Franklin Township
Stormwater Basin Retrofit Projects
Phase I
New Jersey Water Supply Authority

Independent state authority operating state owned water supply facilities:

- Spruce Run Reservoir - natural stream flow - 11BG
- Round Valley Reservoir - pumped storage - 55BG
- Delaware & Raritan Canal - 100MG/day

Delaware & Raritan System serves 1.8+ million people in central New Jersey

- Manasquan Reservoir - pumped storage - 4BG

Manasquan System serves 300,000 people in Monmouth County
Project History

- Studies indicated that sediments do not decrease between 10-Mile Lock & Landing Lane because of stormwater discharges

- Why is increased sediment a problem?
  - Requires additional water treatment by water purveyors – additional chemical cost, additional sludge disposal

- SFY2002 319(h): Delaware and Raritan Canal Tributary Assessment and Nonpoint Source Pollution Management Project

- Focus: final 11 miles of Canal, Amwell Road to Landing Lane

- SFY2006/2007 and 2018 watershed restoration grant funding: Implementation
D&R Canal Restoration Plan

- Identified 72 infalls
- Only includes infalls that discharge to the Canal, many others go under Canal and discharge to Millstone River
- Delineated area draining to each infall, estimated sediment load, prioritized projects
- 15 infalls contribute 75% of sediment to Canal in project area
- Watershed restoration plan approved 2006
Delaware & Raritan Canal Nonpoint Source Management Project Infalls & Drainage Areas
Implementation So Far

• Landing Lane monitoring station
• Rain barrel workshops with Franklin Twp. and South Bound Brook Boro
• Schematic designs and conceptual recommendations for Infalls 5, 28, 60/62
• Installed 5 Filterra units and Suntree baffle box in south Bound Brook
• Basin retrofit at Rutgers Prep completed
• Construction documents completed for Dellwood Lane Basin; construction targeted Spring 2021
• Schematic designs and conceptual recommendations for 8 basins in Franklin Township
  • Construction beginning at 4 of those basins Spring 2020
Problems with traditional stormwater basins

- Minimal water quality treatment – runoff flows through without treatment
- Sediment accumulation
- Clogged low-flow channels and outlet structures
- Standing water or wet soils
- Encourages nuisance species such as geese
- High maintenance costs

Why retrofit stormwater basins?

- Improve water quality
- Reduce maintenance costs
- Improve wildlife habitat
What Happens to Stormwater in a Typical Detention Basin?

1. Water from the neighborhood enters the basin through the inlet, carrying trash, pollutants and sediment from the ground.
2. Water flows rapidly into the low flow channel, crossing the basin in the shortest possible distance.
3. Steep basin edges allow surface runoff to enter the basin quickly and flow into the low flow channel.
4. Water flows quickly through plantings like turf grass, whose shallow roots do not soak up or filter much water.
5. The outlet is designed to move water out of the basin quickly and into receiving streams.
6. Water discharges into the stream at the outflow. In typical basins, water flows through the basin in less than a minute.

http://www.stormwaterpa.org/basin_retrofit/existing.html
1. Water from the neighborhood enters the basin through the **inlet**, carrying trash, pollutants, and sediments from the ground surface.

2. Water slows when it hits the **forebay**, allowing some sediment to settle out.

3. Water hits the **berm**, forcing it to either side, slowing and spreading the flow.

4. Water meanders along the **curved edges**, slowing and spreading the flow.

5. As water passes through the **plantings**, it soaks into the ground, slowing and spreading.

6. Water enters a **rain garden pocket**, slows, collects and soaks into the ground. Water can also evaporate.

7. Water flows through the **outlet** after a certain volume is contained by the basin.

8. **Outflow** discharges a smaller volume of water than enters the basin, and during some small storms, no water flows out of the basin.

http://www.stormwaterpa.org/basin_retrofitted.html
FT #32/Renoir Way
Approximately 3 acres, Receives ~25 acres of residential runoff
Goals:
- extend the detention time
- increase pollutant removal

Actions:
- remove the concrete low flow channels
- replace mowed grass with native meadow vegetation
- regrade the basin to lengthen the retention time for water quality
Renoir Way
FT #57/Gauguin Way
Approximately 2 acres
Connected to Middlebush Park stormwater system
Receives ~19 acres of primarily residential runoff
FT #57/Gauguin Way

