

Pollutant Hot Spots - Priority Ranked Parcel Summary Report

Municipality: Manchester, NH

Date of Report: November, 2021

Purpose

The NH 2017 Small MS4 General Permit requires for permittees to create an inventory and priority ranking of permittee-owned properties that could be retrofitted with Best Management Practices (BMPs) to reduce stormwater discharges and address pollutant loading from catchments identified as having high loading for nitrogen and/or phosphorus. To aid in these efforts, the information presented in this report may be used to identify and prioritize measures to reduce pollutant loading to impaired waters from the permittee's MS4 area.

This information will assist in fulfilling the following permit requirements for Year 4:

1. MCM #5 Post Construction Stormwater Management
 - a. Inventory and priority ranking of permittee-owned property and existing infrastructure that could be retrofitted with BMPs designed to reduce frequency, volume and pollutant loads of stormwater discharges (page 48, section 2.3.6.e).
2. Appendix H - Requirements Related to Water Quality Limited Waters
 - a. Nitrogen Source Identification Report (Appendix H, page 3, section I.1.b).
 - b. Phosphorus Source Identification Report (Appendix H, page 6, section II.1.b).
3. Appendix F - Lake and Pond Phosphorus TMDLs
 - a. Information in this report may be used in the development of Lake Phosphorus Control Plans (LPCP), such as developing a priority ranking of areas and infrastructure for potential implementation of phosphorus control practices.

Methods

Geographic Information System (GIS) analysis of the municipality of Manchester, NH was performed in 2019 using publicly available GIS layers; the analysis yielded total suspended solids (TSS), total nitrogen (TN), and total phosphorus (TP) pollutant load "hot spot" data per parcel by utilizing layers for parcel boundaries, conservation areas, land use, and impervious cover (IC) coupled with the pollutant load export rates found in Table 2-1 of Appendix F of the NH MS4 permit*.

The results were sorted to identify non-conservation parcels owned by the municipality in descending order by acreage of impervious cover, which indicated the priority rank for BMP implementation on municipally owned properties. Parcels were ranked using impervious cover because it is a key metric representing the largest manageable load for pollutants commonly associated with stormwater. Because impervious cover is not evenly distributed on municipal parcels, the graph of cumulative percent of impervious cover for the resulting ranked parcels is non-linear with a typical "knee" which indicates

*<https://www.epa.gov/npdes-permits/new-hampshire-small-ms4-general-permit>

the point of decreasing IC area per additional parcel to be managed. The knee represents the optimal number of parcels to be treated by BMPs as they will treat the most impervious cover on the least number of parcels. This method also generally optimizes the resulting TSS, TN, and TP reductions, and costs for treatment as they are all linked to the IC area.

Results

Figure 1 shows the graph of cumulative percent of IC for the resulting ranked, municipal, non-conservation parcels. The knee of the curve is called out as the goal for treatment.

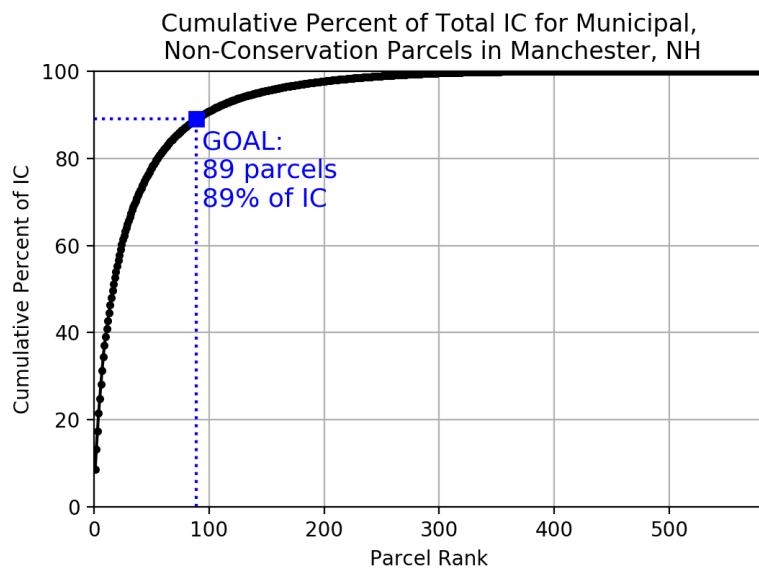


Figure 1: Cumulative percent of IC vs rank (priority) for municipal, non-conservation parcels.

Manchester's target for treatment is 89 parcels . Treating all the IC from these top 89 parcels accounts for 89% of all the municipally owned, non-conservation properties.

Pollutant reductions were estimated using the EPA performance curves for an infiltration basin BMP class** with a physical storage capacity of 0.4 inches and infiltration rate of 1.02 in./hr.. The curve yields 96% TSS reduction, 92% TN reduction, and 81% TP reduction. Table 1 is a summary table showing the IC, TSS reduction, TN reduction, TP reduction, and total estimated costs using the EPA costs outlined in UNH performance fact sheets** for the top 89 parcels and the percentage of the top parcels to the total municipal, non-conservation properties.

Table 1: Summary of priority municipal, non-conservation parcels. The total IC, TSS, TN, and TP reductions using the stated assumed treatment, and estimated cost of treatment are summarized for the priority parcels and their percentage of total municipal, non-conservation parcels.

