S. Edward's Ct. & Fellows St.	Lackawanna	Moderately sized park with open space, Street trees, Mowed lawn, Small paved parking lot	Raingarden, Curb Cut Outs, Pervious Pavers
244	Gas House	S. Washington Ave. & River St.	Lackawanna	Former Gas House adjacent to railroad trestle	Rain Barrels, Downspout Planters
246	Vacant Lot	W. Elm St.	Lackawanna	Overgrown lot	Pocket Park, Bio-retention
248	Vacant Lot	8th Ave. & Oxford St.	Lackawanna	Mowed vacant lot	Bioswale
249	Baseball Field	8th Ave. & Oxford St.	Lackawanna	Baseball field with gravel parking	Bioswale, Bio-retention
250	Wooded Lot	Rogan Pl.	Lackawanna	Steep wooded slope	Conservation
251	Wooded Buffer	S. Wyoming Ave. & Mechanic St.	Lackawanna	Wooded buffer between railroad and Steamtown	Conservation
255	Clover Field	Landis St. & Archbald St.	Lackawanna	Wooded steep slope	Conservation
272	Engine Company No. 2	Pittston Ave. & Gibbons St.	Lackawanna	Fire station with mowed lawn	Rain Barrels, Downspout Planters, Bioswale
273	Connell Park	S. Webster Ave. & Gibbons St.	Lackawanna	Park built on side of hill with dog park, Playground, Fields, and Pool	Raingarden, Bioswales, Infiltration
278	Kennedy Elementary School	Prospect Ave., Saginaw St. to Ohara St.	Lackawanna	School yard	Raingarden, Rain Barrels, Downspout Planters
280	Wooded Lot	Donnelly Ct. to Herz Ct. & Ripple St.	Lackawanna	Un-maintained vegetation covers sidewalk	Conservation, Infiltration
281	Vacant Lot	Pittston Ave. & McDonough St.	Lackawanna	Overgrown lot at the top of a hill	Raingarden, Infiltration
282	Minooka Park / Billy Barrett Playground	Colliery Ave. & McDonough St.	Lackawanna	Small park with tennis courts and playground	Bioswale, Raingarden
289	Municipal Lot	Nay Aug Ave.	Lackawanna	Gravel lot	Bio-retention
290	Municipal Lot	Nay Aug Ave.	Lackawanna	Municipal building	Rain Barrel, Downspout Planter / Disconnect, Bioswale

