

**MUNICIPAL STORMWATER
MANAGEMENT PLAN FOR THE
BOROUGH OF ROCKLEIGH
BERGEN COUNTY, NEW JERSEY**

NEGLIA PROJECT NUMBER: RKLGMUN07.012

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Stormwater Control Ordinance (Adopted by Borough & Approved by Bergen County)

Introduction

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the Borough of Rockleigh to address stormwater-related impacts. The creation of this plan is required by N.J.A.C. 7:14A-25 Municipal Stormwater Management Regulations. This plan contains all of the required elements described in N.J.A.C. 7:8 Stormwater Management Rules.

The plan addresses groundwater recharge, stormwater quantity, and stormwater quality impacts by incorporating stormwater design and performance standards for major new 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 is not required since the municipality does not have greater than 640 acres remaining of vacant developable land. The plan also addresses the review and update of existing ordinances, the Borough Master Plan, and other planning documents to allow for the 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 Plan, specific stormwater management measures are identified to lessen the impact of existing development.

Goals

The goals of this MSWMP are to:

1. Reduce flood damage, including damage to life and property

This is to occur through the adoption of the Stormwater Control Ordinance and the existing stormwater regulations within the New Jersey Residential Site Improvement Standards (NJRSIS). This ordinance along with the NJRSIS will govern stormwater quantity, stormwater quality, and groundwater recharge thereby reducing flooding impacts. This is accomplished through flow and suspended solids reduction to watercourses and stormwater conveyance systems.

All submitted site plans and subdivision plans which are governed by this ordinance and / or the NJRSIS will be reviewed by the municipal and board engineer for conformance with the specified stormwater regulations. The applicant will be required to submit a drainage report including a flooding analysis to ensure conformance.

2. Minimize, to the extent practical, any increase in stormwater runoff from any new development

This is to occur through the adoption of the Stormwater Control Ordinance and the existing stormwater regulations within the New Jersey Residential Site Improvement Standards (NJRSIS). This ordinance along with the NJRSIS will govern stormwater quantity, stormwater quality, and groundwater recharge thereby reducing stormwater runoff quantities from new development.

All submitted site plans and subdivision plans which are governed by this ordinance and / or the NJRSIS will be reviewed by the municipal and board engineer for conformance with the specified stormwater regulations. The applicant will be required to submit a drainage report including a flooding analysis to ensure conformance.

3. Reduce soil erosion from any development or construction project

This is to occur through the implementation of the New Jersey's Soil Erosion and Sediment Control Standards requirements. This Plan is to be consistent with those Standards. The requirements are also included within the Stormwater Control Ordinance.

All submitted site plans and subdivision plans which are governed by this ordinance and / or the NJRSIS will be reviewed by the municipal and board engineer for conformance with the specified Soil Erosion and Sediment Control Standards. In addition, projects with limit of disturbance of five thousand square feet or greater must obtain a Soil Erosion and Sediment Control Permit from the Bergen County Soil Conservation District.

4. Assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures

This is to occur through the adoption of the Stormwater Control Ordinance and the existing stormwater regulations within the New Jersey Residential Site Improvement Standards (NJRSIS). This ordinance along with the NJRSIS will govern stormwater quantity, stormwater quality, and groundwater recharge thereby reducing flow and suspend solids which affect flow channels through culverts and bridges. In addition, inadequate culverts that were constructed prior to the Stormwater Control Ordinance may be updated through the Mitigation Plan section.

All submitted site plans and subdivision plans which are governed by this ordinance and / or the NJRSIS will be reviewed by the municipal and board engineer for conformance with the specified stormwater regulations. The applicant will be required to submit a drainage report including a flooding analysis to ensure conformance.

5. Maintain groundwater recharge and groundwater quality

This is to occur through the adoption of the Stormwater Control Ordinance and the existing stormwater regulations within the New Jersey Residential Site Improvement Standards (NJRSIS). Groundwater recharge and quality requirements for all major development will be governed through the adoption of this ordinance.

Groundwater recharge requirements are to be satisfied through the implementation of design measures to maintain existing groundwater recharge rate and quantity prior to development. Groundwater quality is to be maintained through the implementation of Best Management Practices (Nonstructural and Structural Strategies) to remove constituents and pollutants prior to infiltration / recharge to groundwater.

All submitted site plans and subdivision plans which are governed by this ordinance and / or the NJRSIS will be reviewed by the municipal and board engineer for conformance with the specified stormwater regulations.

6. Prevent, to the greatest extent feasible, an increase in nonpoint pollution

This is to occur through the adoption of a series of ordinances which include a pet waste and wildlife feeding ordinance.

7. Maintain the integrity of stream channels for their biological functions, as well as for drainage

This is to occur through the adoption of the Stormwater Control Ordinance and the existing stormwater regulations within the New Jersey Residential Site Improvement Standards (NJRSIS). This ordinance will govern stormwater quantity, stormwater quality, and groundwater recharge thereby reducing pollutants within the flow which affect biological function and drainage conveyance ability of stream channels.

All submitted site plans and subdivision plans which are governed by this ordinance and / or the NJRSIS will be reviewed by the municipal and board engineer for conformance with the specified stormwater regulations.

8. 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

This is to occur through the adoption of the Stormwater Control Ordinance and the existing stormwater regulations within the New Jersey Residential Site Improvement Standards (NJRSIS). This ordinance will govern stormwater quantity, stormwater quality, and groundwater recharge thereby reducing pollutants. In addition, the adoption of a series of ordinances which include a

pet waste and wildlife feeding ordinance will reduce pollutants within stormwater runoff.

All submitted site plans and subdivision plans which are governed by this ordinance and / or the NJRSIS will be reviewed by the municipal and board engineer for conformance with the specified stormwater regulations.

9. Protect public safety through the proper design and operation of stormwater basins.

This is to occur through the adoption of the Stormwater Control Ordinance and the existing stormwater regulations within the New Jersey Residential Site Improvement Standards (NJRSIS). A section within the adopted ordinance will address safety standards for stormwater management basins.

All submitted site plans and subdivision plans which are governed by this ordinance and / or the NJRSIS will be reviewed by the municipal and board engineer for conformance with the specified stormwater regulations. The applicant will be required to submit a drainage report including a flooding analysis to ensure conformance.

To achieve these goals, this plan outlines specific stormwater design and performance standards for new 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.

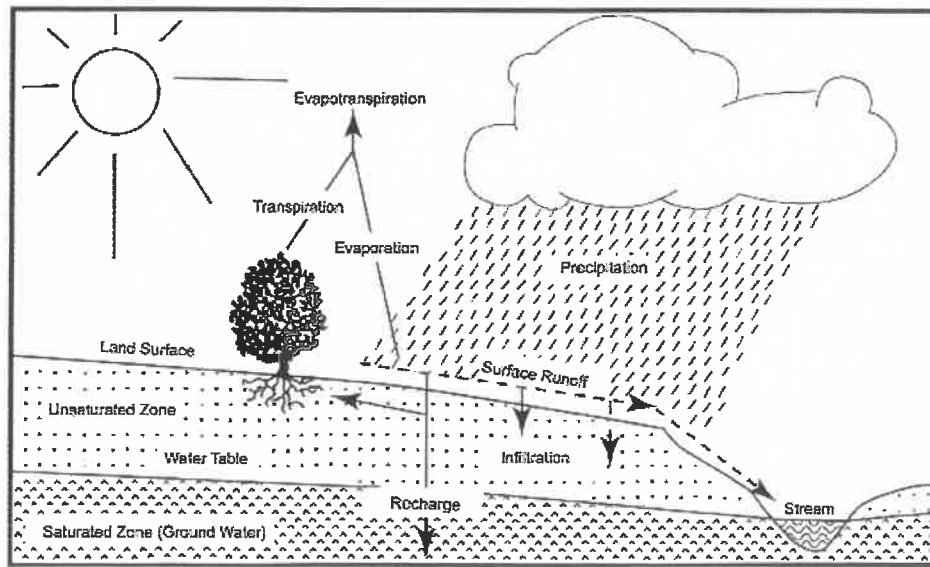
Stormwater Discussion

Land development can dramatically alter the hydrologic cycle (see Figure C-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 flooding and erosion problems and / or 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. Increase 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.

Figure C-1: Groundwater Recharge in the Hydrologic Cycle



Source: New Jersey Geological Survey Report GSR-32.

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

The Borough of Rockleigh is within PA-1 (Planning Area 1) State Planning Commission Area and is included in Watershed Management Area No. 5. It encompasses a 1.125 square miles, 625-acre area in Bergen County. The population of the Borough has increased by 44.8% in the last decade primarily due to the construction of the Jewish Home at Rockleigh. The Borough, under the current zoning, is substantially developed.

Board of Ed/Playground	0 Acres
Playing Fields	0 Acres
Parks	60 Acres
Municipal Use	2 Acres

The available land for new development is very limited. The Borough’s current trends are to expand existing homes, demolish and build larger homes.

	1980	1990	2002
Housing Units	59	68	95
Population	192	270	391

- Homes includes The Jewish Home at Rockleigh

The Department of Public Works, Engineering Division, requires a stormwater management plan for all new single family homes with an existing project expansion of impervious surface over 200 SF, or “teardowns” where an existing structure is demolished and reconstructed. Wherever possible, sufficient drywells must be installed to accept one hundred percent of the storm runoff from all impervious surfaces.

Below the Bergen County Soil Conservation District disturbance limits for soil erosion (less than five thousand square feet), the Borough requires a Soil Erosion Control Plan, which would be included on all single family home site plans. The Borough, wherever and whenever possible, makes every effort to reduce stormwater runoff volumes and pollutant loads to the waterways of the Borough, County and State.

Figure C-2 illustrates the waterways in the Borough. Figure C-3 illustrates the Borough of Rockleigh boundary on the USGS Quadrangle Map.

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 a number of biometrics related to benthic macroinvertebrate community dynamics.

The only major watercourse within the Borough is Sparkill Creek, which is listed as a low priority impaired waterway. Sparkill Creek is not listed for benthic macroinvertebrates and unknown toxicity. In addition to the AMNET data, the NJDEP and other regulatory agencies collect water quality chemical data on the streams in the State. This data shows that the instream water quality constituents frequently exceed the state's criteria. This means that these watercourses are impaired waterways and the NJDEP is required to develop a Total Maximum Daily Load (TMDL) for these pollutants for each waterway.

A TMDL is the pollutant amount that can be accepted by a watercourse without causing an exceedance of water quality standards or interfering with the ability to use a watercourse 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 factor 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 plans, adoption of ordinances, reforestation of stream corridors, retrofitting stormwater systems, and other BMPs.

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 watercourses are attaining water quality standards, and identifies watercourses that are impaired. Sublist 5 of the Integrated List constitutes the list of waters impaired or threatened by pollutants, for which one or more TMDLs are needed.

In addition to water quality problems, the Borough is subject to water quantity problems, including flooding, stream bank erosion, and diminished flow in its watercourses as a result of the impervious coverage increases from upstream, development plus minor increases from the Borough. The peak watercourse volumes and flows have increased. The higher peaks and flows have resulted in some stream bank erosion, home flooding, and degraded stream habitats. Lower summer base flows can have a negative impact on instream habitat during the summer months and dry weather periods. The Borough has been proactive by requiring all roof runoff in recharge areas, wherever possible, to be routed to dry wells and that zero increase in runoff be accomplished.

A map of the groundwater recharge areas are shown in Figure C-4. At this time, the Borough does not have an existing groundwater assessment. Well head protection areas, also required as part of the MSWMP, are shown in Figure C-5.

Design and Performance Standards

The Borough will adopt the design and performance standards for stormwater management measures as presented in N.J.A.C. 7:8-5 to minimize the adverse impact of stormwater runoff on water quality and water quantity and loss of groundwater recharge in receiving water bodies. The design and performance standards include the language for maintenance of stormwater management measures consistent with the stormwater management rules at N.J.A.C. 7:8-5.8 Maintenance Requirements, and language for safety standards consistent with N.J.A.C. 7:8-5.6 Safety Standards for Stormwater Management Basins. At this time, the ordinance has been submitted and approval by Bergen County per the Stormwater Management Regulations. A copy of the Borough's Stormwater Control Ordinance is included within the Appendix of this Plan.

During construction, Borough inspectors and engineers will observe the construction of the project to ensure that the stormwater management measures are constructed and function as designed. If the Borough determines that non-compliance is occurring, the Borough shall issue non-compliance citations, stop work orders, and fines to ensure compliance.

Once construction is completed, long-term maintenance is required for existing and future stormwater facilities to ensure long-term operation for all project governed by the requirements set forth within the Stormwater Control Ordinance. The ordinance will require an operations and maintenance plan that will provide specific preventative maintenance tasks and schedules along with the name of the person or people responsible for preventive or corrective maintenance. The person responsible for maintenance will be required to evaluate the effectiveness of the maintenance plan at least once per year and adjust the plan and the deed as necessary.

To ensure proper maintenance and facility repair, the Borough will notify the responsible person in writing should a stormwater facility become a danger to public safety, public health, or require maintenance and / or repair. Upon receipt of the written notice, the responsible person will have fourteen days to effect maintenance and repair of the facility in a manner that is approved by the municipal engineer. The Borough, in its discretion, may extend the time allowed for effecting maintenance and repair for good cause. If the responsible person fails or refuses to perform such maintenance and repair, the municipality or County may immediately proceed to do so and shall bill the cost to the responsible person.

Plan Consistency

The Borough is not within a Regional Stormwater Management Planning Area. No TMDLs have been developed for waters within the Borough; therefore this plan does not need to be consistent with any regional stormwater management

plan (RSWMP's) or any TMDLs. If any RSWMPs or TMDLs are developed in the future, this Municipal Stormwater Management Plan will be updated to be consistent.

The Municipal Stormwater Management Plan is consistent with the Residential Site Improvement Standards (RSIS) as 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 updated to the RSIS.

The Borough's Stormwater Management Ordinance required 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 erosion and sediment control measures and report any inconsistencies to the local Soil Conservation District.

Nonstructural Stormwater Management Strategies

The Borough reviewed its Master Plan and Ordinances, and has provided a list of the sections in the Borough Land Use and Zoning Ordinances that may be modified to incorporate nonstructural stormwater management strategies. The ordinances identified below, are the section that may require 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 Department of Environmental Protection at the time of submission. Chapters 22, 28, 45, 54, 60, 74, 76, 88, 89, and 99 may need to be revised.

Land Use/Build-Out Analysis

The Borough of Rockleigh is almost one square mile in its entirety and is therefore exempt from requirements to perform a build out analysis.

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 (1 and 2).

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 NJDEP Stormwater BMP Manual.

- A. The applicant can select one of the following projects listed to compensate for the deficit from the performance standards resulting from the proposed project. More detailed information on the projects and a list of additional projects can be obtained from the Borough Engineer. Listed below are some specific projects that can be used to address the mitigation requirement.

GROUNDWATER RECHARGE

- Municipal Building roof runoff to maximize groundwater recharge.
- Retrofit any one of the Borough of Rockleigh DPW property's to construct on permeable soils to facilitate additional groundwater recharge.

WATER QUALITY

- Retrofit any one of the Borough parking lots constructed on low permeable soils or located in high water table areas to provide 80 percent (80%) of total solids. Due to site constraints, the retrofit BMP must be installed underground and cannot reduce the existing number of spaces.

WATER QUANTITY

- Install stormwater management measures on Borough properties to reduce the minimum or equal, to the project created impervious area and additional surface area volumes of the 2, 10, and 100-year storms, respectively.

2. If a suitable site cannot be located from mitigation in the same drainage (HUC 14) area as the proposed development, as presented 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. The borough will only permit this alternate option when all other mitigation venues have been exhausted. For example, if a variance is given because the 80% TSS requirement cannot be met, the selected project may address water quality impacts due to other impairments. Listed below are specific projects that can be used to address the mitigation option.

