EMERALD ISLE
NORTH CAROLINA

Nice Matters!

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Town of Emerald Isle Stormwater Committee Agenda
Tuesday, November 21, 2024-3:00 PM
Town Administration Building Conference Room

1. **Open Meeting**

2. **Roll Call of Committee Members**

3. **Review of Documents**

   a. **Review of meeting notes form the September 19, 2024, meeting.**
   b. **Review of the meeting notes from the October 15, 2024, meeting**
   c. **Review of Potential Code Changes per some of the Committees recommendations**
   d. **Continue site visits to the "Hot Spot" areas in Town**

4. **Other Information needed for this Committee**

5. **Future Meetings (2024)**
   a. **December 5, 2024, 3-5 PM – Town Board Meeting Room**

6. **Potential Meeting Schedule for 2025 – All proposed for the Town Administration Building Conference Room starting at 3:00 PM and ending at 5:00 PM**

   a. **Thursday, January 16, 2025**
   b. **Thursday, February 20, 2025**
   c. **Thursday, March 20, 2025**
   d. **Thursday, April 17, 2025**
   e. **Thursday, May 15, 2025**
   f. **Thursday, June 19, 2025**
   g. **Thursday, July 17, 2025**

7. **Committee Comments**

8. **Adjourn**

Town of Emerald Isle Stormwater Committee meeting notes
Thursday, September 19, 2024-3:00 PM
Town Administration Building Conference Room

The meeting discussed the approval of meeting notes from August 15, 2024, and August 27, 2024. Mr. Chris Seaberg also briefed the Committee members on some of the Stormwater-related regulations reviewed and updated by the Town's UDO Committee prior to finishing the updates on that document.

The Committee also reviewed documentation on vacant lots that have been mapped along with mapped lots with either development or redevelopment potential. Included in that information was the start of a list of "Hot Spots" Town staff has compiled though various flooding events that have occurred in Town.

Mr. Seaberg reminded the Committee members of the upcoming scheduled meetings of October 15, 2024, November 21, 2024, and December 5, 2024. The Committee discussed and decided to have those three future meetings in the Town Administration Building Conference Room.

The Meeting adjourned at 5:00 PM

EMERALD ISLE STORMWATER COMMITTEE MEETING

September 19, 2024

AGENDA

1. Open Meeting

2. Roll Call of Committee Members

3. Review of Documents

    a. Review of meeting notes form the August 15, 2024, meeting.
    b. Review of the meeting notes from the August 27, 2024, meeting
    c. Review of Stormwater issues covered by the UDO Committee
    d. Review documentation on vacant lots along with lots with development and redevelopment potential.
    e. Review of the “Hot Spot” of area prone to continuous flooding during rain events

4. Other Information needed for this Committee

5. Future Meetings (2024)
    a. October 15, 2024 3-5 PM – Town Board Meeting Room
    b. November 21, 2024 3-5 PM – Town Board Meeting Room
    c. December 5, 2024 3-5 PM – Town Board Meeting Room

6. Committee Comments

7. Adjourn

REVIEW OF MEETING NOTES FROM AUGUST 15, 2024 MEETING

REVIEW OF MEETING NOTES FROM AUGUST 27, 2024 MEETING

REVIEW OF STORMWATER ISSUES COVERED BY UDO COMMITTEE

- Provided on the meeting packet are Summaries of Staff Proposed Amendments in November 2022 and April 2023
- Staff is still reviewing UDO Committee documentation and will provide further information when available

REVIEW OF STORMWATER ISSUES COVERED BY UDO COMMITTEE – NOV. 2022 SUMMARY EXCERPT

- Removed minimum dwelling unit size from the table (size limitation already removed)
- Mobile home requirements removed (manufactured homes meeting current requirements wouldn't be smaller than these dimensions anyway)
- Relocated the minimum camping space size to Notes section.
- Relocated the 3ft setback encroachment provision from Section 10.2 Definitions here.

Chapter Six Development Standards

- Section 6.3 Stormwater Management
  - Consolidated introductory subsection to state the purpose, authority, and objectives of the section more succinctly
  - Removed redundant or vague statements and clarified requirements
  - Lowered the permitting exemption from 1000 impervious sf to 500sf
  - Added that all stormwater management plans must be professionally designed (small, as well as large)
  - Added requirement that the installation of stormwater plans must be inspected and approved by a design professional and provide a certification at the completion of the project.

Chapter Seven Subdivision Standards

- NO PROPOSED CHANGES

Chapter Eight Nonconformities

- NO PROPOSED CHANGES

Chapter Nine Enforcement

- Section 9.1 Violations – additional language imported from Chapter 6

Chapter Ten Definitions and Rules of Interpretation

- Removal of standards from definitions to incorporate into relevant ordinance sections
- Added definition for "oceanfront"

CODE OF ORDINANCES CHAPTER 6 BUILDING REGULATIONS

- Removed sections that are conflicting or redundant with UDO provisions

REVIEW OF STORMWATER ISSUES COVERED BY UDO COMMITTEE – APRIL 2023 SUMMARY EXCERPT

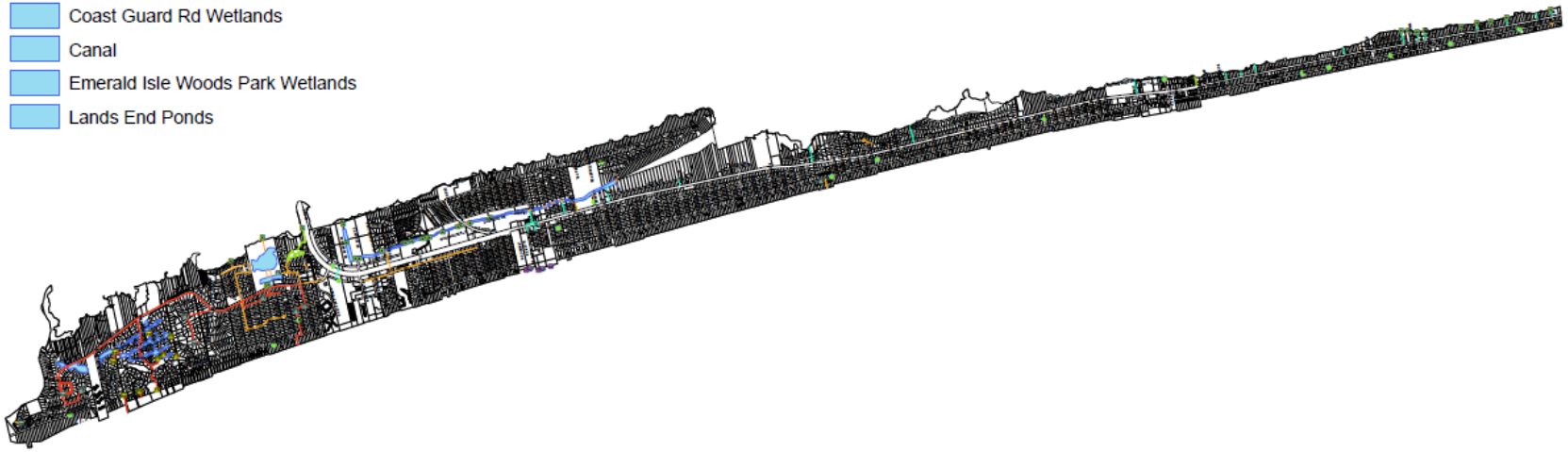
- Replaced “mobile” with “manufactured” to update language regarding manufactured homes
- Removed grandfathering provision from parking areas established in right-of-way (nonconformity provisions cover this)

- Section 6.3 Stormwater Management
  - Section 6.3.3.2.C Erosion and Sediment Control Devices
    - Updated format
    - New provision requiring a stone construction entrance for new construction projects that don’t have an existing driveway connection.
- Section 6.4.2 Dunes and Vegetation Protection Design Standards
  - Section 6.4.2.1.C Residential Area Natural Area Designation
    - Updated format
    - New provision requiring the designated natural area to be fenced (not just staked off), either with construction safety fencing or silt fencing.
  - New Section 6.4.2.1.D -Residential Small Lot Reduced Natural Area Designation
    - New provision that allows lots that are smaller than required in Table 5.1 may provide a reduced 25% natural area
  - New Section 6.4.2.1.E – Residential Revegetation Natural Area Designation
    - New provision applying to development of lots that don’t currently conform to the 35% natural area, have unwieldy topography, etc
    - Allows a reduced 25% natural area requirement with revegetated 5ft buffer
    - Three different revegetation alternatives with specifications
    - Landscaping plan and maintenance agreement to be filed with deed

TOWN OF EMERALD ISLE STORMWATER SYSTEM MAP

Legend

- Ocean Outfall
- Private
- Town
- Coast Guard Rd Closed System
- Town Installed
- NC DOT
- Private Installed
- Town Installed Infiltration System
- Discharge Point
- Tie-in Connection
- Coast Guard Rd Wetlands
- Canal
- Emerald Isle Woods Park Wetlands
- Lands End Ponds



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Created By: Emerald Isle Planning Department

TOWN OF EMERALD ISLE STORMWATER SYSTEM MAP

TOWN OF EMERALD ISLE STORMWATER SYSTEM MAP – WESTERN PORTION

Legend

- Ocean Outfall
- Private
- Town
- Coast Guard Rd Closed System
- Town Installed
- NC DOT
- Private Installed
- Town Installed Infiltration System
- Discharge Point
- Tie-in Connection
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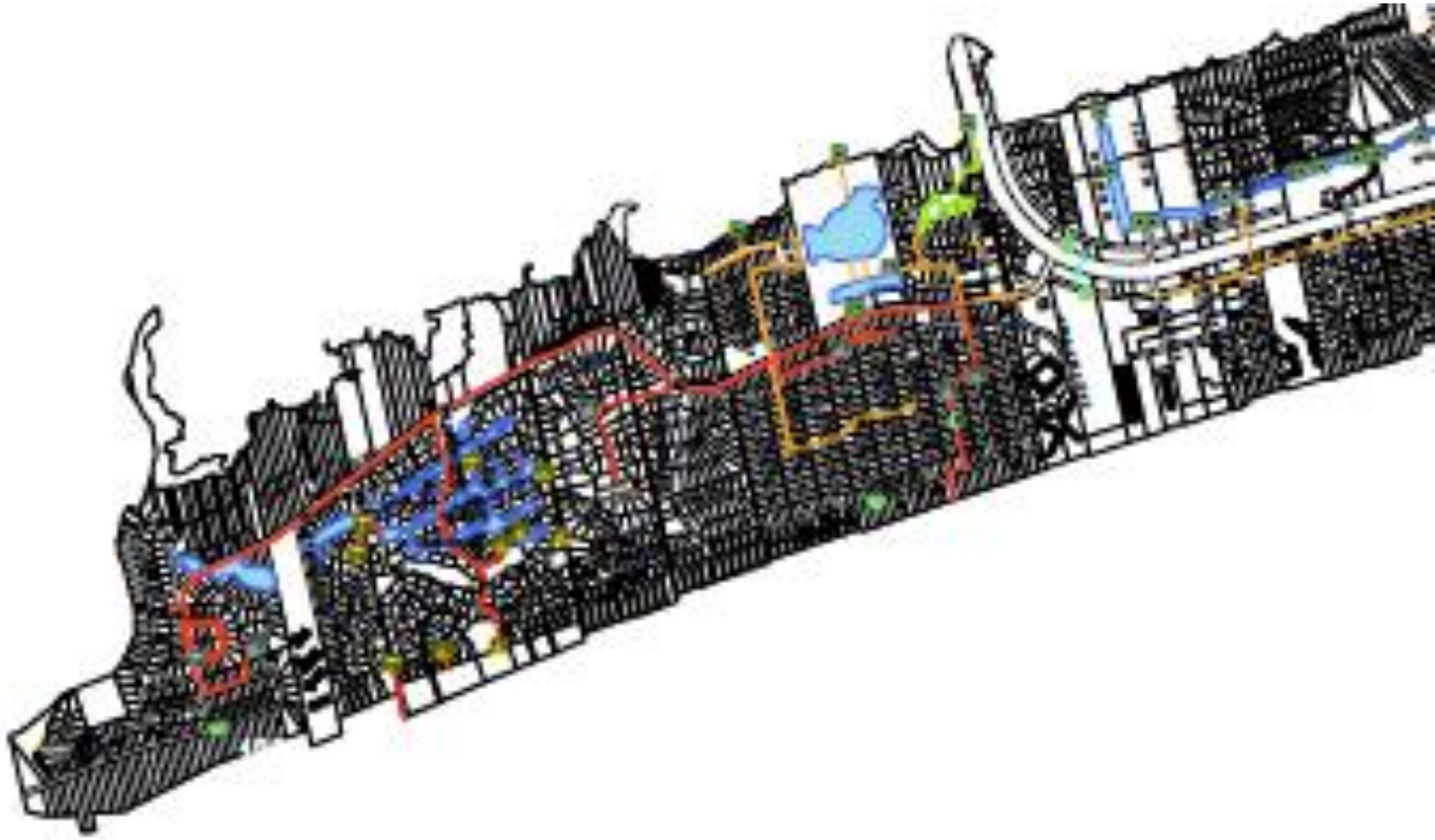
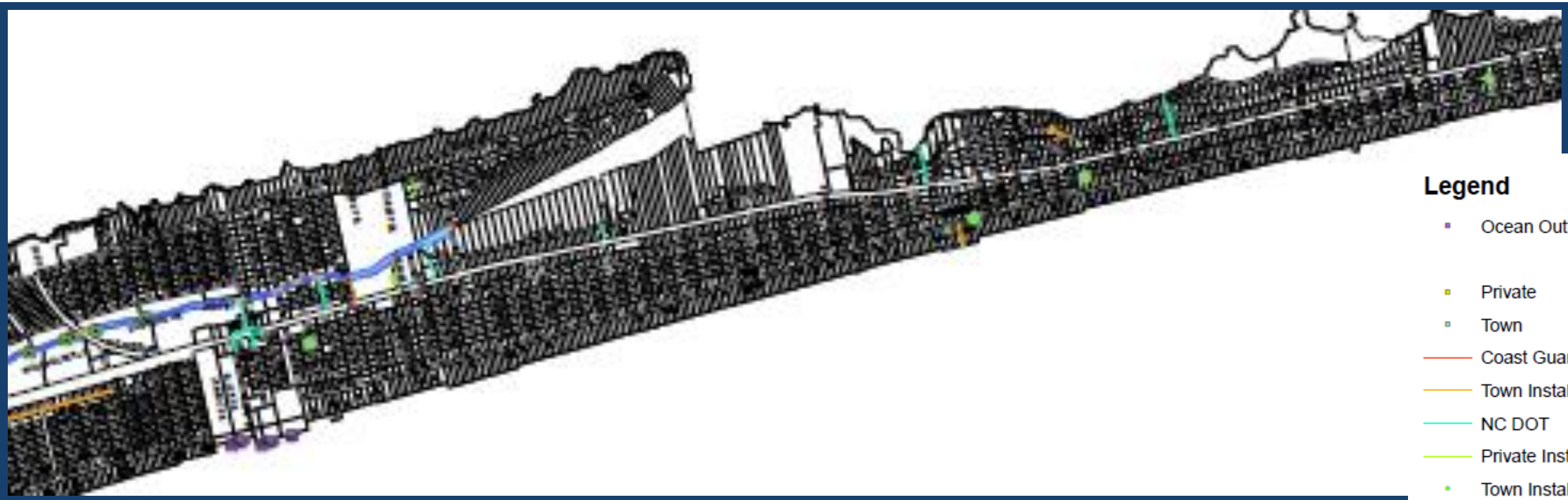


