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Shoreline Situation Report
NEW KENT, KING WILLIAM, AND KING and QUEEN COUNTIES

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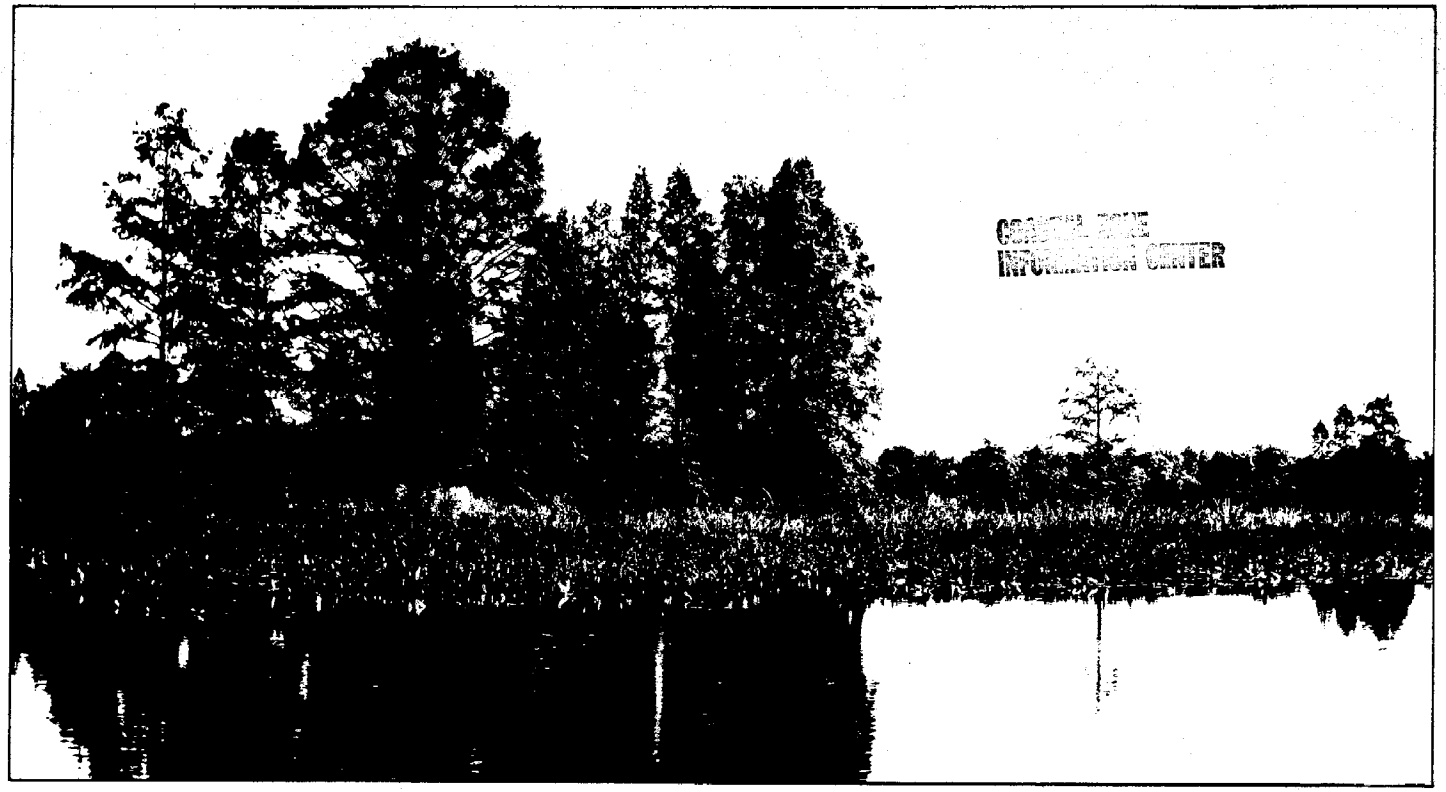

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Shoreline Situation Report
NEW KENT, KING WILLIAM, AND KING and QUEEN COUNTIES

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CHAPTER 1
Introduction

CHAPTER 1
INTRODUCTION

1.1 PURPOSES AND GOALS

It is the objective of this report to supply an assessment, and at least a partial integration, of those important shoreland parameters and characteristics which will aid the planners and the managers of the shorelands in making the best decisions for the utilization of this limited and very valuable resource. The report gives particular attention to the problem of shore erosion and to recommendations concerning the alleviation of the impact of this problem. In addition we have tried to include in our assessment some of the potential uses of the shoreline, particularly with respect to recreational use, since such information could be of considerable value in the way a particular segment of coast is perceived by potential users.

The basic advocacy of the authors in the preparation of the report is that the use of shorelands should be planned rather than haphazardly developed in response to the short term pressures and interests. Careful planning could reduce the conflicts which may be expected to arise between competing interests. Shoreland utilization in many areas of the country, and indeed in some places in Virginia, has proceeded in a manner such that the very elements which attracted people to the shore have been destroyed by the lack of planning and forethought.

The major man-induced uses of the shorelands are:

-- Residential, commercial, or industrial development
-- Recreation
-- Transportation
-- Waste disposal
-- Extraction of living and non-living resources

Aside from the above uses, the shorelands serve various ecological functions.

The role of planners and managers is to optimize the utilization of the shorelands and to minimize the conflicts arising from competing demands. Furthermore, once a particular use has been decided upon for a given segment of shoreland, both the planners and the users want that selected use to operate in the most effective manner. A park planner, for example, wants the allotted space to fulfill the design most efficiently. We hope that the results of our work are useful to the planner in designing the beach by pointing out the technical feasibility of altering or enhancing the present configuration of the shore zone. Alternately, if the use were a residential development, we would hope our work would be useful in specifying the shore erosion problem and by indicating defenses likely to succeed in containing the erosion. In summary our objective is to provide a useful tool for enlightened utilization of a limited resource, the shorelands of the Commonwealth.

Shorelands planning occurs, either formally or informally, at all levels from the private owner of shoreland property to county governments, to planning districts and to the state and federal agency level. We feel our results will be useful at all these levels. Since the most basic level of comprehensive planning and zoning is at the county or city level, we have executed our report on that level although we realize some of the information may be most useful at a higher governmental level. The Commonwealth of Virginia has traditionally chosen to place, as much as possible, the regulatory decision processes at the county level. The Virginia Wetlands Act of 1972 (Chapter 2.1, Title 62.1, Code of Virginia), for example, provides for the establishment of County Boards to act on applications for alterations of wetlands. Thus, our focus at the county level is intended to interface with and to support the existing or pending county regulatory mechanisms concerning activities in the shorelands zone.

1.2 ACKNOWLEDGEMENTS

This report was prepared with funds provided by the Research Applied to National Needs Program (RANN) of the National Science Foundation administered through the Chesapeake Research Consortium (CRC), Inc. George Dawes, Ken Moore, and Gene Silberhorn of the VIMS Wetlands Section contributed many useful ideas and criticisms. Michael Carron, Gaynor Williams, and Dennis Owen assisted with the data reduction. Beth Marshall typed the manuscript. Peggy Peoples, Peter Rosen, Joe Gilley, Russell Bradley, Ken Thornberry, and Bill Jenkins prepared the graphics. We also thank the numerous other persons in Maryland and Virginia who have criticized and commented upon our ideas and methods. Publication funds were provided through the Coastal Zone Management Act, P.L. 92-583, as administered in the Commonwealth of Virginia, Grant Number 04-5-158-50001.

CHAPTER 2
Approach Used and Elements Considered

CHAPTER 2
APPROACH USED AND ELEMENTS CONSIDERED

2.1 APPROACH TO THE PROBLEM

In the preparation of this report the authors utilized existing information wherever possible. For example, for such elements as water quality characteristics, zoning regulations, or flood hazard, we reviewed relevant reports by local, state, or federal agencies. Much of the desired information, particularly with respect to erosional characteristics, shoreland types, and use was not available, so we performed the field work and developed classification schemes. In order to analyze successfully the shoreline behavior we placed heavy reliance on low altitude, oblique, color, 35 mm photography. We photographed the entire shoreline of each county and cataloged the slides for easy access at VIMS, where they remain available for use. We then analyzed these photographic materials, along with existing conventional aerial photography and topographic and hydrographic maps, for the desired elements. We conducted field inspection over much of the shoreline, particularly at those locations where office analysis left questions unresolved. In some cases we took additional photographs along with the field visits to document the effectiveness of shoreline defenses.

The basic shoreline unit considered is called a subsegment, which may range from a few hundred feet to several thousand feet in length. The end points of the subsegments were generally chosen on physiographic consideration such as changes in the character of erosion or deposition. In those cases where a radical change in land use occurred, the point of change was taken as a boundary point of the subsegment. Segments are a grouping of subsegments. The boundaries for segments also were selected on physiographic units such as necks or peninsulas between major tidal creeks. Finally, the county itself is considered as a sum of shoreline segments.

The format of presentation in the report follows a sequence from general summary statements for the county (Chapter 3) to tabular segment summaries and finally detailed descriptions and maps for each subsegment (Chapter 4). The purpose in choosing this format was to allow selective use of the report since some users' needs will adequately be met with the summary overview of the county while others will require the detailed discussion of particular subsegments.

2.2 CHARACTERISTICS OF THE SHORELANDS INCLUDED IN THE STUDY

The characteristics which are included in this report are listed below followed by a discussion of our treatment of each.

a) Shorelands physiographic classification
b) Shorelands use classification
c) Shorelands ownership classification
d) Zoning
e) Water quality
f) Shore erosion and shoreline defenses
g) Potential shore uses
h) Distribution of marshes
i) Flood hazard levels
j) Shellfish leases and public shellfish grounds
k) Beach quality

a) Shorelands Physiographic Classification:

The shorelands of the Chesapeake Bay System may be considered as being composed of three interacting physiographic elements: the fastlands, the shore and the nearshore. A graphic classification based on these three elements has been devised so that the types for each of the three elements portrayed side by side on a map may provide the opportunity to examine joint relationships among the elements. As an example, the application of the system permits the user to determine miles of high bluff shoreland interfacing with marsh in the shore zone.

For each subsegment there are two length measurements, the shore-nearshore interface or shoreline, and the fastland-shore interface. The two interface lengths differ most when the shore zone is embayed or extensive marsh. On the subsegment maps, a dotted line represents the fastland-shore interface when it differs from the shoreline. The fastland-shore interface length is the base for the fastland statistics.

Definitions:

Shore Zone

This is the zone of beaches and marshes. It is a buffer zone between the water body and the fastland. The seaward limit of the shore zone is the break in slope between the relatively steeper shoreface and the less steep nearshore zone. The approximate landward limit is a contour line representing one and a half times the mean tide range above mean low water (refer to Figure 1). In operation with topographic maps the inner fringe of the marsh symbols is taken as the landward limit.

The physiographic character of the marshes has also been separated into three types (see Figure 2). Fringe marsh is that which is less than 400 feet in width and which runs in a band parallel to the

Shoreline Situation Reports

I. Purpose

To assess shoreline parameters and characteristics in order to aid planners and managers in making wise decisions on shoreline resources.

II. Methodology

A. Existing information is used whenever possible.

B. Low altitude, oblique 35 mm color photographs are taken of the entire shoreline and placed on file for office interpretation and future use. Pictures are also taken to document the effectiveness of shoreline protection devices.

C. After office analysis, specific questions are resolved by on-site analyses.

D. In most cases, erosional characteristics, shoreland types and shoreland use are determined through field work.

III. Characteristics of Shorelands

A. Shoreland physiographic classifications.

1) Shore zone - low water mark to 1½ times the tidal range measured from M L W (mean low water).

2) Fastland - land area measured from inland limit of shore zone.

3) Nearshore - area measured from M L W out to 12 foot depth contour.

B. Shoreland use classifications.

1) Residential.
2) Commercial.
3) Industrial.
4) Government.
5) Recreation and other public open space.
6) Preserved.
7) Agricultural.
8) Unmanaged (open and wooded types).

C. Shorelands ownership classification (fastland only).

1) Private

2) Governmental (federal, state, county, town or city)

D. Water Quality (ratings based upon coliform counts taken from the Bureau of Shellfish Sanitation).

1) Satisfactory rating - maximum total coliform counts of 70 per 100 ml. MPN (most probable number). plus maximum fecal coliform count of 23 per 100 ml. MPN.

2) Intermediate Rating - Total coliform MPN of 70/100 ml., but fecal coliform less than 23 MPN.

3) Unsatisfactory - Any waters having total and fecal coliform counts above maximum MPN's.

E. Zoning (zoning regulations included when they exist).

F. Shore erosion and shoreline defenses.

1) Erosion ratings.

a) Slight - less than 1 ft/yr
b) Moderate - 1-3 ft/yr
c) Severe - greater than 3 ft/yr
[Moderate and severe ratings further classified as critical (if structures are endangered) or non-critical]

2) Pictures of shoreline defenses are taken and comments relative to their effectiveness are made. If no defenses exist, but are needed, recommendations are made

G. Potential shore uses (particular attention given to recreation.)

H. Distribution of marshes - information limited to physiographic types (fringing, embayed or extensive) and acreage estimates.

I. Flood hazards (reference given to two tidal flood levels).

1) Intermediate regional flood level - acreage reoccurrence time of 100 years.

2) Standard project flood level - highest probable flood level.

H. Shellfish leases and public grounds (data in this section are based upon the Virginia State Water Control Board's publication, Shellfish Growing Areas in the Commonwealth: Public, Leased, and Condemned - (1971).

K. Beach quality

Tidal Marsh Inventories

I. Purpose

To inventory all of the Commonwealth's wetlands and to make the information available to wetlands boards, planners, and managers in order to facilitate more educated decisions relative to the and non-use of these valuable areas.

II. Methodology

A. All wetlands receive an on-site survey and analysis.

1) The marsh and its location are characterized.

2) Acreage involved is determined.

3) Vegetation zonation maps (identifying marsh types and percentages of various marsh plants) are established.

4) The water-marsh interface, defined as the linear length (in feet) that a marsh fronts a tidal river, stream, or channel having a minimum width of 40 feet, is determined.

5) The interface - marsh area ratio is calculated. (This is computed by dividing the interface length in feet by the total marsh acreage. Generally, the higher the ratio, the more valuable the marsh.)

B. Aerial photographs and topographic maps are utilized to more accurately locate (geographically) the marsh areas.

C. After all wetlands in a county have been inventoried, the information is totalled in terms of total acreage and total acreage of each marsh type.

D. Following county inventories, an overall evaluation of all marshes in Tidewater Virginia will be undertaken.

shore. Extensive marsh is that which has extensive acreage projecting into an estuary or river. An embayed marsh is a marsh which occupies a reentrant or drowned creek valley. The purpose in delineating these marsh types is that the effectiveness of the various functions of the marsh will, in part, be determined by type of exposure to the estuarine system. A fringe marsh may, for example, have maximum value as a buffer to wave erosion of the fastland. An extensive marsh, on the other hand, is likely a more efficient transporter of detritus and other food chain materials due to its greater drainage density than an embayed marsh. The central point is that planners, in the light of ongoing and future research, will desire to weight various functions of marshes and the physiographic delineation aids their decision making by denoting where the various types exist.

The classification used is:

Beach
Marsh
  Fringe marsh, 400 ft. (122 m) in width along shores
  Extensive marsh
  Embayed marsh, occupying a drowned valley or reentrant
Artificially stabilized

Fastland Zone

The zone extending from the landward limit of the shore zone is termed the fastland. The fastland is relatively stable and is the site of most material development or construction. The physiographic classification of the fastland is based upon the slope of the land near the water as follows:

Low shore, 20-ft. (6 m) contour 400 ft. (122 m) from fastland-shore boundary
Moderately low shore, 20-ft. (6 m) contour 400 ft. (122 m); with or without cliff
Moderately high shore, 40-ft. (12 m) contour 400 ft. (122 m); with or without cliff
High shore, 60-ft. (18 m) contour 400 ft. (122 m); with or without cliff
Dune
Artificial fill, urban and otherwise

Nearshore Zone

The nearshore zone extends from the shore zone to the 12-foot (MLW datum) contour. In the smaller tidal rivers the 6-foot depth is taken as the reference depth. The 12-foot depth is probably the maximum depth of significant sand transport by waves in the Chesapeake Bay area. Also, the distinct drop-off into the river channels begins roughly at the 12-foot depth. The nearshore zone includes any tidal flats.

The class limits for the nearshore zone classifications were chosen following a simple statistical study. The distance to the 12-foot underwater contour (isobath) was measured on the appropriate charts at one-mile intervals along the shorelines of Chesapeake Bay and the James, York, Rappahannock, and Potomac Rivers. Means and standard deviations for each of the separate regions and for the entire combined system were calculated and compared. Although the distributions were non-normal, they were generally comparable, allowing the data for the entire combined system to determine the class limits.

The calculated mean was 919 yards with a standard deviation of 1,003 yards. As our aim was to determine general, serviceable class limits, these calculated numbers were rounded to 900 and 1,000 yards respectively. The class limits were set at half the standard deviation (500 yards) each side of the mean. Using this procedure a narrow nearshore zone is one 0-400 yards in width, intermediate 400-1,400, and wide greater than 1,400.

The following definitions have no legal significance and were constructed for our classification purposes:

Narrow, 12-ft. (3.7 m) isobath located 400 yards from shore
Intermediate, 12-ft. (3.7 m) isobath 400-1,400 yards from shore
Wide, 12-ft. (3.7 m) isobath 1,400 yards
  Subclasses: with or without bars
  with or without tidal flats
  with or without submerged vegetation

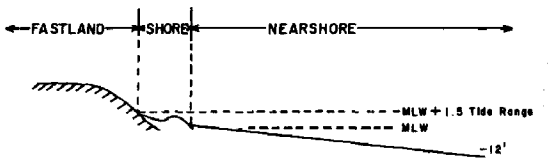


FIGURE 1: An illustration of the definitions of the three components of the shorelands.

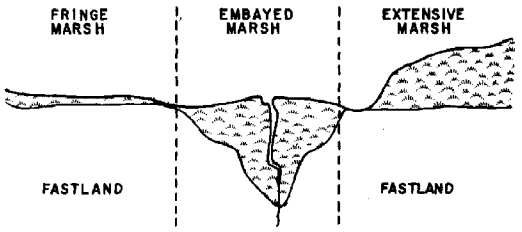


FIGURE 2: A generalized illustration of the three different marsh types.

b) Shorelands Use Classification:

Fastland Zone

Residential

Includes all forms of residential use with the exception of farms and other isolated dwellings. In general, a residential area consists of four or more residential buildings adjacent to one another. Schools, churches, and isolated businesses may be included in a residential area.

Commercial

Includes buildings, parking areas, and other land directly related to retail and wholesale trade and business. This category includes small industry and other anomalous areas within the general commercial context. Marinas are considered commercial shore use.

Industrial

Includes all industrial and associated areas. Examples: warehouses, refineries, shipyards, power plants, railyards.

Government

Includes lands whose usage is specifically controlled, restricted, or regulated by governmental organizations: e.g., Camp Peary, Fort Story.

Recreation and Other Public Open Spaces

Includes designated outdoor recreation lands and miscellaneous open spaces. Examples: golf courses, tennis clubs, amusement parks, public beaches, race tracks, cemeteries, parks.

Preserved

Includes lands preserved or regulated for environmental reasons, such as wildlife or wildfowl sanctuaries, fish and shellfish conservation grounds, or other uses that would preclude development.

Agricultural

Includes fields, pastures, croplands, and other agricultural areas.

Unmanaged

Includes all open or wooded lands not included in other classifications:

a) Open: brush land, dune areas, wastelands; less than 40% tree cover.

b) Wooded: more than 40% tree cover.

The shoreland use classification applies to the general usage of the fastland area to an arbitrary distance of half mile from the shore or beach zone or to some less distant, logical barrier. In multi-usage areas one must make a subjective selection as to the primary or controlling type of usage.

Shore Zone

Bathing
Boat launching
Bird watching
Waterfowl hunting

Nearshore Zone

Pound net fishing
Shellfishing
Sport fishing
Extraction of non-living resources
Boating
Water sports

c) Shorelands Ownership Classification:

The shorelands ownership classification used has two main subdivisions, private and governmental, with the governmental further divided into federal, state, county, and town or city. Application of the classification is restricted to fastlands alone since the Virginia fastlands ownership extends to mean low water. All bottoms below mean low water are in State ownership.

d) Water Quality:

The ratings of satisfactory, intermediate or unsatisfactory assigned to the various subsegments are taken from a listing at the Virginia Bureau of Shellfish Sanitation, based on information from water samples collected in the various tidewater shellfishing areas. The Bureau attempts to visit each area at least once a month.

The ratings are defined primarily in regard to number of coliform bacteria. For a rating of satisfactory the maximum limit is an MPN (Most Probable Number) of 70 per 100 ml. The upper limit for fecal coliforms is an MPN of 23. Usually any count above these limits results in an unsatisfactory rating, and, from the Bureau's standpoint, results in restricting the waters from the taking of shellfish for direct sale to the consumer.

There are instances, however, when the total coliform MPN may exceed 70, although the fecal MPN does not exceed 23, and other conditions are acceptable. In these cases an intermediate rating may be assigned temporarily, and the area will be permitted to remain open pending an improvement in conditions.

Although these limits are somewhat more stringent than those used in rating recreational waters

(see Virginia State Water Control Board, Water Quality Standards 1946, amended 1970), they are used here because the Bureau of Shellfish Sanitation provides the best areawide coverage available at this time. In general, any waters fitting the satisfactory or intermediate categories would be acceptable for water recreation.

e) Zoning:

In cases where zoning regulations have been established the existing information pertaining to the shorelands has been included in the report.

f) Shore Erosion and Shoreline Defenses:

The following ratings are used for shore erosion:

slight or none - less than 1 foot per year

moderate - - - - 1 to 3 feet per year

severe - - - - - greater than 3 feet per year

The locations with moderate and severe ratings are further specified as being critical or noncritical. The erosion is considered critical if buildings, roads, or other such structures are endangered.

The degree of erosion was determined by several means. In most locations the long term trend was determined using map comparisons of shoreline positions between the 1850's and the 1940's. In addition, aerial photographs of the late 1930's and recent years were utilized for an assessment of more recent conditions. Finally, in those areas experiencing severe erosion field inspections and interviews were held with local inhabitants.

The existing shoreline defenses were evaluated as to their effectiveness. In some cases repetitive visits were made to monitor the effectiveness of recent installations. In instances where existing structures are inadequate, we have given recommendations for alternate approaches. Furthermore, recommendations are given for defenses in those areas where none currently exist. The primary emphasis is placed on expected effectiveness with secondary consideration to cost.

g) Potential Shore Uses:

We placed particular attention in our study on evaluating the recreational potential of the shore zone. We included this factor in the consideration of shoreline defenses for areas of high recreational potential. Furthermore, we gave consideration to the development of artificial beaches if this method were technically feasible at a particular site.

h) Distribution of Marshes:

The acreage and physiographic type of the marshes in each subsegment is listed. These estimates of acreages were obtained from topographic maps and should be considered only as approximations. Detailed county inventories of the wetlands are being conducted by the Virginia Institute of Marine Science under the authorization of the Virginia Wetlands Act of 1972 (Code of Virginia 62.1-13.4). These surveys include detailed acreages of the grass species composition within individual marsh systems. The material in this report is provided to indicate the physiographic types of marshes and to serve as a rough guide on acreages until detailed surveys are completed. Additional information of the wetlands characteristics may be found in Coastal Wetlands of Virginia: Interim Report by Marvin L. Wass and Thomas D. Wright, SRAMSOE Report No. 10, Virginia Institute of Marine Science, 1969, and in other VIMS publications.

i) Flood Hazard Levels:

The assessment of tidal flooding hazard for the whole of the Virginia tidal shoreland is still incomplete. However, the United States Army Corps of Engineers has prepared reports for a number of localities which were used in this report. Two tidal flood levels are customarily used to portray the hazard. The Intermediate Regional Flood is that flood with an average recurrence time of about 100 years. An analysis of past tidal floods indicates it to have an elevation of approximately 8 feet above mean water level in the Chesapeake Bay area. The Standard Project Flood level is established for land planning purposes which is placed at the highest probable flood level.

j) Shellfish Leases and Public Grounds:

The data in this report show the leased and public shellfish grounds as portrayed in the Virginia State Water Control Board publication "Shellfish growing areas in the Commonwealth of Virginia: Public, leased and condemned," November 1971, and as periodically updated in other similar reports. Since the condemnation areas change with time they are not to be taken as definitive. However, some insight to the conditions at the date of the report are available by a comparison between the shellfish grounds maps and the water quality maps for which water quality standards for shellfish were used.

k) Beach Quality:

Beach quality is a subjective judgment based on such considerations as the nature of the beach material, the length and width of the beach area, and the general aesthetic appeal of the beach setting.

CHAPTER 3
Present Shorelands Situation

CHAPTER 3
PRESENT SHORELINE SITUATION OF NEW KENT, KING WILLIAM, AND KING AND QUEEN COUNTIES

3.1 THE SHORELANDS OF NEW KENT, KING WILLIAM, AND KING AND QUEEN COUNTIES

The reason for combining the shoreline situation reports for New Kent, King William, and King and Queen Counties, and the municipality of West Point was to reduce the redundancy of data collection, analysis, and presentation. The shoreline characteristics and problems are quite similar. The maps and text of this report have been prepared with little regard to the separation of the counties, whereas the segments and segment summaries and tables do reflect the secular subdivisions. We hope that in this way the needs, ranging from those of regional managers and planners to individuals interested in specific sites, will be satisfied.

The three county study area is contained within two of Virginia's major river basins, the York and the James. The Chickahominy River and its tributary, Diascund Creek, both in New Kent County, flow toward the James. The remaining major streams, the Mattaponi, Pamunkey, and Poropotank flow into the York; indeed part of the York River itself is in the area. Although most of these streams extend through and beyond the counties, this study did not carry so far upstream. On the Chickahominy and Diascund Creek we did not continue our measurements beyond the dams which serve to limit the reach of the tides. On the Mattaponi and Pamunkey, the upper limits of our study were more arbitrary, being the Route 360 highway bridges at Aylett on the Mattaponi and the Pamunkey River Bridge southwest of Manquin.

The measured fastland shoreline for the three county areas is 284.8 miles in length whereas the wetted shoreline is slightly shorter with 272.9 miles. Seventy percent of the shoreline is low shore, fourteen percent moderately low shore, and six percent moderately low shore with bluff. The remaining ten percent is divided amongst five other classification categories. All but three percent of the shore zone is marsh, almost half, 49%, or 135.4 miles, being extensive marsh. Detailed measurements of marsh areas and type will be presented in the formal Wetlands Inventories for the three counties which will be made by the Wetlands Research Section of the Virginia Institute of Marine Science. Measurements of the nearshore will loose significance in the narrower and shallower streams, with the result that the nearshore zone often is left unclassified; however, the greatest portion (half the total shoreline length) of the areas that were classified were narrow. Six percent were intermediate, and none were measured as wide. This directly reflects the fact that the shoreline is along a river and not open bay shore.

The shoreline fastland use fairly accurately reflects the entire three county area's land use. Fifty-four percent, one hundred fifty-five miles, is classified as unmanaged, wooded and unwooded. We should point out that this classification ambiguously includes managed forestland. Thirty-four percent is agricultural cropland, eight percent residential, and two percent governmental, which includes the Mattaponi and Pamunkey Indian Reservations. Very minor percentages of the fastland are used for commercial, recreational, or industrial purposes.

Land ownership is almost entirely private, ninety-eight percent. Of the three counties, King William has the greatest shore length at 118.5 miles, with New Kent and King and Queen having 83.3 and 71.1 miles respectively.

Detailed tables of the shoreline characteristics are in the following pages.

Shoreline Distribution by County and River are:

	New Kent	King William	King& Queen	Total
York	12.1		11.0	23.1
Mattaponi		46.6	47.4	94.0
Pamunkey	53.3	71.9		125.2
Chickahominy	17.9			17.9
Poropotank			12.7	12.7
Total	83.3	118.5	71.1	272.9

3.2 SHORE EROSION PROCESSES, PATTERNS, AND DEFENSES

Shore erosion along the tidal shores of New Kent, King William, and King and Queen Counties is slight compared to other counties in Tidewater Virginia. There are three distinct areas which will be discussed separately, whose erosion characteristics differ somewhat. Map 1E is a summary of these characteristics.

Mattaponi and Pamunkey Rivers

The Mattaponi and Pamunkey Rivers are extremely meandering tidal rivers bordered by extensive marshes. The marshes perform an important function in reducing erosion rates along the river shores. The exposure to wind generated waves is

small due to the narrow width and meandering nature of the rivers. Because of the bends in the river, erosion takes place on the outside of the bends where there is fastland not protected by a marsh. These are the sites where most of the residential development occurs along the rivers.

In times of unusually high water associated with floods or storms the fastlands at the apex of the bends are particularly susceptible to erosion as the currents generated by receding flood waters act to carry away fastland material. If the undercutting is severe enough the trees growing on the face of the cliff will topple, carrying large amounts of soil with them. This undercutting can come from upriver floods, enhanced tides or boat wakes, an ever increasing source of wave energy.

Increased development along a shoreline always brings an increase in use of the nearshore water for recreation of which boating is an integral part. Associated with this use is an increase in the number of piers and access facilities. If they are not installed properly or properly maintained they can lead to increased erosion at the pier site. In addition, if the access must cross a cliff, vegetation is usually eliminated which makes that section of the cliff face susceptible to erosion from runoff. In addition, increased pedestrian traffic near the pier can eliminate protective vegetation that exists on the back portion of the beach or forms the shore zone itself.

Development of the fastland generally results in a reduction in the ground cover. This allows a larger percentage of the water which falls during rain storms to flow over the cliff face, which can accelerate erosion where access ways are installed.

The erosion in this area, although slight, is linked to a combination of natural and man-induced phenomenon. In those areas where problems are encountered and remedial action is necessary, professional advice is the first step in obtaining a feasible solution to the problem.

Several suggestions can be offered in light of the preceeding discussion of the problems which are or can be expected to be encountered.

For those sections of the shore with eroding beaches and fastland, a series of short river training groins are one alternative where applicable. In those areas where sand supply is limited or vegetation has been eliminated, a retaining wall may be necessary. This in conjunction with a reduced and vegetated cliff slope can also be a viable solution.

In those areas where beaches do not exist or could not be generated, intensive planting of selected marsh vegetation can reduce or eliminate erosion. Although this method is a relatively new approach it has been shown to be very effective if used in the proper areas.

Reducing the cliff slope and vegetating it can be very effective retarding slope retreat, particularly in areas with high cliffs. In addition, a drain field installed on the fastland to channel water away from the cliff face to selected drainage areas can reduce runoff erosion.

Although difficult to instigate except as a development begins, community piers are preferable to single residence accesses. Although these concentrate traffic at one area, it confines the adverse effects of breaching the cliff face to one solvable area.

West Point

The residential and industrial growth in the West Point area has put ever increasing pressure on the shorelands of this area. The Chesapeake Corporation facility has artificially stabilized its shoreline to provide access for the freighters and barges which transport its products and supplies. These structures replaced the wetlands which previously protected the shore from erosion. Until the implementation of the Virginia Wetlands Law of 1972, the residential development along the West Point peninsula had severely encroached on the wetlands. Erosion protection capabilities were thus reduced or eliminated which necessitated installation of structures to control erosion. The existing structures at the end of the peninsula are doing a good job of protecting the shore. In the future, such marsh areas should be encouraged to grow. In critical areas, a replanting program should be instituted to replace the marshes. Their natural erosion and flood protection capabilities make them a good selection when addressing the protection of the shoreline in this area.

York River

The York River portion of King and Queen and New Kent Counties is primarily fringe or extensive marshes with the exception of the Belleview area of King and Queen County which is beach. The marshes' regenerative powers help to slow the erosion along their faces. The Belleview area is susceptible to slight wave induced shore erosion of its cliffs during storms. The cliffs of Belleview are the primary source of sand for nourishment

of the beaches in this area. Thus, bulkheading the area would lead to the disappearance of the beaches. A possible solution would be to install groins and then to fill the structures with either dredged or trucked sand. The prevention of flanking and failure of the structures would require a joint action by the area landowners. It also would require a comprehensive study of the area to determine the best spacing, height and length of the groins. At present, the erosion is not great enough to warrant extensive structures which could lead to greater problems. Initially, if it were felt necessary, beach nourishment without structures could keep the problem in abeyance.

Chickahominy River

A series of oxbows characterize the portion of the Chickahominy River which borders New Kent County. The shorelands are primarily marsh with occasional beaches. These beaches occur where the river encroaches on the fastland. These beaches are a product of the erosion of the cliffs.

The two major sources of erosion are man made. The Chickahominy is very popular with boating enthusiasts. Boat wakes cause undercutting of both the cliff and the marsh faces. When the undercutting is severe enough, a large block of marsh or fastland material will slump into the nearshore zone where, in the case of fastland slumping, it adds material to the beach and which in both instances leads to shoaling of the main Chickahominy River Channel. The marshes possess the ability to regenerate the lost portion which is not the case in the fastland.

The other major source of shore erosion is the clearing of the fastland for residential development. The residential developments are usually located atop the high fastland which borders the river. By reducing the ground cover the rain runoff more easily exits over the cliff faces. Although some of this material is added to the beaches, much is lost to the nearshore zone.

There is some erosion on the outside of the bends of the river. Some accretion and marsh growth occurs on the inside of the bends. However, this erosion and accretion has been diminished by the dam at Walkers.

Although shore erosion is slight along the Chickahominy River, increased residential development along its shores will lead to an increase in cleared land. To prevent an increase in the cliff erosion, drain fields should be built to channel runoff through conduits into the Chickahominy. Also the slope of the cliff should be vegetated to decrease the erosion. Some recontouring of the fastland near the cliff edge may be necessary to aid the drain field. The changes in the topography should be designed such that they will direct the runoff to the drains and prevent it from flowing over the cliff face.

Should beach erosion increase, short, river-training groins and beach nourishment should halt the erosion. Bulkheading should be discouraged as it would ultimately lead to the disappearance of the beaches. "No wake" zones should be established to decrease the detrimental effects of boat wakes. Community piers should be encouraged as opposed to single family piers.

In areas of marsh erosion, replanting and fertilization should be encouraged. In areas of severe marsh erosion, riprap or gabions along the eroding face may be necessary to halt the erosion.

3.3 POTENTIAL SHORELANDS USES

The potential for greatly altered shorelands uses in the three county area is, in general, quite limited. The very low projected population increases, the vast marsh areas, the great natural beauty, the historical interest, and the possible inclusion of portions of the area in the Scenic Rivers system all suggest that only limited and careful modifications of the shoreland's use patterns should be considered.

The Chickahominy River with the marina at Walkers Dam and the development at Chickahominy Shores is somewhat more developed than the Mattaponi, Pamunkey, and Poropotank Rivers.

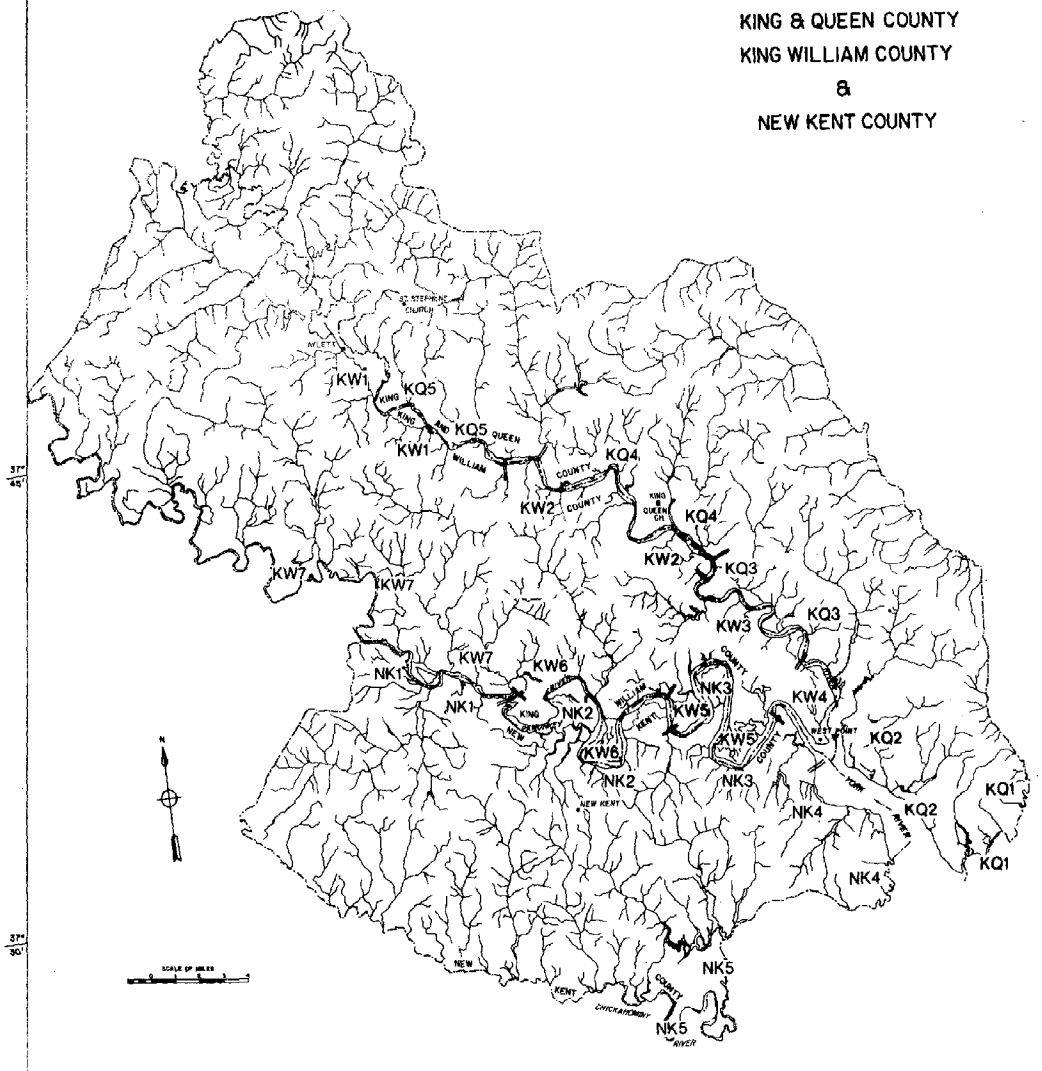
The only substantially developed portion of the three county shoreline is the West Point area, located at the confluence of the Mattaponi and Pamunkey Rivers. The Chesapeake Corporation, a major pulpwood paper industry, makes extensive use of the shore in the transportation of both raw materials and finished products. Portions of the West Point shoreline not specifically used by the industrial facilities should be cleaned and maintained. In view of West Point's location at the head of the York, there might be a developable need for expanded marina facilities catering both to expanded local needs and to transient craft plying Virginia's scenic water byways.

The majority of the shoreline of the Mattaponi and Pamunkey Rivers is undeveloped. The high bluffs on the outside of the meanders might be good locations for limited increases in residential housing. Houses could be built far enough removed from the shore to eliminate the immediate

threat of bank erosion and yet still have a fine view of the area. Some of the low areas might be utilized as small boat launching or access facilities and small campgrounds or recreational areas. Every effort should be made to limit destruction of the marshes.

In conclusion, the likelihood of and pressure for greatly altered shore uses in the three county area is slight. In general, there might be an expansion in the recreational facilities and limited increases in residential housing along portions of the shoreline.