WATER QUALITY

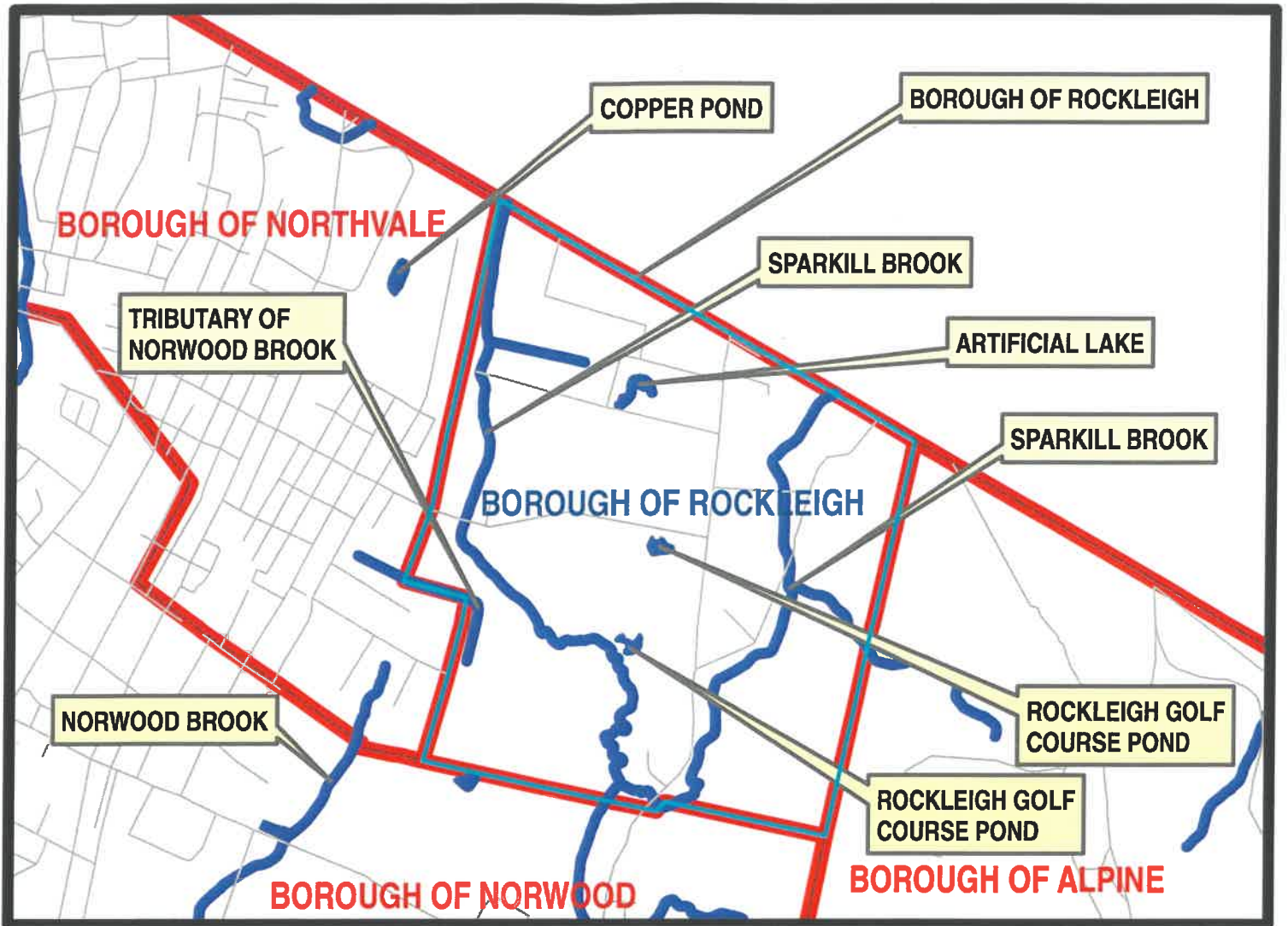
- Re-establish a vegetative buffer (minimum 50 feet wide) along the west shoreline of Sneden Pond as a goose control

measure and to filter stormwater from the high water fowl traffic areas.

- Provide goose management areas, including public education at Sneden Pond.

The Borough 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 great 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.

3. Small projects that create 200 S.F. to 10,890 S.F. (1/4 acre) of impervious area and/or 500 S.F. to 43,560 S.F. of disturbance, and cannot provide recharge or increase surface runoff may be permitted to provide funding to a Borough Stormwater Management Trust Fund. This fund will be utilized for other projects, maintenance, retrofits, abatement, and equipment specific to the Borough's compliance with the Stormwater Management Regulations. The funding amounts will be set by ordinance for impervious area by square feet and planted/vegetative/lawn area by square feet.
4. The Borough Engineer shall maintain a list of current eligible mitigation projects.
5. Non-structural Stormwater Management strategies in ordinance with SPPP, "Stormwater Pollution Prevention Plan" (see attached).



**BOROUGH OF ROCKLEIGH AND ITS WATERWAYS
N.T.S.**

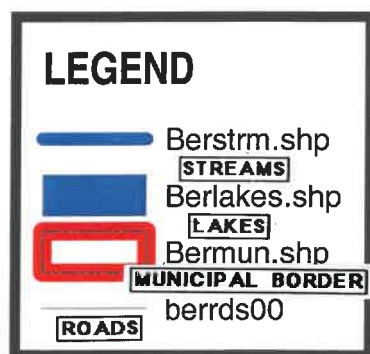
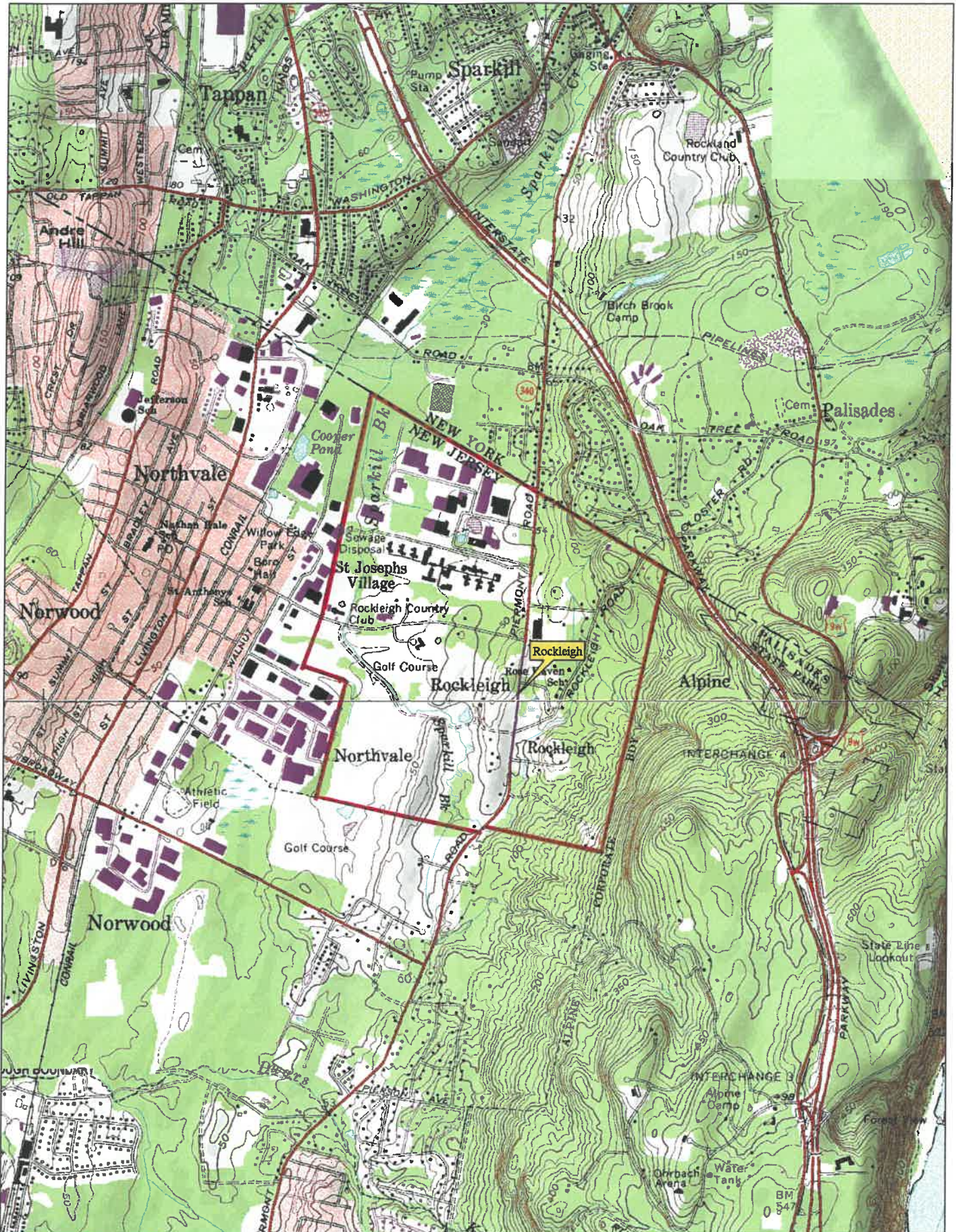


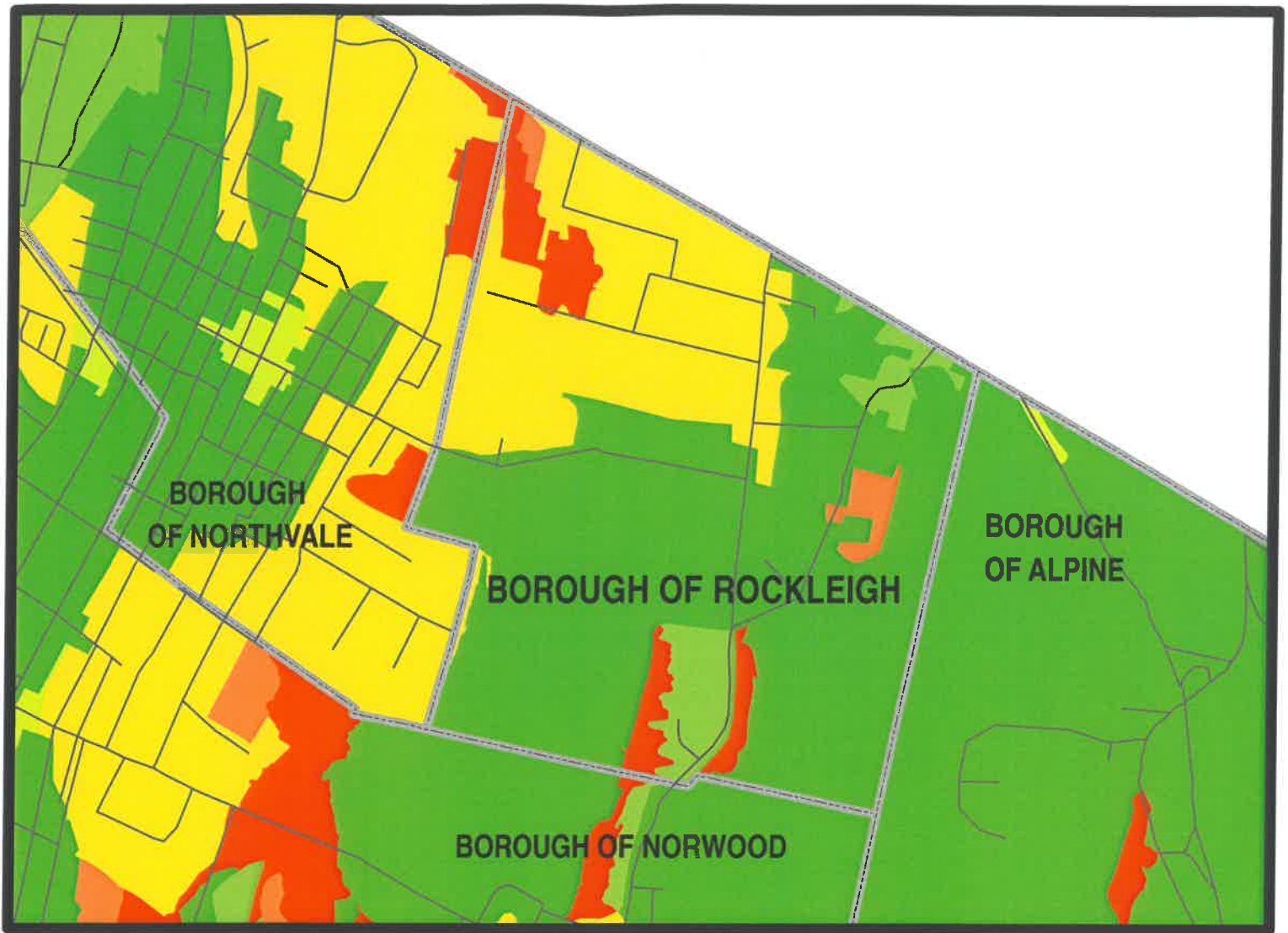
FIGURE C-2



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Scale 1 : 25,000
1" = 2080 ft





GROUNDWATER RECHARGE AREAS

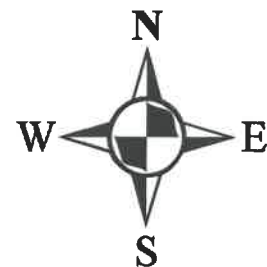
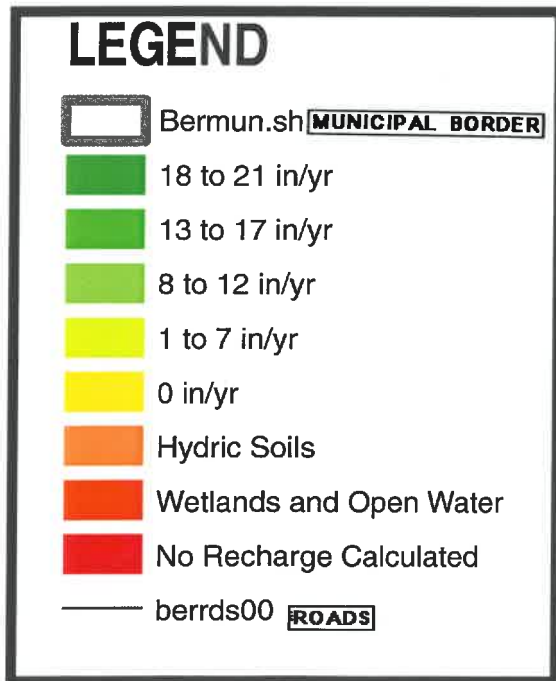
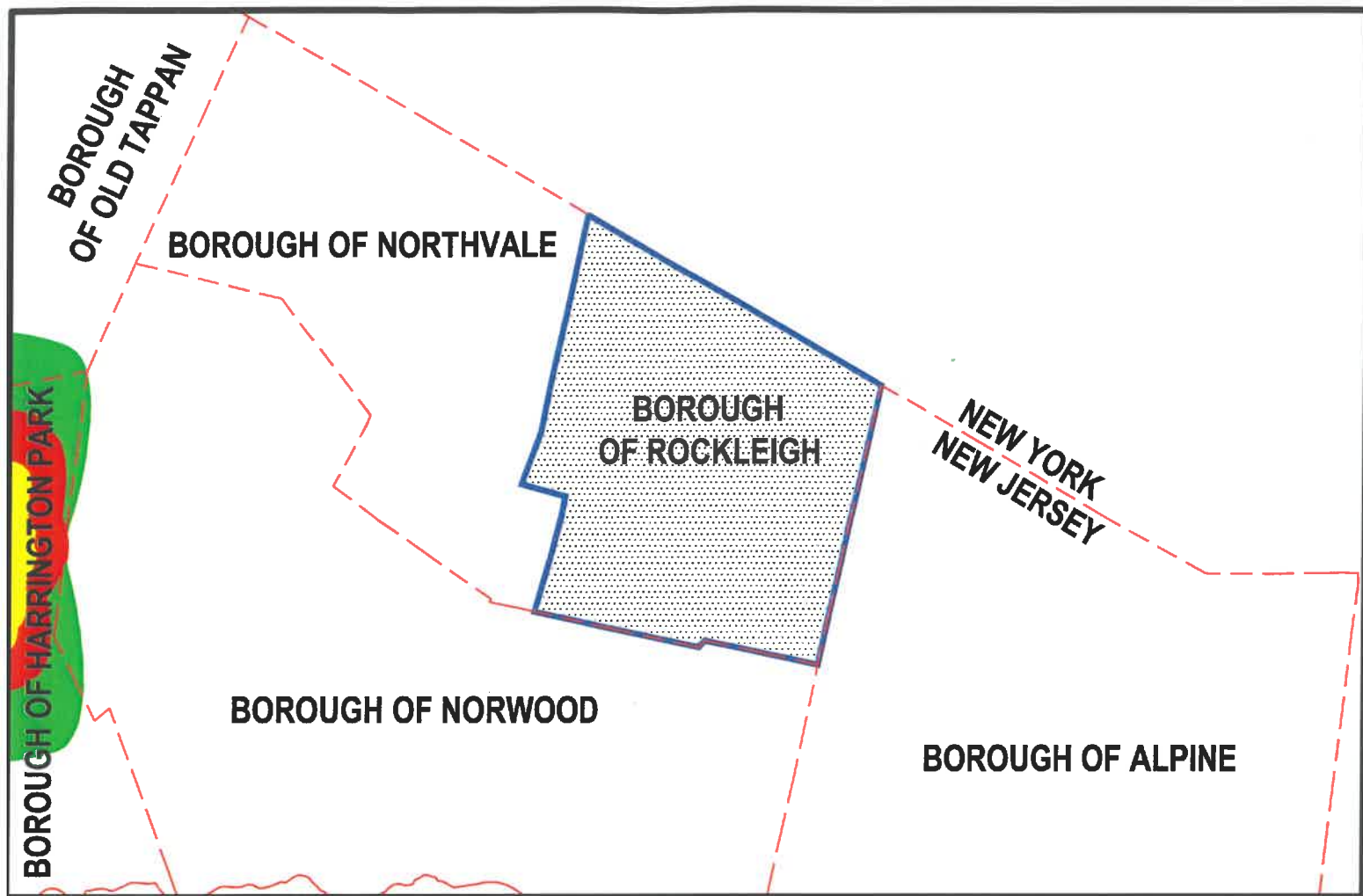
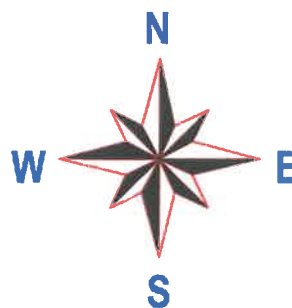
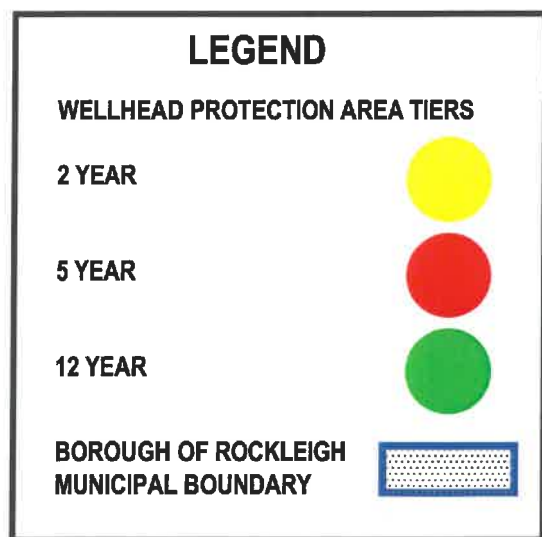


FIGURE C-4

N.T.S.

