Chesapeake Research Consortium, Incorporated

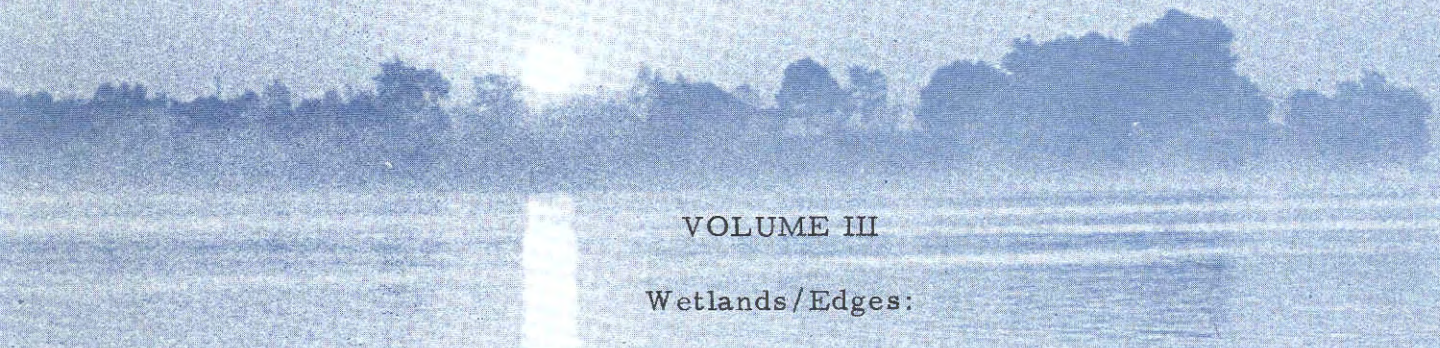
ANNUAL TECHNICAL REPORT

NSF/RANN GRANT G. I. 38973

1973-1974

Submitted to the

NATIONAL SCIENCE FOUNDATION



VOLUME III

Wetlands/Edges:

PRESSURES ON THE EDGES OF CHESAPEAKE BAY

CRC PUBLICATION NO. 43

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The Johns Hopkins University Smithsonian Institution
University of Maryland Virginia Institute of Marine Science

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PREFACE

With funds provided by the Research Applied to National Needs program of the National Science Foundation (Grant No. G.I. 38973), investigators associated with the Wetlands/Edges Program of the Chesapeake Research Consortium initiated a study during the fall of 1973 addressed to the problem of incremental physical alterations of the edges of Chesapeake Bay. The goal of this study is:

> To develop information, criteria and guidelines which can be used by public administrators to manage physical alterations of Chesapeake Bay in a manner that will enhance the uses of the region.

Objectives considered necessary for attainment of the program goal have also been established. The objectives are:

1. An identification of the nature and extent of present demands for physical alterations of the edges of the Bay.

2. A determination of the types and characteristics of environmental impacts resulting from various types of physical alterations.

3. A better understanding of the societal value choices which ultimately underlie agency decisions relating to utilization of the edges of Chesapeake Bay.

4. A greater understanding of the decision making process pertaining to physical alterations of the Bay.

5. Preparation for use by public administrators of criteria and guidelines for making decisions to avoid or mitigate the negative impacts of proposed projects.

6. A complete documentation of the results, the case study process, and the additional priority informational needs of management relating to physical alterations of the Bay.

The research approach selected to achieve the goal and objectives of the study involves three distinct but related activities.

(1) Analysis of permit applications for physical alteration of the edges of Chesapeake Bay (approximately 2,000) which were submitted to the Corps of Engineers during 1973.

(2) Detailed case studies (approximately 40) of a representative set of physical alteration permit applications.

(3) Specific research projects which will be designed to provide information needed by regulatory agencies for permit proposal decisions.

Substantial progress has been made with the analysis of permit applications which were submitted to the Baltimore and Norfolk Offices of the Corps of Engineers during 1973. Upon completion of the analysis, a report entitled, "Pressures on the Edges of Chesapeake Bay - 1973" will be published. The report is being designed to give local, state, and federal management personnel of the Chesapeake region a more detailed and useful understanding of the present pressures for the physical alteration of the edges of Chesapeake Bay, thereby, enabling Bay managers to better focus their attention on the more significant environmental problems. An April 15, 1974 publication date has been established for the "Pressures Report."

