MS4 Permit Review
Dover Utilities Committee

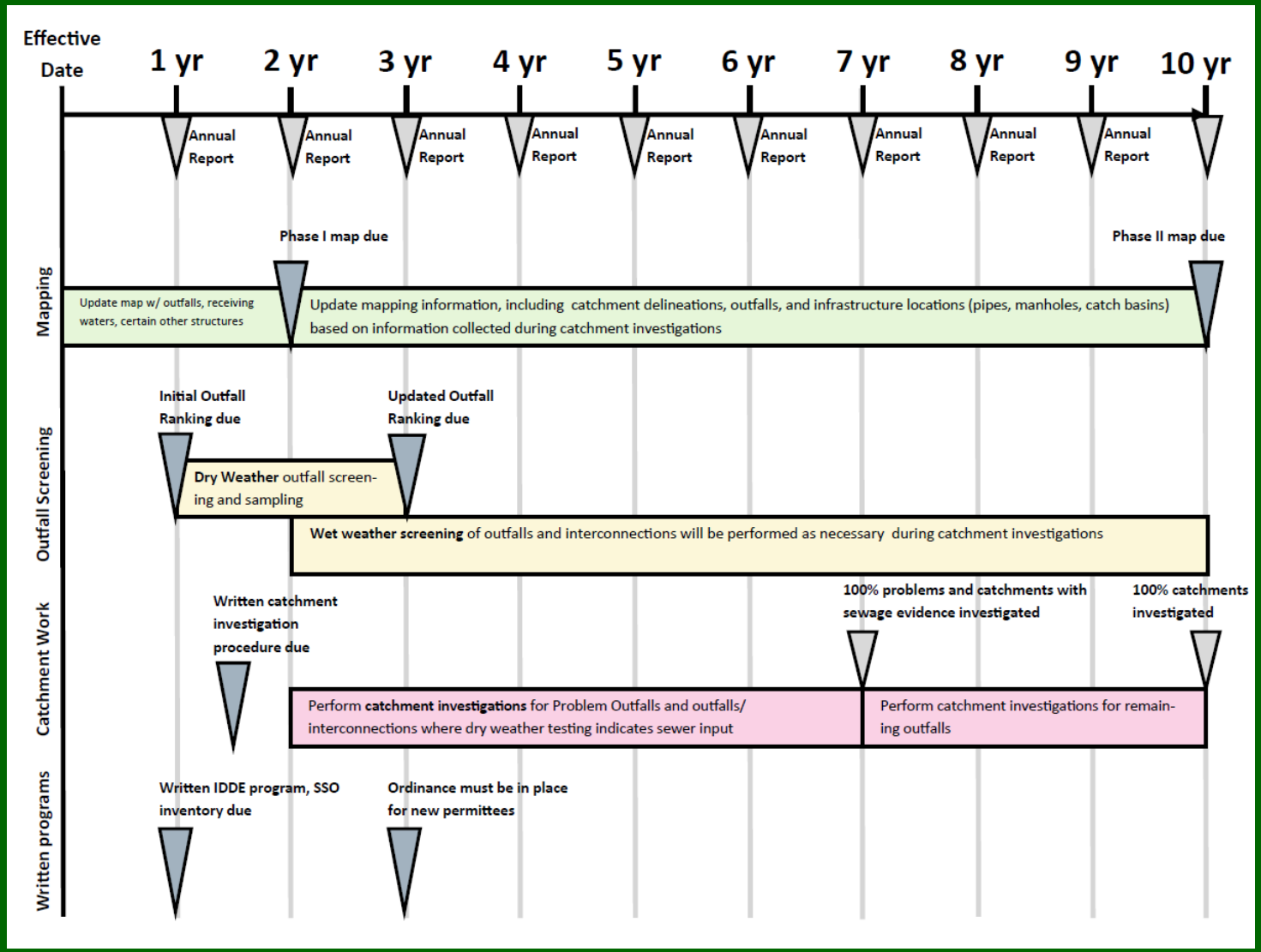
June 20, 2022

Presentation By: Gretchen Young, PE
Environmental Projects Manager

Municipal Separate Storm Sewer Systems (MS4) Permit

- U.S. EPA National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharge for Small Municipal Storm Sewer Systems (MS4) in compliance with the Clean Water Act (CWA) as amended
- Dover has been a permittee since 2003
- Permit was amended in 2017 with implementation starting in 2018 and 2019

Timeline


Effective Date
1 yr
2 yr
3 yr
4 yr
5 yr
6 yr
7 yr
8 yr
9 yr
10 yr
Annual Report
Phase I map due
Phase II map due
Mapping
Update map w/ outfalls, receiving waters, certain other structures
Update mapping information, including catchment delineations, outfalls, and infrastructure locations (pipes, manholes, catch basins) based on information collected during catchment investigations
Initial Outfall Ranking due
Updated Outfall Ranking due
Outfall Screening
Dry Weather outfall screening and sampling
Wet weather screening of outfalls and interconnections will be performed as necessary during catchment investigations
Written catchment investigation procedure due
100% problems and catchments with sewage evidence investigated
100% catchments investigated
Catchment Work
Perform catchment investigations for Problem Outfalls and outfalls/ interconnections where dry weather testing indicates sewer input
Perform catchment investigations for remaining outfalls
Written IDDE program, SSO inventory due
Ordinance must be in place for new permittees
Written programs

City of Dover

- Approx. 33,000 people and quickly growing.
- 29 square miles
- Served by a single WWTF
- Bordered to the south by the Great Bay and brackish rivers
- Freshwater rivers, streams, brooks and wetlands throughout

Municipal Separate Storm Sewer Systems (MS4) Permit

65 miles of drainage pipe
101 miles of open drainage
450 outfalls/discharge locations
140 culverts
100 manholes
3200 catch basins
100 Best Management Practices

Stormwater Management Program

Stormwater Management Program (SWMP)

City of Dover, NH

Permit Year 3

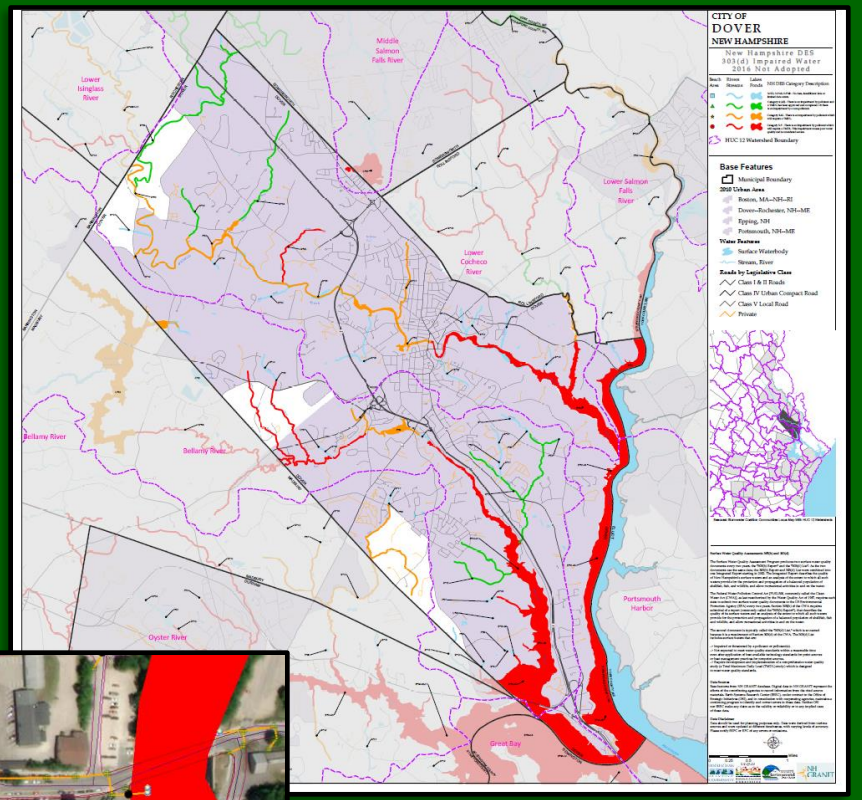
EPA NPDES Permit Number NHR041000

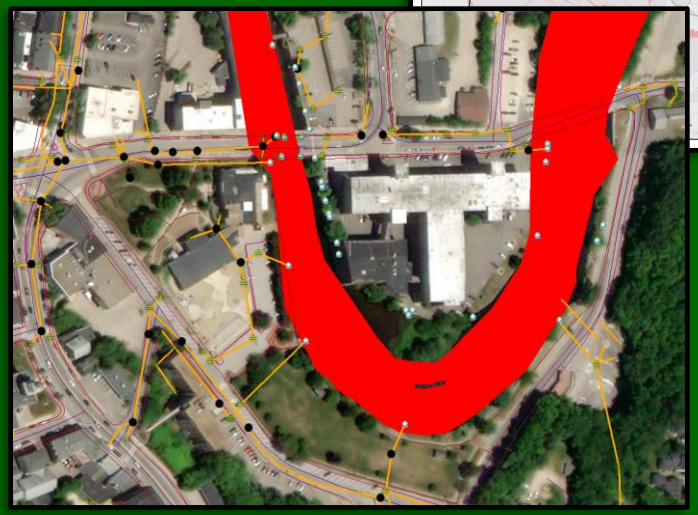
- Outreach and Education
- Public Involvement
- Illicit Discharge Detection and Elimination (IDDE)
- Construction Site Runoff
- Post Construction Management
- Good Housekeeping

Impaired Waterbodies (303d list)

Pollutants of Concern:

- Bacteria/Pathogens
- Solids, Oils and Grease
- Metals
- Chloride (salt)
- Nitrogen





Water Quality Impacts

Pollutant	Sources	Impacts
Nutrients (nitrogen, phosphorus)	Fertilizer, wastewater effluent, pet waste	Algal blooms, reduced dissolved oxygen levels
Sediments	Soil erosion, road sand	Carry contaminants, reduce water clarity, impact aquatic habitat
Pathogens (viruses, bacteria, etc.)	Agricultural and pet waste, wastewater effluent, septic systems	Impacts drinking water, fish and shellfish consumption, recreation

Water Quality Impacts

Pollutant	Sources	Impacts
Toxics (heavy metals, volatile organics, etc.)	Petroleum products, paints, herbicides, solvents, etc.	Poisonous to living organisms, persist in the environment
Chloride (salts)	De-icing salts, water softeners	Impact plants and animals in freshwater systems
Temperature	Runoff from warm surfaces such as parking lots	Reduced dissolved oxygen affects fish and other organisms

MCM 1 – Outreach & Education

Community Conversations Event

Help keep it clean this spring by following these water quality tips

Another spring is fast-approaching and we still find ourselves spending significant time at home during a pandemic. Fortunately, warmer weather will bring renewed opportunities to enjoy our outdoor spaces. Are you thinking about your lawn care or garden plans? Whether you are looking to get outside or engage your children in a project, this season is a great time to develop some new habits that will improve your green thumb, help protect the environment, and save money.

Whatever we do in our yards affects lakes, rivers, streams and bays downhill. By adopting a few simple practices, we can protect the health of water bodies we love while taking care of ourselves and the people around us by sheltering at home. These tips will help grow healthy lawns and protect water quality while we are spending more time at home.

1 **Choose the right grass seed.** The best seed mixes include low maintenance varieties with higher % of fine-leaf fescues and turf- or compact-type tall fescues, and lower % of Kentucky bluegrass and perennial rye grass.

2 **Mow smart.** Leave grass at least 3" high. Cut no more than one-third (⅓) of the blade each time you mow to encourage longer, stronger roots. Leave the grass clippings after mowing so they can return nutrients to the soil.

3 **Don't overwater.** 1" of water per week (from rain or irrigation) is usually enough. Overwatering can cause nutrients to move out of root zones and into waterbodies or groundwater.

4 **Have your soil tested** to learn more about specific characteristics and needs of your lawn. Contact UNH Cooperative Extension: extension.unh.edu/programs/soil-testing-services

***Only* if your lawn requires added nutrients from fertilizer:**

5 **Avoid overapplying.** Measure the area where you plan to apply and calculate the square footage. For lawns 10+ years old, apply half (½) the amount recommended for your square area one time per season. New lawns may need another application. Don't apply more than four times per season.

6 **Choose the right fertilizer.** Select fertilizers with zero or low phosphrous unless a soil test says otherwise. Slow release nitrogen fertilizer is generally preferable. Over-applying fertilizer (any type) can cause water quality problems.

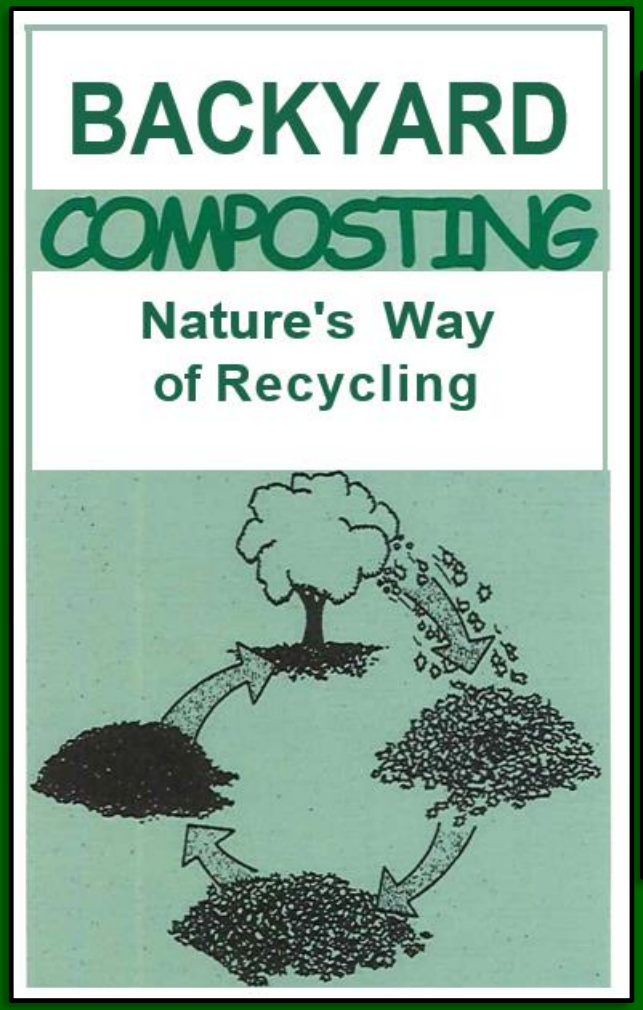
7 **Know when and where to apply.** Apply only after spring "green up" and before mid-September. Avoid applying in mid-summer. Never apply near waterbodies or storm drains.

MCM 1 – Outreach & Education

Pet Waste Mailer

Working on a pet waste bag dispenser

MCM 1 – Outreach & Education



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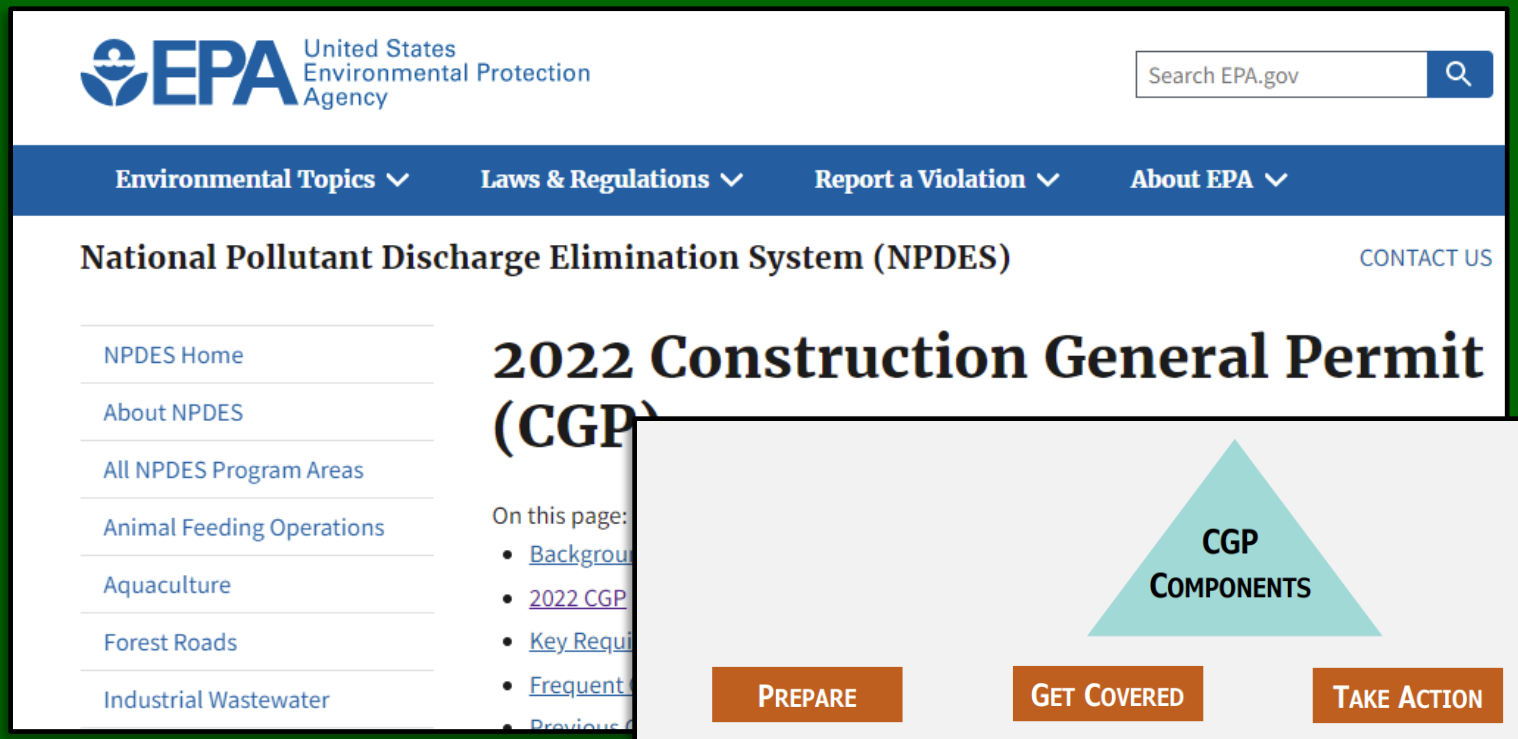