Parcel #	Parcel Name & Type	Location	Sub-Watershed	Notes	Opportunities for Green Infrastructure
298	Utility Lot	8th Ave. & Middle St.	Lackawanna	Utility lot adjacent to River	Streambank Stabilization, Riparian Buffer
299	Park	Green Pl.	Lackawanna	Park with baseball field, basketball court, play area	Open Space, Pervious Pavers
302	Nay Aug	Arthur Ave. & Roselynn St.	Lackawanna	Streambank	Conservation
307	Tripp Park	N. Filmore Ave. & Dorothy St.	Lackawanna	Baseball fields, Paved parking lot, Woodland	Conservation, Raingarden, Pervious Pavers
314	Wooded Slope	Terrace St.	Lackawanna	Steep wooded slope	Conservation
315	Open Space	Bridge St. & Lackawanna Ave.	Lackawanna	Sloped, mowed area in front of Steamtown Historic sign	Raingarden, Bioswale
318	Recreation Space	Olyphant Ave.	Lackawanna	Large park with baseball fields, basketball courts, woodland	Conservation, Raingarden, Bio-retention
319	Dunmore Historical Society	Barton St. & Tripp St.	Lackawanna	Former church	Rain Barrels, Downspout Planters
321	River Levi	S. Washington Ave. & W. Elm St.	Lackawanna	River bank	Streambank Stabilization, Riparian Buffer
322	Steamtown	N. Washington Ave. & Mechanic St.	Lackawanna	Large amount of brownfield space	Soil Restoration, Bio-retention, Rain Barrels, Downspout Planters
329	Industrial Lot	Providence Rd. & Gilligan St.	Lackawanna	Brownfield industrial/commercial lot	Soil Restoration, Bio-retention, Rain Barrels, Downspout Planters
330	River Bank	Love Rd. & W. Olive St.	Lackawanna	Mowed river bank	Streambank Stabilization, Riparian Buffer
331	Wooded Lot	Mineral Ave. & Mica St.	Lackawanna	Wooded lot	Conservation
332	River Bank	Love Rd. & Providence Rd.	Lackawanna	River bank with detention basin, Outlet flows into River, Riverwalk	Streambank Stabilization, Riparian Buffer
337	Theodore Park	W. Pass Ave. & Theodore St.	Lackawanna	Steep wooded slope	Parking Lot Improvements, Raingarden
340	River Levi	S. Washington Ave. & Cherry St.	Lackawanna	River bank	Streambank Stabilization, Riparian Buffer
345	River Bank	Love Rd. & Providence Rd.	Lackawanna	Vegetated slope leading away from Riverwalk	Bio-retention
108-303	River Bank	Green Ridge St. to Albright Ave.	Lackawanna	108/109/111/113/114/115/116 117/141/143/144/145/147/148 149/150/151/153/154/155/157 159/160/162/165/167/169/170 171/172/175/286/287/292/303 River Bank	Streambank Stabilization, Riparian Buffer
128-323	River Bank	Albright Ave. to W. Poplar St.	Lackawanna	128/129/168/174/182/294/296 305/323 River Bank	Streambank Stabilization, Riparian Buffer
191/192	Holy Cross High School	Harper St. & Truman Ave.	Lackawanna	Mowed open space, Paved parking,	Raingarden, Rain Barrels, Downspout Planters / Disconnects, Bioswales
197/201	Monroe Park / Dunmore Community Center	Monroe Ave.	Lackawanna	Large complex, Playground, Fields, Parking, Community center, Community garden	Raingardens, Rain Barrels, Downspout Planters / Disconnects, Bioswales

Parcel #	Parcel Name & Type	Location	Sub-Watershed	Notes	Opportunities for Green Infrastructure
21-339	River Bank	I-81 to E. Parker St.	Lackawanna	21/24/26/310/338/339 Wooded river bank down to Throop St. then turns into mowed bank, Culm bank refuse	Streambank Stabilization, Riparian Buffer, Bio-retention, Reforestation
221	West Scranton Memorial	S. Main Ave. & Price St.	Lackawanna	Small memorial space with mowed lawn, gazebo	Pervious Pavers, Raingarden
226/227 228/238	Parking Lot	S. Main Ave. & Price St.	Lackawanna	Moderately sized paved parking lot	Bio-retention, Pervious Pavers
236/240	Park Garden	Dix Ct. & Mulberry St.	Lackawanna	Tiered planting beds in front of Municipal building, Fire Dept. HQ	Rain Barrels, Downspout Planters
252/253	Football Fields	S. 6th Ave. & W. Locust St.	Lackawanna	Small gravel parking, Mowed grass, Seating area, Football fields	Remove Berm, Bioswale
4-304	River Bank	E. Market St. to Green Ridge St.	Lackawanna	4/66/73/74/78/80/81/84/90/91 94/98/101/102/110/130/134 291/293/304 Mowed bank on one side, Wooded on the other	Streambank Stabilization, Riparian Buffer
58-344	River Bank	Sanderson Ave. to E. Market St.	Lackawanna	58/75/85/92/93/100/121/285 306/320/324/325/326/327/336 341/342/343/344 Mostly wooded bank	Streambank Stabilization, Riparian Buffer
83/131	Vacant Lot	E. Market St. & Ross Ave	Lackawanna	Mowed vacant lot with pervious paver parking lot	Raingarden



**APPENDIX D:
ENVIRONMENTAL EDUCATION
MATERIALS**

Additional educational materials are available at www.lrca.org.

Lackawanna River Watershed Conservation Plan

prepared by The Lackawanna River Corridor Association

November 2001



This project is funded with support from the Chesapeake Bay Program Small Watershed Grants Program administered by the National Fish and Wildlife Foundation, the Scranton Area Foundation, the Rivers Conservation Program of the Commonwealth of Pennsylvania, Department of Conservation and Natural Resources

and

The membership and community support funding received through contributions to the Lackawanna River Corridor Association.