KING & QUEEN COUNTY
KING WILLIAM COUNTY
&
NEW KENT COUNTY



MAP 1A

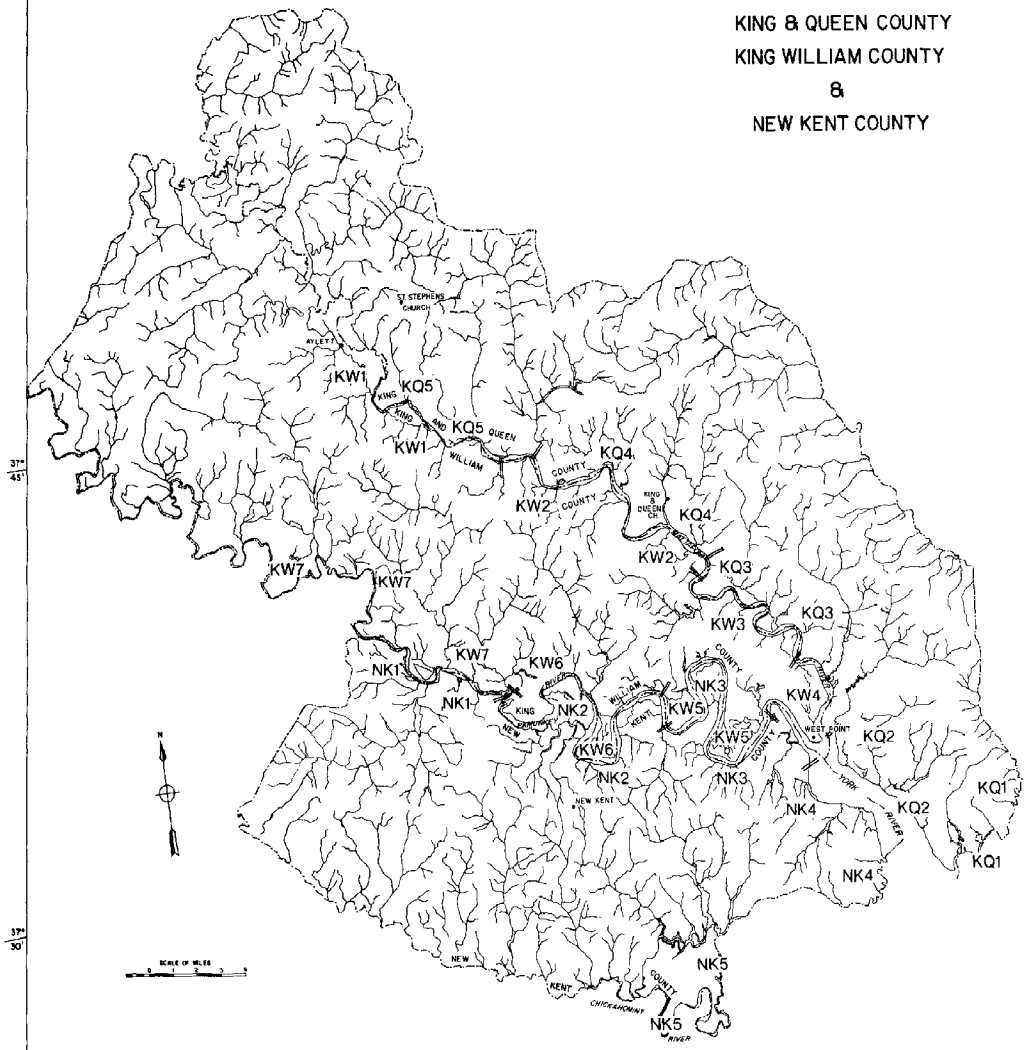
SEGMENT LOCATION MAP

// = Segment Boundary
/ = Subsegment Boundary

KW 1 HEAD OF MATTAPONI RIVER - WEST SHORE
2 MATTAPONI RIVER - WESTSHORE - INDIAN RESERVATION AREA
3 LOWER MATTAPONI - WEST SHORE
4 WEST POINT AREA
5 LOWER PAMUNKEY - NORTH SHORE - SWEET HALL MARSH TO LEE MARSH
6 PAMUNKEY RIVER - NORTH SHORE - INDIAN RESERVATION TO SWEET HALL LANDING
7 HEAD OF PAMUNKEY RIVER - NORTH SHORE

K&Q 1 POROPOTANK RIVER
2 HEAD OF YORK RIVER - EAST SHORE
3 LOWER MATTAPONI RIVER - EAST SHORE
4 MATTAPONI RIVER - EAST SHORE - RICKAHOCK TO GRASS CREEK
5 HEAD OF MATTAPONI RIVER - EAST SHORE

2 PAMUNKEY RIVER - SOUTH SHORE - COUSIAC MARSH TO RAILWAY BRIDGE LOWER
3 LOWER PAMUNKEY RIVER - SOUTH SHORE
4 HEAD OF YORK RIVER -WEST SHORE
5 CHICKAHOMINY RIVER - NORTH SHORE



MAP 1B

SHORELANDS TYPES

FASTLAND

- Low Shore
- Low Shore with Bluff
- Moderately Low Shore
- Moderately Low Shore with Bluff
- Moderately High Shore
- Moderately High Shore with Bluff
- High Shore
- High Shore with Bluff
- Dune
- Artificial Fill

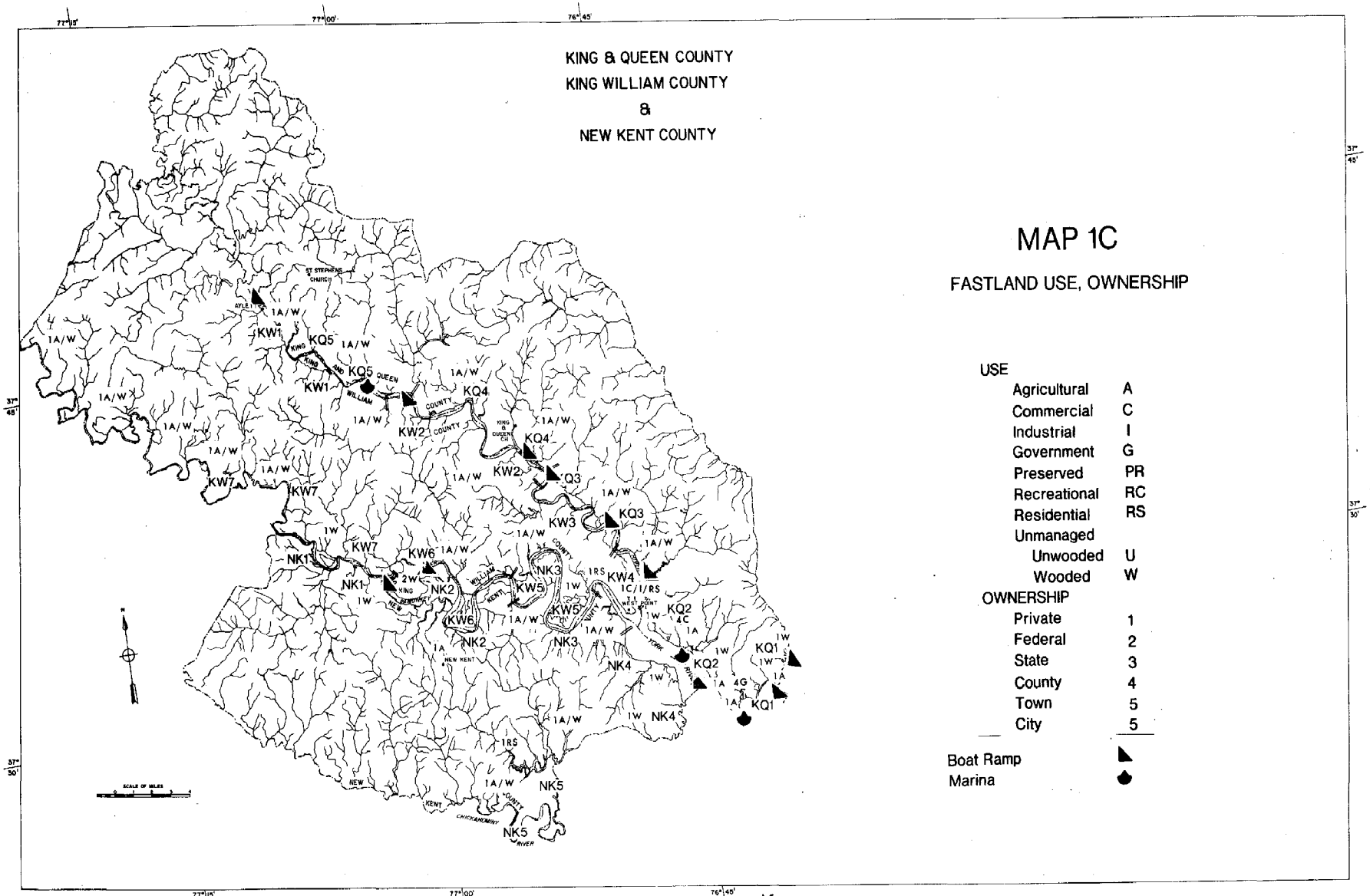
SHORE

- Beach
- Fringe Marsh
- Extensive Marsh
- Embayed Marsh

NEARSHORE

- Narrow
- Intermediate
- Wide

See Section 4.3 - Pages 42-89



MAP 1C

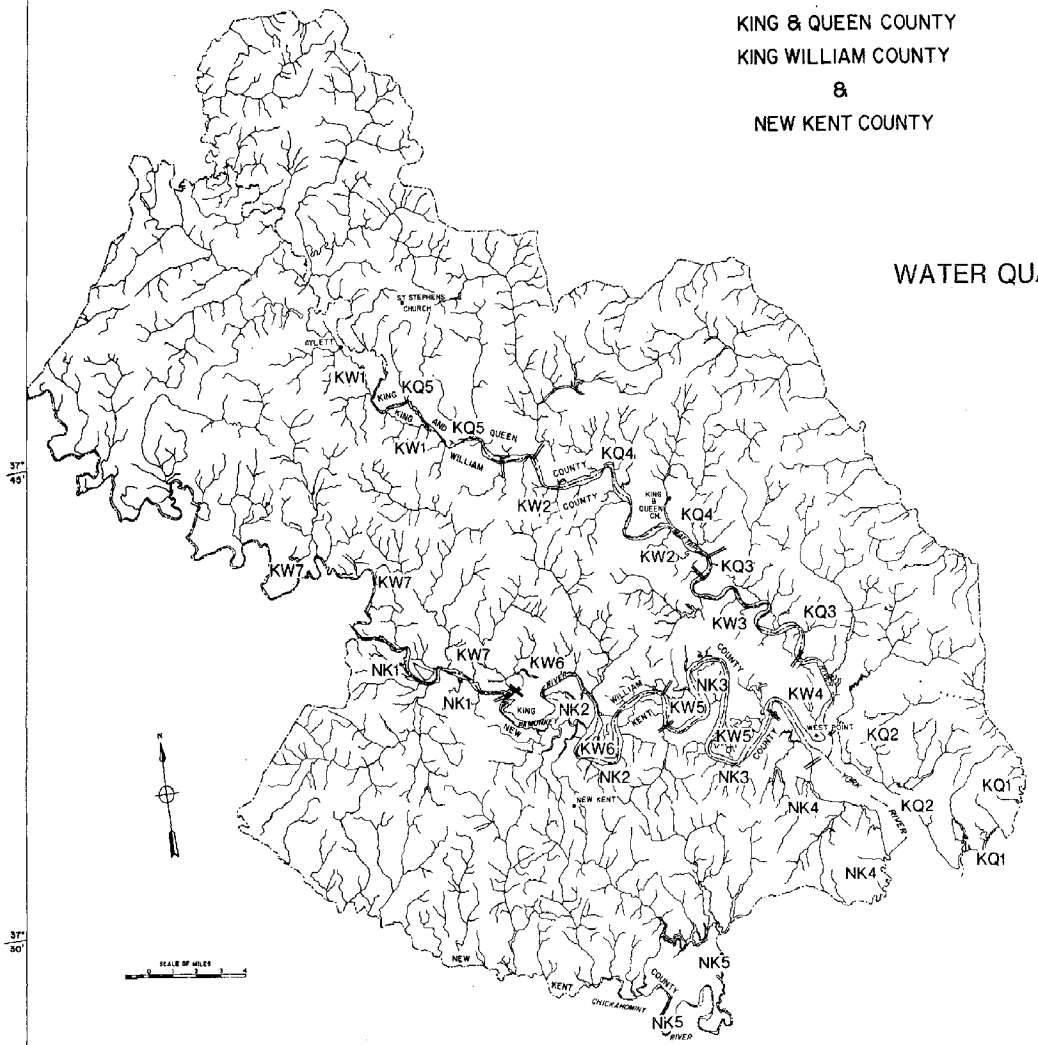
FASTLAND USE, OWNERSHIP

USE	
Agricultural	A
Commercial	C
Industrial	I
Government	G
Preserved	PR
Recreational	RC
Residential	RS
Unmanaged	
Unwooded	U
Wooded	W
OWNERSHIP	
Private	1
Federal	2
State	3
County	4
Town	5
City	5
Boat Ramp	◣
Marina	●

KING & QUEEN COUNTY
KING WILLIAM COUNTY
&
NEW KENT COUNTY

MAP 1D

WATER QUALITY, OYSTER GROUNDS, AND SEWAGE DISCHARGES



WATER QUALITY

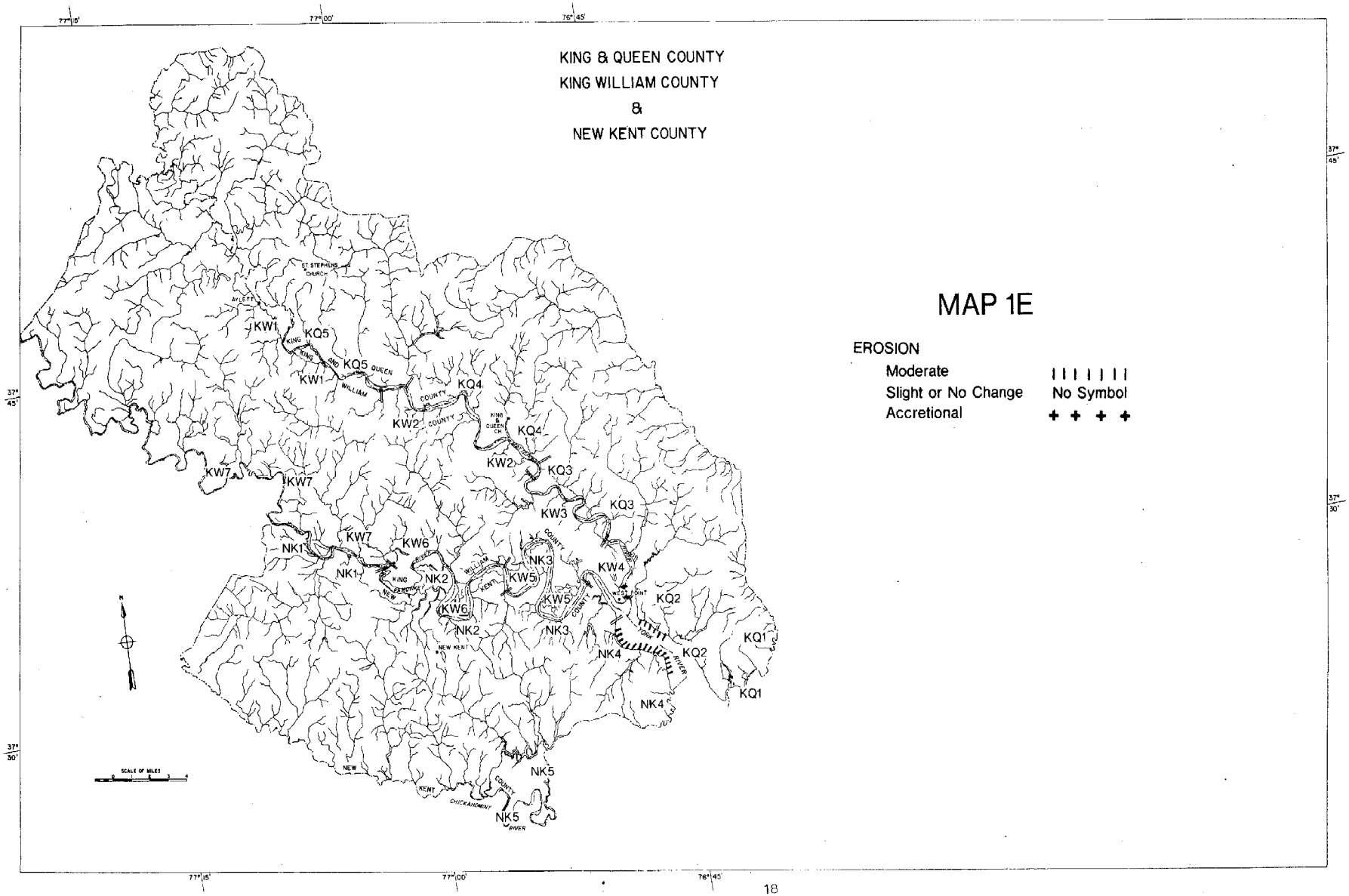
Satisfactory	S
Intermediate	I
Unsatisfactory	U

GENERALIZED DELINEATION OF OYSTER GROUNDS

- Public Grounds
- Leased Grounds
- Condemnation Areas

SEWAGE DISCHARGES

See Section 4.3 - Pages 42-89


KING & QUEEN COUNTY
KING WILLIAM COUNTY
&
NEW KENT COUNTY
MAP 1E
EROSION
Moderate
Slight or No Change
No Symbol
Accretional
77°15'
77°00'
76°45'
37°45'
37°30'
KW1
KQ5
KW2
KQ4
KW3
KQ3
KW4
KQ2
KW5
KQ1
KW6
NK1
NK2
NK3
NK4
NK5
KW7
KING & QUEEN CO.
KING WILLIAM COUNTY
NEW KENT COUNTY
PAMUNKEY RIVER
MATTAPONI RIVER
CHICKAHOMINY RIVER
SCALE OF MILES

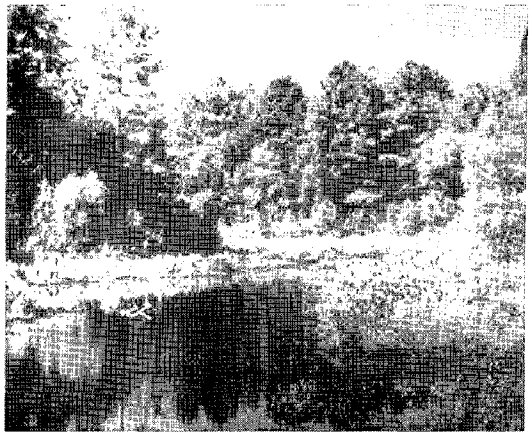


Figure 3

Figure 4

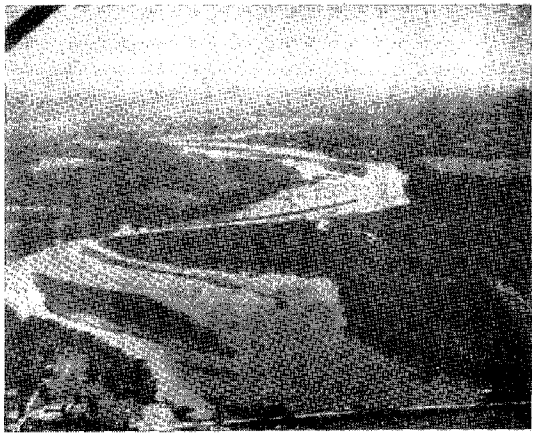


Figure 5

Figure 6

FIGURE 3: A portion of Diascund Creek in New Kent County. This is a very valuable area of fresh water wetlands.

FIGURE 4: Near the mouth of Diascund Creek. Most of the erosion of the bluff is due to surface wash and not the forces of the river.

FIGURE 5: View downstream from the Mattaponi River bridge. This was the upstream limit of the study.

FIGURE 6: The Pamunkey River near its mouth at West Point. This is the only industrial area along the tri-county shore zone.

FIGURE 7: An overview of the city of West Point from the Mattaponi River across to the Pamunkey.

Figure 7

TRI-COUNTY SHORELANDS PHYSIOGRAPHY, FASTLAND USE, OWNERSHIP (STATUTE MILES)

Physiographic, use, and ownership classification / Counties	SHORELANDS PHYSIOGRAPHY																FASTLANDS USE							OWNERSHIP			TOTAL MILES	
	FASTLANDS								SHORE					NEARSHORE															
	LOW SHORE	LOW SHORE WITH BLUFF	MODERATELY LOW SHORE	MODERATELY LOW SHORE WITH BLUFF	MODERATELY HIGH SHORE	MODERATELY HIGH SHORE WITH BLUFF	HIGH SHORE	HIGH SHORE WITH BLUFF	ARTIFICIALLY STABILIZED	BEACH	FRINGE MARSH	EMBAYED MARSH	EXTENSIVE MARSH	NARROW	INTERMEDIATE	AGRICULTURAL	COMMERCIAL	GOVERNMENTAL	INDUSTRIAL	RECREATIONAL	RESIDENTIAL	UNMANAGED, WOODED AND UNWOODED	PRIVATE	COUNTY	FEDERAL	FASTLAND	SHORE
NEW KENT	51.5	3.3	18.3	2.3	2.8		1.6	4.3	0.4	1.2	24.6	11.2	45.9	48.9	6.1	31.3				0.2	7.9	44.7	84.1			84.1	83.3
KING WILLIAM	73.4	1.5	10.7	10.5	0.9	4.5	1.2	2.7	1.1		47.4	6.6	63.4	51.7		40.4	2.4	3.9	0.9		9.1	48.7	101.5		3.9	105.4	118.5
KING & QUEEN	74.8	1.0	10.7	4.1	1.7	1.4	0.4	1.2	0.1	3.2	25.5	16.2	26.1	35.2	11.0	25.7		2.2		0.2	5.5	61.7	93.1	2.2		95.3	71.1
TOTAL	199.7	5.8	39.7	16.9	5.4	5.9	3.2	8.2	1.6	4.4	97.5	34.0	135.4	135.8	17.1	97.4	2.4	6.1	0.9	0.4	22.5	155.1	278.7	2.2	3.9	284.8	272.9
% of SHORELINE									1%	2%	36%	12%	49%	50%	6%												100%
% of FASTLAND	70%	2%	14%	6%	2%	2%	1%	3%								34%	1%	2%	0%	0%	8%	54%	98%	1%	1%	100%	

SUMMARY OF NEW KENT COUNTY SHORELANDS PHYSIOGRAPHY, FASTLANDS USE, OWNERSHIP (STATUTE MILES)

Physiographic, use and ownership classification / Segment	SHORELANDS PHYSIOGRAPHY													FASTLANDS USE				OWNERSHIP	TOTAL MILES	
	FASTLANDS							SHORE					NEARSHORE							
	LOW SHORE	LOW SHORE WITH BLUFF	MODERATELY LOW SHORE	MODERATELY LOW SHORE WITH BLUFF	MODERATELY HIGH SHORE	HIGH SHORE	HIGH SHORE WITH BLUFF	FRINGE MARSH	EMBAYED MARSH	EXTENSIVE MARSH	BEACH	ARTIFICIALLY STABILIZED	NARROW	INTERMEDIATE	AGRICULTURAL	RECREATIONAL	RESIDENTIAL	UNMANAGED, WOODED	PRIVATE	FASTLAND	SHORE
1	8.1	0.6	2.8	0.7				3.5	0.5	6.4					8.8		0.5	2.9	12.2	12.2	10.4
2	4.8	2.7	3.9	1.2	0.3		2.4	7.8		16.8			24.6		7.6		0.3	7.4	15.3	15.3	24.6
3	18.9		1.1	0.2				4.5	1.6	12.2			18.3		10.6		2.9	6.7	20.2	20.2	18.3
4	6.3		9.2		2.0	1.4	0.8	0.9	5.2	4.8	1.2		6.0	6.1	2.5		0.9	16.3	19.7	19.7	12.1
5	13.4		1.3	0.2	0.5	0.2	1.1	7.9	3.9	5.7		0.4			1.8	0.2	3.3	11.4	16.7	16.7	17.9
SUBTOTAL	51.5	3.3	18.3	2.3	2.8	1.6	4.3	24.6	11.2	45.9	1.2	0.4	48.9	6.1	31.3	0.2	7.9	44.7	84.1	84.1	83.3
% of SHORELINE								30%	13%	55%	1%	1%	59%	7%							100%
% of FASTLAND	61%	4%	22%	3%	3%	2%	5%								37%	0	9%	53%	100%	100%	

SUMMARY OF KING WILLIAM COUNTY SHORELANDS PHYSIOGRAPHY, FASTLANDS USE, OWNERSHIP (STATUTE MILES)

Physiographic, use, and ownership classification / Segment	SHORELANDS PHYSIOGRAPHY													FASTLANDS USE						OWNERSHIP		TOTAL MILES	
	FASTLANDS								SHORE				NEARSHORE										
	LOW SHORE	LOW SHORE WITH BLUFF	MODERATELY LOW SHORE	MODERATELY LOW SHORE WITH BLUFF	MODERATELY HIGH SHORE	MODERATELY HIGH SHORE WITH BLUFF	HIGH SHORE	HIGH SHORE WITH BLUFF	FRINGE MARSH	EMBAYED MARSH	EXTENSIVE MARSH	ARTIFICIALLY STABILIZED	NARROW	AGRICULTURAL	COMMERCIAL	GOVERNMENTAL	INDUSTRIAL	RESIDENTIAL	UNMANAGED, WOODED	PRIVATE	FEDERAL	FASTLAND	SHORE
1	6.6		1.9	3.0	0.7	1.1			8.9	0.4	5.7		3.9	6.9				1.4	5.0	13.3		13.3	15.0
2	8.7	1.1	0.2	2.1		0.9	1.2		4.9		9.5		14.4	0.9		0.5		0.7	12.1	13.7	0.5	14.2	14.4
3	9.9		1.6						3.6		5.0		8.6	2.9				0.6	8.0	11.5		11.5	8.6
4	10.2			1.4					3.5		4.0	1.1	8.6	2.3	2.4		0.9	6.0		11.6		11.6	8.6
5	6.4		0.2	0.6		0.2		2.3	4.2	1.1	10.9		16.2	2.1					7.6	9.7		9.7	16.2
6	9.0		2.3	1.0					6.9	2.0	11.4			6.4		3.4		0.2	2.3	8.9	3.4	12.3	20.3
7	22.6	0.4	4.5	2.4	0.2	2.3		0.4	15.4	3.1	16.9			18.9				0.2	13.7	32.8		32.8	35.4
SUBTOTAL	73.4	1.5	10.7	10.5	0.9	4.5	1.2	2.7	47.4	6.6	63.4	1.1	51.7	40.4	2.4	3.9	0.9	9.1	48.7	101.5	3.9	105.4	118.5
% of SHORELINE									40%	6%	53%	1%	44%										100%
% of FASTLAND	70%	1%	10%	10%	1%	4%	1%	3%						38%	2%	4%	1%	9%	46%	96%	4%	100%	

SUMMARY OF KING AND QUEEN COUNTY SHORELANDS PHYSIOGRAPHY, FASTLANDS USE. OWNERSHIP (STATUTE MILES)

Physiographic, use and ownership classification / Segment	SHORELANDS PHYSIOGRAPHY															FASTLANDS USE					OWNERSHIP		TOTAL MILES	
	FASTLAND								SHORE					NEARSHORE										
	LOW SHORE	LOW SHORE WITH BLUFF	MODERATELY LOW SHORE	MODERATELY LOW SHORE WITH BLUFF	MODERATELY HIGH SHORE	MODERATELY HIGH SHORE WITH BLUFF	HIGH SHORE	HIGH SHORE WITH BLUFF	BEACH	FRINGE MARSH	EXTENSIVE MARSH	EMBAYED MARSH	ARTIFICIALLY STABILIZED	MARSH	INTERMEDIATE	AGRICULTURAL	GOVERNMENTAL	RECREATIONAL	RESIDENTIAL	UNMANAGED, WOODED AND UNWOODED	PRIVATE	COUNTY	FASTLAND	SHORE
1	13.1		5.1		0.6		0.4		0.4	0.2		12.1				4.9				14.3	19.2		19.2	12.7
2	21.8								2.8	2.4	5.7		0.1		11.0	1.7	2.2		0.6	17.3	19.6	2.2	21.8	11.0
3	20.3		1.6		0.8					4.8	11.3	2.8		18.9		6.4			2.8	13.5	22.7		22.7	18.9
4	10.3	1.0	3.3	1.9						5.6	6.8			12.4		6.9			0.3	9.3	16.5		16.5	12.4
5	9.3		0.7	2.2	0.3	1.4		1.2		12.5	2.3	1.3		3.9		5.8		0.2	1.8	7.3	15.1		15.1	16.1
SUBTOTAL	74.8	1.0	10.7	4.1	1.7	1.4	0.4	1.2	3.2	25.5	26.1	16.2	0.1	35.2	11.0	25.7	2.2	0.2	5.5	61.7	93.1	2.2	95.3	71.1
% of SHORELINE									4%	36%	37%	23%	0%	50%	15%									100%
% of FASTLAND	78%	1%	11%	4%	2%	2%	1%	1%								27%	2%	0	6%	65%			100%	

CHAPTER 4

4.1 Table of Subsegment Summaries

4.2 Segment and Subsegment Descriptions

4.3 Segment and Subsegment Maps

TABLE 2. SHORELINE SITUATION REPORT SEGMENT SUMMARIES, NEW KENT COUNTY

SEGMENT	SHORELANDS TYPE	SHORELANDS USE	OWNERSHIP	WATER QUALITY	FLOOD HAZARD	BEACH QUALITY	SHORE EROSION SITUATION	POTENTIAL USE ENHANCEMENT
1 PAMUNKEY RIVER: MATADEQUEN CREEK to WHITE HOUSE 10.4 miles (12.2 miles of fastland)	FASTLAND: Low shore 66%, with bluff 5%, moderately low shore 23%, with bluff 6%. SHORE: Fringe marsh 34%, embayed marsh 5%, extensive marsh 61%. RIVER: Narrow.	FASTLAND: Agricultural 72%, unmanaged, wooded 24%, residential 4%. SHORE: Hunting, fishing, etc. NEARSHORE: Some sport fishing.	Private.	No data.	Low, noncritical.	No beaches.	None.	Low. The several marshes should be preserved as wildlife habitats.
2 WHITE HOUSE to MILL CREEK 24.6 miles (15.3 miles of fastland)	FASTLAND: Low shore 31%, with bluff 18%, moderately low shore 25%, with bluff 8%, moderately high shore 2%, high shore with bluff 16%. SHORE: Extensive marsh 68%, fringe marsh 32%. NEARSHORE: Narrow.	FASTLAND: Agricultural 50%, unmanaged, wooded 48%, residential 2%. SHORE: Little recreational use. RIVER: Sport fishing, water sports.	Private.	No data.	Low, noncritical.	No beaches.	There is no erosion data but one building at Morgan Landing is endangered. There are no protective structures in the segment.	Moderate. There is potential for a recreational camping spot at Cumberland Thorofare.
3 MILL CREEK to PERRY CREEK 18.3 miles (20.2 miles of fastland)	FASTLAND: Low shore 94%, moderately low shore 5%, with bluff 1%. SHORE: Extensive marsh 67%, fringe marsh 24%, embayed marsh 9%. NEARSHORE: Narrow.	FASTLAND: Agricultural 53%, unmanaged, wooded 33%, residential 14%. SHORE: Recreation, hunting, fishing. NEARSHORE: Shipping of pulpwood, water sports, sport fishing.	Private.	No data for Pamunkey River. Intermediate for West Point area.	Low, noncritical.	No beaches.	No erosion data for the Pamunkey River. The York River portion is slight or no change. There are no endangered structures or shore protective structures in this area.	Low. Marshes should be left as they are.
4 YORK RIVER: PERRY CREEK to WARE CREEK 12.1 miles (19.7 miles of fastland)	FASTLAND: Low shore 32%, moderately low shore 47%, moderately high shore 10%, high shore 7%, with bluff 4%. SHORE: Embayed marsh 43%, extensive marsh 40%, beach 10%, fringe marsh 7%. RIVER: Intermediate and wide.	FASTLAND: Unmanaged, wooded 83%, agricultural 13%, residential 4%. SHORE: Hunting, recreation. RIVER: Shipping to West Point.	Private.	Intermediate.	Low, noncritical, except at the mouth of Philbates Creek where it is moderate, critical.	Fair to poor. Most beaches in the segment are narrow. Those north of Baker Creek are fair.	Slight to none to just south of Baker Creek; moderate, noncritical from here to Ware Creek. There are no endangered structures or shore protective structures.	Moderate. Present use seems best.
5 CHICKAHOMINY RIVER - DIASCUND CREEK 17.9 miles (16.7 miles of fastland)	FASTLAND: Low shore 80%, moderately low shore 6%, with bluff 1%, moderately high shore 3%, high shore 1%, with bluff 7%. SHORE: Fringe marsh 44%, extensive marsh 32%, embayed marsh 22%, artificially stabilized 2%. RIVER: Narrow. Averages 6 feet in depth.	FASTLAND: Unmanaged, wooded 68%, residential 20%, agricultural 11%, recreational 1%. SHORE: Recreation. RIVER: Sport fishing, boating, some water sports.	Private.	No data.	Low, noncritical except moderate, critical for one house down river of Chickahominy Shores.	Poor.	No erosion data. There is 0.4 miles of bulkheading on the west bank of Chickahominy Shores and at the several marinas at Chickahominy Shores.	Low. Present use of the area is the best possible utilization.

TABLE 2. SHORELINE SITUATION REPORT SEGMENT SUMMARIES, KING WILLIAM COUNTY

SEGMENT	SHORELANDS TYPE	SHORELANDS USE	OWNERSHIP	WATER QUALITY	FLOOD HAZARD	BEACH QUALITY	SHORE EROSION SITUATION	POTENTIAL USE ENHANCEMENT
1 MATTAPONI RIVER: Bridge at AYLETT to HORSE LANDING 15.0 miles (13.3 miles of fastland)	FASTLAND: Low shore 50%, moderately low shore 14%, with bluff 23%, moderately high shore 5%, with bluff 6%. SHORE: Fringe marsh 59%, extensive marsh 38%, embayed marsh 3%. RIVER: Narrow. Headwaters of Mattaponi averages 6-foot depth. At Walkerton, river depth is 10-20 feet in places.	FASTLAND: Agricultural 52%, unmanaged, wooded 38%, residential 10%. SHORE: Mostly unused, some hunting and fishing. RIVER: Some sport fishing, boating, water sports.	Private.	No data.	Low, noncritical.	No beaches.	No data on erosion rate. There are no endangered structures or shore protective structures. If action eventually appears necessary any of a number of methods could be implemented.	Low. The marsh should be preserved as a wildlife refuge. Recreational use could be enhanced.
2 HORSE LANDING to end of GLEASON MARSH 14.4 miles (14.2 miles of fastland)	FASTLAND: Low shore 61%, with bluff 8%, moderately low shore 1%, with bluff 15%, moderately high shore with bluff 6%, high shore 8%. SHORE: Extensive marsh 66%, fringe marsh 34%. RIVER: Narrow.	FASTLAND: Unmanaged, wooded 85%, agricultural 6%, residential 5%, governmental 4%. SHORE: Little or no formal use. RIVER: Some sport fishing, boating, water sports.	Private and Federal government.	No data.	Low, noncritical.	No beaches.	None.	Low. Marshes should be left as they are. There is some potential for low-density recreational use.
3 GLEASON MARSH to WEST POINT CORPORATE LIMITS 8.6 miles (11.5 miles of fastland)	FASTLAND: Low shore 86%, moderately low shore 14%. SHORE: Extensive marsh 58%, fringe marsh 42%. RIVER: Narrow.	FASTLAND: Unmanaged, wooded 70%, agricultural 25%, residential 5%. SHORE: Mostly unused. RIVER: Some sport fishing, boating, water sports.	Private.	No data.	Low, noncritical.	No beaches.	None.	Low. There is little need for enhancement of this area. Marshes should be left in their natural state.
4 WEST POINT 8.6 miles (shore) (11.6 miles of fastland)	FASTLAND: Low shore 88%, moderately low shore with bluff 12%. SHORE: Extensive marsh 46%, fringe marsh 41%, artificially stabilized 13%. RIVER: Narrow.	FASTLAND: Residential 52%, agricultural 20%, commercial 20%, industrial 8%. SHORE: Dockage and access to boats. RIVER: Sport fishing, boating, water sports, extensive pulpwood shipping.	Private.	Unsatisfactory for York River. No data for Pamunkey or Mattaponi.	Low, noncritical for most, moderate, critical at some houses on West Point shoreline.	Poor.	Historically, from Lord Delaware Bridge the area is accreting at 1.3 ft/yr. Slight or no change from Eltham Bridge to bulkheading. There are no endangered structures. The York River portion of West Point is bulkheaded and riprapped. These structures seem effective.	Low. The industrial use virtually precludes any recreational use.
5 PAMUNKEY RIVER: HERRICK CREEK to SWEET HALL LANDING 16.2 miles (9.7 miles of fastland)	FASTLAND: Low shore 66%, moderately low shore 2%, with bluff 6%, moderately high shore with bluff 2%, high shore with bluff 24%. SHORE: Extensive marsh 67%, fringe marsh 26%, embayed marsh 7%. RIVER: Narrow.	FASTLAND: Unmanaged, wooded 78%, agricultural 22%. SHORE: No specific use. RIVER: Sport fishing, boating, water sports.	Private.	No data.	Low, noncritical.	No beaches.	Erosion is concentrated at the outside of the meanders. At present there are no endangered structures. If the need arises, any of a number of shore protective structures could be used to protect the shore.	Low. The marshes should be preserved as very valuable wetlands.
6 SWEET HALL LANDING to west side of WILLIAMS CREEK 20.3 miles (12.3 miles of fastland)	FASTLAND: Low shore 73%, moderately low shore 19%, with bluff 8%. SHORE: Extensive marsh 56%, fringe marsh 34%, embayed marsh 10%. RIVER: Narrow.	FASTLAND: Agricultural 52%, governmental 28%, unmanaged, wooded 19%, residential 1%. SHORE: River access. RIVER: Sport fishing, boating, water sports.	Private and Federal.	No data.	Low, noncritical.	No beaches.	None.	Low. Possible development of campsites.
7 WILLIAMS CREEK to PAMUNKEY RIVER BRIDGE 35.4 miles (34.8 miles of fastland)	FASTLAND: Low shore 69%, with bluff 1%, moderately low shore 14%, with bluff 7%, moderately high shore 1%, with bluff 7%, high shore with bluff 1%. SHORE: Extensive marsh 48%, fringe marsh 43%, embayed marsh 9%. RIVER: Narrow.	FASTLAND: Agricultural 57%, unmanaged, wooded 42%, residential 1%. SHORE: Unused. RIVER: Some sport fishing, small craft boating.	Private.	No data.	Low, noncritical.	No beaches.	None.	Low.

TABLE 2. SHORELINE SITUATION REPORT SEGMENT SUMMARIES, KING AND QUEEN COUNTY

SUBSEGMENT	SHORELANDS TYPE	SHORELANDS USE	OWNERSHIP	FLOOD HAZARD	BEACH QUALITY	SHORE PROTECTIVE STRUCTURES	POTENTIAL USE ENHANCEMENT
1 POROPOTANK RIVER 12.7 miles (19.2 miles of fastland)	FASTLAND: Low shore 68%, moderately low shore 27%, moderately high shore 3%, high shore 2%. SHORE: Beach 3%, embayed marsh 95%, fringe marsh 2%. RIVER: Narrow, averages 6 feet in depth.	FASTLAND: Unmanaged, unwooded 6%, unmanaged, wooded 68%, agricultural 26%. SHORE: Waterfowl hunting. NEARSHORE: Sport fishing, boating, commercial fishing.	Private.	Low, noncritical, except at Roane, where it is moderate, critical.	No beaches.	Slight or no change.	Low, continuation of the present land use patterns probably is satisfactory. The extensive wetlands could not survive extensive use.
2 YORK RIVER to BROOKESHIRE 11.0 miles (21.8 miles of fastland)	FASTLAND: Entirely low shore. SHORE: Sand beach 25%, extensive marsh 52%, fringe marsh 22%, artificially stabilized 1%. NEARSHORE: Intermediate.	FASTLAND: Residential 3%, agricultural 8%, unmanaged, wooded 79%, governmental 10%. SHORE: Hunting, mostly unused. NEARSHORE: Sport fishing, boating, water sports, shellfishing.	Private and County (West Point Municipal Airport).	Low, noncritical, except for several houses at Belleview and 1 house SE of Roane triangulation, here it is moderate, critical.	Most beaches are narrow. There is one moderately wide beach between Goalders and Robinson Creeks.	Moderate from Goff Point to Belleview, slight or no change for rest. There are no endangered structures. Bulkheading and groins at Brookeshire seem effective.	Low, the wetlands should be preserved for fish and game habitats. Belleview and the area from Goff Point to Brookeshire might be suitable for more residences.
3 MATTAPONI RIVER: BROOKESHIRE to MELROSE LANDING 18.9 miles (22.7 miles of fastland)	FASTLAND: Low shore 89%, moderately low shore 7%, moderately high shore 4%. SHORE: Extensive marsh 60%, fringe marsh 26%, embayed marsh 14%. NEARSHORE: Narrow.	FASTLAND: Unmanaged, wooded 60%, agricultural 28%, residential 12%. SHORE: Mostly unused. NEARSHORE: Boating, sport and commercial fishing.	Private.	Slight to none.	No beaches.	There is no historical erosion rate for this area. Erosion is concentrated on the outside of the river bends. Specific locations could be protected by any of a number of methods.	Low.
4 MATTAPONI RIVER: MELROSE LANDING to RICKAHOCK 12.4 miles (16.5 miles of fastland)	FASTLAND: Low shore 62%, with bluff 6%, moderately low shore 20%, with bluff 12%. SHORE: Extensive marsh 55%, fringe marsh 45%. NEARSHORE: Narrow.	FASTLAND: Agricultural 42%, unmanaged, wooded 56%, residential 2%. SHORE: Mostly unused. NEARSHORE: Sport fishing, water sports.	Private.	Low, noncritical.	No beaches.	No erosion data, endangered structures, or shore protective structures. No action is necessary but if ever needed, areas could be protected by any of a number of methods.	Low.
5 MATTAPONI RIVER: RICKAHOCK to bridge at AYLETT (0.8 miles past map edge) 16.1 miles (15.1 miles of fastland)	FASTLAND: High shore with bluff 8%, moderately high shore 2%, with bluff 9%, moderately low shore 5%, with bluff 15%, low shore 61%. SHORE: Extensive marsh 14%, embayed marsh 8%, fringe marsh 78%. NEARSHORE: Narrow from Rickahock to 4,000 feet past Walkerton bridge; there becomes shallow, less than 10 feet deep.	FASTLAND: Residential 12%, agricultural 38%, unmanaged, wooded 49%, recreational 1%. SHORE: Little used. RIVER: Sport fishing, boating, water sports.	Private.	Low, noncritical.	No beaches.	No action is required at present. Virtually any specific area could be protected, if necessary by any of a number of measures.	Low.

PAMUNKEY RIVER, NEW KENT COUNTY, VIRGINIA

SEGMENT 1 (Maps 13, 14, and 15)

EXTENT: 54,912 feet (10.4 mi.) from Matadequin Creek to White House. The segment includes 64,416 feet (12.2 mi.) of fastland.

SHORELANDS TYPE
FASTLAND: Low shore 66% (8.1 mi.), low shore with bluff 5% (0.6 mi.), moderately low shore 23% (2.8 mi.), and moderately low shore with bluff 6% (0.7 mi.).
SHORE: Extensive marsh 61% (6.4 mi.), fringe marsh 34% (3.5 mi.), and embayed marsh 5% (0.5 mi.).
RIVER: Narrow. The controlling depths in this segment are 6 feet.

SHORELANDS USE
FASTLAND: Agricultural 72% (8.8 mi.), unmanaged, wooded 24% (2.9 mi.), and residential 4% (0.5 mi.).
SHORE: Hunting, fishing, and other water sports.
RIVER: Some sport fishing (bass, blue gill, pickerel) west of White House. The river depths allow navigation only by small boats.

WIND AND SEA EXPOSURE: The shoreline runs approximately NW - SE, having many meanders. Predominant fetches in this segment are at Putneys Mill, SE - 1.0 miles, and west of White House, NE - 1.1 miles.

OWNERSHIP: Private.

FLOOD HAZARD: Low, noncritical.

WATER QUALITY: No data available.

BEACH QUALITY: There are no beaches in this segment.

PRESENT SHORE EROSION SITUATION
EROSION RATE: No data available.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: None.

Suggested Action: None.

OTHER SHORE STRUCTURES: Public Landings.

POTENTIAL USE ENHANCEMENT: Low. The several marsh areas should be preserved due to their ecological values as wildlife habitats.

MAPS: USGS, 7.5 Min.Ser. (Topo.), KING WILLIAM Quadr., 1968.
USGS, 7.5 Min.Ser. (Topo.), NEW KENT Quadr., 1968.
USGS, 7.5 Min.Ser. (Topo.), QUINTON Quadr., 1965.
USGS, 7.5 Min.Ser. (Topo.), TUNSTALL Quadr., 1966.
C&GS, #496, 1:40,000 scale, PAMUNKEY AND MATTAPONI RIVERS, 1973.

