Municipal Stormwater Management Plan
For
Borough of Califon
Hunterdon County, New Jersey

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Introduction

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the Borough of Califon to address stormwater-related impacts. The creation of this plan is required by The Municipal Stormwater Regulation Program (N.J.A.C. 7:8-4). This plan contains all the required elements described in the Stormwater Management Rules (N.J.A.C. 7:8). The plan addresses groundwater recharge, stormwater quantity, and stormwater quality impacts by incorporating stormwater design and performance standards for new major development, defined as projects that disturb one or more acre of land. These standards are intended to minimize the adverse impact of stormwater runoff on water quality and water quantity and the loss of groundwater recharge that provides base flow in receiving water bodies. The plan describes long-term operation and maintenance measures for existing and future stormwater facilities.

A "build-out" analysis has been included in this plan based upon existing zoning and land available for development. The plan also addresses the review and update of existing ordinances, the Borough Master Plan, and other planning documents to allow for project designs that include low impact development techniques. The final component of this plan is a mitigation strategy for when a variance or exemption of the design and performance standards is sought. As part of the mitigation section of the stormwater plan, specific stormwater management measures are identified to lessen the impact of existing development.

Goals

The goals of this MSWMP are to:

- reduce flood damage, including damage to life and property;
- minimize, to the extent practical, any increase in stormwater runoff from any new development;
- reduce soil erosion from any development or construction project;
- assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures;
- maintain groundwater recharge;
- prevent, to the greatest extent feasible, an increase in nonpoint pollution;
- maintain the integrity of stream channels for their biological functions, as well as for drainage;
- minimize pollutants in stormwater runoff from new and existing development to restore, enhance, and maintain the chemical, physical, and biological integrity of the waters of the state, to protect public health, to safeguard fish and aquatic life and scenic and ecological values, and to enhance the domestic, municipal, recreational, industrial, and other uses of water; and,
- protect public safety through the proper design and operation of stormwater basins.

In addition, it is the purpose of the Borough of Califon's stormwater management requirements, outlined in Chapter 15.60 of the Borough's Code Book, to establish minimum stormwater management requirements and controls to serve the purposes expressed in the state's Stormwater Management Rules (NJAC 7:8).

To achieve these goals, this plan outlines specific stormwater design and performance standards for new development. Additionally, the plan proposes stormwater management controls to address impacts from existing development. Preventative and corrective maintenance strategies are included in the plan to ensure long-term effectiveness of stormwater management facilities. The plan also outlines safety standards for stormwater infrastructure to be implemented to protect public safety.

Stormwater Discussion

Land development can dramatically alter the hydrologic cycle (See Figure 1) of a site and, ultimately, an entire watershed. Prior to development, native vegetation can either directly intercept precipitation or draw that portion that has infiltrated into the ground and return it to the atmosphere through evapotranspiration. Development can remove this beneficial vegetation and replace it with lawn or impervious cover, reducing the site's evapotranspiration and infiltration rates. Clearing and grading a site can remove depressions that store rainfall. Construction activities may also compact the soil and diminish its infiltration ability, resulting in increased volumes and rates of stormwater runoff from the site. Impervious areas that are connected to each other through gutters, channels, and storm sewers can transport runoff more quickly than natural areas. This shortening of the transport or travel time quickens the rainfall-runoff response of the drainage area, causing flow in downstream waterways to peak faster and higher than natural conditions. These increases can create new and aggravate existing downstream flooding and erosion problems and increase the quantity of sediment in the channel. Filtration of runoff and removal of pollutants by surface and channel vegetation is eliminated by storm sewers that discharge runoff directly into a stream. Increases in impervious area can also decrease opportunities for infiltration which, in turn, reduces stream base flow and groundwater recharge. Reduced base flows and increased peak flows produce greater fluctuations between normal and storm flow rates, which can increase channel erosion. Reduced base flows can also negatively impact the hydrology of adjacent wetlands and the health of biological communities that depend on base flows. Finally, erosion and sedimentation can destroy habitat from which some species cannot adapt.

In addition to increases in runoff peaks, volumes, and loss of groundwater recharge, land development often results in the accumulation of pollutants on the land surface that runoff can mobilize and transport to streams. New impervious surfaces and cleared areas created by development can accumulate a variety of pollutants from the atmosphere, fertilizers, animal wastes, and leakage and wear from vehicles. Pollutants can include metals, suspended solids, hydrocarbons, pathogens, and nutrients.

In addition to increased pollutant loading, land development can adversely affect water quality and stream biota in more subtle ways. For example, stormwater falling on impervious surfaces or stored in detention or retention basins can become heated and raise the temperature of the downstream waterway, adversely affecting cold water fish species such as trout. Development can remove trees along stream banks that normally provide shading, stabilization, and leaf litter that falls into streams and becomes food for the aquatic community.

Background

Location

The Borough of Califon (Borough) encompasses 1.0 square mile area in the northeasterly section of Hunterdon County, New Jersey. The Borough is bordered by Tewksbury Township to the east and by Lebanon Township to the west. The Borough is located in the Highlands physiographic province of New Jersey in the valley of the South Branch of the Raritan River, generally known as Long Valley. Major transportation routes serving the Borough are County Route 512 and County Route 513. Figure 2 illustrates the Borough boundary on USGS Quadrangle.

History

Initial settlement occurred in the mid-18th century around waterpower sites established on the South Branch of the Raritan River and has historically functioned as a rural center. Much of the community's 19th century heritage survives intact within a designated National and State Register of Historic Places historic district. The C.R.N.J. rail line of 1875 is abandoned and its right-of-way has been rededicated to recreational uses.

The central historic core of the Borough consists of small lot residential uses mixed with village commercial establishments. The southern portion of the municipality climbs a northeast-southwest ridge, known as the Fox Hill Range. Residential lots tend to be larger due to steep slopes and other natural constraints. North of the Raritan River, there is more recent residential development mostly constructed between 1950 to 1970. Commercial retail development exists along CR513.

Historically, the Raritan River was utilized to power gristmills in the Borough. Today, much of the waterfront land has been reinterpreted as open space and recreational area. Preservation of the river access and the overall condition of the river is of major importance to maintaining the unique character of the Borough.

Population

The population of the Borough has decreased by 71 persons, from 1,076 in 2010, to 1,005 in 2020, a decrease of 6.6%. The data indicates there has not been a significant change in population during this time period and in turn there have been few changes in the landscape which would increase stormwater runoff volumes and pollutant loads to the waterways of the municipality.

Waterways/Ponds

The Borough has within its borders two major waterways; the South Branch Raritan River which flows south through the center of the municipality and the Frog Hollow Brook which also flows south through the center of the municipality to its confluence with the South Branch Raritan River. The South Branch of the Raritan River flows through the Borough in a southwesterly direction. The South Branch of the Raritan River emanates from Budd Lake and then flows through Roxbury, Washington, and Lebanon Townships before entering the Borough. The river is impounded by a stone masonry dam located along River Road. This structure creates a slack water area that is valuable as a recreational and aesthetic facility. An area of open space adjoins this pool on the north side of the river along First Street. Overall, the river is a highly valuable landscape feature in the Borough.

Frog Hollow Brook enters the Borough at the eastern border. The headwaters are located in Washington Township and then flows through Tewksbury Township before entering the Borough. Frog Hollow Brook flows southwesterly following Philhower Avenue before turning northwesterly, parallel to Main Street and entering the South Branch of the Raritan River just upstream of the Main Street Bridge.

A small unnamed tributary forms between Academy and Main Streets, and then is piped via brick masonry culvert to Frog Hollow Brook. Figure 3 illustrates the waterways in the Borough.

Two (2) ponds are located within the Borough. One pond is located in close proximity to Frog Hollow Brook near the Borough's eastern border. The other pond is located within Island Park.

The South Branch Raritan River has the following connecting tributaries within the Borough: one located adjacent to Bank Street, two along Hoffman Drive and two along Raritan River Road. Frog Hollow Brook has the following connecting tributaries within the Borough: one along Philhower Avenue, one along Railroad Avenue and one that runs perpendicular to Bank Street that connects to South Branch Raritan River. In addition to these two water courses, there is an un-coded tributary that is located in the south east quadrant of the Borough (adjacent to Califon Cokesbury Road). Lastly, although the Rockaway Creek Tributary is located approximately 1,000 ft south of the Borough's border, the Rockaway Creek Tributary is a Category One waterway that has a floodway that expands into the Borough's border.

The Borough of Califon is located entirely within the Highlands Preservation Area. The South Branch Raritan River, Frog Hollow Brook and the minor tributaries to these waterways within the Borough of Califon are designated as a "Category One" water bodies. The NJDEP has designated a special level of protection for a number of waterways in New Jersey. This protection targets water bodies that provide drinking water, habitat for endangered and threatened species, and popular recreational and/or commercial species, such as trout or shellfish. Waterways can be designated Category One because of exceptional ecological significance, exceptional water supply significance, exceptional recreational significance, exceptional shellfish resource, or exceptional fisheries resource. The Category One designation provides additional protections to water bodies that help prevent water quality degradation and discourage development where it would impair or destroy natural resources and environmental quality. The maintenance of water quality resources is important to all residents, particularly to the many communities that depend upon surface waters for public, industrial, and agricultural water supplies, recreation, tourism, fishing, and shellfish harvesting. Many, if not all, tributaries of the Raritan River have been nominated for inclusion in the Category One designation for reasons including the use of these waters for drinking water; exceptional ecological significance; exceptional recreational significance; and, exceptional water supply.

The Borough of Califon town center (located where Academy Street and Main Street converge) is located at the bottom of steeply sloped areas, in the range of 8 to 10 percent. Within this central area, a majority of the Borough's flooding occurs; particularly along unnamed tributaries, which traverses a natural wooded area between Academy Street and Main Street. In 2015, the Borough undertook a major drainage improvement project which involved the replacement of an existing culvert (located in-between Academy Street and Main Street), drainage improvements along Main Street and recharge trenches in the mitigation property that is bounded by Academy Street, Main Street and Railroad Avenue.

As imperviousness increases in the Borough, the peak and volumes of stream flows also increase. The increase in the amount of water results in stream bank erosion, which results in unstable areas at roadway and bridge crossings, and degraded stream habitats. The creation of impervious surfaces within the Borough has significantly decreased groundwater recharge, decreasing base flows in streams during dry weather periods. Lower base flows can have a negative impact on in-stream habitat during the summer months.

Water Quality

The New Jersey Department of Environmental Protection (NJDEP) has established an Ambient Biomonitoring Network (AMNET) to document the health of the state's waterways. There are over 800 AMNET sites throughout the state of New Jersey. These sites are sampled for benthic macroinvertebrates by NJDEP on a five-year cycle. Streams are classified as non-impaired, moderately impaired, or severely impaired based on the AMNET data. The data is used to generate a New Jersey Impairment Score (NJIS), which is based on several biometrics related to benthic macroinvertebrate community dynamics.

A TMDL is the amount of a pollutant that can be accepted by a waterbody without causing an exceedance of water quality standards or interfering with the ability to use a waterbody for one or more of its designated uses. The allowable load is allocated to the various sources of the pollutant, such as stormwater and wastewater discharges, which require an NJPDES permit to discharge, and nonpoint source, which includes stormwater runoff from agricultural areas and residential areas, along with a margin of safety. Provisions may also be made for future sources in the form of reserve capacity. An implementation plan is developed to identify how the various sources will be reduced to the designated allocations. Implementation strategies may include improved stormwater treatment plants, adoption of ordinances, reforestation of stream corridors, retrofitting stormwater systems, and other BMPs.