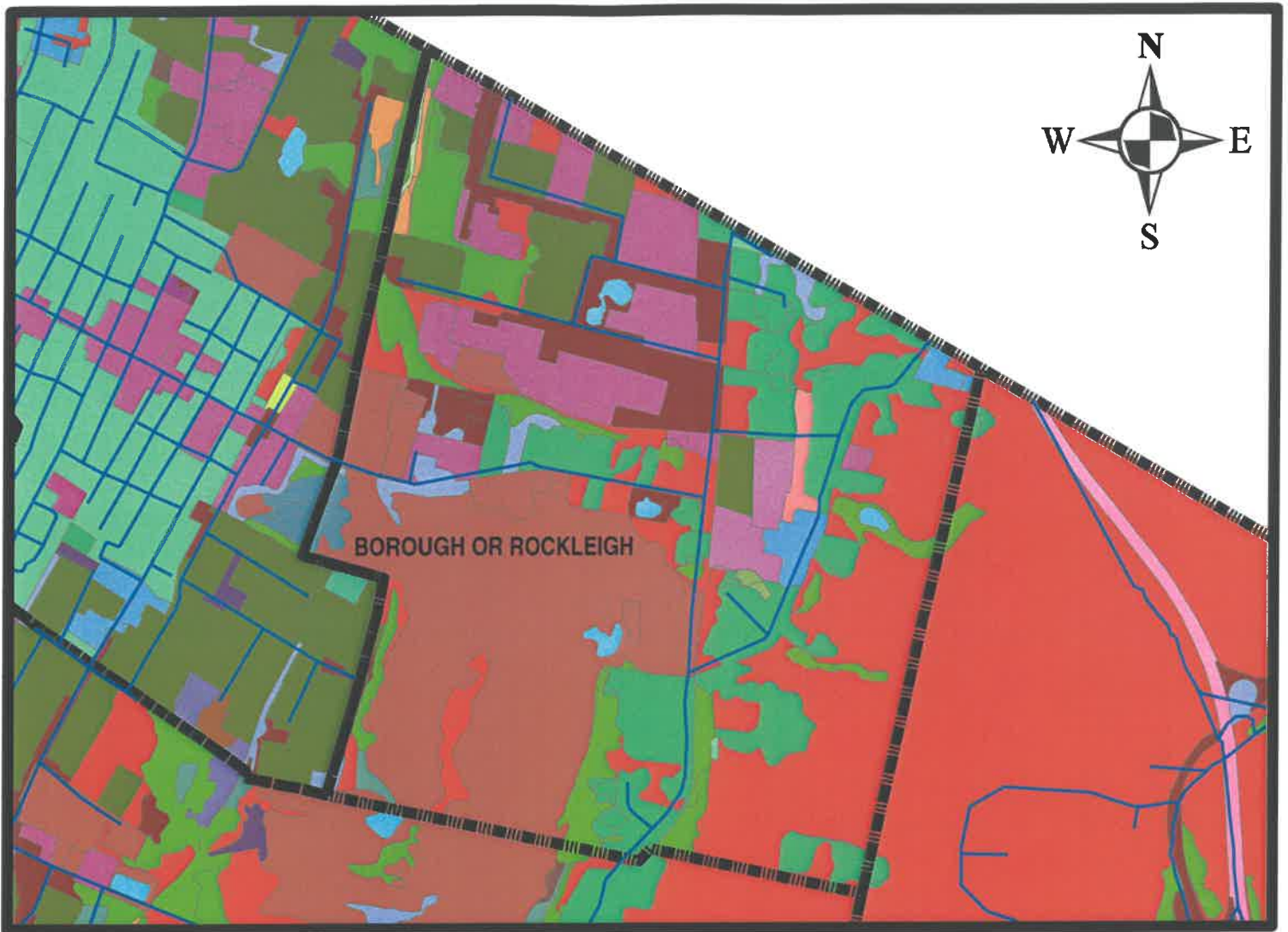


**WELLHEAD PROTECTION AREAS
N.T.S.**



**THERE ARE NO RECOGNIZED NJDEP WELLHEAD PROTECTION AREAS WITHIN
THE BOROUGH OF ROCKLEIGH BOUNDARIES**

FIGURE C-5



NJDEP LANDUSE/LANDCOVER 2002

LEGEND

Bermun.shp

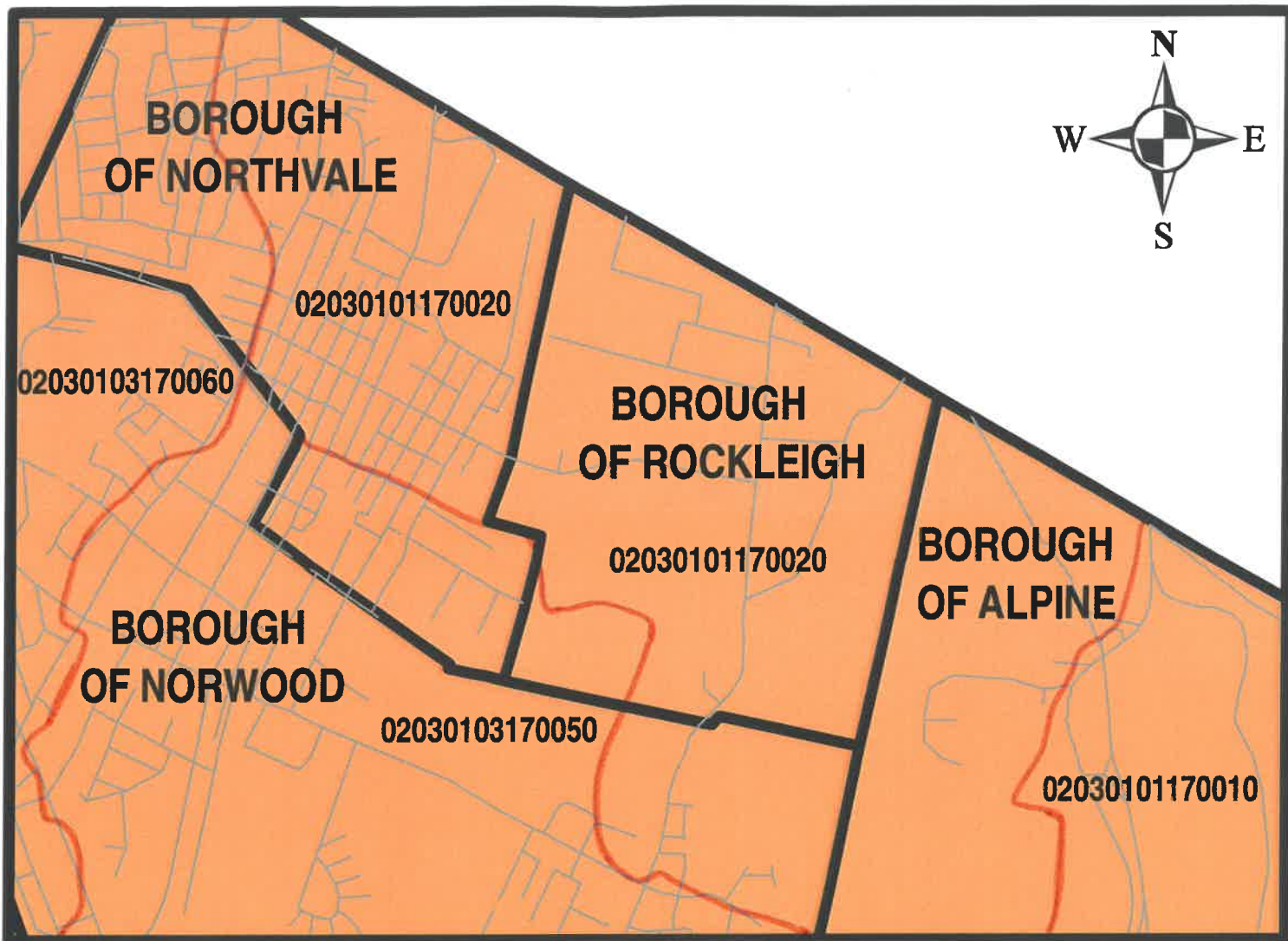
w051u02_D

MUNICIPAL BORDER

LABEL02

- | | | |
|--|--|---|
| AGRICULTURAL WETLANDS (MODIFIED) | DISTURBED WETLANDS (MODIFIED) | OTHER URBAN OR BUILT-UP LAND |
| AIRPORT FACILITIES | DREDGED LAGOON | PHRAGMITES DOMINATE COASTAL WETLANDS |
| ALTERED LANDS | EXTRACTIVE MINING | PHRAGMITES DOMINATE INTERIOR WETLANDS |
| ARTIFICIAL LAKES | HERBACEOUS WETLANDS | PHRAGMITES DOMINATE OLD FIELD |
| ATHLETIC FIELDS (SCHOOLS) | INDUSTRIAL | PHRAGMITES DOMINATE URBAN AREA |
| BARE EXPOSED ROCK, ROCK SLIDES, ETC. | INDUSTRIAL/COMMERCIAL COMPLEXES | PLANTATION |
| BRIDGE OVER WATER | MAJOR ROADWAY | RECREATIONAL LAND |
| CEMETERY | MANAGED WETLAND IN BUILT-UP MAINTAINED REC AREA | RESIDENTIAL, HIGH DENSITY OR MULTIPLE DWELLING |
| CEMETERY ON WETLAND | MANAGED WETLAND IN MAINTAINED LAWN GREENSPACE | RESIDENTIAL, RURAL, SINGLE UNIT |
| COMMERCIAL/SERVICES | MILITARY INSTALLATIONS | RESIDENTIAL, SINGLE UNIT, LOW DENSITY |
| CONFINED FEEDING OPERATIONS | MIXED DECIDUOUS/CONIFEROUS BRUSH/SHRUBLAND | RESIDENTIAL, SINGLE UNIT, MEDIUM DENSITY |
| CONIFEROUS BRUSH/SHRUBLAND | MIXED FOREST (>50% CONIFEROUS WITH 10-50% CROWN CLOSURE) | SALINE MARSH (HIGH MARSH) |
| CONIFEROUS FOREST (10-50% CROWN CLOSURE) | MIXED FOREST (>50% CONIFEROUS WITH >50% CROWN CLOSURE) | SALINE MARSH (LOW MARSH) |
| CONIFEROUS FOREST (>50% CROWN CLOSURE) | MIXED FOREST (>50% DECIDUOUS WITH 10-50% CROWN CLOSURE) | STADIUM THEATERS CULTURAL CENTERS AND ZOOS |
| CONIFEROUS SCRUB/SHRUB WETLANDS | MIXED FOREST (>50% DECIDUOUS WITH >50% CROWN CLOSURE) | STORMWATER BASIN |
| CROPLAND AND PASTURELAND | MIXED RESIDENTIAL | STREAMS AND CANALS |
| DECIDUOUS BRUSH/SHRUBLAND | MIXED SCRUB/SHRUB WETLANDS (DECIDUOUS DOM.) | TIDAL RIVERS, INLAND BAYS, AND OTHER TIDAL WATERS |
| DECIDUOUS FOREST (10-50% CROWN CLOSURE) | MIXED URBAN OR BUILT-UP LAND | TRANSITIONAL AREAS |
| DECIDUOUS FOREST (>50% CROWN CLOSURE) | MIXED WOODED WETLANDS (CONIFEROUS DOM.) | TRANSPORTATION/COMMUNICATION/UTILITIES |
| DECIDUOUS SCRUB/SHRUB WETLANDS | MIXED WOODED WETLANDS (DECIDUOUS DOM.) | UNDIFFERENTIATED BARREN LANDS |
| DECIDUOUS WOODED WETLANDS | NATURAL LAKES | UPLAND RIGHTS-OF-WAY DEVELOPED |
| | OLD FIELD (< 25% BRUSH COVERED) | UPLAND RIGHTS-OF-WAY UNDEVELOPED |
| | ORCHARDS/VINEYARDS/NURSERIES/HORTICULTURAL AREAS | WETLAND RIGHTS-OF-WAY |
| | OTHER AGRICULTURE | |
| | | berrds00 |
| | | ROADS |

FIGURE C-6
N.T.S.