TOWN OF EMERALD ISLE STORMWATER SYSTEM MAP – CENTRAL PORTION



Legend

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TOWN OF EMERALD ISLE STORMWATER SYSTEM MAP – EASTERN PORTION

Legend

- Ocean Outfall
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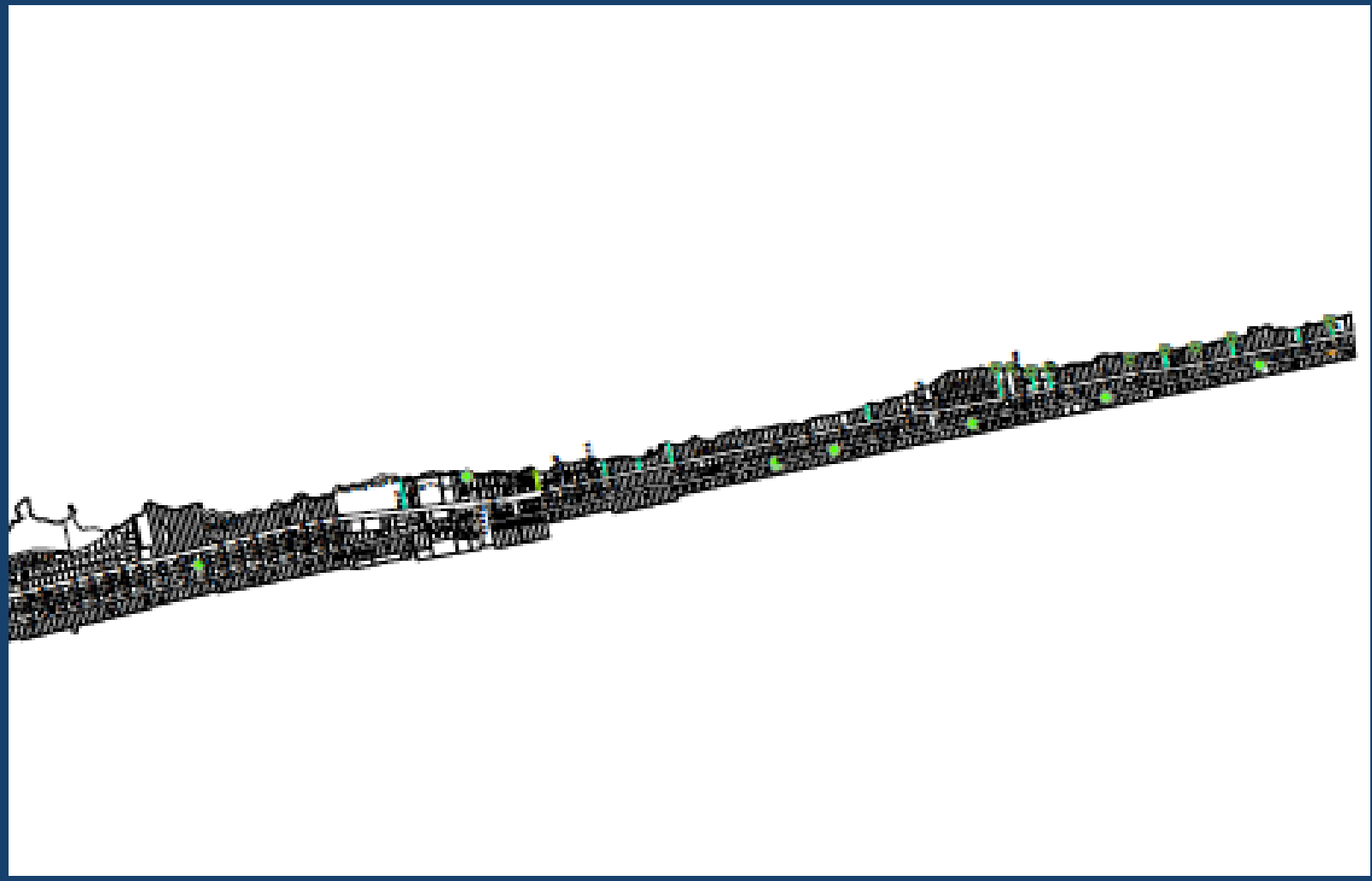


REVIEW OF DOCUMENTATION ON VACANT LOTS – CAMA LUP EXISTING CONDITIONS - STORMWATER

REVIEW OF DOCUMENTATION ON VACANT LOTS – CAMA LUP EXISTING CONDITIONS - STORMWATER

There are no current plans to develop a large-scale, public, central sewer system in Emerald Isle. In lieu of a central wastewater treatment system controlled by the Town, Emerald Isle will continue to rely on state and county permitting for wastewater systems. A wastewater permit issued by the Carteret County Health Department is required prior to commencing any development project throughout town, regardless of whether an on-site septic or package treatment plant is being utilized. Permit staff at Carteret County Health Department indicates that generally permits for septic tanks are not a problem in Emerald Isle and that once installed, the systems function as intended.

Currently, all package treatment plants are functioning properly and there are no documented overflows, bypasses, or other problems that may degrade water quality or constitute a threat to public health. Each facility is monitored and maintained by a licensed operator. According to Carteret County Environmental Health, neither the private package treatment plants nor private septic systems pose a threat to local water quality.

Natural Gas

Emerald Isle does not have access to central natural gas service. There are several private companies that provide LP gas service for commercial and private residential use.

Stormwater

Since adoption of the 2004 Emerald Isle CAMA Land Use Plan, the Town has worked diligently to expand and improve upon the Town's municipal stormwater drainage system, while also adopting development regulations pertaining to on-site retention of stormwater. Town staff, in concert with the Planning Board and Board of Commissioners, has developed a comprehensive stormwater management program that is carried out through the Town's Unified Development Ordinance.

The current regulations require that all residential and non-residential development address on-site management of non-point source runoff from a respective project site. The standards and best management practices required/recommended vary according to the proposed development site.

In addition to local stormwater management standards, the Town also works with NCDEQ to enforce NC State Coastal Stormwater Management Regulations.

Map 11 provides an overview of the existing Town of Emerald Isle Stormwater Management System. The system has been upgraded substantially since adoption of the Town's 2004 plan; however, there are additional improvements necessary to adequately address all documented stormwater drainage "hot spots." These "hot spots" are characterized by low-lying areas where ponding of water occurs during and following substantial rain events. It should be noted that there are no point source stormwater discharges located within Emerald Isle's planning jurisdiction. Future improvements relating to the stormwater system will be addressed under Section 4 of this plan.

Solid Waste

The Town of Emerald Isle contracts out all curbside waste management services to a local contractor. The Town provides curbside trash pickup to oceanfront properties on Mondays and Fridays and soundside properties on Tuesdays and Thursdays. Curbside pickup of recyclables is provided weekly on Wednesdays. Additionally, the Town Public Works Department collects yard waste on a weekly rotation. Commercial solid waste removal is provided by a private contractor on an as-needed basis.

REVIEW OF DOCUMENTATION ON VACANT LOTS

Overview of Vacant Properties

Throughout the corporate limits of Emerald Isle, there are approximately 999 undeveloped parcels. The majority of these parcels are well under an acre in size and zoned for single-family residential development. Of the 999 undeveloped parcels, 925 are under an acre in size, while 74 are over an acre in size. While zoning regulations will require that a majority of the 925 parcels under an acre will be developed as single-family residential, the larger parcels will provide for additional development scenarios, which may require Zoning Ordinance text and map amendments.

The following provides a summary of the Town's existing Zoning Districts (see Map 13, Zoning):

- **Residential (R2)** – Residential district allowing a single-family dwelling or a two-family dwelling on a lot.
- **Residential Multi-Family (RMF)** – Residential district allowing a single-family dwelling, a two-family dwelling, or a multi-family dwelling on a lot.
- **Mobile Home (MH)** – Mobile home district allowing manufactured homes on lots located outside of manufactured home parks. This district also allows single-family dwellings and duplexes.
- **Business (B)** – Business district allowing a general and wide variety of retail trade.
- **Camp (C)** – Recreational district allowing travel-trailers, campers and tents.
- **Government (G)** – A district allowing a variety of governmental and public uses.
- **Village-East (VE)** – A mixed use district consisting of residential, commercial, recreational, institutional, and office land uses.
- **Village-West (VW)** – A mixed use district consisting of residential, commercial, recreational, institutional, and office land uses.
- **Marina Village (MV)** – A mixed use district consisting of residential, commercial, recreational, institutional, and office land uses.

The following table and Map 14 provide a snapshot of the zoning classification for all undeveloped parcels remaining in the Town of Emerald Isle. Additionally, Map 15 depicts all remaining undeveloped parcels based on whether they are over or under one acre in size.