There are two separate stretches of the South Branch Raritan River that traverse through the Borough that have been listed as having both TMDL's and impairments that have been recognized and studied by the NJDEP. The first stretch that is listed by the NJDEP as having both TDML's and impairments is "HUC 02030105010060, Raritan R SB (Califon Br to Long Valley)/Stream Classifications FW2-NT, FW2-NTC1, FW2-TCP1". This stretch has the following TMDL's: fecal coliform, total phosphorus and total suspended solids. In addition, this stretch has a temperature impairment listed by the NJDEP. The second stretch that is listed by the NJDEP as having a TDML only is "HUC 02030105010070, Raritan R SB (Stone Mill gage to Califon)/Stream Classifications FW2-NT, FW2-TPC1. This stretch has the following TMDL's: fecal coliform, total phosphorus and total suspended solids. The Frog Hollow Creek water quality was not studied by the NJDEP for having TDML's or any impairments at the time this report was written. All TDML's and impairments have been summarized in the table below.

Although Rockaway Creek does not pass through the Borough, its tributary still effects the southerly border of the municipality during a flood event therefore a stretch of this tributary was studied and included in this report. The stretch of the Rockaway Creek affecting the Borough has been recognized by the NJDEP as having both TDML's and impairments and is listed as "HUC 02030105010080 Rockaway Ck (above McCrea Mills)/Stream Classifications FW2-NT, FW2-TPC1. This stretch has the following TMDL's: total phosphorus and total suspended solids. In addition, this

stretch has a temperature impairment listed by the NJDEP. All TDML's and impairments have been summarized in the table below.

The New Jersey Integrated Water Quality Monitoring and Assessment Report (305(b) and 303(d)) (Integrated List) is required by the federal Clean Water Act to be prepared biennially and is a valuable source of water quality information. This combined report presents the extent to which New Jersey waters are attaining water quality standards and identifies waters that are impaired. The USEPA Guidance for developing Integrated Reports of water quality and listings of impaired water segments recommends placing the assessment results into one of five specific categories as follows:

Category 1: A water body is attaining for all designated uses and no uses are threatened;
Category 2: Water body is attaining the designated use;
Category 3: Insufficient or no data and information to determine if the designated use is attained;
Category 4: Impaired or threatened for one or more designated uses but does not require the development of a TMDL (3 sub-categories).
- A. TMDL has been completed.
- B. Other enforceable pollution control requirements are reasonably expected to result in the attainment of the water quality standard in the near future.
- C. Impairment is not caused by a pollutant.

Category 5: The designated use is not attained. The water body is impaired or threatened for one or more designated uses by a pollutant(s) and requires a TMDL.

The following table summarizes the categories for the water bodies of the Borough of Califon:

Category	Site ID / Assessment Unit ID	Stream Classifications	Station Name/Waterbody	Pollutant of Concern	Impairment
5	02030105010060	FW2-NT FW2-NTC1 FW2-TPC1	Raritan River SB (Califon BR to Long Valley)	Fecal Coliform, Total Phosphorus, Total Suspended Solids (TSS)	Temperature
5	02030105010070	FW2-NT FW2-TPC1	Raritan River SB (StoneMill gage to Califon)	Fecal Coliform, Total Phosphorus, Total Suspended Solids (TSS)	None
5	02030105050080	FW2-NT FW2-TPC1	Rockaway Ck (above McCrea Mills)	Total Phosphorus, Total Suspended Solids (TSS)	Temperature

A TMDL is considered "proposed" when NJDEP publishes the TMDL Report as a proposed Water Quality Management Plan Amendment in the New Jersey Register (NJR) for public review and comment. A TMDL is considered to be "established" when NJDEP finalizes the TMDL Report after considering comments received during the public comment period for the proposed plan amendment and formally submits it to EPA Region 2 for thirty (30)-day review and approval. The TMDL is considered "approved" when the NJDEP-established TMDL is approved by EPA Region 2. The TMDL is "adopted" when the EPA-approved TMDL is adopted by NJDEP as a water quality management plan amendment and the adoption notice is published in the NJR. The Department has adopted each of the approved TMDLs to the appropriate management plan.

Flooding

The Borough of Califon was accepted for participation in the National Flood Insurance Program on August 3, 1981. The National Flood Insurance Program (NFIP) floodplain management regulations encourage that all Federal, State, and Local regulations that are more stringent than the minimum NFIP standards take precedence in permitting decisions. The FHACA requires that the effective Flood Insurance Rate Map, most recent preliminary FEMA mapping and flood studies, and Department delineations be compared to determine the most restrictive mapping. The FHACA also regulates unstudied flood hazard areas in watersheds measuring 50 acres or greater in size and most riparian zones in New Jersey. Because of these higher standards, the regulated flood hazard area in New Jersey may be more expansive and more restrictive than the FEMA Special Flood Hazard Area. Maps and studies that establish flood hazard areas are on file at the Borough municipal office building at 39 Academy St, Califon, New Jersey 07830. The areas of special flood hazard are identified by the Federal Insurance Administration in a report entitled the "Flood Insurance Study, Borough of Califon," dated September 25, 2009 with accompanying Flood Insurance Rate Maps and Flood Boundary-Floodway Maps. The Title 16 of the Borough of Califon that details Flood Damage Prevention and Protection was adopted August 24, 2000 and last amended on December 21, 2022.

Wellhead Protection Areas

There are Public Community Water Supply (PCWS) wells within the Borough of Califon. There are three wellhead protection areas, one community and two non-community, within the Municipal Boundary. Refer to Figure 15 for their location. The two non-community well head protection areas are located along the western border and the one community well head protection area is located directly to the east of the Raritan River that runs through the center of the Municipality. Aqua New Jersey operates a water system within portions of the Borough. Areas outside Aqua's service area are self-supplied by on-site groundwater wells.

Groundwater Recharge

A map of the various annual groundwater recharge rates in the Borough are depicted in Figure 3. As can be seen in the Figure, the annual recharge rates in the Borough range from essentially no recharge to an annual rate of 23 inches per year. These annual recharge rates were obtained from the New Jersey Geological Survey (NJGS) and are based on New Jersey Geological Survey Report GSR-32 – A Method for Evaluating Ground-Water-Recharge Areas in New Jersey. These rates are presented as guidance for identifying both general groundwater recharge rates and areas for potential recharge measures and are not intended for design purposes.

Geology

Figure 4 depicts the surface geology within the Borough prepared by the NJDEP in cooperation with the US Geological Service. Califon is located on the border of the Highlands and Newark Basin geologic provinces. The Highlands province is an upland formed of gneiss and granite of Middle Proterozioc Age. It includes two low-lying inliers of Paleozioc carbonate rock. The Newark Basin is a half-graben of Triassic and Jurassic age containing shale, conglomerate, basalt and diabase. Surficial deposits in the Califon quadrangle include glacial, river and hillslope sediment and weathered-rock material. Glacial advances in the Califon quadrangle created weather rock material on hillslopes, which was unstable and moved downslope to accumulate as aprons of colluvium. Most

of the colluvium at the surface is lightly weathered and was deposited during the most recent glacial period known as the Wisconsinan stage. Today, most of the soils within the Borough ranges from loam, silt loam, gravelly loam and cobbly loam. Soils range from poorly drained to somewhat excessively well drained. Figure 4 shows the Soil Rating Polygons for the Borough.

Watersheds

The Borough of Califon is within Watershed Management Area 8 (North and South Branch Raritan). Figure 5 shows there are three (3) Hydrologic Unit Code (HUC) 14 areas within the Borough. The HUC14 information for this watershed is shown below:

Sub-Watershed Name: Raritan R SB (Califon BR to Long Valley)
Sub-Watershed ID: 08AA06
HUC 14: 02030105010060
Watershed Name: Raritan River SB (above Spruce Run)
Watershed ID: 08AA
Watershed Management Area: North and South Branch Raritan
Management Area: 282 Acres

Sub-Watershed Name: Raritan R SB (StoneMill gage to Califon)
Sub-Watershed ID: 08AA07
HUC 14: 02030105010070
Watershed Name: Raritan River SB (above Spruce Run)
Watershed ID: 08AA
Watershed Management Area: North and South Branch Raritan
Management Area: 337 Acres

Sub-Watershed Name: Rockaway Ck (above McCrea Mills)
Sub-Watershed ID: 08BA08
HUC 14: 02030105010080
Watershed Name: Lamington River
Watershed ID: 08BA
Watershed Management Area: North and South Branch Raritan
Management Area: 13 Acres

Design and Performance Standards

Any major residential land development proposed subject to review and approval by the Borough of Califon will also be reviewed in accordance with the stormwater management requirements of the New Jersey Residential Site Improvement Standards (NJAC 5:21). These standards may be supplemented where permitted by additional stormwater design and performance standards developed by the Borough. In addition, any application for a new development that meets the definition of major development shall be submitted to the Hunterdon Soil Conservation District for review and approval in accordance with the requirements of this section and the Standards for Soil Erosion and Sediment Control in New Jersey.

In accordance with the requirements of the New Jersey Stormwater Management Rules (NJAC 7:8), major land developments within the Borough of Califon will be required to meet specific stormwater design and performance standards. The stormwater design and performance standards have been and will continue to be applied to major developments through the Stormwater Control Ordinance, most recently amended in 2024. Complete details of each standard can be found in Subchapter 5 of the New Jersey Stormwater Management Rules and summaries of these design and performance standards are presented below:

Soil Erosion and Sediment Control: All major developments shall meet the requirements of the Soil Erosion and Sediment Control Standards for New Jersey. The Hunterdon County Soil Conservation District has review authority for compliance with these standards.

Groundwater Recharge: Unless otherwise exempted by the Stormwater Management Rules, all major developments must either maintain 100% of the development site's pre-developed annual groundwater recharge under post-developed site conditions or infiltrate the runoff increase between pre- to post-developed site conditions for a 2-year storm is infiltrated. Compliance with this standard must consider certain designated redevelopment areas, high pollutant loading areas, and known contaminated sites within the Borough.

Stormwater Quality: All major developments must reduce the total suspended solids (TSS) load in the development site motor vehicle surface runoff by a minimum of 80%. In addition, the post-construction nutrient load from the site must be reduced by the maximum extent feasible while also incorporated green infrastructure BMP's. Additional stormwater quality requirements are described below for land developments that drain to a Category One watercourse or its mapped tributaries.

Stormwater Quantity: All major developments must demonstrate compliance with one of three alternative stormwater quantity requirements for the 2, 10, and 100-Year storm events. These alternatives are: 1) preservation of existing development site runoff volumes and rates, 2) preservation of existing downstream peak runoff rates under full watershed development, or 3) reduction in existing site peak runoff rates by 50%, 25%, and 20%, respectively.

Green Infrastructure: Compliance with the groundwater recharge and stormwater quality and quantity standards described above must be achieved using Green Infrastructure BMP's to the maximum extent feasible. If the standards cannot be met through the exclusive use of Green Infrastructure BMP's, then the Borough has the authority to grant waivers and variances on a case-by-case basis. Documentation and guidelines on acceptable Green Infrastructure BMP's are provided in the NJ Stormwater Best Management Practices Manual, last updated in July 2023.

Plan Consistency

The Borough is within the New Jersey Highlands Preservation Region. All major Highlands development as defined by the Highlands Act in the Preservation Area are regulated and will require NJDEP approval, unless otherwise exempted by the Act.

TMDLs have been adopted for Fecal Coliform in the Raritan Water Region and its within the Borough. Actions taken to address include adopting a Pet Waste Ordinance (Chapter 6, Section 4.06) and a Feeding of Unconfined Wildlife (Chapter 17, Section 3). In addition, the Borough has implemented and will continue to execute an Illicit Discharge Detection and Elimination program as required by the MS4 Permit for Tier A municipalities.

TMDL's have been adopted for Phosphorous, Total Suspended Solids and temperature impairments within the Raritan River Basin that impact the Borough. Actions taken to address the TMDL includes adopting the previously mentioned a Feeding of Unconfined Wildlife (Chapter 17, Section 3). The use of Phosphorous based is generally forbidden except for certain situations. The Borough does not use herbicides within the Borough. In addition, the Borough will continue to implement Good Housekeeping BMP's at municipal yards, a street sweeping program, and a catch basin cleaning program as required for the MS4 Permit.