NJDEP HUC14 WATERSHEDS

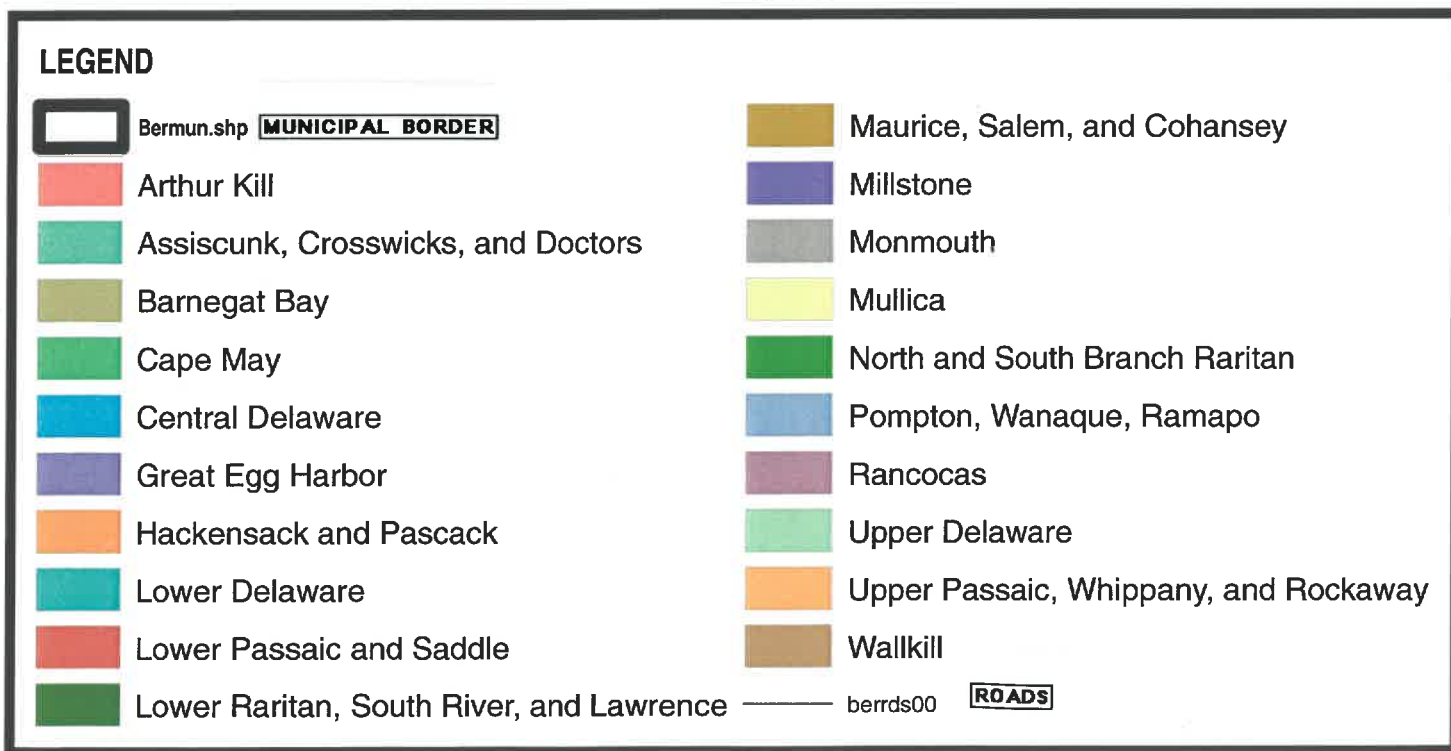


FIGURE C-7
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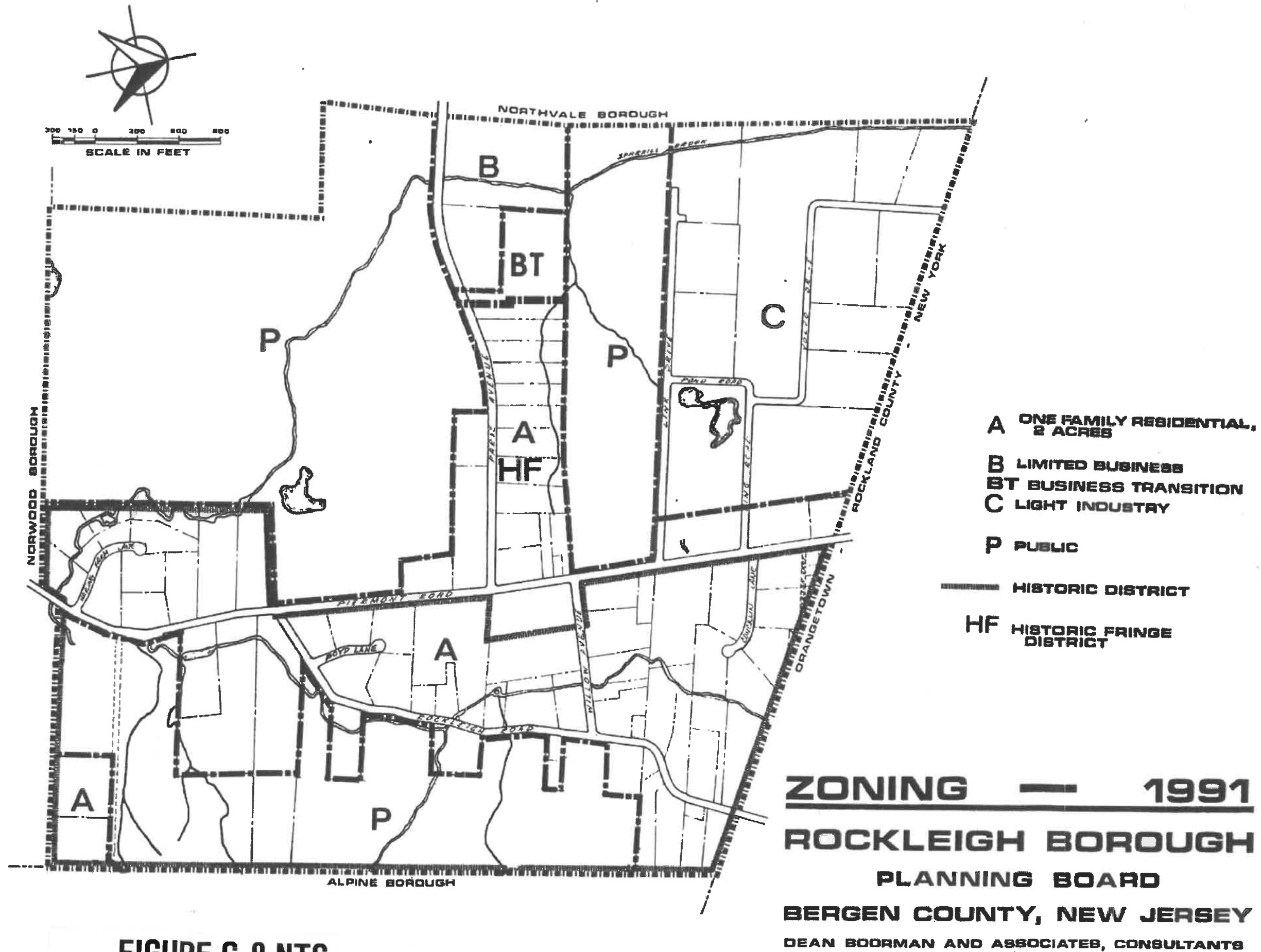
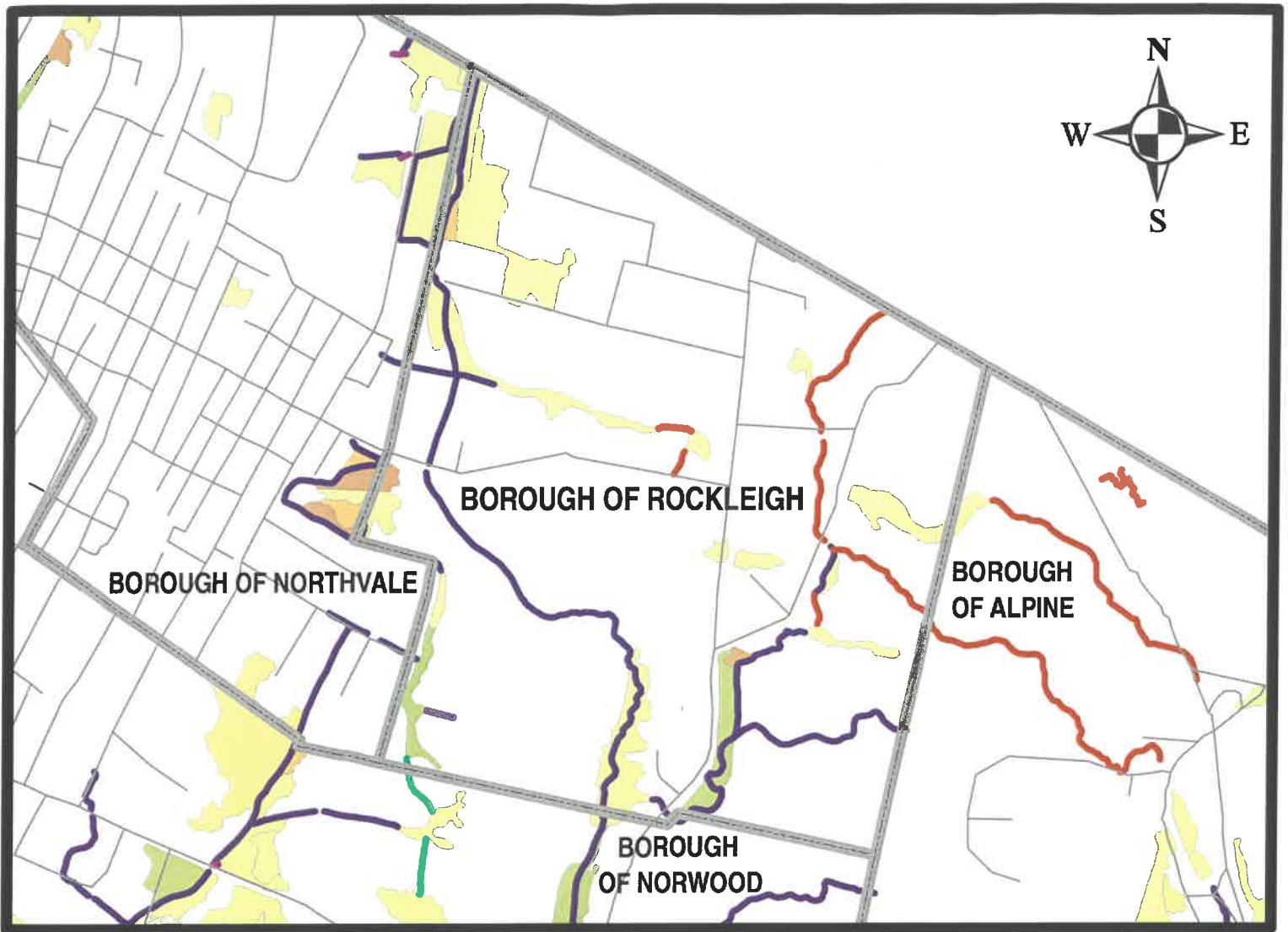


FIGURE C-8 NTS



WETLANDS, LINEAR WETLANDS AND WATER LAND USES

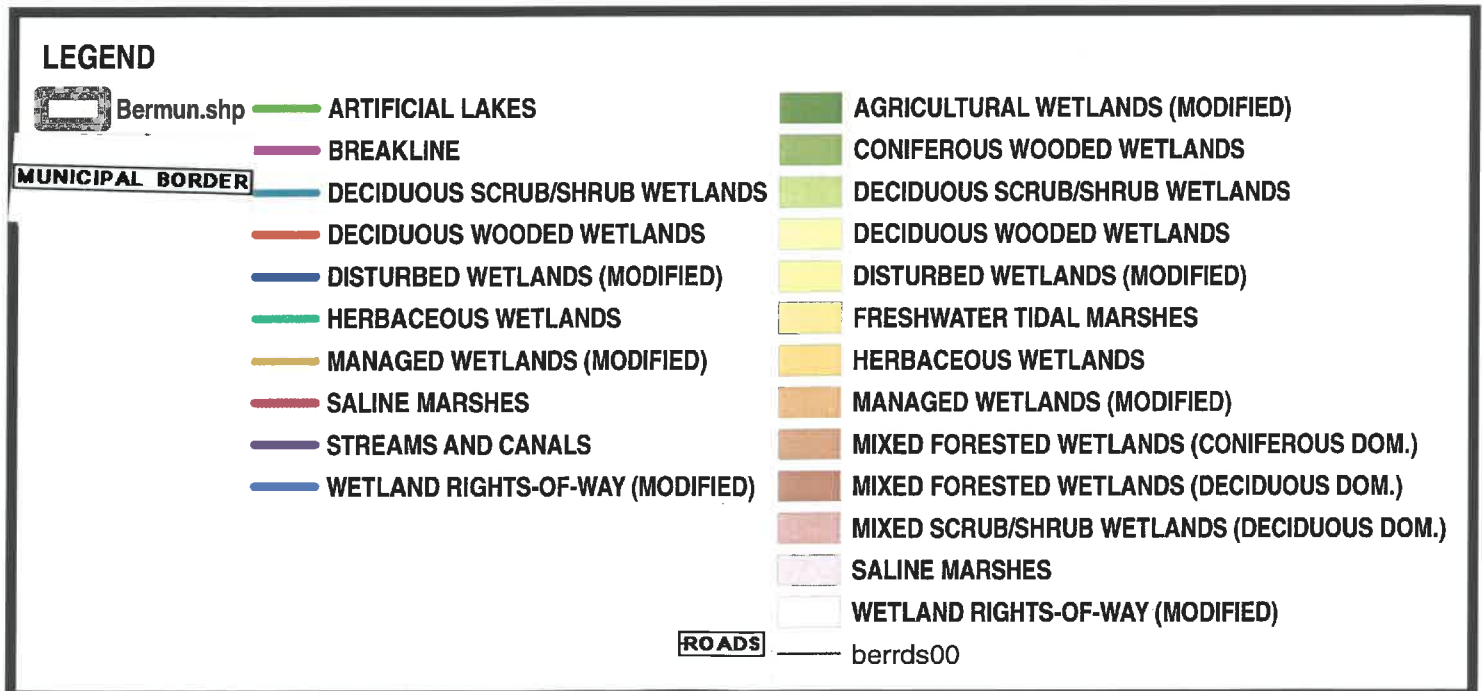


FIGURE C-9
N.T.S.

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map preparator should be consulted for possible updates or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or Floodway Boundaries have been determined, users are encouraged to consult the Flood Profile, Floodway Data and/or Summary of Floodway Tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only to landward of 61° National Geodetic Vertical Datum of 1929 (NGVD 29). Users of this FIRM should be aware that coastal flood elevations are also included in the Summary of Floodway Tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Floodway Tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodway width based on hydraulic computations with regard to requirements of the National Flood Insurance Program Floodway Widths and other pertinent floodway data is provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The projection used in the preparation of this map was Universal Transverse Mercator (UTM) zone 18. The horizontal datum was NAD 83. DATUM CONVERSION: Differences in datum, spheroid projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referred to the National Geodetic Vertical Datum of 1929. In case flood elevations must be compared to datum and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

National Geodetic Survey
National Geodetic Survey, NOAA
Silver Spring, Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
202/775-3191

To obtain current elevation, orientation and/or location information for beach areas shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (800) 713-3242, or visit the website at www.ngs.noaa.gov.

Base map information shown on the FIRM was derived from U.S. Geological Survey Digital Orthophoto Quadrangles (DOQs) produced at a scale of 1:25,000 from photography dated 1994 or later.

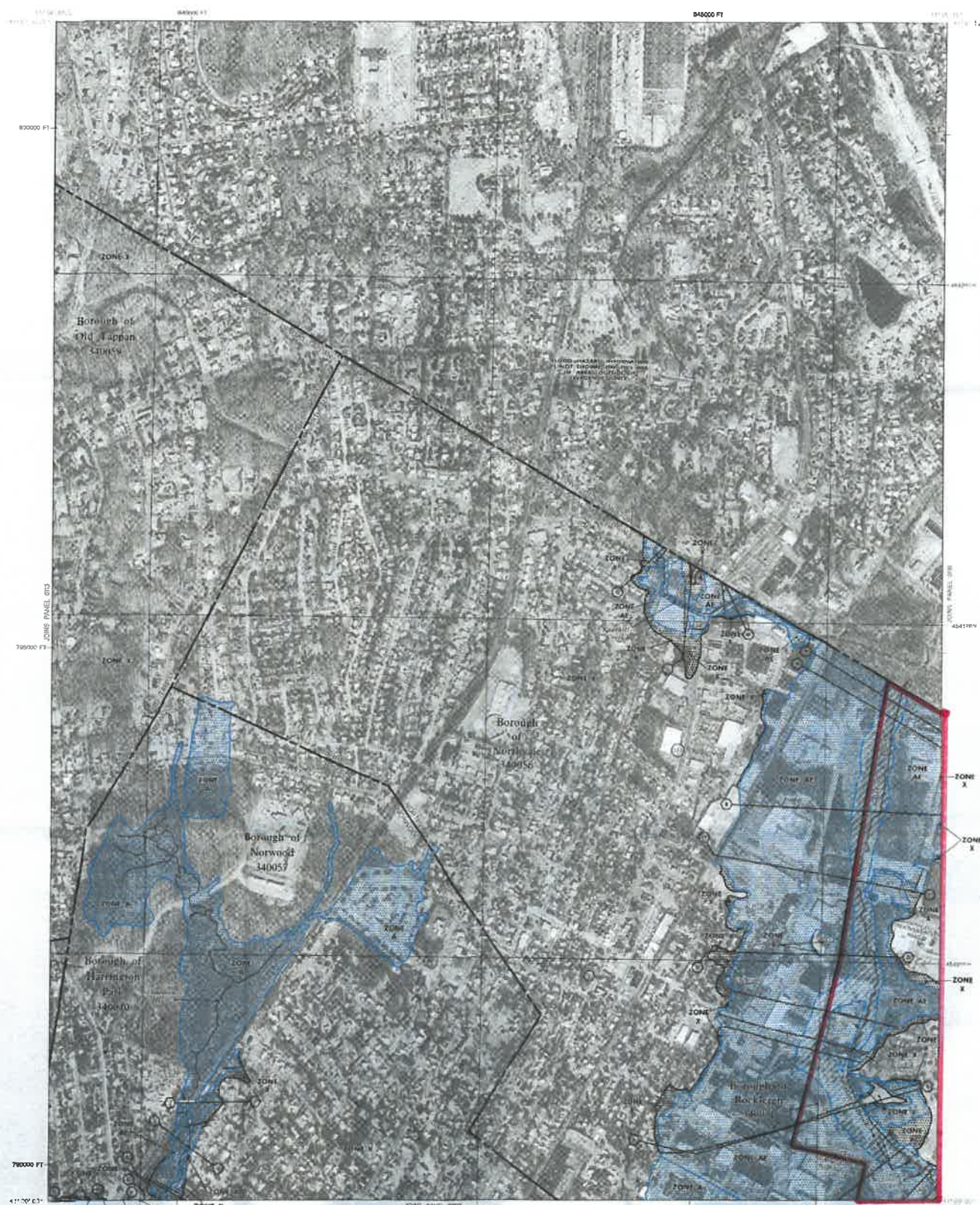
This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profile and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydrologic data) may reflect stream channel dimensions that differ from what is shown on this map.

Corporate limits shown on the map are based on the best data available at the time of publication. Significant changes due to annexations or disannexations may have occurred after this map was published; map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed Map Index for an overview map of the county showing the layout of map panels, community map repository addresses and a listing of Communities with existing National Flood Insurance Program data for each community as well as a listing of the panels on which each community is located.

Contact the FIRM Map Services Center at 1-800-255-9688 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Services Center may also be reached by Fax at 1-800-368-9620 and their website at www.fema.gov.

If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA-MAP (1-877-362-9277) or visit the FEMA website at www.fema.gov.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SPECIAL SUBJECT FLOODING BY THE 1% ANNUAL CHANCE FLOOD)

The 1% annual chance flood (100 year flood) also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The 5% Special Flood Hazard includes Zones A, AE, AO, AH, AV, and VE. The Flood Elevation is the maximum elevation of the 1% annual chance flood.

- ZONE A** No Base Flood Elevations determined.
- ZONE AE** Base Flood Elevations determined. Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevation determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually shore flow on sloping topography depths determined for areas of unusual tank flooding, etc. also determined).
- ZONE AF** Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently removed; Zone AF indicates that the former flood control system provided protection from the 1% annual chance flood.
- ZONE AV** Areas to be protected from 1% annual chance flood by a flood protection system under construction; no Base Flood Elevation determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevation determined.

FLOODWAY AREAS IN ZONE AF
The floodway is the channel of a stream plus any adjacent floodplain areas that may help limit the depth of the 1% annual chance flood to an amount not substantially in excess of flood heights.

OTHER FLOODED AREAS
ZONE B Areas of 0.1% annual chance flood, areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile, and areas protected by levees from 1% annual chance flood.