Table 16. Undeveloped Parcels By Zoning District

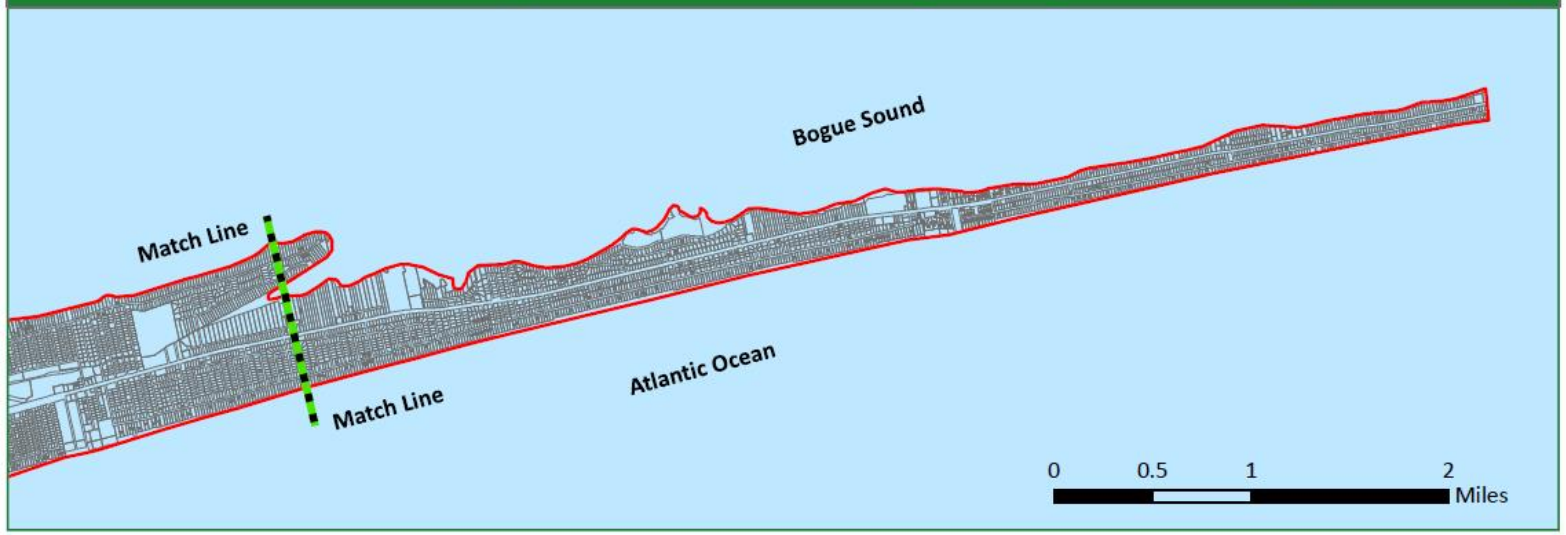
Zoning District	Acres	% of Vacant Parcels
R2 Residential	363.39	87.24%
RMF Residential Multi Family	10.93	2.62%
MH Mobile Home	6.57	1.58%
B Business	16.23	3.90%
C Camp	0.00	0.0%
G Government	10.93	2.62%
VE Village-East	1.47	0.35%
VW Village-West	6.95	1.67%
MV Marina Village	0.05	0.01%
Total	416.52	100.0%

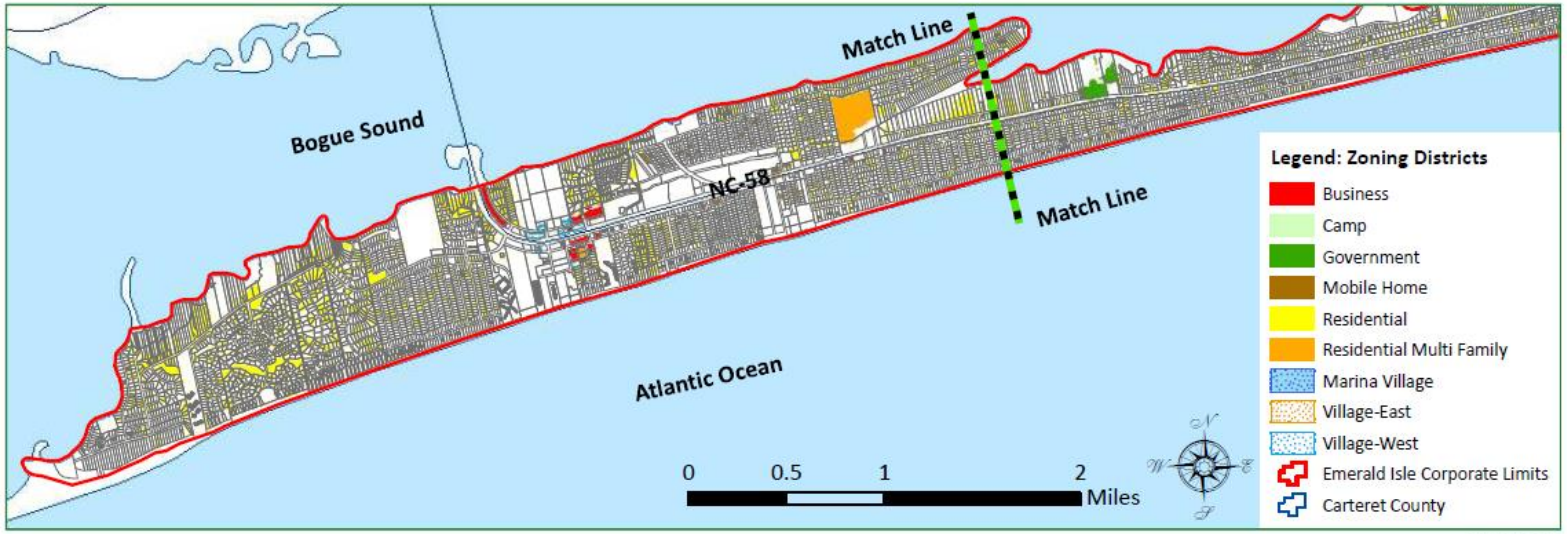
Source: HCP, Inc.