The Municipal Stormwater Management Plan is consistent with the Residential Site Improvement Standards (RSIS) at N.J.A.C. 5:21. The municipality will utilize the most current update of the RSIS in the stormwater management review of residential areas. This Municipal Stormwater Management Plan will be updated to be consistent with any future updates to the RSIS.

The Borough's Stormwater Management Ordinance requires all new development and redevelopment plans to comply with New Jersey's Soil Erosion and Sediment Control Standards. During construction, Borough inspectors will observe on-site soil erosion and sediment control measures and report any inconsistencies to the Hunterdon County Soil Conservation District.

Nonstructural Stormwater Management Strategies

Strategies that seek to reduce and/or prevent adverse impacts from runoff through sound site planning and stormwater management measures are known as Low Impact Development (LID). These strategies are intended to preserve or closely mimic a site's natural or pre-developed condition. Effective low impact development includes the use of both nonstructural and structural stormwater management measures known as LID-BMPs. The New Jersey Stormwater Best Management Practices Manual (BMP manual) provides guidance to address the standards in the proposed Stormwater Management Rules N.J.A.C. 7:8.

The Stormwater Management Rules require municipalities to review their master plans and ordinances in order to incorporate LID practices into their land development regulations to the maximum extent practicable. The Borough has reviewed the master plan and ordinances, and has provided a list of the sections in the Borough land use and zoning ordinances that are to be modified to incorporate nonstructural stormwater management strategies. These are the ordinances identified for revision. Once the ordinance texts are completed, they will be submitted to the county review agency for review and approval. A copy will be sent to the NJDEP at the time of submission.

The Land Development Ordinance of the Borough, was reviewed with regard to incorporating nonstructural stormwater management strategies. The following subjects are detailed in Chapter 16 of the Borough Ordinance. Below is a summarization of strategies that should be incorporated to promote low impact development as well as several changes recommended:

Section 28.101.	Drainage
Section 28.050.	Natural Features
Section 28.060.	Desing of Off Street Parking, Loading Areas and Driveways
Section 28.070.	Landscaping
Section 28.100.	Streets, Curbs and Sidewalks
Section 28.130.	Soil Erosion and Sediment Control

Section 701: Drainage addresses stormwater runoff and control measures. It is recommended that cited stormwater management provisions be updated to include all requirements outlined in N.J.A.C. 7:8-5.

Section 705: Natural Features requires that natural features, such as trees, open waters, hilltops, and views be preserved to the maximum extent possible. It is encouraged that care be taken to preserve existing vegetation and trees to enhance the natural scenic qualities of the Borough. It is recommended that this section be amended to expand trees to forested areas, to ensure that leaf litter and other beneficial aspects of the forest are maintained in addition to the trees.

Section 706: Design of Off-Street Parking, Loading Areas and Driveways details off-street parking and loading requirements and describes the procedure for construction of any new driveway or accessway to any street. It is recommended that this section be amended to allow the use of pervious paving materials to minimize stormwater runoff and promote groundwater recharge. The use of pervious paving materials, however, should be carefully considered, especially where deicing materials may potentially be used.

Section 707: Landscaping requires landscape plantings to be integrated in overall site design and buffer areas. It is recommended that this section be amended to require the use of native vegetation, which requires less fertilization and watering than non-native species. Additionally, it is recommended that language be included to allow buffer areas to be used for stormwater management by disconnecting impervious surfaces and treating runoff from these impervious surfaces. Recommended native shrubs for riparian buffers includes spicebush, red chokeberry, sweet pepperbush, steeplebush, buttonbush, and swamp azalea. Invasive exotics should not be used. Additional plantings guidance is given in Chapter 7 of the New Jersey Stormwater BMP Manual.

Section 710: Streets, Curbs and Sidewalks describes the requirements for streets in the Borough. It is recommended that this section be amended to allow for curb cuts or flush curbs with curb stops to allow vegetated swales to be used for stormwater conveyance and to allow the disconnection of impervious areas. It is also recommended that language was added to this section to require developers to design sidewalks to discharge stormwater to neighboring lawns where feasible to disconnect these impervious surfaces, or use permeable paving materials where appropriate.

Section 713: Soil Erosion and Sediment Control addresses soil erosion and sediment control measures by requiring developers to comply with the New Jersey Soil Erosion and Sediment Control Standards. It is recommended that this section be amended to include some general design principles, such as retain and protect natural vegetation; minimize and retain water runoff to facilitate groundwater recharge; tighten sequence to reduce duration of disturbance, and install diversions, and similar required structures prior to any on-site grading or disturbance.

Land Use/Build-Out Analysis

Build-Out Analysis. A build-out analysis is part of the Borough's Master Plan and is made part of this Stormwater Management Plan by reference. The Borough's Master Plan was re-examined and adopted on March 16, 2022. Figure 6 shows the current land use within the Borough and Figure 7 shows the current zoning districts within the Borough. In addition, Figure 8 shows the Highlands Council designated zones that have land use capabilities of "protection", "conservation" and "existing community". In addition, Figure 8 shows Highlands Council designated sub-zones zones that have land use capabilities of "existing community environmentally constrained" and "conservation environmentally constrained".

Land Cover. Land use and land cover are not synonymous terms. Land cover indicates a type or class of land surface condition, while land use generally refers to specific activities taking place within the land cover category. Land cover mapping is highly useful in quickly identifying patterns of developed and undeveloped land. In more highly developed municipalities like Califon, the undeveloped areas usually remain undeveloped due to some type of environmental constraint. The easily seen remaining open space areas often indicate patterns of wetlands, forests, and other critical natural features that constrain development. Land cover classifications are:

Urban – Lands altered by traditional development
Agriculture – Lands primarily used for production of food
Forest – Lands covered by wooded vegetation
Water – Open water bodies and areas periodically water covered
Wetlands – Areas of saturated soil condition that support vegetation
Barren Land – Landfills, active construction sites, and surface mines

Figures 8 through 14 show the Highlands Council designed areas for Highlands Zones (Figure 8), Open Waters (Figure 10), Critical Wildlife Habitats (Figure 11), Carbonate Rock Area (Figure 12), Agricultural Resource Area (Figure 13) and Historic, Cultural and Archaeological Resources. In addition, Figure 6 illustrates the existing land cover in the Borough based on 1995/97 GIS information *from NJDEP. Land Use percentages are as follows:*

Agriculture: 27 acres (4.3%)

Urban: 318 Ac. (50.3%)

Forest: 275 Ac. (43.5%)

Water: 11 Ac. (1.8%)

Urban Land. This land use is the most dominant land use in the Borough. It is heavily concentrated in the northern section of the Borough between CR 513 and the historic core. This land use category also

includes landscaped open spaces. Island Park located along the South Branch and the Columbia Trail located along the abandoned railroad right-of-way are included in this category.

Agricultural Land. Farmlands within the Borough are scarce with only a few parcels remaining.

Forests. Forests are the second largest land use/land cover category present in the Borough. Although fragmented to a considerable degree, the forested lands in the Borough are located primarily in the southern and eastern sections of the Borough. One area of woodlands is located between Academy and Main Streets. There is also a fairly large area of woodlands associated with the river corridor between the Island Park and the Tewksbury border.

Open Water. The major water area in the Borough is the South Branch of the Raritan River that traverses the municipality flowing from northeast to southwest. This portion of the South Branch is classified by the NJDEP as freshwater, trout maintenance (FW2-TM).

Frog Hollow Brook is tributary to the South Branch and flows through the most densely developed areas of the Borough. Frog Hollow Brook is classified by NJDEP as freshwater, trout production, (FW2-TP) Category 1 waters.

Wetlands. According to mappings, wetlands are present immediately along the South Branch of the Raritan below the impoundment. Although not shown on general mappings, it is likely that wetlands also exist along portions of Frog Hollow Brook.

Barren Land. No land in this classification is shown within the Borough.

Zoning.

The Borough of Califon is divided into the following zones:

R-1 Rural Residential (3 acres minimum)

R-2 Low Density Residential District (1 acre minimum)

R-3 Medium Density Residential District (22,000 s.f. minimum)

R-MF Multi-Family Residential District

GB General Business/Historic Preservation District

HB Highway Business District

FP/R-1 Flood Plain/Residential District (3 acres minimum)

CRD Carbonate Rock District (The Carbonate Rock District is a secondary or overlay to the zoning districts).

Carbonate Rock District. Areas within the municipality are underlain by carbonate bedrock, including the area between the abandoned railroad bed south of the river and running northward beyond the northern Borough boundary. The solution of this bedrock causes surface depressions, open drainage

passages, and the development of irregular, subsurface rock topography known as karst. Groundwater travels quickly through the many solution channels that may enlarge to considerable size. These conditions make such areas unstable and susceptible to subsidence and surface collapse. As a result, the alteration of drainage patterns in these areas by the placement of impervious coverage or grade changes from site improvements can lead to land subsidence and sinkholes.
Dolomite is the predominate carbonate rock formation, composed primarily of calcium and magnesium carbonates. Dolomite is particularly susceptible to rapid weathering and the development of solution channels. Fractures or solution openings and fissures in the carbonate rock may lead to public or private water supplies, making those sources especially susceptible to groundwater contamination. Sinkholes pose serious concerns about possible structural collapse and rapid contamination of groundwater by surface water reaching the groundwater table directly.

There is little undeveloped land within the area underlain by carbonate rock. The special floodplain zoning and dominate conservation and recreational uses in the FP/R-1 zone pose little problem. Developments with relatively large areas of impervious surfaces have the potential to generate considerable run-off and to concentrate it in collection systems and detention facilities. Exposing carbonate geology to large amounts of ponded water or injected subsurface flows may induce collapse due to surface water rapidly entering solution channels. Special design considerations and site investigations are necessary as set forth in the Borough's Carbonate Rock Ordinance. The Borough Zoning Map is shown in Figure 7.

Mitigation Plans

This mitigation plan is provided for a proposed development that is granted a variance or exemption from the stormwater management design and performance standards. Presented is a hierarchy of options.

Mitigation Project Criteria

1. The mitigation project must be implemented in the same drainage area as the proposed development. The project must provide additional groundwater recharge benefits, or protection from stormwater runoff quality and quantity from previously developed property that does not currently meet the design and performance standards outlined in the Municipal Stormwater Management Plan. The developer must ensure the long-term maintenance of the project, including the maintenance requirements under Chapters 8 and 9 of the New Jersey Stormwater BMP Manual. Currently there are no site/drainage area specific mitigation projects that are planned or that have been identified for future implementation.

2. If a suitable site cannot be located in the same drainage area as the proposed development, as discussed in Option 1, the mitigation project may provide mitigation that is not equivalent to the impacts for which the variance or exemption is sought, but that addresses the same issue. For example, if a variance is given because the 80 percent TSS requirement is not met, the selected project may address water quality impacts due to a fecal impairment. Listed below are specific projects that can be used to address the mitigation option. More detailed information on the projects can be obtained from the Borough Engineer.

Water Quality.