OTHER AREAS
ZONE D Areas determined to be outside the 0.2% annual chance floodplain. Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

- OTHERWISE PROTECTED AREAS (OPAs)**
OPAs areas are OPAs are normally located within or adjacent to Special Flood Hazard Areas.
- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and CPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, Flood Depths or Flood Velocities
- Base Flood Elevation low and velocity elevation in feet
- Base Flood Elevation value where uniform within an elevation in feet

- EL: BFE
- Section line
- Surveying
- UTM coordinates referenced to the North American Datum of 1983 (NAD 83) 27° Westing Hemisphere
- 427849N
- 800000 FT
- DENSE
- Location of map for elevation elevation calculation
- MAP REPOSITORY
- Refer to listing of Map Repositories on Map Index
- EFFECTIVE DATE OF DATA SOURCE
- "FLOOD INSURANCE RATE MAP"
- SEPTEMBER 30, 2005
- EFFECTIVE DATES OF REVISIONS TO THIS PANEL
- SEPTEMBER 30, 2005 - to change Base Flood Elevations and Special Flood Hazard Areas and to reflect updated geographic information.

For community map revision history prior to community mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-877-362-9622.



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 01146

FIRM
FLOOD INSURANCE RATE MAP
BERGEN COUNTY,
NEW JERSEY
(ALL JURISDICTIONS)

PANEL 114 OF 332

SEE MAP INDEX FOR FIRM PANEL LAYOUT

JURISDICTION	DATE	SCALE	PANEL	E/F/T
BERGEN COUNTY	04/01/05	1"=500'	01146	1/1
HARRISON	04/01/05	1"=500'	01146	1/1
NORWOOD	04/01/05	1"=500'	01146	1/1
OLD TAPPAN	04/01/05	1"=500'	01146	1/1
ROCKLEDGE	04/01/05	1"=500'	01146	1/1

Map Number: 34003C01146
Map Revised: SEPTEMBER 30, 2005
Federal Emergency Management Agency

F I G U R E C - 1 1 0

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFE) and/or Floodways have been determined, users are encouraged to consult the Flood Profiles, Floodway Data and/or Summary of Substrate Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood resistance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only to landward of 0.0 National Geodetic Vertical Datum of 1929 (NGVD-29). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Substrate Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Substrate Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the Floodways were computed at cross sections and interpolated between cross sections. The Floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by Flood Control Structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The projection used in the preparation of this map was Universal Transverse Mercator (UTM) zone 18. The horizontal datum was NAD 83. GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These positional differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the National Geodetic Vertical Datum of 1929. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversions between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1985, visit the National Geodetic Survey website at www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

National Geodetic Survey
National Geodetic Survey, NGS
Stop Spring, Map Center
1305 East West Highway
Silver Spring, Maryland 20910
(301) 713-2731

To obtain current elevation, description, and/or location information for beech marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-2842, or visit their website at www.ngs.noaa.gov.

Base Map information shown on the FIRM was derived from U.S. Geological Survey Digital Orthophoto Quarterframes (DOQs) produced at a scale of 1:12,000 from photography dated 1995 or later.

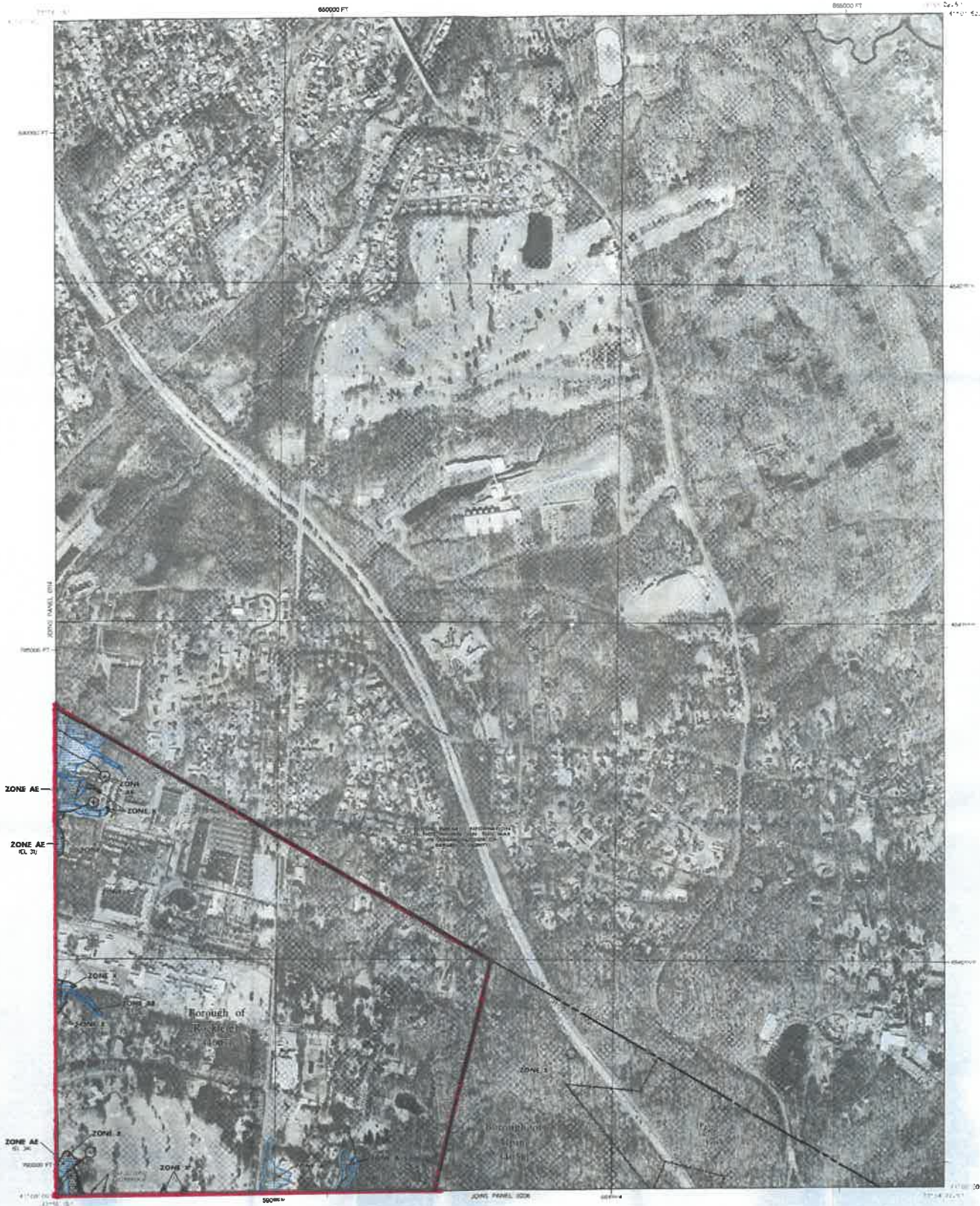
This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Geographic labels shown on this map are based on the best data available at the time of publication. Because changes due to acquisitions or de-acquisitions may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate firm locations.

Please refer to the separately printed Map Index for an overview map of the county showing the layout of map panels, community map repository addresses, and a listing of Communities with existing National Flood Insurance Program data for each community as well as a listing of the panels in which each community is located.

Contact the FEMA Map Service Center at 1-800-368-5848 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital editions of the map. The FEMA Map Service Center may also be reached by fax at 1-800-368-5820 and their website at www.fema.gov.

If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA-8471 (1-877-362-8471) or visit the FEMA website at www.fema.gov.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHA) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD
The 1% annual chance flood (100 year flood) also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The 50 year Flood Hazard Area is the area subject to flooding by the 1% annual chance flood, 7 of Special Flood Hazard include Zones A1 through A18. The Flood Elevation is the water surface elevation of the 1% annual chance flood.

- ZONE A** No Base Flood Elevations determined
- ZONE A1** Base Flood Elevation determined
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevation determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of sheet flow flooding, water also determined.
- ZONE A1** Special Flood Hazard Area formerly produced from the 1% annual chance flood, but a flood control system that was subsequently determined. Zone A1 indicates that the former flood control system being removed to provide protection from the 1% annual chance greater flood.
- ZONE A1V** Area to be protected from 1% annual chance flood by a levee flood protection system under construction; no Base Flood Elevation determined.
- ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevation determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevation determined.

FLOODWAY AREAS IN ZONE AE
The Floodway is the channel of a stream plus any adjacent floodplain areas that may help limit the elevation of the 1% annual chance flood (AE) by control and substantial increases in flood heights.

OTHER FLOOD AREAS
ZONE X Area of 0.2% annual chance flood, areas of 0.1% annual chance flood with average depth of less than 1 foot or with discharge rates less than 1 cubic foot per second, and areas protected by levees from 1% annual chance flood.

OTHER AREAS
ZONE Z Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)
CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.
1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
Zone V boundary
CBRS and OPAs boundary
Boundary showing Special Flood Hazard Areas of different Flood Elevation, Flood depths or flood velocity
Base Flood Elevation line and water elevation in feet
Base Flood Elevation value where uniform within at elevation in feet
*Referenced to the National Geodetic Vertical Datum of 1929

- Low water line
- Trained line
- Contour coordinates referenced to the North American Datum of 1929 (NAD 22) (Station 1000000)
- 1000-meter Universal Transverse Mercator grid values, zone 18
- 5000-foot grid and 10-foot New Jersey State Plane coordinate system, NAD 83 (Zone 18)
- Bench mark (see explanation in Notes to Users section of this FIRM panel)
- Location of node for elevation calculation
- MAP REPOSITORY
- Refer to Index of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP: SEPTEMBER 29, 1985

September 20, 2003 - to change Base Flood Elevation and Special Flood Hazard Area and to reflect updated geographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table included in the Flood Insurance Study report for this jurisdiction.
To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-616-6622.



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0116C

FIRM
FLOOD INSURANCE RATE MAP
BERGEN COUNTY,
NEW JERSEY
(ALL JURISDICTIONS)

PANEL 116 OF 332
SEE MAP INDEX FOR FIRM PANEL LAYOUT

JURISDICTION	NUMBER	PANEL	DATE
BERGEN COUNTY	116	0116C	SEP 29 1985

Notes to Users: The Map Number shown below should be used when the map is used. The Community Number and Date should be used as a reference to the map repository.

MAP NUMBER
34003C0116

MAP REVISION
SEPTEMBER 30, 2004

Federal Emergency Management Agency

F I G U R E C 1 1 1

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or Floodways have been determined, users are encouraged to consult the Flood Profiles, Floodway Data and/or Summary of Elevation Tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only to landward of 10' National Geodetic Vertical Datum of 1929 (NGVD 29). Users of the FIRM should be aware that coastal flood elevations are also provided in the Summary of Elevation Tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Elevation Tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic computations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for the jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The projection used in the preparation of this map was Universal Transverse Mercator (UTM) zone 18. The horizontal datum was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the National Geodetic Vertical Datum of 1929. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversions between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1215 East-West Highway
Silver Spring, Maryland 20910
(301) 713-2993

To obtain current elevation description and/or location information for beach marks shown on the map, please contact the Information Services Branch of the National Geodetic Survey at (202) 713-3242, or visit their website at www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from U.S. Geological Survey Digital Orthophoto Quadrangles (DOQs) produced at a scale of 1:2,000 from photography dated 1996 or later.

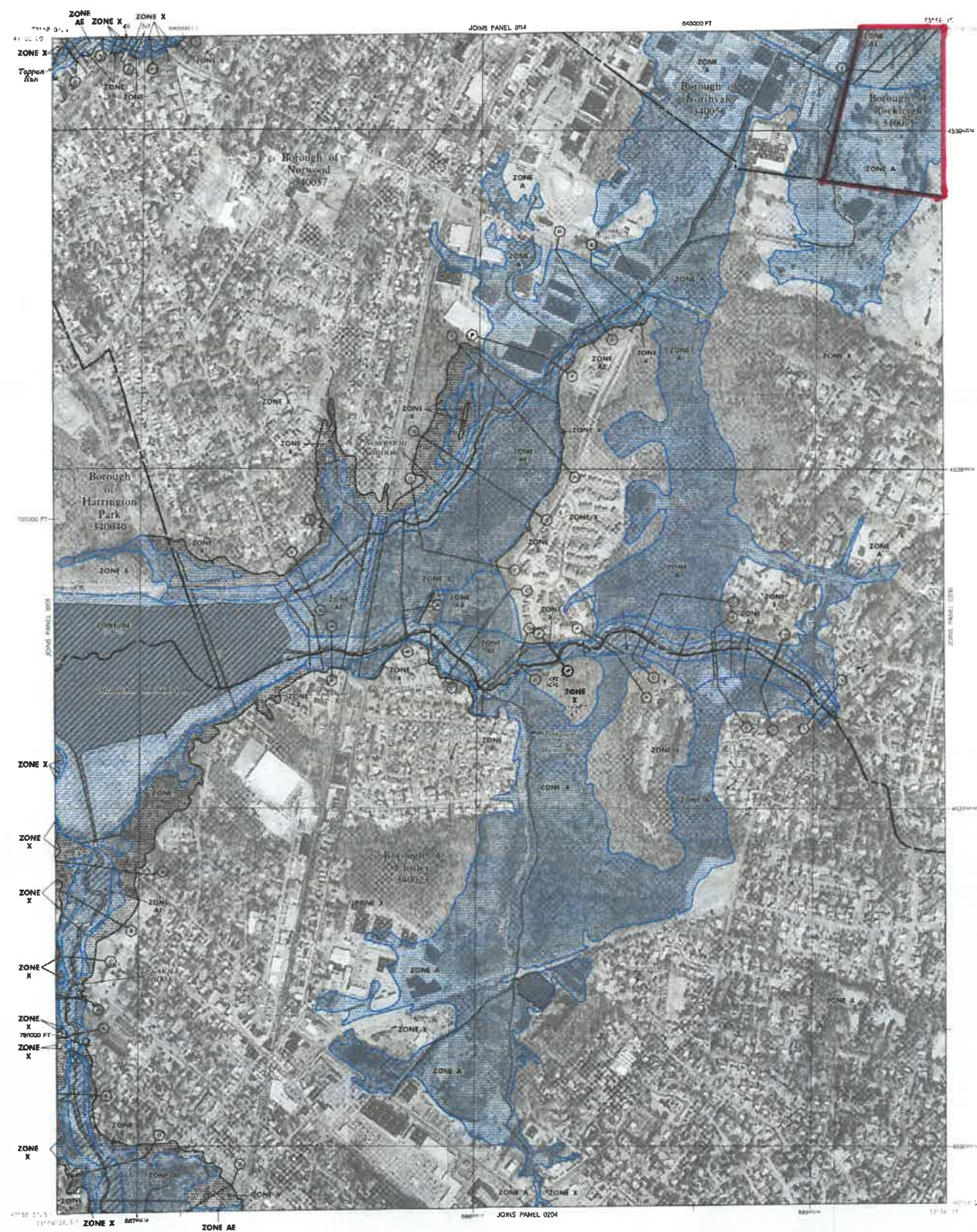
This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydrologic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or dis-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limits locations.

Please refer to the separately printed Map Index for an overview map of the county showing the layout of map panels; community map repository addresses; and a listing of communities participating in the National Flood Insurance Program, dates for each community as well as a listing of the panels in which each community is located.

Contact the FEMA Map Service Center at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by fax at 1-800-358-9620 and their website at www.fema.gov.

If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA (1-877-336-6577) or visit the FEMA website at www.fema.gov.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SPECIAL SUBC INUNDATION BY THE 1% ANNUAL CHANCE FLOOD)

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The 1% annual chance flood is the basis for determining the Special Flood Hazard Areas. The 1% annual chance flood elevation is the water surface elevation of the 1% annual chance flood.

- ZONE A** Area in which flood elevations are determined.
- ZONE AE** Area in which flood elevations are determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of parking); Base Elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually about flow or sloping or average depths determined); For areas of elevated structures, not also determined.
- ZONE AR** Special Flood Hazard Area (formerly protected from the 1% annual chance flood by a flood control system that was subject to a Floodway Analysis (FWA) study). Zone AR indicates that the former flood control system is being removed to provide protection from the 1% annual chance flood.
- ZONE AVP** Area to be protected from 1% annual chance flood by a flood protection system under construction; no Base Flood Elevation determined.
- ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Elevations determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevation determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream, plus any adjacent floodplain area that is a part of the floodway, plus any adjacent floodplain area that is a part of the floodway, plus any adjacent floodplain area that is a part of the floodway.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 100 acres; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

OPAs are areas that are not included within Special Flood Hazard Areas and are not included within Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary defining Special Flood Hazard Areas of all Base Flood Elevations, flood depths or flood velocities
- Base Flood Elevation line and value (elevation in feet)
- Base Flood Elevation value where uniform within divisions in feet

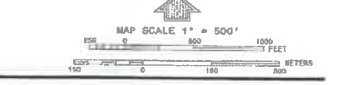
*Referenced to the National Geodetic Vertical Datum of 1929

- Coastal high water line
- 1:500 scale
- Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) 2-D Western Hemisphere
- 300-meter Universal Transverse Mercator grid values
- 500-foot grid values; New Jersey State Plane coordinate system, Universal Transverse Mercator projection
- North magnetic declination on map is shown with the FIRM panel
- Location of study for elevation calculations
- MAP RL7051001
- Refer to 1025 of Map Repository on Map Index

EFFECTIVE DATE OF DOWNGRADING: 11/03/2005 (INSURANCE RATE) 10/11/2005 (SEPTEMBER 30, 1995)

EFFECTIVE DATE OF REVISIONS TO THIS PANEL: September 30, 2005 - to change Base Flood Elevations and Special Flood Hazard and to reflect updated topographic information.

For community map repository please refer to community map repository in the Community Map Repository section of the Flood Insurance Study report for this jurisdiction. To determine if flood insurance is available in this community, contact your agent or call the National Flood Insurance Program at 1-800-436-6620.