PHOTOS: Aerial-VIMS 07Dec73 NK-2/24-29;
01Feb74 NK-2/85-89, 92, 93, 95-109, 114-116, 118-122, 124-127;
04Jun74 NK-2/384.

PAMUNKEY RIVER, NEW KENT COUNTY, VIRGINIA

SEGMENT 2 (Maps 13, 14, and 15)

EXTENT: 129,888 feet (24.6 mi.) of shoreline from White House to Mill Creek. The segment has 80,784 feet (15.3 mi.) of fastland.

SHORELANDS TYPE
FASTLAND: Low shore 31% (4.8 mi.), low shore with bluff 18% (2.7 mi.), moderately low shore 25% (3.9 mi.), moderately low shore with bluff 8% (1.2 mi.), moderately high shore 2% (0.3 mi.), and high shore with bluff 16% (2.4 mi.).
SHORE: Extensive marsh 68% (16.8 mi.), and fringe marsh 32% (7.8 mi.).
RIVER: Narrow. The river averages 12 feet in depth and 1,200 feet in width in this segment. The bottom is hard.

SHORELANDS USE
FASTLAND: Agricultural 50% (7.6 mi.), unmanaged, wooded 48% (7.4 mi.), and residential 2% (0.3 mi.).
SHORE: Some recreational use, but mostly unused.
RIVER: Sport fishing (rock, white perch, large mouth bass) and other water sports.

WIND AND SEA EXPOSURE: The shoreline runs NW - SE, having many wide and broad meanders. Predominant fetches are at 700 feet southwest of Morgan Landing, WNW - 1.7 miles; the marsh 1,200 feet north of the west side entrance to Cumberland Thorofare, W - 2.2 miles; 400 feet south of Walnut Triangulation, NE - 1.7 miles.

OWNERSHIP: Private.

FLOOD HAZARD: Low, noncritical. All houses in the segment are located at least at the 5-foot contour.

WATER QUALITY: No data available.

BEACH QUALITY: There are no beaches in this segment.

PRESENT SHORE EROSION SITUATION
EROSION RATE: No data available.
ENDANGERED STRUCTURES: One building at Morgan Landing is endangered.
SHORE PROTECTIVE STRUCTURES: None.

Suggested Action: None.

OTHER SHORE STRUCTURES: There are numerous piers and several boat ramps in the segment.

POTENTIAL USE ENHANCEMENT: Moderate. This segment has one section that could become a nice recreational camping spot. This is the peninsula of fastland located at Cumberland Thorofare. The river at Cumberland Thorofare is over 12 feet deep, and the Thorofare itself is of sufficient depth to allow passage of sport boats. Fishing around Cohoke Marsh is good, however, swimming could prove hazardous, since the river bottom drops off rapidly to 12 feet with 100 feet of shore. Elsewhere in the segment the low density residential/agricultural areas should continue. The marshes should be preserved in their natural state due to their ecological value.

MAPS: USGS, 7.5 Min.Ser. (Topo.), NEW KENT Quadr., 1965.
USGS, 7.5 Min.Ser. (Topo.), TUNSTALL Quadr., 1966.
C&GS, #496, 1:40,000 scale, PAMUNKEY AND MATTAPONI RIVERS, 1973.

PHOTOS: Aerial-VIMS 07Dec73 NK-2/24-27;
01Feb74 NK-2/85-89, 92, 93, 95-109, 114-116, 118-122, 124-127;
04Jun74 NK-2/284.

PAMUNKEY RIVER, NEW KENT COUNTY, VIRGINIA

SEGMENT 3 (Maps 4, 5, 10, and 11)

EXTENT: 96,624 feet (18.3 mi.) of shoreline from Mill Creek to Ferry Creek, including Mill Creek. The segment includes 106,656 feet (20.2 mi.) of fastland.

SHORELANDS TYPE
FASTLAND: Low shore 94% (18.9 mi.), moderately low shore 5% (1.1 mi.), and moderately low shore with bluff 1% (0.2 mi.).
SHORE: Extensive marsh 67% (12.2 mi.), fringe marsh 24% (4.5 mi.), and embayed marsh 9% (1.6 mi.).
RIVER: Narrow. The river reaches the 12-foot depth within 400 feet of the shore in most parts of the segment.

SHORELANDS USE
FASTLAND: Agricultural 53% (10.6 mi.), unmanaged, wooded 33% (6.7 mi.), and residential 14% (2.9 mi.).
SHORE: Waterfowl hunting in the marsh areas.
RIVER: In the West Point area, traffic consists mainly of vessels laden with pulpwood. The river is used also for water sports and sport fishing (spot, white perch, large mouth bass, bluegill, catfish, and rock). The West Point area is a closed shellfish area, according to the U.S. Army Corps of Engineers.

WIND AND SEA EXPOSURE: The shoreline trend is basically WNW - ESE with many wide and broad meanders. Predominant fetches are across from the west corner of Lee Marsh, NNE - 2.3 miles, across from the southern most tip of Sweet Hall Marsh, ENE - 1.6 miles, and at the tidal flat at the mouth of the Thorofare in Eltham Marsh, SSE - 4.9 miles.

OWNERSHIP: Private.

FLOOD HAZARD: Low, noncritical. All buildings are above the 7-foot contour.

WATER QUALITY: There is no data available for the Pamunkey River. The water quality for the West Point area has been determined unsatisfactory as of January, 1975.

BEACH QUALITY: There are no beaches in this segment.

PRESENT SHORE EROSION SITUATION
EROSION RATE: No data for the Pamunkey River. Slight or no change for the York River section of the segment (Eltham Bridge to Ferry Creek).
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: None.

Suggested Action: None.

OTHER SHORE STRUCTURES: Several piers and Eltham Bridge.

POTENTIAL USE ENHANCEMENT: Low. Hill and Eltham marshes are major wetlands and should be preserved.

MAPS: USGS, 7.5 Min.Ser. (Topo.), NEW KENT Quadr., 1965.
USGS, 7.5 Min.Ser. (Topo.), WEST POINT Quadr., 1965.
C&GS, #496, 1:40,000 scale, PAMUNKEY AND MATTAPONI RIVERS, 1973.
C&GS, #495, 1:40,000 scale, YORK RIVER, Yorktown to West Point, 1973.

PHOTOS: Aerial-VIMS 07Dec73 NK-3/23;
06Jun74 NK-3/363-383.

YORK RIVER, NEW KENT COUNTY, VIRGINIA

SEGMENT 4 (Maps 3 and 4)

EXTENT: 63,888 feet (12.1 mi.) of shoreline from Ferry Creek to Ware Creek. The segment includes 104,016 feet (19.7 mi.) of fastland.

SHORELANDS TYPE
FASTLAND: Low shore 32% (6.3 mi.), moderately low shore 47% (9.2 mi.), moderately high shore 10% (2.0 mi.), high shore 7% (1.4 mi.), and high shore with bluff 4% (0.8 mi.).
SHORE: Extensive marsh 40% (4.8 mi.), embayed marsh 43% (5.2 mi.), beach 10% (1.2 mi.), and fringe marsh 7% (0.9 mi.).
RIVER: The nearshore zone alternates from narrow to wide.

SHORELANDS USE
FASTLAND: Unmanaged, wooded 83% (16.3 mi.), agricultural 13% (2.5 mi.), and residential 4% (0.9 mi.).
SHORE: Hunting and other recreation.
RIVER: Commercial shipping to West Point.

WIND AND SEA EXPOSURE: The York River trends NW - SE in this segment. Fetches in the segment are at Terrapin Point, SE - 17.8 miles, NNW - 3.8 miles, NW - 5.4 miles; at Ferry Creek, SE - 5.6 miles, and at Ware Creek, ESE - 2.3 miles, N - 2.7 miles, and NE - 1.9 miles.

OWNERSHIP: Private.

FLOOD HAZARD: Low, noncritical except for one house at the mouth of Philbates Creek, where it is moderate, critical.

WATER QUALITY: Intermediate as of January 1975.

BEACH QUALITY: Fair to poor. Most beaches in the segment are thin patches in front of the houses north of Baker Creek.

PRESENT SHORE EROSION SITUATION
EROSION RATE: Slight or no change from Ferry Creek to just south of Baker Creek; moderate, noncritical (1.4 ft/yr.) from here to Ware Creek.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: None.

Suggested Action: None.

OTHER SHORE STRUCTURES: There are two boathouses at Philbates Creek and several piers.

POTENTIAL USE ENHANCEMENT: Moderate. Present use as an agricultural and low density residential area seems best. Recreational development is limited due to the fact that most beaches are located in front of private residences. The marshes should be preserved in their natural state.

MAPS: USGS, 7.5 Min.Ser. (Topo.), TOANO Quadr., 1965.
USGS, 7.5 Min.Ser. (Topo.), WEST POINT Quadr., 1965.
C&GS, #495, 1:40,000 scale, YORK RIVER, Yorktown to West Point, 1973.

PHOTOS: Aerial-VIMS 01Feb74 NK-4/1-22.

CHICKAHOMINY RIVER - DIASCUND CREEK,

NEW KENT COUNTY, VIRGINIA

SEGMENT 5 (Maps 16 and 17)

EXTENT: 94,512 feet (17.9 mi.) of shoreline from the dam north of Chickahominy Shores on the Chickahominy River to the headwaters of Diascund Creek almost at the pumping station on the Diascund Creek Reservoir.

SHORELANDS TYPE
FASTLAND: Low shore 80% (13.4 mi.), moderately low shore 8% (1.3 mi.), moderately low shore with bluff 1% (0.2 mi.), moderately high shore 3% (0.5 mi.), high shore 1% (0.2 mi.), and high shore with bluff 7% (1.1 mi.).
SHORE: Extensive marsh 32% (5.7 mi.), embayed marsh 22% (3.9 mi.), fringe marsh 44% (7.9 mi.), and artificially stabilized 2% (0.4 mi.).
RIVER: Narrow. The Chickahominy River has average depths of 6 feet in this segment. Diascund Creek is too shallow for measurement.

SHORELANDS USE
FASTLAND: Residential 20% (3.3 mi.), agricultural 11% (1.8 mi.), unmanaged, wooded 68% (11.4 mi.), and recreational 1% (0.2 mi.). The recreational usage is at Chickahominy Shores, where there is a marina on the east bank of the peninsula. Also, there is a camping area with a boatramp just southeast of the dam. There is another ramp further down river from Chickahominy River across from Wilcox Neck.
SHORE: Waterfowl hunting and recreational usage.
RIVER: There is a large amount of sport fishing on the Chickahominy (crappie, catfish, large mouth bass, white perch, etc.). Also, there is boating on the river, and some water sports areas, mainly around Chickahominy Shores.

WIND AND SEA EXPOSURE: The shoreline trends NW - SE, with many wide meanders.

OWNERSHIP: Private except for one public, county-owned boatramp taking about 20 feet of the shoreline.

FLOOD HAZARD: Low, noncritical except at the marina down river of Chickahominy Shores, where it is moderate, critical for one house.

WATER QUALITY: No data available.

BEACH QUALITY: Poor. Beaches generally are narrow and soft.

PRESENT SHORE EROSION SITUATION
EROSION RATE: No data available.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: Bulkheading on the west bank of the Chickahominy Shores peninsula, at the several marinas located at Chickahominy Shores and across from Wilcox Neck. Most of the structures are effective in retaining fill and guarding against boat wake erosion.

Suggested Action: None.

OTHER SHORE STRUCTURES: There are several boatramps and numerous piers.

POTENTIAL USE ENHANCEMENT: Low. Continuation of the present use of the segment as a sparcely populated area where an emphasis is on the enjoyment of its natural resources is preferred over any other commercial - residential development.

MAPS: USGS, 7.5 Min.Ser. (Topo.), WALKERS Quadr., 1965.

PHOTOS: Aerial-VIMS 01Feb74 NK-5/130-148.

MATTAPONI RIVER, KING WILLIAM COUNTY, VIRGINIA

SEGMENT 1 (Maps 8 and 9)

EXTENT: 79,200 feet (15.0 mi.) of shoreline from the bridge at Aylett to Horse Landing. The segment includes 70,224 feet (13.3 mi.) of fastland.

SHORELANDS TYPE
FASTLAND: Low shore 50% (6.6 mi.), moderately low shore 14% (1.9 mi.), moderately low shore with bluff 23% (3.0 mi.), moderately high shore 5% (0.7 mi.), and moderately high shore with bluff 8% (1.1 mi.).
SHORE: Fringe marsh 59% (8.9 mi.), extensive marsh 38% (5.7 mi.), and embayed marsh 3% (0.4 mi.).
RIVER: Narrow. At its headwaters, the Mattaponi River averages 6 feet in depth. At Walkerton, the river depth increases to 10-20 feet in places, which remains true to Horse Landing.

SHORELANDS USE
FASTLAND: Agricultural 52% (6.9 mi.), unmanaged, wooded 38% (5.0 mi.), and residential 10% (1.4 mi.).
SHORE: Little or no formal use, some hunting and fishing.
RIVER: Some sport fishing, boating, and other water sports. According to the U.S. Army Corps of Engineers, this is a closed shellfish area.

WIND AND SEA EXPOSURE: The shoreline trend meanders NW - SE for most of the segment. One 11,000 foot section near the headwaters trends NE - SW.

OWNERSHIP: Private.

FLOOD HAZARD: Low, noncritical. All houses are above the 5-foot contour.

WATER QUALITY: No data available.

BEACH QUALITY: There are no beaches in this segment.

PRESENT SHORE EROSION SITUATION
EROSION RATE: No data available.
ENDANGERED STRUCTURES: None. All of the houses in this segment are significantly into the fastland.
SHORE PROTECTIVE STRUCTURES: None.

Suggested Action: If the need developed, individual areas might be protected by any of a number of structures. The type of structure would depend upon local circumstances.

OTHER SHORE STRUCTURES: None.

POTENTIAL USE ENHANCEMENT: Low. The extensive marsh areas downstream from Roanes Wharf should be preserved as wildlife habitats. Other than for increased recreational use, camping, hunting, etc., the segment has little potential for a significantly enhanced use.

MAPS: USGS, 7.5 Min.Ser. (Topo.), AYLETT Quadr., 1968.
USGS, 7.5 Min.Ser. (Topo.), KING AND QUEEN COURT HOUSE Quadr., 1968.
USGS, 7.5 Min.Ser. (Topo.), KING WILLIAM Quadr., 1968.
C&GS, #496, 1:40,000 scale, PAMUNKEY AND MATTAPONI RIVERS, 1973.

PHOTOS: Aerial-VIMS 04Jun74 KW-1/291-301.

MATTAPONI RIVER, KING WILLIAM COUNTY, VIRGINIA

SEGMENT 2 (Maps 6, 7, and 8)

EXTENT: 76,032 feet (14.4 mi.) of shoreline from Horse Landing to the end of Gleason Marsh. The segment has 74,976 feet (14.2 mi.) of fastland.

SHORELANDS TYPE
FASTLAND: Low shore 61% (8.7 mi.), low shore with bluff 8% (1.1 mi.), moderately low shore 1% (0.2 mi.), moderately low shore with bluff 15% (2.1 mi.), moderately high shore with bluff 6% (0.9 mi.), and high shore 8% (1.2 mi.).
SHORE: Extensive marsh 66% (9.5 mi.) and fringe marsh 34% (4.9 mi.).
RIVER: Narrow.

SHORELANDS USE
FASTLAND: Unmanaged, wooded 85% (12.1 mi.), agricultural 6% (0.9 mi.), residential 5% (0.7 mi.), and governmental (Mattaponi Indian Reservation) 4% (0.5 mi.).
SHORE: Little or no formal use.
RIVER: Some sport fishing, boating, and other water sports. According to the U.S. Army Corps of Engineers, this is a closed shellfish area.

WIND AND SEA EXPOSURE: The shoreline trend meanders NW - SE. Fetches at Oak triangulation are WSW - 1.5 miles, just south of the Mattaponi Indian Reservation, SSW - 1.3 miles, and at Lum triangulation, W - 2.3 miles.

OWNERSHIP: Private and Federal (the Mattaponi Indian Reservation).

FLOOD HAZARD: Low, noncritical for most of the segment. One house between the Mattaponi Indian Reservation and Wakema is below 5 feet. Here, the flood hazard is moderate, critical. The rest of the houses in the segment are above the 5-foot contour.

WATER QUALITY: No data available.

BEACH QUALITY: There are no beaches in this segment.

PRESENT SHORE EROSION SITUATION
EROSION RATE: No data available.
ENDANGERED STRUCTURES: None.

SHORE PROTECTIVE STRUCTURES: None.

Suggested Action: None.

OTHER SHORE STRUCTURES: None.

POTENTIAL USE ENHANCEMENT: Low. The extensive marsh areas are valuable wildlife areas and should be maintained in an undistrubed state. There appears to be little potential for alternate uses other than low density, individual, recreational uses.

MAPS: USGS, 7.5 Min.Ser. (Topo.), KING AND QUEEN COURT HOUSE Quadr., 1968.
USGS, 7.5 Min.Ser. (Topo.), TRUHART Quadr., 1968.
C&GS, #496, 1:40,000 scale, PAMUNKEY AND MATTAPONI RIVERS, 1973.

PHOTOS: Aerial-VIMS 04Jun74 KW-2/302-362.

MATTAPONI RIVER, KING WILLIAM COUNTY, VIRGINIA

SEGMENT 3 (Maps 5 and 6)

EXTENT: 45,408 feet (8.6 mi.) of shoreline from Gleason Marsh to the West Point Corporate Limits. The segment includes 60,720 feet (11.5 mi.) of fastland.

SHORELANDS TYPE
FASTLAND: Low shore 86% (9.9 mi.) and moderately low shore 14% (1.6 mi.).
SHORE: Extensive marsh 58% (5.0 mi.) and fringe marsh 42% (3.6 mi.).
RIVER: Narrow.

SHORELANDS USE
FASTLAND: Unmanaged, wooded 70% (8.0 mi.), agricultural 25% (2.9 mi.), and residential 5% (0.6 mi.).
SHORE: Mostly unused.
RIVER: Some sport fishing, boating, and water sports. According to the U.S. Army Corps of Engineers, it is a closed shellfish area.

WIND AND SEA EXPOSURE: The shoreline trend meanders NW - SE. Fetches to 3,400 feet SW of the segment start are ESE - 1.1 miles; across the Mattaponi River from Ken triangulation, WSW - 1.1 miles; to the creek at the residential section at the end of Route 645, ENE - 1.1 miles; to the West Point Corporate Limits, NE - 1.0 miles.

OWNERSHIP: Private.

FLOOD HAZARD: Low, noncritical.

WATER QUALITY: No data available.

BEACH QUALITY: There are no beaches in this segment.

PRESENT SHORE EROSION SITUATION
EROSION RATE: No data available.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: None.

Suggested Action: None.

OTHER SHORE STRUCTURES: None.

POTENTIAL USE ENHANCEMENT: Low. At present there is little pressure to develop the area. As with most of the Mattaponi River shore, the marshes should be preserved as valuable natural resources.

MAPS: USGS, 7.5 Min.Ser. (Topo.), TRUHART Quadr., 1968.
USGS, 7.5 Min.Ser. (Topo.), WEST POINT Quadr., 1965.
C&GS, #496, 1:40,000 scale, PAMUNKEY AND MATTAPONI RIVERS, 1973.

PHOTOS: Aerial-VIMS 04Jun74 KW-3/363-383.

WEST POINT, KING WILLIAM COUNTY, VIRGINIA

SEGMENT 4 (Maps 4 and 5)

EXTENT: 45,408 feet (8.6 mi.) of shoreline, 61,248 feet (11.6 mi.) of fastland extending from across Muddy Point to Herrick Creek.

SHORELANDS TYPE
FASTLAND: Low shore 88% (10.2 mi.), and moderately low shore with bluff 12% (1.4 mi.).
SHORE: Extensive marsh 46% (4.0 mi.), fringe marsh 41% (3.5 mi.), and artificially stabilized 13% (1.1 mi.).
RIVER: Narrow.

SHORELANDS USE
FASTLAND: Residential 52% (6.0 mi.), agricultural 20% (2.3 mi.), commercial 20% (2.4 mi.), and industrial 8% (0.9 mi.).
SHORE: Dockage, access to boats, etc.
RIVER: Sport fishing, boating, water sports, and extensive pulpwood shipping. According to the U.S. Army Corps of Engineers "Chesapeake Bay" study, the area is a closed shellfish area.

WIND AND SEA EXPOSURE: The shoreline trend on the Mattaponi meanders NW - SSE; on the Pamunkey, NW - SE. Fetches at the tip of the West Point peninsula are SE - 6.6 miles, SSW - 2.2 miles. Fetches at the east point of the West Point peninsula face are S - 2.5 miles. Fetches at the marsh northeast of Glass Island are SSW - 3.6 miles. On the Mattaponi, fetches at 800 feet southeast of West Point Corporate Limits are NNE - 1.2 miles. The fetches at Rail triangulation, west of Port Richmond, are SSE - 5.1 miles.

OWNERSHIP: Private.

FLOOD HAZARD: Low, noncritical, except for moderate, critical at some of the houses and storage facilities on the West Point shoreline.

WATER QUALITY: The York River water quality is unsatisfactory for the West Point area. There is no data on the Mattaponi and Pamunkey River water quality.

BEACH QUALITY: Poor. There is one narrow beach on west of the bulkheading at West Point.

PRESENT SHORE EROSION SITUATION
EROSION RATE: No data except from Lord Delaware Bridge to the bulkheading, where, historically, it has been accreting at a rate of 1.3 feet per year. From Eltham Bridge to the bulkheading, the erosion rate is slight or no change (0.8 ft/yr. historically).
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: There is bulkheading along the section of the West Point peninsula facing the York River. Also, there is some riprapping in this section of West Point. Both bulkheading and riprapping seem to be effective.

Suggested Action: None.

OTHER SHORE STRUCTURES: There are ten to fifteen piers along the segment's shores.

POTENTIAL USE ENHANCEMENT: Low. The committed industrial use virtually precludes any other usage.

MAPS: USGS, 7.5 Min.Ser. (Topo.), WEST POINT Quadr., 1965.
C&GS, #496, 1:40,000 scale, PAMUNKEY AND MATTAPONI RIVERS, 1973.

PHOTOS: Aerial-VIMS 07Dec73 KW-4/28-46.
01Feb74 KW-4/90, 92, 93, 94.

PAMUNKEY RIVER, KING WILLIAM COUNTY, VIRGINIA

SEGMENT 5 (Maps 10 and 11)

EXTENT: 85,536 feet (16.2 mi.) of shoreline from Herrick Creek to Sweet Hall Landing. The segment has 51,216 feet (9.7 mi.) of fastland.

SHORELANDS TYPE
FASTLAND: Low shore 66% (6.4 mi.), moderately low shore 2% (0.2 mi.), moderately low shore with bluff 6% (0.6 mi.), moderately high shore with bluff 2% (0.2 mi.), and high shore with bluff 24% (2.3 mi.).
SHORE: Extensive marsh 67% (10.9 mi.), fringe marsh 26% (4.2 mi.), and embayed marsh 7% (1.1 mi.).
RIVER: Narrow. The river averages 1,400 feet wide, and is at least 12 feet deep throughout the segment.

SHORELANDS USE
FASTLAND: Unmanaged, wooded 78% (7.6 mi.) and agricultural 22% (2.1 mi.).
SHORE: No specific use.
RIVER: Sport fishing (bass and perch fishing in the marsh, rock and bluegill in parts of the river), boating, and water sports.

WIND AND SEA EXPOSURE: The Pamunkey River in this segment generally trends WNW - ESE, with very wide and broad meanders. Predominant fetches are at Romancoke, SSW - 2.5 miles, and Sweet Hall Landing, S - 1.5 miles.

OWNERSHIP: Private.

FLOOD HAZARD: Low, noncritical.

WATER QUALITY: No data available.

BEACH QUALITY: There are no beaches in this segment.

PRESENT SHORE EROSION SITUATION
EROSION RATE: No data available. Erosion is concentrated on the outside of the meanders.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: None.

Suggested Action: None, due to the economical feasibility. However, the local areas of

erosion could be controlled through any number of methods if ever required.

OTHER SHORE STRUCTURES: There are piers and several boatramps in the segment.

POTENTIAL USE ENHANCEMENT: Low. The two very large marshes, Lee Marsh and Sweet Hall Marsh should be preserved as valuable wetlands.

MAPS: USGS, 7.5 Min.Ser. (Topo.), NEW KENT Quadr., 1965.
USGS, 7.5 Min.Ser. (Topo.), WEST POINT Quadr., 1965.
C&GS, #496, 1:40,000 scale, PAMUNKEY AND MATTAPONI RIVERS, 1973.

PHOTOS: Aerial-VIMS 01Feb74 KW-5/95, 97, 100-012, 106, 107.

PAMUNKEY RIVER, KING WILLIAM COUNTY, VIRGINIA

SEGMENT 6 (Maps 11, 12, and 13)

EXTENT: 107,184 feet (20.3 mi.) of shoreline from Sweet Hall Landing to the west side of Williams Creek. The segment has 64,944 feet (12.3 mi.) of fastland.

SHORELANDS TYPE
FASTLAND: Low shore 73% (9.0 mi.), moderately low shore 19% (2.3 mi.), and moderately low shore with bluff 8% (1.0 mi.).
SHORE: Extensive marsh 56% (11.4 mi.), fringe marsh 34% (6.9 mi.), and embayed marsh 10% (2.0 mi.).
RIVER: Narrow. The Pamunkey River averages at least 12 feet in depth to the southern part of the Pamunkey Indian Reservation. From there to Williams Creek the average depth is 10 feet. There are depths in this segment of up to 58 feet.

SHORELANDS USE
FASTLAND: Agricultural 52% (6.4 mi.), governmental (Pamunkey Indian Reservation) 28% (3.4 mi.), unmanaged, wooded 19% (2.3 mi.), and residential 1% (0.2 mi.).
SHORE: River access.
RIVER: Sport fishing in the Colcke Marsh area, some sport boating and water sports.

WIND AND SEA EXPOSURE: The Pamunkey River generally trends WNW - ESE, with wide and broad meanders in this segment. Representative fetches are at Resident triangulation, SW - 1.8 miles, and at Brickhouse Landing, ENE - 1.4 miles.

OWNERSHIP: Private, except for the Pamunkey Indian Reservation, which is federally owned.

FLOOD HAZARD: Low, noncritical. All houses are above the 5-foot contour, most are above the 10-foot contour.

WATER QUALITY: No data available.

BEACH QUALITY: There are no beaches in this segment.

PRESENT SHORE EROSION SITUATION
EROSION RATE: No data available.
ENDANGERED STRUCTURES: None.

SHORE PROTECTIVE STRUCTURES: None.

Suggested Action: None.

OTHER SHORE STRUCTURES: There are numerous piers, and 1 boatramp at Lester Manor.

POTENTIAL USE ENHANCEMENT: Low, except for the possible development of camp areas in one or two locations.

MAPS: USGS, 7.5 Min.Ser. (Topo.), NEW KENT Quadr., 1965.
C&GS, #496, 1:40,000 scale, PAMUNKEY AND MATTAPONI RIVERS, 1973.

PHOTOS: Aerial-VIMS 01Feb74 KW-6/109-114, 117-119, 122, 123, 126-129.

PAMUNKEY RIVER, KING WILLIAM COUNTY, VIRGINIA

SEGMENT 7 (Maps 13, 14, and 15)

EXTENT: 186,912 feet (35.4 mi.) of shoreline from Williams Creek to the Pamunkey River Bridge. The segment includes 173,184 feet (32.8 mi.) of fastland.

SHORELANDS TYPE
FASTLAND: Low shore 69% (22.6 mi.), low shore with bluff 1% (0.4 mi.), moderately low shore 14% (4.5 mi.), moderately low shore with bluff 7% (2.4 mi.), moderately high shore 1% (0.2 mi.), moderately high shore with bluff 7% (2.3 mi.), and high shore with bluff 1% (0.4 mi.).
SHORE: Extensive marsh 48% (16.9 mi.), fringe marsh 43% (15.4 mi.), and embayed marsh 9% (3.1 mi.).
RIVER: Narrow. Controlling depths in this segment are 6 feet almost to Piping Tree Ferry.

SHORELANDS USE
FASTLAND: Agricultural 57% (18.9 mi.), unmanaged, wooded 42% (13.7 mi.), and residential 1% (0.2 mi.).
SHORE: Unused.
RIVER: Some sport fishing (bass, bluegill, pickerel) west of the Pamunkey Indian Reservation. The river is deep enough in this segment to allow travel by small boats only. Above Retreat, the river is covered with debris and snags.

WIND AND SEA EXPOSURE: The shoreline runs approximately NW - SE, with many meanders. Representative fetches are at the point southeast of Liberty Hall, SE - 1.6 miles and the marsh in front of Old Town Creek, SW - 1.4 miles.

OWNERSHIP: Private.

FLOOD HAZARD: Low, noncritical.

WATER QUALITY: No data available.

BEACH QUALITY: There are no beaches in this segment.

PRESENT SHORE EROSION SITUATION
EROSION RATE: No data available.

ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: None.

Suggested Action: None.

OTHER SHORE STRUCTURES: Numerous landings.

POTENTIAL USE ENHANCEMENT: Low.

MAPS: USGS, 7.5 Min.Ser. (Topo.), KING WILLIAM Quadr., 1968.
USGS, 7.5 Min.Ser. (Topo.), MANQUIN Quadr., 1968.
USGS, 7.5 Min.Ser. (Topo.), NEW KENT Quadr., 1965.
USGS, 7.5 Min.Ser. (Topo.), TUNSTALL Quadr., 1966.
C&GS, #496, 1:40,000 scale, PAMUNKEY AND MATTAPONI RIVERS, 1973.

PHOTOS: Aerial-VIMS 04Jun74 KW-7/387-389.

POROPOTANK RIVER, KING AND QUEEN COUNTY, VIRGINIA

SEGMENT 1 (Maps 2 and 3)

EXTENT: 67,056 feet (12.7 mi.) of shoreline along Poropotank River. The segment has 101,376 feet (19.2 mi.) of fastland.

SHORELANDS TYPE
FASTLAND: Low shore 68% (13.1 mi.), moderately low shore 27% (5.1 mi.), moderately high shore 3% (0.6 mi.), and high shore 2% (0.4 mi.).
SHORE: The shore zone is mainly embayed marsh 95% (12.1 mi.). The rest of the segment is beach 3% (0.4 mi.) and fringe marsh 2% (0.2 mi.).
RIVER: Narrow (400 ft.), the Poropotank River averages 6 feet in depth, though near its mouth it has a depth of 13 feet and at Partridge Landing it has a depth of 11 feet. Channel entrance is marked with buoys.

SHORELANDS USE
FASTLAND: Unmanaged, wooded 68% (13.2 mi.), agricultural 26% (4.9 mi.), and unmanaged, unwooded 6% (1.1 mi.).
SHORE: Waterfowl hunting.
RIVER: Sport fishing, sport boating and commercial fishing is found on the Poropotank. According to U.S. Army Corps of Engineers "Chesapeake Bay" study, this is a closed shellfish area (Plate C-V1-15).

WIND AND SEA EXPOSURE: The shoreline trend meanders from NNE - SW.

OWNERSHIP: Private.

FLOOD HAZARD: Low, noncritical, except at Roane, where it is moderate, critical.

WATER QUALITY: Intermediate.

BEACH QUALITY: There are no beaches in this segment.

PRESENT SHORE EROSION SITUATION
EROSION RATE: Slight or no change.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: None.

Suggested Action: None.

OTHER SHORE STRUCTURES: There are a few small piers.

POTENTIAL USE ENHANCEMENT: Low. The area is wooded and very rural. The extensive wetlands along the Poropotank River would be severely damaged by any major use change.

MAPS: USGS, 7.5 Min.Ser. (Topo.), GRESSIT Quadr., 1965, photorevised 1973.
C&GS, #495, 1:40,000 scale, YORK RIVER, Yorktown to West Point, 1973.

PHOTOS: Slides coincident with Gloucester County.
Aerial-VIMS 07Dec73 KQ-1/76-84.

Ground - 06Nov73 GL-1A/25G-27G.

YORK RIVER, KING AND QUEEN COUNTY, VIRGINIA

SEGMENT 2 (Maps 3 and 4)

EXTENT: 58,080 feet (11.0 mi.) of shoreline from the mouth of Poropotank Bay to Brookeshire. The segment includes 115,104 feet (21.8 mi.) of fastland.

SHORELANDS TYPE
FASTLAND: Entirely low shore.
SHORE: Extensive marsh 52% (5.7 mi.), sand beach 25% (2.8 mi.), fringe marsh 22% (2.4 mi.), and artificially stabilized 1% (0.1 mi.).
NEARSHORE: The York River is intermediate in width in this segment. The bottom is hard and covered with oysters and oyster shells.

SHORELANDS USE
FASTLAND: Unmanaged, wooded 79% (17.3 mi.), government, including the West Point Municipal Airport, 10% (2.2 mi.), agricultural 8% (1.7 mi.), and residential 3% (0.6 mi.).
SHORE: Hunting, other than this the shore has very little use.
NEARSHORE: Sport fishing, boating, water sports, and shellfishing.

WIND AND SEA EXPOSURE: The shoreline trend is NW - SE. Fetches at Goff Point are NW - 2.3 miles, NNW - 1.9 miles, W - 1.4 miles, and SSE - 2.0 miles. Fetches at Belleview are WNW - 4.3 miles, W - 1.5 miles, and S - 3.4 miles. Fetches at the point south of Roane are W - 2.2 miles, SW - 1.6 miles, and SSE - 3.8 miles.

OWNERSHIP: Private, except for West Point Municipal Airport, which is county owned.

FLOOD HAZARD: Low, noncritical for most of the subsegment. The flood hazard is moderate, critical for several houses at Belleview and one house southeast of Roane 2 triangulation which are below the 5-foot contour.

WATER QUALITY: Intermediate.

BEACH QUALITY: Fair to poor. Most beaches in the segment are narrow. There is one moderately wide beach between Goalders Creek and Robinson Creek.

PRESENT SHORE EROSION SITUATION
EROSION RATE: Moderate, noncritical from Goff Point to Belleview. The historical erosion rate indicates a loss in this area of 1.1 to 1.6 feet per year. Slight or no change for the rest of the segment.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: There is several hundred feet of bulkheading with groins at Brookeshire that appears to be effective.

Suggested Action: None.

OTHER SHORE STRUCTURES: There are 8 piers in the segment. There are 4 at Brookeshire and 4 between Belleview and Roane 2 triangulation.

POTENTIAL USE ENHANCEMENT: Low, except for the areas near Belleview and between Goff Point and Brookeshire. These areas might be used for more residential or seasonal homes. The marsh areas should be protected as fish and game habitats.

MAPS: USGS, 7.5 Min.Ser. (Topo.), GRESSIT Quadr., 1965, photorevised 1973.
USGS, 7.5 Min.Ser. (Topo.), TOANO Quadr., 1965.
USGS, 7.5 Min.Ser. (Topo.), WEST POINT Quadr., 1965.
C&GS, #496, 1:40,000 scale, PAMUNKEY AND MATTAPONI RIVERS, 1973.

PHOTOS: Aerial-VIMS 07Dec KQ-2/44-75.

MATTAPONI RIVER, KING AND QUEEN COUNTY, VIRGINIA

SEGMENT 3 (Maps 4, 5, and 6)

EXTENT: 99,792 feet (18.9 mi.) of shoreline from Brookeshire to Melrose Landing. The segment includes 119,856 feet (22.7 mi.) of fastland.

SHORELANDS TYPE
FASTLAND: Low shore 89% (20.0 mi.), moderately low shore 7% (1.6 mi.), and high shore 4% (2.8 mi.).
SHORE: Extensive marsh 60% (11.3 mi.), fringe marsh 26% (4.8 mi.), and embayed marsh 14% (2.8 mi.).
NEARSHORE: The Mattaponi River is narrow, with a soft bottom from Brookeshire to Water Fence Landing, the rest has a hard bottom.

SHORELANDS USE
FASTLAND: Unmanaged, wooded 60% (13.5 mi.), agricultural 28% (6.4 mi.), and residential 12% (2.8 mi.).
SHORE: Little or no formal use.
NEARSHORE: Boating and sport and commercial fishing.

WIND AND SEA EXPOSURE: The shoreline trend meanders NW - SSE. Fetches at Brookeshire are SW - 2.5 miles, WSW - 1.5 miles, and NW - 1.1 miles. Fetches at the mouth of Burnt Mill Creek are SW - 1.7 miles and NW - 1.5 miles. Fetches at Ryefield Landing are SW - 1.2 miles and W - 1.3 miles.

OWNERSHIP: Private.

FLOOD HAZARD: Low, noncritical.

WATER QUALITY: No data.

BEACH QUALITY: There are no beaches in this segment.

PRESENT SHORE EROSION SITUATION
EROSION RATE: No data available.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: None.

Suggested Action: Erosion is concentrated on the outside of the river bends. Any of several structures, depending on the site specifics, might be used to slow erosion in selected areas.

OTHER SHORE STRUCTURES: None.

POTENTIAL USE ENHANCEMENT: Low. There is little pressure to develop the area. The marshes should be preserved.

MAPS: USGS, 7.5 Min.Ser. (Topo.), TRUHART Quadr., 1968.
USGS, 7.5 Min.Ser. (Topo.), WEST POINT Quadr., 1965.
C&GS, #496, 1:40,000 scale, PAMUNKEY AND MATTAPONI RIVERS, 1973.

PHOTOS: Aerial-VIMS 04Nov74 KQ-3/149-199.

MATTAPONI RIVER, KING AND QUEEN COUNTY, VIRGINIA

SEGMENT 4 (Maps 6, 7, and 8)

EXTENT: 65,472 feet (12.4 mi.) of shoreline from Melrose Landing to Rickahock. The segment includes 87,120 feet (16.5 mi.) of fastland.

SHORELANDS TYPE
FASTLAND: Low shore 62% (10.3 mi.), low shore with bluff 6% (1.2 mi.), moderately low shore 20% (3.3 mi.), and moderately low shore with bluff 12% (1.9 mi.).
SHORE: Extensive marsh 55% (6.8 mi.) and fringe marsh 45% (5.6 mi.).
NEARSHORE: The Mattaponi River is narrow in this segment.

SHORELANDS USE
FASTLAND: Unmanaged, wooded 56% (9.3 mi.), agricultural 42% (6.9 mi.), and residential 2% (0.3 mi.).
SHORE: Little or no formal use.
NEARSHORE: Sport fishing and water sports.

WIND AND SEA EXPOSURE: The shoreline trend meanders from NW - SE. The fetch at Melrose Landing is NW - 2.2 miles. The fetch at Courthouse Landing is WSW - 1.3 miles. Other fetches are interrupted by marsh islands in the river.

OWNERSHIP: Private.

FLOOD HAZARD: Low, noncritical.

WATER QUALITY: No data available.

BEACH QUALITY: There are no beaches in this segment.

PRESENT SHORE EROSION SITUATION
EROSION RATE: No data available.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: None.

Suggested Action: Erosion is concentrated at the outside corner of river bends. No erosion control action appears necessary, but if any should become necessary, site specific analysis should be employed to determine the most effective shore defense structure.

OTHER SHORE STRUCTURES: None.

POTENTIAL USE ENHANCEMENT: Low.

MAPS: USGS, 7.5 Min.Ser. (Topo.), KING AND QUEEN COURT HOUSE Quadr., 1968.
USGS, 7.5 Min.Ser. (Topo.), TRUHART Quadr., 1968.
C&GS, #496, 1:40,000 scale, PAMUNKEY AND MATTAPONI RIVERS, 1973.

PHOTOS: Aerial-VIMS 11Apr74 KQ-4/200-250;
04Jun74 KQ-4/251-267.

MATTAPONI RIVER, KING AND QUEEN COUNTY, VIRGINIA

SEGMENT 5 (Maps 8 and 9)

EXTENT: 85,008 feet (16.1 mi.) of shoreline from Rickahock to the bridge at Aylett. The segment has 79,728 feet (15.1 mi.) of fastland.

SHORELANDS TYPE
FASTLAND: Low shore 61% (9.3 mi.), moderately low shore 5% (0.7 mi.), moderately low shore with bluff 15% (2.2 mi.), moderately high shore 2% (0.3 mi.), moderately high shore with bluff 9% (1.4 mi.), and high shore with bluff 8% (1.2 mi.).
SHORE: Fringe marsh 78% (12.5 mi.), extensive marsh 14% (2.3 mi.), and embayed marsh 8% (1.3 mi.).
RIVER: Narrow, with depths ranging from 6 to 23 feet from Rickahock to the bridge at Walkerton, and depths averaging 6 feet past Walkerton Bridge. The bottom between Rickahock and Locust Grove is soft.

SHORELANDS USE
FASTLAND: Unmanaged, wooded 49% (7.3 mi.), agricultural 38% (5.8 mi.), residential 12% (1.8 mi.), and recreational 1% (0.2 mi.).
SHORE: Little or no formal use.
RIVER: Some sport fishing, boating, and other water sports. According to the Army Corps of Engineers, this is a closed shellfish area.

WIND AND SEA EXPOSURE: The shoreline trend is NW - SE for most of the segment, with the headwaters of the Mattaponi having a shoreline trend of first NW - SE, then NE - SW.

OWNERSHIP: Private.

FLOOD HAZARD: Low, noncritical.

WATER QUALITY: No data available.

BEACH QUALITY: There are no beaches in this segment.

PRESENT SHORE EROSION SITUATION
EROSION RATE: No data available.
ENDANGERED STRUCTURES: None. All of the houses in this segment are above the 5-foot contour.
SHORE PROTECTIVE STRUCTURES: None.