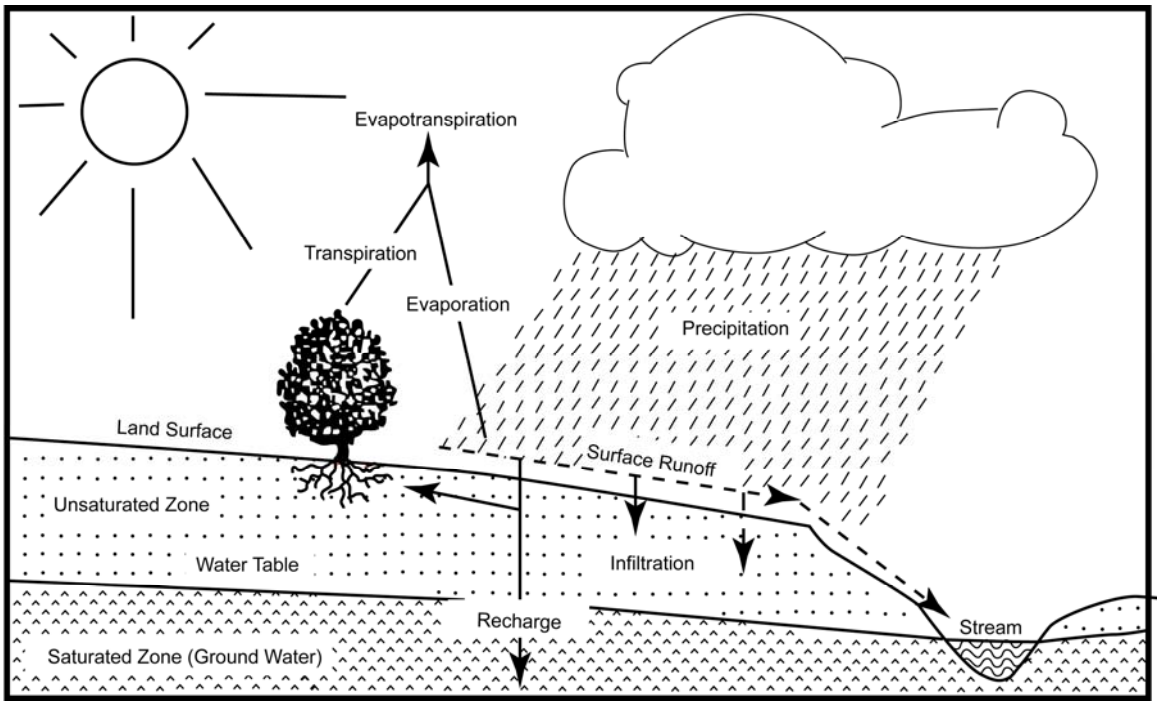
- An area of open space adjoins the impoundment of the South Branch along First Street. Numerous waterfowl, particularly Canada Geese, are present and may be generating water quality concerns. Provide goose management measures and public education.
- Immediately downstream of the impoundment along First Street, the north streambank has eroded and undercut root systems of adjacent vegetation. Provide bioengineering measures for erosion reduction and native riparian plantings for stream shading.

Stormwater Quantity.

- Many of the culverts associated with road crossings in the Borough were constructed years ago and are undersized. During severe storm events, these undersized culverts do not have adequate capacity, thereby causing localized flooding on certain streets. Provide replacement of undersized culverts and pipes to control flooding.

3. The municipality may allow a developer to provide funding or partial funding to the municipality for an environmental enhancement project that has been identified in a Municipal Stormwater Management Plan, or towards the development of a Regional Stormwater Management Plan. The funding must be equal to or greater than the cost to implement the mitigation outlined above, including costs associated with purchasing the property or easement for mitigation, and the cost associated with the long-term maintenance requirements of the mitigation measure.

FIGURE 1



Source: New Jersey Geological Survey Report GSR-32.

FIGURE 2

Source: Califon USGS Quadrangles

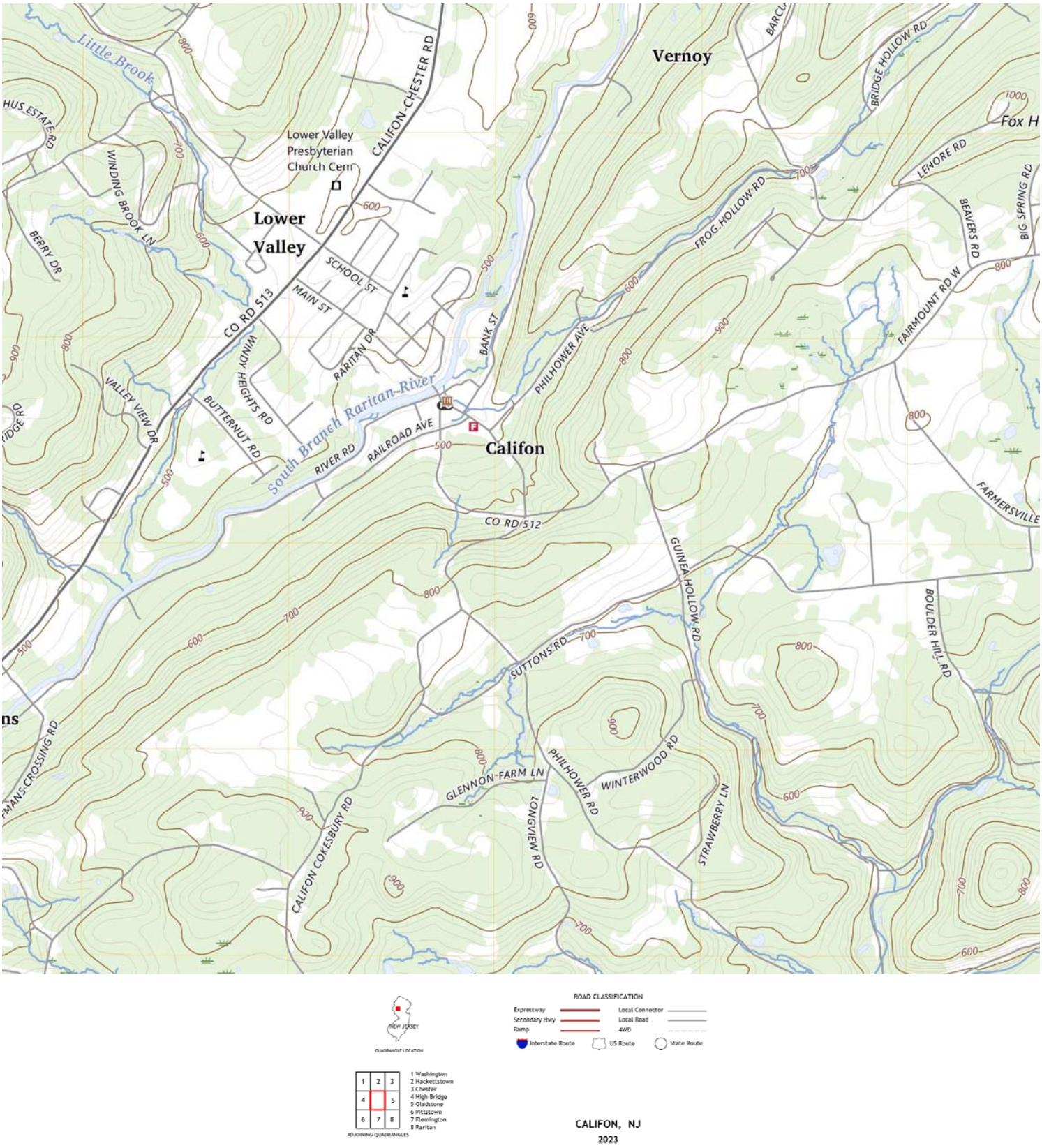


FIGURE 3

Groundwater Recharge

3/8/2024

1:23,722

0 0.15 0.3 0.6 mi

0 0.23 0.45 0.9 km

Municipal_Boundary

Ground Water Recharge Areas in New Jersey - Ground Water Recharge Areas

16 to 23 in/yr

11 to 15 in/yr

1 to 7 in/yr

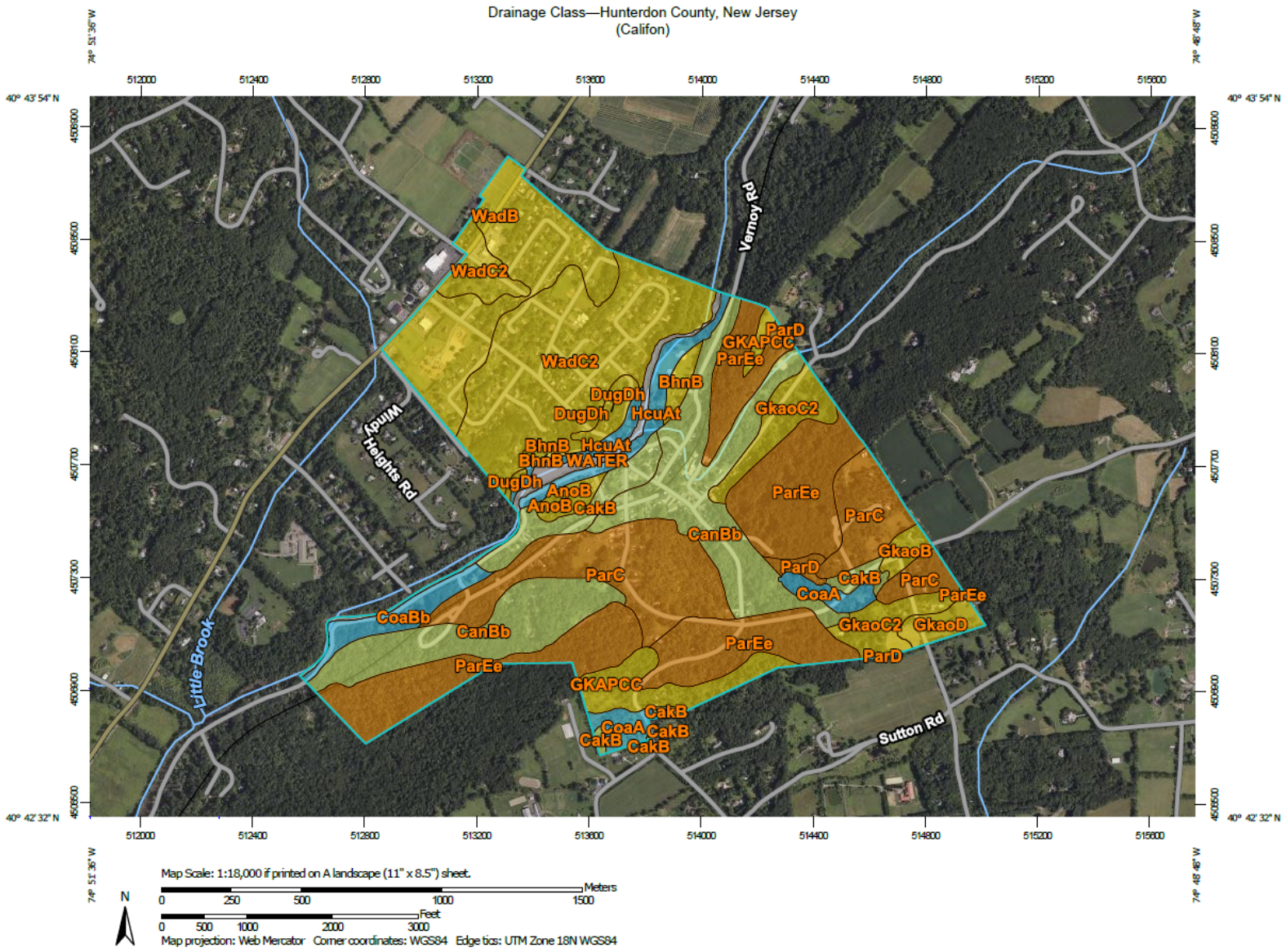
hydric soil

wetlands and open water

World Hillshade

Esri, NASA, NGA, USGS, FEMA, data.pa.gov, New Jersey Office of GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS

FIGURE 4 – Soil Survey



MAP LEGEND

- **Area of Interest (AOI)**
  - Area of Interest (AOI)
- **Soils**
  - Soil Map Unit Polygons
- **Soil Rating Polygons**
  - Excessively drained
  - Somewhat excessively drained
  - Well drained
  - Moderately well drained
  - Somewhat poorly drained
  - Poorly drained
  - Very poorly drained
  - Subaqueous
  - Not rated or not available
- **Water Features**
  - Streams and Canals
- **Transportation**
  - Rails
  - Interstate Highways
  - US Routes
  - Major Roads
  - Local Roads
- **Background**
  - Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hunterdon County, New Jersey
Survey Area Data: Version 19, Aug 29, 2023