This document has been prepared by:

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Gail Pareto, Education and Outreach Coordinator

For the:



Lackawanna River Citizens

Water Quality Handbook



The Lackawanna River Guide

A publication of the
Lackawanna River Corridor Association

Second Edition

This Guide is dedicated to
the membership
of

The Lackawanna River Corridor Association
whose support and commitment are helping to create
a revitalized Lackawanna River.

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LACKAWANNA RIVER CLEAN

Easy Tips to Help Reduce Flooding and Stormwater Pollution

- Lawns add to the problem! Use natural or organic lawn chemicals, fertilizers, and pesticides. Reduce the amount you use.
- Plant trees, shrubs and ground cover to reduce the amount of water run-off from your property.
- Leave a buffer of vegetation along the road to reduce water run-off.
- Pick up after your dog. Pet waste adds to water pollution.
- Don't pour oil or hazardous chemicals down storm drains. They all lead to the river.
- Mulch grass clippings. Use compost and mulch to reduce the amount of chemical fertilizers needed.
- Use a rain barrel to catch water run-off from your property. This can be used later to water lawns and plants.
- Reduce the amount of impervious (paved) surface on your property. Plant grass, shrubs and ground cover instead.
- Don't litter. Put trash where it belongs. Recycle everything you can.

We're all part of the solution.

**Each home owner, business, or school can help
to reduce flooding and water pollution.**

“Thinking Globally and Acting Locally”



LACKAWANNA RIVER CLEAN



[www.scrantonpa.gov/
Municipal Separate Storm System.html](http://www.scrantonpa.gov/Municipal%20Separate%20Storm%20System.html)



347-6311



348-5330

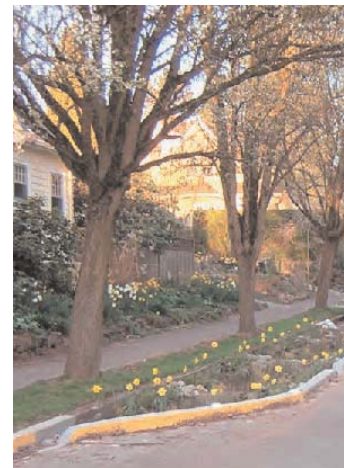
LACKAWANNA RIVER CLEAN

Vegetated Swales

(bioswales, grassy swales)

Swales have many options in design and planting

Swales are gently sloping depressions planted with dense vegetation or grass that treat stormwater runoff from rooftops, streets, and parking lots. As the runoff flows along the length of the swale, the vegetation slows and filters it and allows it to infiltrate into the ground. Where soils do not drain well, swales are typically lined and convey runoff to a drywell or soakage trench. Swales can include check dams to help slow and detain the flow. A swale can look like a typical landscaped area.



Benefits

The plants in a swale filter and slow stormwater runoff while sediments and other pollutants settle out. Swales are cost effective, attractive and can provide wildlife habitat and visual enhancements. Single or multiple swale systems can treat and dispose of stormwater runoff from an entire site. Swales can reduce the number and cost of storm drains and piping required when developing a site.

Vegetation

Swales can be planted with a variety of trees, shrubs, grasses, and ground covers. Plants that can tolerate both wet and dry soil conditions are best. Plant grassy swales with native broadleaf, dense-rooted grass varieties. Avoid trees in areas that require enhanced structural stability, such as bermed side slopes. Summer irrigation and weed pulling may be required in the first one to three years.

Maintenance

Inspect swales periodically, especially after major storm events. Remove sediment and