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 02020

FIRM
FLOOD INSURANCE RATE
BERGEN COUNTY,
NEW JERSEY
(ALL JURISDICTIONS)

PANEL 202 OF 332
USE MAP INDEX FOR FIRM PANELS

COMMUNITY		MAJORS	PANEL
CLOSTER, BOR OF	34085	3082	
HARRINGTON PARK, BOR OF	34086	3083	
NORTHVALE, BOR OF	34087	3084	
NORWOOD, BOR OF	34088	3085	
ROSELAND, BOR OF	34089	3086	

MAP NUMBER: 3400300
MAP REVISION: SEPTEMBER 30, 2005
Federal Emergency Management Agency

FIGURE C-12

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily certify all areas subject to flooding, particularly from local discharge sources of storm water. The community map preparatory should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information on areas where Base Flood Elevations (BFEs) and/or Floodway Areas have been determined, users are encouraged to consult the Flood Profiles, Floodway Data and/or Summary of Elevation Data tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on this FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accurate flood elevation data presented in the FIS reports should be used in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of the National Geodetic Vertical Datum of 1929 (NGVD 29). Users of this FIRM should be aware that coastal high tide elevations are also provided in the Summary of Elevation Data tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Elevation Data tables should be used for construction and/or floodplain management purposes where they are higher than the elevations shown on this FIRM.

Boundaries of the Floodways were computed at cross sections and interpolated between cross sections. The Floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4, Flood Protection Measures, of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The projection used in the preparation of this map was Universal Transverse Mercator (UTM) zone 18. The horizontal datum was NAD 83. Orthographic projections of UTM zones are not used in the production of FIRMs for adjacent jurisdictions. Any resulting differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Height elevations on this map are referenced to the National Geodetic Vertical Datum of 1929. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NGA
Silver Spring Metro Center
1205 East West Highway
Silver Spring, Maryland 20910
(301) 713-3351

To obtain current elevation, location, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3348, or visit their website at www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from U.S. Geological Survey Digital Orthophoto Quadrangles (DOQs) produced at a scale of 1:12,000 from photography dated 2005 or later.

This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodways and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel features that differ from what is shown on the map.

Corporate Limits shown on this map are based on the best data available at the time of publication. Because changes due to annexation or de-annexation may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed Map Index for an overview map of the county showing the layout of map panels, community map reporting addresses, and a listing of Community Data, including National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the FIRM Map Service Center at 1-800-368-5896 for information on available products associated with the FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by fax at 1-800-368-5820 and their website at www.fema.gov/msc.

If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-368-2627) or visit the FEMA website at www.fema.gov.



LEGEND

- SPECIAL FLOOD HAZARD AREAS (SFHA) SUBCATEGORIES: 1% ANNUAL CHANCE FLOOD
- The 1% annual chance flood (100-year flood) shown on the base flood of the map is a 1% chance of being equalled or exceeded in any given year. The Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Special Flood Hazard Areas include Zones AE, AH, AO, AR, AV, V, and VE. Flood Elevation is the water surface elevation of the 1% annual chance flood.
- ZONE A**: No Base Flood Elevation determined.
- ZONE AE**: Base Flood Elevation determined. Flood depths of 1 to 3 feet (usually areas of parking, low elevation structures).
- ZONE AH**: Flood depths of 1 to 3 feet (usually areas of parking, low elevation structures).
- ZONE AO**: Flood depths of 1 to 3 feet (usually areas of parking, low elevation structures).
- ZONE AR**: Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was authorized. Zone AR indicates that the former flood control or being retained to provide protection from the 1% annual chance flood.
- ZONE AV**: Area to be protected from 1% annual chance flood by a flood protection system under construction, no Base Flood Elevation determined.
- ZONE V**: Coastal Flood Zone with velocity hazard (wave action); no Base Flood Elevation determined.
- ZONE VE**: Coastal Flood Zone with velocity hazard (wave action); Base Flood Elevation determined.
- FLOODWAY AREAS IN ZONE AE
- The Floodway is the channel of a stream plus any adjacent floodplain areas that together with encroachments on the 1% annual chance flood can be carried without increases in flood heights.
- OTHER FLOOD AREAS**
- ZONE Y**: Area of 0.2% annual chance flood; area of 1% annual chance with average depth of less than 1 foot or with average area of 1 square mile, and area protected by levees from 1% annual flood.
- OTHER AREAS**
- ZONE X**: Areas determined to be outside the 0.2% annual chance floodplain.
- ZONE D**: Areas in which flood hazard are undetermined, but possible.
- COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**
- OTHERWISE PROTECTED AREAS (OPA)**
- CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.
- 1% annual chance floodplain boundary.
- 0.2% annual chance floodplain boundary.
- Floodway boundary.
- Zone D boundary.
- CBRS and OPA boundary.
- Boundary dividing Special Flood Hazard Area of Base Flood Elevation, flood depths or flood velocity.
- Base Flood Elevation line and water elevation in feet. (E.L. 087)
- Referenced to the National Geodetic Vertical Datum of 1929.
- Cross section line.
- Tangent line.
- Graphic coordinate referenced to the North of Datum of 1929 (NAD 27) Western Hemisphere.
- 4298' = 4298.00
- 60000 FT
- D3550 X
- Location of water for offshore elevation calculation.
- Map projection.
- Refer to listing of Map Projections on Map Index.
- EFFECTIVE DATE OF CURRENT FLOOD INSURANCE RATE MAP**
SEPTEMBER 29, 1996
- EFFECTIVE DATE OF REVISIONS TO THIS PANEL**
September 30, 2005 in change Base Flood Elevations and Special Flood Hazard and to reflect updated topographic information.
- For community map update history prior to nationwide mapping refer to the CMA Map History Table located in the Flood Insurance Study report for this jurisdiction.
- To determine if flood insurance is available in this community, contact your agent or call the National Flood Insurance Program at 1-800-633-6620.

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0206G

FIRM FLOOD INSURANCE RATE BERGEN COUNTY, NEW JERSEY (ALL JURISDICTIONS)

PANEL 206 OF 332

(SEE MAP INDEX FOR FIRM PANEL 1)

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COMMUNITY	140583	0003
COMMUNITY	140584	0004

MAP NO. 34003C
MAP R
SEPTEMBER 30
Federal Emergency Management Agency

F I G U R E C - 1 3

APPENDIX



BOROUGH OF ROCKLEIGH

26 Rockleigh Road
Rockleigh, NJ 07647-2706
Tel: 201-768-4217
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BOROUGH OF ROCKLEIGH

ORDINANCE NO. 06-06

"AN ORDINANCE TO AMEND THE ROCKLEIGH CODE BY THE ADDITION TO PART II GENERAL LEGISLATION OF CHAPTER 56 TO BE ENTITLED "STORMWATER CONTROL ORDINANCE""

NOW THEREFORE BE IT ORDAINED, by the Mayor and Council of the Borough of Rockleigh, in the County of Bergen, State of New Jersey, that Chapter 56, entitled "Stormwater Control Ordinance" is hereby added to the Rockleigh Code as follows:

Section 1: Scope and Purpose

A. Policy Statement

Flood control, groundwater recharge, and pollutant reduction through nonstructural or low impact techniques shall be explored before relying on structural BMPs. Structural BMPs should be integrated with nonstructural stormwater management strategies and proper maintenance plans. Nonstructural strategies include both environmentally sensitive site design and source controls that prevent pollutants from being placed on the site or from being exposed to stormwater. Source control plans should be developed based upon physical site conditions and the origin, nature, and the anticipated quantity or amount of potential pollutants. Multiple stormwater management BMPs may be necessary to achieve the established performance standards for water quality, quantity and groundwater recharge.

B. Purpose

It is the purpose of this ordinance to establish minimum stormwater management requirements and controls for "major developments" as defined in Section 2.

C. Applicability

1. This ordinance shall be applicable to all site plans and subdivisions for the following

major developments that require preliminary or final site plan or subdivision review:

- a. Non-residential major developments; and
- b. Aspects of residential major developments that are not pre-empted by the Residential Site Improvement Standards at N.J.A.C. 5:21.

2. This ordinance shall also be applicable to all major developments undertaken by the Borough of Rockleigh

D. **Compability with Other Permit and Ordinance Requirements**

Development approvals issued for subdivisions and site plans pursuant to this ordinance are to be considered an integral part of development approvals under the subdivision and site plan review process and does not relieved the applicant of the responsibility to secure required permits or approvals for activities regulated by any other applicable code, rule, act, or ordinance. In their interpretation and application, the provisions of this ordinance shall be held to be the minimum requirements for the promotion of the public health, safety, and general welfare. This ordinance is not intended to interfere with, abrogate, or annul any other ordinances, rule or regulation, statute, or other provision of lay except that, where any provision of this ordinance imposes restrictions different from those imposed by any other ordinance, rule or regulation, or other provision of law, the more restrictive provisions or higher standards shall control.

Section 2: Definitions

Unless specifically defined below, words or phrases used in this ordinance shall be interpreted so as to give them the meaning they have in common usage and to give this ordinance its most reasonable application. The definitions below are the same as or based on the corresponding definitions in the Stormwater Management Rules at N~J.A.C. 7:8-1.2.

“Compaction” means the increase in soil bulk density,

“Core” means a pedestrian-oriented area of commercial and civic uses serving the surrounding municipality, generally including housing and access to public transportation.

“County review agency” means an agency designate by the County Board of Chosen Freeholders to review municipal stormwater management plans and implementing ordinance(s). The county review agency may either be:

A county planning agency; or

A county water resource association created under N.J.S.A. 58:16A-55.5, if the ordinance or resolution delegates authority to approve, conditionally approve, or disapprove municipal stormwater management plans and implementing ordinances.

“Department” means the New Jersey Department of Environmental Protection.

“Designate Center” means a State Development and Redevelopment Plan Centers as designated by the State Planning Commission such as urban, regional, Borough, village, or hamlet.

“Design engineer” means a person professionally qualified and duly licensed in New Jersey to perform engineering services that may include, but not necessarily be limited to, development of project requirements, creation and development of project design and preparation of drawings and specifications.

“Development” means the division of a parcel of land into two or more parcels, the construction, reconstruction, conversion, structural alteration, relocation or enlargement of any building or structure, any mining excavation or landfill, and any use or change in the use of any building or other structure, or land or extension of use of land, by any person, for which permission is required under the Municipal Land Use Law, N.J.S.A. 40:55D-1 et. seq. In the case of development of agriculture lands, development means: any activity that requires a State permit; any activity reviewed by the County Agricultural Board (CAB) and the State Agricultural Development Committee (SADC), and municipal review of any activity not exempted by the Right to Farm Act, N.J.S.A. 4:1C-1 et. seq.

“Drainage area” means a geographic area within which stormwater, sediments, or dissolved materials drain to a particular receiving waterbody or to a particular point along a receiving waterbody.

“Environmentally critical areas” means an area or feature which is of significant environmental value, including but not limited to: stream corridors; natural heritage priority sites; habitat of endangered or threatened species; large areas of contiguous open space or upland forest; steep slopes; and well head protection and groundwater recharge areas. Habitats of endangered or threatened species are identified using the Department’s Landscapes Project as approved by the Department’s Endangered and Non-game Species Program.

“Empowerment Neighborhood” means a neighborhood designated by the Urban Coordinating Council” in consultation and conjunction with” the New Jersey Redevelopment Authority pursuant to N.J.S.A. 55:19-69.

“Erosion” means the detachment and movement of soil or rock fragments by water, wind, ice or gravity.

“Impervious surface” means a surface that has been covered with a layer of material so that is highly resistant to infiltration by water.

“Infiltration” is the process by which water seeps into the soil from precipitation.

“Major development” means any “development” that provides for ultimately disturbing one or more acres of land. Disturbance for the purpose of this rule is the placement of impervious surface or exposure and/or movement of soil or bedrock or clearing, cutting, or removing of vegetation.

“Municipality” means any city, Borough, Borough, Boroughship or village.

“Node” means an area designated by the State Planning Commission concentrating facilities and activities which are not organized in a compact form

- “Nutrient” means a chemical element or compound, such as nitrogen or phosphorus, which is essential to and promotes the development of organisms.
- “Person” means any individual, corporation, company, partnership, firm, association, the Borough of Rockleigh, or political subdivision of this State subject to municipal jurisdiction pursuant to the Municipal Land Use Law, N.J.S.A. 40:55D-1 et. Seq.
- “Pollutant” means any dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, refuse, oil, grease, sewage sludge, munitions, chemical wastes, biological materials, medical wastes, radioactive substance (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.)), thermal waste, wrecked or discarded equipment, rock, sand, cellar dirt, industrial, municipal, agricultural, and construction waste or runoff, or other residue discharged directly or indirectly to the land, ground waters or surface waters of the State, or to a domestic treatment works. “Pollutant” includes both hazardous and nonhazardous pollutants.
- “Recharge” means the amount of water from precipitation that infiltrates into the ground and is not evapotranspired.
- “Sediment” means solid material, mineral or organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water or gravity as a product of erosion.
- “Site” means that lot or lots upon which a major development is to occur or has occurred.
- “Soil” means all unconsolidated mineral and organic material of any origin.
- “State Development” and Redevelopment Plan Metropolitan Planning Area (PAL)” means an area delineated on the State Plan Policy Map and adopted by the State Planning Commission that is intended to be the focus for much of the state’s future redevelopment and revitalization efforts.
- “State Plan Policy Map” is defined as the geographic application of the State Development and Redevelopment Plan’s goals and statewide policies, and the official map of these goals and policies.
- “Stormwater” means water resulting from precipitation (including rain and snow) that runs off the land’s surface, is transmitted to the subsurface, or is captured by separate storm sewers or other sewage or drainage facilities, or conveyed by snow removal equipment.
- “Stormwater runoff” means water flow on the surface of the ground or in storm sewers, resulting from precipitation.
- “Stormwater management basin” means an excavation or embankment and related areas designed to retain stormwater runoff. A stormwater management basin may either be normally dry (that is, a detention basin or infiltration basin), retain water in a permanent pool (a retention basin) or be planted mainly with wetland vegetation (most constructed stormwater wetlands).
- “Stormwater management measure” means any structural or nonstructural strategy, practice, technology, process, program, or other method intended to control or reduce stormwater or to

eliminate illicit or illegal non-stormwater discharges into stormwater conveyances.

“Tidal Flood Hazard Area” means a flood hazard area, which may be influenced by stormwater runoff from inland areas, but which is primarily caused by the Atlantic Ocean.

“Urban Coordinating Council Empowerment Neighborhood” means a neighborhood given priority access to State resources through the New Jersey Redevelopment Authority.

“Urban Enterprise Zones” means a zone designated by the New Jersey Enterprise Zone Authority pursuant to the New Jersey Enterprise Urban Zones Act, N.J.S.A. 52:27H-60 et. Seq.

“Urban Redevelopment Area” is defined as previously developed portions of areas:

- (1) Delineated on the State Plan Policy Map (SPPM) as the Metropolitan Planning Area (PAI), Designated Centers, Cores or Nodes;
- (2) Designated as CAFRA Centers, Cores or Nodes;
- (3) Designated as Urban Enterprise Zones; and
- (4) Designated as Urban Coordinating Council Empowerment Neighborhoods.

“Waters of the State” means the ocean and its estuaries, all springs, streams, wetlands, and bodies of surface or ground water, whether natural or artificial, within the boundaries of the State of New Jersey or subject to its jurisdiction.

“Wetlands” or “wetland” means an area that is inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrolytic vegetation.

Section 3: General Standards

A. Design and Performance Standards for Stormwater Management Measures

1. Stormwater management measures for major development shall be developed to meet the erosion control, groundwater recharge, stormwater runoff quantity, and stormwater runoff quality standards in Section 4. To the maximum extent practicable, these standards shall be met by incorporating nonstructural stormwater management strategies into the design. If these strategies alone are not sufficient to meet these standards, structural stormwater management measures necessary to meet these standards shall be incorporated into the design.
2. The standards in this ordinance apply only to new major development and are intended to minimize the impact of stormwater runoff on water quality and water quantity in receiving water bodies and maintain groundwater recharge. The standards do not apply to new major development to the extent that alternative design and performance standards are applicable under a regional stormwater management plan or Water Quality Management Plan adopted in accordance with Department rules.