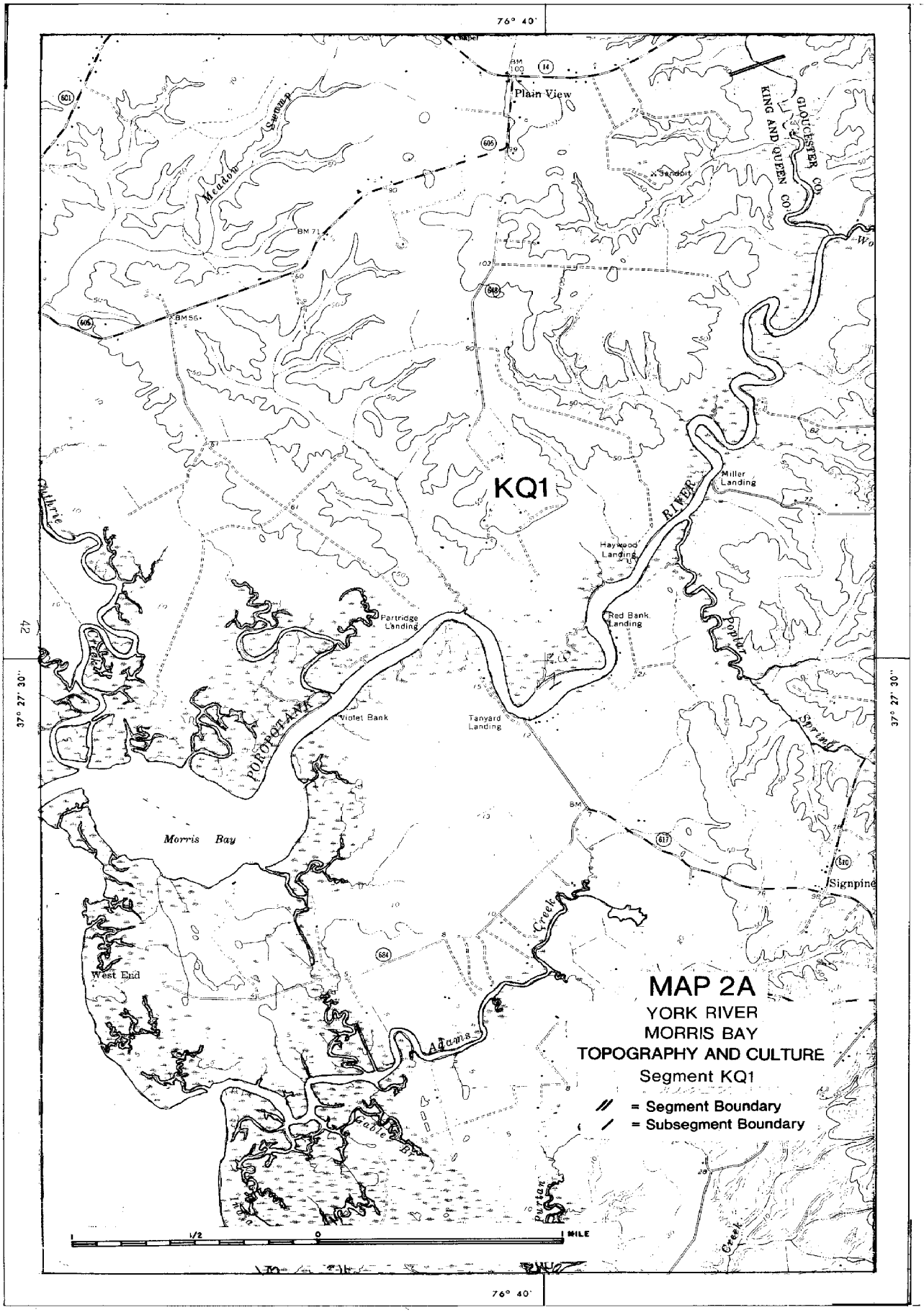
Suggested Action: There appears to be little need for shore protective structures. Future development might generate needs for local defense mechanisms.

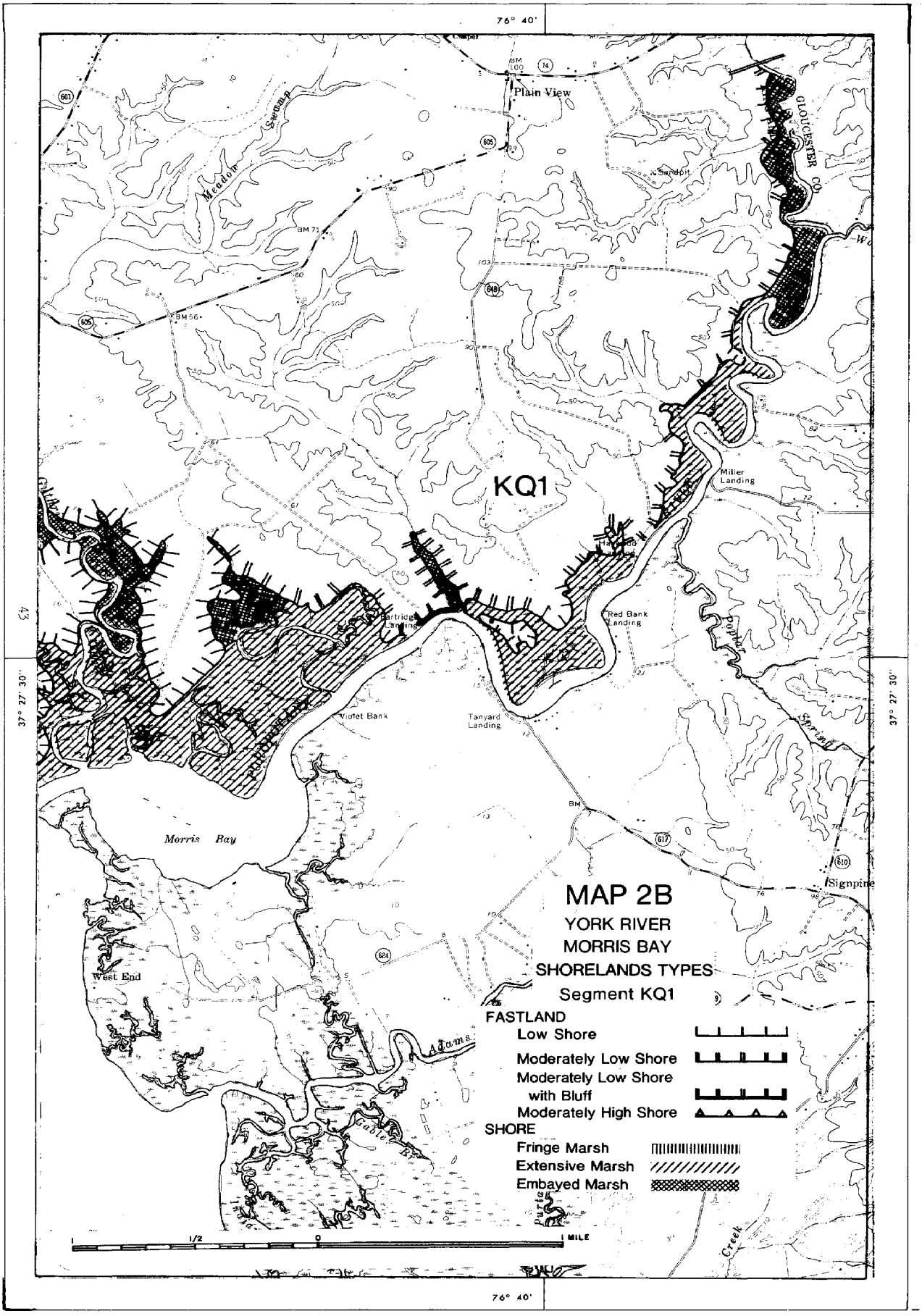
OTHER SHORE STRUCTURES: None.

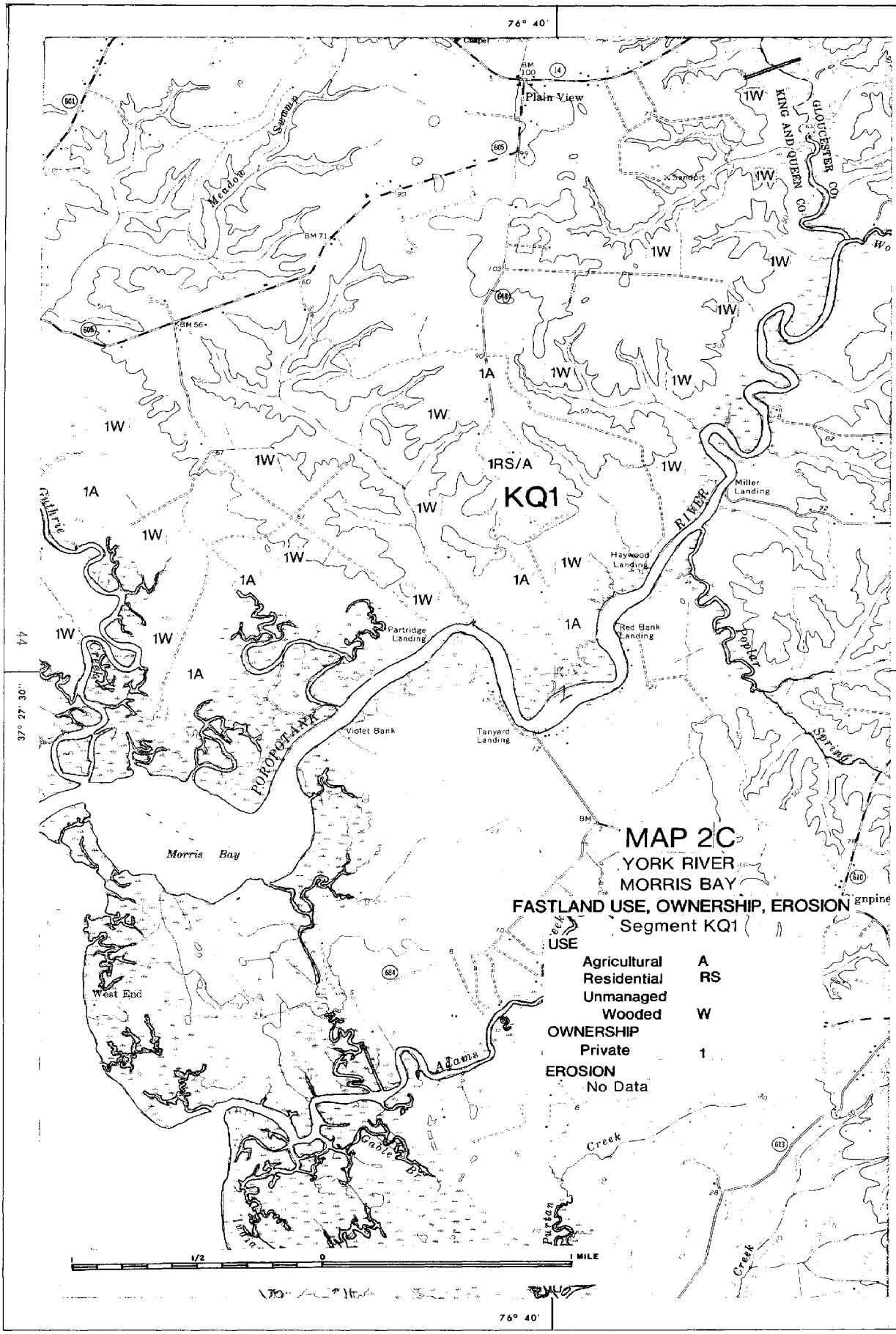
POTENTIAL USE ENHANCEMENT: Low.

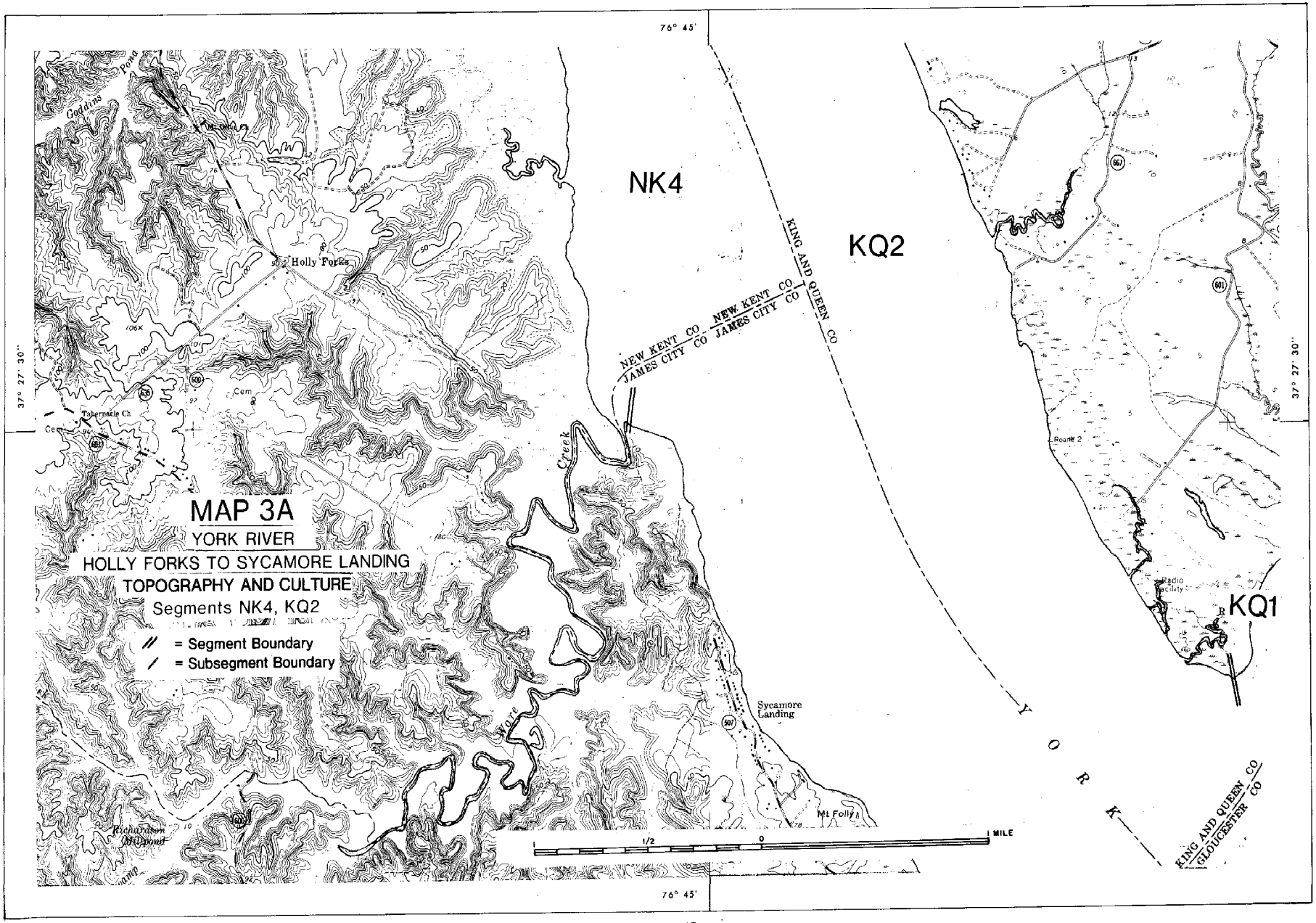
MAPS: USGS, 7.5 Min.Ser. (Topo.), AYLETT Quadr., 1968.
USGS, 7.5 Min.Ser. (Topo.), KING AND QUEEN COURT HOUSE Quadr., 1968.
USGS, 7.5 Min.Ser. (Topo.), KING WILLIAM Quadr., 1968.
C&GS, #496, 1:40,000 scale, PAMUNKEY AND MATTAPONI RIVERS, 1973.

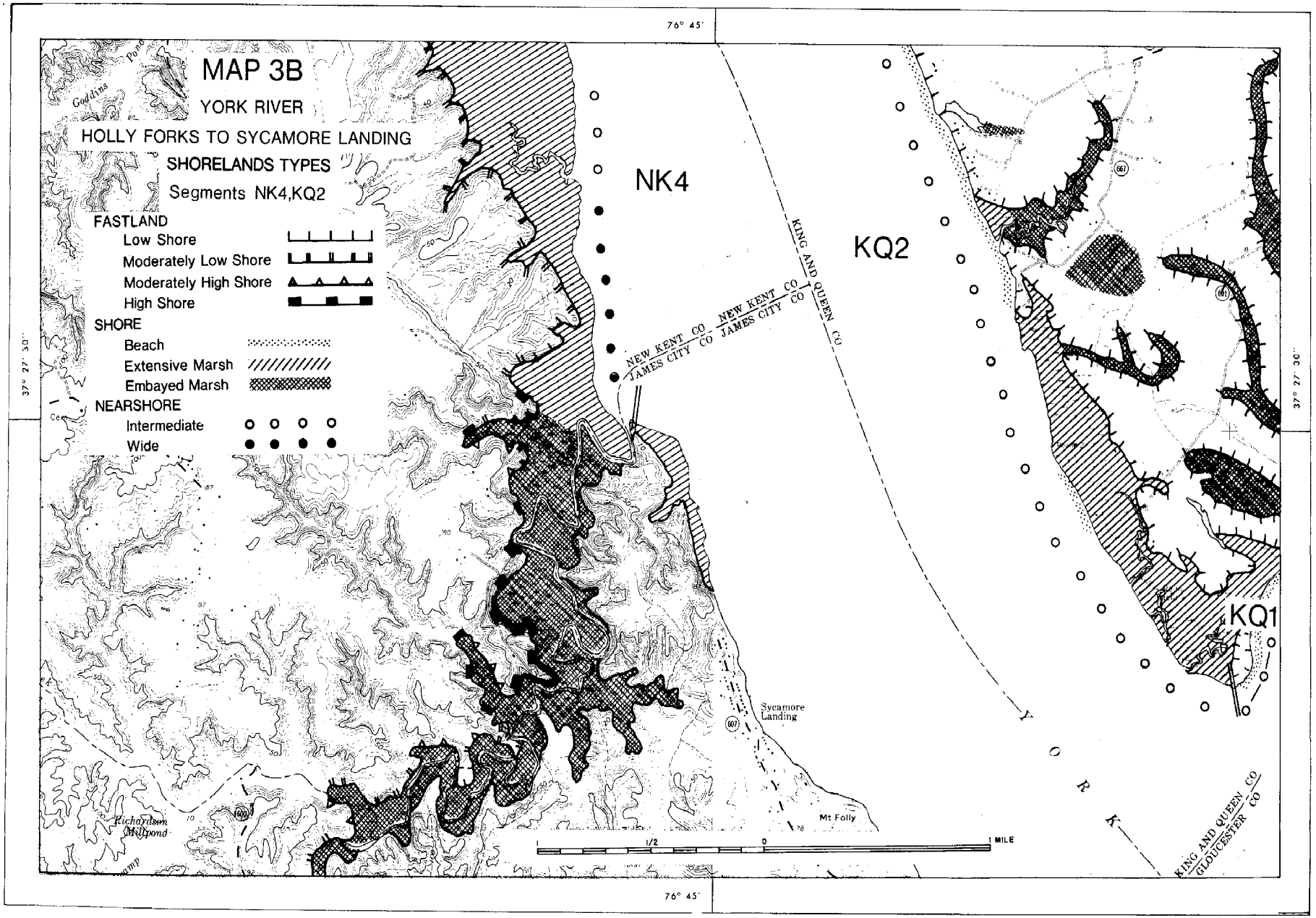
PHOTOS: Aerial-VIMS 04Jun74 KQ-5/268-290.

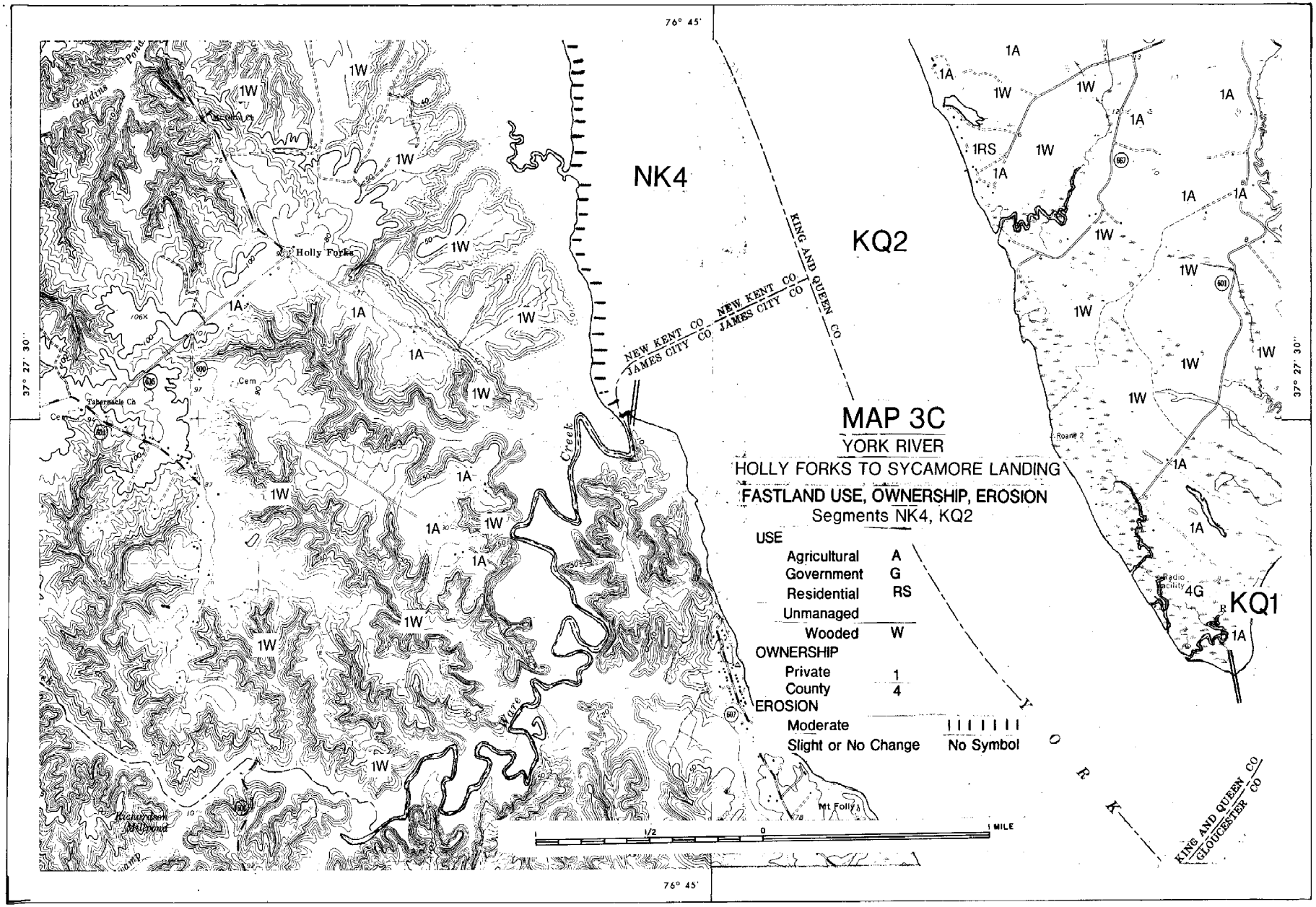

76° 40'
37° 27' 30"
42
Plain View
KING AND QUEEN CO.
GLOUCESTER CO.
Meadow
Swamp
BM 71
BM 56
KQ1
RIVER
Miller Landing
Haywood Landing
Red Bank Landing
Partridge Landing
Violet Bank
Tanyard Landing
POROPOTANK
Poplar
Spring
Morris Bay
Signpine
West End
Adams
Creek
Purtan
MAP 2A
YORK RIVER
MORRIS BAY
TOPOGRAPHY AND CULTURE
Segment KQ1
= Segment Boundary
= Subsegment Boundary
1/2
0
1 MILE

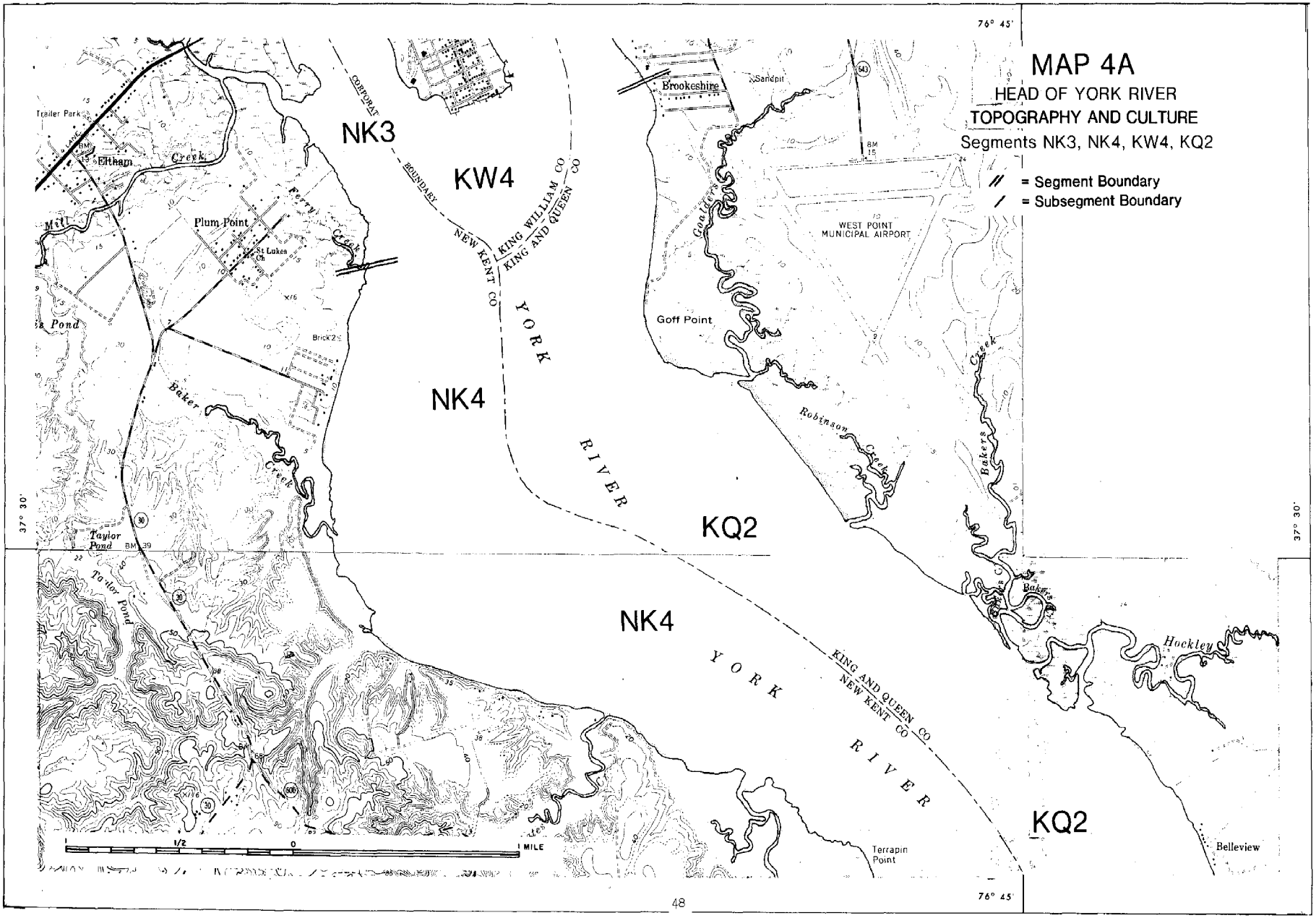

76° 40'
Plain View
Meadow Swamp
GLOUCESTER CO.
Sandpit
BM 71
BM 56
KQ1
Miller Landing
Red Bank Landing
Bartridge Landing
Violet Bank
Tanyard Landing
Morris Bay
West End
Signpine
Adams
Gable Br.
Creek
37° 27' 30"
MAP 2B
YORK RIVER
MORRIS BAY
SHORELANDS TYPES
Segment KQ1
FASTLAND
Low Shore
Moderately Low Shore
Moderately Low Shore with Bluff
Moderately High Shore
SHORE
Fringe Marsh
Extensive Marsh
Embayed Marsh
1/2
0
1 MILE

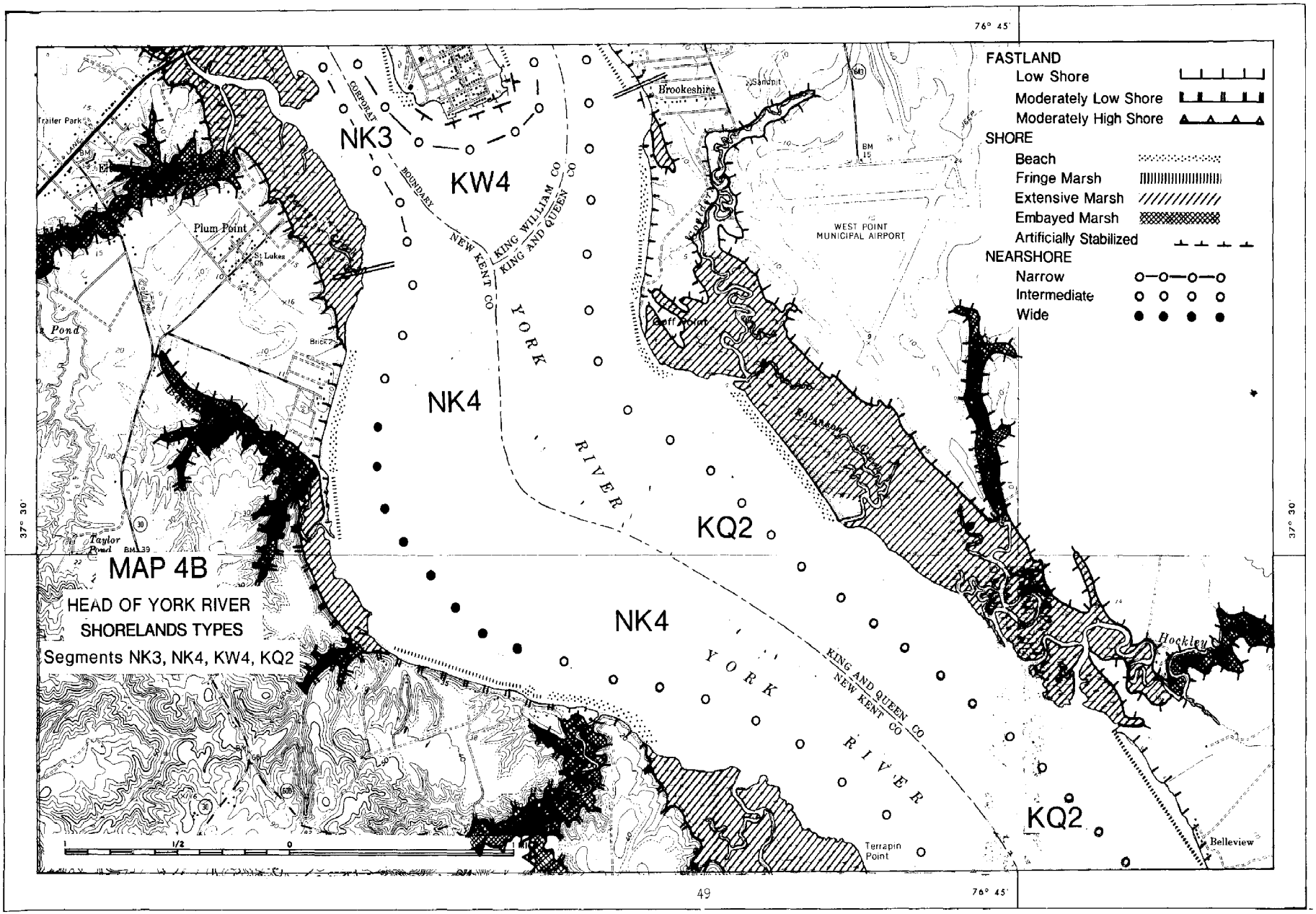

76° 40'
Plain View
Meadow Swamp
KING AND QUEEN CO
GLOUCESTER CO
Sandpit
1W
1A
1RS/A
KQ1
Miller Landing
Haywood Landing
Red Bank Landing
Partridge Landing
Violet Bank
Tanyard Landing
Guthrie Creek
POROPOTANK
RIVER
Poplar Spring
Morris Bay
West End
Adams
Gable Br
Creek
Purtan
37° 27' 30"
MAP 2C
YORK RIVER
MORRIS BAY
FASTLAND USE, OWNERSHIP, EROSION
Segment KQ1
USE
Agricultural A
Residential RS
Unmanaged
Wooded W
OWNERSHIP
Private 1
EROSION
No Data
1/2
0
1 MILE

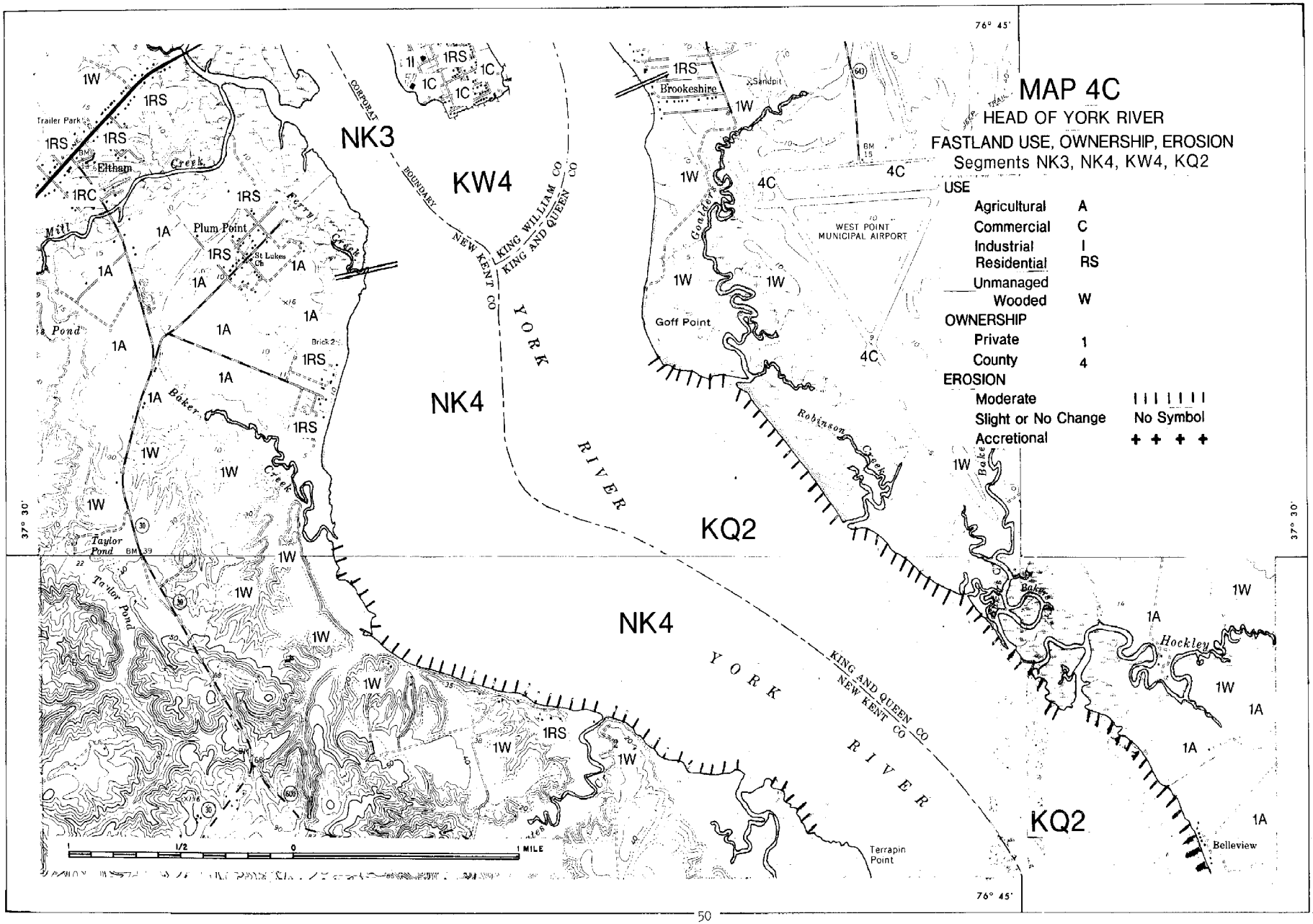

MAP 3A
YORK RIVER
HOLLY FORKS TO SYCAMORE LANDING
TOPOGRAPHY AND CULTURE
Segments NK4, KQ2
// = Segment Boundary
/ = Subsegment Boundary
NK4
KQ2
KQ1
KING AND QUEEN CO
NEW KENT CO
JAMES CITY CO
NEW KENT CO
JAMES CITY CO
KING AND QUEEN CO
GLOUCESTER CO
Holly Forks
Sycamore Landing
Mt Folly
Tabernacle Ch
Cem
Ware Creek
Goodins Pond
Richardson Millpond
Radio Facility
Roads 2
Y O R K
1/2
0
MILE
76° 45'
37° 27' 30"

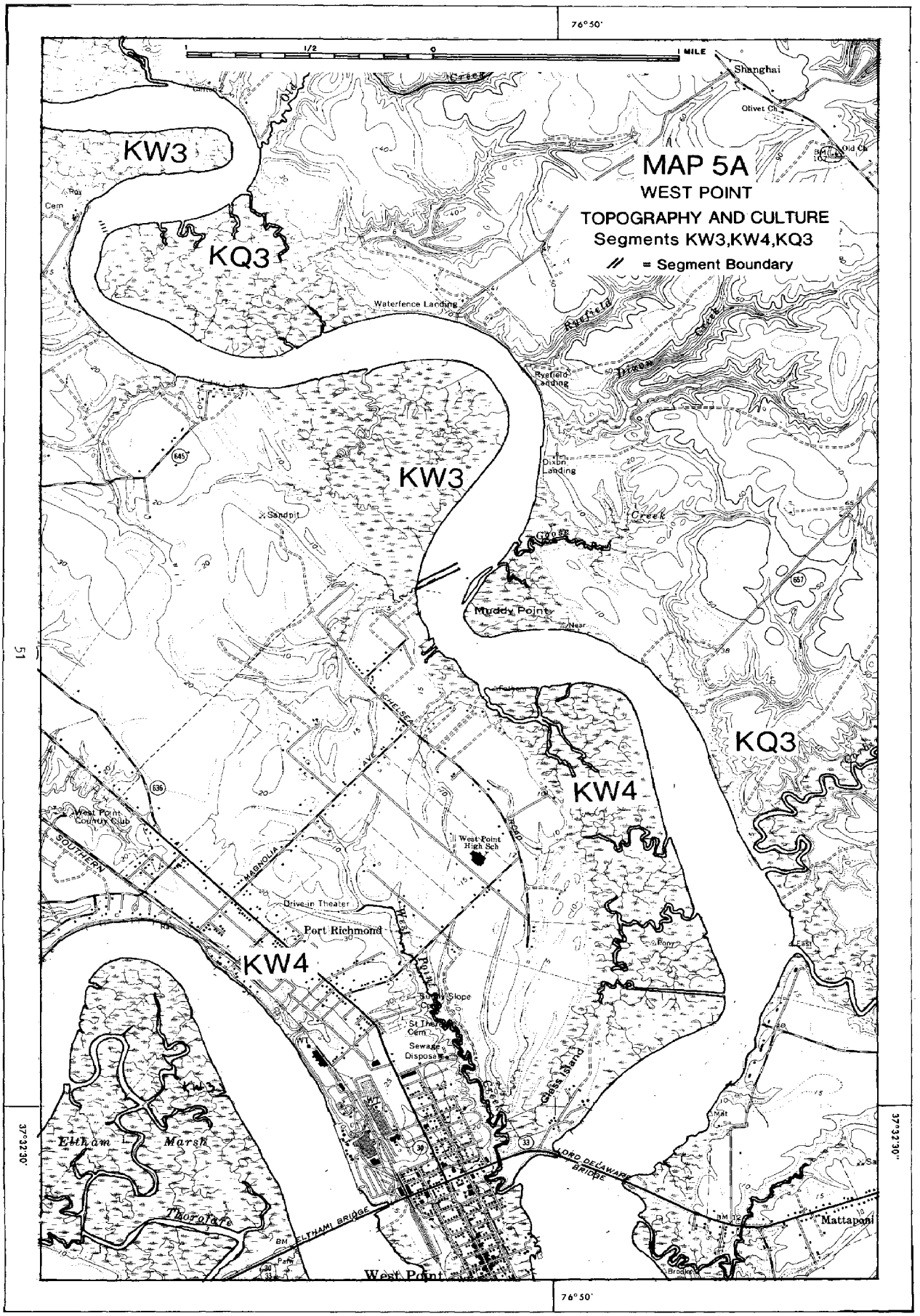

MAP 3B
YORK RIVER
HOLLY FORKS TO SYCAMORE LANDING
SHORELANDS TYPES
Segments NK4,KQ2
FASTLAND
Low Shore
Moderately Low Shore
Moderately High Shore
High Shore
SHORE
Beach
Extensive Marsh
Embayed Marsh
NEARSHORE
Intermediate
Wide
NK4
KQ2
KQ1
NEW KENT CO
JAMES CITY CO
KING AND QUEEN CO
KING AND QUEEN CO
GLOUCESTER CO
Sycamore Landing
Mt Folly
Richardson Millpond
Godwins Pond
76° 45'
37° 27' 30"
1/2
0
MILE