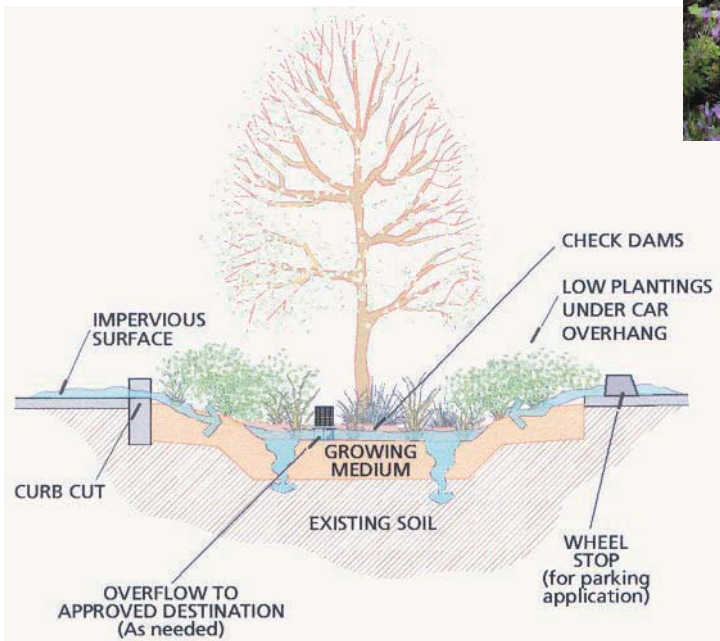
trash, clean and repair inlets, curb cuts, check dams, and outlets as needed. Maintain side slopes to prevent erosion and ensure proper drainage. With proper construction and maintenance, swales can last indefinitely.

Cost

Costs vary but swales typically cost less than a standard piped drainage system.

Safety and Siting Requirements

- Swales should not be located closer than 10 feet from building foundations.
- Locate swales at least 5 feet from any property line.
- Grade the site so that water drains to the swale, or provide some form of conveyance such as a trench or berm to direct the runoff into the swale if site grading is impractical.
- Many parking lot planting islands can be excavated and retrofitted into swale systems with curb cuts.
- Refer to Pennsylvania's Stormwater Management Manual for detailed information on sizing, placement, and design.



Call the
Sewer Authority at 348-5330
or visit www.scrantonsewer.org.

Call the
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at 347-3611 or visit www.lrca.org.

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LACKAWANNA RIVER CLEAN

Rain Barrels

Rain barrels are containers that capture the roof runoff flowing out of a downspout.

Rain barrels placed at the end of roof downspouts capture and store roof runoff for non-potable water use, like irrigation. Rain barrels come in a wide variety of materials, designs, and colors. Common sizes for residential use are 55 gallons and 90 gallons. They are usually installed on the ground next to buildings.

Commercial or industrial properties are more likely to use cisterns because of their larger capacity and durability.



Benefits

Using rain barrels to temporarily store and reuse rainwater slows and reduces stormwater runoff from the site. They conserve non-potable water and may reduce water use charges. Rain barrels are inexpensive, easy to install and maintain, and readily available.

Maintenance

Inspect periodically for leaks, especially spigots and other connection points. Make sure debris does not clog the system. Screen all vents to prevent mosquito breeding. For maximum stormwater benefits, empty the barrel between rain events in the wet season. Clean the rain barrel interior annually by brushing or disinfecting with vinegar or other non-toxic cleaners. The washout can be disposed of onsite to vegetated areas if disinfecting agents are adequately diluted so they do not harm plants. A rain barrel and its system components have a lifespan of about 20 years.

Cost

Do-it-yourself rain barrels can be constructed for under \$30. Ready-made 55 gallon to 90 gallon rain barrels generally cost from \$50 to \$300 uninstalled. All rain barrels must be mosquito proof, have approved overflow points and meet city standards.



Safety and Siting Requirements

- A typical residential rain barrel design includes an opening in the sealed lid to accept downspout flow, an overflow pipe for when the barrel is full, and a spigot at or near the bottom to attach a hose or faucet. A screen at the opening controls mosquitoes and other insects. Several rain barrels can be connected to store more rainwater.
- Locate rain barrels on a flat surface next to or near roof downspouts.
- In areas with soils that drain well, you can direct overflow from the rain barrels onto the yard or landscape areas. The area must meet the safety requirements listed under downspout disconnect.
- Only collect roof water for reuse. Do not reuse water from parking or pedestrian areas, surface water runoff, or bodies of standing water.
- Refer to Lackawanna River Clean's *A better way to manage stormwater - Rain Gardens* brochure for detailed sizing, placement, and design information.

Permits

- Rain barrels attached to a downspout that do not connect back into the building's water system do not require permits.