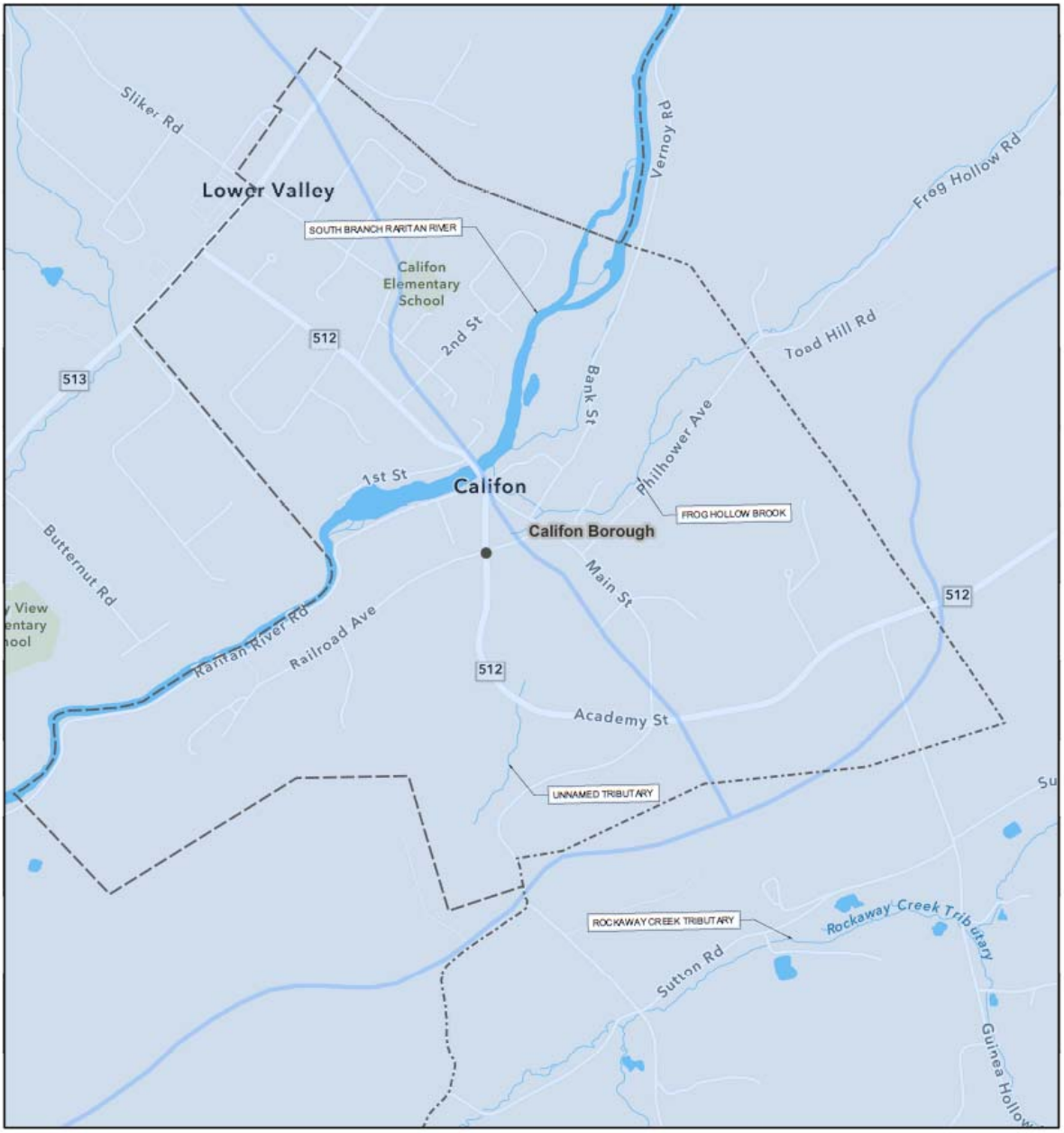
Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 13, 2021—Sep 14, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

FIGURE 5

Hydrologic Units (HUC14s)



3/15/2024, 2:56:11 PM

1:18,056

0 0.1 0.2 0.4 mi

0 0.17 0.35 0.7 km

County Boundaries

Municipalities

Sub-Watersheds (HUC14)

Watershed Management Areas

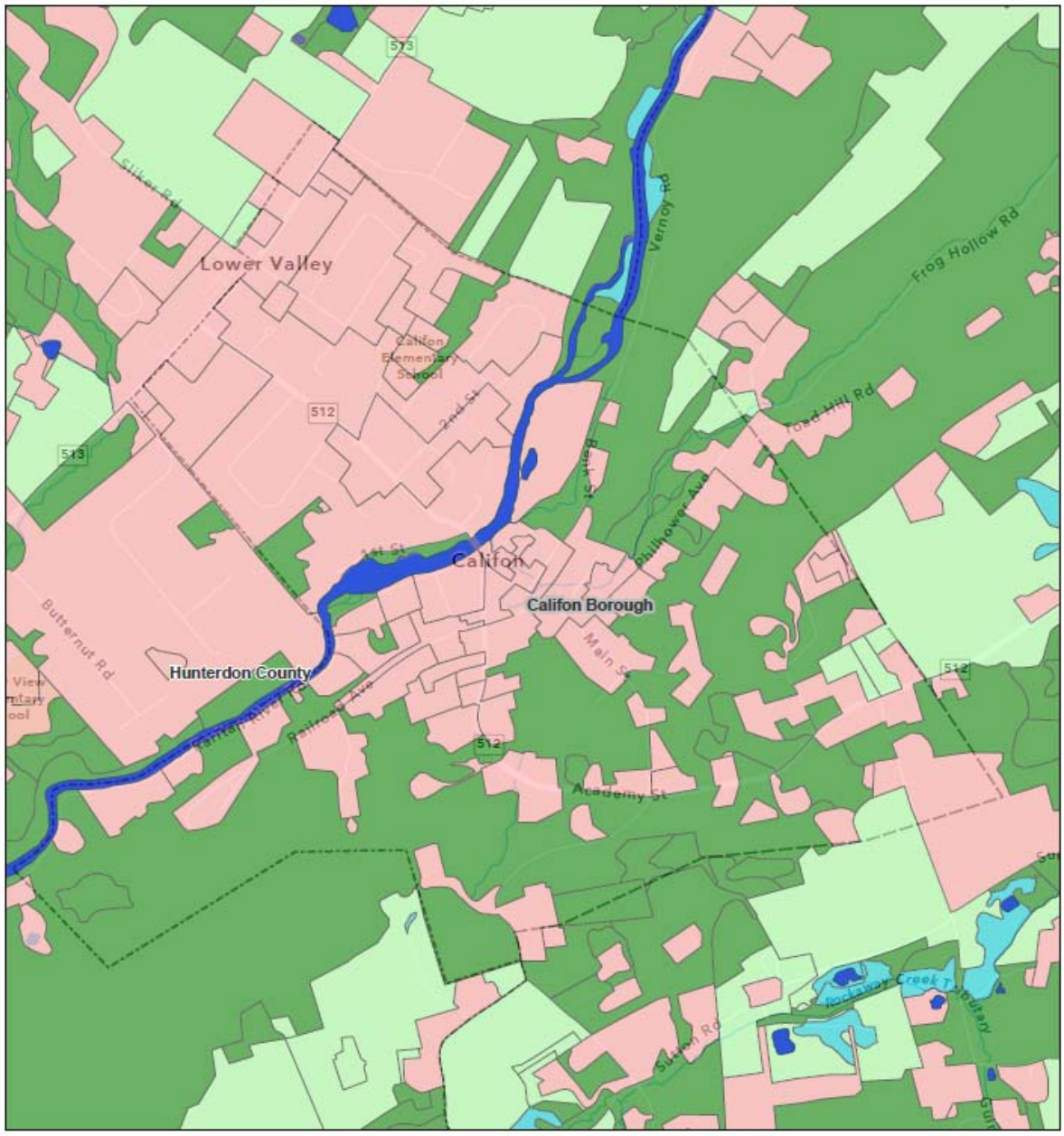
Esri Community Maps Contributors, data.pa.gov, New Jersey Office of GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS

New Jersey Department of Environmental Protection

Esri Community Maps Contributors, data.pa.gov, New Jersey Office of GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA,

FIGURE 6

Califon Land Use 2020



3/8/2024, 2:42:24 PM

1:18,056

0 0.1 0.2 0.4 mi

0 0.17 0.35 0.7 km

County Boundaries

Land Use 2020

AGRICULTURE

FOREST

URBAN

WATER

WETLANDS

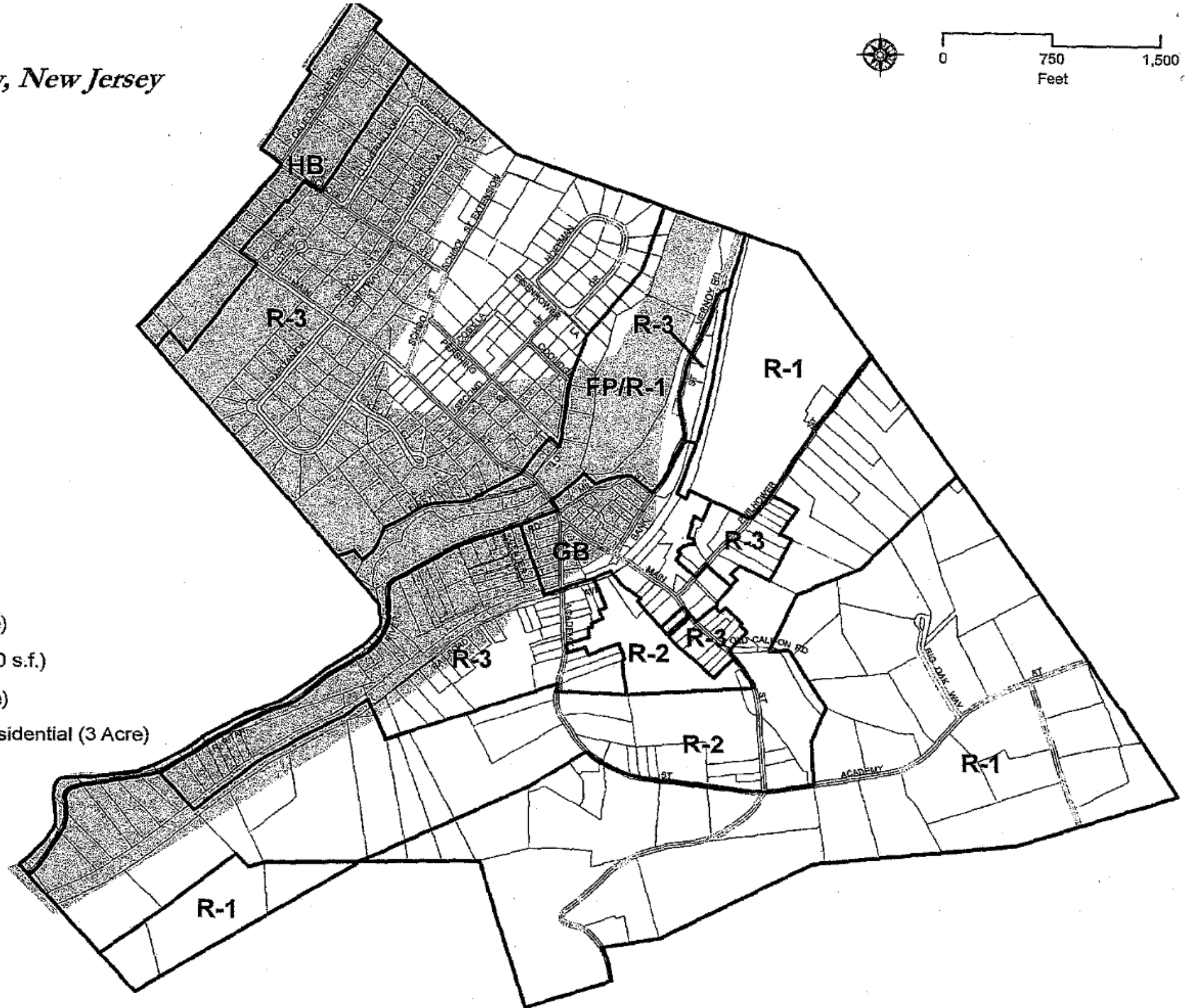
Municipalities

Esri Community Maps Contributors, data.pa.gov, New Jersey Office of GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS

New Jersey Department of Environmental Protection

Esri Community Maps Contributors, data.pa.gov, New Jersey Office of GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA,

Califon Borough
Hunterdon County, New Jersey



Zoning Map

October 2014

Legend

R-2 - Residential (1 Acre)

R-3 - Residential (22,000 s.f.)