Section 4: Stormwater Management Requirements for Major

Development

- A. The development shall incorporate a maintenance plan for the stormwater management measures incorporated into the design of a major development in accordance with Section 10.
- B. Stormwater management measures shall avoid adverse impacts of concentrated flow on habitat for threatened and endangered species as documented in the Department Landscape Project or Natural Heritage Database established under N.J.S.A. 13:IB-15.147 through 15.150 particularly *Helonias bit/iota* (swamp pink) and/or *Clemmys muhlenbergi* (bog turtle)
- C. The following linear development projects are exempt from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements of Section 4.F and 4.0:
 - 1. The construction of an underground utility line provided that the disturbed areas are revegetated upon completion;
 - 2. The construction of an aboveground utility line provided that the existing conditions are maintained to the maximum extent practicable; and
 - 3. The construction of a public pedestrian access, such as a sidewalk or trail with a maximum width of 14 feet, provided that the access is made of permeable material.
- D. A waiver from strict compliance from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements of Section 4.F and 4.0 may be obtained for the enlargement of an existing public roadway or railroad; or the construction or enlargement of a public pedestrian access, provided that the following conditions are met:
 - 1. The applicant demonstrates that there is a public need for the project that cannot be accomplished by any other means;
 - 2. The applicant demonstrates through an alternatives analysis, that through the use of nonstructural and structural stormwater management strategies and measures, the option selected complies with the requirements of Section 4.F and 4.0 to the maximum extent practicable;
 - 3. The applicant demonstrates that in order to meet the requirements of Section 4.F and 4.0, existing structures currently in use, such as homes and buildings, would need to be condemned; and
 - 4. The applicant demonstrates that it does not own or have other rights to areas, including the potential to obtain through condemnation lands not falling under D.3 above within the upstream drainage area of the receiving stream that would provide additional opportunities to mitigate the requirements of Section 4.F and 4.0. that were no achievable on-site.
- E. Nonstructural Stormwater Management Strategies
 - 1. To the maximum extent practicable, the standards in Sections 4.F and 4.0 shall be met by incorporating nonstructural stormwater management strategies set forth at Section 4.E into the

design. The applicant shall identify the nonstructural measures incorporated into the design of the project. If the applicant contends that is not feasible for engineering, environmental, or safety reasons to incorporate any nonstructural stormwater management measures identified in Paragraph 2 below into the design of a particular project, the applicant shall identify the strategy considered and provide a basis for the contention.

2. Nonstructural stormwater management strategies incorporated into site design shall:

- a. Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss;
- b. Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces;
- c. Maximize the protection of natural drainage features and vegetation;
- d. Minimize the decrease in the “time of concentration” from pre-construction to post construction.” Time of concentration” is defined as the time it takes for runoff to travel from the hydraulically most distant point on the watershed to the point of interest within a watershed;
- e. Minimize land disturbance including cleaning and grading;
- f. Minimize soil compaction;
- g. Provide low-maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers and pesticides;
- h. Provide vegetated open-channel conveyance systems discharging into and through stable vegetated areas;
- i. Provide other source controls to prevent or minimize the use or exposure of pollutants at the site, in order to prevent or minimize the release of those pollutants into stormwater runoff. Such source controls include, but are not limited to:
 - (1) Site design features that help to prevent accumulation of trash and debris in drainage systems, including features that satisfy Section 4.E.3 below;
 - (2) Site design features that help to prevent discharge of trash and debris from drainage systems;
 - (3) Site design features that help to prevent and/or contain spills or other harmful accumulations of pollutants at industrial or commercial developments; and
 - (4) When establishing vegetation after land disturbance, applying fertilizer in accordance with the requirements established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et. Seq., and implementing rules.

3. Site design features identified under Section 4.E.2.i. (2) above shall comply with the following standard

to control passage of solid and floatable materials through storm drain inlets. For purposes of this paragraph, "solid and floatable materials" means sediment, debris, trash, and other floating, suspended, or settleable solids. For exemptions to this standard see Section 4.E,3.c below,

- a. Design engineers shall use either of the following grates whenever they use a grate in pavement or another ground surface to collect stormwater from that surface into a storm drain or surface water body under that grate:
 - (1) The New Jersey Department of Transportation (NJDOT) bicycle safe grate, which is described in Chapter 2.4 of the NJDOT Bicycle Compatible Roadways and Bikeways Planning and Design Guidelines (April 1996); or
 - (2) A different grate, if each individual clear space in that grate has an area of no more than seven (7.0) square inches, or is no greater than 0.5 inches across the smallest dimension.

Examples of grate subject to this standard include grates in grate inlets, the grate portion (non-curb-opening portion) of combination inlets, grates on storm sewer manholes, ditch grates, trench grates, and grates of spacer bars in slotted drains. Examples of ground surfaces include surfaces of roads (including bridge), driveways, parking areas, bikeways, plazas, sidewalks, lawns, fields, open channels, and stormwater basin floors.

- b. Whenever design engineers use a curb-opening inlet, the clear space in that curb opening (or each individual clear space, if the curb opening has two or more clear spaces) shall have an area of no more than seven (7.0) square inches, or be no greater than two (2.0) inches across the smallest dimension,
- c. This standard does not apply:
 - (1) Where the review agency determines that this standard would cause inadequate hydraulic performance that could not practicably be overcome by using additional or larger storm drain inlets that meet these standards;
 - (2) Where flows from the water quality design storm as specified in Section 4.G.1 are conveyed through any device (e.g., end of pipe netting facility, manufactured treatment device, or a catch basin hood) that is designed, at a minimum, to prevent delivery of all solid and floatable materials that could not pass through one of the following:
 - (a) A rectangular space four and five-eighths inches long and one and one-half inches wide (this option does not apply for outfall netting facilities); or
 - (b) A bar screen having a bar spacing of 0.5 inches.
 - (3) Where flows are conveyed through a trash rack that has parallel bars with one-inch (1") spacing between the bars, to the elevation of the water quality design storm as specified in Section 4.0.1; or
 - (4) Where the New Jersey Department of Environmental Protection determines, pursuant to the New Jersey Register of Historic Places Rules at N.J.A.C 7:4-7.2(c), that action to meet this standard is an undertaking that constitutes an encroachment or will damage or destroy the New Jersey Register listed historic property.

4. Any land area used as a nonstructural stormwater management measure to meet the performance standards in Sections 4.F and 4.G shall be dedicated to a government agency, subjected to a conservation restriction filed with the appropriate County Clerk's office, or subject to an approved equivalent restriction that ensures that measure or an equivalent stormwater management measure approved by the reviewing agency is maintained in perpetuity.
5. Guidance for nonstructural stormwater management strategies is available in the New Jersey Stormwater Best Management Practices Manual. The BMP Manual may be obtained from the address identified in Section 7, or found on the Department's website at [~j~jstormw~4g](#).

F. Erosion Control, Groundwater Recharge and Runoff Quantity Standards

1. This subsection contains minimum design and performance standards to control erosion, encourage and control infiltration and groundwater recharge, and control stormwater runoff quantity impacts of major developments.
 - a. The minimum design and performance standards for erosion control are those established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq. and implementing rules.
 - b. The minimum design and performances standards for groundwater recharge are as follows:
 - (1) The design engineer shall, using the assumptions and factors for stormwater runoff and groundwater recharge calculations at Section 5, either:
 - (a) Demonstrate through hydrologic and hydraulic analysis that the site and its stormwater management measures maintain 100 percent of the average annual pre-construction groundwater recharge volume for the site; or
 - (b) Demonstrate through hydrologic and hydraulic analysis that the increase of stormwater runoff volume from preconstruction to post-construction for the 2-year storm is infiltrated.
 - (2) This groundwater recharge requirement does not apply to projects within the "urban redevelopment area," or to projects subject to (3) below.
 - (3) The following types of stormwater shall not be recharged:
 - (a) Stormwater from areas of high pollutant loading. High pollutant loading areas are areas in industrial and commercial developments where solvents and/or petroleum products are loaded/unloaded, stored, or applied, areas where pesticides are loaded/unloaded or stored; areas where hazardous materials are expected to be present in greater than "reportable quantities" as defined by the United States Environmental Protection Agency (EPA) at 40 CFR 302.4; areas where recharge would be inconsistent with Department approved remedial action work

plan or landfill closure plan and areas with high risks for spills or toxic materials, such as gas stations and vehicle maintenance facilities; and

- (b) Industrial stormwater exposed to “source material.” “Source material” means any material (s) or machinery, located at an industrial facility that is directly or indirectly related to process, manufacturing or other industrial activities, which could be a source of pollutants in any industrial stormwater discharge to groundwater. Source materials include, but are not limited to, raw materials; intermediate products; final products; waste materials; by-products; industrial machinery and fuels, and lubricants, solvents, and detergents that are related to process, manufacturing, or other industrial activities that are exposed to stormwater.
- (4) The design engineer shall assess the hydraulic impact on the groundwater table and design the site so as to avoid adverse hydraulic impacts. Potential adverse hydraulic impacts include, but are not limited to, exacerbating a naturally or seasonally high water table so as to cause surficial ponding, flooding of basements, or interference with the proper operation of subsurface sewerage disposal systems and other subsurface structures in the vicinity or downgradient of the groundwater recharge area.
- c. In order to control stormwater runoff quantity impacts, the design engineer shall, using the assumptions and factors for stormwater runoff calculations at Section 5, complete on the following:
 - (1) Demonstrate through hydrologic and hydraulic analysis that for stormwater leaving the site, post-construction runoff hydrographs for the two, 10 and 100-year storm events do not exceed, at any point in time, the pre-construction runoff hydrographs for the same storm events;
 - (2) Demonstrate through hydrologic and hydraulic analysis that there is no increase, as compared to the pre-construction condition, in the peak runoff rates of stormwater leaving the site for the 10, and 100-year storm events and that the increased volume or change in timing of stormwater runoff will not increase flood damage at or downstream of the site. This analysis shall include the analysis of impacts on existing land uses and projected land uses assuming full development under existing zoning and land use ordinance in the drainage area;
 - (3) Design stormwater management measures so that the post-construction peak runoff rates for the 2, 10 and 100 year storm events are 50, 75 and 80 percent, respectively, of the pre-construction peak runoff rates. The percentages apply only to the post-construction stormwater runoff that is attributable to the portion of the site on which the proposed development or project is to be constructed. The percentages shall not be applied to post-construction stormwater runoff into tidal flood hazard areas if the increased volume of stormwater runoff will not increase flood damages below the point of discharge; or
 - (4) In tidal flood hazard areas, stormwater runoff quantity analysis in accordance with (1), (2) and (3) above shall only be applied if the increased volume of stormwater runoff could increase flood damages below the point of discharge.

2. Any application for a new agricultural development that meets the definition of major

development at Section 2 shall be submitted to the appropriate Soil Conservation District for review and approval in accordance with the requirements of this section and any applicable Soil Conservation District guidelines for stormwater runoff quantity and erosion control. For the purpose of this section, “agricultural development” means land uses normally associated with the production of food, fiber, and livestock for sale, Such uses do no include the development of land for the processing or sale of food and the manufacturing of agriculturally related products.

G. Stormwater Runoff Quality Standards

1. Stormwater management measures shall be designed to reduce the post-construction load of total suspended solids (TSS) in stormwater runoff by 80 percent of the anticipated load from the developed site, expressed as an annual average. Stormwater management measures shall only be required for water quality control if an additional .4 acre of impervious surface is being proposed on a development site. The requirement to reduce TSS does not apply to any stormwater runoff in a discharge regulated under a numeric effluent limitation for TSS imposed under the New Jersey Pollution Discharge Elimination System (NJPDES) rules, N.J.A.C. 7:14A, or in a discharge specifically exempt under a NJPDES permit from this requirement. The water quality design storm is 1.25 inches of rainfall in two hours. Water quality calculations shall take into account the distribution of rain from the water quality design storm, as reflected in Table 1. The calculation of the volume of runoff may take into account the implementation of non-structural and structural stormwater management measures.

TABLE 1: WATER QUALITY DESIGN STORM DISTRIBUTION			
Time (Minutes)	Cumulative Rainfall (Inches)	Time (Minutes)	Cumulate Rainfall (Inches)
0	0.0000	65	0.8917
.5	0.0083	70	0.9917
10	0.0166	75	1.0500
15	0.0250	80	1.0840
20	0.0500	85	1.1170
25	0.0750	90	1.1500
30	0.1000	95	1.1759
35	0.1330	100	1.2000
40	0.1660	105	1.2250
45	0.2000	110	1.2334
50	0.2583	115	1.2417
55	0.3583	120	1.2500
60	0.6250		

2. For purposes of TSS reduction calculations, Table 2 below presents the presumed removal rates for certain BMPs designed in accordance with the New Jersey Stormwater Best Management Practices Manual. The BMP Manual may be obtained from the address identified in Section 7, or found on the Department's website at www.nistormwater.org. The BMP Manual and other sources of technical guidance are listed in Section 7. TSS reduction shall be calculated based on the removal rates for the BMPs in Table 2 below. Alternative removal rates and methods of calculating removal rates may be used if the design engineer provides documentation demonstrating the capability of these alternative rates and methods to the review agency. A copy of any approved alternative rate or method of calculating the removal rate shall be provided to the Department at the following address: Division of Watershed Management, New Jersey Department of Environmental Protection, P.O. Box 418 Trenton, New Jersey 08625-0418.
3. If more than one BMP in series is necessary to achieve the required 80 percent TSS reduction for a site, the applicant shall utilize the following formula to calculate TSS reduction:

$$R = A + B - (A \times B) / 100$$

Where

R = total TSS percent load removal from application of both BMPs,

and

A = the TSS percent removal rate applicable to the first BMP

B = the TSS percent removal rate applicable to the second BMP

TABLE 2: TSS Removal Rates for BMPs	
Best Management Practice	TSS Percent Removal Rates
Bioretention Systems	90
Constructed Stormwater Wetland	90
Extended Detention Basin	40-60
Infiltration Structure	80
Manufactured Treatment Device	See Section 6.C
Sand Filter	80
Vegetative Filter Strip	60-80
Wet Pond	50-90

4. If there is more than one onsite drainage area, the 80 percent TSS removal rate shall apply to each drainage area, unless the runoff from the subareas converge on site in which case the removal rate can be demonstrated through a calculation using a weighted average.
5. Stormwater management measures shall also be designed to reduce, to the maximum extent feasible, the post-construction nutrient load of the anticipated load from the developed site in stormwater runoff generated from the water quality design storm. In achieving reduction of nutrients to the maximum extent feasible, the design of this site shall include nonstructural strategies and structural measures that optimize

nutrient removal while still achieving the performance standards in Section 4.F and 4.G.

6. Additional information and examples are contained in the New Jersey Stormwater Best Management Practices Manual, which may be obtained from the address identified in Section 7.
7. In accordance with the definition of FW1 at N.J.A.C. 7:9B-1.4, stormwater management measure shall be designed to prevent any increase in stormwater runoff to waters classified as FW1.
8. Special water resource protection areas shall be established along all waters designated Category One at N.J.A.C. 7:9B, and perennial or intermittent streams that drain in to or upstream of the Category One waters as shown on the USGS Quadrangle Maps or in the County Soil Surveys, within the associated HUC14 drainage area. These areas shall be established for the protection of water quality, aesthetic value, exception ecological significance, exception recreational significance, exception water supply significance, and exceptional fisheries significance of those established Category One waters. These areas shall be designated and protected as follow:
 - a. The applicant shall preserve and maintain a special water resource protection area in accordance with one of the following:
 - (1) A 300-foot special water resource protection area shall be provided on each side of the waterway, measured perpendicular to the waterway from the top of the bank outwards or from the centerline of the waterway where the bank is not defined, consisting of existing vegetation or vegetational allowed to follow natural succession is provided (2) Encroachment within the designated special water resource protection area under Subsection (1) above shall only be allowed where previous development or disturbance has occurred (for example, active agricultural use, parking area or maintained lawn area). The encroachment shall only be allowed where applicant demonstrates that the functional value and overall condition of the special water resource protection area will be maintained to the maximum extent practicable. In no case shall the remaining special water resource protection area be reduced to less than 150 feet as measured perpendicular to the top of bank of the waterway or centerline of the waterway where the bank is undefined. All encroachments proposed under this subparagraph shall be subject to review and approval by the Department.
 - b. All stormwater shall be discharged outside of and flow through the special water resource protection area and shall comply with the Standard for Off-Site Stability in the "Standards for Soil Erosion and Sediment Control in New Jersey," established under the Soil erosion and Sediment Control Act, N.J.S.A. 4:24-39 et. seq.
 - c. If stormwater discharged outside of and flowing through the special water resource protection area cannot comply with the Standard for Off-Site Stability in the "Standards for Soil Erosion and Sediment Control in New Jersey," established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et., seq., then the stabilization measures in accordance with the requirements of the above standards may be placed within the special water resource protection area, provided that:
 - (1) Stabilization measures shall not be placed within 150 feet of the Category One

Waterway.

- (2) Stormwater associated with discharges allowed by this section shall achieve a 95 percent TSS post-construction removal rate;
 - (3) Temperature shall be addressed to ensure no impact on the receiving waterway;
 - (4) The encroachment shall only be allowed where the applicant demonstrates that the functional value and overall condition of the special water resource protection area will be maintained to the maximum extent practicable;
 - (5) A conceptual project design meeting shall be held with the appropriate Department staff and Soil Conservation District staff to identify necessary stabilization measures; and
 - (6) All encroachments proposed under this section shall be subject to review and approval by the Department.
- d. A stream corridor protection plan may be developed by a regional stormwater management planning committee as an element of a regional stormwater management plan, or by a municipality through an adopted municipal stormwater management plan. If a stream corridor protection plan for a waterway subject to Section 4.G(8) has been approved by the Department of Environmental Protection, then the provisions of the plan shall be the applicable special water resource protection area requirements for that waterway. A stream corridor protection plan for a waterway subject to G.8 shall maintain or enhance the current functional value and overall condition of the special water resource protection area as defined in G.8.a.(1) above. In no case shall a stream corridor protection plan allow the reduction of the Special Water Resource Protection Area to less than 150 feet as measure perpendicular to the waterway subject to this subsection.
- e. Paragraph G.8 does not apply to the construction of one individual single family dwelling that is not part of a larger development on a lot receiving preliminary or final subdivision approval on or before February 2, 2004, provided that the construction begins on or before February 2, 2009.