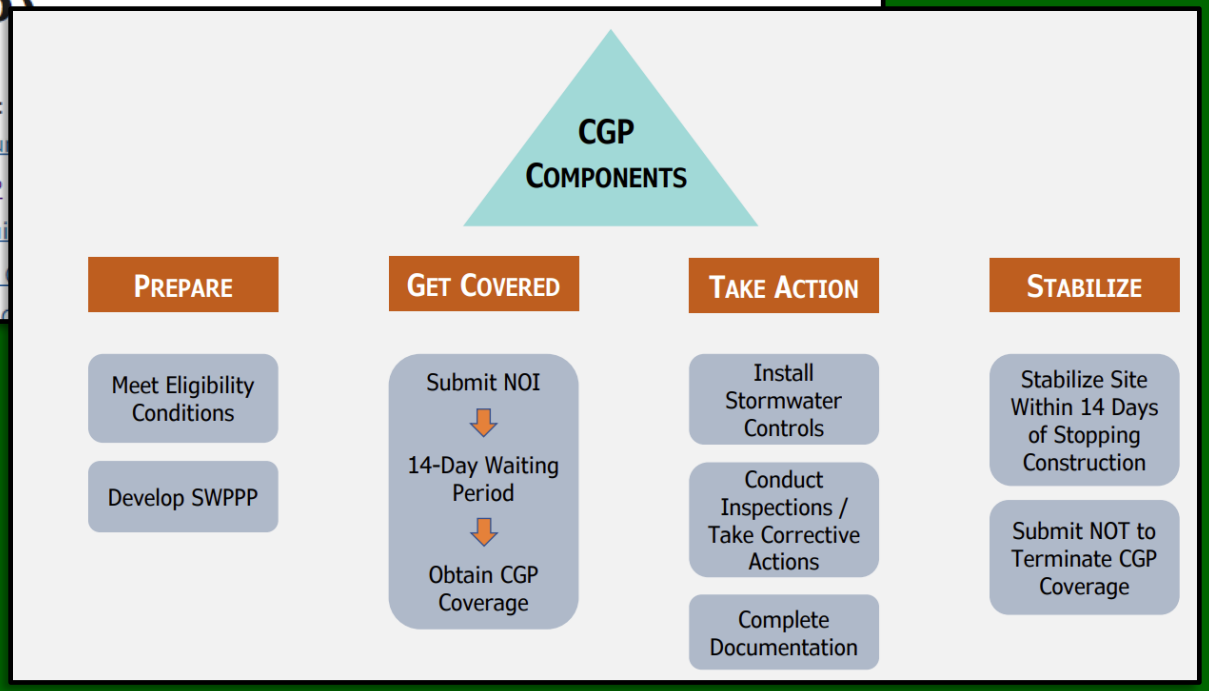

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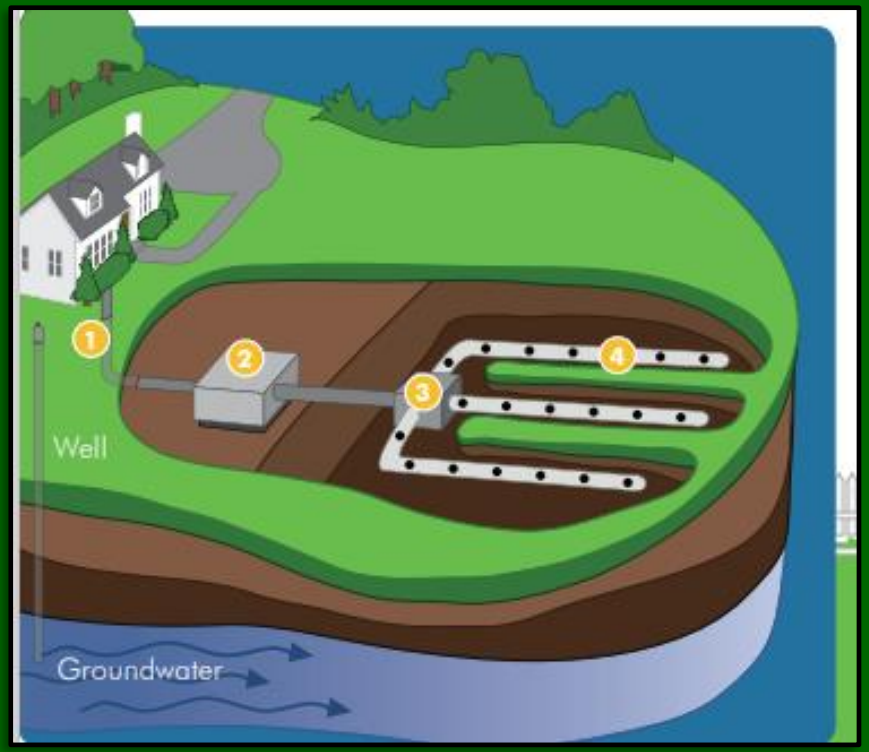
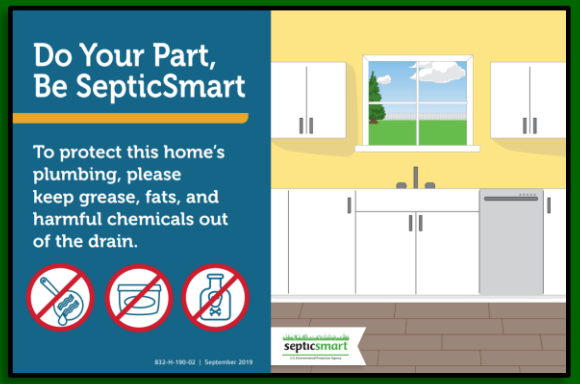
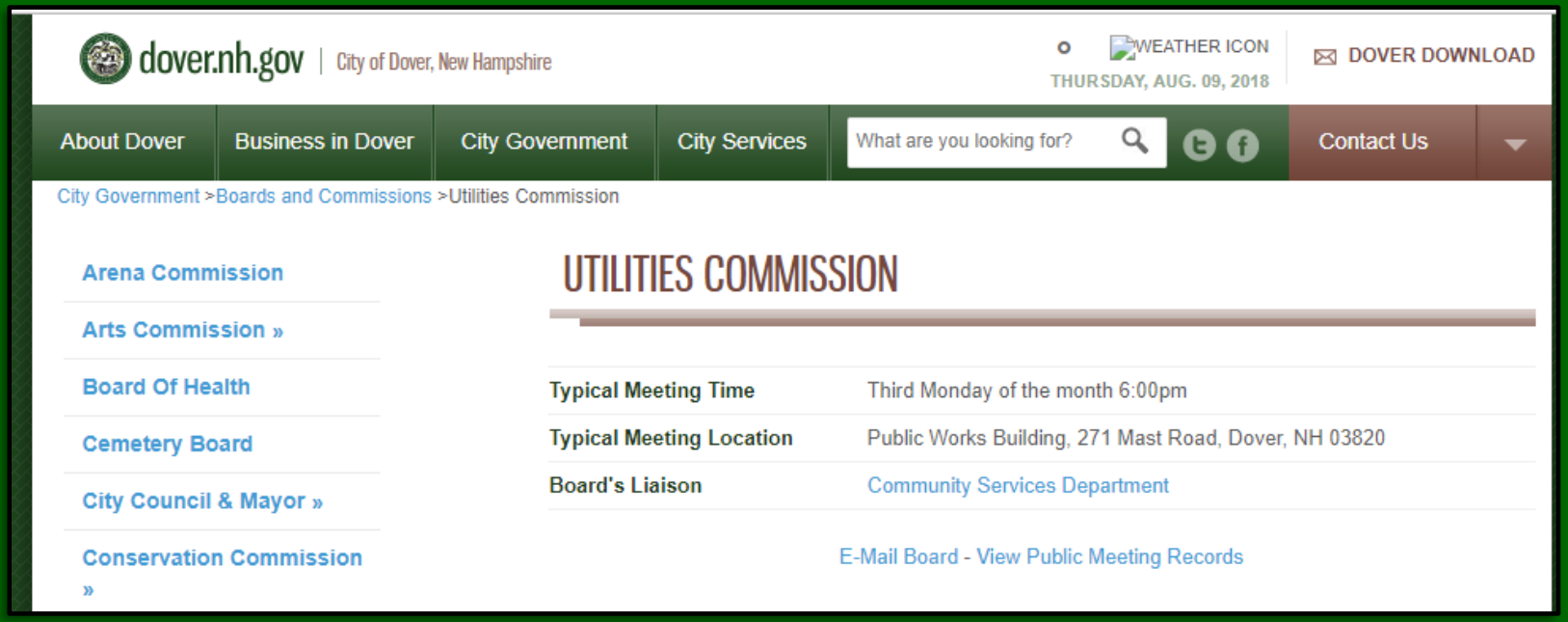




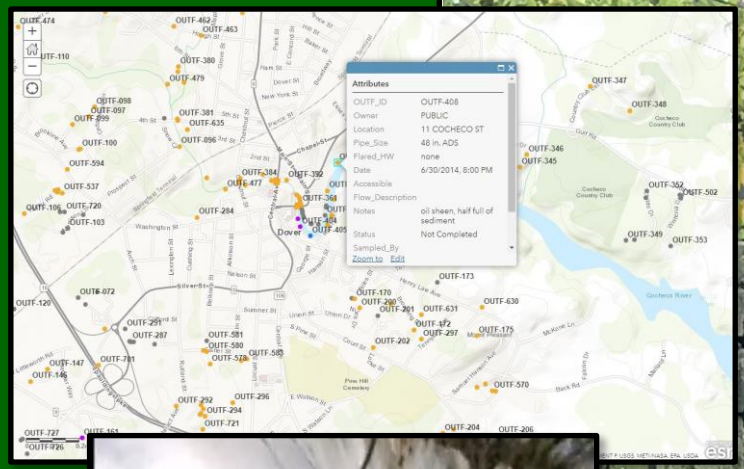
National Septic Smart Week a good time to check septic systems