R-1 - Residential (3 Acre)

FP/R-1 - Flood Plain Residential (3 Acre)

GB - General Business

HB - Highway Business

Carbonate Rock

Please consult Historic District map in Borough Clerk's Office for applicability of Historic District regulations in Land Development Ordinance to individual properties.

Prepared by:
Elizabeth C. McKenzie, P.P., P.A.

FIGURE 7

FIGURE 8

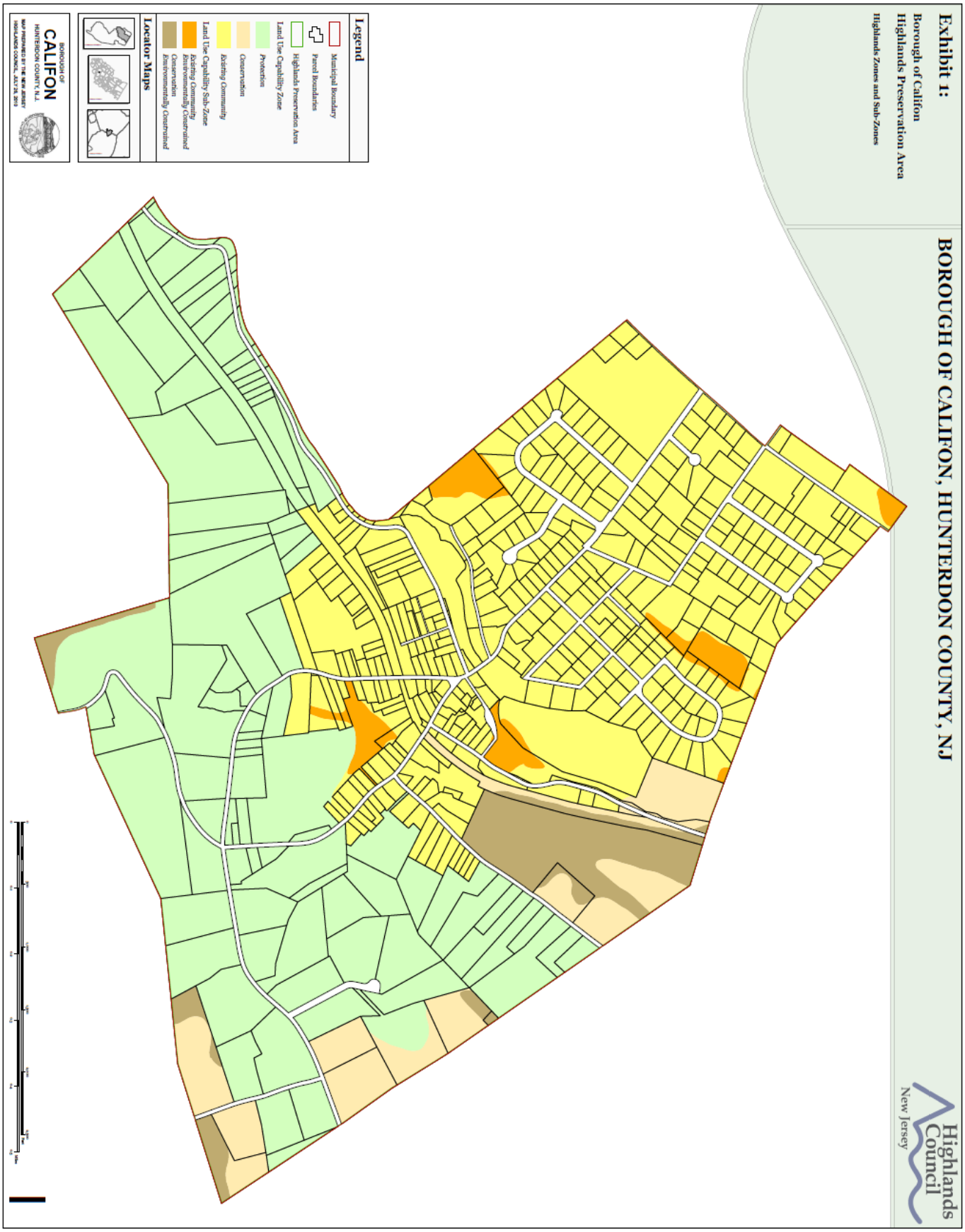


Exhibit 1:
Borough of Califon
Highlands Preservation Area
Highlands Zones and Sub-Zones
BOROUGH OF CALIFON, HUNTERDON COUNTY, NJ
Highlands Council
New Jersey
Legend
Municipal Boundary
Parcel Boundaries
Highlands Preservation Area
Land Use Capability Zone
Protection
Conservation
Existing Community
Land Use Capability Sub-Zone
Existing Community
Environmentally Constrained
Conservation
Environmentally Constrained
Locator Maps
BOROUGH OF
CALIFON
HUNTERDON COUNTY, N.J.
MAP PREPARED BY THE NEW JERSEY
HIGHLANDS COUNCIL JULY 26, 2010

FIGURE 9

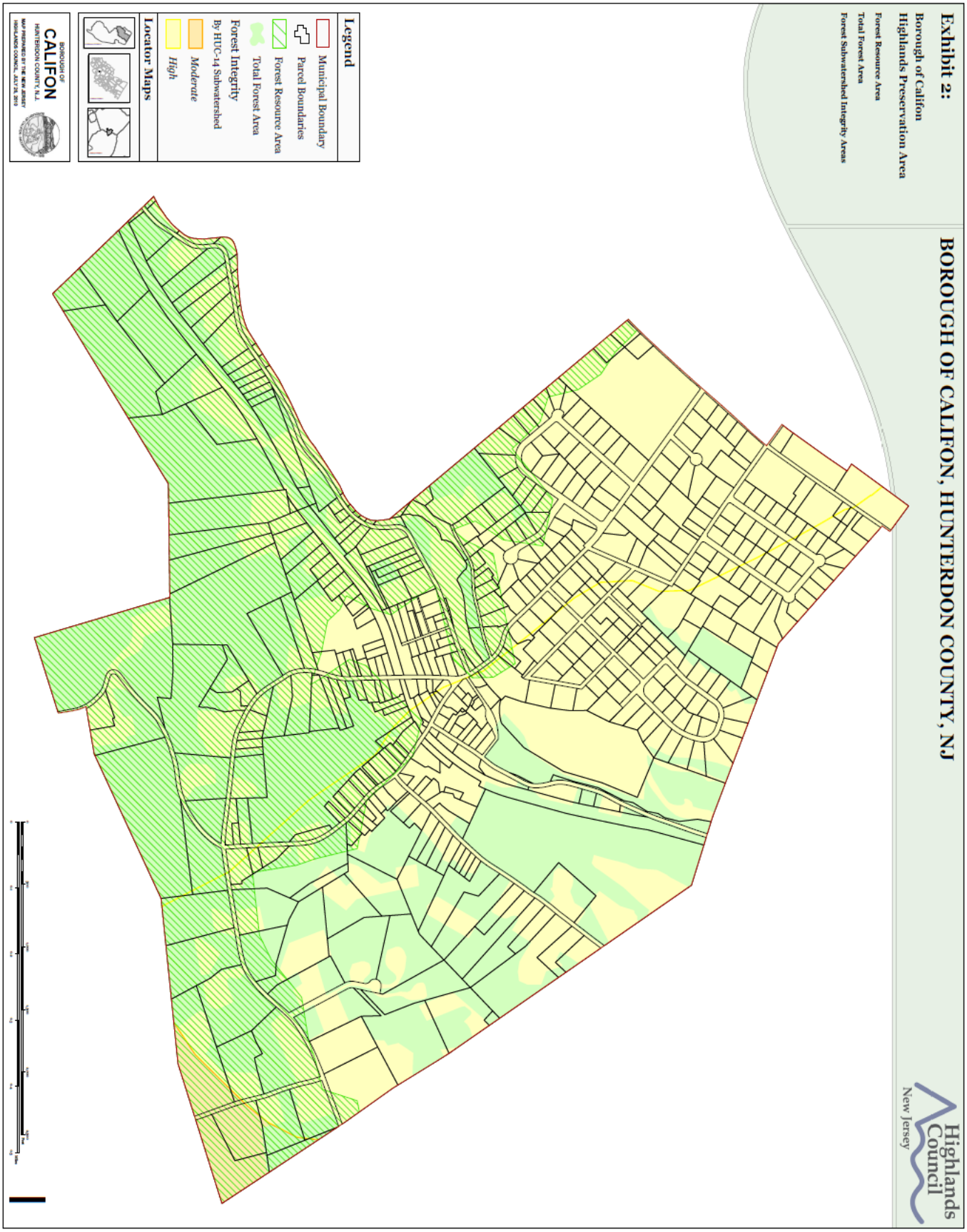


Exhibit 2:
Borough of Califon
Highlands Preservation Area
Forest Resource Area
Total Forest Area
Forest Subwatershed Integrity Areas
BOROUGH OF CALIFON, HUNTERDON COUNTY, NJ
Highlands Council
New Jersey
Legend
Municipal Boundary
Parcel Boundaries
Forest Resource Area
Total Forest Area
Forest Integrity
By HUC-14 Subwatershed
Moderate
High
Locator Maps
BOROUGH OF
CALIFON
HUNTERDON COUNTY, N.J.