REVIEW OF DOCUMENTATION ON VACANT LOTS

REVIEW OF DOCUMENTATION ON VACANT LOTS

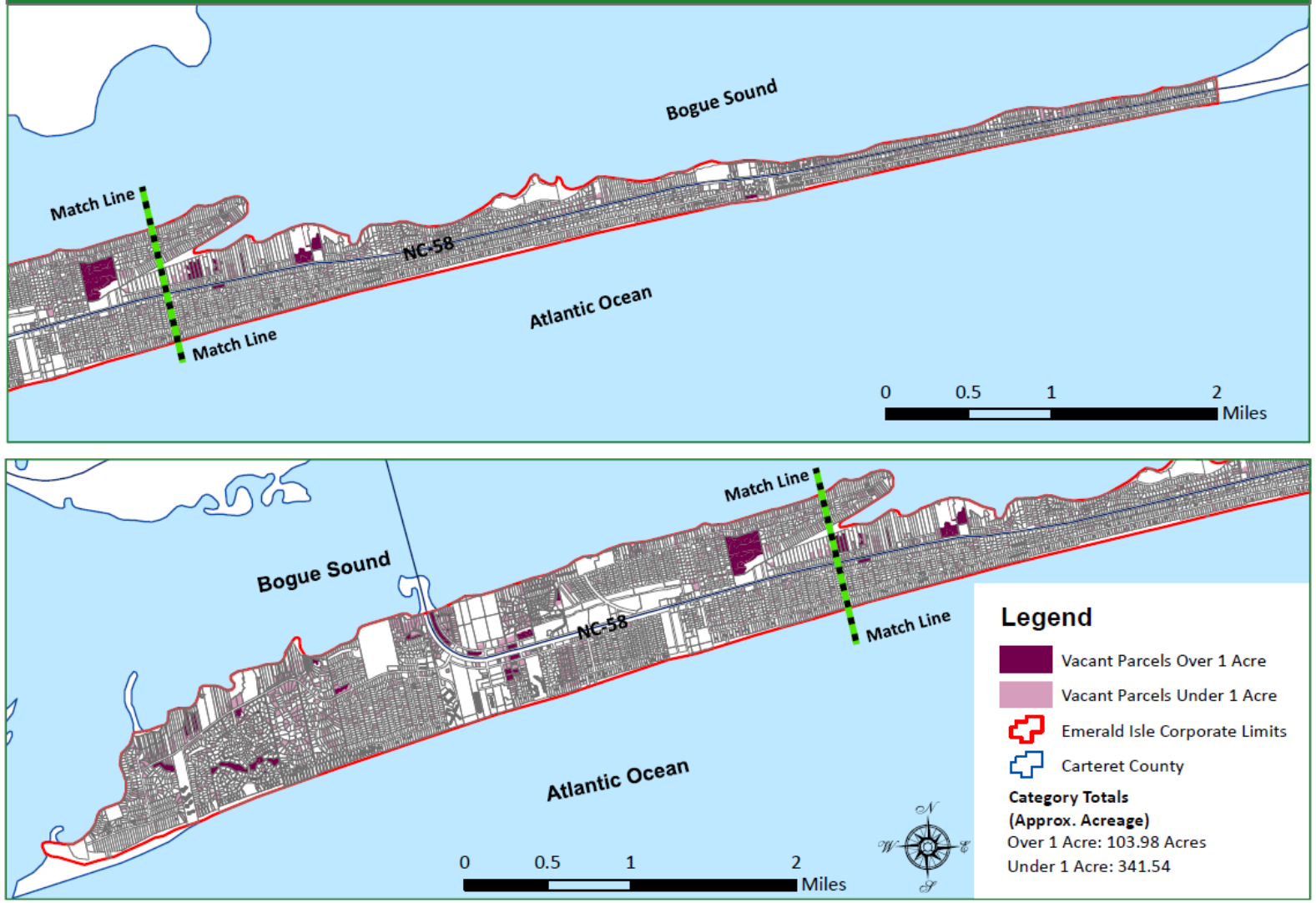
MAP 14. VACANT PARCELS BY ZONING





REVIEW OF DOCUMENTATION ON VACANT LOTS UNDER 1 ACRE

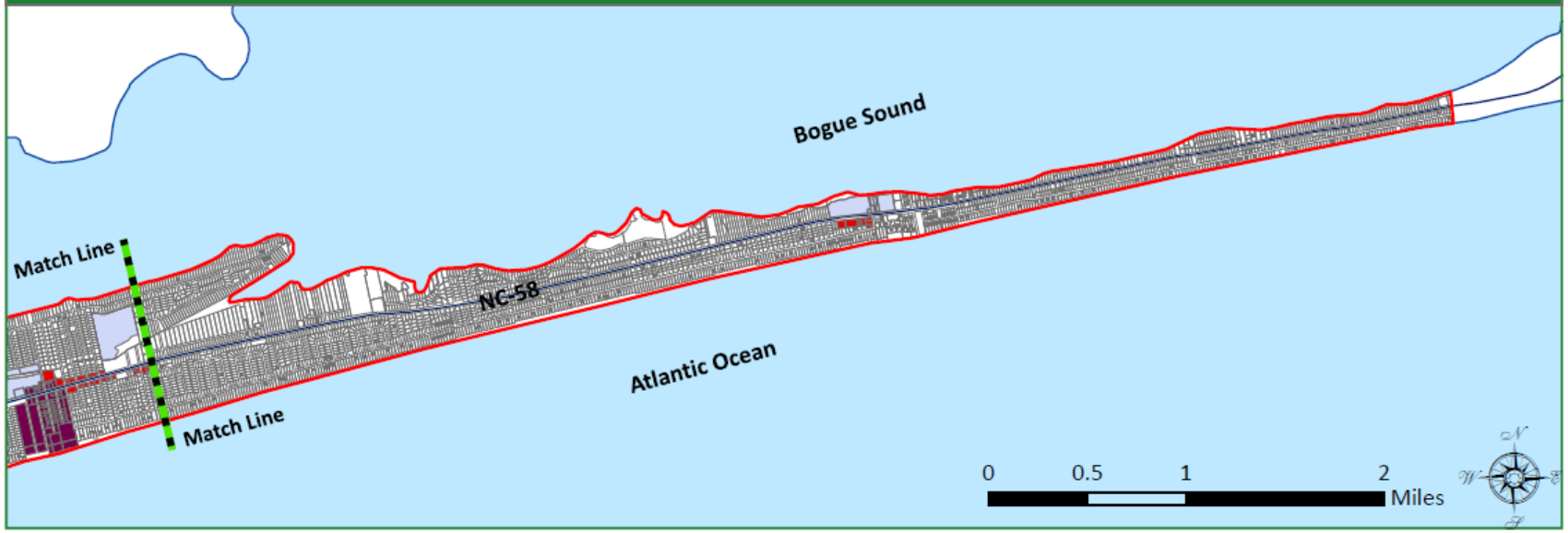
MAP 15. VACANT OVER/UNDER 1 ACRE

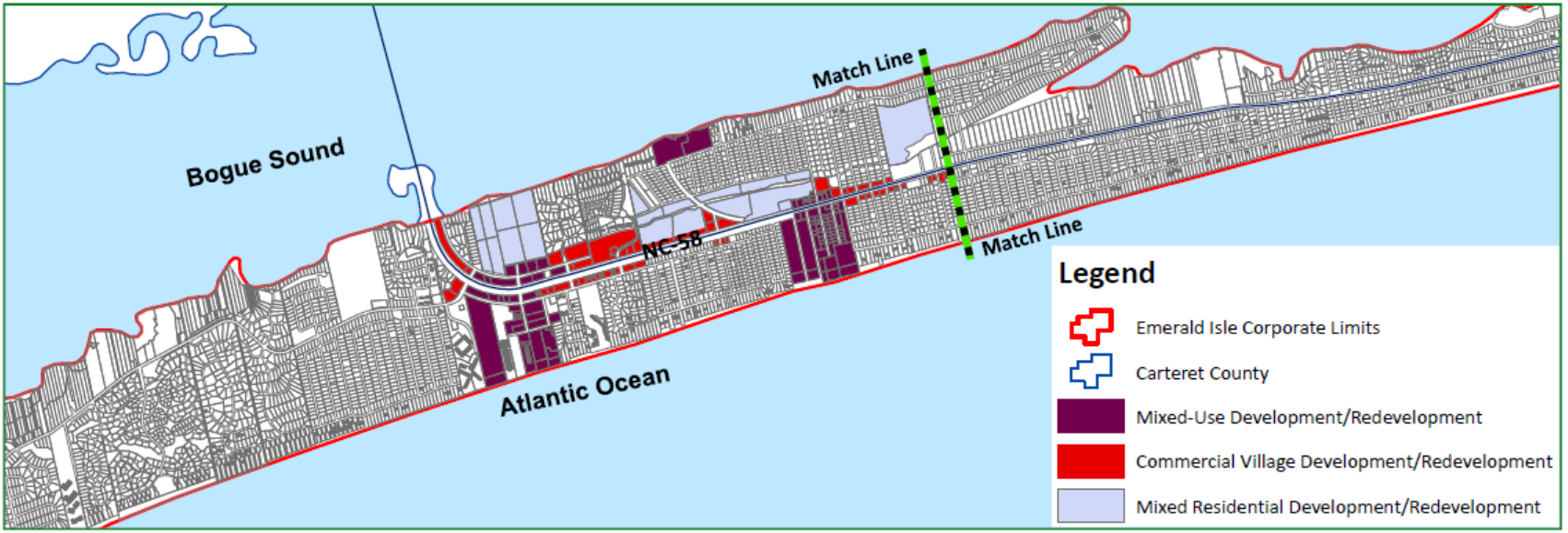


PAGE 3-38

REVIEW OF DOCUMENTATION LOTS WITH DEVELOPMENT AND REDEVELOPMENT POTENTIAL

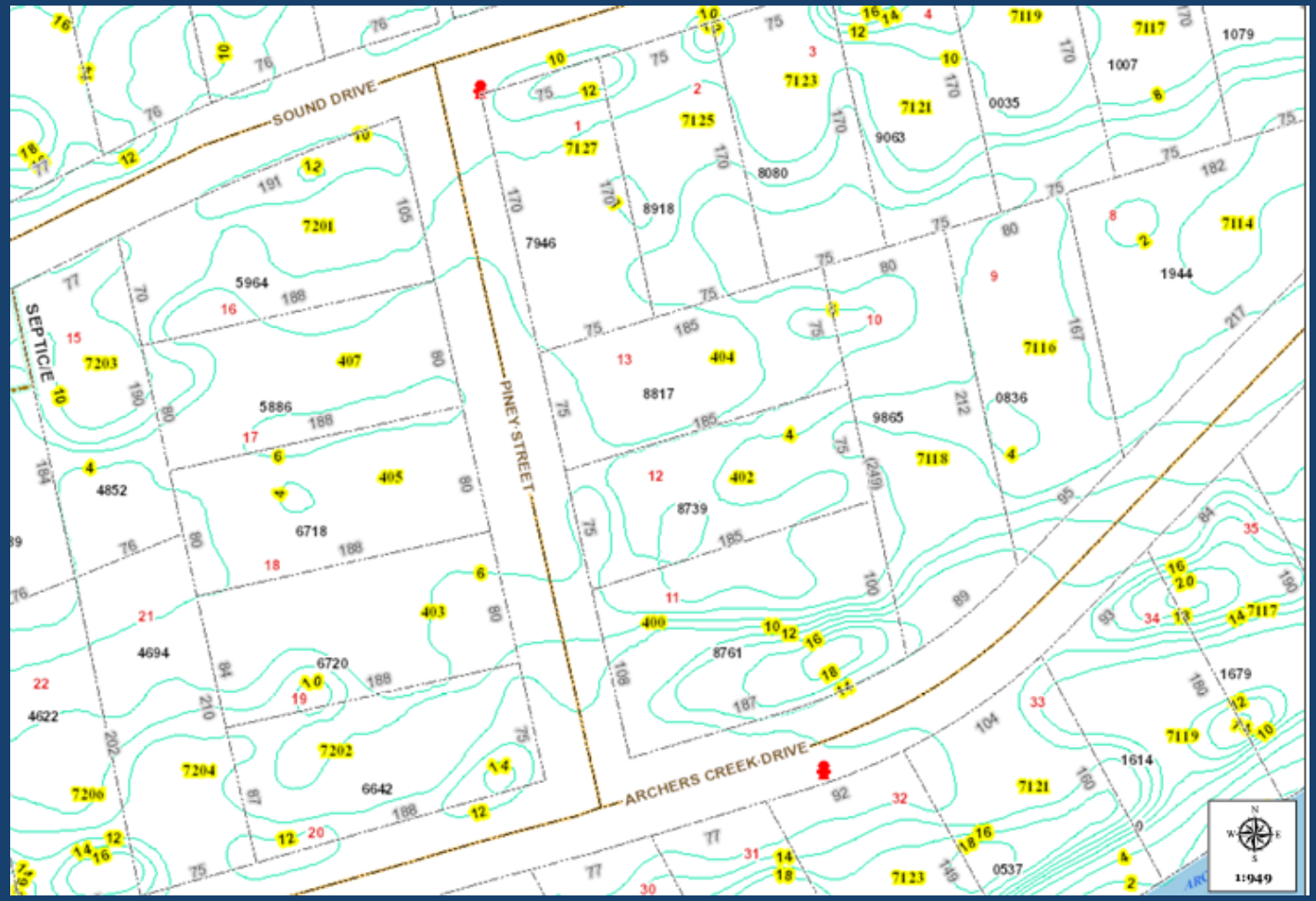
MAP 17.DEVELOPMENT/REDEVELOPMENT POTENTIAL



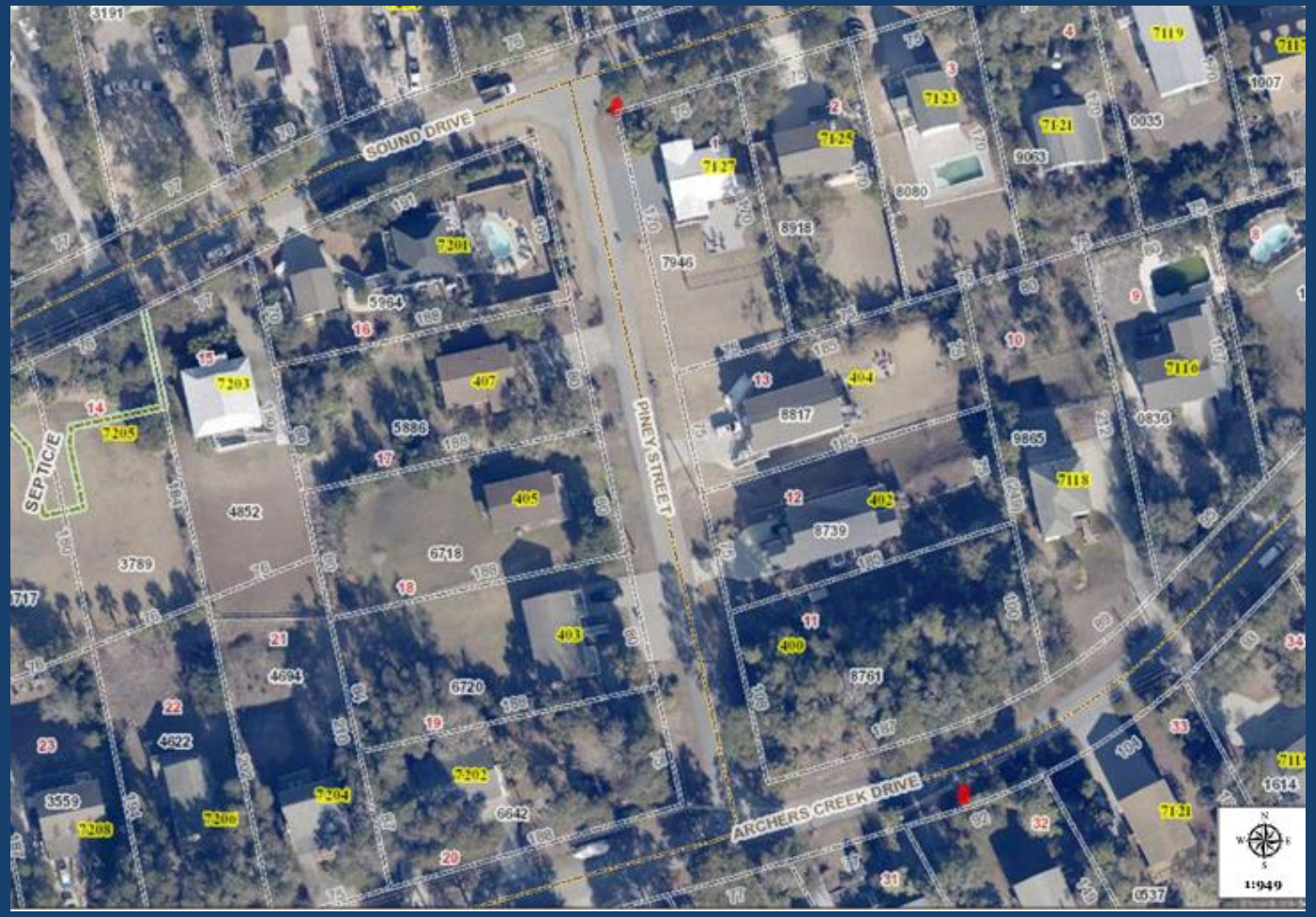


REVIEW OF DOCUMENTATION LOTS WITH DEVELOPMENT AND REDEVELOPMENT POTENTIAL

REVIEW OF SOME OF THE "HOT SPOTS" AS DOCUMENTED BY TOWN STAFF – PINEY STREET



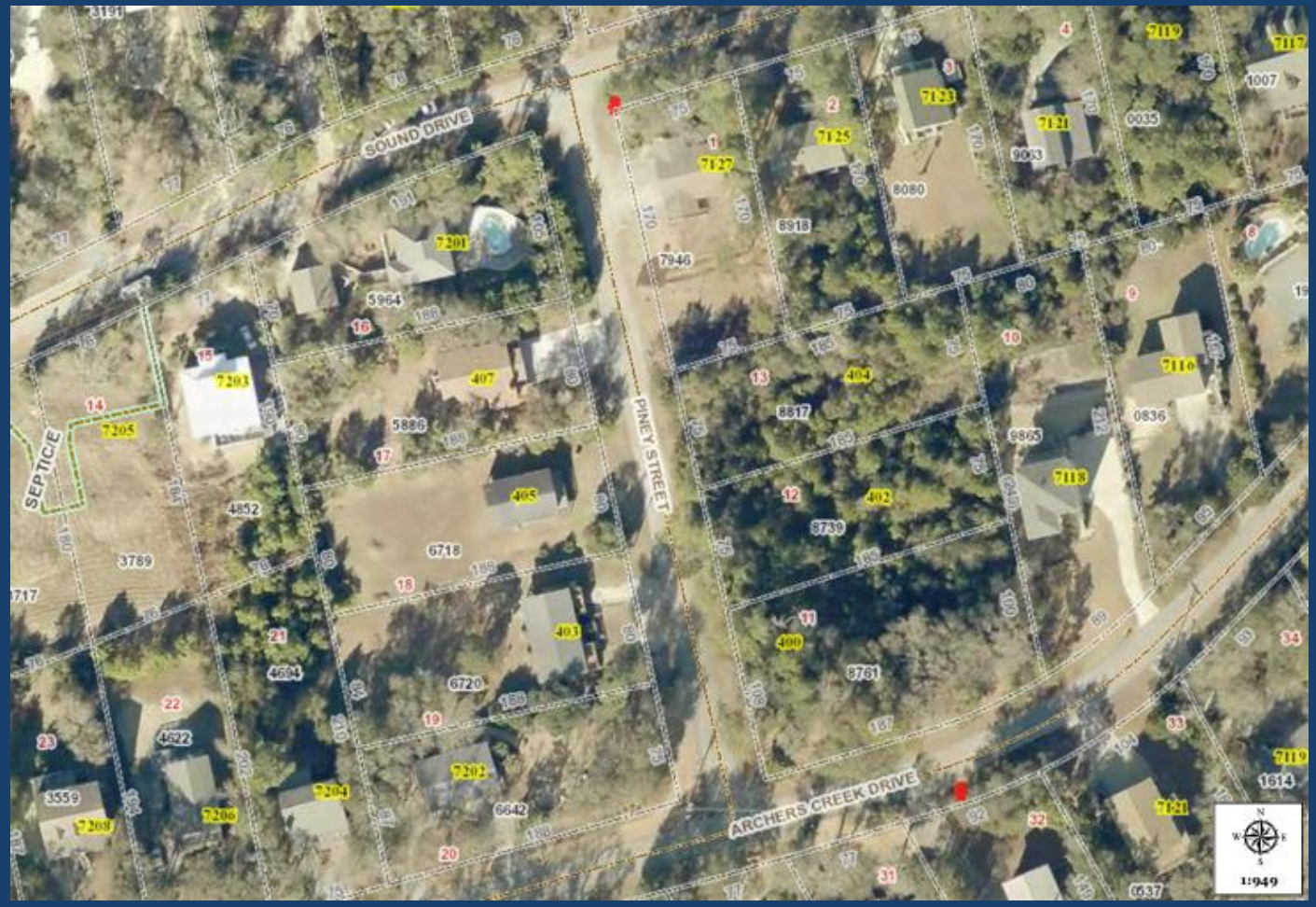
REVIEW OF SOME OF THE “HOT SPOTS” AS DOCUMENTED BY TOWN STAFF – PINEY STREET 2024