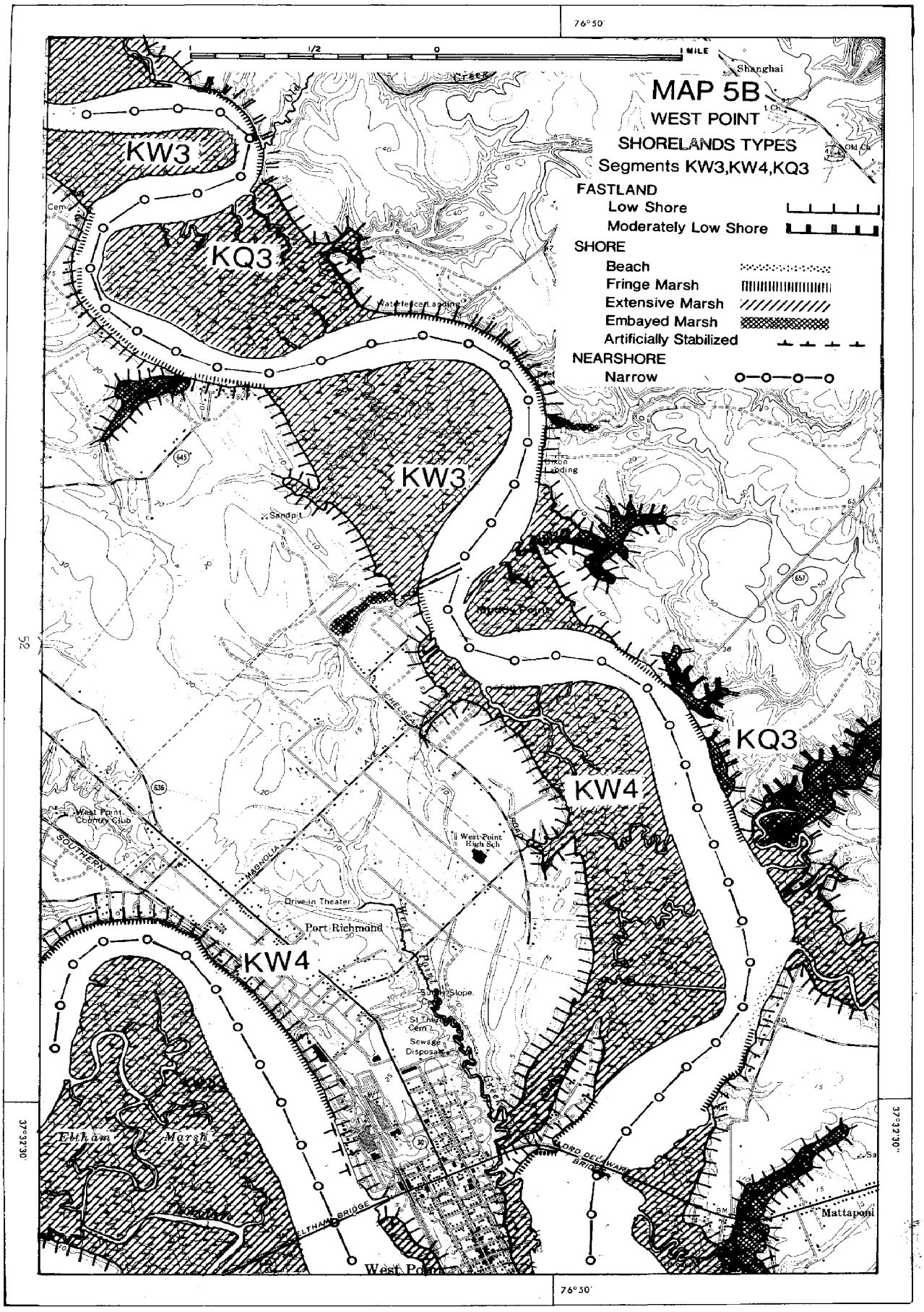

76° 45'
37° 27' 30"
NK4
KQ2
KQ1
KING AND QUEEN CO
NEW KENT CO
JAMES CITY CO
MAP 3C
YORK RIVER
HOLLY FORKS TO SYCAMORE LANDING
FASTLAND USE, OWNERSHIP, EROSION
Segments NK4, KQ2
USE
Agricultural A
Government G
Residential RS
Unmanaged
Wooded W
OWNERSHIP
Private 1
County 4
EROSION
Moderate
Slight or No Change No Symbol
Holly Forks
Goodins Pond
Tabernacle Ch
Cem
Mt Folly
Roane 2
Radio Facility
4G
Y O R K
KING AND QUEEN CO
GLOUCESTER CO
1/2
0
1 MILE


MAP 4A
HEAD OF YORK RIVER
TOPOGRAPHY AND CULTURE
Segments NK3, NK4, KW4, KQ2
= Segment Boundary
= Subsegment Boundary
NK3
KW4
NK4
KQ2
NK4
KQ2
YORK RIVER
YORK RIVER
CORPORATE BOUNDARY
NEW KENT CO
KING WILLIAM CO
KING AND QUEEN CO
KING AND QUEEN CO
NEW KENT CO
Brookeshire
Sandpit
WEST POINT MUNICIPAL AIRPORT
Goff Point
Goalders
Robinson Creek
Bakers Creek
Hockley
Belleview
Terrapin Point
Plum Point
St Lukes Ch
Eltham
Trailer Park
Mill Creek
Ferry Creek
Baker Creek
Taylor Pond
Brick 2
76° 45'
37° 30'
1/2
0
1 MILE

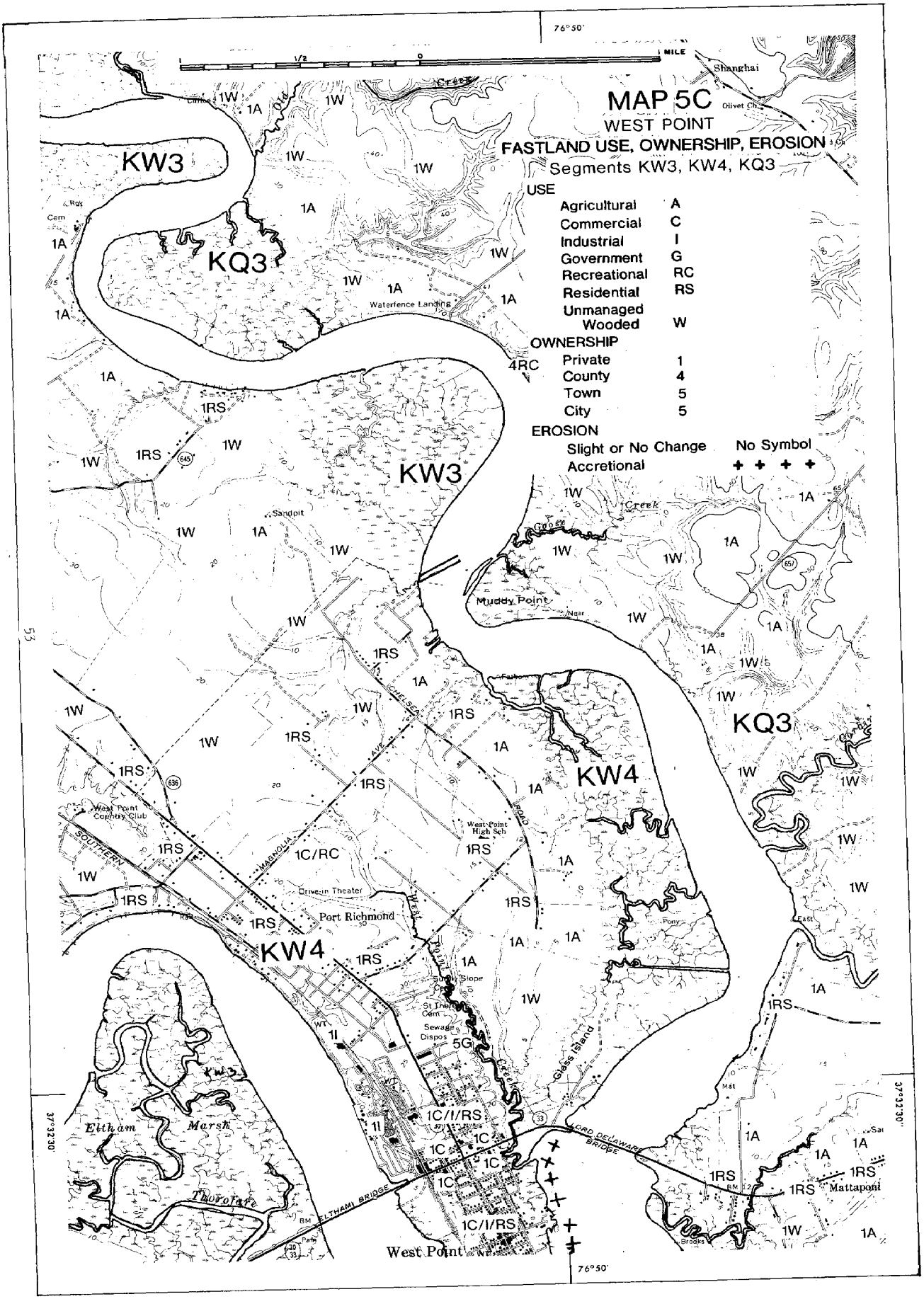

MAP 4B
HEAD OF YORK RIVER
SHORELANDS TYPES
Segments NK3, NK4, KW4, KQ2
FASTLAND
Low Shore
Moderately Low Shore
Moderately High Shore
SHORE
Beach
Fringe Marsh
Extensive Marsh
Embayed Marsh
Artificially Stabilized
NEARSHORE
Narrow
Intermediate
Wide
NK3
KW4
NK4
KQ2
NK4
KQ2
YORK RIVER
YORK RIVER
CORPORAT BOUNDARY
NEW KENT CO
KING WILLIAM CO
KING AND QUEEN CO
KING AND QUEEN CO
NEW KENT CO
Brookeshire
Sandpit
WEST POINT MUNICIPAL AIRPORT
Plum Point
St Lukes Ch
Trailer Park
Taylor Pond
Hockley
Belleview
Terrapin Point
76° 45'
37° 30'
1/2
0

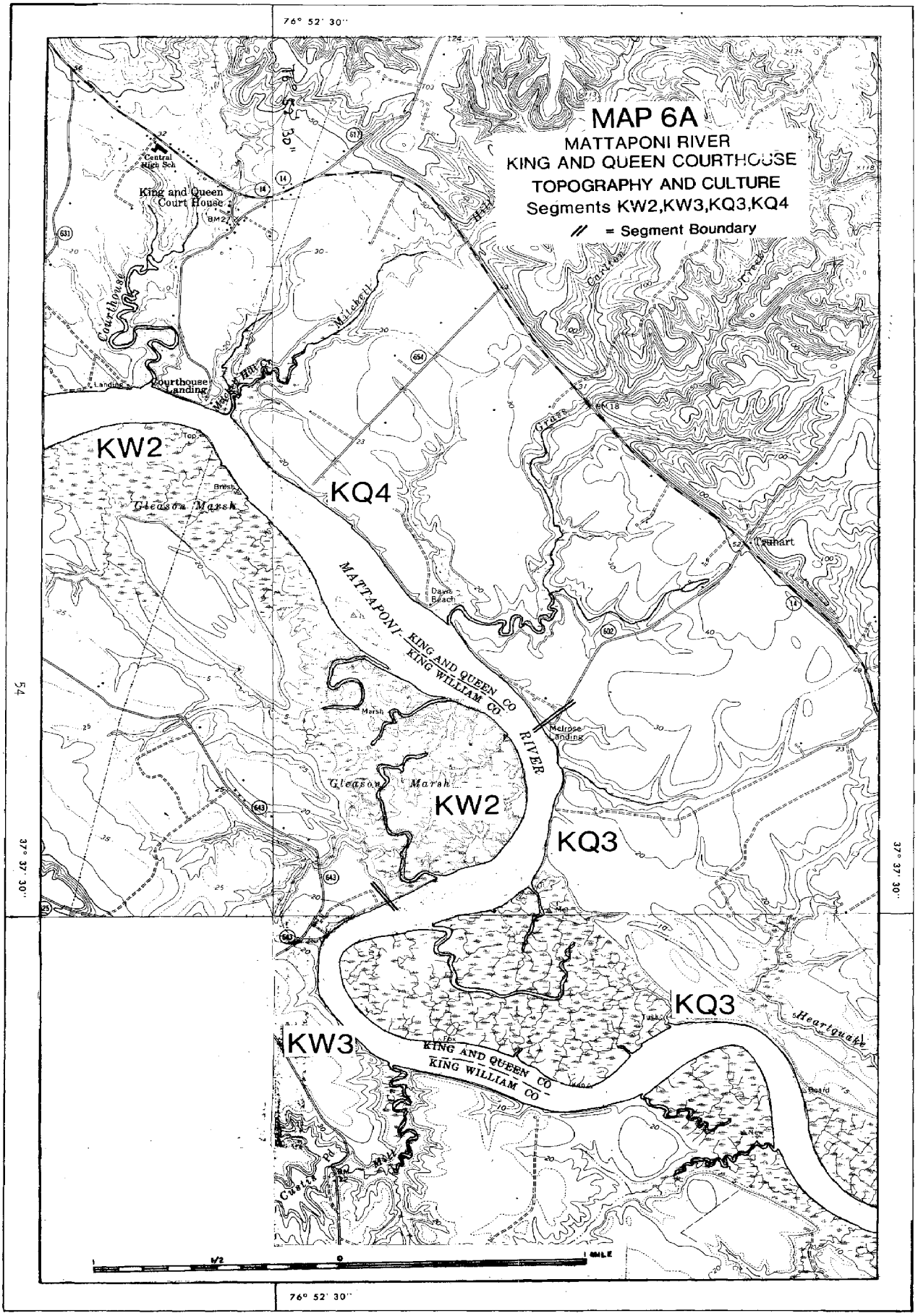

MAP 4C
HEAD OF YORK RIVER
FASTLAND USE, OWNERSHIP, EROSION
Segments NK3, NK4, KW4, KQ2
USE
Agricultural A
Commercial C
Industrial I
Residential RS
Unmanaged Wooded W
OWNERSHIP
Private 1
County 4
EROSION
Moderate
Slight or No Change No Symbol
Accretional + + + +
NK3
KW4
NK4
KQ2
NK4
KQ2
YORK RIVER
YORK RIVER
CORPORAT BOUNDARY
NEW KENT CO
KING WILLIAM CO
KING AND QUEEN CO
KING AND QUEEN CO
NEW KENT CO
Trailer Park
Eltham
Plum Point
St Lukes Ch
Brick 2
Taylor Pond
Brookeshire
Sandpit
WEST POINT MUNICIPAL AIRPORT
Goff Point
Robinson Creek
Hockley
Belleview
Terrapin Point
1 1/2 0 1 MILE
76° 45'
37° 30'

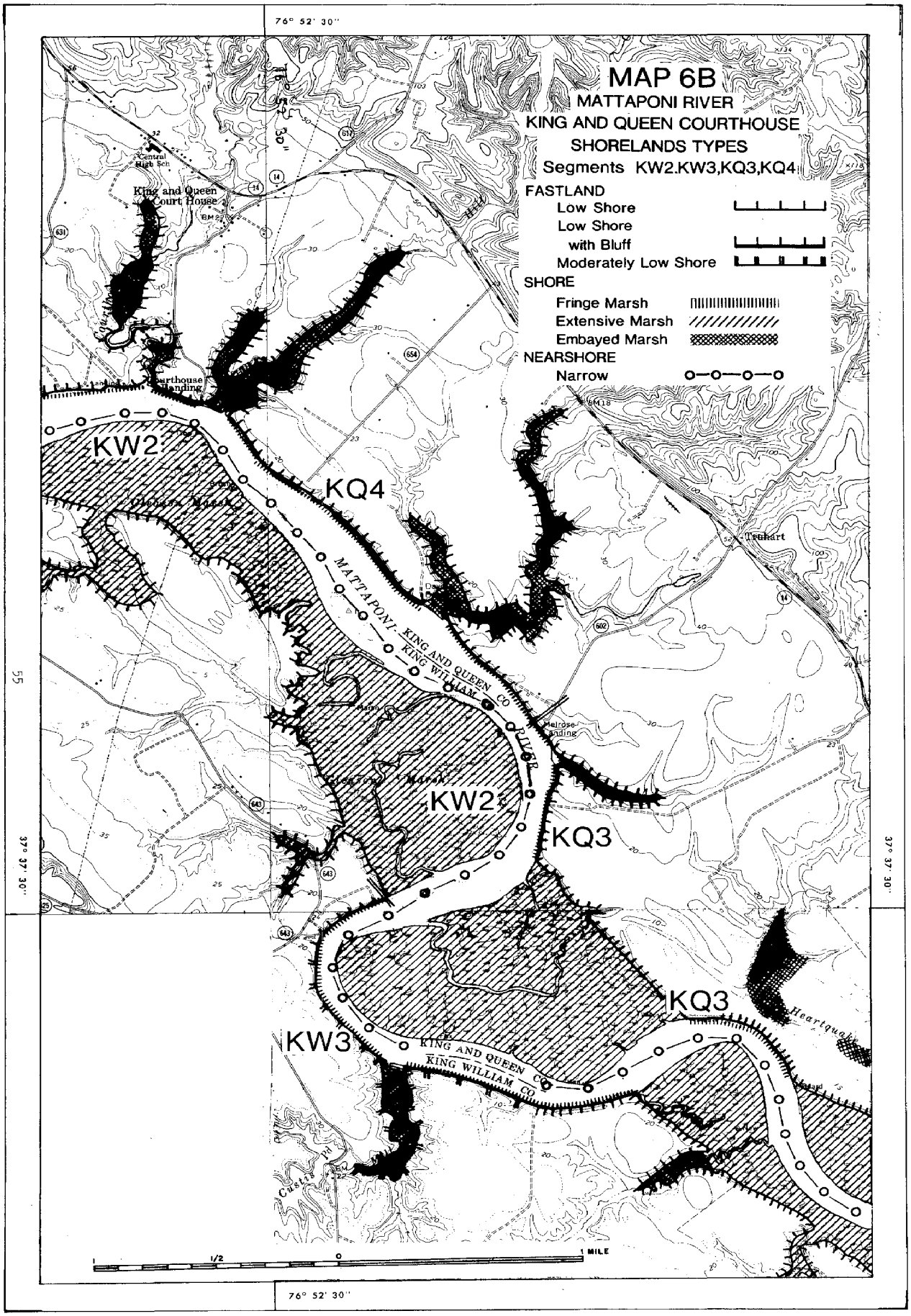

MAP 5A
WEST POINT
TOPOGRAPHY AND CULTURE
Segments KW3,KW4,KQ3
// = Segment Boundary
KW3
KQ3
KW3
KW4
KQ3
KW4
76°50'
37°32'30"
1 MILE
Shanghai
Olivet Ch
Old Ch
Waterfence Landing
Ryefield Landing
Dixon Landing
Muddy Point
Sandpit
West Point Country Club
West Point High Sch
Drive-in Theater
Port Richmond
St Thomas Cem
Sewage Disposal
Glass Island
Eltham Marsh
Thoroughfare
ELTHAM BRIDGE
WOODROW WILSON MEMORIAL BRIDGE
Mattaponi
West Point
SOUTHERN
MAGNOLIA
CHELSEA
AVE
ROAD

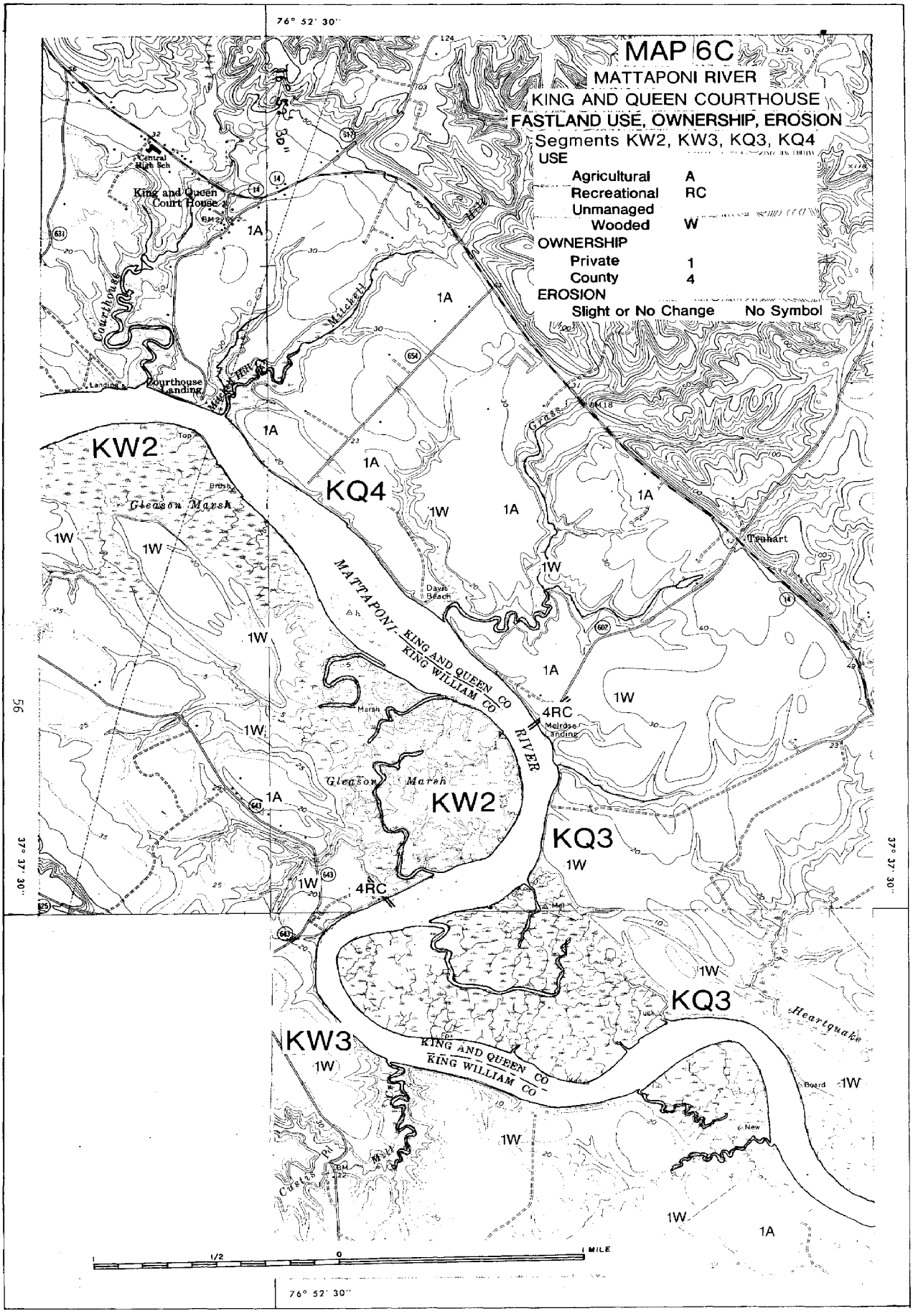


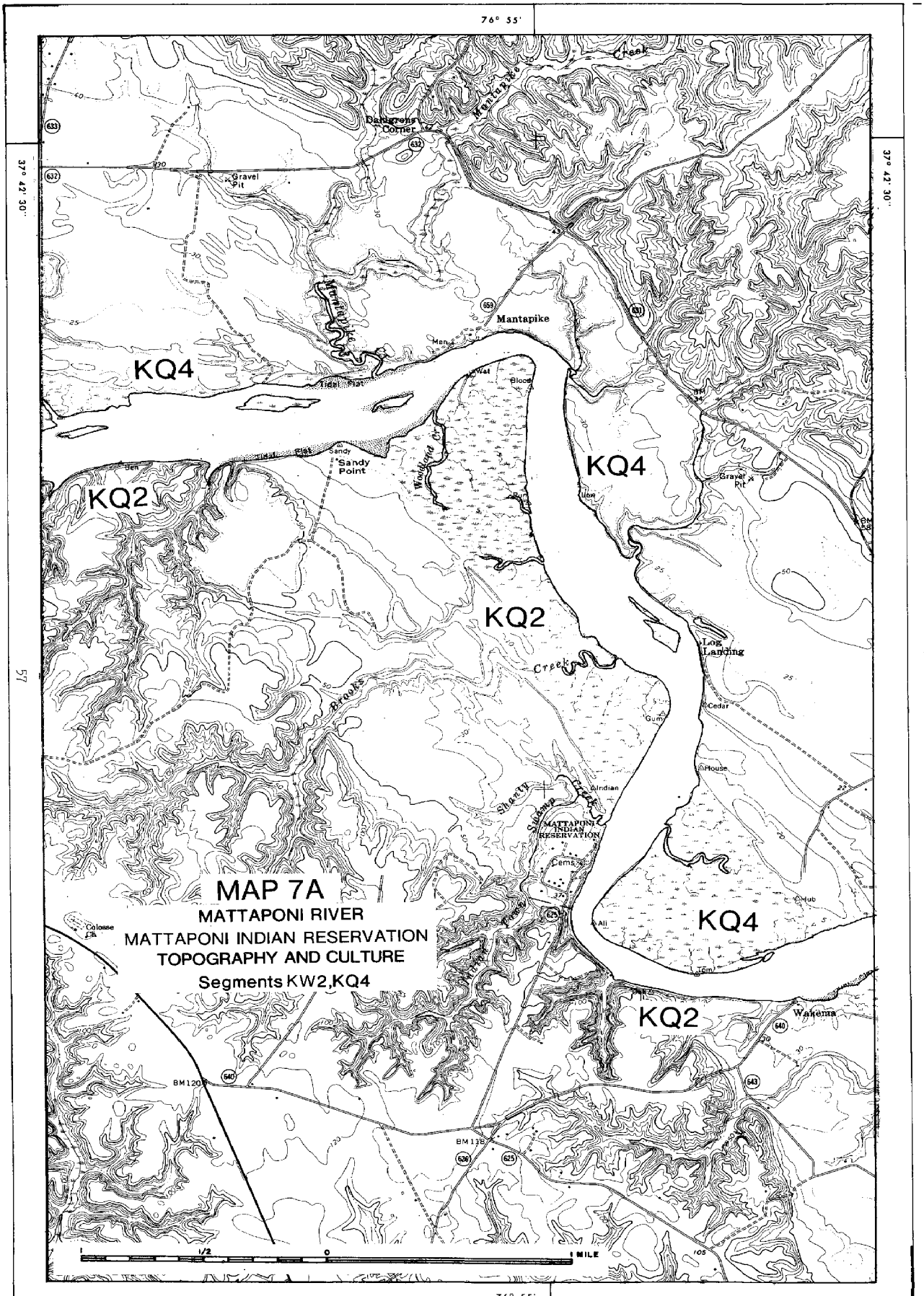
76°50'
1/2
0
1 MILE
MAP 5B
WEST POINT
SHORELANDS TYPES
Segments KW3,KW4,KQ3
FASTLAND
Low Shore
Moderately Low Shore
SHORE
Beach
Fringe Marsh
Extensive Marsh
Embayed Marsh
Artificially Stabilized
NEARSHORE
Narrow
KW3
KQ3
KW3
KQ3
KW4
KW4
Shanghai
Old Ch
Waterfence Landing
Dixon Landing
Sandpit
Muddy Point
West Point Country Club
SOUTHERN
MAGNOLIA
AVE
CHELSEA
West Point High Sch
Drive-in Theater
Port Richmond
Sunny Slope
St Thomas Cem
Sewage Disposal
Eltham Marsh
ELTHAM BRIDGE
LORD DELAWARE BRIDGE
Mattaponi
West Point
37°32'30"
37°32'30"
76°50'


MAP 5C
WEST POINT
FASTLAND USE, OWNERSHIP, EROSION
Segments KW3, KW4, KQ3
USE
Agricultural A
Commercial C
Industrial I
Government G
Recreational RC
Residential RS
Unmanaged Wooded W
OWNERSHIP
Private 1
County 4
Town 5
City 5
EROSION
Slight or No Change No Symbol
Accretional + + + +
KW3
KQ3
KW4
KQ3
KW4
KW3
1W
1A
1RS
1C/RC
1C/I/RS
1C
1I
5G
4RC
Waterfence Landing
Sandpit
Muddy Point
Drive-in Theater
Port Richmond
West Point High Sch
West Point Country Club
Sewage Dispos
Glass Island
Eltham Marsh
Thorofare
ELTHAM BRIDGE
DELAWARE BRIDGE
Mattaponi
West Point
Shanghai
76°50'
37°32'30"
MILE

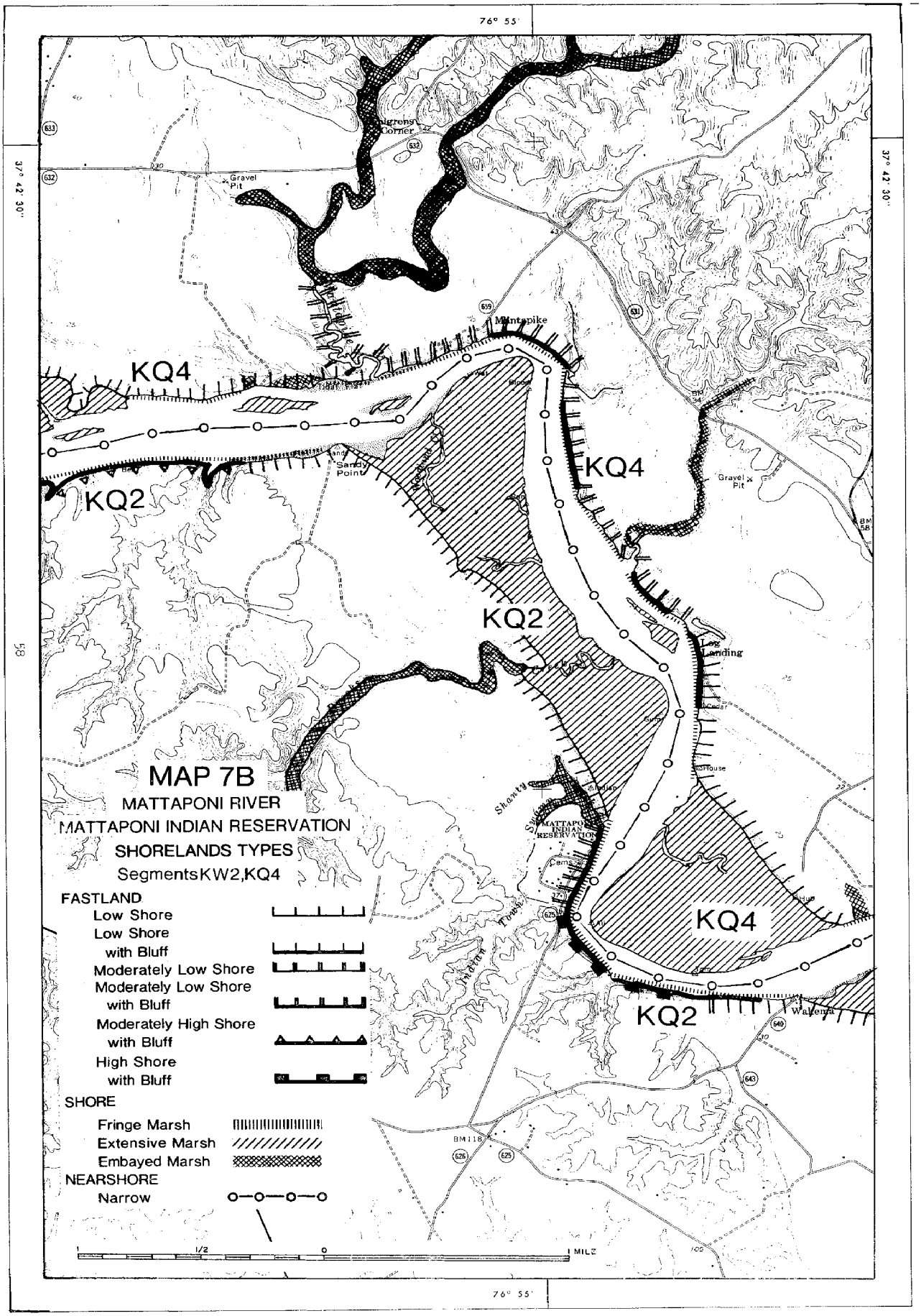

MAP 6A
MATTAPONI RIVER
KING AND QUEEN COURTHOUSE
TOPOGRAPHY AND CULTURE
Segments KW2,KW3,KQ3,KQ4
// = Segment Boundary
76° 52' 30"
37° 37' 30"
KW2
KQ4
KW2
KQ3
KQ3
KW3
MATTAPONI RIVER
KING AND QUEEN CO
KING WILLIAM CO
Central High Sch
King and Queen Court House
Courthouse Landing
Gleason Marsh
Davis Beach
Melrose Landing
Truhart
Heartquake
Custis Pd
1 MILE

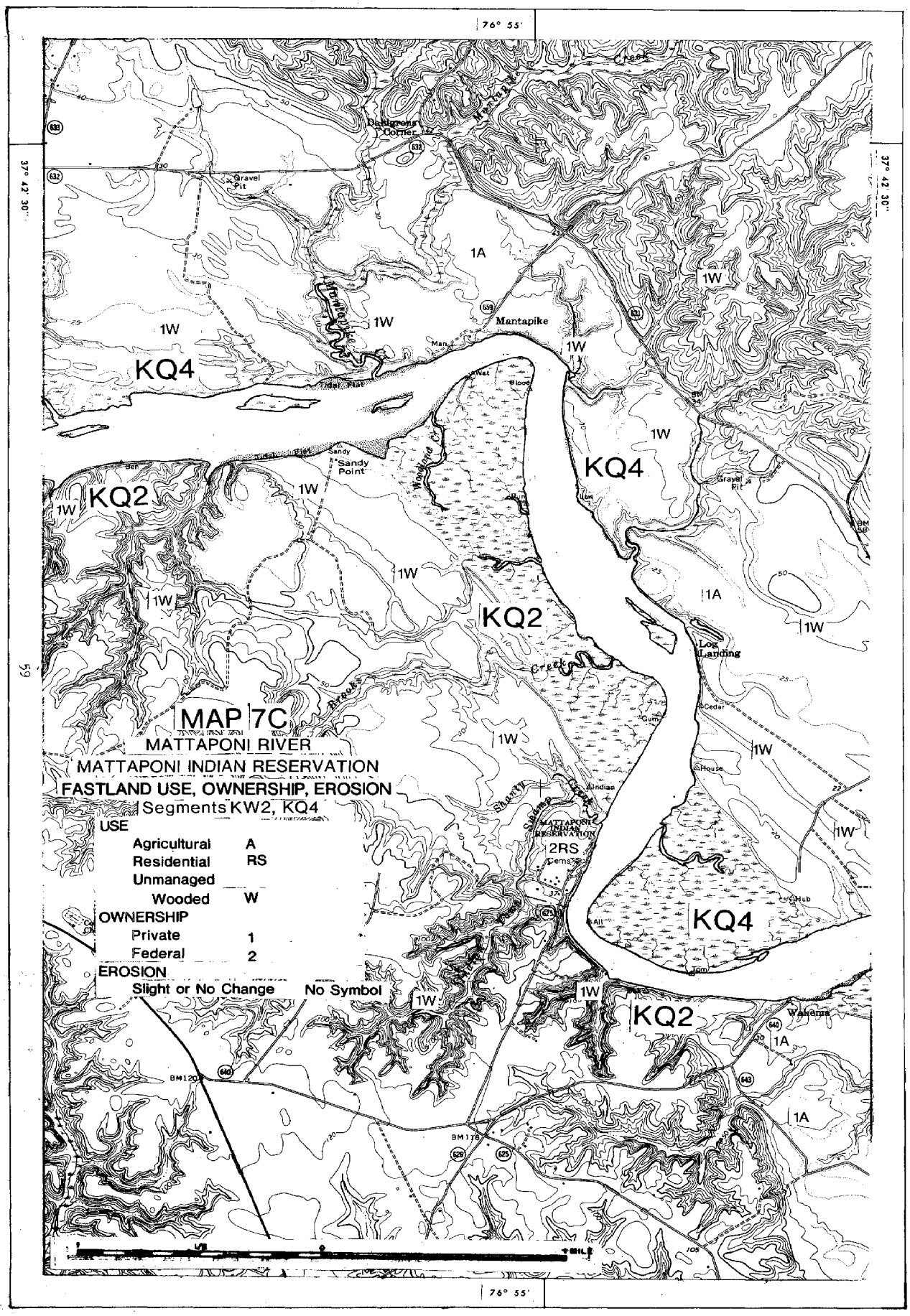

MAP 6B
MATTAPONI RIVER
KING AND QUEEN COURTHOUSE
SHORELANDS TYPES
Segments KW2.KW3,KQ3,KQ4
FASTLAND
Low Shore
Low Shore with Bluff
Moderately Low Shore
SHORE
Fringe Marsh
Extensive Marsh
Embayed Marsh
NEARSHORE
Narrow
KW2
KQ4
KW2
KQ3
KQ3
KW3
MATTAPONI - KING AND QUEEN CO
KING WILLIAM CO
KING AND QUEEN CO
KING WILLIAM CO
King and Queen Court House
Courthouse Landing
Melrose Landing
Tsuhart
Heartquake
Custis
76° 52' 30"
37° 37' 30"
1/2
0
1 MILE

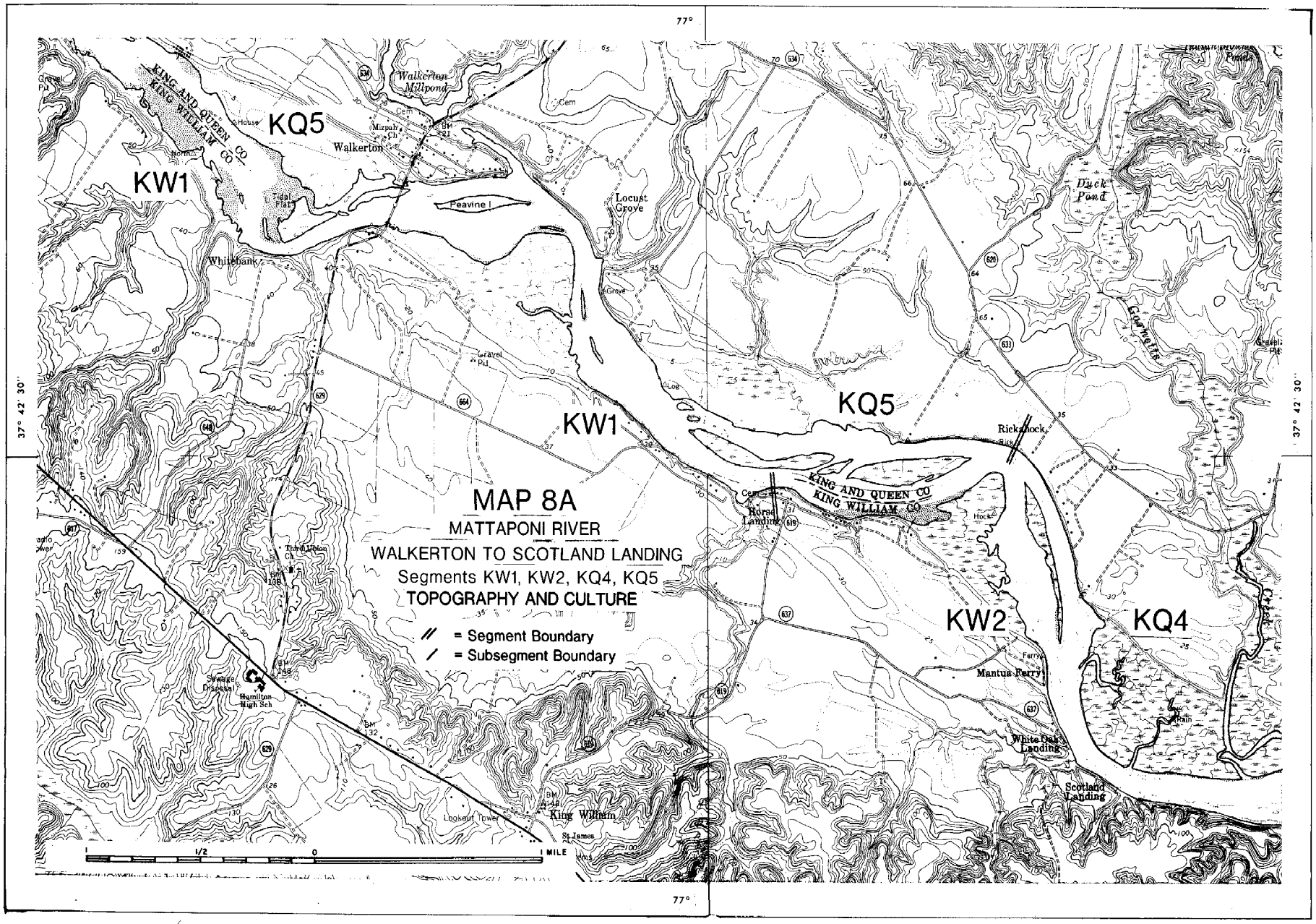

MAP 6C
MATTAPONI RIVER
KING AND QUEEN COURTHOUSE
FASTLAND USE, OWNERSHIP, EROSION
Segments KW2, KW3, KQ3, KQ4
USE
Agricultural A
Recreational RC
Unmanaged
Wooded W
OWNERSHIP
Private 1
County 4
EROSION
Slight or No Change No Symbol
76° 52' 30"
37° 37' 30"
KW2
KQ4
KW2
KQ3
KQ3
KW3
1A
1W
4RC
MATTAPONI RIVER
KING AND QUEEN CO
KING WILLIAM CO
Gleason Marsh
Courthouse Landing
King and Queen Court House
Central High Sch
Davis Beach
Melrose Landing
Truhart
Heartquake
Custis Pd
1/2
0
1 MILE