Work has also been initiated on the second activity listed above - case studies. The material presented herein represents the first case study report. Both the study and the report represents the collective efforts of a multidisciplinary task force which worked under the general direction of Professor Garrett Power of the University of Maryland. Task force members are:

Dr. Robert J. Byrne, Geologist, Virginia Institute of Marine Science
Dr. V. J. Chapman, Biologist, Auckland University, Auckland, New Zealand
Dr. Lyle E. Craine, Resource Planner, University of Michigan
Dr. Russell C. Eberhart, Engineer, Applied Physics Laboratory, The Johns Hopkins University
Dr. Robert Ellis, Planning and Analysis Consultant, Hartford, Conn.
Prof. Garrett Power, Lawyer, University of Maryland
Dr. William H. Queen, Biologist, Chesapeake Research Consortium
Dr. Kevin Sullivan, Land Use Planner, Smithsonian Institution

As other case studies are completed, additional reports will be released.

The assistance of federal, state and local management agency personnel of the Chesapeake Bay region in supplying information necessary to this study is gratefully acknowledged. Information contributed by the Chesapeake Bay Foundation to this report is appreciated.

William H. Queen
Program Manager

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INTRODUCTION

The application by Watergate Village to the Baltimore District Office of the U. S. Army Corps of Engineers for permission to expand its boat docking facilities was selected for review by the Case Study Group for two reasons. First, the proposed physical alterations are fairly typical in purpose, size and design of those for which the Corps receives applications. Second, the application presents a good cross-section of the issues faced by decision-makers in determining whether to permit physical alterations of the shoreline.

The applicant, owner of an apartment complex, proposes to add 30 additional boat slips to the marina facility which it provides for its tenants. The plans provide for bulkheads, mooring piles, cat walks and will involve both dredging and filling. Most applications reviewed by the Corps include structures of these types and are intended to afford access to the waters.

Public notices issued by the Corps explain that "the decision as to whether a permit will be issued will be based on an evaluation of the impact of the proposed work on the public interest." In the review of the Watergate Village application this evaluation was reduced to a concern with four major issues: (1) whether the project would obstruct navigation; (2) whether the project would degrade or destroy a marsh (thereby having a bad effect on water quality, and fish and wildlife); (3) whether the use of additional boats made possible by the project would impair recreation by creating congestion; and (4) whether the increment of sewage discharge associated with the use of these additional boats would impair water quality. These issues transcend the Watergate Village application, and decision-makers are recurrently called upon to resolve them.

The case study which follows, proceeds in five steps. First the facts involving application (its initial submission, the ensuing objections, the

resulting design changes, and its present status) are developed and presented. Second, the administrative procedures (a morass of overlapping and interacting regulations at the federal, state and local levels) which the applicant must comply with, are outlined. Third, existing conditions (physical, biological, land use, water use) both at the site and in the region are ascertained. Fourth, an analysis is conducted which attempts to state the major issues raised by the application, to resolve these issues to the extent possible, and to measure the capacity of the existing regulatory process to assure that the ultimate decision will be in the "public interest." Fifth and finally, recommendations are made which range from the specific (a recommendation of how the group feels the Corps should respond to the Watergate Village application) to the general (suggested decision-making criteria and guidelines, scientific research projects to supply needed information, and changes in the regulatory structure).

This case study is intended to serve several purposes. It provides the model of a methodology which if employed by existing regulatory agencies could improve the quality of their decisions. It discloses deficiences in the existing information needed by decision-makers and has led the researchers to suggest research projects which fill some of the gaps. It produces guidelines and criteria which may be employed in the evaluation of other similar applications. It suggests ways in which the decision process could be improved. And it identifies some of the basic societal value choices which inhere in decisions relating to shoreline utilization, which once identified can then be referred to appropriate legislative bodies for their consideration.

FACTUAL BACKGROUND

On May 7, 1973, Watergate Village, the corporate owner of an apartment complex on a cove of Back Creek in Annapolis, applied to the Baltimore District Office of the Army Corps of Engineers for permission to expand its marina facility so as to provide 30 additional boats slips for its tenants. At present it has 134 boat slips to accommodate the recreational boating demands of tenants in 608 apartments.