REVIEW OF SOME OF THE “HOT SPOTS” AS DOCUMENTED BY TOWN STAFF – PINEY STREET 2024

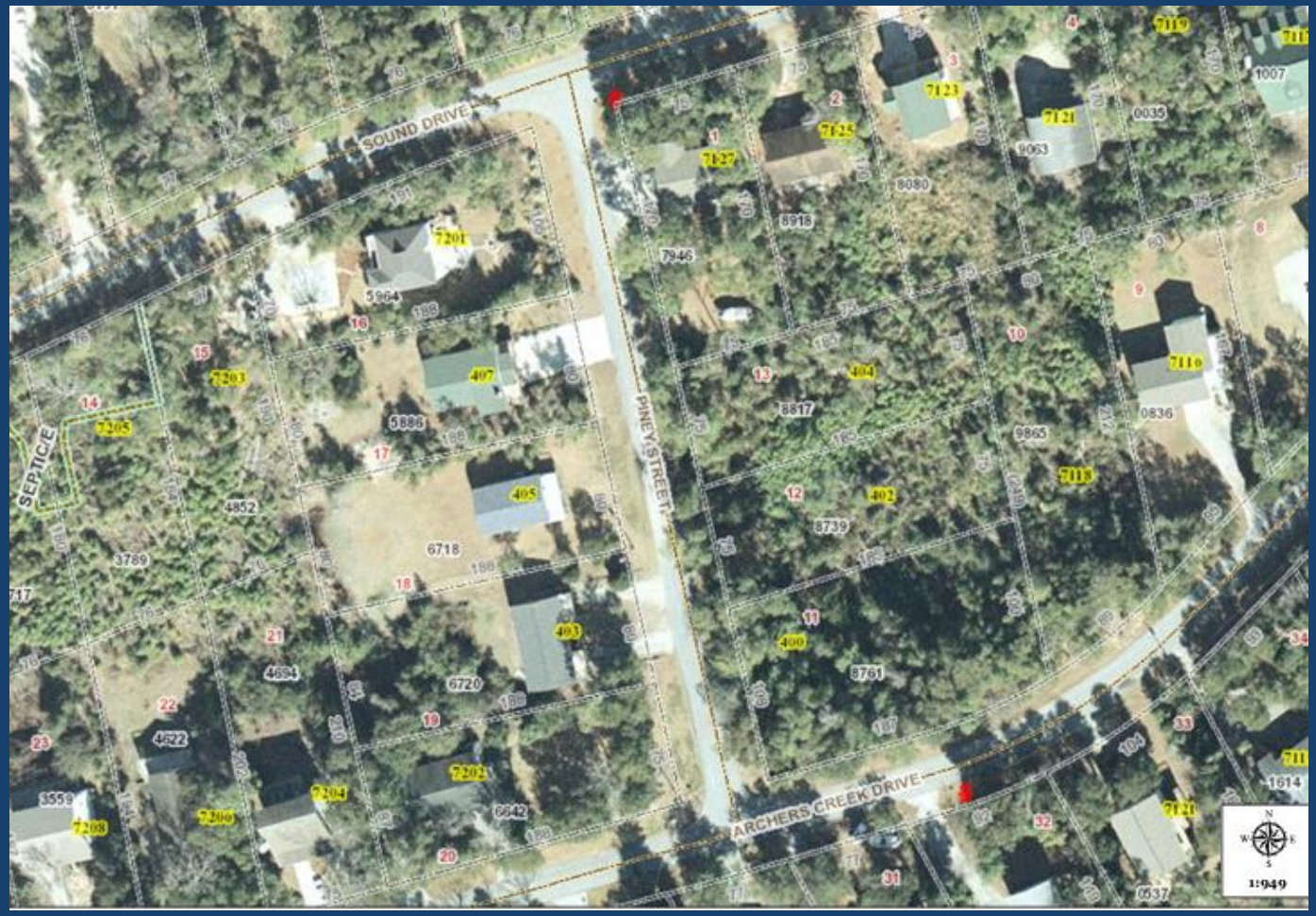
REVIEW OF SOME OF THE "HOT SPOTS" AS DOCUMENTED BY TOWN STAFF – PINEY STREET 2019

REVIEW OF SOME OF THE "HOT SPOTS" AS DOCUMENTED BY TOWN STAFF – PINEY STREET 2015



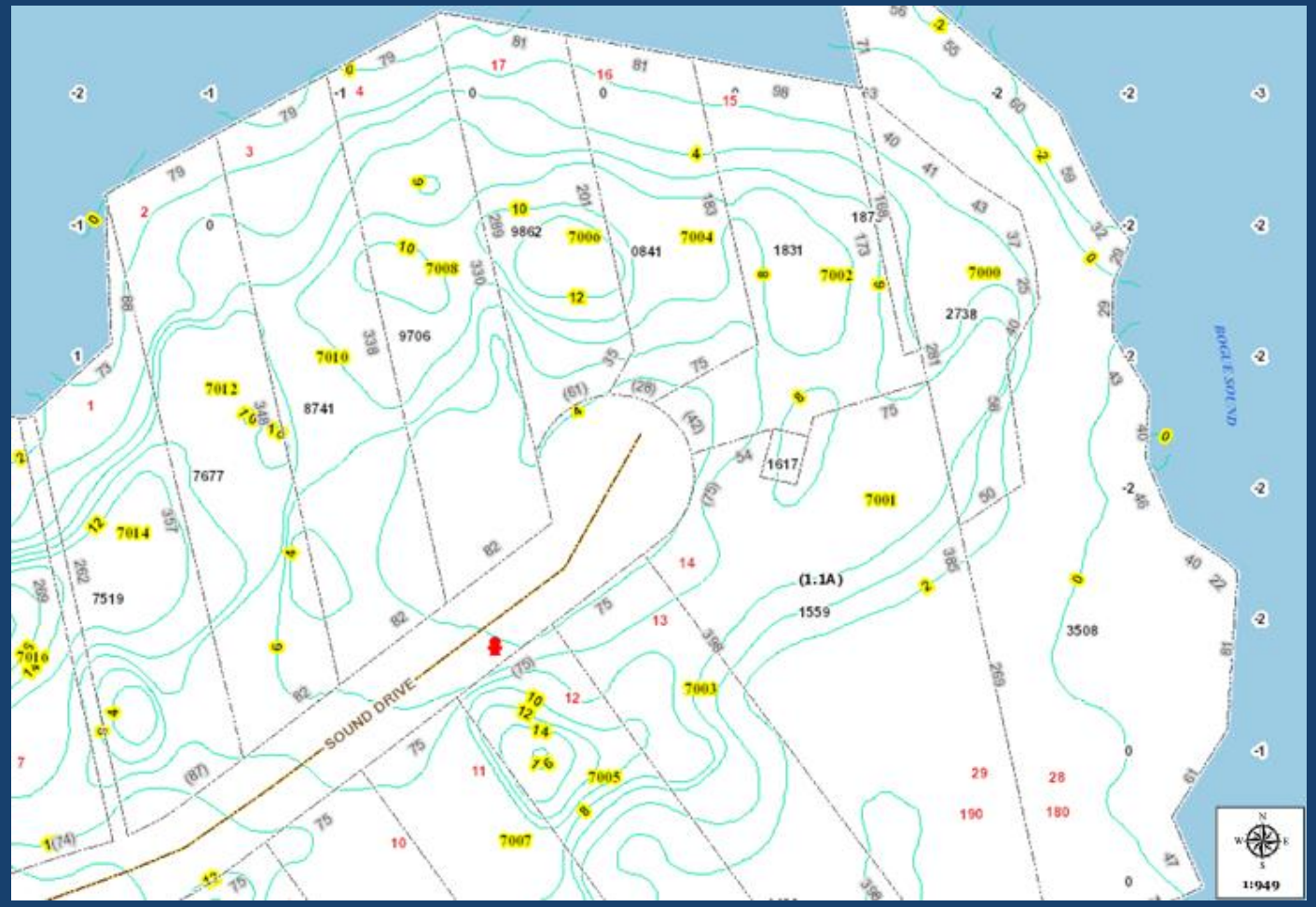
REVIEW OF SOME OF THE “HOT SPOTS” AS DOCUMENTED BY TOWN STAFF – PINEY STREET 2007

REVIEW OF SOME OF THE “HOT SPOTS” AS DOCUMENTED BY TOWN STAFF – PINEY STREET 2004



REVIEW OF SOME OF THE “HOT SPOTS” AS DOCUMENTED BY TOWN STAFF – PINEY STREET SEPTEMBER 17, 2024

REVIEW OF SOME OF THE “HOT SPOTS” AS DOCUMENTED BY TOWN STAFF – SOUND DRIVE CUL-DE-SAC



REVIEW OF SOME OF THE “HOT SPOTS” AS DOCUMENTED BY TOWN STAFF – SOUND DRIVE CUL-DE-SAC - 2024

REVIEW OF SOME OF THE “HOT SPOTS” AS DOCUMENTED BY TOWN STAFF – SOUND DRIVE CUL-DE-SAC - 2024

REVIEW OF SOME OF THE “HOT SPOTS” AS DOCUMENTED BY TOWN STAFF – SOUND DRIVE CUL-DE-SAC - 2019

REVIEW OF SOME OF THE “HOT SPOTS” AS DOCUMENTED BY TOWN STAFF – SOUND DRIVE CUL-DE-SAC - 2015

REVIEW OF SOME OF THE “HOT SPOTS” AS DOCUMENTED BY TOWN STAFF – SOUND DRIVE CUL-DE-SAC - 2007

REVIEW OF SOME OF THE “HOT SPOTS” AS DOCUMENTED BY TOWN STAFF – SOUND DRIVE CUL-DE-SAC - 2004

REVIEW OF SOME OF THE “HOT SPOTS” AS DOCUMENTED BY TOWN STAFF – SOUND DRIVE CUL-DE-SAC – SEPTEMBER 17, 2024

OTHER INFORMATION NEEDED FOR THIS COMMITTEE

FUTURE MEETINGS SCHEDULE

FUTURE MEETING SCHEDULE

- Tuesday, October 17, 2024 – Town Board Meeting Room 3-5 PM
- Thursday, November 21 2024 – Town Board Meeting Room 3-5 PM
- Thursday, December 5, 2024 – Town Board Meeting Room 3-5 PM

FUTURE MEETINGS SCHEDULE 2025 SCHEDULE?

COMMITTEE COMMENTS

ADJOURN

Town of Emerald Isle Stormwater Committee meeting notes
Thursday, October 15, 2024-3:00 PM
Town Administration Building Conference Room

The Committee discussed documentation requested at their September 19, 2024, meeting. The documentation provided was Section A-8 of the NCDEQ Stormwater Design Manual that provides "Guidance on SCM Selection". For this information, SCM are defined as Stormwater Control Measures. The Committee was also provided a more detailed list from Town staff on "Hot Spots" better defined as areas of extreme concern during any potential flooding event.

Committee Member Athan Parker went through the State document, providing the choices available for Stormwater devices. Mr. Seaberg provided the Committee with an overview of the Town's documentation.

Mr. Seaberg asked the Committee members to think about if the Town should require the stormwater collection system be installed when the impervious surface has been installed versus installing the system closer to the end of the project. The Committee agreed that, with all the heavy construction traffic that may or may not occur on a project site, the system will likely be damaged and require replacement. That is why the installation is typically once all site work is complete.

Mr. Seaberg reminded the Committee members of the upcoming scheduled meetings of November 21, 2024, and December 5, 2024, both at the Town Administration Building Conference Room.

The Committee then traveled to some of the sites on the Town's "Hot Spot" list including Piney Street, various locations on Sound Drive, Archers Creek Road, various locations on Ocean Drive, and Reed Drive.

The Meeting adjourned at 5:00 PM

A-8. Guidance on SCM Selection

Chapter Contents

Overview

Selecting the most appropriate SCMs for a development is an art as well as a science. This Chapter provides the link between stormwater regulatory requirements and physical site constraints, as well as issues of cost and community acceptance.

For several reasons, there is no one SCM that is best for every site. First, different SCMs are better suited for different aspects of stormwater management (sediment removal, nutrient removal, peak runoff reduction, and volume control). One particular SCM might not provide all of the required stormwater management goals of the regulations that apply to a site. Additionally, each site has unique features, such as slope, soils, size, and development density that encourage the use of some types of SCMs and eliminate the use of other types of SCMs. Issues of cost, community acceptance, and site compatibility are also vital to consider in the SCM selection process. For example, SCM's which feature standing water are inappropriate for airports and other locations where waterfowl present a hazard.