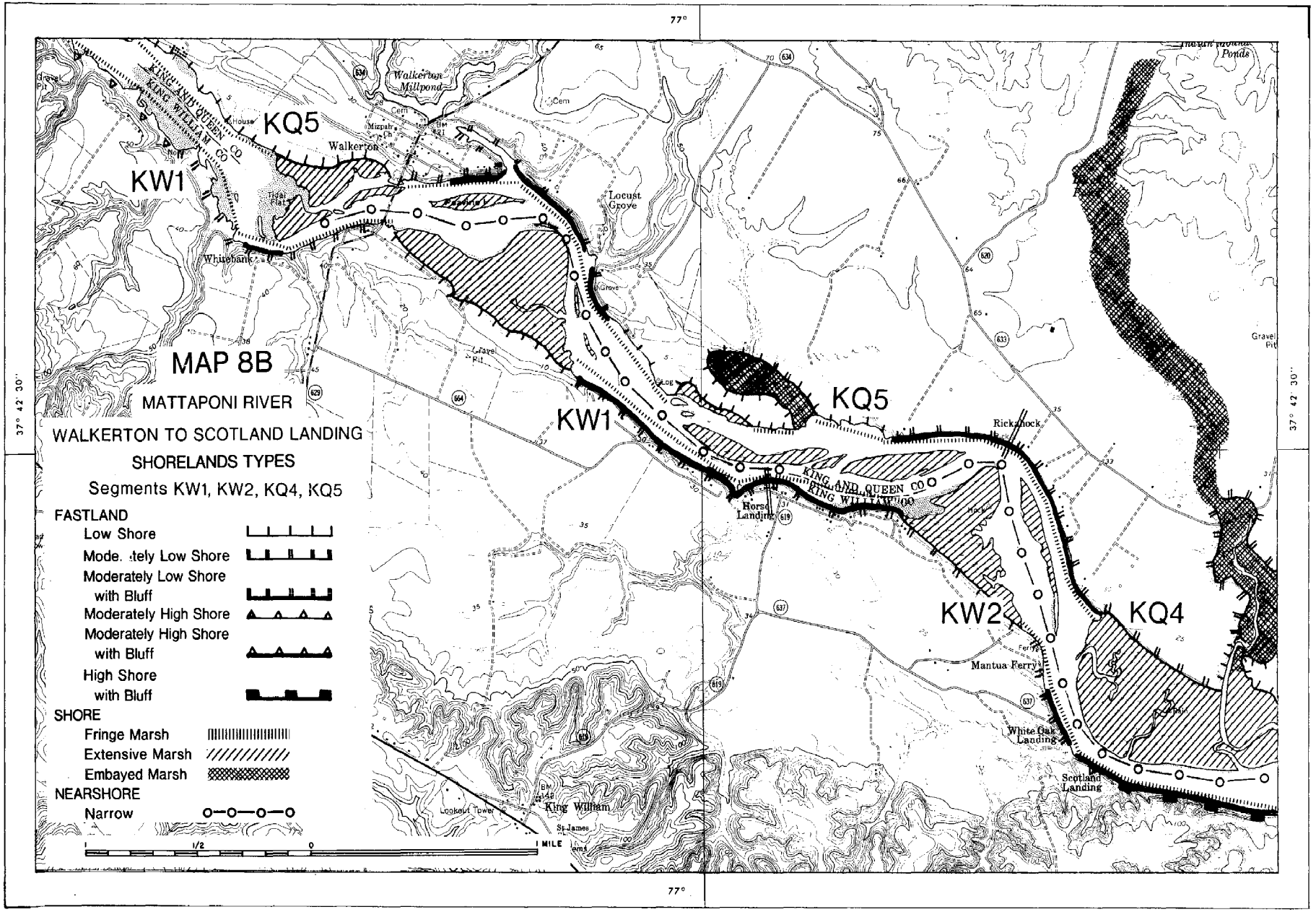


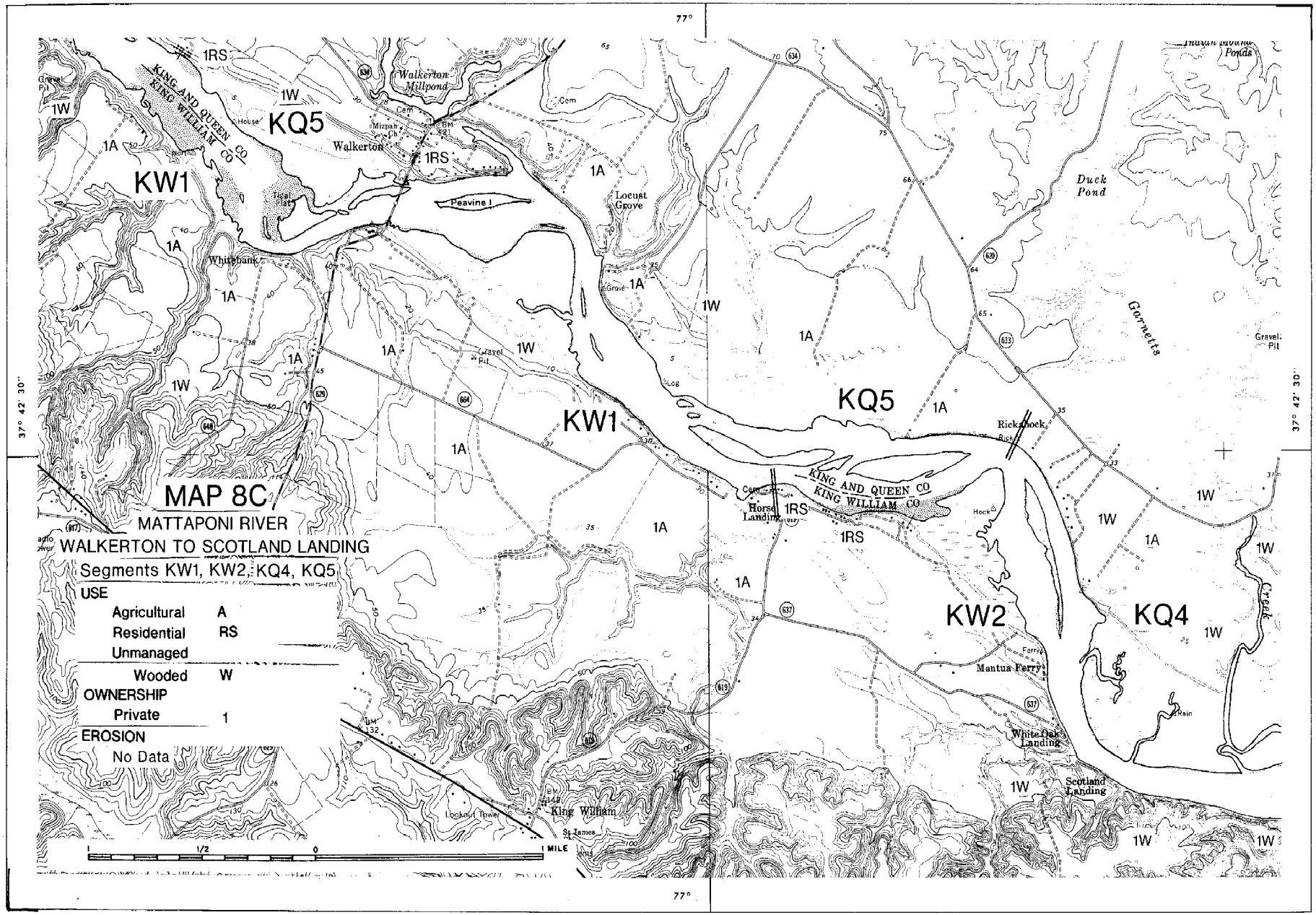
MAP 7A
MATTAPONI RIVER
MATTAPONI INDIAN RESERVATION
TOPOGRAPHY AND CULTURE
Segments KW2,KQ4

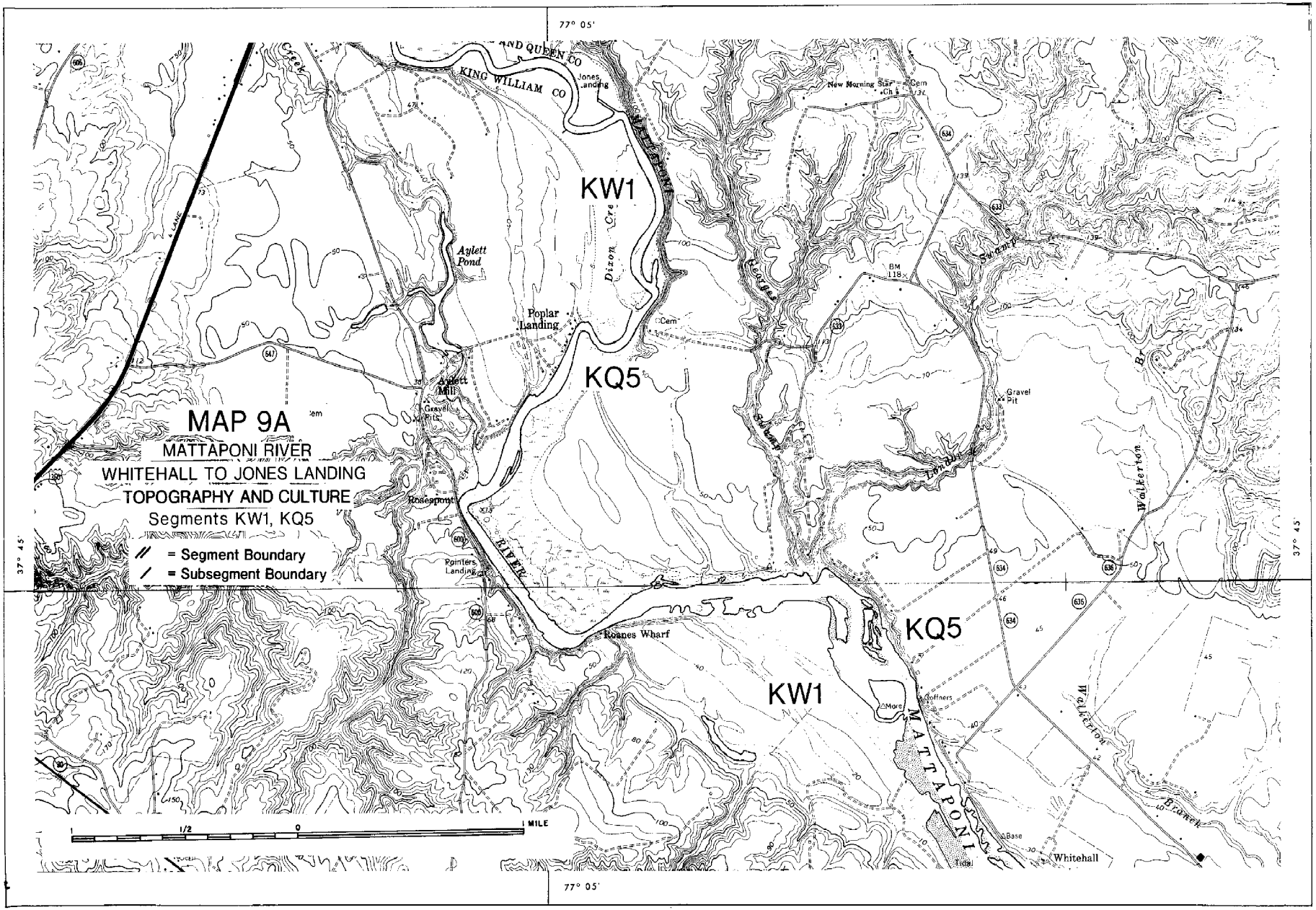

76° 55'
37° 42' 30"
Gravel Pit
Mintapike
KQ4
KQ2
Sandy Point
Gravel Pit
Log Landing
Shanty
MATTAPONI INDIAN RESERVATION
Indian Town
Wakema
MAP 7B
MATTAPONI RIVER
MATTAPONI INDIAN RESERVATION
SHORELANDS TYPES
Segments KW2, KQ4
FASTLAND
Low Shore
Low Shore with Bluff
Moderately Low Shore
Moderately Low Shore with Bluff
Moderately High Shore with Bluff
High Shore with Bluff
SHORE
Fringe Marsh
Extensive Marsh
Embayed Marsh
NEARSHORE
Narrow
1/2
0
1 MILE

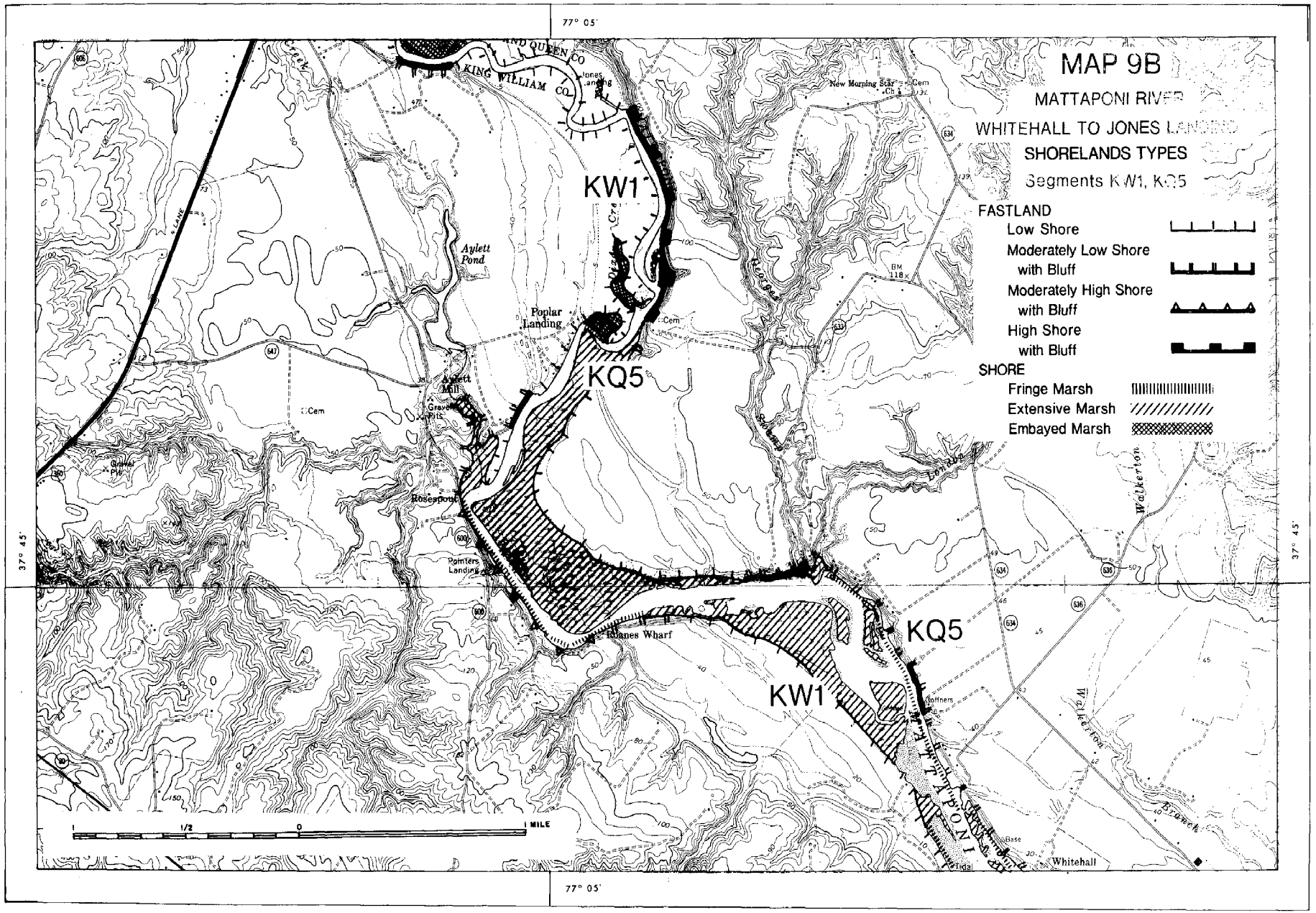

76° 55'
37° 42' 30"
Dahlgrens Corner
Gravel Pit
1A
1W
Mantapike
KQ4
Tidal Flat
Sandy Point
KQ2
Woodland Cr.
Log Landing
Cedar
House
Indian
MATTAPONI INDIAN RESERVATION
2RS
Cems
Hub
Wakema
BM120
BM116
MAP 7C
MATTAPONI RIVER
MATTAPONI INDIAN RESERVATION
FASTLAND USE, OWNERSHIP, EROSION
Segments KW2, KQ4
USE
Agricultural A
Residential RS
Unmanaged
Wooded W
OWNERSHIP
Private 1
Federal 2
EROSION
Slight or No Change No Symbol
1 MILE

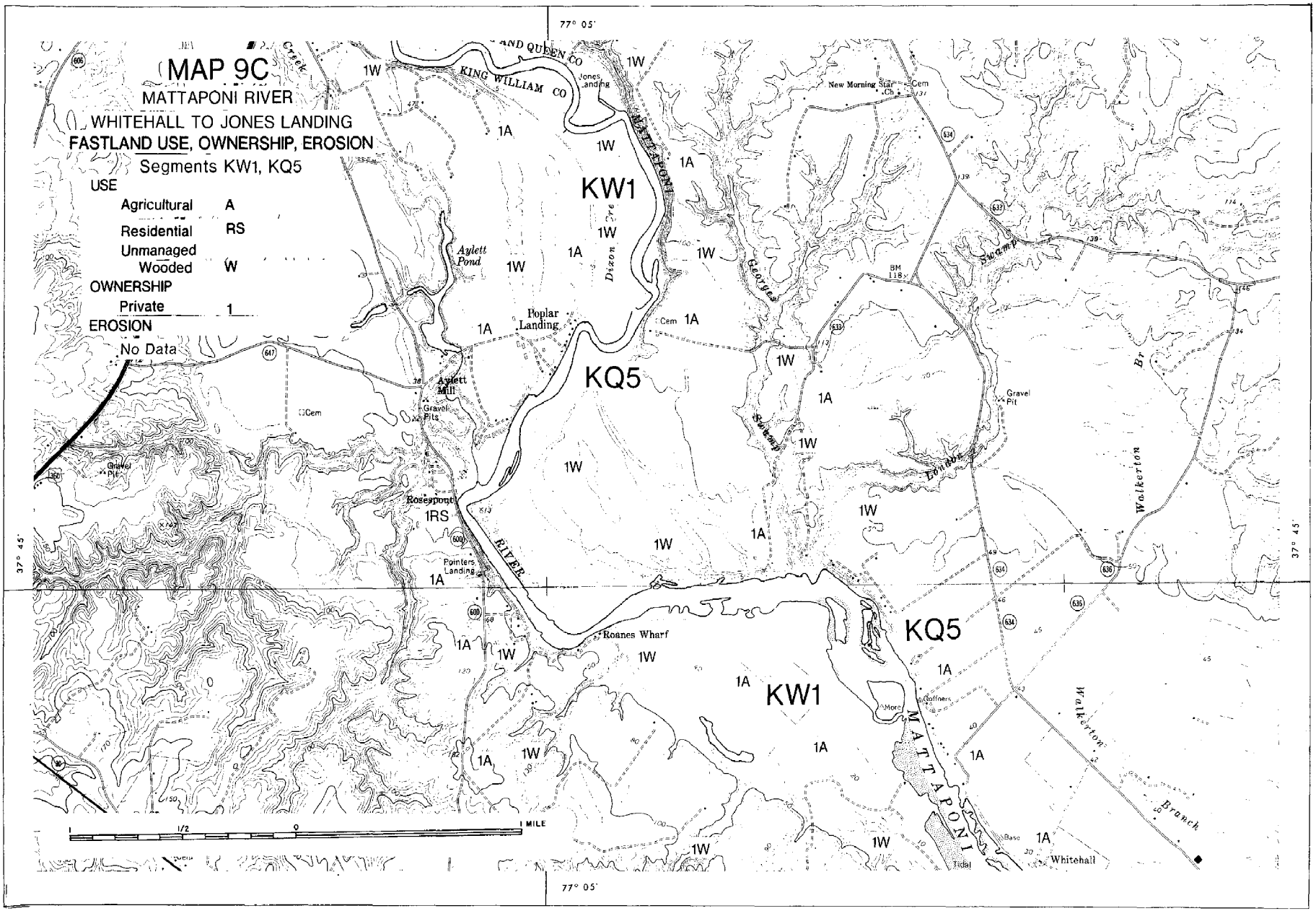

MAP 8A
MATTAPONI RIVER
WALKERTON TO SCOTLAND LANDING
Segments KW1, KW2, KQ4, KQ5
TOPOGRAPHY AND CULTURE
// = Segment Boundary
/ = Subsegment Boundary
KW1
KQ5
KW2
KQ4
KING AND QUEEN CO
KING WILLIAM CO
Walkerton
Walkerton Millpond
Peavine I
Locust Grove
Whitebank
Duck Pond
Rickahock
Horse Landing
Mantua Ferry
White Oak Landing
Scotland Landing
King William
Hamilton High Sch
Sewage Disposal
Lookout Tower
77°
37° 42' 30"
1/2
0
1 MILE

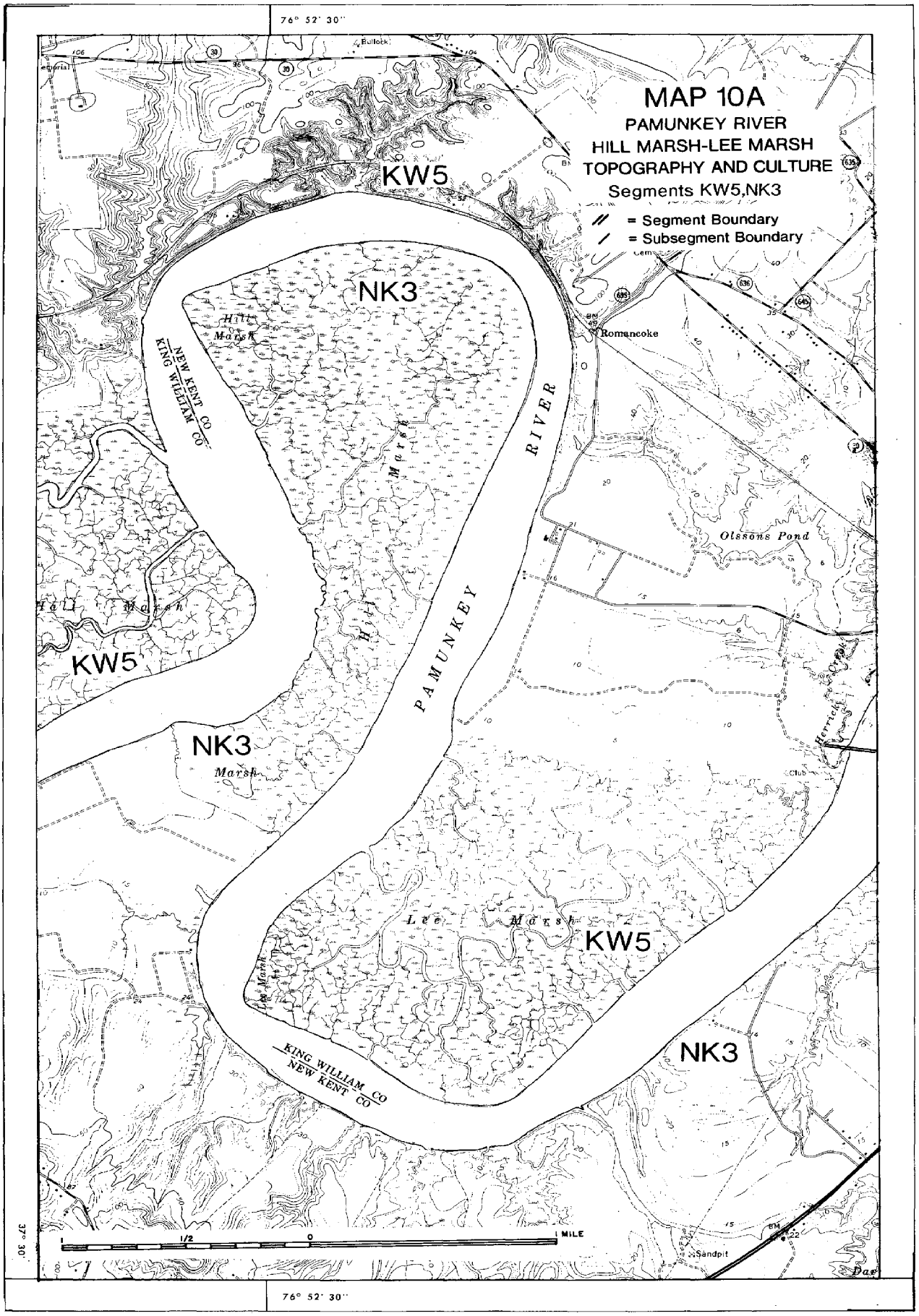

77°
37° 42' 30"
KW1
KQ5
KW2
KQ4
MAP 8B
MATTAPONI RIVER
WALKERTON TO SCOTLAND LANDING
SHORELANDS TYPES
Segments KW1, KW2, KQ4, KQ5
FASTLAND
Low Shore
Moderately Low Shore
Moderately Low Shore with Bluff
Moderately High Shore
Moderately High Shore with Bluff
High Shore with Bluff
SHORE
Fringe Marsh
Extensive Marsh
Embayed Marsh
NEARSHORE
Narrow
1/2
0
1 MILE
KING AND QUEEN CO
KING WILLIAM CO
Walkerton
Walkerton Millpond
Locust Grove
Whitebank
Rickahock
Horse Landing
Mantua Ferry
White Oak Landing
Scotland Landing
King William
St James
Lookout Tower
Gravel Pit

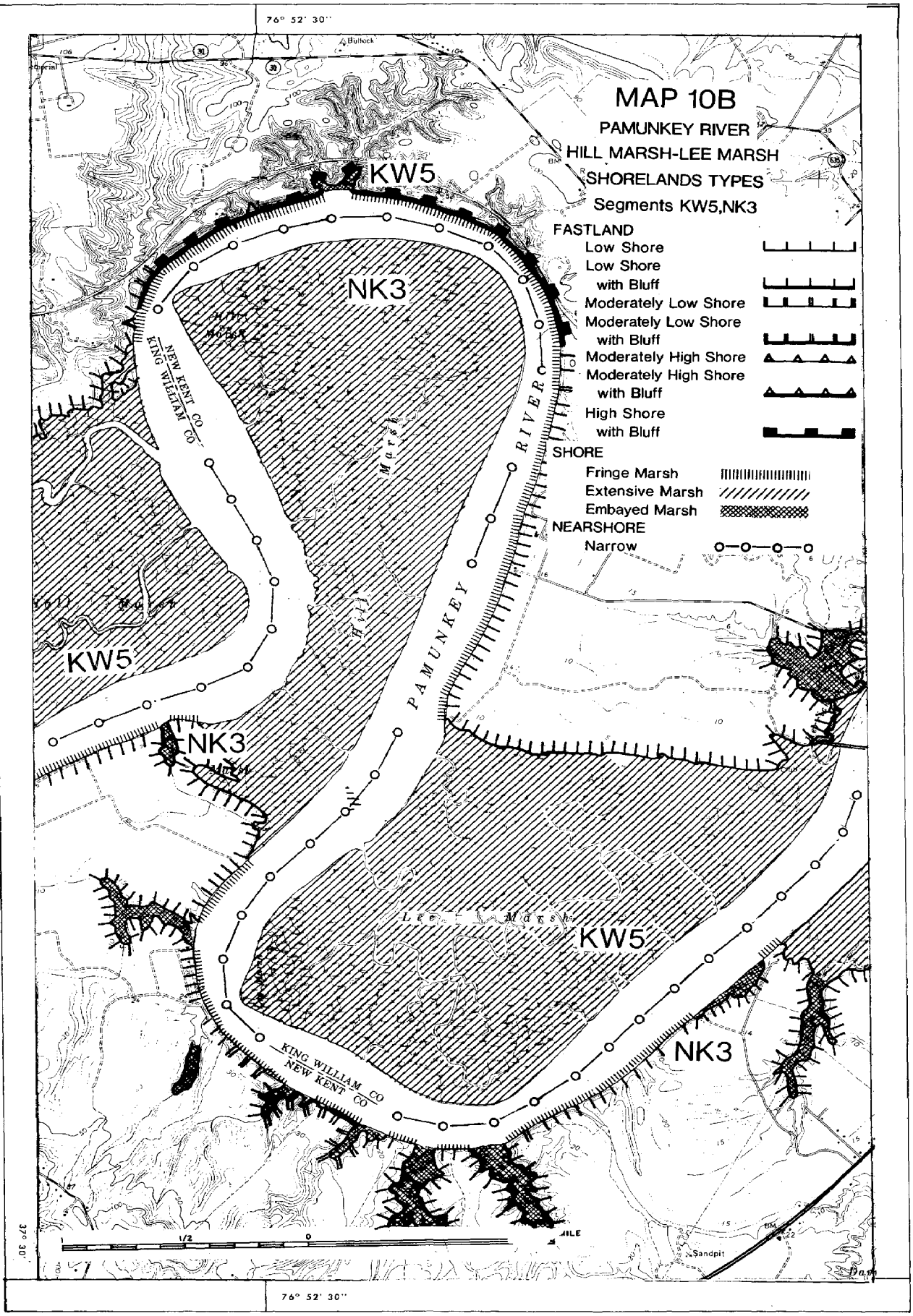

MAP 8C
MATTAPONI RIVER
WALKERTON TO SCOTLAND LANDING
Segments KW1, KW2, KQ4, KQ5
USE
Agricultural A
Residential RS
Unmanaged
Wooded W
OWNERSHIP
Private 1
EROSION
No Data
KW1
KW2
KQ4
KQ5
1RS
1W
1A
KING AND QUEEN CO
KING WILLIAM CO
Walkerton
Walkerton Millpond
Peavine I
Locust Grove
Whitebank
Duck Pond
Gormetts
Horse Landing
Mantua Ferry
White Oak Landing
Scotland Landing
King William
St James
77°
37° 42' 30"
1 1/2 0 1 MILE

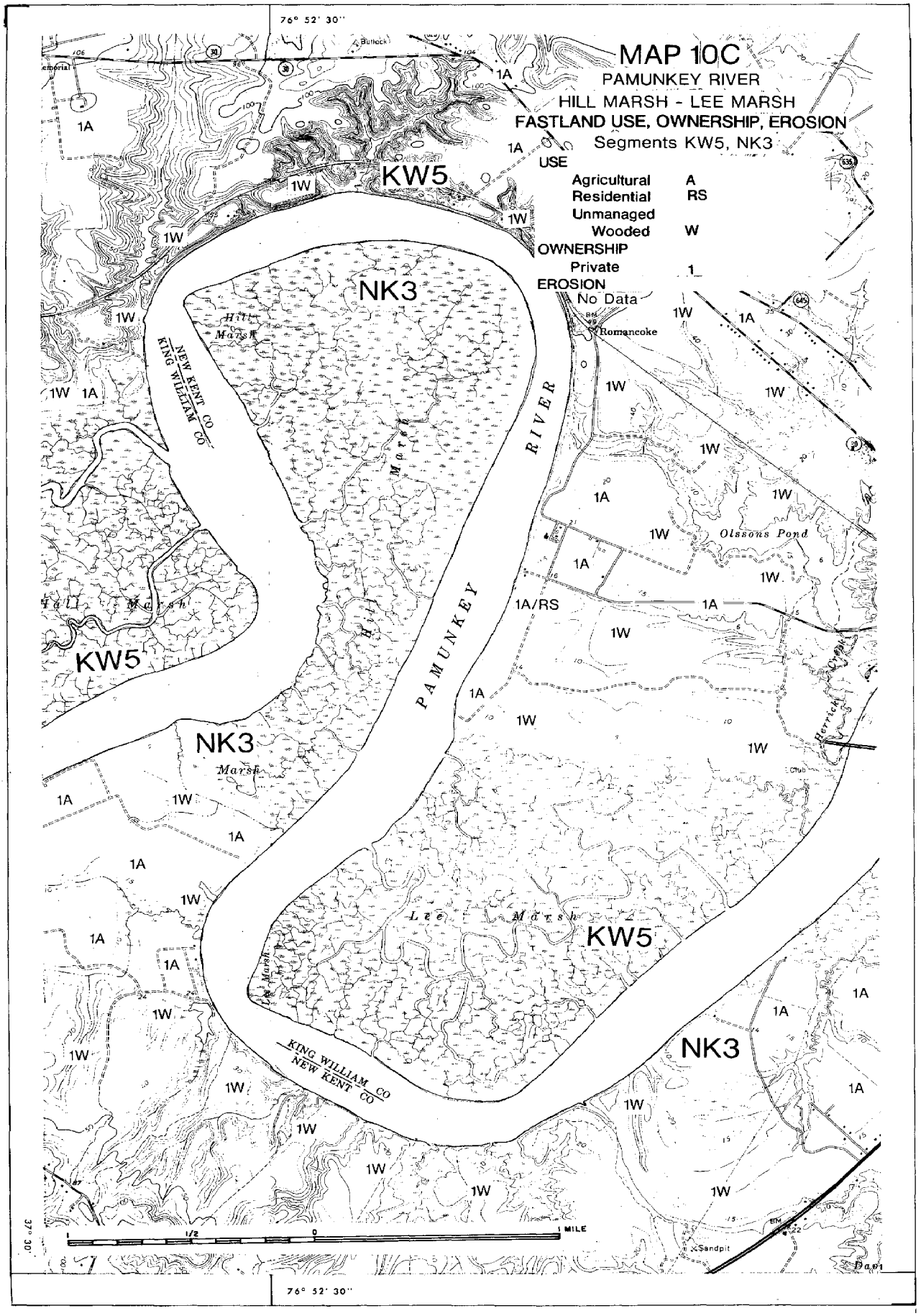

MAP 9A
MATTAPONI RIVER
WHITEHALL TO JONES LANDING
TOPOGRAPHY AND CULTURE
Segments KW1, KQ5
= Segment Boundary
= Subsegment Boundary
KW1
KQ5
KQ5
KW1
77° 05'
37° 45'
KING WILLIAM CO
Jones Landing
Aylett Pond
Poplar Landing
Aylett Mill
Gravel Pits
Rosepont
Pointers Landing
Roanes Wharf
Dixon Cre
Walkerton Br
Walkerton Branch
Whitehall
MATTAPONI
RIVER
1/2
0
1 MILE

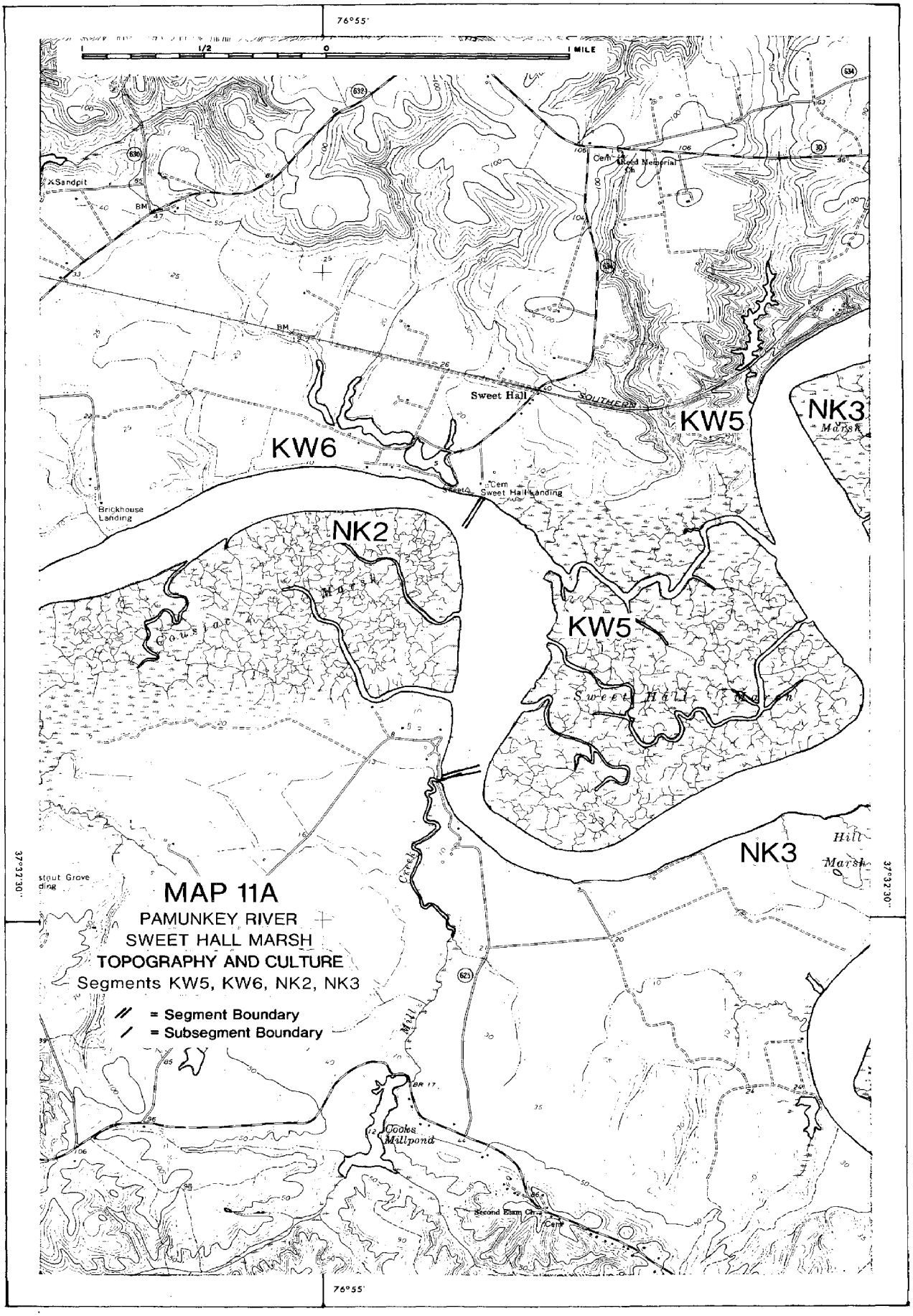

MAP 9B
MATTAPONI RIVER
WHITEHALL TO JONES LANDING
SHORELANDS TYPES
Segments KW1, KQ5
FASTLAND
Low Shore
Moderately Low Shore with Bluff
Moderately High Shore with Bluff
High Shore with Bluff
SHORE
Fringe Marsh
Extensive Marsh
Embayed Marsh
KW1
KQ5
KQ5
KW1
KING WILLIAM CO
Aylett Pond
Poplar Landing
Aylett Mill
Rosespout
Pointers Landing
Roanes Wharf
New Morning Star
Whitehall
Walkerton
Branch
1/2
0
1 MILE
77° 05'
37° 45'


MAP 9C
MATTAPONI RIVER
WHITEHALL TO JONES LANDING
FASTLAND USE, OWNERSHIP, EROSION
Segments KW1, KQ5
USE
Agricultural A
Residential RS
Unmanaged Wooded W
OWNERSHIP
Private 1
EROSION
No Data
77° 05'
37° 45'
KW1
KQ5
1W
1A
1RS
KING WILLIAM CO
Jones Landing
Aylett Pond
Poplar Landing
Aylett Mill
Gravel Pits
Rosespont
Pointers Landing
Roanes Wharf
New Morning Star Ch
Cem
Gravel Pit
Walkerton Br
Walkerton Branch
Whitehall
MATTAPONI
RIVER
Dixon Cre
Georges Swamp
London Swamp
1/2
0
1 MILE

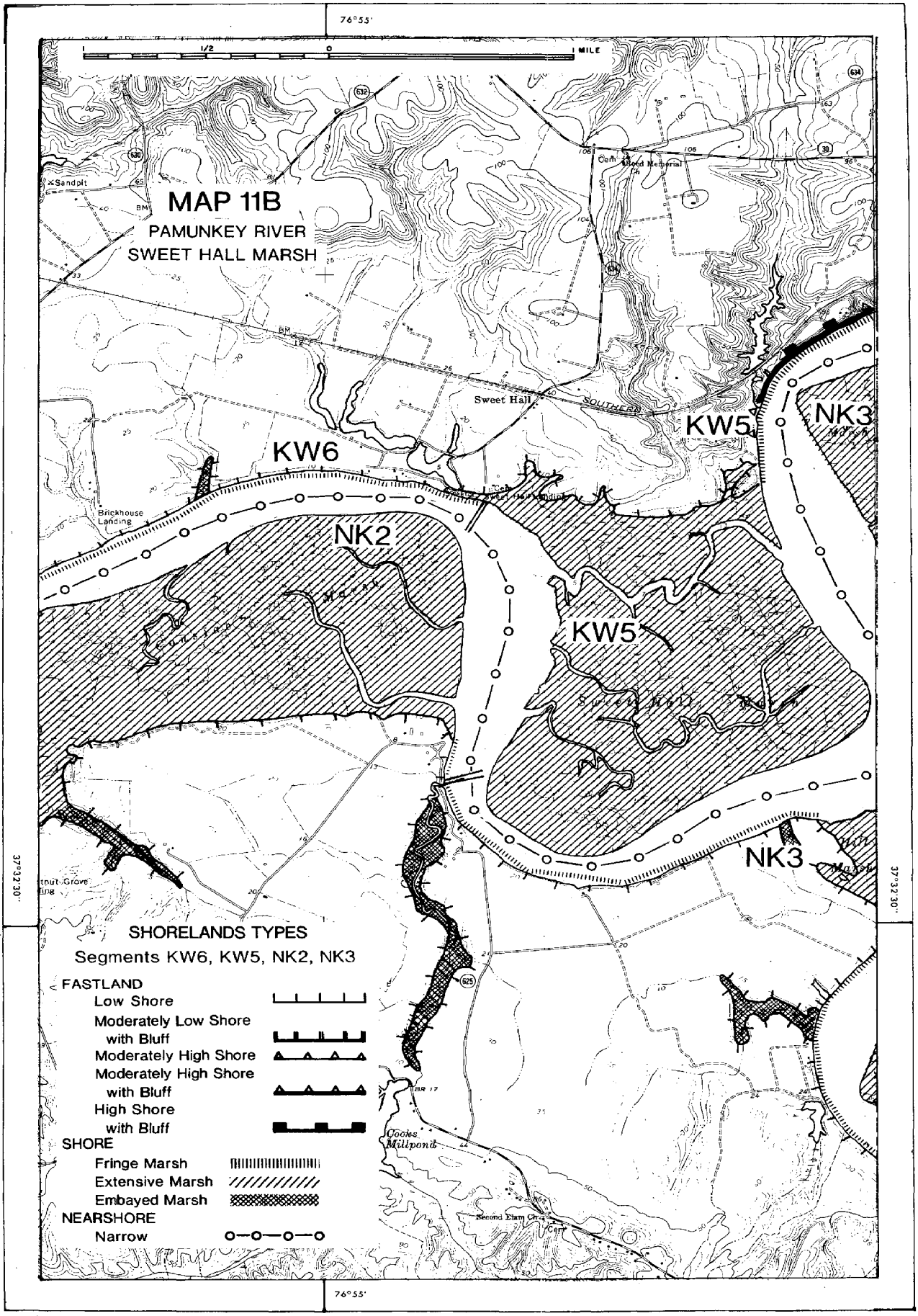

MAP 10A
PAMUNKEY RIVER
HILL MARSH-LEE MARSH
TOPOGRAPHY AND CULTURE
Segments KW5,NK3
= Segment Boundary
= Subsegment Boundary
KW5
NK3
Hill Marsh
NEW KENT CO
KING WILLIAM CO
PAMUNKEY RIVER
Romancoke
Olssons Pond
Hill Marsh
KW5
NK3
Marsh
Lee Marsh
KW5
NK3
KING WILLIAM CO
NEW KENT CO
Sandpit
1/2
0
1 MILE
76° 52' 30"
37° 30'

