

Attachment D-3 Structural BMPs to be Utilized to Reduce Existing Load

**Doylestown Township Pollutant Reduction Plan/TMDL Plan
Attachment D-2 - Structural BMPs to be Utilized to Reduce Existing Loading**

BMP ID	Description	Latitude / Longitude	Watershed	Installation Date	Drainage Area (Acres)	Hydrologic Soil Group	BMP Efficiency	TSS Load Reduction (Lbs)
20	Detention Basin	40.306304° / -75.147991°	Cooks Run	2004	23	D	60%	10,281
21	Detention Basin	40.312703° / -75.165132°	Pine Run	2005	46	D	60%	12,420
24	Detention Basin	40.301440° / -75.141761°	Neshaminy	2008	50	B	60%	13,860
26	Detention basin	40.292544° / -75.151223°	Neshaminy	2008	9	C	60%	2,495
29	Detention Basin	40.285579° / -75.137111°	Neshaminy	2010	32	B	60%	8,870
30	Detention Basin	40.298256° / -75.085774°	Neshaminy	2012	8	C	60%	2,218
32	Rain Garden	40.318402° / -75.138994°	Cooks Run	2012	14	B	80%	8,344
34	Detention Basin	40.288739° / -75.141304°	Cooks Run	2012	26	B	60%	11,622
35	Rain Garden	40.319405° / -75.154693°	Pine Run	2012	2	B	80%	720
36	Rain Garden	40.295540° / -75.110280°	Neshaminy	2013	2	B	80%	739
37	Rain Garden	40.279494° / -75.120528°	Neshaminy	2013	2	D	55%	508
39	Infiltration Bed	40.328737° / -75.131342°	Cooks Run	2013	16	D	55%	6,556
40	Detention Basin	40.298768° / -75.145133°	Neshaminy	2014	17	B	60%	4,712
44	Infiltration Bed	40.305817° / -75.098676°	Neshaminy	2014	2	B	85%	785
45	Infiltration Bed	40.302517° / -75.102577°	Neshaminy	2014	3	C	55%	762
46	Rain Garden	40.279694° / -75.120609°	Neshaminy	2014	2	D	55%	508
47	Infiltration Bed	40.339454° / -75.131631°	Neshaminy	2014	1	A	85%	393
48	Detention Basin	40.311528° / -75.166664°	Pine Run	2015	8	C	60%	2,160
49	Rain Garden	40.307070° / -75.169982°	Pine Run	7/9/2013	2	D	55%	495
50	Rain Garden	40.307021° / -75.145144°	Cooks Run	2009	10	D	55%	4,098
51	Detention Basin	40.294796° / -75.129625°	Neshaminy	2014	9	B	60%	2,495
52	Infiltration Bed	40.303527° / -75.103337°	Neshaminy	2015	4	C	55%	1,016
53	Infiltration Bed	40.301290° / -75.093384°	Neshaminy	2015	1	B	85%	393
54	Infiltration Bed	40.293228° / -75.096805°	Neshaminy	2015	1	B	85%	393
55	Rain Garden	40.330485° / -75.152865°	Pine Run	2015	2	D	55%	495
56	Rain Garden	40.330665° / -75.152437°	Pine Run	2015	2	D	55%	495
57	Infiltration Bed	40.310917° / -75.163020°	Pine Run	2014	3	C	55%	743
58	Infiltration Bed	40.285605° / -75.177521°	Pine Run	2014	1	B	85%	383
59	underground cistern	40.285624° / -75.109246°	Neshaminy	2015	0.1	D	100%	46
60	Infiltration Bed	40.280519° / -75.117435°	Neshaminy	2015	1	B	85%	393
62	rain garden	40.273411° / -75.152977°	Neshaminy	2016	2	D	55%	508
63	Rain Garden	40.331158° / -75.152458°	Pine Run	UNKNOWN	2	D	55%	495
64	Rain Garden	40.299870° / -75.112150°	Mills Creek	UNKNOWN	1	D	55%	183
65	Infiltration Bed	40.283440° / -75.136022°	Neshaminy	2010	9	B	85%	3,534

Attachment E-1

Photographs – Selected BMPs

APPENDIX E.1

PHOTOS

UNNAMED TRIBUTARY TO NESHAMINY CREEK



Photo 1 view of channel where land use changes from forest to residential and the east bank riparian zone is mowed.