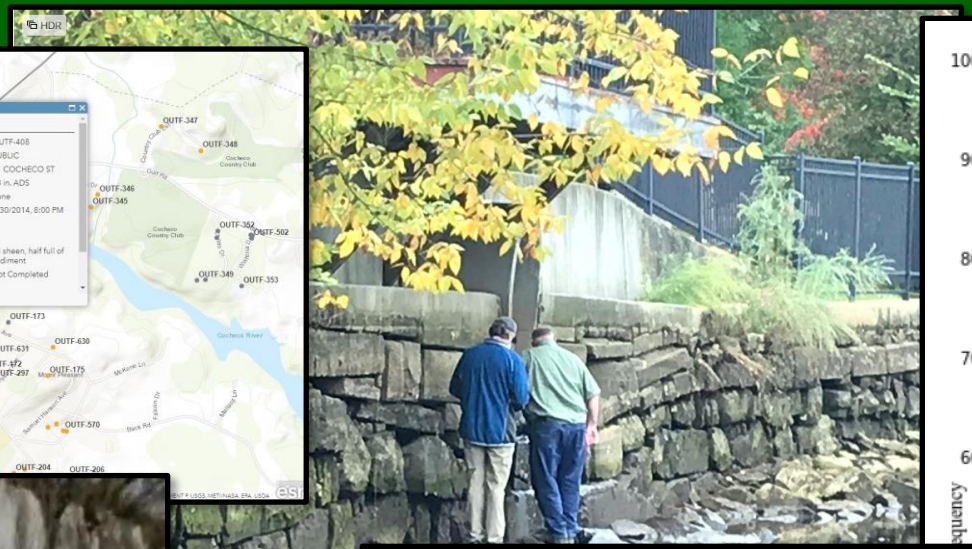
Even though most Dover residents are connected to the sanitary sewer line, there are still thousands of Dover residents who rely on a septic system to handle wastewater. This week is National Septic Smart Week to encourage septic tank users to follow best practices to avoid costly bills and polluting the environment.

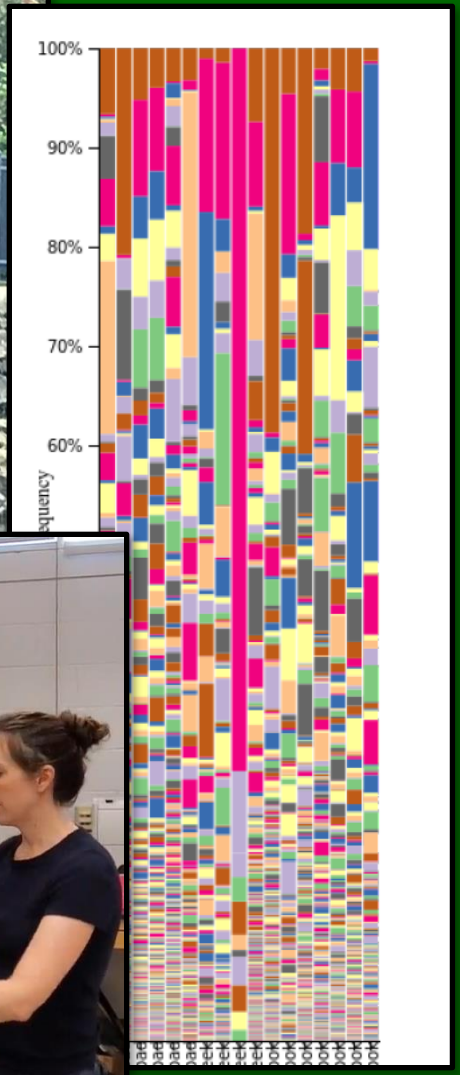
MCM 2 – Public Involvement & Participation



MCM 3 - Illicit Discharge Detection and Elimination (IDDE)







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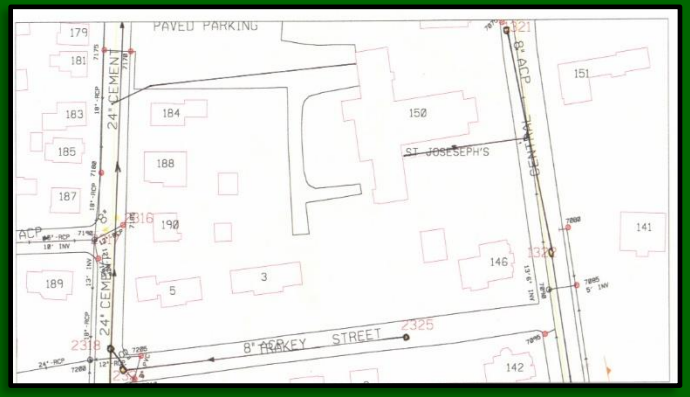
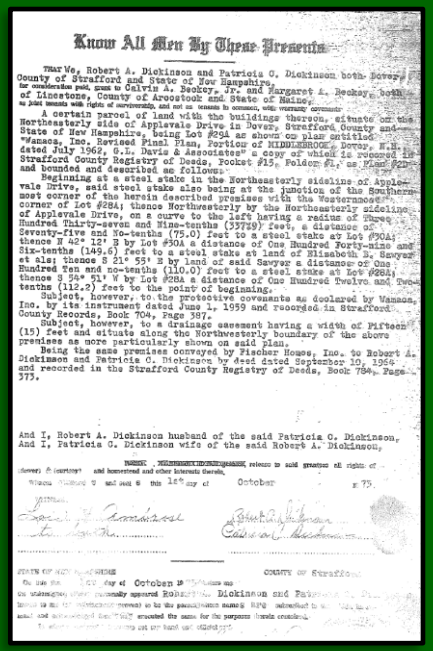




Know All Men By These Presents

THAT We, Robert A. Dickinson and Patricia C. Dickinson both Dover, County of Strafford and State of New Hampshire, for consideration paid, grant to Calvin A. Beckey, Jr. and Margaret A. Beckey, both of Limestone, County of Aroostook and State of Maine,

A certain parcel of land with the buildings thereon, situate on the Northeasterly side of Applevale Drive in Dover, Strafford County and State of New Hampshire, being Lot #28A as shown on plan entitled "Wamaca, Inc. Revised Final Plan, Portion of MIDDLEBROOK, Dover, N.H." dated July 1967, G.L. Davis & Associates" a copy of which is recorded in Strafford County Registry of Deeds, Pocket #15, Folder #1, as Plan #20 and bounded and described as follows:

Beginning at a steel stake in the Northeasterly sideline of Applevale Drive, said steel stake also being at the junction of the Southernmost corner of the herein described premises with the Westernmost corner of Lot #28A; thence Northwesterly by the Northeasterly sideline of Applevale Drive, on a curve to the left having a radius of Three Hundred Thirty-seven and Nine-tenths (337.9) feet, a distance of Seventy-five and No-tenths (75.0) feet to a steel stake at Lot #30A; thence N 42° 12' E by Lot #30A a distance of One Hundred Forty-nine and Six-tenths (149.6) feet to a steel stake at land of Elizabeth B. Sawyer et als; thence S 21° 55' E by land of said Sawyer a distance of One Hundred Ten and no-tenths (110.0) feet to a steel stake at Lot #28A; thence S 52° 51' W by Lot #28A a distance of One Hundred Twelve and Two-tenths (112.2) feet to the point of beginning.

Subject, however, to the protective covenants as declared by Wamaca, Inc. by its instrument dated June 1, 1959 and recorded in Strafford County Records, Book 704, Page 387.

Subject, however, to a drainage easement having a width of Fifteen (15) feet and situate along the Northwesterly boundary of the above premises as more particularly shown on said plan.

Being the same premises conveyed by Fischer Homes, Inc. to Robert A. Dickinson and Patricia C. Dickinson by deed dated September 10, 1964 and recorded in the Strafford County Registry of Deeds, Book 784, Page 373.

And I, Robert A. Dickinson husband of the said Patricia C. Dickinson, And I, Patricia C. Dickinson wife of the said Robert A. Dickinson,

[illegible] release to said grantee all right of dower & courtesy and homestead and other interests therein,

Witness [illegible] and seal this 16th day of October A.D. 19 75.

[illegible]

STATE OF NEW HAMPSHIRE COUNTY OF Strafford

On this the 16th day of October 19 [illegible] before me personally appeared Robert A. Dickinson and Patricia [illegible] known to me (or satisfactorily proven) to be the persons whose name[illegible] subscribed to the within instrument and acknowledged that [illegible] executed the same for the purposes therein contained.