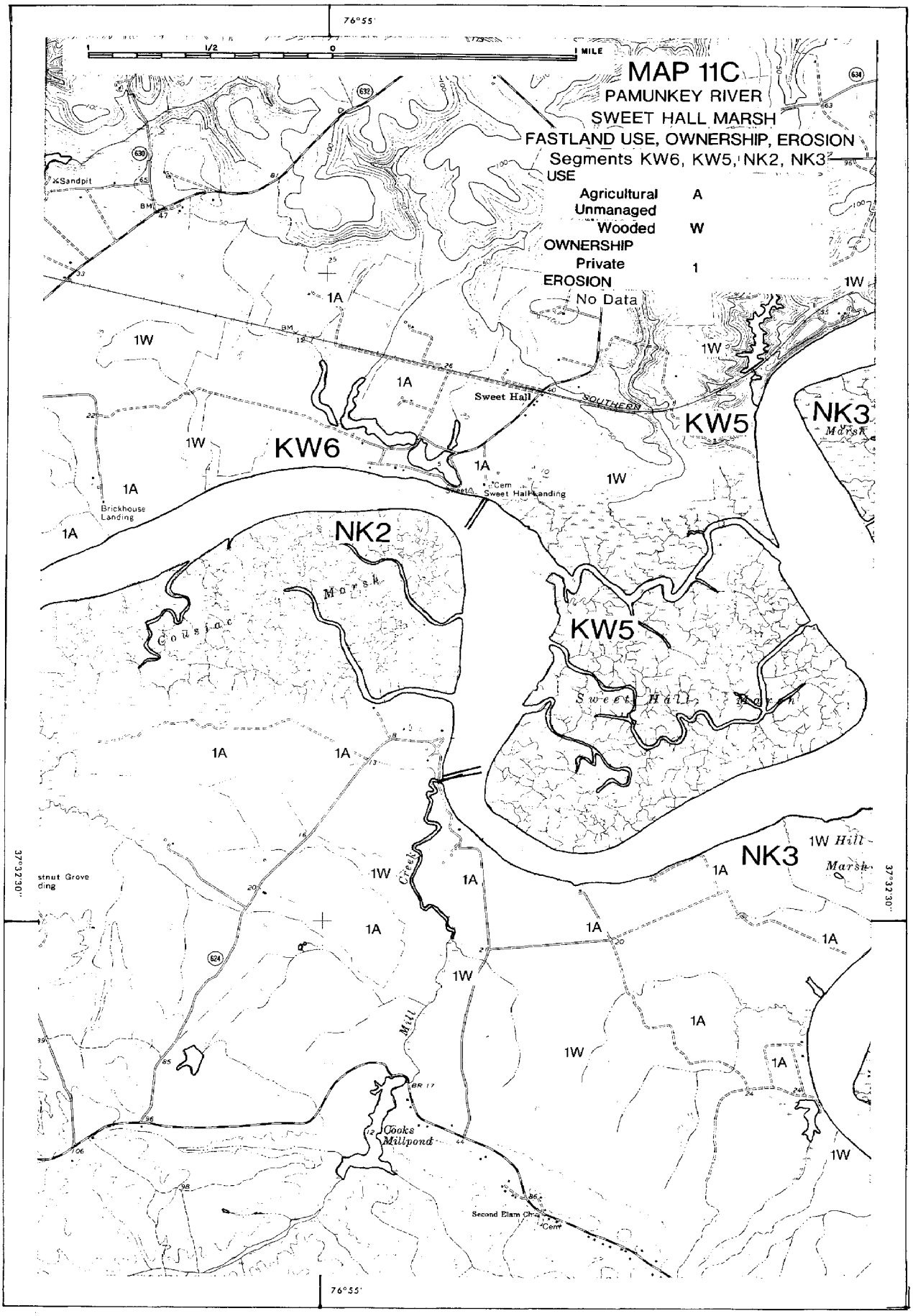

MAP 10B
PAMUNKEY RIVER
HILL MARSH-LEE MARSH
SHORELANDS TYPES
Segments KW5,NK3
FASTLAND
Low Shore
Low Shore with Bluff
Moderately Low Shore
Moderately Low Shore with Bluff
Moderately High Shore
Moderately High Shore with Bluff
High Shore with Bluff
SHORE
Fringe Marsh
Extensive Marsh
Embayed Marsh
NEARSHORE
Narrow
KW5
NK3
KW5
NK3
KW5
NK3
PAMUNKEY RIVER
NEW KENT CO
KING WILLIAM CO
KING WILLIAM CO
NEW KENT CO
Hill Marsh
Lee Marsh
76° 52' 30"
37° 30'
Sandpit

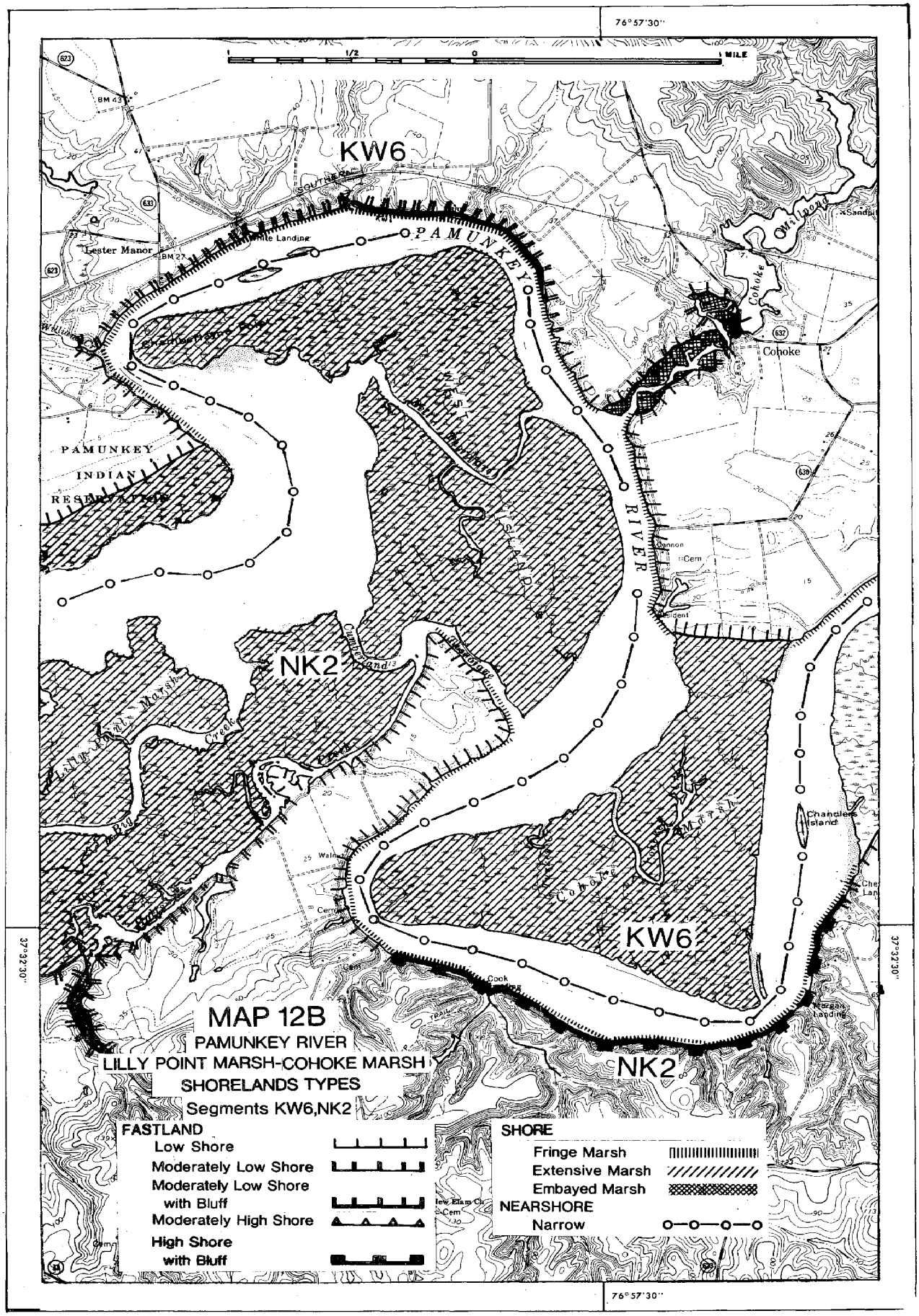

MAP 10C
PAMUNKEY RIVER
HILL MARSH - LEE MARSH
FASTLAND USE, OWNERSHIP, EROSION
Segments KW5, NK3
USE
Agricultural A
Residential RS
Unmanaged
Wooded W
OWNERSHIP
Private 1
EROSION
No Data
76° 52' 30"
37° 30'
KW5
NK3
Hill Marsh
Lee Marsh
PAMUNKEY RIVER
NEW KENT CO
KING WILLIAM CO
Romancoke
Olssons Pond
Herrick Creek
Sandpit
1A
1W
1A/RS
1/2
0
1 MILE

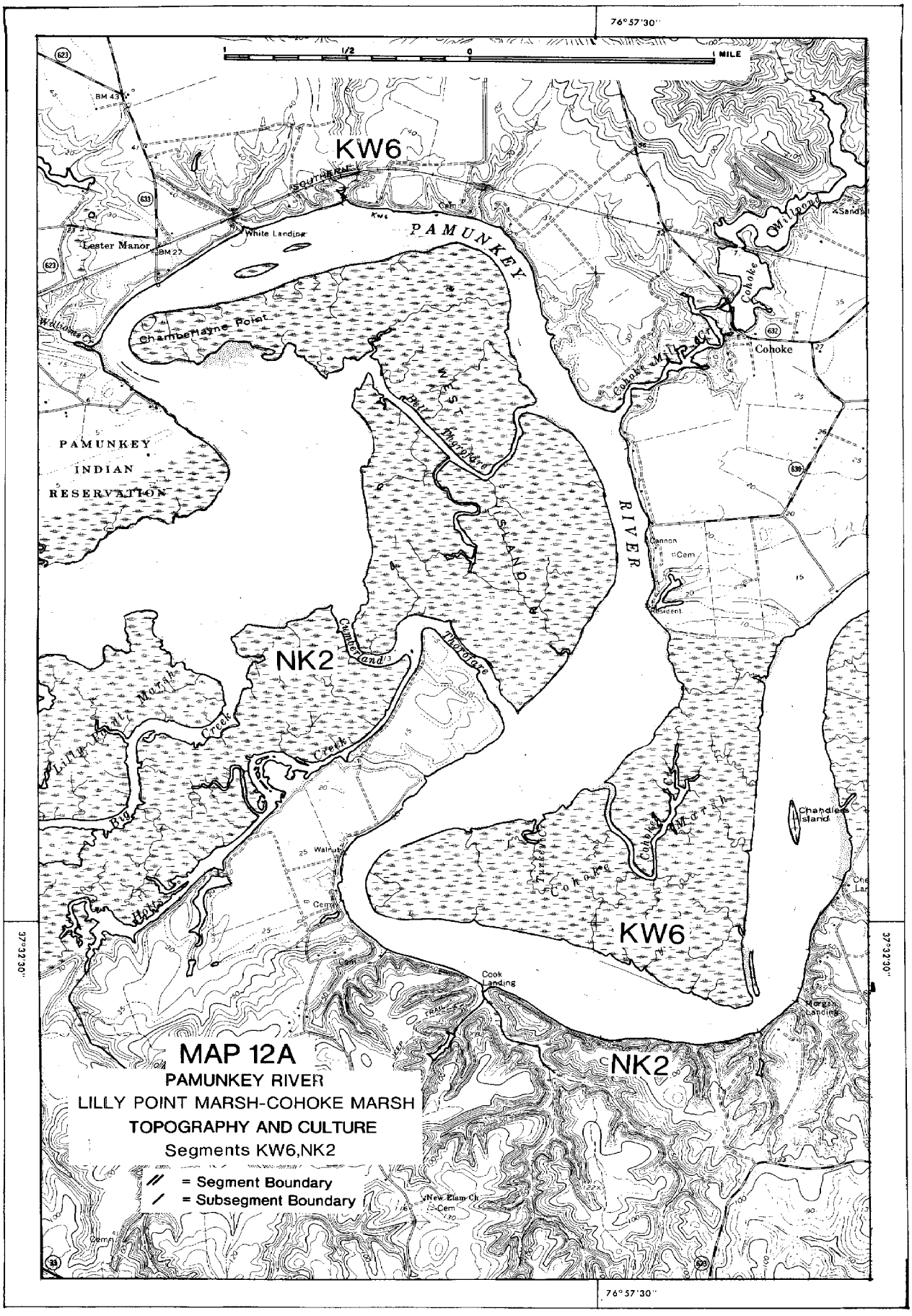


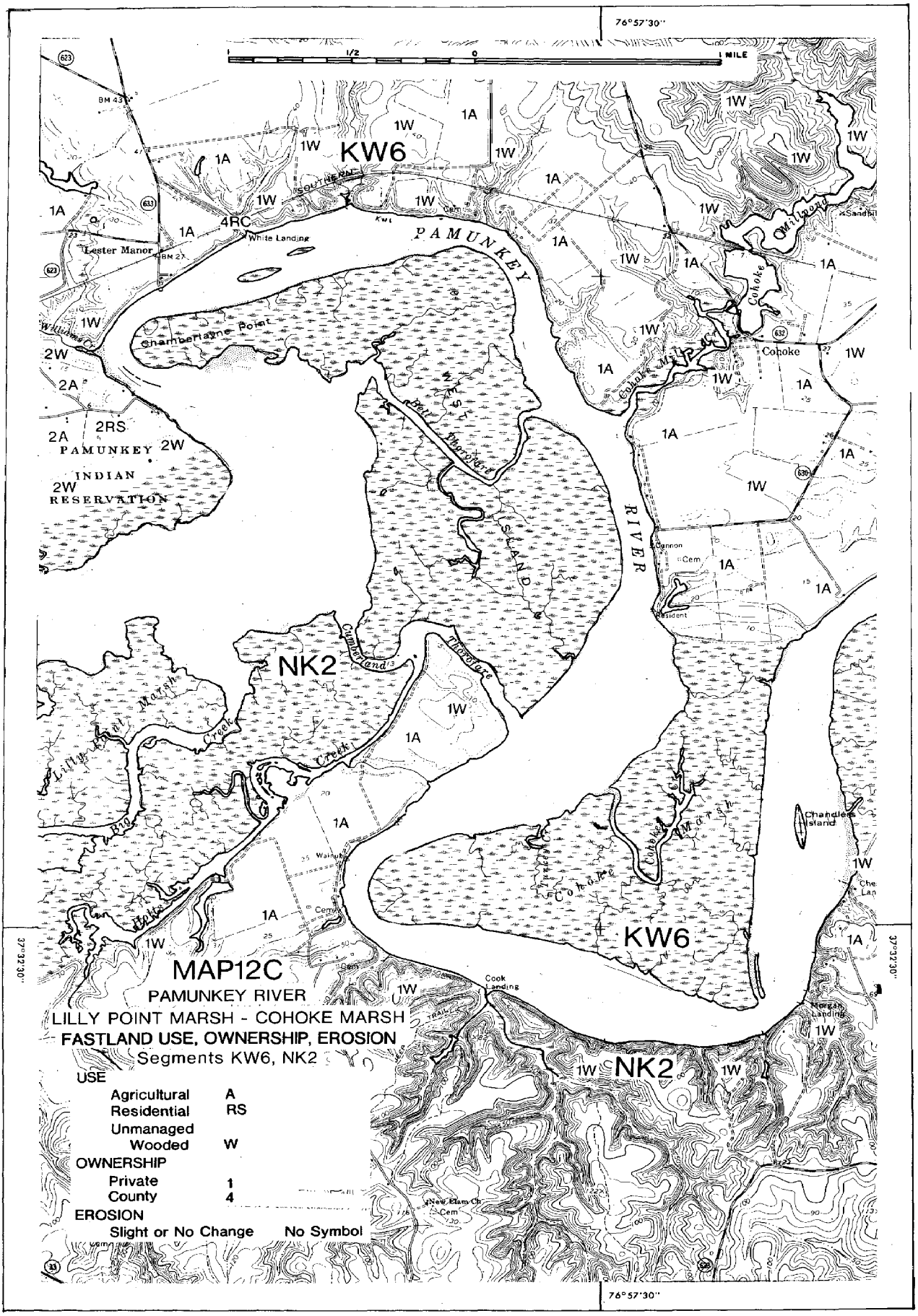
MAP 11A
PAMUNKEY RIVER
SWEET HALL MARSH
TOPOGRAPHY AND CULTURE
Segments KW5, KW6, NK2, NK3
// = Segment Boundary
/ = Subsegment Boundary

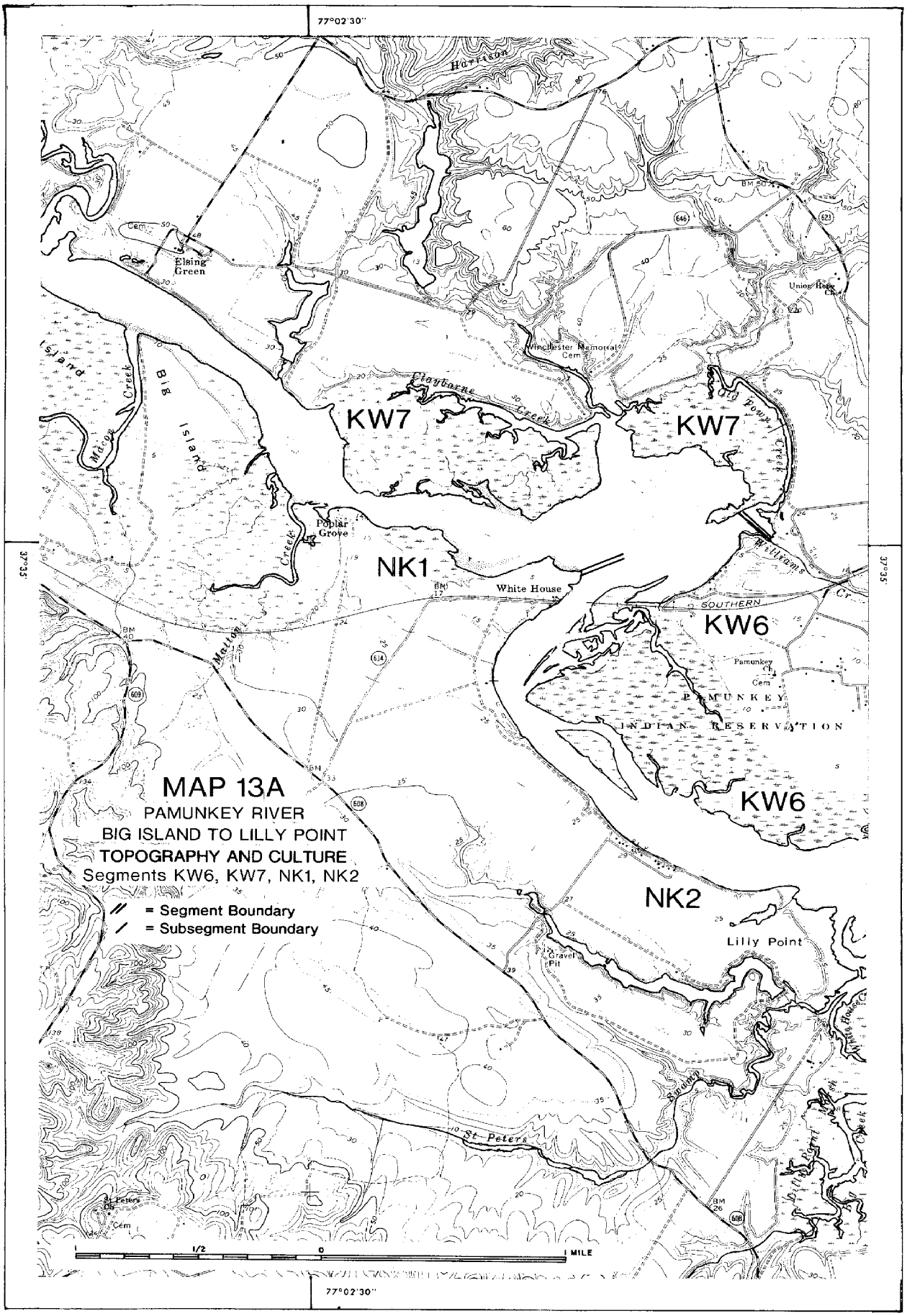

76°55'
1/2
0
MILE
MAP 11B
PAMUNKEY RIVER
SWEET HALL MARSH
KW6
KW5
NK3
NK2
KW5
NK3
Sweet Hall
Brickhouse Landing
Cooks Millpond
37°32'30"
SHORELANDS TYPES
Segments KW6, KW5, NK2, NK3
FASTLAND
Low Shore
Moderately Low Shore with Bluff
Moderately High Shore
Moderately High Shore with Bluff
High Shore with Bluff
SHORE
Fringe Marsh
Extensive Marsh
Embayed Marsh
NEARSHORE
Narrow


MAP 11C
PAMUNKEY RIVER
SWEET HALL MARSH
FASTLAND USE, OWNERSHIP, EROSION
Segments KW6, KW5, NK2, NK3
USE
Agricultural A
Unmanaged
Wooded W
OWNERSHIP
Private 1
EROSION
No Data
1/2
0
1 MILE
76°55'
37°32'30"
KW6
KW5
NK2
NK3
Sweet Hall
Sweet Hall Landing
Brickhouse Landing
Cousiac Marsh
Sweet Hall Marsh
Hill Marsh
Mill Creek
Cooks Millpond
Second Elam Ch
Sandpit
1A
1W


76°57'30"
1/2
0
1 MILE
KW6
PAMUNKEY
RIVER
Lester Manor
White Landing
PAMUNKEY
INDIAN
RESERVATION
Cohoke
Cohoke Millpond
Cannon
Cem
Resident
NK2
Cumberland
Lilly Point Marsh
Creek
Big
Cohoke Marsh
Chandlers Island
Cook
Morgan Landing
KW6
NK2
37°32'30"
37°32'30"
MAP 12B
PAMUNKEY RIVER
LILLY POINT MARSH-COHOKE MARSH
SHORELANDS TYPES
Segments KW6,NK2
FASTLAND
Low Shore
Moderately Low Shore
Moderately Low Shore with Bluff
Moderately High Shore
High Shore with Bluff
SHORE
Fringe Marsh
Extensive Marsh
Embayed Marsh
NEARSHORE
Narrow
76°57'30"

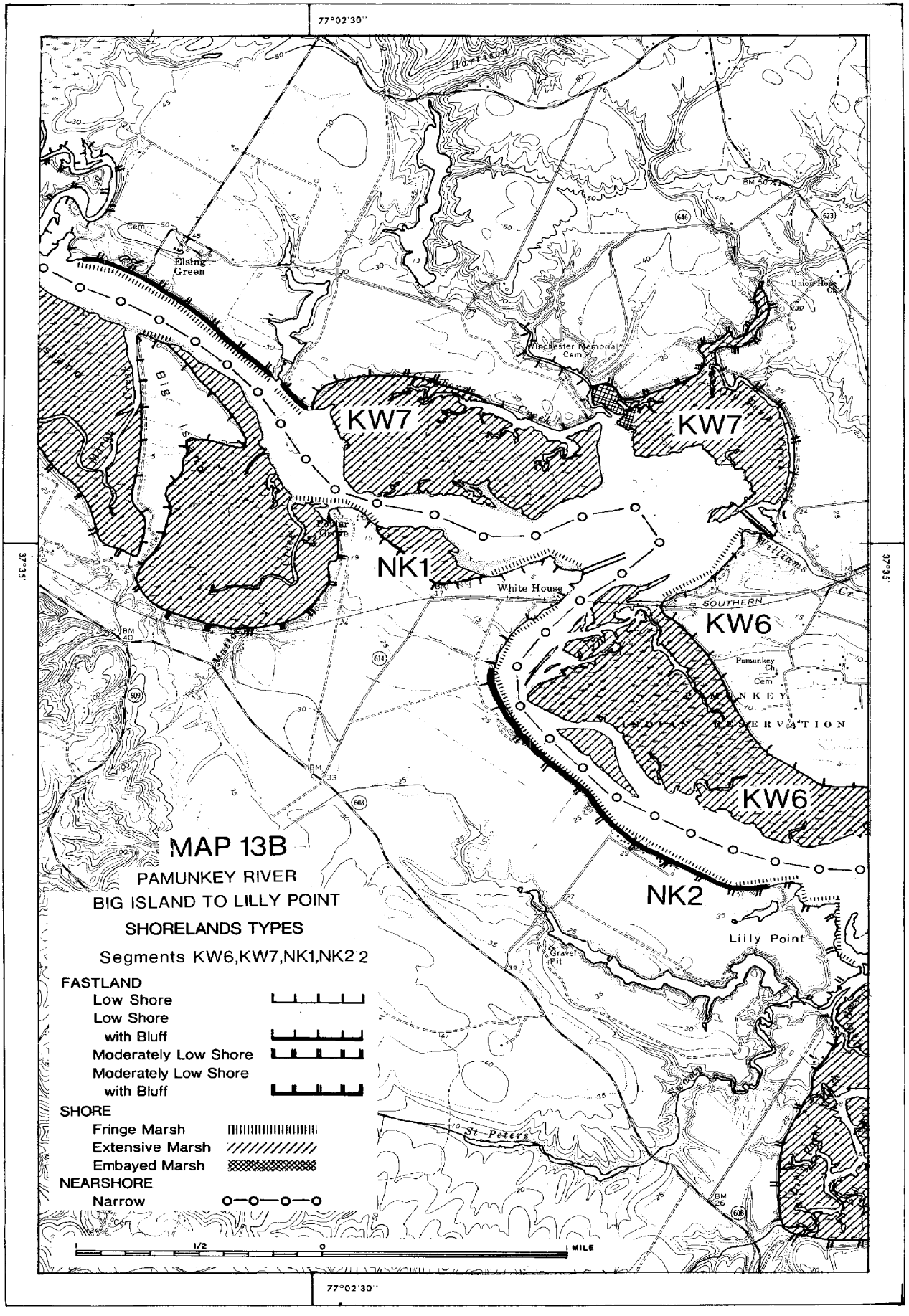

76°57'30"
1/2
0
1 MILE
KW6
PAMUNKEY
RIVER
White Landing
Lester Manor
Chamberlayne Point
Cohoke
Cohoke Mill Cr
Cohoke Millpond
PAMUNKEY
INDIAN
RESERVATION
Belt Thorofare
Cumberland Thorofare
NK2
Lilly Point Marsh
Big Creek
Holts Creek
Cohoke Marsh
Chandlers Island
Cook Landing
Morgan Landing
New Elam Ch
Cem
37°32'30"
MAP 12A
PAMUNKEY RIVER
LILLY POINT MARSH-COHOKE MARSH
TOPOGRAPHY AND CULTURE
Segments KW6,NK2
= Segment Boundary
= Subsegment Boundary

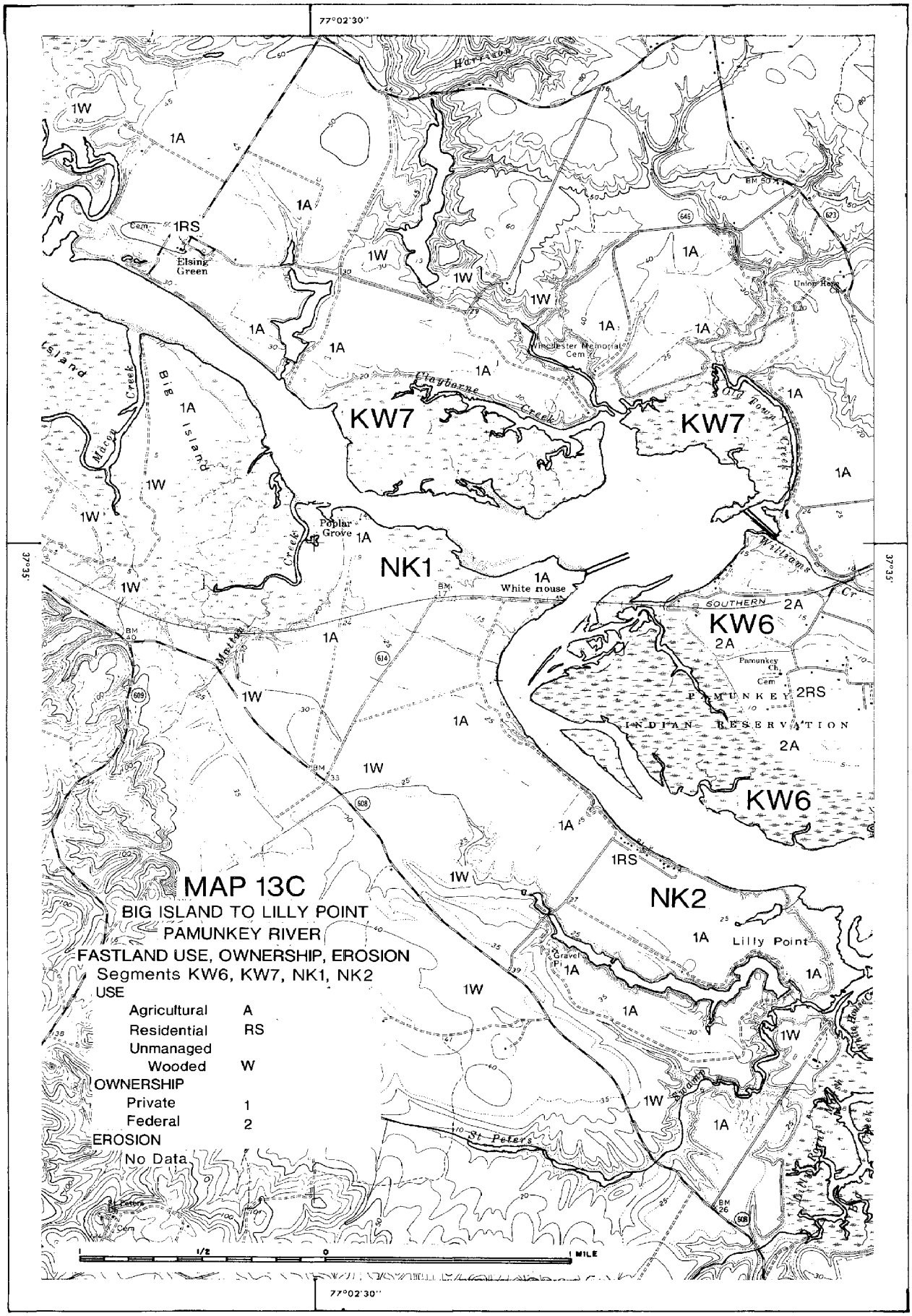

76°57'30"
1/2
0
1 MILE
KW6
NK2
PAMUNKEY
RIVER
Chamberlayne Point
Lester Manor
White Landing
Cohoke
Cohoke Mill Pond
Cohoke Mill Cr
Cohoke Marsh
Cumberland Thorofare
Bell Thorofare
Lilly Point Marsh
Big Creek
Cook Landing
Chandlers Island
Morgan Landing
New Elam Ch
PAMUNKEY INDIAN RESERVATION
Cannon Cem
Resident
Walnut
Cem
1A
1W
2A
2W
2RS
4RC
37°32'30"
MAP12C
PAMUNKEY RIVER
LILLY POINT MARSH - COHOKE MARSH
FASTLAND USE, OWNERSHIP, EROSION
Segments KW6, NK2
USE
Agricultural A
Residential RS
Unmanaged Wooded W
OWNERSHIP
Private 1
County 4
EROSION
Slight or No Change No Symbol

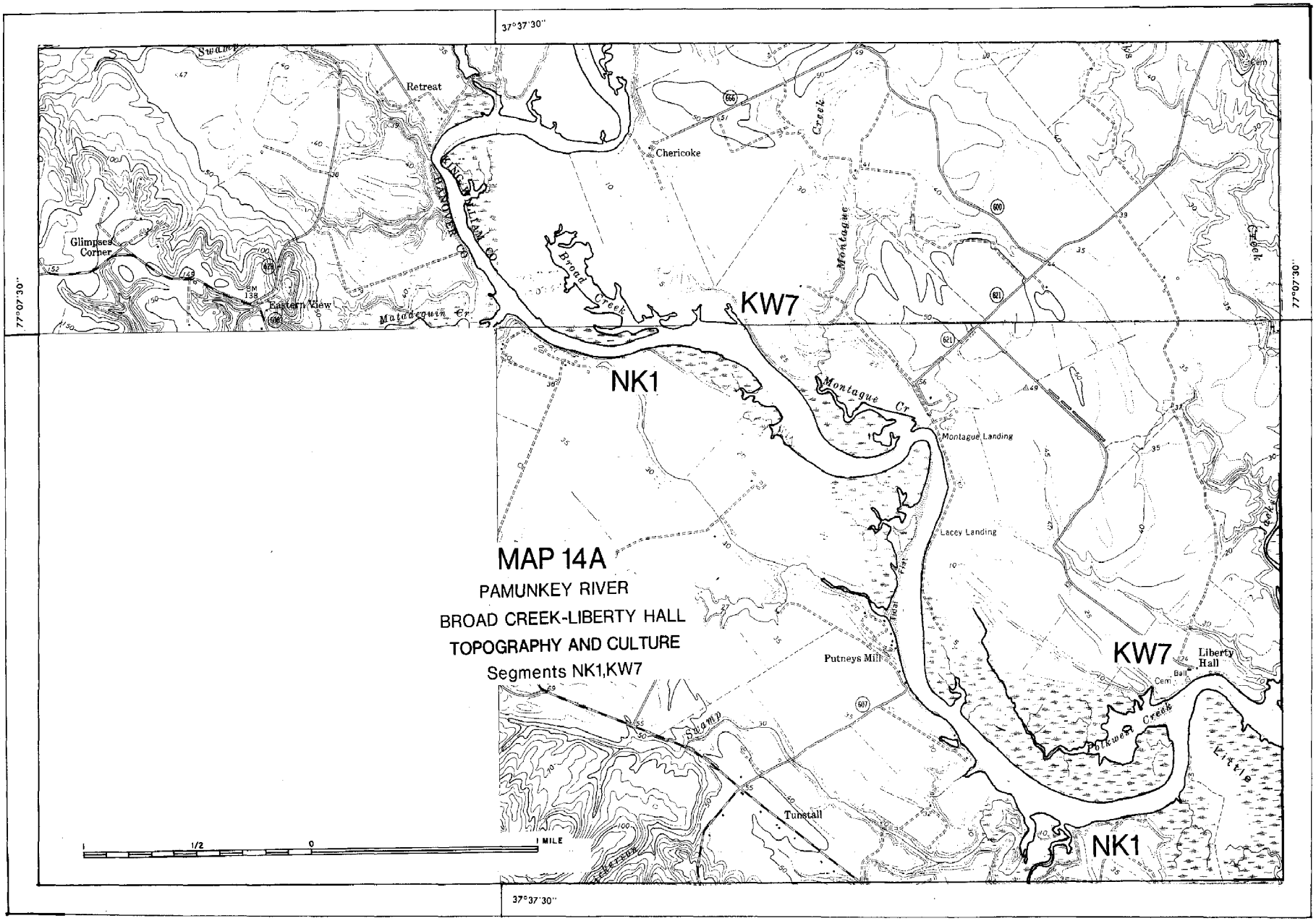


MAP 13A
PAMUNKEY RIVER
BIG ISLAND TO LILLY POINT
TOPOGRAPHY AND CULTURE
Segments KW6, KW7, NK1, NK2

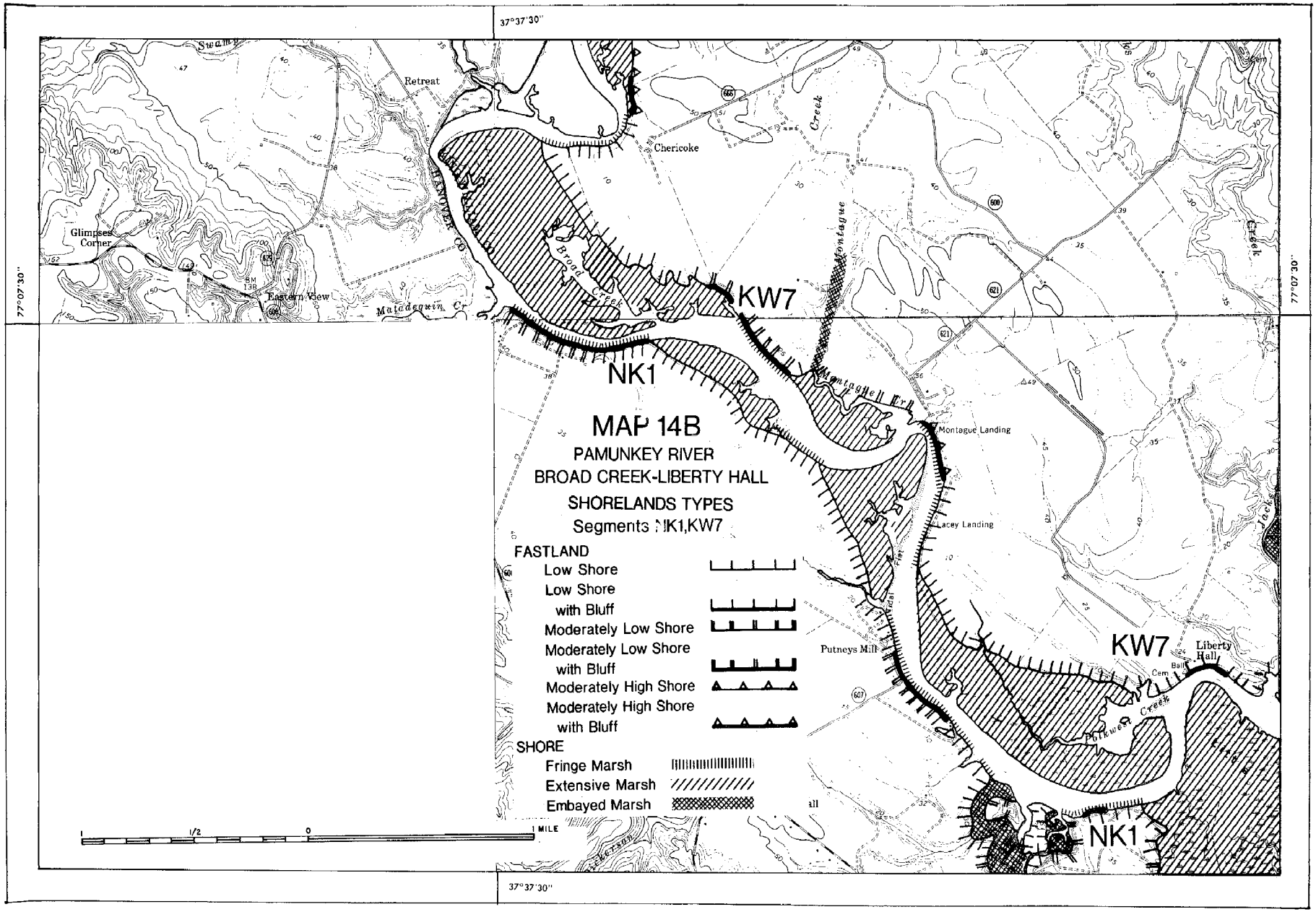
// = Segment Boundary
/ = Subsegment Boundary

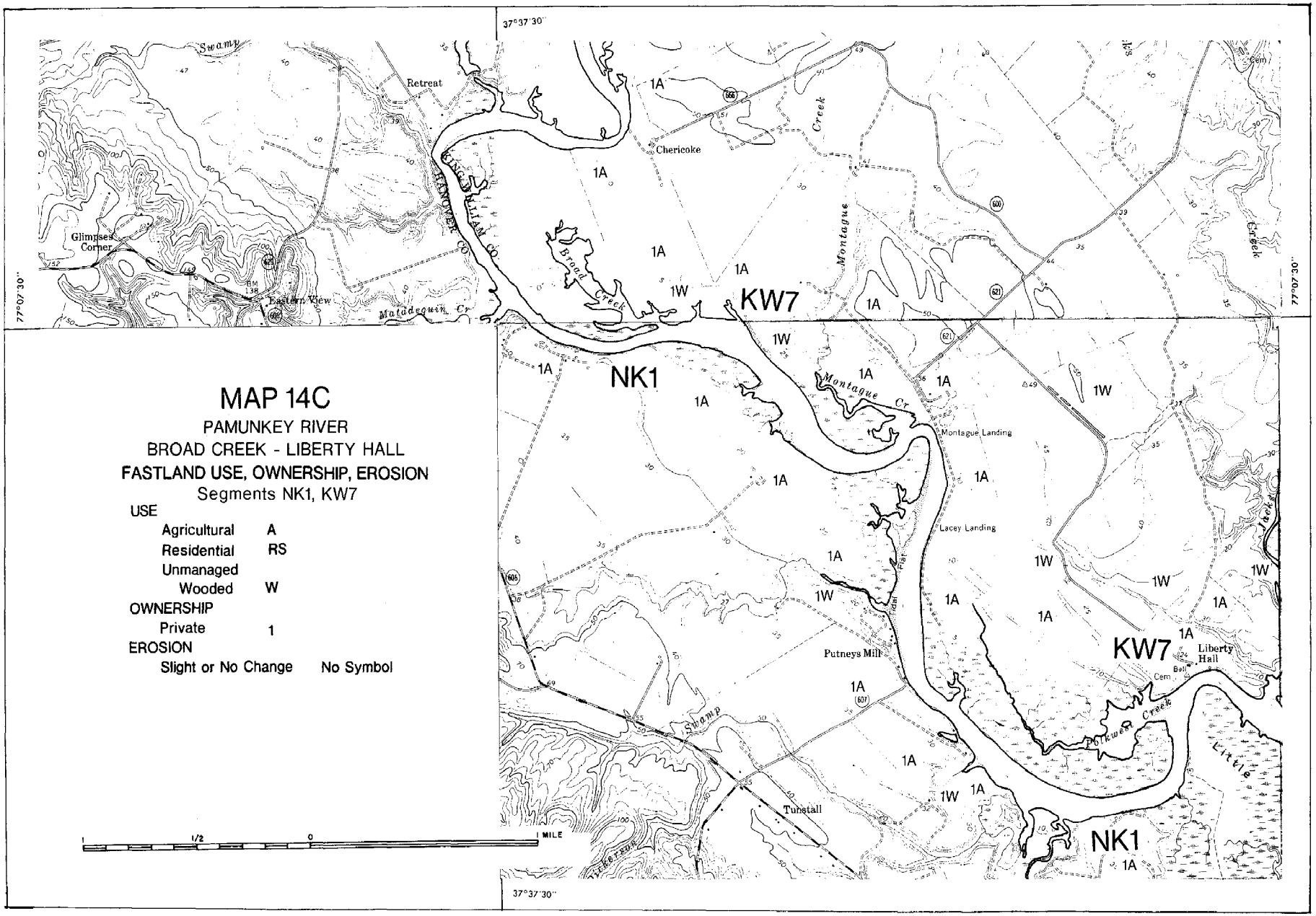

77°02'30"
37°3.5'
KW7
KW7
NK1
KW6
KW6
NK2
White House
Elsing Green
Winchester Memorial Cem
Union Hope
Pamunkey Ch Cem
INDIAN RESERVATION
Lilly Point
Gravel Pit
St Peters
MAP 13B
PAMUNKEY RIVER
BIG ISLAND TO LILLY POINT
SHORELANDS TYPES
Segments KW6,KW7,NK1,NK2 2
FASTLAND
Low Shore
Low Shore with Bluff
Moderately Low Shore
Moderately Low Shore with Bluff
SHORE
Fringe Marsh
Extensive Marsh
Embayed Marsh
NEARSHORE
Narrow
1
1/2
0
1 MILE