Goals:
• extend the detention time
• increase pollutant removal

Actions:
• remove concrete low flow channels
• replace mowed grass with native meadow vegetation
• modify outlet orifice to increase detention time
• regrading to remove preferential flow path
FT #60/Municipal Complex
Approximately 1.5 acres, Receives ~10 acres of institutional runoff
Franklin Township Municipal Complex Stormwater Basin/FT #60

Goals:
• lengthen the flowpath through the basin
• increase the overall detention time for runoff

Actions include:
• remove concrete low flow channels,
• replace mowed grass with native meadow vegetation
• regrade the basin and add berms to increase retention time
• modify outlet structure
Municipal Complex
FT #226/ Laird Terrace
Approximately 4 acres, Receives ~62 acres of residential runoff
FT #226/ Laird Terrace

Goals:
• extend the detention time for runoff
• increase pollutant removal

Actions:
• remove concrete low flow channels
• replace mowed grass with native meadow vegetation
• regrade the basin to remove the preferential flow path
• modify the outlet structure
Next project?
Dellwood Lane Basin
Readington Middle School
Readington Middle School
CONSTRUCTION SEQUENCE

1. ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE FOLLOWING SEQUENCE. EACH STAGE SHALL BE COMPLETED AND IMMEDIATELY STABILIZED BEFORE ANY FOLLOWING STAGE IS INITIATED. CLEARING, GRUBBING AND TOPSOIL STRIPPING SHALL BE LIMITED ONLY TO THOSE AREAS DESCRIBED IN EACH STAGE.
2. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO ELIMINATE THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION.
3. DEWATERING SHALL BE PERFORMED AS THE CONTRACTOR DETERMINES NECESSARY TO PERFORM PROJECT SCOPE. ALL PUMPING OF SEDIMENT LADEN WATER SHALL BE THROUGH A SEDIMENT CONTROL BMP, SUCH AS PUMPED WATER FILTER BAG OR EQUIVALENT SEDIMENT REMOVAL FACILITY, OVER UNDISTURBED VEGETATED AREAS.
4. CONTACT NJ ONE CALL, SCHEDULE ON SITE MEETING ONE WEEK IN ADVANCE OF SITE DISTURBANCE ACTIVITIES WITH THE SOMERSET SOIL CONSERVATION DISTRICT, LAND OWNER, PROJECT ENGINEER, AND INSPECTOR PROVIDING OVERSIGHT OF CONSTRUCTION ACTIVITIES.
5. INSTALL TEMPORARY CONSTRUCTION ENTRANCE WITH ACCOMPANYING SILT FENCING.
6. INSTALL SILT FENCE AS SHOWN ON THE PLANS OR AS INDICATED BY THE ON SITE ENGINEER, AND AS NECESSARY.
7. REMOVE EXISTING CONCRETE LOW FLOW CHANNEL.
8. INSTALL SCOUR HOLE OUTLET PROTECTION.
9. MODIFY EXISTING OUTLET STRUCTURE AS PER DESIGN.
10. PREPARE SOIL PLANTING BED AS PER DESIGN, INCORPORATE LEAF COMPOST USING DEEP TILL TECHNIQUE.
11. PLANT PLUGS AND SPREAD SEED ACCORDING TO THE PLANTING PLAN.
12. IMMEDIATELY SEED AND MULCH ALL DISTURBED AREAS ONCE FINAL GRADE IS ACHIEVED.
13. COMPLETE SITE STABILIZATION AND REMOVE OF ALL TEMPORARY SOIL EROSION AND SEDIMENT CONTROL MEASURES.
14. DISPOSE OF ANY EXCESS FILL MATERIALS AND DEMOBILIZE.

ANTICIPATED PROJECT DURATION: 10 - 15 DAYS
Maintenance

• Franklin Township responsibility
• Frequent inspections
• Mowing once per year
• Removal of sediment and trash as needed
River Friendly Programs
Partnerships to improve water quality

• Golf Course
• Business
• Farm
• Resident
• Schools

Better management of existing land uses:
• Water Quality Management
• Water Conservation Techniques
• Wildlife and Habitat Enhancement
• Education & Outreach
Questions?

Native grass restoration area, NJWSA Administration Facility – Spruce Run Reservoir
New Jersey Water Supply Authority
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• Angela Mostwill
• Kyle Clonan
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Princeton Hydro (design engineers)
• Amy McNamara

SumCo Construction
• Construction contractor