FIGURE 10

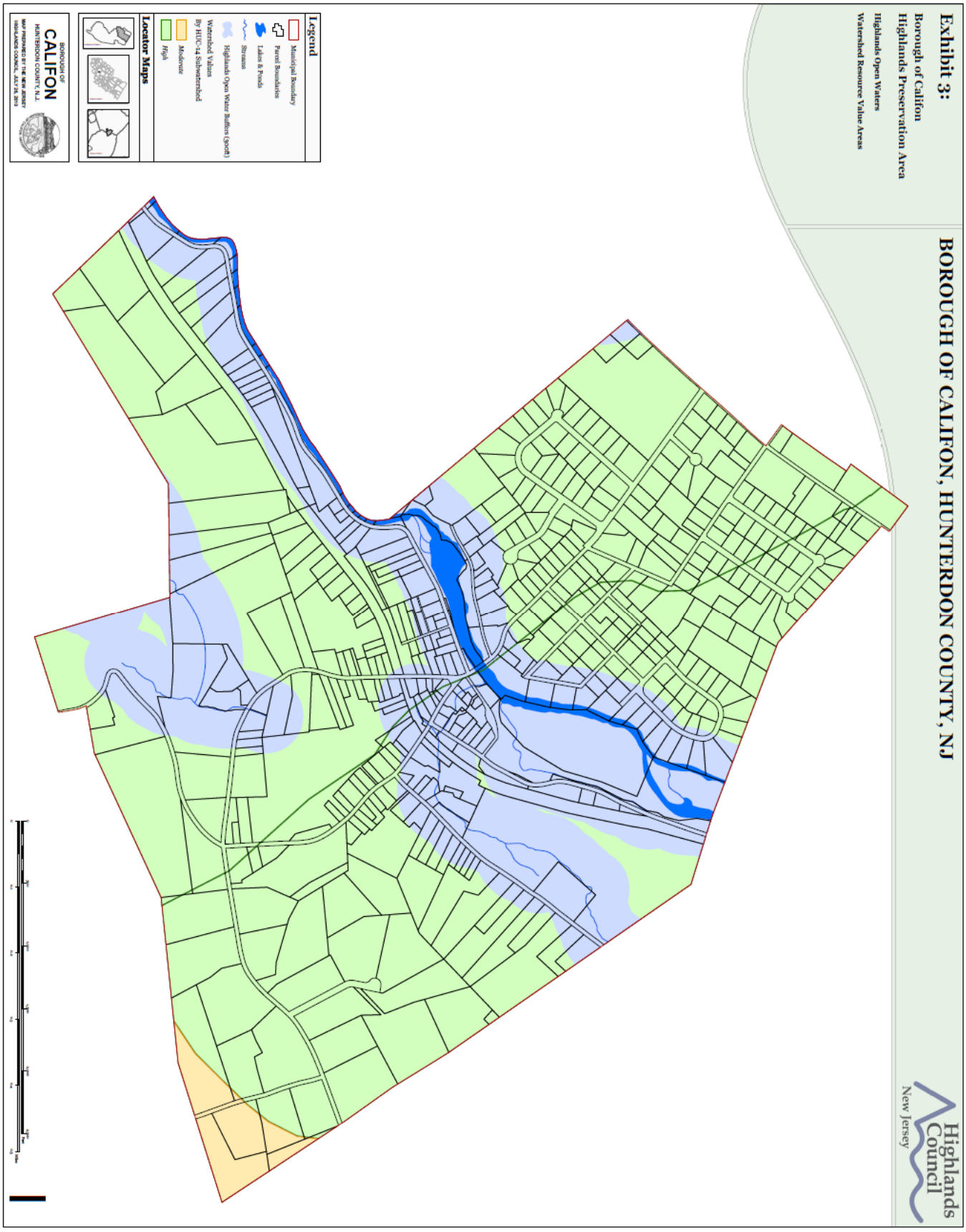


Exhibit 3:
Borough of Califon
Highlands Preservation Area
Highlands Open Waters
Watershed Resource Value Areas
BOROUGH OF CALIFON, HUNTERDON COUNTY, NJ
Highlands Council
New Jersey
Legend
Municipal Boundary
Parcel Boundaries
Lakes & Ponds
Streams
Highlands Open Water Buffers (300ft)
Watershed Values
By HUC-14 Subwatershed
Moderate
High
Locator Maps
BOROUGH OF
CALIFON
HUNTERDON COUNTY, N.J.

FIGURE 11

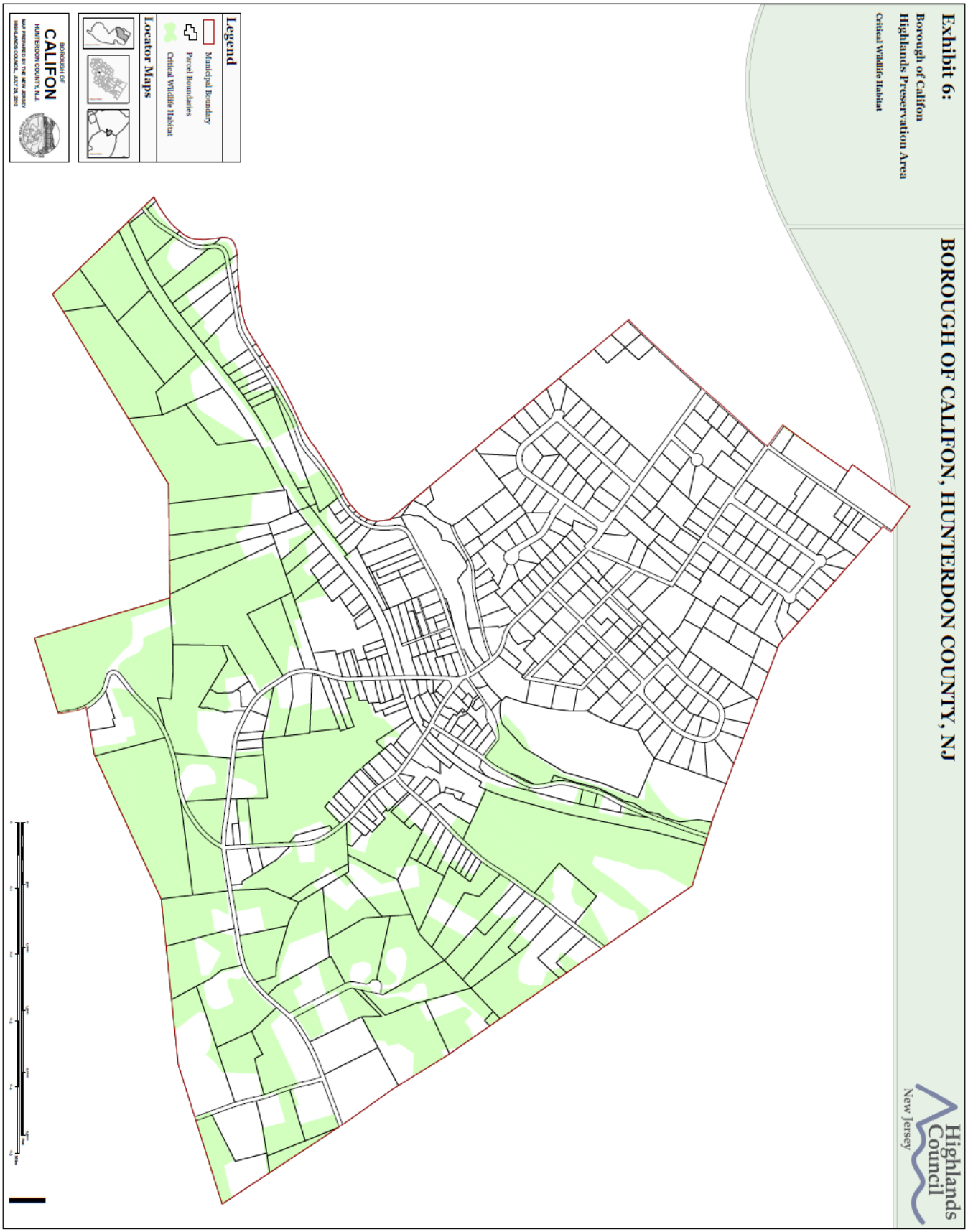


Exhibit 6:
Borough of Califon
Highlands Preservation Area
Critical Wildlife Habitat
BOROUGH OF CALIFON, HUNTERDON COUNTY, NJ
Highlands Council
New Jersey
Legend
Municipal Boundary
Parcel Boundaries
Critical Wildlife Habitat
Locator Maps
BOROUGH OF
CALIFON
HUNTERDON COUNTY, N.J.

FIGURE 12

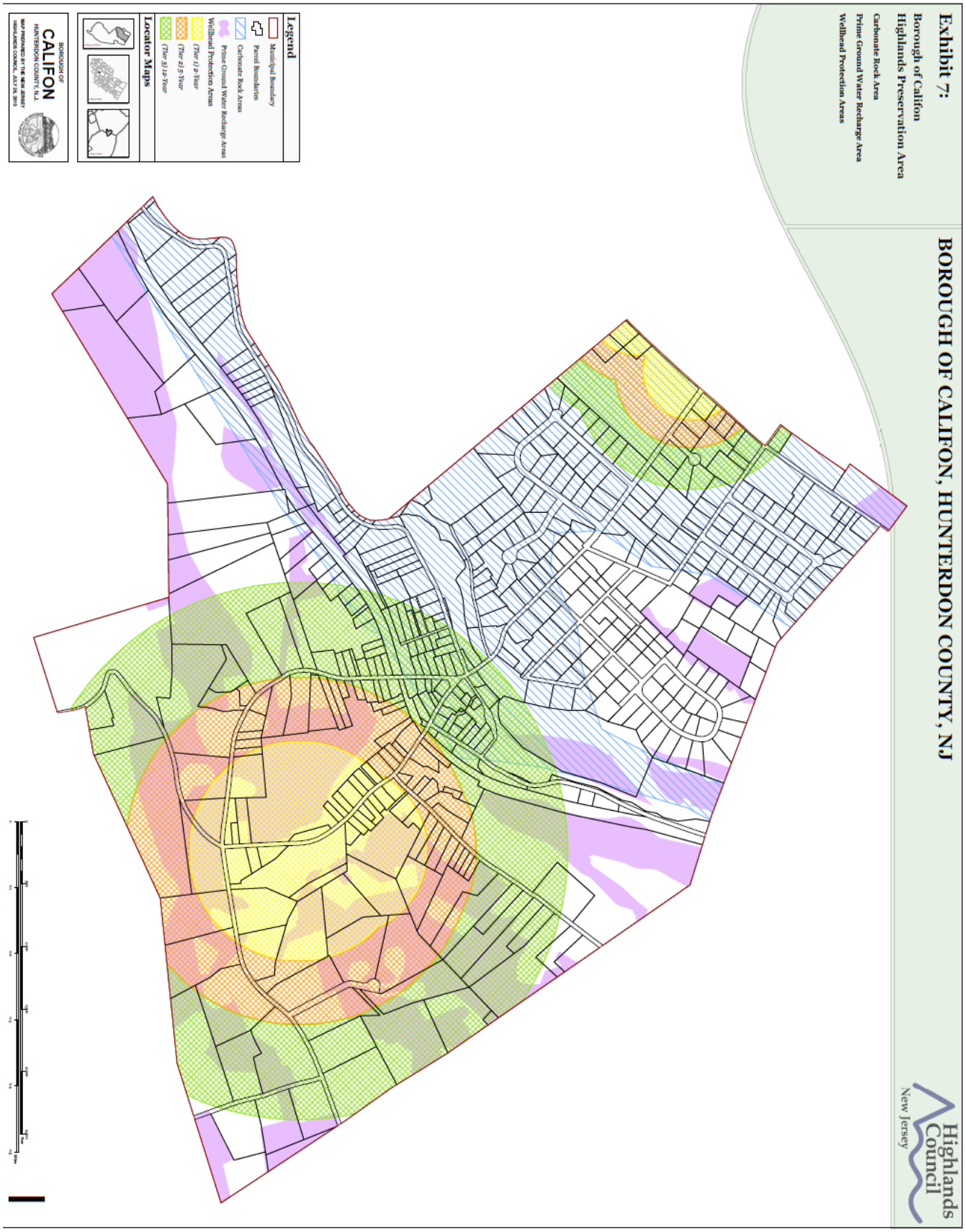


Exhibit 7:
Borough of Califon
Highlands Preservation Area
Carbonate Rock Area
Prime Ground Water Recharge Area
Wellhead Protection Areas
BOROUGH OF CALIFON, HUNTERDON COUNTY, NJ
Highlands Council
New Jersey
Legend
Municipal Boundary
Parcel Boundaries
Carbonate Rock Areas
Prime Ground Water Recharge Areas
Wellhead Protection Areas
(Tier 1) 2-Year
(Tier 2) 5-Year
(Tier 3) 12-Year
Locator Maps
BOROUGH OF
CALIFON
HUNTERDON COUNTY, N.J.
MAP PREPARED BY THE NEW JERSEY
HIGHLANDS COUNCIL, JULY 26, 2019