Whether or not a structural SCM is needed will be determined by the applicable regulatory requirements for the site, which are covered in Part B. For an exact determination of the applicable regulations at a site, please check with local planning and zoning authorities, as well as using the Interactive Stormwater Permitting Map.

General SCM Selection Guidance

Prior to selecting a structural SCM, a designer should first consider if it is possible to reduce the impervious surfaces on the site. Reducing impervious surfaces can minimize or eliminate the need for structural SCMs. Strategies for reducing impervious surfaces are discussed in the next section below.

If structural SCMs will be required, the following process is recommended for selecting the appropriate one to use:

1. Determine the treatment capability (TSS removal, nutrient removal, volume reduction, and peak flow control) that is required of the SCM based on the applicable regulatory requirements for the site.
2. Determine which SCMs will meet the treatment capability requirements and create a "short list."
3. Evaluate which of the "short listed" SCMs will be appropriate for the physical site characteristics.
4. Consider other factors such as construction cost, maintenance effort, community acceptance, site compatibility, and wildlife habitat.

When a site has numerous physical constraints and the regulatory requirements are stringent, it can be especially challenging to find an appropriate SCM t. In this case, it may be necessary to modify the SCM design for the site characteristics (see individual SCM chapters) or to provide a combination of SCMs that are suitable for the site in series to provide the required level of stormwater treatment.

Getting even further into the art of good SCM design requires blending the SCM into the natural environment to make it more acceptable to the community (especially in areas with considerable pedestrian traffic such as residential, commercial, and office locations). This often requires collaboration between various professions such as civil engineers and landscape architects.

When siting SCMs, conforming to the natural features of the landscape such as drainage swales, terraces, and depressions should be considered. Many of the more "natural" SCMs can readily achieve these goals, such as filter strips, grassed swales, and restored riparian buffers. Other natural-looking SCMs such as bioretention and stormwater wetlands can be blended into natural areas of site designs, or even create new, small sized natural areas within normally barren portions of the site, such as parking lots, walking areas, and outdoor plazas.

Recent trends in stormwater management favor reintroducing runoff from impervious surfaces into the natural environment as close to the impervious surfaces as possible. Ideally, impervious surfaces should be hydrologically divided so that runoff is delivered in smaller volumes that can be accommodated by smaller, less expensive and less obtrusive SCMs. Large "end-of-pipe" facilities may be less suitable because of their high cost, maintenance requirements, consumption of land, and disruption of the landscape.

Primary Versus Secondary SCMs

In the past, 85% TSS removal has been used as a standard. DEQ is no longer using that standard because it is not reflective of the actual field performance of SCMs. Most SCMs do not remove 85% of TSS, especially at lower concentrations of TSS in the influent.

SCMs are designated as either primary or secondary based on their demonstrated performance at TSS removal in research studies. With stakeholder input, DEQ developed the table and graph below to characterize the performance that is required of primary SCMs. In addition to the table below, primary SCMs shall be capable of treating the design storm (1.5 inches in Coastal Counties and 1 inch in the remainder of the state).

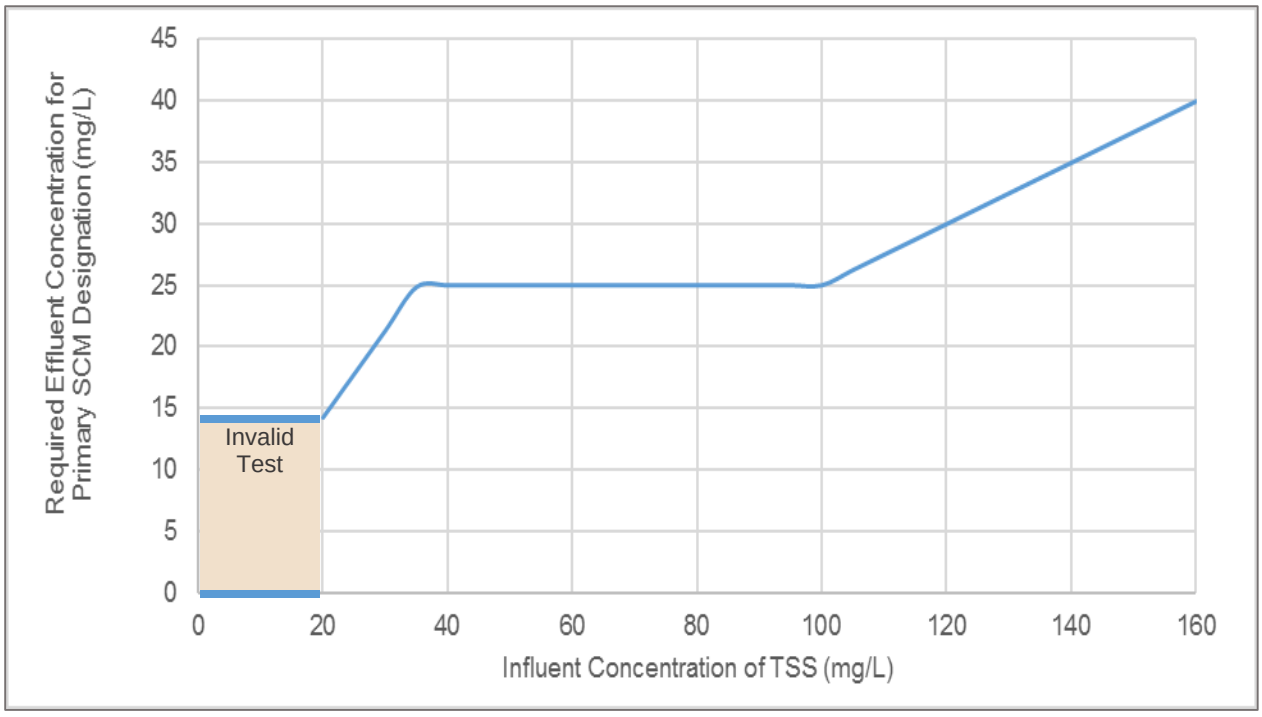
Table 1: Potential Siting Constraints for SCMs

Median Influent EMC	Applicable Performance Standard[1,2]
< 20 mg/L	Invalid test
20 – 35 mg/L	≥ 29% removal
35 – 100 mg/L	≤ 25 mg/L
100 mg/L	≥ 75% removal

[1] The median effluent EMC requirements may also be considered on a total load basis for SCMs that reduce runoff volume. Divide the performance standard by [100% – (% of runoff reduced)] to determine the corresponding load-based standards.

[2] Primary SCMs comply with the above standards as demonstrated through research studies. Proposed new stormwater technologies shall be held to this same standard.

Figure 0-1: Required Performance Standard for Primary SCMs



Based on applying the above criteria to the available research results, the SCMs were designated in accordance with Table 2 below.

Table 2: List of Primary and Secondary SCMs

List & Uses	Primary SCMs	Secondary SCMs
List	- Bioretention Cell - Infiltration System - Permeable Pavement - Wet Pond[1] - Stormwater Wetland[1] - Sand Filter - Rainwater Harvesting	- Green Roof - Disconnected Impervious Surface - Level Spreader-Filter Strip - Pollutant removal Swale - Dry Pond
Uses	- As a stand-alone SCM to treat a new development site (when 100% sized). - As a retrofit.	- In series with a primary SCM to reduce the volume of runoff and thus reduce the size of the primary SCM. - In series with a primary SCM to provide pretreatment. - In series with a primary SCM as a hydraulic device to slowly "feed" the stormwater runoff to the primary SCM, to reduce the size of the primary SCM. - In series with another secondary SCM to treat the design storm in a manner that meets or exceeds performance standard. - As a retrofit.

[1] The research data on wet ponds and stormwater wetlands actually indicate that only about 50% of those studied meet the performance standard shown in the figure above. However, DEQ is retaining these as Primary SCMs due to their history as being considered stand-alone SCMs and their capacity to manage peak flows.

[2] The research data on level spreader-filter strips actually indicate that they do meet the performance standard shown in the figure above. However, DEQ is retaining LS-FS as a Secondary SCM for the present because the research sites were sized 50-300 times larger than the MDC for this SCM require.

Reducing Impervious Surfaces

Most stormwater rules provide an option to avoid the need for engineered stormwater controls if certain low density development criteria are met. Keeping the percent impervious surface low when possible is the preferred method of stormwater control. In addition, reducing the percentage of impervious cover in a high density development may reduce the size of required SCMs.

Some of the options for reducing impervious surfaces are listed below. The local planning jurisdiction will usually determine the availability of these options.

- Reducing road widths
- Reducing minimum parking requirements
- Minimizing use of curb and gutter
- Cluster or open-space developments
- Traditional neighborhood developments
- Mixed-use developments
- The use of permeable pavements
- Shared driveways

Appendix G of the Neuse River Basin: Model Stormwater Program for Nitrogen Control (1999) discusses site design techniques to reduce impervious surfaces in greater detail.

Comparison of SCM Treatment Capabilities

If the low-density option is not chosen or not available, then one or more structural SCMs may be needed. For structural SCMs, one or more of the following general requirements will apply:

- There will be a pollutant removal requirement for TSS (primary vs. secondary SCM) and/or a maximum pollutant discharge limit (maximum pollutant export rate for TN and possibly also TP) imposed.
- There will be a volume of stormwater that must be captured and treated prior to release (typically first 1 inch or first 1.5 inches of rainfall).
- The post-construction peak stormwater discharge rate must be reduced to no greater than the pre-construction peak stormwater discharge rate (usually for the 1-year, 24-hour storm).

Fecal coliform reduction is currently regulated as a narrative requirement rather than a quantitative requirement. Effort should be made to reduce fecal coliform levels in SA waters. The primary mechanism for reducing fecal coliform in stormwater SCMs is through exposure to UV light (sunlight), which happens regularly in devices containing areas which become temporarily inundated with stormwater. Additionally, fecal coliforms can be reduced by filtration, drying events between storms, and sedimentation. Some scientists also believe predation from other microbes can significantly reduce fecal coliform numbers (Hathaway and Hunt, 2008).

Thermal impacts of SCM discharges is of concern in HQW waters that support trout. The higher temperatures reduce dissolved oxygen, reduce reproductive rates, hinder growth, increase disease exposure, and may have other negative impacts. Temperatures are typically increased due to ponded water being exposed to sunlight.

Detailed information and tables on SCM treatment capabilities is available in the SCM Crediting Document located on the NCDEQ Stormwater Design Manual website.

Comparison of SCM Site Constraints

The basic nature of stormwater SCMs often places them in low-lying areas and next to existing waterways, which can conflict with other regulations. The designer should consider other regulations and site constraints when siting SCMs. A non-exhaustive list of possible environmental and regulatory issues is provided below:

- Jurisdictional & isolated wetlands
- Stream channels
- FEMA floodplains
- Riparian buffers
- Forest or tree conservation areas
- Critical water supply watershed areas
- Endangered species
- Standing water near airports

SCMs should also be sited in a manner that avoids the following types of infrastructure: Utilities

- Roads
- Structures
- Septic drain fields
- Wells

A SCM will not work unless it is sited appropriately. It is critical to obtain information about the size of the drainage area, soils and slopes as well as depth to groundwater table and bedrock.

The various site considerations for siting SCMs is presented in Table 1 below. Each of these considerations is discussed below.

The size of drainage area is a primary consideration in selecting a SCM. Some SCMs will only function properly with drainage area that is of sufficient size to maintain a permanent pool of water. Other SCMs, such as bioretention areas and sand filters, may only handle smaller flows and could become overwhelmed if sited at the outlet of a large drainage area.

The space required for a SCM is another important consideration, particularly if the site has limited space to accommodate a SCM and the room to access and maintain it. However, SCMs that require a small space may be relatively expensive (i.e., sand filter) or may not have high treatment capabilities (i.e., grassed swale).

The head required (elevation difference) will also affect the SCM selected. In areas of low relief, costly excavation is often required for basins. In addition, the hydraulic head necessary for some devices to function properly may not be available in low relief areas.

Steep slopes will affect the SCM selection process. Larger SCMs, such as wet detention basins and extended detention wetlands, may be impractical on a site where steep topography results in an impractically large embankment height or slopes that cannot be stabilized with vegetation. Also, steep slopes may create excessive flow velocities for some systems (e.g.: filter strips, swales, restored riparian buffer). When an entire site has steep slopes, it may be best to provide a number of smaller SCMs that can fit into the existing contours of the site.

A shallow water table can limit some types of SCM systems. For example, bioretention areas normally require a minimum depth to groundwater of two feet; otherwise, the bioretention area will actually function as a stormwater wetland.