The plans accompanying the application provided for construction of a bulkhead with projecting boat slips and placement of 30 mooring piles. Six hundred and twenty-six cu. yds. of sandwere to be dredged and used as fill behind the bulkhead. Much of this fill material was to be placed on a marsh contained by the bulkhead. Catwalks were also to be constructed over the marsh area. The work was to extend no more than 135 ft. channelward of mean high water. These plans are set out in Fig. 1.

The application was circulated to other governmental agencies for their comments and on July 5, 1973 the Corps issued a public notice on the application. On August 21, 1973 the Environmental Protection Agency commented unfavorably on the grounds that the project would result in the destruction of a marsh. Various private parties responded to the public notice with unfavorable comments because of the marsh destruction and because of already crowded boating conditions in the cove. A particular point was made that proposed structure when coupled with an existing pier on the opposite bank would impede navigation at the entrance to the cove. (In response to this argument, the applicant pointed out that the opposite shore pier had been laterally extended without permission and that there was an outstanding administrative order requiring that this unauthorized extension be removed.) In addition, Bowie Duckett the owner of land immediately adjacent to the proposed structure argued that it would encroach on his riparian

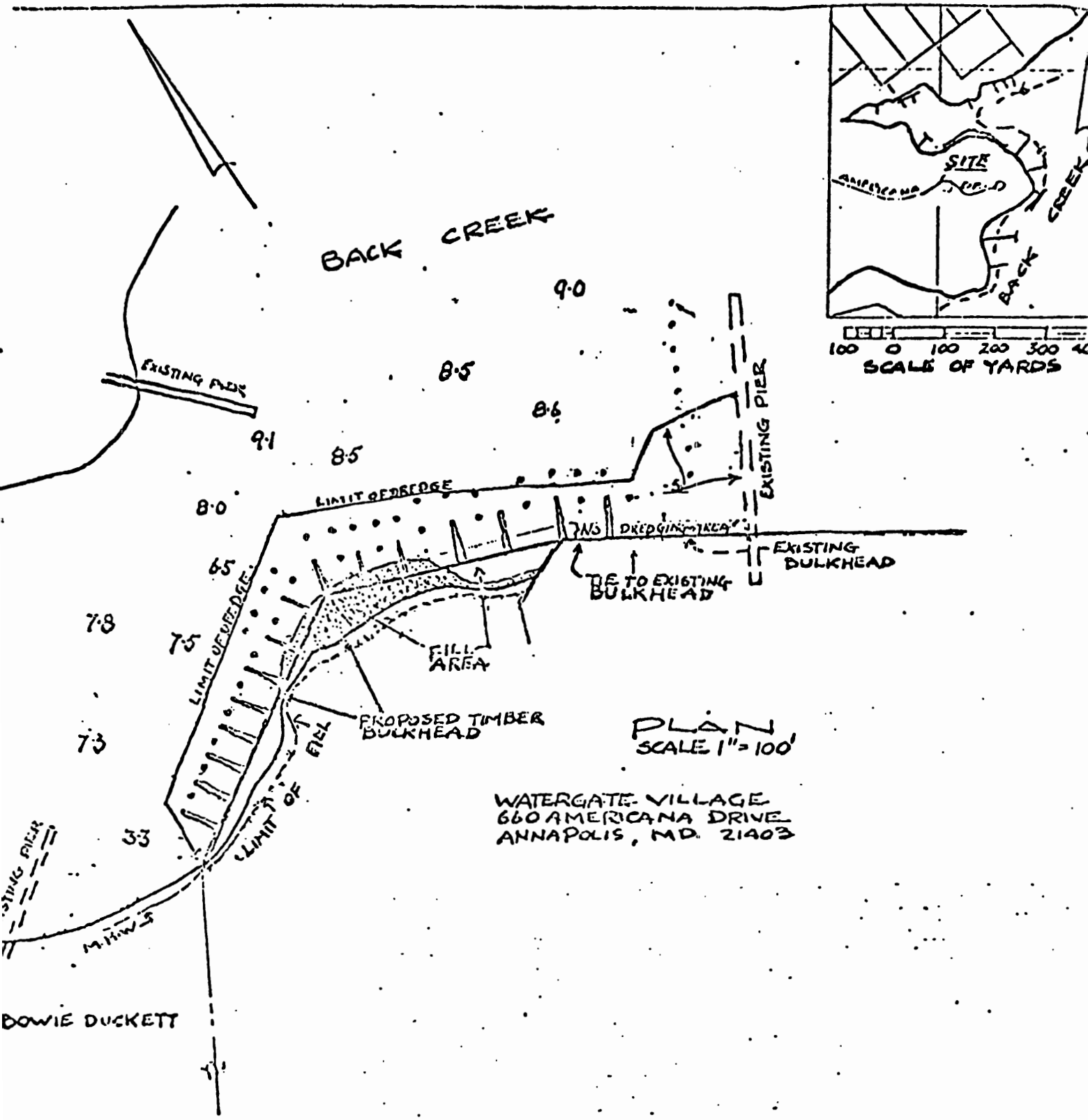


Figure 1. Original plan for Watergate Village

rights. And on October 5, 1973 the Maryland Water Resources Administration joined the objectors when it refused a Certification of Water Quality on the grounds that the marsh destruction would result in degradation of water quality.

On October 18, 1973 Watergate Village submitted a revised application. The new plans replaced 2/3 of the bulkhead with a stone rip-rap on the existing shore leaving the marsh untouched either by dredge or fill. The catwalks were to be constructed in front of the marsh instead of over it, and adjustments were made at the Bowie Duckett boundary. The limit of extension channelward and the amount of dredged material remain as in the original proposal but there will be surplus dredged material to be taken to an off-site disposal area. Assuming that the unauthorized lateral extension of the pier on the opposite bank is removed, the minimum navigable channel width will be 90 feet. Figure 2 presents the revised plans.

There was one quick response to the applicant's revised plans. On October 24, 1973 the Maryland Board of Public Works issued the required state Wetlands License which in essence approved the project, as revised. Since then there has been little action. EPA has not yet commented on the project as revised and the Maryland Water Resources Administration has not yet reconsidered its denial of a Water Quality Certification. The most recent event occurred at the level of local government when the Annapolis Planning Zoning Office, on January 31, 1974, requested the Annapolis Port Wardens (which also has licensing authority) to postpone its decision pending a determination of whether the project is permissible under the City's zoning ordinance.

Hence at the date of this writing it remains an open question as to whether the project will be approved by the Corps and other state and local regulators.