FIGURE 13

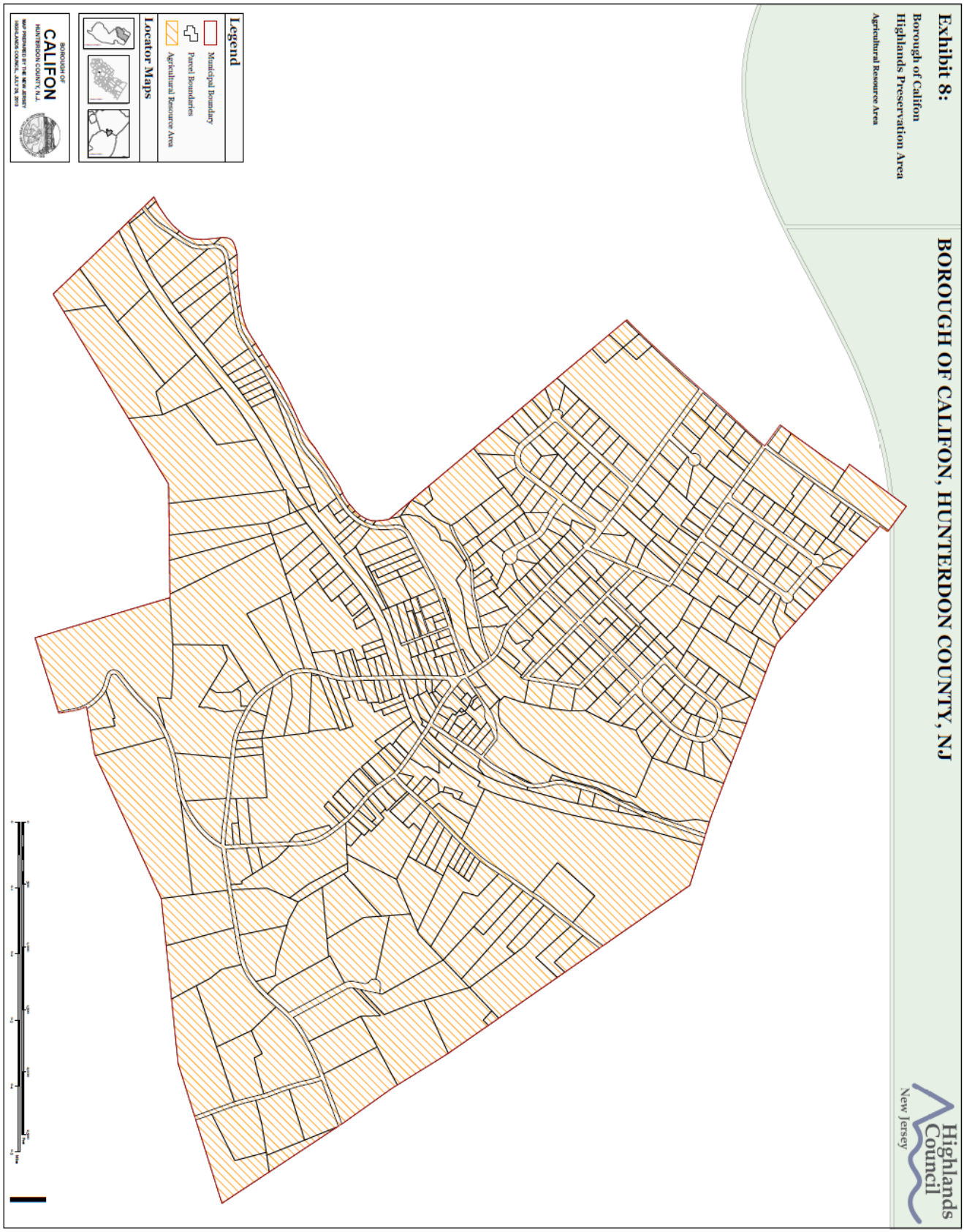


Exhibit 8:
Borough of Califon
Highlands Preservation Area
Agricultural Resource Area
BOROUGH OF CALIFON, HUNTERDON COUNTY, NJ
Highlands Council
New Jersey
Legend
Municipal Boundary
Parcel Boundaries
Agricultural Resource Area
Locator Maps
BOROUGH OF
CALIFON
HUNTERDON COUNTY, N.J.

FIGURE 14

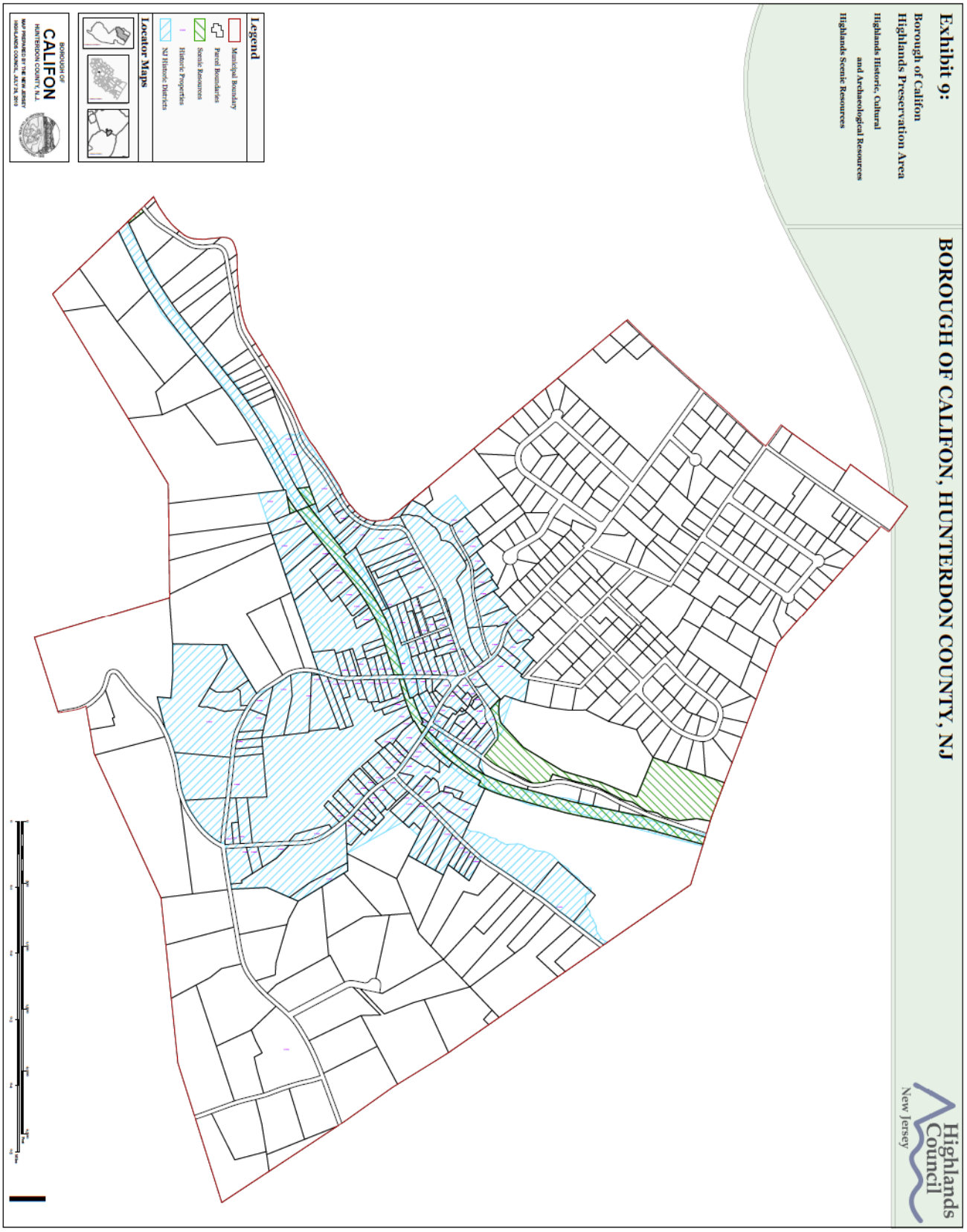
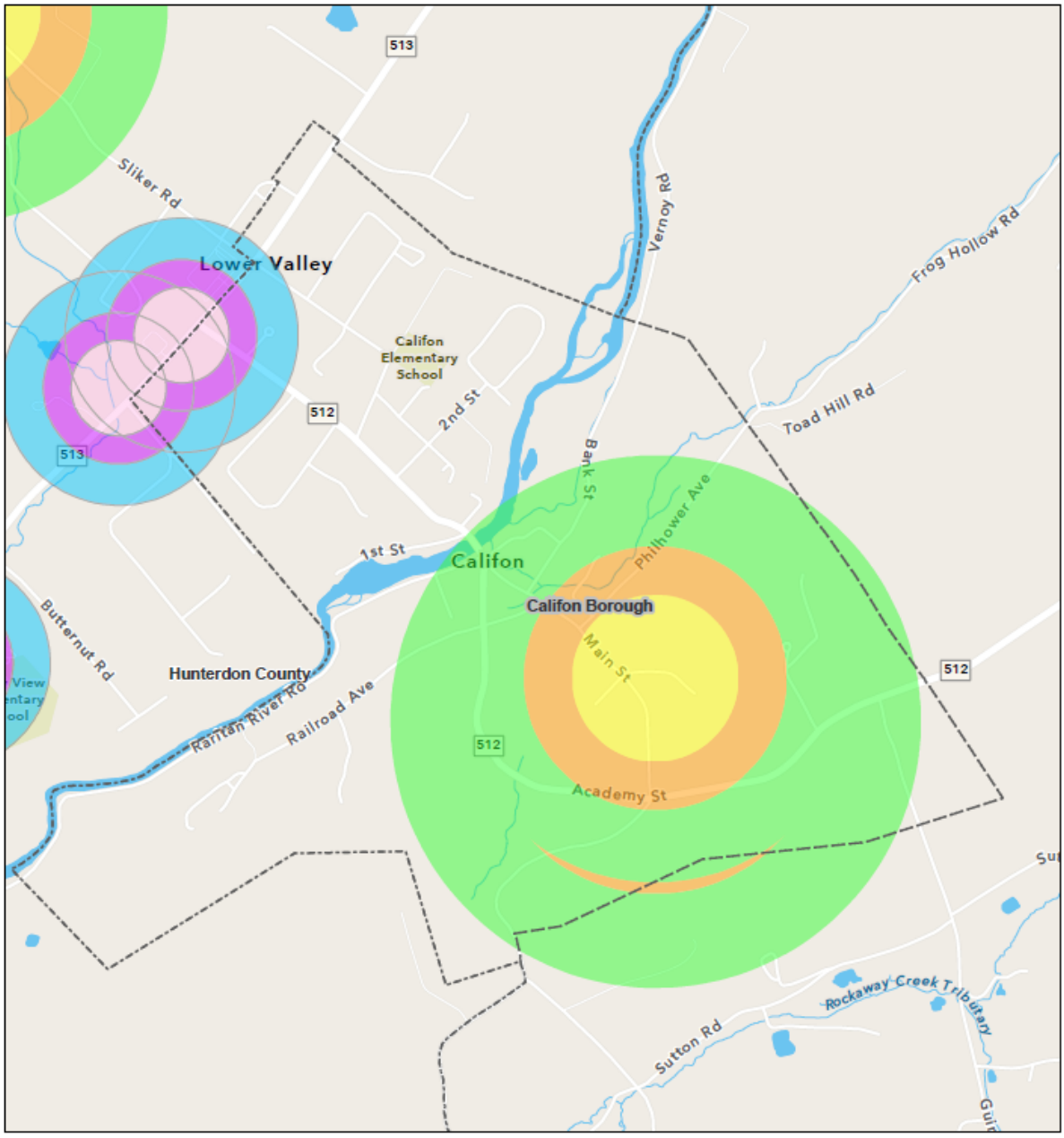


Exhibit 9:
Borough of Califon
Highlands Preservation Area
Highlands Historic, Cultural
and Archaeological Resources
Highlands Scenic Resources
BOROUGH OF CALIFON, HUNTERDON COUNTY, NJ
Highlands Council
New Jersey
Legend
Municipal Boundary
Parcel Boundaries
Scenic Resources
Historic Properties
NJ Historic Districts
Locator Maps
BOROUGH OF
CALIFON
HUNTERDON COUNTY, N.J.

FIGURE 15

Califon Well Head Protection Areas



3/8/2024, 2:47:17 PM

1:18,056

0 0.1 0.2 0.4 mi

0 0.17 0.35 0.7 km

County Boundaries

Municipalities

Well Head Protection Areas (Community)

Tier 1: 2-Year

Tier 2: 5-Year

Tier 3: 12-Year

Well Head Protection Areas (Non-Community)

Tier 1: 2-Year

Tier 2: 5-Year

Tier 3: 12-Year

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New Jersey Department of Environmental Protection

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