Section 5: Calculation of Stormwater Runoff and Groundwater Recharge

- A. Stormwater runoff shall be calculated in accordance with the following:
1. The design engineer shall calculate runoff using one of the following methods;
 - a. The USDA Natural Resources Conservation Service (NRCS) methodology, including the NRCS Runoff Equation and Dimensionless Unit Hydrograph, as described in the NRCS National Engineering Handbook Section 4 Hydrology and Technical Release 55 Urban Hydrology for Small Watersheds; or

- b. The Rational Methods for peak flow and the Modified Rational Method for hydrograph computations.
2. For the purpose of calculating runoff coefficients and groundwater recharge, there is a presumption that the pre-construction condition of a site or portion thereof is a wooded land use with good hydrologic condition. The term “runoff coefficient” applies to both the NRCS methodology at Section 5.A.1.a and the Rational and Modified Rational Methods at Section 5.A.1.b. A runoff coefficient or a groundwater recharge land cover for an existing condition may be used on all or a portion of the site if the design engineer verifies that the hydrologic condition has existed on the site or portion of the site for at least five years without interruption prior to the time of application. If more than one land cover have existed on the site during the five years immediately prior to the time of application, the land cover with the lowest runoff potential shall be used for the computations. In addition, there is the presumption that the site is in good hydrologic condition (if the land use type is pasture, lawn, or park), with good cover (if the land use type is woods), or with good hydrologic condition and conservation treatment (if the land use type is cultivation).
 3. In computing pre-construction stormwater runoff, the design engineer shall account for all significant land features and structures, such as ponds, wetlands, depressions, hedgerows, or culverts that may reduce pre-construction stormwater runoff rates and volumes.
 4. In computing stormwater runoff from all design storms, the design engineer shall consider the relative stormwater runoff rates and/or volumes of pervious and impervious surfaces separately to accurately compute the rates and volume of stormwater runoff from the site. To calculate runoff from unconnected impervious cover, urban impervious area modifications as described in the NRCS Technical Release 55 -Urban Hydrology for Small Watersheds and other methods may be employed.
 5. If the invert of the outlet structure of a stormwater management measure is below the flood hazard design flood elevation as defined at N.J.A.C. 7:13, the design engineer shall take into account the effects of tailwater in the design of structural stormwater management measures.

B. Groundwater recharge may be calculated in accordance with the following:

1. The New Jersey Geological Survey Report GSP-32, A Method for Evaluating Ground-Water Recharge Areas in New Jersey, incorporated herein by reference as amended and supplemented. Information regarding the methodology is available from the New Jersey Stormwater Best Management Practices Manual: as <http://www.state.nj.us/dep/nigs/>; or at New Jersey Geological Survey, 29 Arctic Parkway, P.O. Box 427 Trenton, New Jersey 08625-0427; (609) 984-6587.

Section 6: Standards for Structural Stormwater Management Measures

- A. Standards for structural stormwater management measures are as follows:
1. Structural stormwater management measures shall be designed to take into account the existing site conditions, including, for example, environmentally critical areas, wetlands; flood-prone areas; slopes depth the seasonal high water table; soil type, permeability and texture; drainage area and drainage pattern; and the presence of solution-prone carbonate rocks (limestone).
 2. Structural stormwater management measures shall be designed to minimize maintenance, facilitate maintenance and repairs, and ensure proper functioning. Trash racks shall be installed at the intake to the outlet structure as appropriate, and shall have parallel bars with one-inch (1") spacing between the bars to the elevation of the water quality design storm. For elevations higher than the water quality design storm, the parallel bars at the outlet structure shall be spaced no greater than one-third (1/3) the width of the diameter of the orifice or one-third (1/3) the width of the weir, with a minimum spacing between bards of one-inch and a maximum spacing between bars of six inches. In addition, the design of trash racks must comply with the requirements of Section 8D.
 3. Structural stormwater management measures shall be designed, constructed, and installed to be strong, durable, and corrosion resistant. Measures that are consistent with the relevant portions of the Residential Site Improvement Standards at N.J.A.C. 5:21-7.3, 7.4. and 7.5 shall be deemed to meet this requirement.
 4. At the intake to the outlet from the stormwater management basin, the orifice size shall be a minimum of two and one-half inches in diameter.
 5. Stormwater management basins shall be designed to meet the minimum safety standards for stormwater management basins at Section 8.
- B. Stormwater management measure guidelines are available in the New Jersey Stormwater Best Management Practices Manual. Other stormwater management measures may be utilized provided the design engineer demonstrates that the proposed measure and its design will accomplish the required water quantity, groundwater recharge and water quality design and performance standards established by Section 4 of this ordinance.
- C. Manufactured treatment devices may be used to meet the requirements of Section 4 this ordinance, provided the pollutant removal rates are verified by the New Jersey Corporation for Advanced Technology and certified by the Department.

Section 7: Sources for Technical Guidance

- A. Technical guidance for stormwater management measures can be found in the documents

listed at 1 and 2 below, which are available from Maps and Publications, New Jersey Department of Environmental Protection, 428 East State Street, P.O. Box 420, Trenton, New Jersey, 08625; telephone (609) 777-1038.

1. Guidelines for stormwater management measures are contained in the New Jersey Stormwater Best Management Practices Manual, as amended. Information is provided on stormwater management measures such as: bioretention systems, constructed stormwater wetlands, dry wells, extended detention basins, infiltration structures, manufactured treatment devices, pervious paving, sand filters, vegetative filter strips, and wet ponds.
 2. The New Jersey Department of Environmental Protection Stormwater Management Facilities Maintenance Manual, as amended.
- B. Additional technical guidance for stormwater management measures can be obtained from the following:
1. The “Standards for Soil Erosion and Sediment Control in New Jersey” promulgated by the State Soil Conservation Committee and incorporated into N.J.A.C. 2:90. Copies of these standards may be obtained by contacting the State Soil Conservation Committee or any of the Soil Conservation Districts listed in N.J.A.C. 2:90-1.3(a)4. The location, address, and telephone number of each Soil Conservation District may be obtained from the State Soil Conservation Committee, P.O. Box 330, Trenton, New Jersey 08625; (609) 292-5540.
 2. The Rutgers Cooperative Extension Services, 732-932-9306; and
 3. The Soil Conservation Districts listed in N.J.A.C. 2:90-1.3(a) 4. The location, address, and telephone number of each Soil Conservation District may be obtained from the State Soil Conservation Committee, P.O. Box 330, Trenton, New Jersey, 08625, (609) 292-5540.

Section 8: Safety Standards for Stormwater Management Basins

- A. This section sets forth requirements to protect public safety through the proper design and operation of stormwater management basins. This section applies to any new stormwater management basin.
- B. Requirements for Trash Racks, Overflows Grates and Escape Provisions
1. A trash rack is a device designed to catch trash and debris and prevent the clogging of outlet structures. Trash racks shall be installed at the intake to the outlet from the stormwater management basin to ensure proper functioning of the basin outlets in accordance with the following:

- a. The trash rack shall have parallel bars, with no greater than six inch spacing between the bars.
 - b. The trash rack shall be designed so as not to adversely affect the hydraulic performance of the outlet pipe or structure.
 - c. The average velocity of flow through a clean trash rack is not to exceed 2.5 feet per second under the full range of stage and discharge. Velocity is to be computed on the basis of the net area of opening through the rack.
 - d. The trash rack shall be constructed and installed to be rigid, durable, and corrosion resistant, and shall be designed to withstand a perpendicular live loading of 300lbs/ft sq.
2. An overflow grate is designed to prevent obstruction of the overflow structure. If an outlet structure has an overflow grate, such grate shall meet the following requirements:
- a. The overflow grate shall be secured to the outlet structure but removable for emergencies and maintenance.
 - b. The overflow grate spacing shall be no less than two inches across the smallest dimension.
 - c. The overflow grate shall be constructed and installed to be rigid, durable, and corrosion resistant, and shall be designed to withstand a perpendicular live loading of 300 lbsift. sq.
3. For purposes of this paragraph 3, escape provisions means the permanent installation ladders, steps rungs, or other features that provide easily accessible means of egress from stormwater management basins. Stormwater management basins shall include escape provisions as follows:
- a. If a stormwater management basin has an outlet structure, escape provisions shall be incorporated in or on the structure. With the prior approval of the reviewing agency identified in Section 8.C a free-standing outlet structure may be exempted from this requirement.
 - b. Safety ledges shall be constructed on the slopes of all new stormwater management basins having a permanent pool of water deeper than two and one-half feet. Such safety ledges shall be comprised of two steps. Each step shall be four to six feet in width. One step shall be located approximately two and one-half feet below the permanent water surface, and the second step shall be located one to one and one-half feet above the permanent water surface.

- c. In new stormwater management basins, the maximum interior slope for an earthen dam, embankment, or berm shall not be steeper than 3 horizontal to 1 vertical.

C. Variance or Exemption from Safety Standards

1. A variance or exemption from the safety standards for stormwater management basins may be granted only upon a written finding by the appropriate reviewing agency (municipality, county or Department) that the variance or exemption will not constitute a threat to public safety.

Section 9: Requirements for a Site Development Stormwater Plan

A. Submission of Site Development Stormwater Plan

1. Whenever an applicant seeks municipal approval of a development subject to this ordinance, the applicant shall submit all of the required components of the Checklist for the Site Development Stormwater Plan at Section 9.C below as part of the submission of the applicant's application for subdivision or site plan approval.
2. The applicant shall demonstrate that the project meets the standards set forth in this ordinance.
3. The applicant shall submit eighteen copies of the materials listed in the checklist for site development stormwater plans in accordance with Section 9.C of this ordinance.

B. Site Development Stormwater Plan Approval

The applicant's Site Development project shall be reviewed as a part of the subdivision or site plan review process by the municipal board or official from which municipal approval is sought. That municipal board or official shall consult the engineer retained by the Planning and/or Zoning Board (as appropriate) to determine if all of the checklist requirements have been satisfied and to determine if the project meets the standards set forth in this ordinance.

C. Checklist Requirements

The following information shall be required:

1. Topographic Base Map

The reviewing engineer may require upstream tributary drainage system information

as necessary. It is recommended that the topographic base map of the site be submitted which extends a minimum of 200 feet beyond the limits of the proposed development, at a scale of 1"=200' or greater, showing 2-foot contour intervals. The map as appropriate may indicate the following: existing surface water drainage, shorelines, steep slopes, soils, erodible soils, perennial or intermittent streams that drain into or upstream of the Category One waters, wetlands and flood plains along with their appropriate buffer strips, marshlands and other wetlands, pervious or vegetative surfaces, existing man-made structures, roads, bearing and distances of property lines, and significant natural and manmade features not otherwise shown.

2. Environmental Site Analysis

A written and graphic description of the natural and man-made features of the site and its environs. This description should include a discussion of soil conditions, slopes, wetlands, waterways and vegetation on the site. Particular attention should be given to unique, unusual, or environmentally sensitive features and to those that provide particular opportunities or constraints for development.

3. Project Description and Site Plan(s)

A map (or maps) at the scale of the topographical base map indicating the location of existing and proposed buildings, roads, parking areas, utilities, structural facilities for stormwater management and sediment control, and other permanent structures. The map(s) shall also clearly show areas where alterations occur in the natural terrain and cover, including lawns and other landscaping, and seasonal high ground water elevations. A written description of the site plan and justification of proposed changes in natural conditions may also be provided.

4. Land Use Planning and Source Control Plan

This plan shall provide a demonstration of how the goals and standards of Sections 3 through 6 are being met. The focus of this plan shall be to describe how the site is being developed to meet the objective of controlling groundwater recharge, stormwater quality and stormwater quantity problems at the source by land management and source controls whenever possible.

5. Stormwater Management Facilities Map

The following information, illustrated on a map of the same scale as the topographic base map, shall be included:

- a. Total area to be paved or built upon, proposed surface contours, land area to be occupied by the stormwater management facilities and the type of vegetation thereon, and details of the proposed plan to control and dispose of stormwater.

- b. Details of all stormwater management facility designs, during and after construction, including discharge provisions, discharge capacity for each outlet at different levels of detention and emergency spillway provisions with maximum discharge capacity of each spillway.
6. Calculations
- a. Comprehensive hydrologic and hydraulic design calculations for the predevelopment and post-development conditions for the design storms specified in Section 4 of this ordinance.
 - b. When the proposed stormwater management control measures (e.g. infiltration basins depends on the hydrologic properties of soils, then a soils report shall be submitted. The soils report shall be based on onsite borings logs or soil pits profiles. The number and location of required soil borings or soil pots shall be determined based on what is needed to determine the suitability and distribution of soils present at the location of the control measure.

7. Maintenance and Repair Plan

The design and planning of the stormwater management facility shall meet the maintenance requirements of Section 10.

8. Waiver from Submission Requirements

The municipal official or board reviewing an application under this ordinance may, in consultation with the municipal engineer, waive submission of any of the requirements in Sections 9.C.1 through 9.C.6 of this ordinance when it can be demonstrated that the information requested is impossible to obtain or it would create a hardship on the applicant to obtain and its absence will not materially affect the review process.

Section 10: Maintenance and Repair:

A. Applicability

- 1. Projects subject to review as in Section 1 .C of this ordinance shall comply with the requirements of Sections 103 and b.C.

B. General Maintenance

- 1. The design engineer shall prepare a maintenance plan for the stormwater management measures incorporated into the design of a major development.
- 2. The maintenance plan shall contain specific preventative maintenance tasks and schedules; cost estimates, including estimated cost of sediment, debris, or trash

removal; and the name, address, and telephone number of the person or persons responsible for preventative and corrective maintenance (including replacement). Maintenance guidelines for stormwater management measures are available in the New Jersey Stormwater Best Management Practices Manual. If the maintenance plan identifies a person other than the developer (for example, a public agency or homeowners' association) as having the responsibility for maintenance, the plan shall include documentation of such person's agreement to assume this responsibility, or of the developer's obligation to dedicate a stormwater management facility to such person under an applicable ordinance or regulation.

3. Responsibility for maintenance shall not be assigned or transferred to the owner or tenant of an individual property in a residential development or project, unless such owner or tenant owns or leases the entire residential development or project.
4. If the person responsible for maintenance identified under Section 10.B.2 above is not a public agency, the maintenance plan and any future revisions based on Section 10.B.7 below shall be recorded upon the deed of record for each property on which the maintenance described in the maintenance plan must be undertaken.
5. Preventative and corrective maintenance shall be performed to maintain the function of the stormwater management measure, including repairs or replacement to the structure; removal of sediment, debris, or trash; restoration of eroded areas; snow and ice removal; fence repair or replacement; restoration of vegetation; and repair or replacement of nonvegetated linings.
6. The person responsible for maintenance identified under Section 10.B.2 above shall maintain a detailed log of all preventative and corrective maintenance for the structural stormwater management measures incorporated into the design of the development, including a record of all inspections and copies of all maintenance-related work orders.
7. The person responsible for maintenance identified under Section 10.B.2 above shall evaluate the effectiveness of the maintenance plan at least once per year and adjust the plan and the deed as needed.
8. The person responsible for maintenance identified under Section 10.B.2 above shall retain and make available, upon request by any public entity with administrative, health, environmental, or safety authority over the site, the maintenance plan and the documentation required by Sections 10.B.6 and 10.B.7 above.
9. The requirements of Section 10.B.3 and 10.B.4 do not apply to stormwater management facilities that are dedicated to and accepted by the municipality or another governmental agency.
10. In the event that the stormwater management facility becomes a danger to public

safety or public health, or if it is need of maintenance or repair, the municipality shall so notify the responsible person in writing. Upon receipt of that notice, the responsible person shall have fourteen (14) days to effect maintenance and repair of the facility in a manner that is approved by the municipal engineer or his designee. The municipality, in its discretion, may extend the time allowed for effecting maintenance and repair for good cause. If the responsible person fails or refuses to perform such maintenance and repair, the municipality or County may immediately proceed to do so and shall bill the cost thereof to the responsible person.

- C. Nothing in this section shall preclude the municipality in which the major development is located from requiring the posting of a performance or maintenance guarantee in accordance with N.J.S.A. 40:55D-53.

Section 11: Penalties

Any person who erects, constructs, alters, repairs, converts, maintains, or uses any building, structure or land in violation of this ordinance shall be subject to the following penalties:

- A. Any person who is convicted for violating any of the provision of the Chapter shall be subject to one or more of the following: a fine of not more than two thousand dollars (\$2,000.00), imprisonment for any term not exceeding ninety (90) days, and/or a period of community service not exceeding ninety (90) days.
- B. A separate offense or violation shall be deemed to be committed on each day that a violation occurs or continue.

Section 12: Effective Date

This ordinance shall take effect upon final approval and publication and upon the approval by the county review agency, or sixty (60) days from the receipt of the ordinance by the county review agency if the county review agency should fail to act.

Section 13: Severability

If the provisions of any section, subsection, paragraph, subdivision, or clause of this ordinance shall be judged invalid by a court of competent jurisdiction, such order of judgment shall not affect or invalidate the remainder of any section, subsection, paragraph, subdivision, or clause of this ordinance.

I hereby certify that the foregoing is a true copy of the Ordinance adopted by the Governing Body of the Borough of Rockleigh on June 8, 2006.



William J. McGuire
Borough Clerk-Administrator