A shallow depth to bedrock can greatly limit SCM options. Shallow bedrock can restrict the use of infiltration systems, prevent the excavation of basins, and limit the hydraulic functions of

certain SCMs. The SCM options available in this scenario may be limited to filter strips, restored riparian buffers rooftop runoff management, and other above ground measures Sites with contaminated soils may require locating SCM's in uncontaminated areas, impervious linings to prevent infiltration from transporting contaminants, removing the contaminated soil, or selecting an SCM that does not involve infiltration.

High sediment input can significantly reduce the longevity of certain SCMs, especially sand filters, bioretention, infiltration systems, stormwater wetlands, and permeable pavement. These SCMs should not be placed in locations where high sediment loads are anticipated upstream in the future (typically from future development). Alternatively, high sediment loads that might adversely affect SCMs can be overcome by providing pre-treatment in the form of filter strips, fore-bays, and sediment basins.

Poorly drained soils are another SCM siting consideration. For example, poorly drained soils may exclude the use of any system relying on infiltration, such as bioretention areas unless an underdrain is utilized Poorly drained soils may be very well suited, however, for SCMs that retain water, such as a wet detention basin or a stormwater wetland.

Comparison of SCM Costs, Community Acceptance & Site Compatibility

Construction costs and operation and maintenance efforts for each of the SCMs are listed in Table 3. However, it is important to note that some of the lowest cost or lowest maintenance level SCMs also have some of the lowest treatment capabilities. Using low-cost SCMs could result in a need for additional SCMs to achieve regulatory requirements, thereby increasing costs and maintenance requirements. In addition, several of the lowest cost SCMs may be difficult to integrate into the natural features of a site or may be the least desirable from an aesthetic or safety point of view. Often, a slightly more expensive or maintenance intensive SCM may be a better choice for overall site design. Since land cost will vary from site to site it is not included in the table but should also be considered in the selection of the most appropriate SCM.

Sometimes community and environmental factors seem like the least important, but they can actually have a big impact on the public perception and acceptance of a site development. For instance, a prospective homeowner may think twice before buying a property bordering a large, fenced-in dry extended detention basin with a large corrugated metal riser pipe or next to a constructed wetland due to concerns of mosquitos and their role as disease vectors. However, acceptance might be improved if the SCM served as an aesthetic amenity on the site, possibly with birds, frogs, and fish.

Safety is also of concern in the selection of SCMs. Wet ponds, constructed wetlands, and other SCMs that maintain pools of water may not be appropriate for residential areas, schools, or day care facilities where young children may have access to them. Ponded water and accessible confined spaces such as open culverts and risers should be avoided or fenced to prevent unwanted access.

Similarly, airports must manage stormwater in a way that will not compromise aircraft safety. Many traditional stormwater BMPs SCMs promote standing water that may attract wildlife. Wildlife, including birds and mammals, can be a threat to human safety during takeoff and landing, and stormwater BMPs must not increase that threat. Stormwater BMPs SCM should

be selected and designed to minimize habitat and associated risks. Table 4 provides information on each SCM's potential safety concerns, community acceptance, and wildlife habitat.

Table 3: Potential Siting Constraints for SCMs

SCM	Size of Drainage Area	Space Needed	Stage Allowed	Works with Steep Slopes	Works with Shallow Water Table	Works with Shallow Depth to Bedrock	Works with High Sediment Input	Works in Poorly Drained Soils
Bioretention without Underdrain	S	L	Low	Y	N	N	N	N
Bioretention with Underdrain	S	L	Low	Y	N	N	N	Y
Stormwater Wetland	S-L	L	Low	N	Y	N	Y	Y
Wet Pond	M-L	M-L	High	N	Y	N	Y	Y
Sand Filter	S	S	Medium	Y	N	N	N	Y
Permeable Pavement	S-M	N/A	Low	N	N	N	N	Y
Infiltration Device	S-L	S-L	High	N	N	N	N	N
Filter Strip	S	M	Low	N	Y	Y	N	Y
Treatment Swale	S	S	Low	Y	Y	N	N	Y
Dry Pond	S-L	S-L	High	N	N	N	Y	Y

Table 4: Cost, Community & Environmental Issues for SCMs

SCM	Construction Cost	Maintenance Level	Safety Concerns	Community Acceptance	Wildlife Habitat
Bioretention	Med-High	Med-High	N	High	High
Stormwater Wetland	Med	Med	Y	Med	High
Wet Pond	Med	Med	Y	Med	Med
Sand Filter	High	High	N	Med	Low
Permeable Pavement	Med-High	High	N	High	N/A
Infiltration Device	Med	Med	N	Med-High	Low
Filter Strip	Low	Low	N	High	Med
Treatment Swale	Low	Low	N	High	Low
Dry Pond	Med	Med	Y	Low	Low
Rooftop Runoff System	Med-High	High	N	High	Med

Name	Street #	Street Name	Phone #	Email Add.	Notes	
Tom Gill		Sand Castle Dr		c141club@aol.com	June 2020 requests that we consider solutions to the flooding issue in the neighborhood including blowing out of pipes, recurring trenching and cleaning of easements, andensuring downstream ponds are properly draining.	
Ron Brewer		Sand Castle Dr		rbrewer11@comcast.net	Not much info on the email from Artie. Assuming it is general flooding issues in and around their home.	
Dan and Beth Crompton	115	Sand Castle Dr	919-909-1536	beth.crompton@gmail.com	May 2020 contacted Matt asking if something can be done about drainage problem on their street which they believe is cuasing lingering water.	
Bob Walters	117	Sand Castle Dr	919-906-5413	rpwalters5@gmail.com	June 2020 J. Edmondson, and A.Dunn had a conference call with owner, Spoke with Matt, A. Dunn, and J. Edmondson on 6/12/2020. Owner states that he believes the drainage system from sandcastle to Sea Dunes to Conch and further down is inadequate and poorly maintained.	
Diane Brewer	119	Sand Castle Dr	901-830-4049	dbrewer1967@gmail.com	May 2020 resident contacted J. Edmondson about a neighbor draining onto their lot. Owner states they have planned and paid for water/drainage mitigation plan and issues around their property are being caused by other neighbor. Would like to town to address the neighbor or the water issue in general.	833 Richmon Street, Raleigh, NC 27609
Pat Sheldon	120	Sand Castle Dr	434-728-3593	pat@romarelevators.com	May 2020 contacted Matt about the flooding on their property.	
Rick Landis	121	Sand Castle Dr	252-523-2000 Mobile: 252-939-5748	rfl@wmblawyers.com	Met with J.Edmondson on 11/13/18 and owners of 114 and 121 Sandcastle Dr. Is asking for use of existing easements or acquire more, cleaning easment areas and ponds, running/installing pumping system, and town purchase of lot 19, Block E for a retention pond.	
Rob Labriola	137	Sand Castle Dr		roblabs@aol.com	Asking for a drainage survey for a solution to flooding issues.	
James Anderson	214	Cedar St	252-342-5033	janderson@ufsrw.com	Jan 2019 Josh had contact with owner and stated that the hole (do not have back information about this "hole") was not filled with correct material offering a sub-optimal drainage situation. At that time, J. Edmondson offered a solution consisting of removing some of fill and creating a large storage area. June 2020 owner contacted J. Edmondson stating that the problem has not been resolved.	
Michele Sullivan	108	Fawn Drive	203-598-5985	jmjsullivan124@gmail.com	June 2020 contacted Matt, A.Dunn, and J. Edmondson about flooding in the Royall Oaks neighborhood and water blocking the roads and beach accesses by Pebble Beach and Deer Horn Drive.	
Ray Register	121	Fawn Drive	703-785-6105	rreggi@aol.com	June 2020 contacted Matt about flooding and their de-watering pond located behind their home. Owner believes there are additional measure that can be taken to mitigtate the flooding near their home.	
Tina Siegel	124	Fawn Drive		tsiegel@eyecarecenter.com	Tina has contacted the town over the years regarding issues in Pebble Beach. She attended Town Hall meeting in September 2019 where she didn't feel like her concerns were addressed properly. There were many communicates between then and EOY 2019 regarding Pebble Beach and their drainage system. Pebble Beach stated that were going to re-do their system and Josh has been in contact with her and Pebble Beach during this time. She suggested a "Stormwater Management Committee" in June 2020	
	9253	Ocean Drive				
Kate Mazza		Doe Drive	919-244-1762	kmazza300@gmail.com	June 2020 contacted Matt about flooding issues on property regarding 1) mosquito spraying, 2) plans on future town pump purchases, 3)new building permit compliance suggestion.	
Chuck Lewis	112	Doe Drive	919-619-9878	lewisbldgco@bellsouth.net	June 2020 has questions about the culvert drain in their yard	
Anna Mae Neltner	10501	Island Circle		sanddollar@embarqmail.com	Sent pictures showing backyard June 2020.	
Jan Joseph	9251	Ocean Drive		jkjoseph30@gmail.com	Artie, Josh, and Town have been contacted by the owner starting May 2020. TOEI has stated that the solution will not happen over night and Pebble Beach has not changed anything to affect their area. Resdient contacted TOEI again stating that drieway was flooded and guests could not use it and asked PD if thye can park on Ocean Drive. They were directed to PD and told the solution is still being addresse behind the scenes. Also asked if they can pump into Pebble Beach parking lot. Not sure if they were given any particular answer.	
Deanna Feddersen		Ocean Drive	703-629-1751	ddfeddersen@gmail.com	Is related to the Jan Joseph case. May be a property manager or something of that sort.	
Gina Lambert		Deer Horn Dr		gina.nccoast@gmail.com	June 2020 contacted TOEI asking for the town to better maintain the drainage pond on Deer Horn Dr.	
Nicki Sirmans		Channel Dr		nickibtsid@gmail.com	May 2020 contacted J. Edmondson about installing a pump to redirect to closest retention pond	
Pamela James	103	Inlet Ct		par4@carolina.rr.com	May 2020 contact J. Edmondson regarding flooding issues in their neighborhood and lot.	
Susan Nichols	11012	Inlet Dr	717-554-6929	snichols@falcontherapeutics.com	June 2020 contacted Matt about flooding on her property and asks what is being done to mitigate it.	
Clint Routson		Dolphon Ridge	252-670-0966	cdr@wardandsmiht.com	May 2020 asks for PW to clear the pipes leading from DR to Spinnaker's Reach.	
Henry Mull		Coast Guard Rd	252-241-5489	hemulljr@gmail.com	June 2020 is asking for help with drainage issues on Island Circle.	
Tyler Marcell		Lands End	972-838-6740	tmmarcell@yahoo.com	May 2020 held a Zoom meeting with J.Smith, J. Edmondson, A.Dunn, and Matt to discuss storwater issues. Later they met in person to continue conversations. In the meantime, Don Brookins contacted United Rentals for a pump and found that they have 3-inch trash pumps which will not work for their concerns.	
Don Brookins					Related to Tyler Marcell situation	
Joe Weckerly					Related to Tyler Marcell situation	
Greg Ohmstede					Related to Tyler Marcell situation	
Charmione Marcell					Related to Tyler Marcell situation	
Joe Gross	301	Osprey Ridge	910-389-2056	grosssjs@hotmail.com	April 2020 contacted A.Dunn and Matt to ask about the stormwater pump installed in El Woods and asks whether there is the ability to use a generator when power goes out. At this point, there is not.	
Mat Matheson	7000 block	Sound Dr	252-503-5606	marble@centurylink.net	June 2020 contacted Matt about 1) 7000 Sound Dr gutter being filled by contractors using it to store dirt and never restored it and 2)neighbor at 7010 Sound Dr storm water mitigation plan was not completed to code and would like a curb at 7010 installed to keep the water in the road ROW.	
Jerry Blythe	7209	Sound Dr	Mobile: 252-635-7021 Office: 252-393-1722	jblythe10@yahoo.com	June 2020 contacted TOEI regarding flooding on their lot. Also discussed issues with the drain pipe and clogging issues. Owner was told that TOEI is securing prices to clean and camera undergroun pipes owned and maintained by the town.	
Jimmy Marler	8513	Sound Dr	919-631-6490		June 2020 contacted TOEI to speak to Matt about flooding	
Charles and Jan Hannan	114	Wyndward Ct		eibeachers@twc.com	June 2020 contacted A.Dunn and Matt about flooding in their area. Stated a town rep let them know that their area was part of an overall assessment for EI.	
Ed Batten				ebatten28594@gmail.com	June 2020 contacted A.Dunn regarding flooding issues in his area claiming it to be caused b Ocean Oaks pipe and EI Woods Park.	
Tom Markovich		Cape Emerald	330-518-6331	tommarkovich@homail.com	Preside of Cape Emerald	
Karen Dee	321	Cape Fear Lp		kdennis05@gmail.com	May 2020 contacted J. Edmondson regarding flooding in their yard claiming that the flooding ahs gotten worse since the EI Woods Park retention pond work.	
John Farmer	8614	Reed Drive	252-299-0156	farmerj@myglnc.com	June 2020 contacted Matt regarding the flow of ditch runoff between his property and Loon dr. Would like to know what plans there are for Reed Dr.	
Pam Frutinger	8512	Reed Drive	252-714-4470	pfrutinger1134@hotmail.com	June 2020 contacted EI about flooding on Reed Dr. Would like to have a pump allocated to East Reed Dr	
Debbie and Ken Gardner	8502	Reed Drive	19-880-5284	debragardner4@gmail	Pam Frutinger has had contact with this person and they are "supportive of developing solutions"	
Paul and Jeanette Lamm	8505	Reed Drive	252-289-0131		Pam Frutinger has had contact with this person and they are "supportive of developing solutions"	
Gerald and Nelda Futrell	8508	Reed Drive	910-389-0527		Pam Frutinger has had contact with this person and they are "supportive of developing solutions"	
Roger and Chris Allen	8510	Reed Drive	919-810-0773	chrishumphrey1@yahoo	Pam Frutinger has had contact with this person and they are "supportive of developing solutions"	
Joy Legget	8514	Reed Drive	252-567-2388		Pam Frutinger has had contact with this person and they are "supportive of developing solutions"	
Twyla Ashley-Cates	8516	Reed Drive			Pam Frutinger has had contact with this person and they are "supportive of developing solutions"	
Guy and Lana Russell	8518	Reed Drive	252-560-0636	beachtime42@hotmail	Pam Frutinger has had contact with this person and they are "supportive of developing solutions"	
Ethan Lenker	114	Sea Dunes	252-342-2694	elenker@hotmail.com	June 2020 contacted TOEI stating that pipe between 116-118 Sea Dunes is not draining and water is being held up on the streets. Artie has been made aware of the problem as well.	