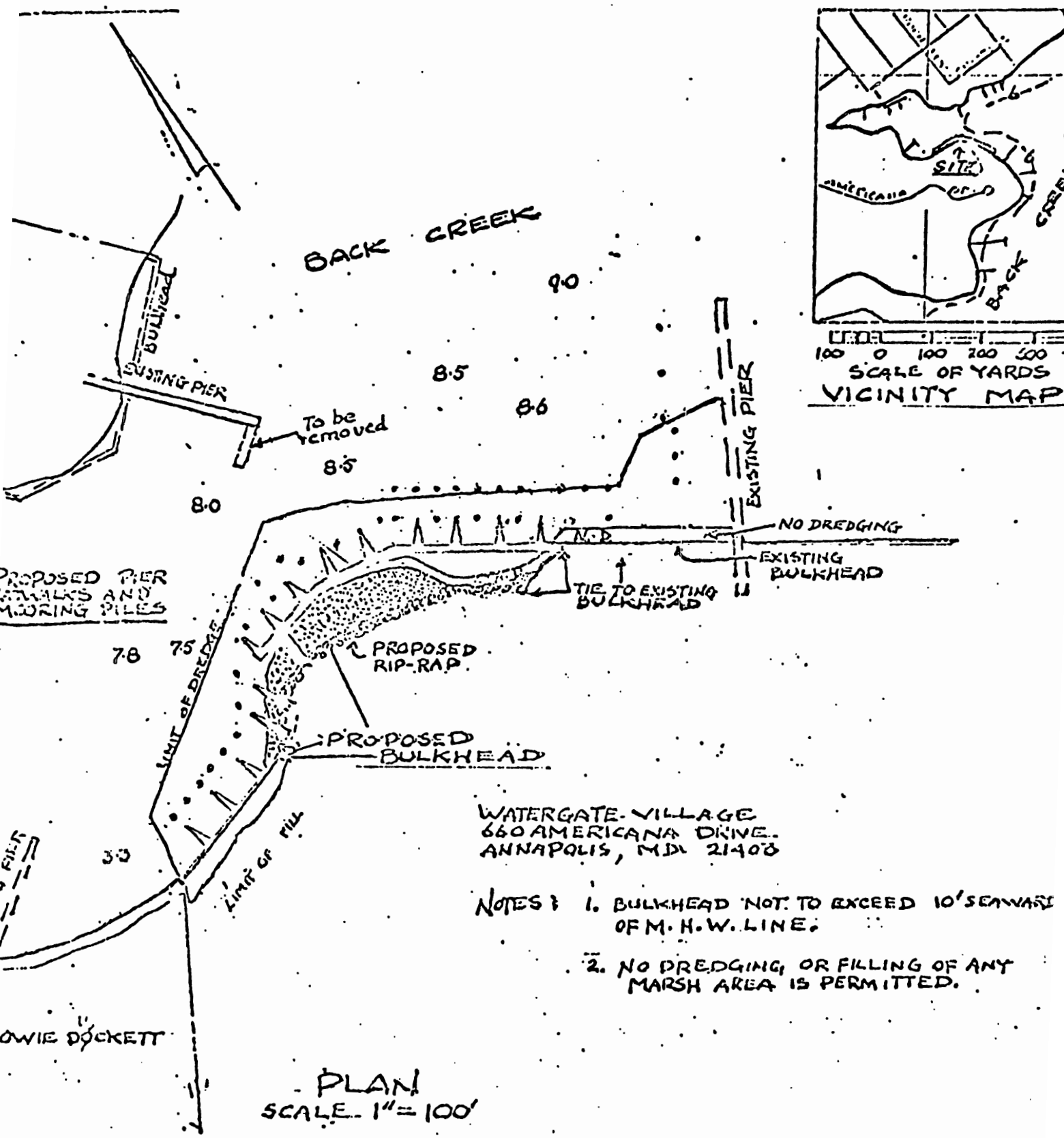


Figure 2. Revised plan for Watergate Village

REGULATORY PROCESS

The preceding section presented a chronology of the major events in the year history of Watergate Village's application to the Corps. Since the Corps' regulatory process interacts with decisions by other Federal agencies, and with decisions by state and local officials, some of these other procedures were referred to as well. This section will outline the overall regulatory process faced by the Watergate Village developer at federal, state and local level. It will discuss the scope of the regulatory power which has been delegated to the various administrative agencies, the criteria which they employ in the exercise of this power, and the coordination mechanisms which have developed between them. A discussion of this regulatory backdrop whould establish the path which the Watergate Village project will have to follow if it is to be approved, and should facilitate analysis of the efficacy of the existing decision proces.

A. Federal

Under authority granted to it by the River and Harbors Act of 1899, 33 U.S.C. S401 et seq, the Army Corps of Engineers serves as the lead federal agency in the evaluation of requests to make physical alteration in navigable waters; Section 403 precludes construction of any structure, excavation or filling without consent of the Corps.

While the concern of the Corps was originally limited to prevention of the obstruction of navigation, today the Corps is to evaluate permit applications by weighing of all benefits and detriments and determining whether the proposed structure or work is in the "public interest." Such a standard or review is mandated by S209.123(f) of the proposed regulations of the Corps which are serving as an interim guide until a final version is adopted (see 38 Federal Register 12217).

In most instances the Baltimore District Corps Office endeavors to accomplish this broad mandate by serving as a clearing house for objection rather than by intensive internal review. Permit applications are regularly circulated for comment to the Environmental Protection Agency, the Department of Interior, and appropriate state and local agencies. This circulation procedure is in part required by statute and in part is a product of the Corps' self-imposed rules. EPA's review authority over Corps' applications derives from its water quality responsibilities under the Federal Water Pollution Control Act, 33 U.S.C. S1151 et seq. Section 401 of this Act also requires state certification that the proposed project will not result in water quality violations. D.O.I.'s review authority derives from the Fish and Wildlife Coordination Act of 1950, 16 U.S.C. S661-66, which requires that "wildlife conservation shall receive equal consideration" in any federal decision, and that the federal agency making a decision consult with the United States Fish and Wildlife Service of D.O.I.