MCM 3 - Illicit Discharge Detection and Elimination (IDDE)

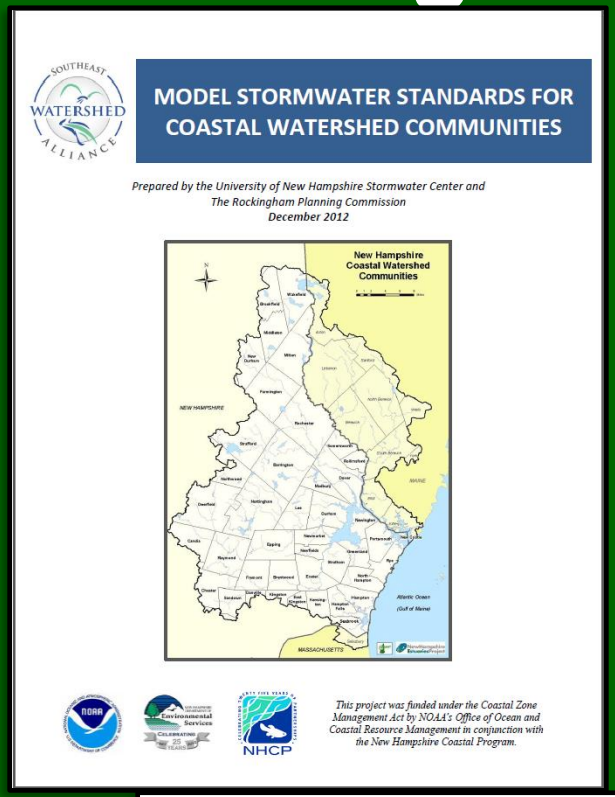
MCM 4- Construction Runoff

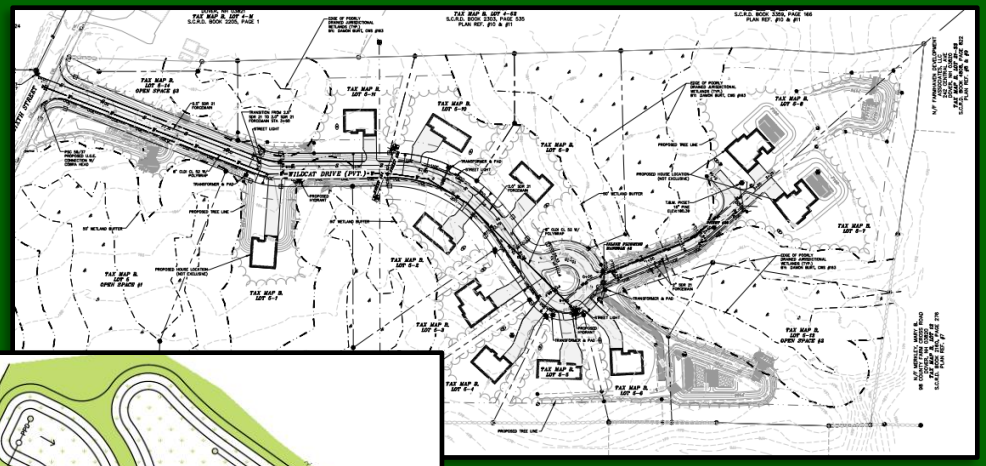
City of Dover
Community Services
Engineering Division

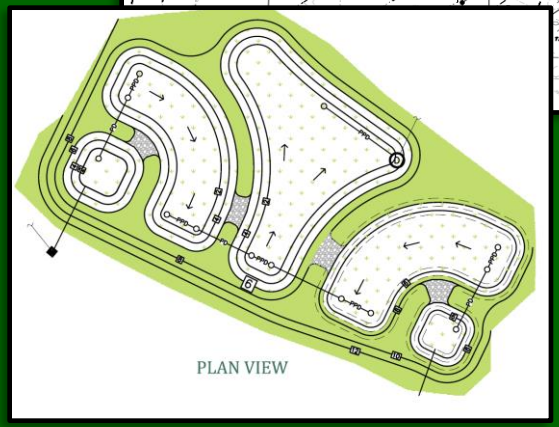
Pre-Construction Check List

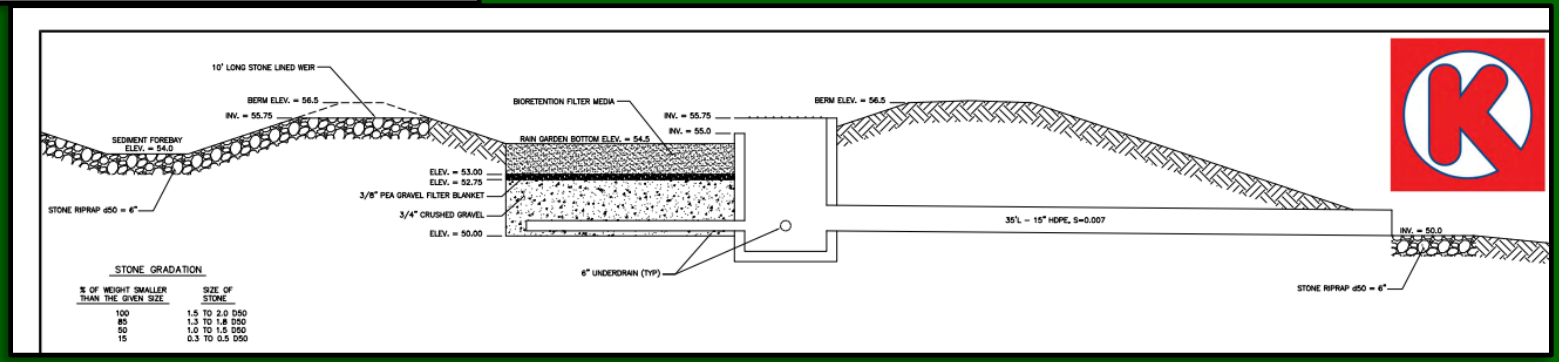
1) _____Stamped Plans-Required on Site at all Times
2) _____Construction Entrance/Roadway must be kept Swept
3) _____Erosion Control-Must Be Maintained at all times
4) _____NOI applied For
5) _____S.W.P.P.P inspections must be done by a CPESC/PE
6) _____Wetlands Clearly Marked-and 50' Buffers
7) _____Wetland Permit Displayed
8) _____Construction Sequence- (Must be Follow
9) _____Water-All Fittings to be North American
10) -----Water Service Shut offs must not be in pa

MCM 5 - Post Construction Management









MCM 5 - Post Construction Management

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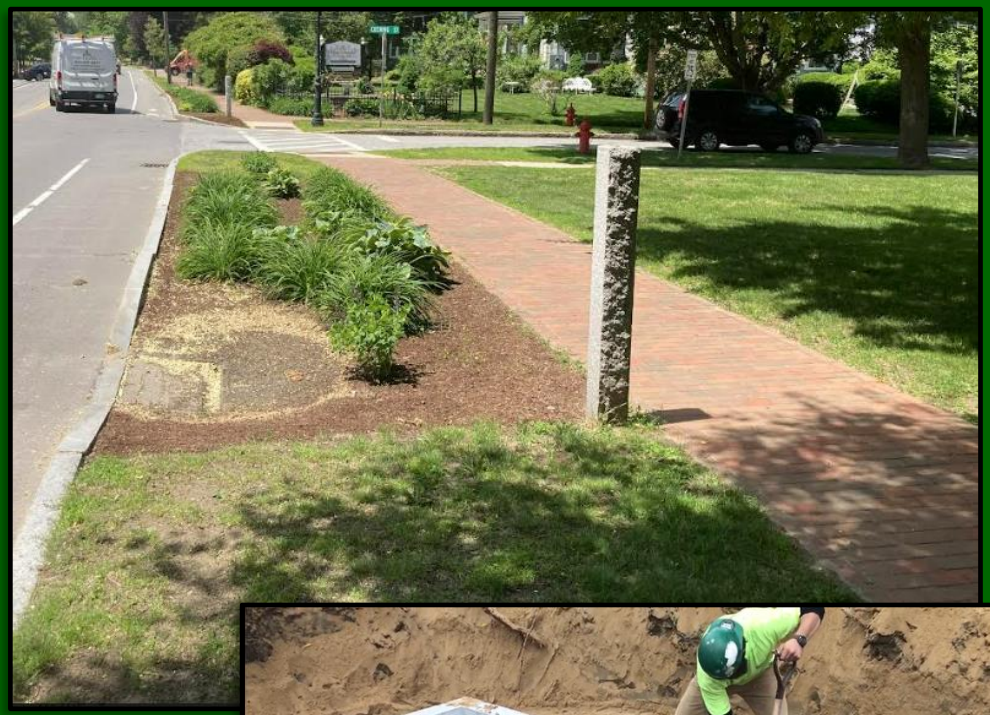
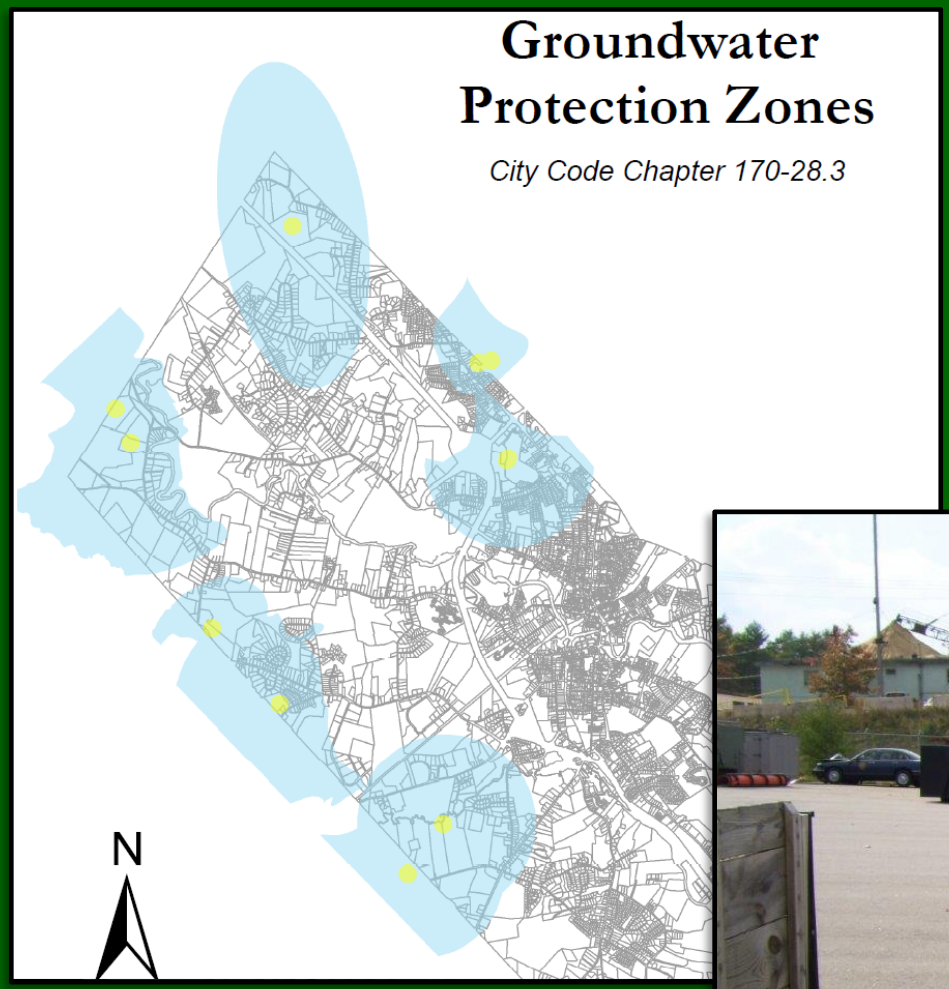