Photo 2 View looking downstream of Trail bridge crossing. The riparian zone on the west bank is grass and the east bank is primarily . Stream bank erosion is noted along with mid channel bar formation



Photo 3 View looking upstream of Trail bridge crossing. Note vertical stream bank and erosion on the east bank and limited riparian vegetation.



Photo 4 View looking downstream at undercut stream banks, fine grain sediment deposition and dense, shallow rooted invasive vegetation in riparian zone.



Photo 5 View looking downstream showing vertical eroded stream banks and mid channel bar formation.



Photo 6 View looking downstream showing channel migration. The stream bank is vertical with exposed fine grained soil and excessive new gravel deposition on the inside of the meander. Lack of woody Riparian vegetation.



Photo 7 View looking downstream at undermined and leaning trees, fine grained sediment on channel bottom and excessive side gravel bar development.



Photo 8 view looking at eroded channel meander bend an no woody riparian vegetation.



Photo 9 View looking downstream at bank erosion and active channel migration.



Photo 10 View looking upstream at eroded stream banks, channel widening and mid channel gravel bar development



Photo 11 View looking upstream at large wood debris jam which provides grade control and enhances upstream floodplain connectivity. Restoration should incorporate more long term grade control to maintain upstream floodplain connectivity.



Photo 12 View looking downstream of log debris jam. The channel becomes more entrenched. Note vertical stream, eroded eastern stream and mid channel bar.



Photo 13 View looking downstream approximately 350 feet upstream of Turk Road. The channel is cut to bedrock with eroding stream banks and no floodplain access



Photo 14 View looking upstream from Turk Road. The channel has cut down to bedrock with eroding stream banks.

APPENDIX E.2

PHOTOS

PINE RUN



Photo 1- View looking north across Pine Run showing eroded stream bank and exposed tree roots.



Photo 2- view looking downstream showing near vertical and eroding stream banks.



Photo 3- View looking downstream showing bank erosion



Photo 4- View looking upstream showing steeply sloping, eroding stream bank on the left with a stable lower bank and floodplain on the right.



Photo 5 Proposed BMP-B: Ridings at Covered Bridge BMP Retrofits



Photo 6 Proposed BMP-B: Ridings at Covered Bridge BMP Retrofits



Photo 7 Proposed BMP-B: Ridings at Covered Bridge BMP Retrofits

APPENDIX E.3

PHOTOS

COOKS RUN



Photo 1 view looking downstream at vertical eroding stream banks and limited riparian vegetation



Photo 2 View looking upstream at eroding stream bank. The stream is slightly entrenched and could benefit from minor channel adjustments to provide better floodplain connection.



Photo 3 View looking upstream showing bank erosion and exposed tree roots. The riparian zone is currently mowed to the top of stream banks.



Photo 4 View looking downstream showing undermined trees and bank erosion.



Photo 5 View looking downstream at eroded stream banks. There appears to be some limited connection to floodplain along the reach.



Photo 6 View looking downstream where Cooks run flow just north and parallel to Limekiln Road for 180 feet. Stream bank erosion is present along the south side of the channel.



Photo 7 View looking downstream. The channel is entrenched with bank erosion along the left bank and a mowed riparian zone on the right bank.



Photo 8 View looking upstream from Limekiln Road bridge. The area on the left side could be excavated to create a better floodplain connection. Limited opportunity exists for riparian zone enhancement along the south side of the channel due to required ROW restrictions



Photo 9 Proposed BMP-D: Cottonwood Court BMP Retrofit



Photo 10 Proposed BMP-D: Cottonwood Court BMP Retrofit

APPENDIX E.4

PHOTOS

MILL CREEK



Photo 1 View looking downstream at eroded stream banks



Photo 2 View looking upstream showing eroded stream bank and undermined concrete splash apron



Photo 3 View looking downstream showing mid channel gravel bar development, channel widening and stream bank erosion



Photo 4 View looking upstream towards bridge showing channel widening, bank erosion and uprooted mature trees