	IC	TSS Red.	TN Red.	TP Red.	Cost
Top 89 Parcels Total	282 ac	196,211 lb/yr	4,297 lb/yr	456 lb/yr	\$12,995,000
Percent of Municipal, Non-Cons.	89%	83%	87%	87%	89%

**https://www.unh.edu/unhsc/sites/default/files/media/ms4_permit_nomographs_sheet_final_2020.pdf

Table 2 shows the priority list of the 89 municipal, non-conservation parcels with their NH GIS ID and street address.

*Table 2: Priority municipal, non-conservation parcels ranked by descending IC with NH GIS ID and street address.****

Treatment Priority	IC (ac)	NH GIS ID	Street Address
1	27.11	06134-876-1	1 Crusader Wy
2	14.82	06134-651A-18	300 Winston St
3	13.37	06134-777-13	315 Kimball St
4	12.76	06134-540-1	61 Trahan St
5	10.68	06134-465-1	W Mitchell St
6	10.52	06134-932-16	100 Gerald Connors Cir
7	9.88	06134-110-1	350 Valley St
8	9.77	06134-396-8	145 Parkside Av
9	8.55	06134-766-15M	943 Dunbarton Rd
10	6.28	06134-145-1	555 Elm St
11	5.91	06134-889-2	223 James A Pollock Dr
12	5.79	06134-789-13	Dunbarton Rd
13	5.62	06134-854-5	4034 S Willow St
14	5.58	06134-859-1	475 Valley St
15	5.41	06134-TPK4-16	121 Main St
16	5.12	06134-473-46	Page St
17	5.02	06134-909-7	1 Line Dr
18	4.49	06134-604-3	625 Mammoth Rd
19	4.19	06134-906-3A	Bridge St
20	4.18	06134-783-1B	1 Beatrice Lawrence Dr
21	4.16	06134-900-2	10 Arms St
22	3.92	06134-414-100	180 S Jewett St
23	3.87	06134-68A-2	Beech St
24	3.80	06134-587-13A	245 Bruce Rd
25	3.75	06134-297-34N	9 Notre Dame Av
26	2.87	06134-172-10	211 Tarrytown Rd
27	2.86	06134-41-3A	Orange St
28	2.83	06134-TPK4-15	199 Main St
29	2.66	06134-314-7A	Second St
30	2.62	06134-668-8A	7 Michigan Av
31	2.55	06134-906-3C	Bridge St
32	2.49	06134-68A-1	Maple St
33	2.45	06134-651A-1A	Winston St
34	2.24	06134-721-20	Garside Wy
35	2.21	06134-721-19	Garside Wy

36	2.16	06134-655-17	Harvell St
37	1.98	06134-4-11	25 Vine St
38	1.95	06134-525-28	Head St
39	1.89	06134-144-6	Valley St
40	1.89	06134-461-1	Queen City Av
41	1.85	06134-50-32	198 Hanover St
42	1.77	06134-770-39	2519 Elm St
43	1.77	06134-906-1	Tower Hill St
44	1.71	06134-168-15	755 Elm St
45	1.64	06134-68A-3	Union St
46	1.56	06134-177-12	55 Amory St
47	1.55	06134-439-3	Hancock St
48	1.53	06134-144-1	Chestnut St
49	1.52	06134-766-15K	141 Hackett Hill Rd
50	1.45	06134-766-15H	Hackett Hill Rd
51	1.44	06134-636-1	Bridge St
52	1.39	06134-95-14A	Summer St
53	1.38	06134-102-51A	259 Chestnut St
54	1.31	06134-541-1B	Chalet Wy
55	1.29	06134-349-3	407 Hayward St
56	1.27	06134-276-5B	Commercial St
57	1.26	06134-172-9	313 Tarrytown Rd
58	1.13	06134-160-8	1528 Elm St
59	1.10	06134-73-30	Pine St
60	1.09	06134-536-41	48 Lancaster Av
61	1.05	06134-710-8	Brown Av
62	1.03	06134-132-10	555 Cedar St
63	1.02	06134-68A-4	Pine St
64	1.00	06134-79-31A	275 Jewett St
65	0.99	06134-73-4	100 Merrimack St
66	0.99	06134-789-14	Dunbarton Rd
67	0.98	06134-109-1	485 Valley St
68	0.94	06134-900-9	307 Kidder St
69	0.91	06134-717-1B	280 E Industrial Park Dr
70	0.83	06134-541-5A	50 Chalet Wy
71	0.83	06134-721-12	2033 S Willow St
72	0.81	06134-56-5	Merrimack St
73	0.81	06134-465-1A	Mitchell St
74	0.81	06134-6-2	405 Pine St
75	0.78	06134-112-4	89 Pine St

76	0.74	06134-95-26A	Belmont St
77	0.73	06134-266-4	275 Clay St
78	0.68	06134-150-4	Elm St
79	0.68	06134-121-2	Lowell St
80	0.67	06134-318-3	Blucher St
81	0.66	06134-629-18	151 Douglas St
82	0.64	06134-99-19	Young St
83	0.62	06134-315-10	S Main St
84	0.62	06134-538-58	W Mitchell St
85	0.61	06134-150-7	119 Canal St
86	0.61	06134-54-8A	Lake Av
87	0.60	06134-6-1	Chestnut St
88	0.59	06134-108-1	275 Maple St
89	0.58	06134-114-23	Young St

***For the complete prioritized spreadsheet including loads, reductions, and estimated costs, see:
https://www4.des.state.nh.us/nh-ms4/?page_id=1798