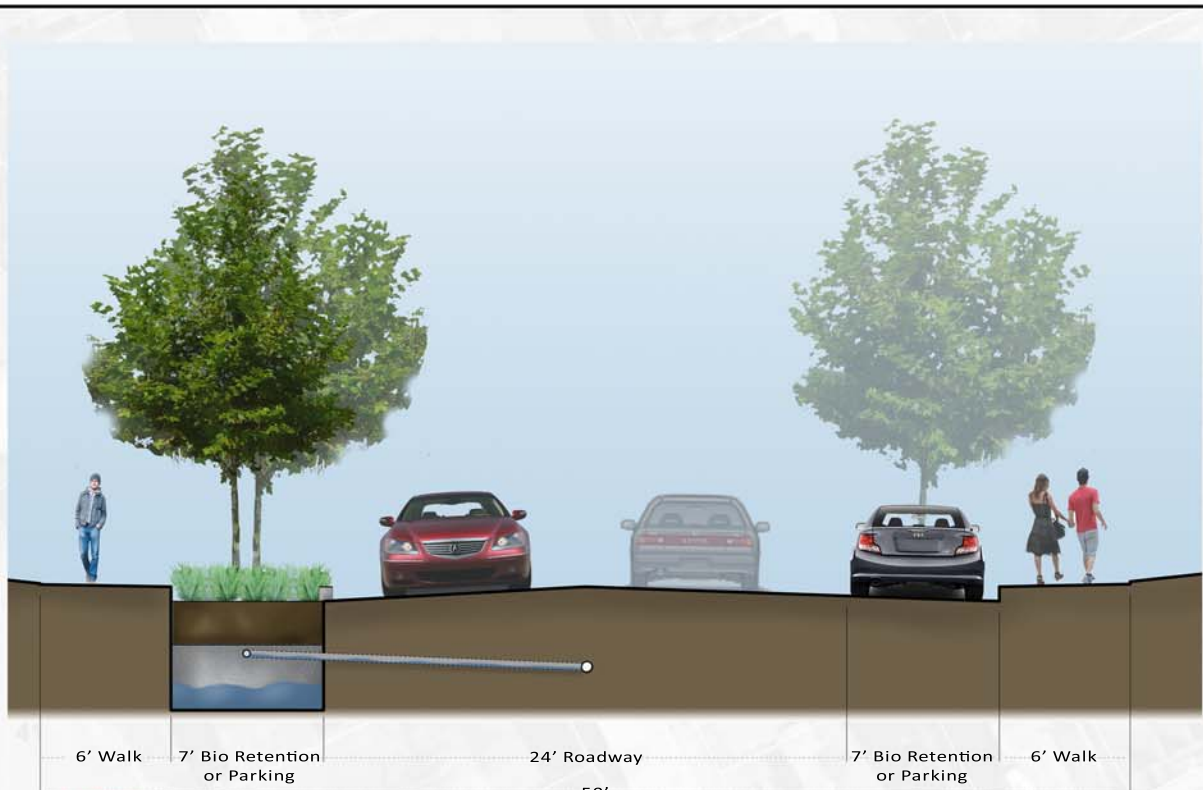
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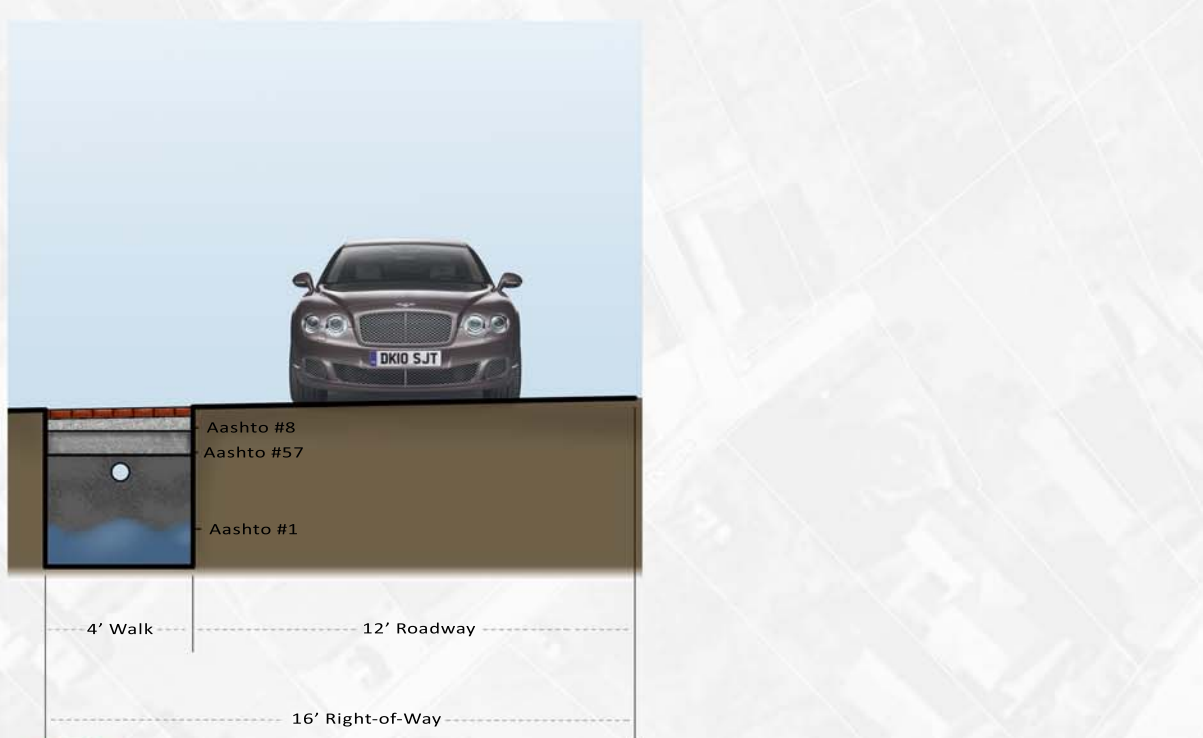
50' Right-Of-Way Street Scope