MCM 5 - Post Construction Management

MCM 6 – Pollution Prevention & Good Housekeeping

MCM 6 – Salt Reduction Plan

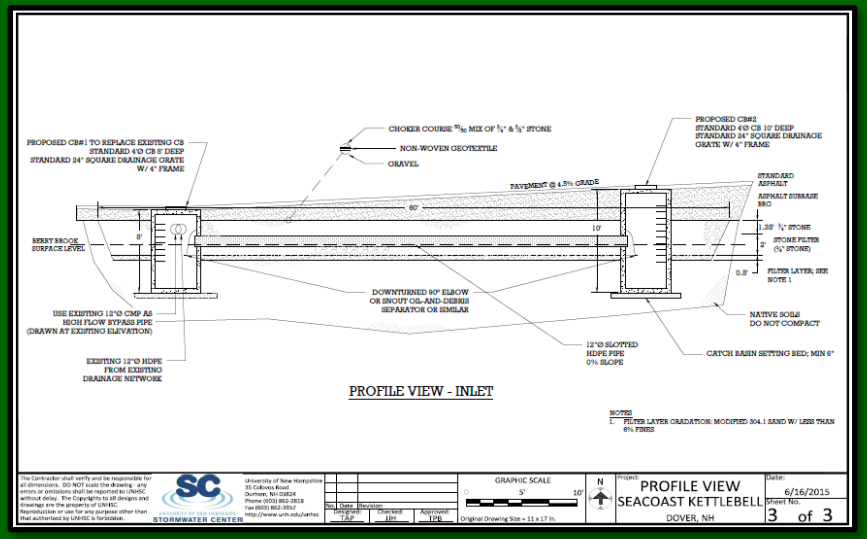


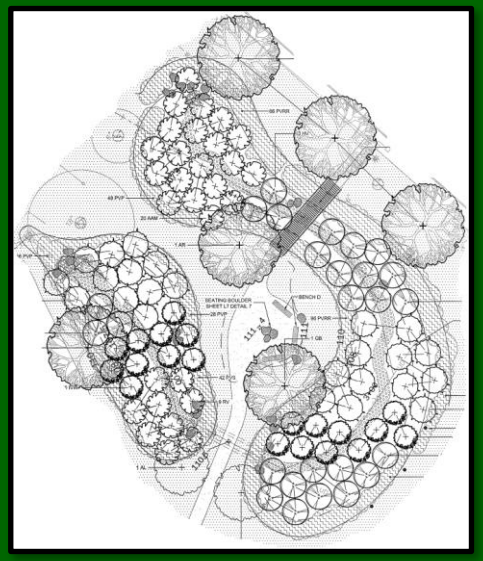
MCM 6 – Good Housekeeping

Approximately 25% of pipe segments in the urban core have a “likelihood of failure” rating greater than 3 out of 5

MCM 6 – Good Housekeeping

City owns many different BMP's… All need ongoing maintenance





MCM 6 – Good Housekeeping

3 years of growth

Vegetation removed

Property Owner Responsibility

WQL – Nitrogen Source Identification Report

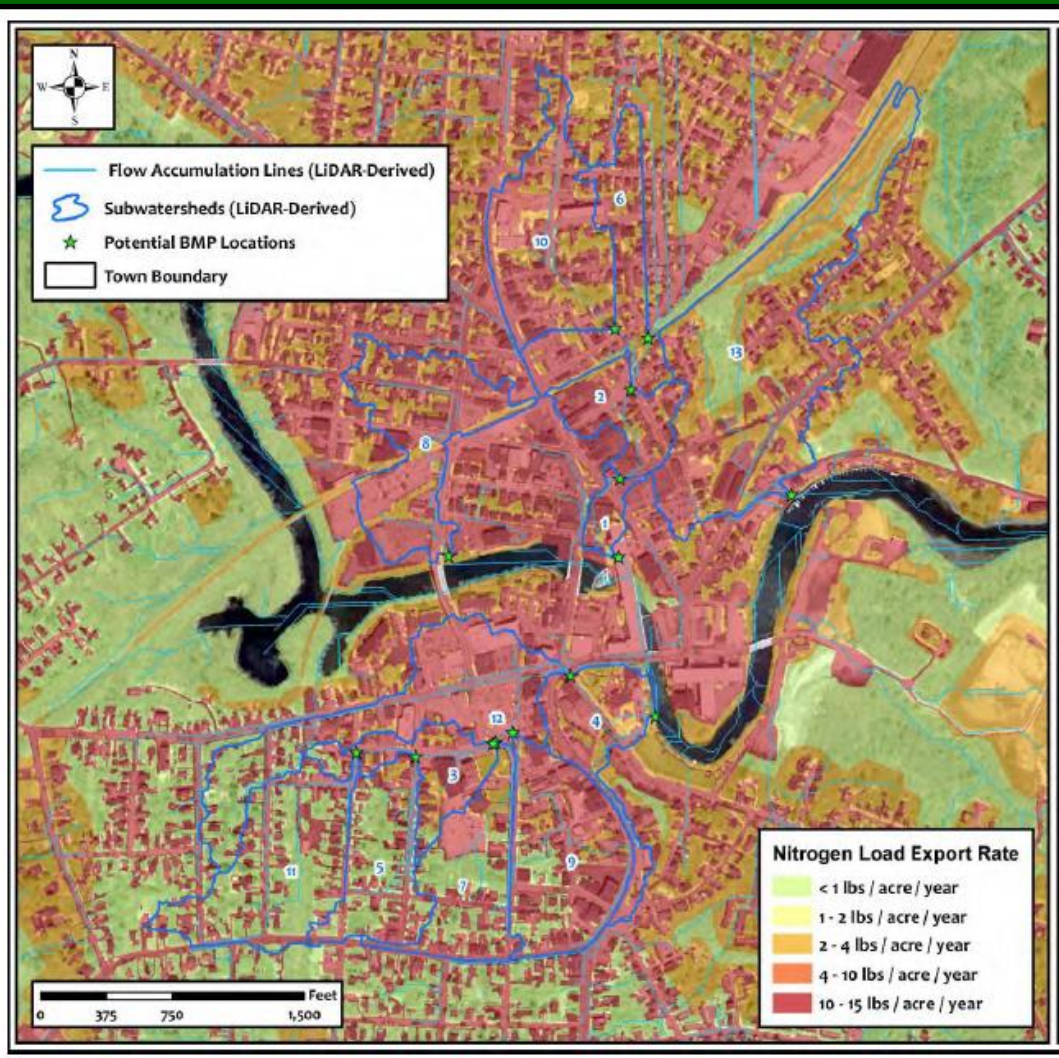


Table 2 shows the priority list of the 22 municipal, non-conservation parcels with their NH GIS ID and street address.

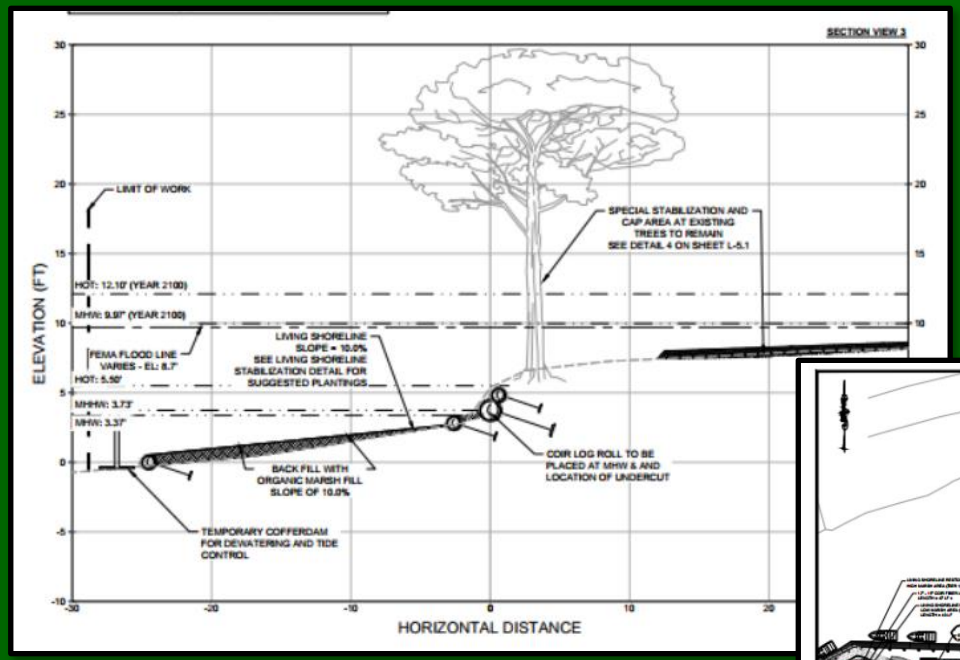
*Table 2: Priority municipal, non-conservation parcels ranked by descending IC with NH GIS ID and street address.****