Troutner Family	909	Emerald Drive	301-580-5760	kristineessman@gmail.com	Has had contact with TOEI regarding flooding on their property, specifically, in and around their shed since 2015. Stated that this started when the bike path was built. There have been options provided by the Town in the past including buying a new shed, but owners have not agreed to this. The problems they discussed then are the same in June 2020.	
Russ Swindell		Janell Steet	919-418-6104	raswindell@gmail.com	June 2020 Owner contacted Pine Knoll Shores regarding flooding issues on their poroperty who then let Matt know of the issue.	
Kathy Hunt	120	Myrtle	252-354-3300	kathythunt@yahoo	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Graham Hunt	121	Sea Oats	919-690-6968		Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Jen Temple	121	Shell Dr.	910-382-2128	jentemple67@yahoo	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Joy Rouse	8514	Reed	252-558-2569	jmrjwr1@gmail	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Tim & Diane	126	Sea Oats			Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Jane Craver	103	W. Seaview	252-503-2156		Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
James E. Boyd	105	Sea Oats	919-971-0358		Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Cindy Boyd	105	Sea Oats	919-971-0761	clcouch@aol	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Amos & Fay Mantyla	105	w. Seaview	252-626-1825	fmantyla@embarqmail	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Rose Richards	103	Yaupon Dr.			Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
John Richards	105	Yaupon Dr.			Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Penny & Paul Rhodes	8522	Reed	252-413-7846	pennyhyde11@gmail	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Roger Barrow	118	Sandbur		rlbarrow@embarqmail	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	F
Barbara Young	118	Myrtle Dr.	336-413-6233	bhyoung123@gmail	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Stacey Whitley		Myrtle Dr.	919-524-5555	jymco@earthlink.net	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Brynn Shoffner	8612	Reed Dr.	910-200-3850	brynnshoffner@gmail	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Ashly Massey	118	E. Seaview	336-214-1328	ashlymassy7@gmail	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Tracy Pickett	110	E. Seaview	919-824-3768	teuliss@yahoo.com	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Bill & Betty Grooms	116	W. Seaview	336-813-3738		Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Angela McLemore	123	Seaview			Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Billy Eatmos	112	W. Seaview	252-977-2196	msdazj@aol	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Bill & Karen Mitchell	109	W. Seaview	336-212-4335		Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Douglas Efland	107	East Seaview		dougmkc@msn	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Ofelia Waddell	1578	Burgaw Hwy.	910-581-7935	najj1530@icloud	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Mel Laakso	8504	Ocean View Dr.	919-610-5754	mellaakso@mc.rr	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Lewis Wilson	112	E. Seaview	910-352-4295	lawviv@yahoo	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Charles McBode	106	E. Seaview	336-580-1218	acmcdade2@yahoo	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Jim Sams	130	E. Seaview			Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Austin McIntyre	128	E. Seaview		austinbmcintyre@gmail	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Brent Theisboges	2713	CreekB Graham (NC)	919-451-4102		Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Mike Bartholmue	2913	Foxwood Rd.	336-578-7243		Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Jeff Casper	119	E. Seaview	919-662-1822	jeffcasper456@gmail	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Anita Hendrickson	120	E. Seaview			Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Marsha & Gregory Dowd	143	Ball Hill Rd. Raleigh (N	978-464-5026		Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Christine Bright	1938	Corbett Twn, Snow Hi	252-321-1565	cbbright5@gmail.	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Dorothy Wester	116	E. Seaview	919-495-1013	westerfarms@embarqmail	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Coty Stancill	111	E. Seaview			Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Debbie & David Grimes	111	W. Seaview	252-775-1037	dgrimes@lenoir.cc.edu	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Sheila Hunter-White	115	Bayberry Dr.	252-916-8080	nursesheila1@embarqmail	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Faye Stephenson Bob Cle	118	W. Seaview	919=558-0555	123Flloyd@gmail.	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Rick & Trudy Waters	119	W. Seaview	252-354-3427		Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Jeff & Ann Jeffreys	108	W. Seaview	252-813-4401	jccinc@embarqmail	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Philip & Joan Lytle	110	W. Seaview	252-237-3358	pjlytle1@yhahoo.com	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Sid & Onie Coppedge	122	W. Seaview Dr.	919-801-4405	oniecoppedge@gmail	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
B. W. Thomas	Holiday Travel Park		919-810-1760		Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Jeffrey Patrick	123	W. Seaview	252-939-5090	jpatrick3@ec.rr.com	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Donna Collins	121	E. Seaview	252-764-3162		Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Chris Johnson/Cjohnson@	8504	Reed Dr.	804-869-3005	jamesriverequipment.com	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Darcy Johnson			434-250-3719		Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Charles & Maryanne Tingen	114	E. Seaview	252-354-7238	matingen@embarqmail.com	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Bonnie Hughbanks	121	W. Seaview	859-421-2698		Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Kathy & David Cauley	123	Sea Oats Dr.	252-560-0901	kscauley@gmail.com	Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Joseph Martin	3721	Landshore Dr.	615-761-7179		Pam Frutinger has had contact with this person and they completed a survey to demonstrate community support	
Al Roxo	130	Doe Dr	631-807-3119	aroxo@roxoenterprises.com	Stormwater issues in backyard	
Judie Ware	9259	Ocean Drive (West)	252-354-4836	Jware209@hotmail.com	Stormwater issues along the 9200 block of Ocean Drive	
Susan Fitzgerald	9259	Ocean Drive (East)	703-927-2039	fitzgerald151@gmail.com	Stormwater issues along the 9200 block of Ocean Drive	
Athan Parker		Canal Drive		athan.parker@ampdengineering.com	Has emailed with Matt and Josh about a desining a retention pond on his property. Alleviate ponding and "flash flooding" on canal	
Adam and Carrie Papp		12th and Ocean Dr			Artie asked me to add these names. Concerned about stormwater	
Betty and Wilson Price (Daughter Pam Smith is POA)		6301 Ocean Dr	252-532-6797	smithpam2006@yahoo.com	Paige talked to the daughter who was concerned about stormwater floding at 6301 (103 Country Court, RR, NC, 27870)	
Sonya & John Watkins		201 Seagull Rd	919-426-8309 or 919-426-8758	sonywat@aol.com	Email with Matt. Happy to stormwater initiatives, hope Seagull is being looked at. They can see the water coming from 58, Sandpiper, down to Seagull	
Ed Miner		Beachview Ln		edward.miner@gmail.com	Sent an email to Matt after a rain event. Ground flooding on Beach View Ln. Water in driveway	
Robert Ditaranti		113 Black Skimmer			Sent an email to Josh gets runoff from both directions of street during rain events and is causing issues to his driveway.	
Edward Brice		210 Old Cove Rd			Following moderate to less moderate rain storms excessive ponding occurs and washout of neighboring topsoil and mulch. Email and Photo sent to Josh.	
Bogue Ct						
Channel Dr Cul De Sac						
Pney St Area and East End Archers Creek						
Neal Newhouse			(919) 349-4097	neal.newhouse@transimpact.com	Deerhorn Dunes entrance floods, sometimes to the point that cars cannot get through	
Eric Stonehouse	131	Wyndward Ct	(919) 397-4112	estonehouse@micron.com	Flooding at the culdesac at Wyndward Ct	
Jason M. Vande Linde	110	Live Oak	704-231-1949	COASTAL4@live.com	Flooding off of Live Oak	
Jeff Patrick	123	W Seaview Dr			Bought property in the 60's and has been experiencing flooding for 50 years from street and others. He is and has been the low spot.	
Ed Holland	7309	Sound Dr	252-916-2719	eehollandjr@gmail.com	would like to see HIGH WATER signs on his block (7300 block of Sound Dr) during standing water	

Mrs. Patricia Leonard	325	Cedar St	336-596-0580		Water is ponding on both the north and south side of her driveway-- It dissipates quickly, but she is concerned about erosion and future issues.
Frank Lahnste,	303	Spell Drive			Water ponds in road in front of his house during rain events. Sometimes comes on driveway in front yard. Has been an issue for a long time
George Ritchie (Mailing: 4441 S Pecan Dr. Chandler, ZA 85248)	203	Scotch Bonnet	949-573-8430	georitchie@icloud.com	Asphalt improvements made along NC 58 (*associated with the boat ramp turning lane*) are causing increased sheet water flow. This flow is moving southbound down Scotch Bonnet and impacting the southern property line of 203 Scotch Bonnet, where it intersects the northern property lir
Bogue Inlet Drive Culvert					Bogue Inlet Dr- Culvert replacement/ embankment improvement to project list
Andy S. Truell		Sound Drive		andytruell@yahoo.com	Sent picture of his yard after rainstorms (email sent on 08/02/2021), said that standing water had reached 3 ft deep at one point. Email & Photo.
Christy and Al Roxo	8516 130	Doe Drive	631-807-4378	Christy Roxo archristy28@icloud.com Al Roxo aroxo@roxoenterprises.com	sent picture of their yard with flooding, emailed concerns that the yard floods with heavy rain events
Dr Donna Anderson	7004	Sound Drive		drandy2008@yahoo.com>	emailed pictures after heavy rain events showing their flooded cul de sac, saying it is frequently underwater when there is rain
Helen Ramazaio	7206	Sound Drive		hramazio@emeraldisle-nc.org	emailed saying there was major flooding in her area
Peter VanDermuelen	143	Doe Drive	(315) 447-8685		stagnant water/storm water issues, Frank Rush allowed him to pump stormwater drain to the nearest catch basin
Karen Dee	321	Cape Fear loop	(619) 384-1992	kdennis05@gmail.com	Yard floods, retention ponds overflow
Jimmy Marler	8513	Sound Drive	919-631-6490	Jmarlerc2@yahoo.com	standing water on 8513 Sound Drive
Richard Mazloon	10518	Wyndtree	919-614-3351		upset because of storm water running from Wyndward Court onto his property. According to Mr. Mazloom, the neighbor behind his home installed a pool (131 Wyndward Court) in December. Mr. Mazloom said the storm water from that property now fills his driveway and his neighbor's driveway since the pool was installed. The adjacent neighbor, John Griffin, who resides at 10516 Wyndtree, is experiencing the same issue (storm water in his driveway).
Maureen Callaghan Lau		Inlet Drive	910.688.3571; 443.854.0822		due to development over the years and build-up of properties, water flows down the street into her yard causing standing water. She sent a link
Jeff Eveland	11008 4801	Ocean Drive	(mobile direct) (703) 217-5444	coastalncliving1@gmail.com jeffreyweveland@yahoo.com	showing a video and pictures as well. Link to video: https://drive.google.com/drive/folders/1tAVMT2keBlBlfxsLinYI2xmbGw8adCSI?usp=sharing Our property gets rain runoff coming straight down Edna Street, and the slope of Ocean Drive adds to the accumulation of water. When the house at 4803 Ocean was built a few years ago, they raised the driveway and put in drains which empty into my driveway at its lowest point. A conflue
David and Angela Williamson	106	Pinta Dr	919-219-9454	agwilliamson@earthlink.net; dkwilliamson@earthlink.net	had questions about retaining wall at 108 Pinta and ponding on their property
Tom and Lisa Mackey	105	Channel Dr	910-709-6967	tomhmackey@gmail.com	stormwater issues on street
Vicki Byrd		5004 Bogue Sound Ct			Concenred with 5002 Bogue Sound Ct development and flooding