40' Right-Of-Way Street Scope



Raingarden With Underdrains



Pervious Pavers



Project By Locations

	Estimated Cost	CSO Impervious Treated
City Owned Parcels		
A1 Fire Station Raingarden	\$20,000	2,500 SF
A2 Parking Lot Bio Infiltration Area	\$25,000	6,000 SF
Public Owned Land Including R.O.W.s		
B1 School Street Pervious Paver Band	\$40,000	22,000 SF
B2 West Market Street Scope	\$235,000	55,000 SF
B3 Wayne Ave Street Scope	\$135,000	38,000 SF
B4 Remaining Improvements along School and William Street	\$85,000	18,000 SF
Civic Parcels		
C1 Howard Gardener School Roof Disconnect and Raingardens	\$15,000	6,500 SF
C2 Shilo Baptist Church Raingarden	\$25,000	11,000 SF
C3 Puritan Congregational Church Roof Disconnect	\$10,000	4,000 SF
C4 Holy Rosary Rain Garden	\$5,000	4,500 SF
C5 Casa Bella Infiltration Strip	\$10,000	6,500 SF
C6 Holy Rosary Impervious Pavers	15,000	7,000 SF
Residential Parcels		
D1 Deed Book 0968 Pg 0214 Purchase and Raingarden Installation	\$35,000	6,500 SF
D2 Deed Book 0834 Pg 0194 Purchase and Raingarden Installation	\$35,000	18,000 SF
D3 Deed Book 1382 Pg 0212 Purchase and Raingarden Installation	\$35,000	17,000 SF
Total	\$725,000	222,500SF*

*42% Of All Impervious Surfaces Will Pass Through a Minimum of One Green Infrastructure Technology Before Emptying Into the Combined Sewer

PROJECT PARTNERS:



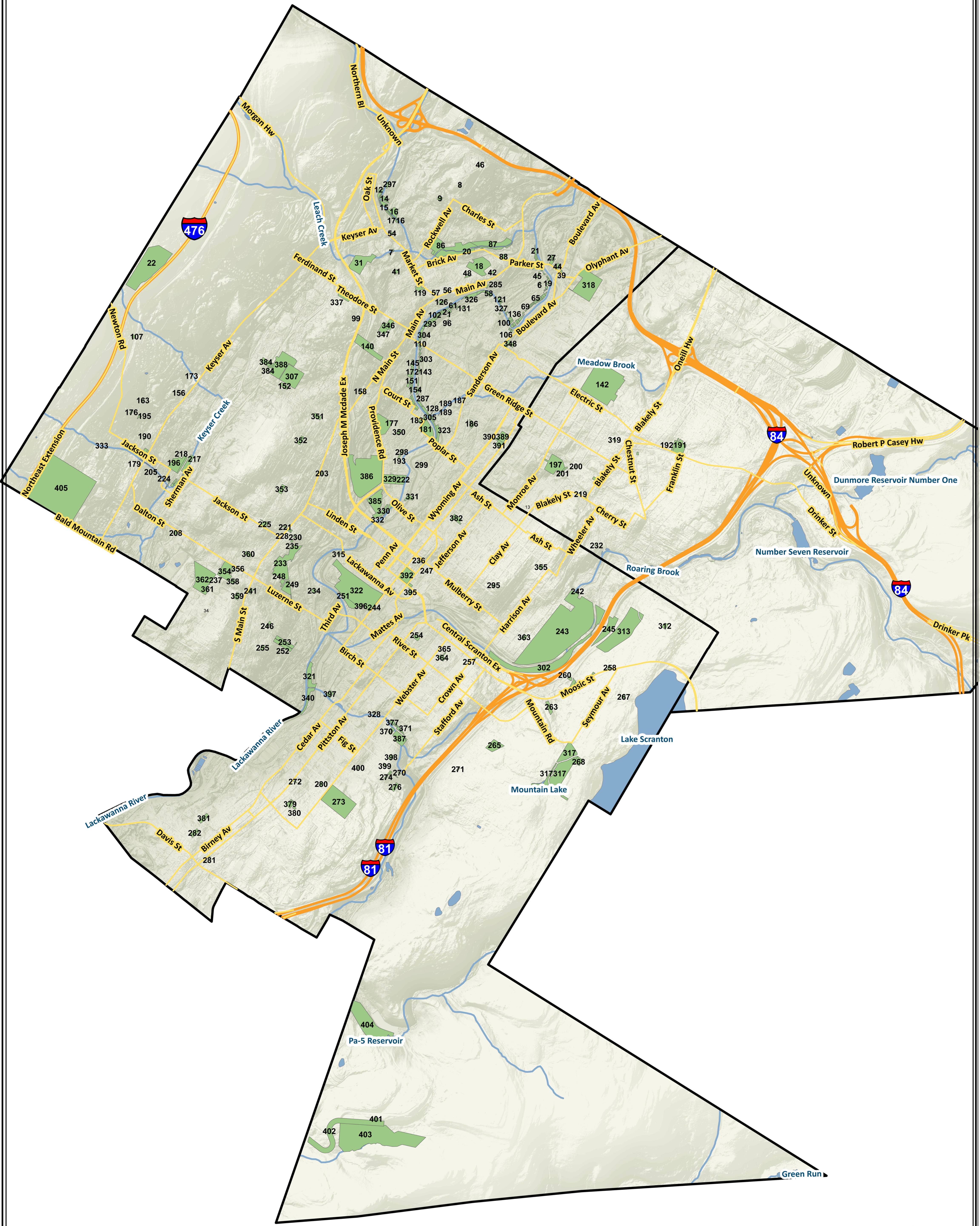
Legend:

- Catchment Area 40 Boundary
- Sanitary Sewer Lines, Manholes, & Invert Elevations
- Stormwater Lines, Manholes, & Invert Elevations
- Stormwater Catchbasins that tie into Sanitary Network
- Street Tree
- Street Greening
- Pervious Pavers
- Bio Retention
- Building Greening

SUBCATCHMENT DESCRIPTION

- West Market Street Subcatchment Area
- NPDES Outfall#40
- Outlets to the Upper Lackawanna River
- 530,000 Square Feet of Impervious Surfaces
- \$870,000 LTCP Proposed Investment
- 17,000 Gallons LTCP Estimated Storage
- 810,000 Gallons of Estimated Annual Overflow

Subcatchment Area Case Study Comprehensive Plan



PROJECT PARTNERS:



**Scranton & Dunmore
Public Parcels**

Key:

- City Owned Parcels
- Minor Roads
- Water Body
- Major Roads