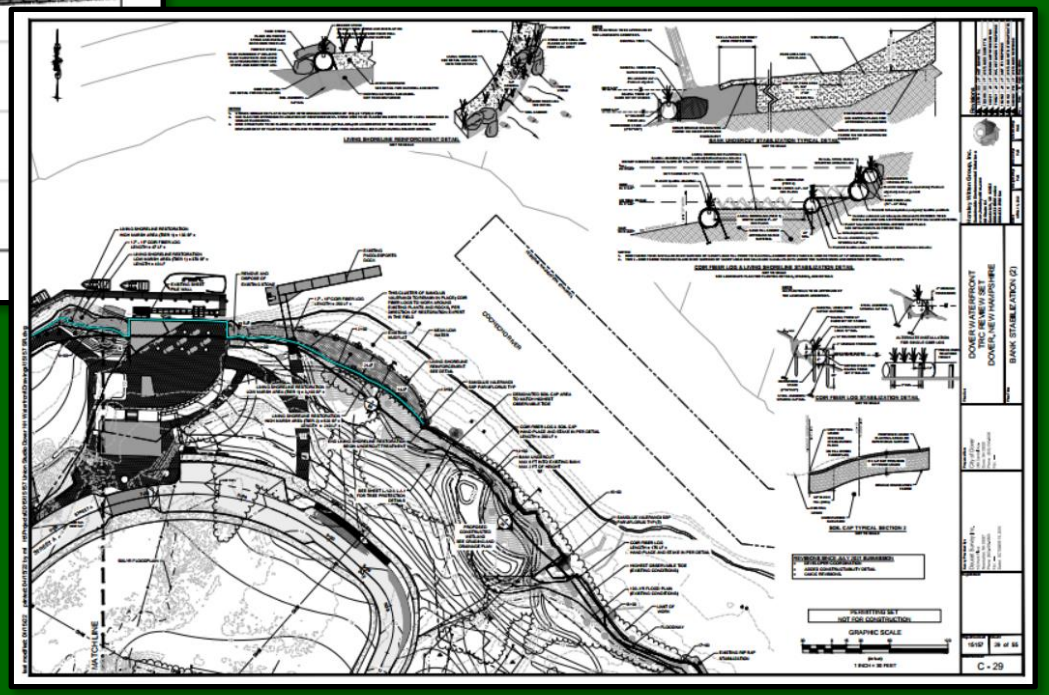
Treatment Priority	IC (ac)	NH GIS ID	Street Address
1	14.08	09058-H0012-000000	25 Alumni Dr
2	6.92	09058-H0011-001000	16 Daley Dr
3	6.10	09058-26002-000000	100 Portland Av
4	5.75	09058-13004-000000	Woodman Park Dr
5	5.69	09058-22001-000000	31 River St
6	4.43	09058-36030-000000	78 Horne St
7	3.67	09058-09057-000000	61 Locust St
8	3.44	09058-19052-001000	131 Central Av
9	3.37	09058-I0002-G00000	50 Garrison Rd
10	2.78	09058-18001-000000	East Watson St
11	2.59	09058-20096-000000	31 Union St
12	2.43	09058-23015-000000	6 Washington St
13	1.29	09058-I0002-G00001	Garrison Rd
14	1.28	09058-02083-000000	46 Chestnut St
15	1.19	09058-37040-000000	11 Lowell Av
16	1.11	09058-22042-000000	Towne Dr
17	1.02	09058-01042-000000	3 Green St
18	1.00	09058-02083-001000	Orchard St
19	0.96	09058-E0024-001000	262 Sixth St
20	0.93	09058-23016-000000	279 Central Av
21	0.87	09058-28032-000000	10 Abbey Sawyer Memorial Dr
22	0.86	09058-D0010-A00000	32 Long Hill Rd

Notes:
1) Subwatershed delineation is conducted at BMP scale to demonstrate a possible implementation plan. The area of analysis is a subset of higher target load areas and does not include the entire municipal area which may require stormwater management to meet nitrogen load reduction targets.
2) Subwatersheds are LiDAR-derived and do not account for sewersheds, which might significantly impact drainage areas.
3) 'Potential BMP Locations' are based on LiDAR-derived stormwater runoff accumulation paths and do not consider any site-specific feasibility assessments.
4) Detailed, site-specific analysis will be required to refine subwatershed boundaries and determine an optimal, feasible BMP implementation strategy.

Data Sources:
-USGS NRCS Maine Lidar, 2013
-LiDAR for the North East, 2011
-NH Granit, Land Use 2015 for Southeastern New Hampshire
-USGS, National Land Cover Database, 2016
-NRCS, Web Soil Survey, 2019
-NH Granit, Impervious Surfaces in the Coastal Watershed of NH and Maine, 2015
-Basemap: Google Earth Imagery, 2019

WQL – Nitrogen Source Identification Report





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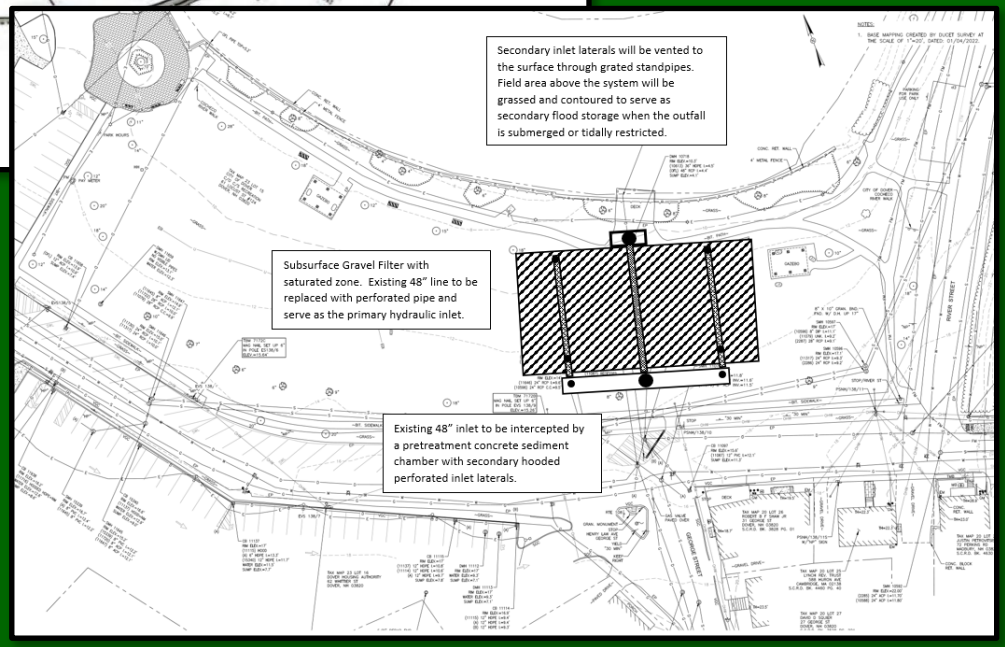
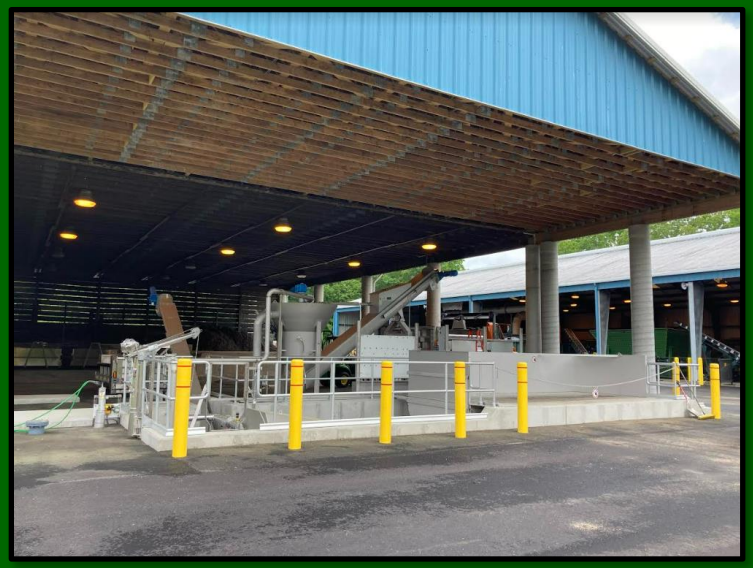


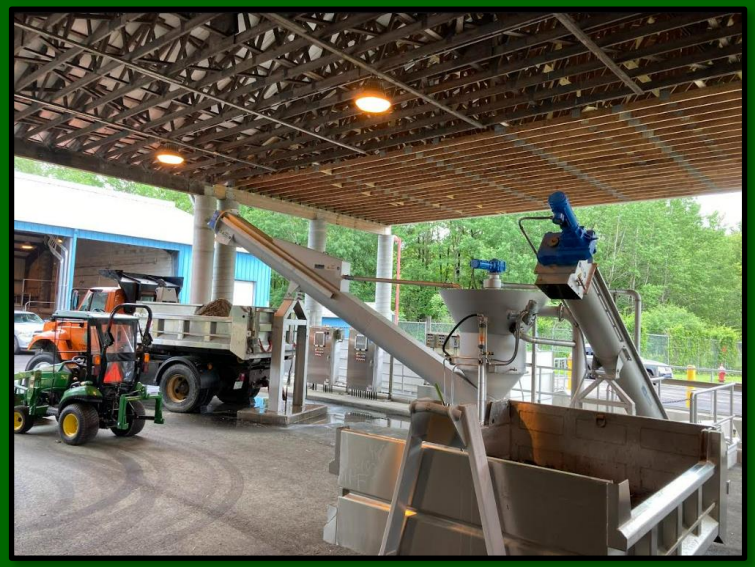
WQL – Nitrogen Source Identification Report