77°02'30"
37°35'
KW7
KW7
NK1
KW6
KW6
NK2
1W
1A
1RS
2A
2RS
Elsing Green
Big Island
Macon Creek
Poplar Grove
White House
Winchester Memorial Cem
Claybarne Creek
Old Town Creek
Williams Cr
SOUTHERN
Pamunkey Ch. Cem
PAMUNKEY INDIAN RESERVATION
Lilly Point
Gravel Pit
St Peters
Swamp
Harrison
1/2
0
1 MILE
MAP 13C
BIG ISLAND TO LILLY POINT
PAMUNKEY RIVER
FASTLAND USE, OWNERSHIP, EROSION
Segments KW6, KW7, NK1, NK2
USE
Agricultural A
Residential RS
Unmanaged Wooded W
OWNERSHIP
Private 1
Federal 2
EROSION
No Data



MAP 14A
PAMUNKEY RIVER
BROAD CREEK-LIBERTY HALL
TOPOGRAPHY AND CULTURE
Segments NK1,KW7


37°37'30"
77°07'30"
Retreat
Chericoke
Glimpses Corner
Eastern View
Matadequin Cr
Broad Creek
Montague Creek
Montague Landing
Lacey Landing
Putneys Mill
Liberty Hall
Cem
Ball
Polkwest Creek
KW7
NK1
MAP 14B
PAMUNKEY RIVER
BROAD CREEK-LIBERTY HALL
SHORELANDS TYPES
Segments NK1,KW7
FASTLAND
Low Shore
Low Shore with Bluff
Moderately Low Shore
Moderately Low Shore with Bluff
Moderately High Shore
Moderately High Shore with Bluff
SHORE
Fringe Marsh
Extensive Marsh
Embayed Marsh
1 1/2 0 1 MILE



MAP 14C

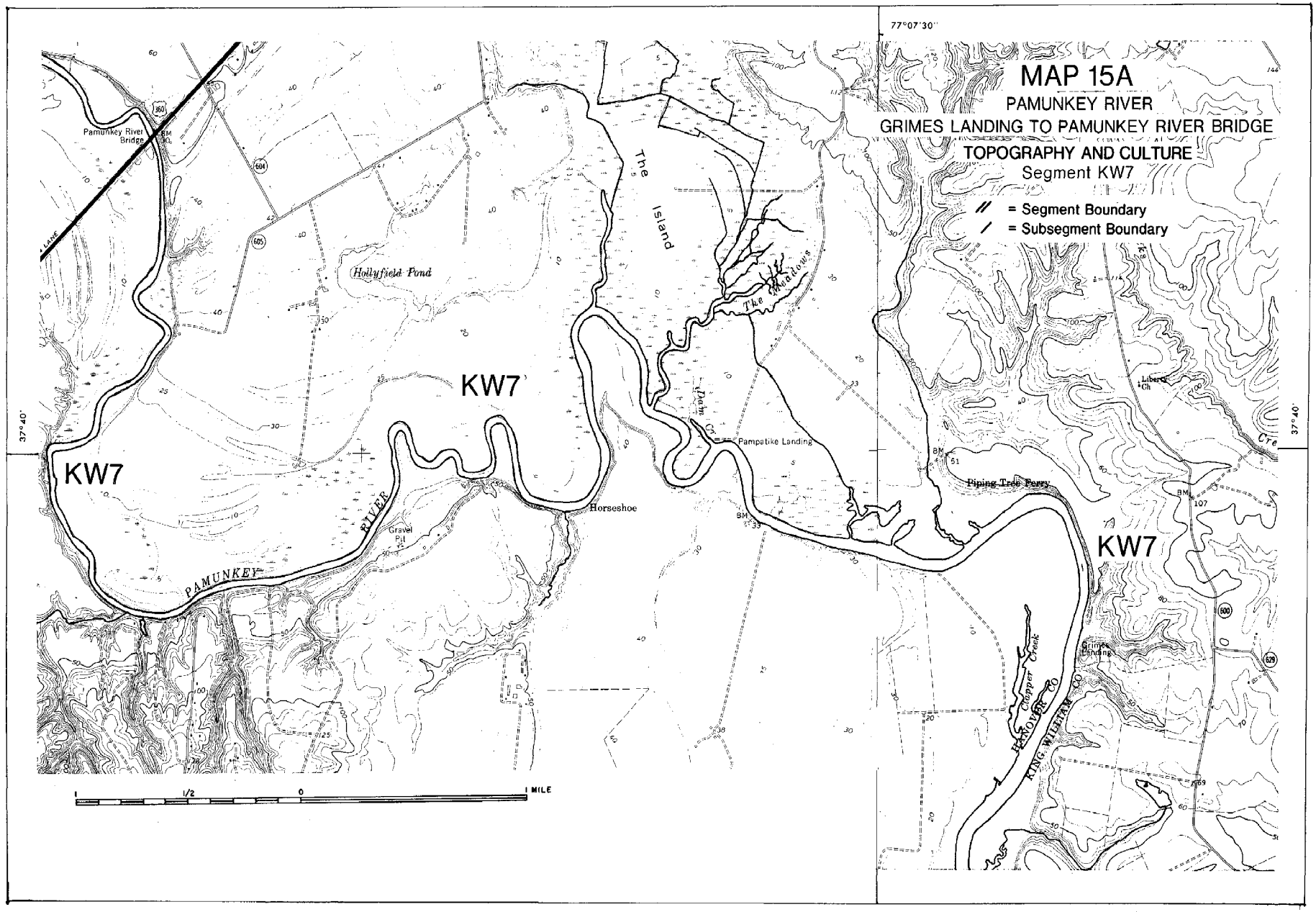
PAMUNKEY RIVER

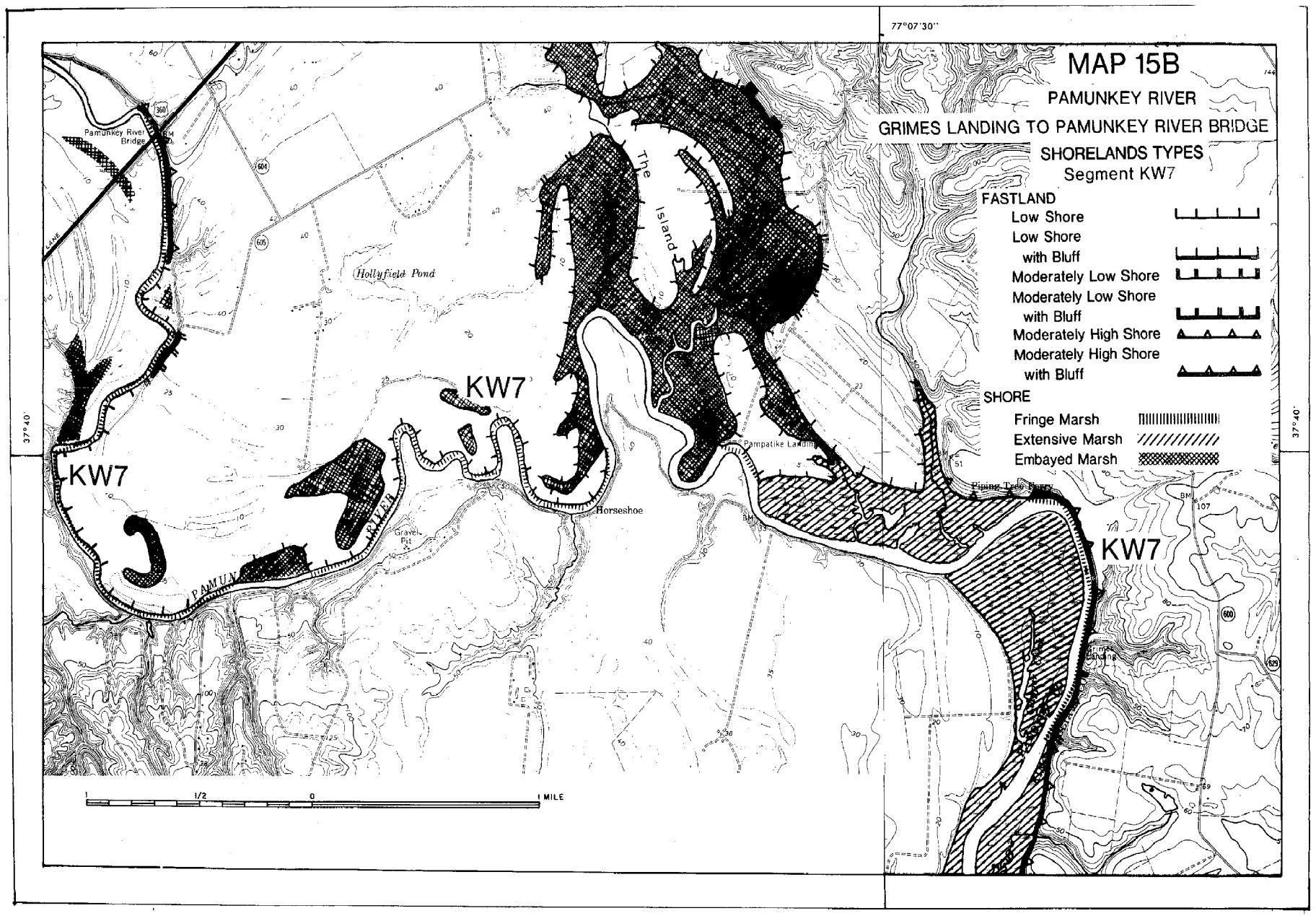
BROAD CREEK - LIBERTY HALL

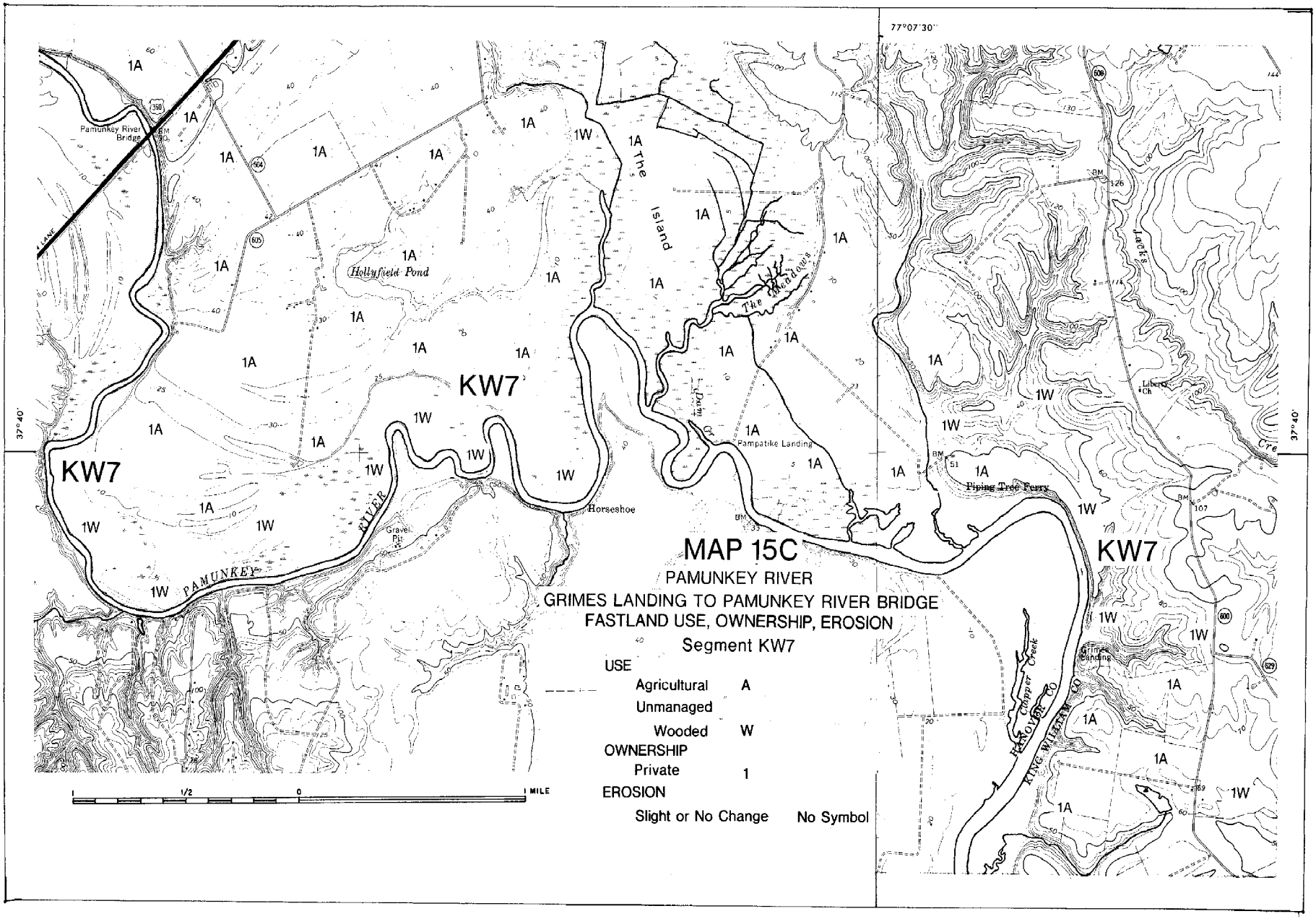
FASTLAND USE, OWNERSHIP, EROSION

Segments NK1, KW7

USE	
Agricultural	A
Residential	RS
Unmanaged Wooded	W
OWNERSHIP	
Private	1
EROSION	
Slight or No Change	No Symbol


MAP 15A
PAMUNKEY RIVER
GRIMES LANDING TO PAMUNKEY RIVER BRIDGE
TOPOGRAPHY AND CULTURE
Segment KW7
= Segment Boundary
= Subsegment Boundary
77°07'30"
37°40'
KW7
KW7
KW7
Pamunkey River Bridge
Hollyfield Pond
The Island
The Meadows
Pampatike Landing
Horseshoe
Gravel Pit
PAMUNKEY RIVER
Piping Tree Ferry
Chapper Creek
KING WILLIAM CO
1/2
0
1 MILE


77°07'30"
MAP 15B
PAMUNKEY RIVER
GRIMES LANDING TO PAMUNKEY RIVER BRIDGE
SHORELANDS TYPES
Segment KW7
FASTLAND
Low Shore
Low Shore with Bluff
Moderately Low Shore
Moderately Low Shore with Bluff
Moderately High Shore
Moderately High Shore with Bluff
SHORE
Fringe Marsh
Extensive Marsh
Embayed Marsh
KW7
KW7
KW7
37°40'
37°40'
Pamunkey River Bridge
Hollyfield Pond
The Island
Pampatike Landing
Horseshoe
Gravel Pit
Piping Tree Park
Grimes Landing
PAMUNKEY RIVER
1
1/2
0
1 MILE



MAP 15C

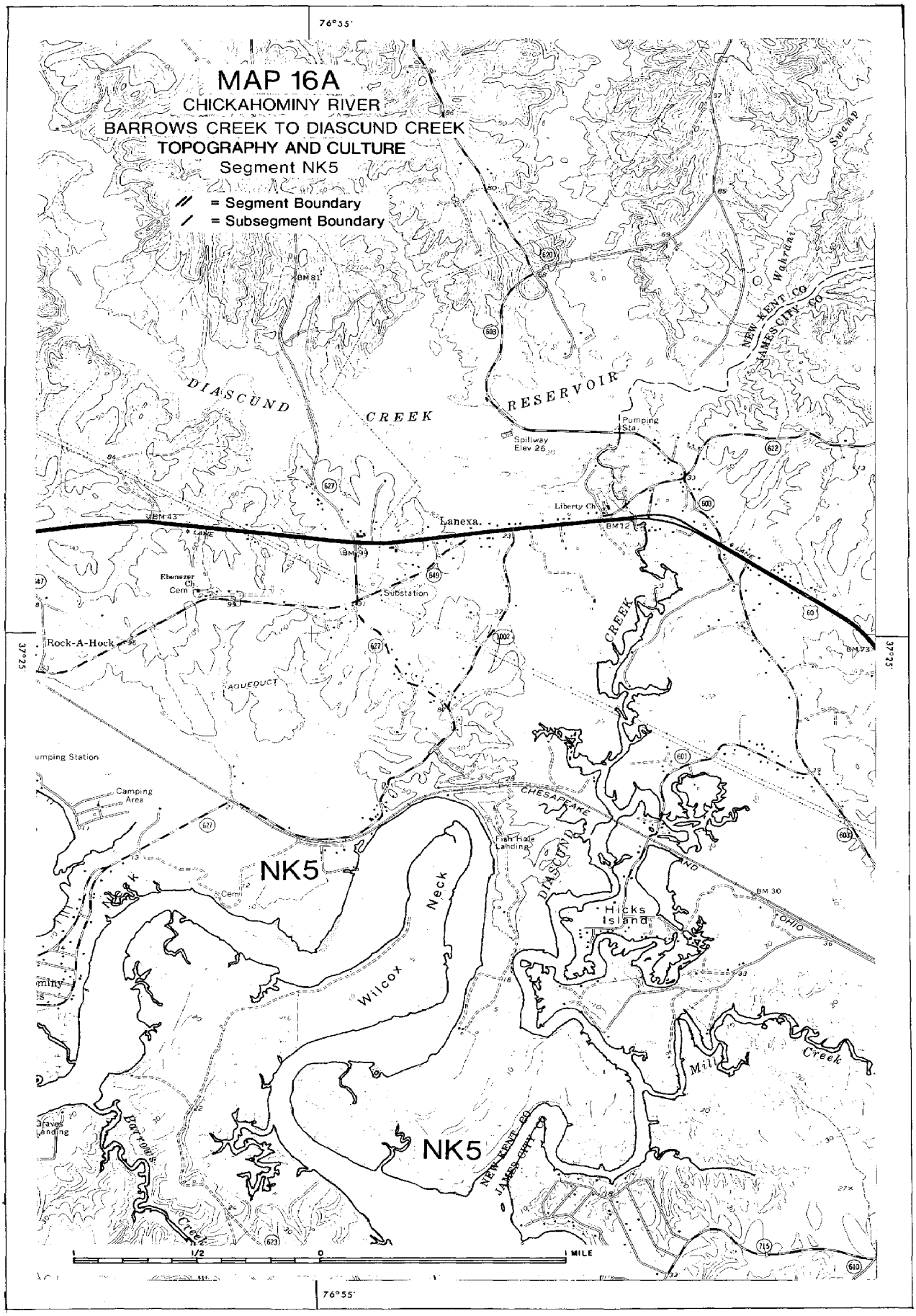
PAMUNKEY RIVER

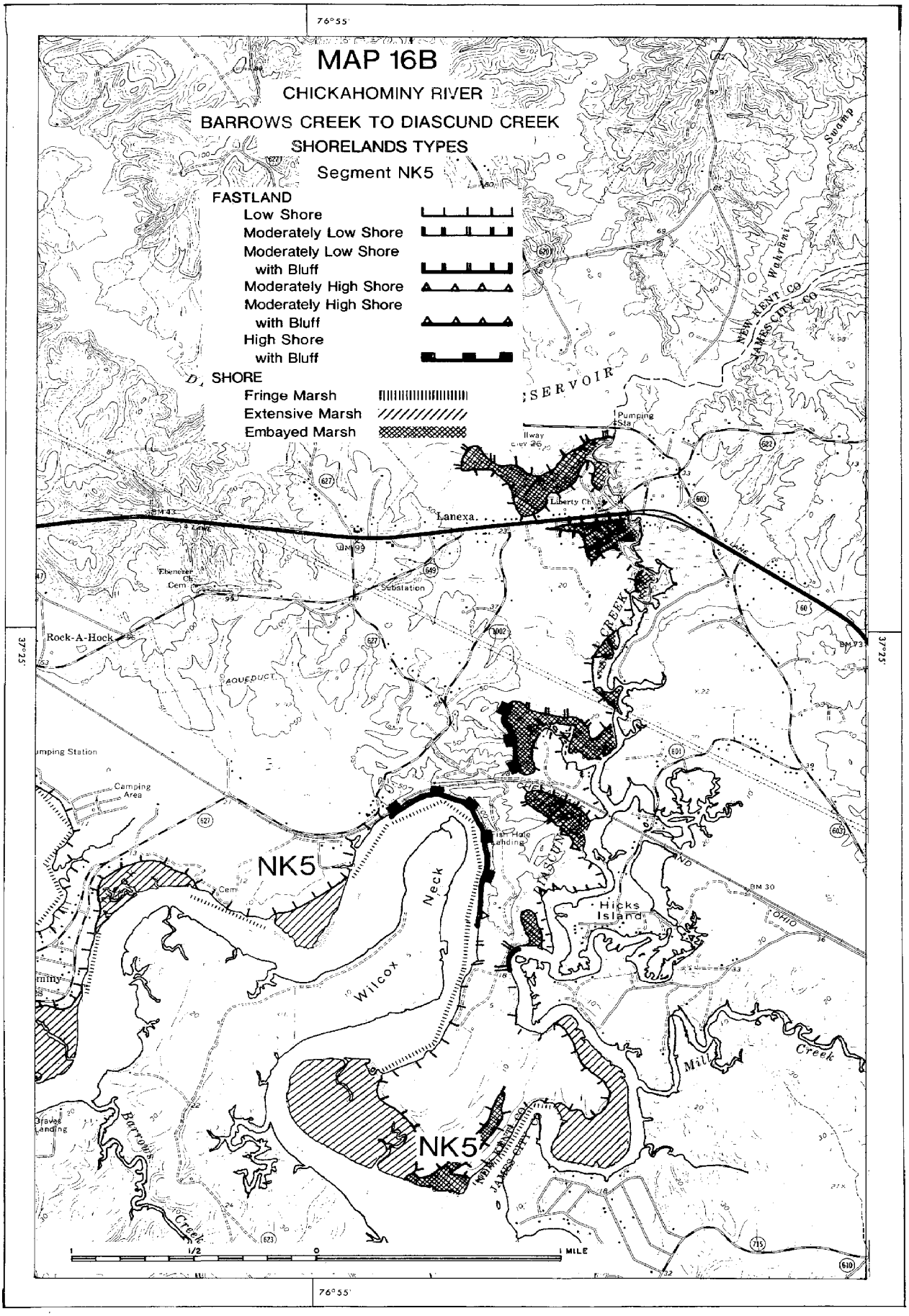
GRIMES LANDING TO PAMUNKEY RIVER BRIDGE

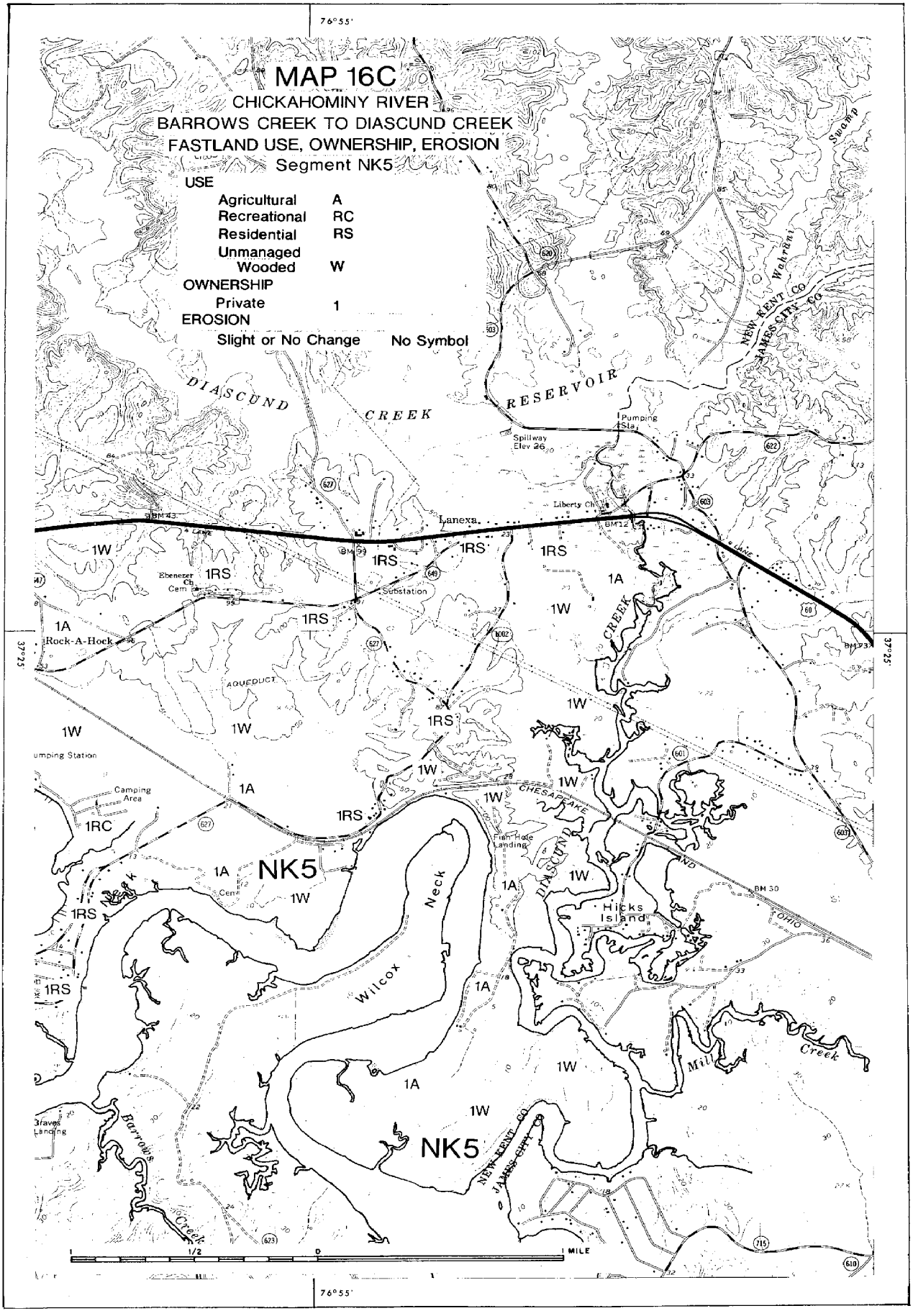
FASTLAND USE, OWNERSHIP, EROSION

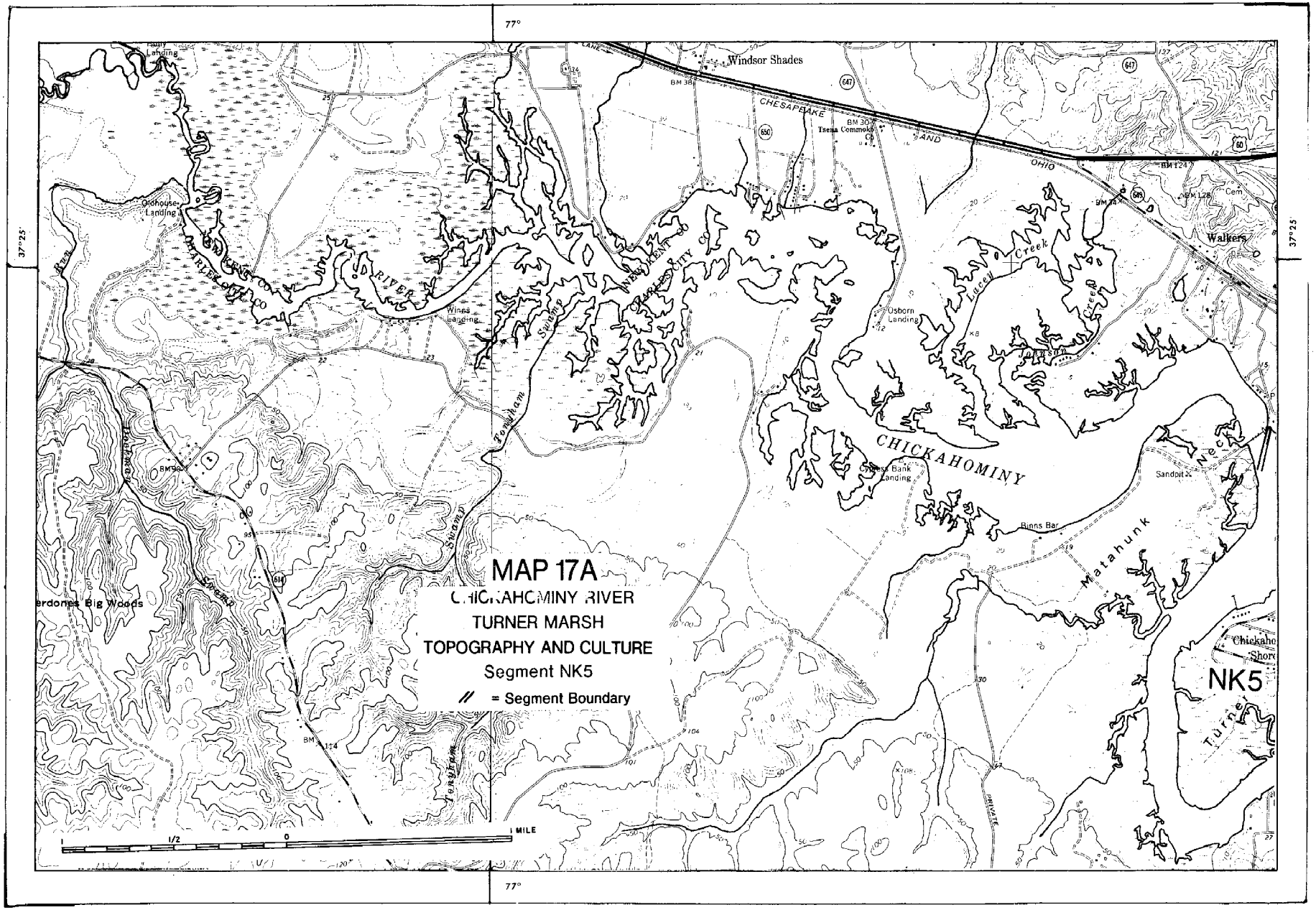
Segment KW7

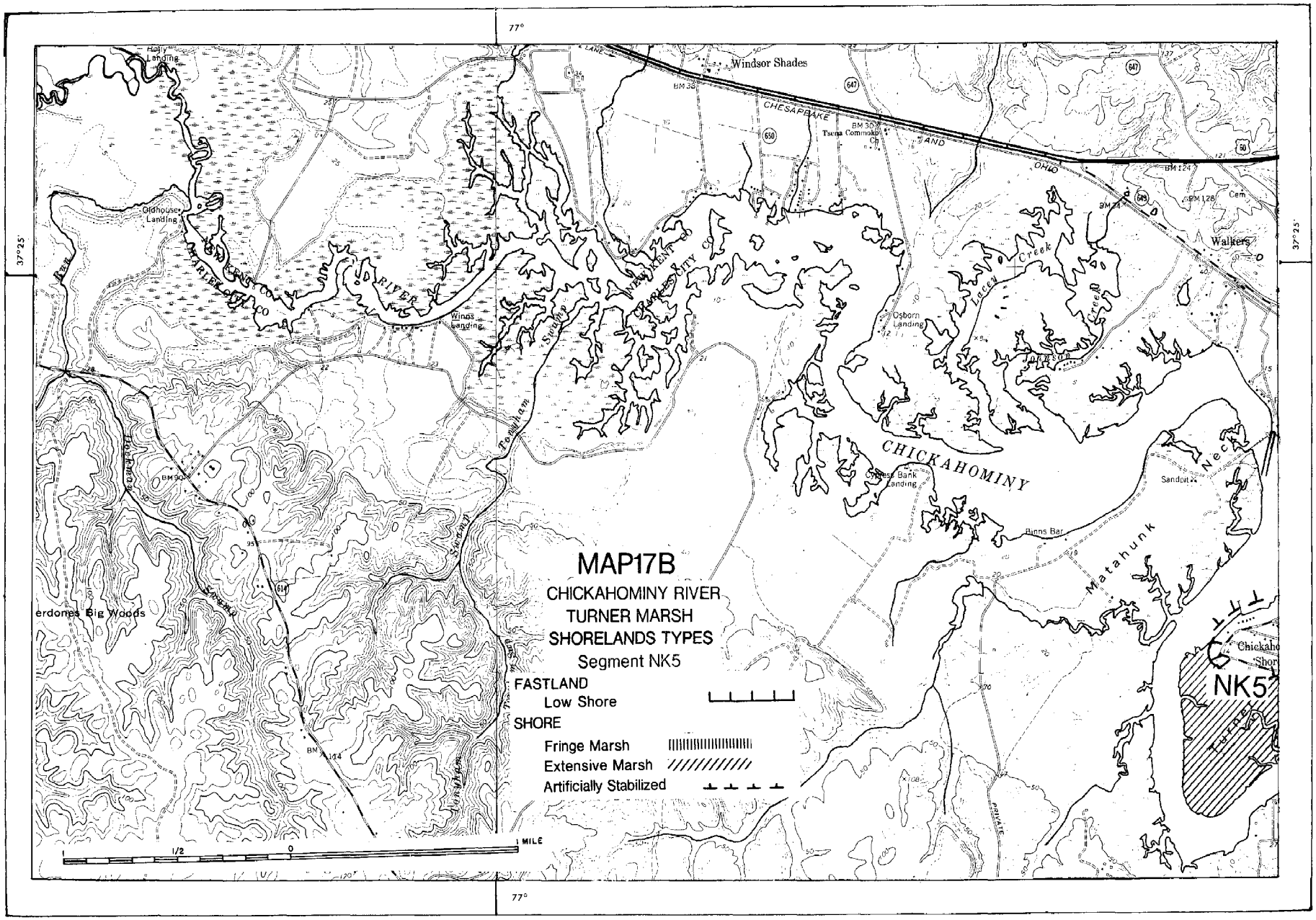
USE		
Agricultural Unmanaged	A	
Wooded	W	
OWNERSHIP		
Private	1	
EROSION		
Slight or No Change		No Symbol

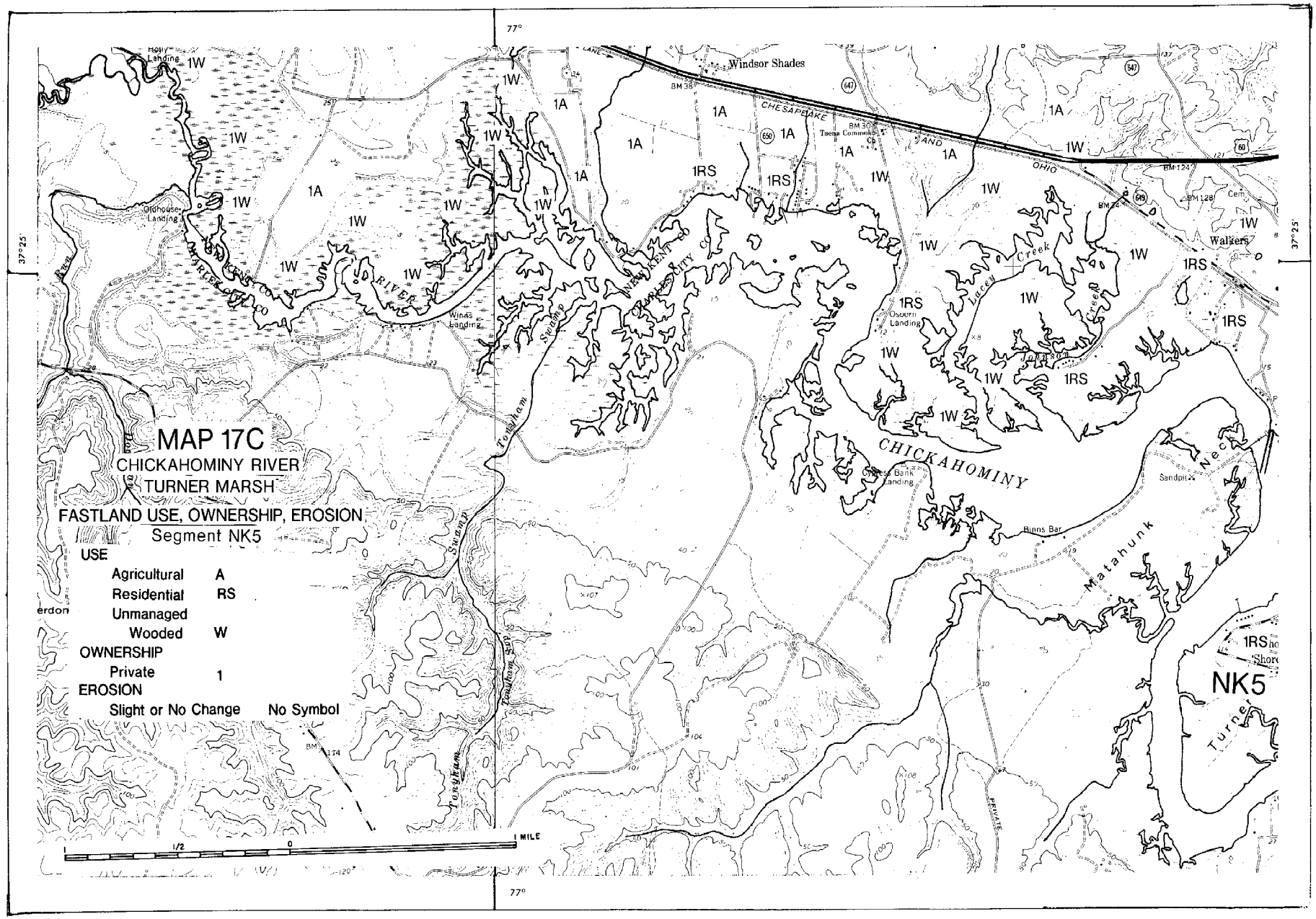

MAP 16A
CHICKAHOMINY RIVER
BARROWS CREEK TO DIASCUND CREEK
TOPOGRAPHY AND CULTURE
Segment NK5
= Segment Boundary
= Subsegment Boundary
76°55'
37°25'
DIASCUND CREEK RESERVOIR
Spillway Elev 26
Pumping Sta
Liberty Ch
Lanexa
Ebenezer Ch
Cem
Substation
Rock-A-Hock
AQUEDUCT
umping Station
Camping Area
CHESAPEAKE AND OHIO
Fish Hole Landing
DIASCUND CREEK
Hicks Island
Wilcox Neck
Neck
Mill Creek
Barrows Creek
Graves Landing
NK5
NK5
NEW KENT CO
JAMES CITY CO
Wahrani Swamp
1/2
0
1 MILE


MAP 16B
CHICKAHOMINY RIVER
BARROWS CREEK TO DIASCUND CREEK
SHORELANDS TYPES
Segment NK5
FASTLAND
Low Shore
Moderately Low Shore
Moderately Low Shore with Bluff
Moderately High Shore
Moderately High Shore with Bluff
High Shore with Bluff
SHORE
Fringe Marsh
Extensive Marsh
Embayed Marsh
76°55'
37°25'
Lanexa
Rock-A-Hock
Ebenezer Ch
Cem
Substation
Pumping Sta
Liberty Ch
Camping Area
Wilcox Neck
Hicks Island
Mill Creek
Barrows Creek
NK5
NK5
1/2
0
1 MILE


MAP 16C
CHICKAHOMINY RIVER
BARROWS CREEK TO DIASCUND CREEK
FASTLAND USE, OWNERSHIP, EROSION
Segment NK5
USE
Agricultural A
Recreational RC
Residential RS
Unmanaged Wooded W
OWNERSHIP
Private 1
EROSION
Slight or No Change No Symbol
76°55'
37°25'
DIASCUND CREEK
RESERVOIR
Spillway Elev 26
Pumping Sta
Lanexa
Liberty Ch
BM 43
BM 99
BM 12
BM 73
Ebenezer Ch
Cem
Substation
Rock-A-Hock
AQUEDUCT
Camping Area
Fish Hole Landing
CHESAPEAKE & OHIO
Hicks Island
BM 30
Wilcox Neck
Barrows Creek
Graves Landing
Mill Creek
NEW KENT CO
JAMES CITY CO
Wahrani Swamp
NK5
NK5
1W
1RS
1A
1RC
1/2
0
1 MILE


MAP 17A
CHICKAHOMINY RIVER
TURNER MARSH
TOPOGRAPHY AND CULTURE
Segment NK5
// = Segment Boundary
NK5
77°
37°25'
Windsor Shades
CHESAPEAKE AND OHIO
Tsena Commoke Co
Walkers
Cem
Oldhouse Landing
Winns Landing
Osborn Landing
Lacey Creek
Johnson Creek
CHICKAHOMINY
Cypress Bank Landing
Binns Bar
Sandpit
Matahunk Neck
Turner
Tonyham Swamp
Swamp
Dookman Swamp
Run
NEW KENT CO
CHARLES CITY CO
RIVER
erdones Big Woods
PRIVATE
1/2
0
1 MILE


MAP17B
CHICKAHOMINY RIVER
TURNER MARSH
SHORELANDS TYPES
Segment NK5
FASTLAND
Low Shore
SHORE
Fringe Marsh
Extensive Marsh
Artificially Stabilized
NK5
CHICKAHOMINY
Matahunk
Windsor Shades
Walkers
Osborn Landing
Cypress Bank Landing
Winns Landing
Oldhouse Landing
Holly Landing
Tsena Commoko Ch
Sandpit
Binns Bar
Lacey Creek
Johnson Creek
Tonyham Swamp
Swamp
Turner
1/2
0
1 MILE
77°
37°25'


MAP 17C
CHICKAHOMINY RIVER
TURNER MARSH
FASTLAND USE, OWNERSHIP, EROSION
Segment NK5
USE
Agricultural A
Residential RS
Unmanaged
Wooded W
OWNERSHIP
Private 1
EROSION
Slight or No Change No Symbol
1 MILE
1/2
0
77°
37°25'
Windsor Shades
CHESAPEAKE AND OHIO
Walkers
Oldhouse Landing
Winns Landing
Osborn Landing
Cypress Bank Landing
Binns Bar
Sandpit
Matahunk Neck
CHICKAHOMINY
Lacey Creek
Johnson Creek
Tonyham Swamp
Turner
NK5
1W
1A
1RS

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3 6668 00002 4705