Dover plans first-in-NH environmental project

Jeff McMenemy Fosters Daily Democrat

Published 4:53 p.m. ET Oct. 20, 2020





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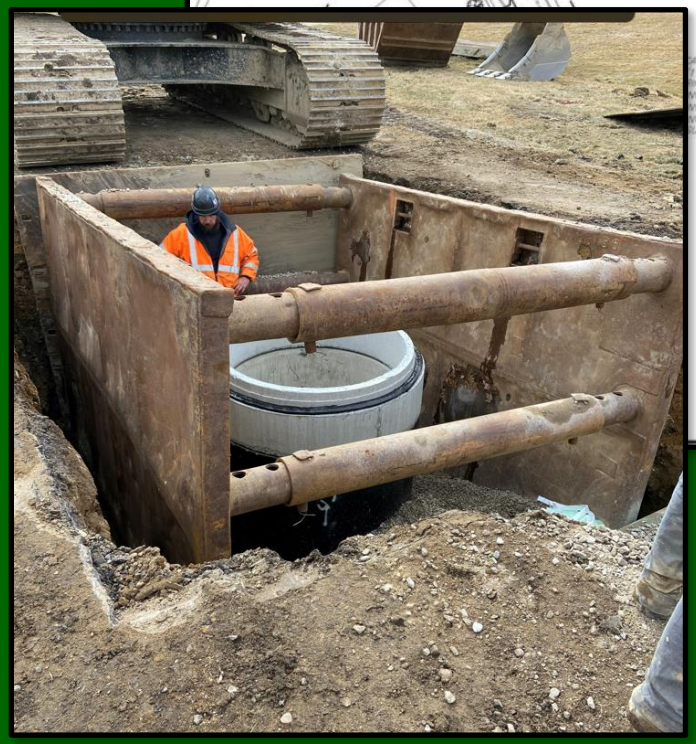
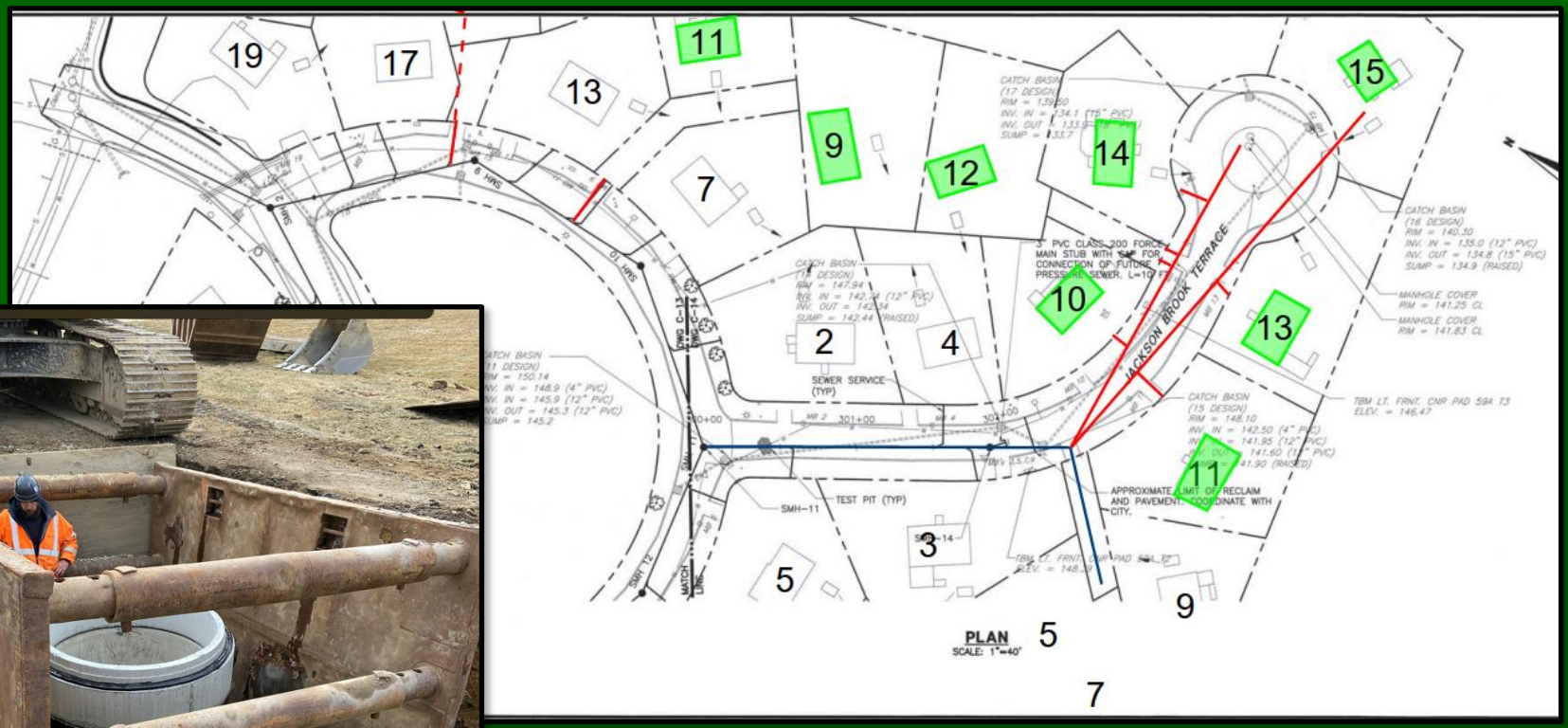
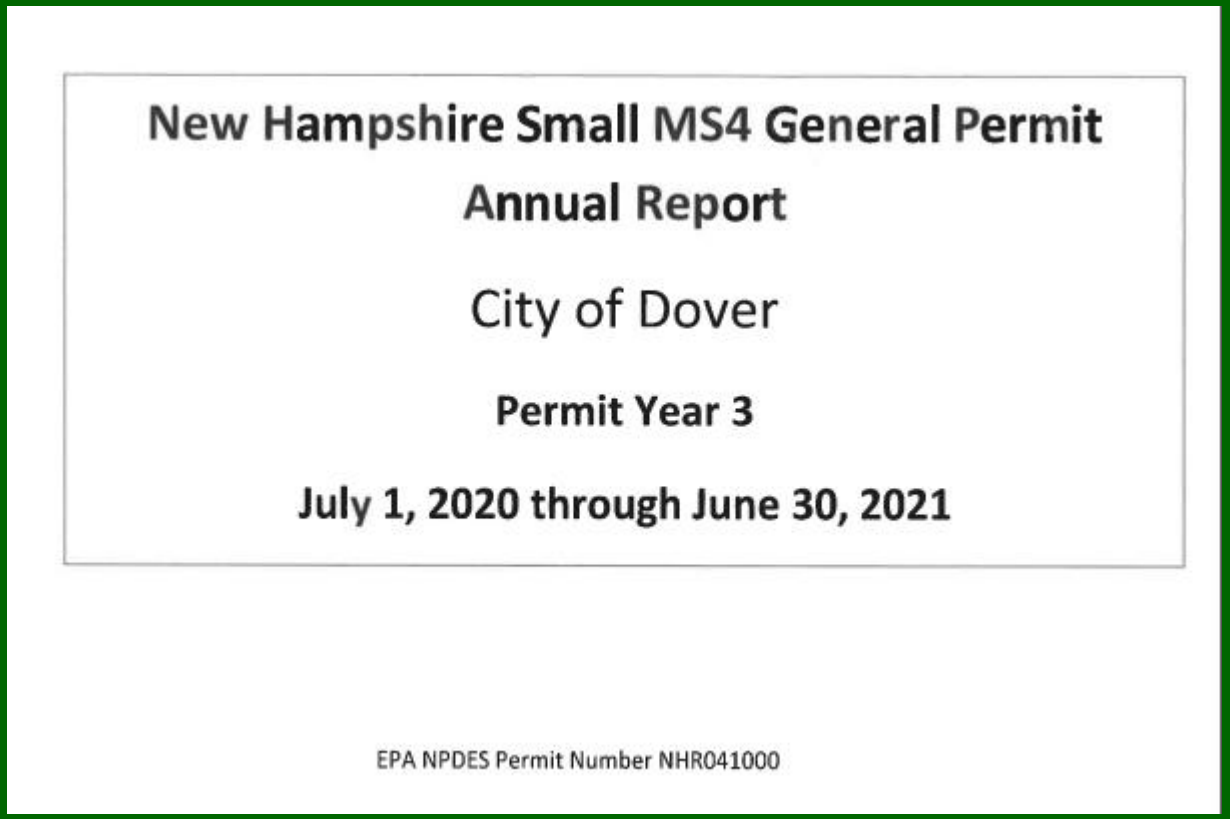




Permit Compliance

MS4 Permit:



Questions???

June 20, 2022

Presentation By: Gretchen Young, PE
Environmental Projects Manager