The proposed policy, practice and procedure rules for the Corps, 33 C.F.R. part 209 (38 Federal Register 12217), also provide in Section 209.120 F(3) that permits will not be issued where authorization of the proposed work is required by state and/or local law, and that authority has been denied. Accordingly, the District Office of the Corps works out agreements with state and local authorities which have such legal authority in order to seek their approval or disapproval. With respect to the Watergate Village application this procedure in effect gives the Maryland Board of Public Works (wetlands license), the Annapolis Port Wardens (wharving permit), and the Annapolis City Council (zoning authorization) a veto power over issuance of the Corps' permit.

In addition, Section 209.120(f)(3)(iii) of the Corps' rules provides that the Corps should take into consideration the comments of other state, regional or local agencies which have no direct legal authority concerning the

alteration. This opportunity is afforded by placing such agencies on a mailing list to receive public notices for a given region.

The Operations Division of the Baltimore District Office of the Corps will undertake a limited substantive review of the potential effects of an application on access to and navigation of the water. Section 209.120(g) of the Corps' proposed rules establishes the following policy:

> "Authorization of work on structures ....does not .... authorize any injury to property or invasion of other rights."

This section goes on to implement this policy with the following guidelines:

> "A significant probability of resulting damage to nearby properties can be a basis for denial of an application."

And:

> "A landowner's general right of access to navigable waters is subject to the similar rights of access held by nearby landowners and to the general public's right-of-navigation on the water surface. Proposals which create undue interference with access to, or use of, navigation waters will generally not receive favorable consideration."

The Operations Division is assisted in spotting the potential adverse effects of structures on the riparian rights of neighbors by circulation procedures which guarantee that adjacent property owners will receive a public notice on the application and an opportunity to register a complaint.

The Baltimore District Office of the Corps has also developed some of its own "rules of thumb" to be used in appraising the navigation effects of a proposed project:

1. The structure must not exceed 1/3 the width of the waterway.

2. The applicant must stay away from the deepest portion of the waterway.

3. The applicant must not build within 15 feet of a dredged channelway.

4. The applicant in general must avoid any hazards to navigation.

The National Environmental Policy Act of 1969, 42 U.S.C. 4321-4347, presents the possibility that the Watergate Village proposal might be subject to additional review by the Corps. Section 102(2)C requires all federal agencies, with respect to major federal actions significantly affecting the quality of the human environment to submit to the Council on Environmental Quality a detailed statement on the environmental impact of the proposed action. It is up to the District Engineer to determine whether such an Environmental Impact Statement (EIS) is required in connection with a permit application.

As seen in the preceding section, the Watergate Village applicant originally applied for a Corps permit on May 7, 1973. Following adverse comment from the Environmental Protection Agency and denial of a water quality certification by the Maryland Water Resources Administration, the applicant reapplied on October 18, 1973 with revised plans. The Maryland Board of Public Works responded on October 24, 1973 with the issuance of wetlands license based on the revised plans. But EPA has not yet commented on the revised plans; the Maryland Water Resources Administration's denial of a Certification of Water Quality has not yet been reversed. The U.S. Fish and Wildlife Service has not commented on the revised application, and the Annapolis Port Wardens are postponing consideration of issuance of a license pending a determination by the Annapolis City Council of whether to give zoning authorization for the project. Hence the Corps is presently withholding decision pending further comments at the Federal level and further decisions at the state and local level. In any

event, based on past practices it appears unlikely that an Environmental Impact Statement will be prepared in connection with their decision. If EPA, the Department of Interior or the State comments unfavorably, the Corps will refuse the application on that basis without preparation of an EIS; and if there are favorable comments from these public agencies, the District Engineer will probably conclude that an EIS is not required since permit issuance would not significantly affect environmental quality.

B. State

The Watergate Village application will be subject to three basic review procedures at the state level. Pursuant to Title 9 of the Natural Resources Article of the Revised Code of Maryland, a license from the Board of Public Works is required to dredge or fill on state wetlands. State wetlands are defined to include "any land under the navigable waters of the State below the mean high tide," NR S9-101(M). The Board is charged with the responsibility of determining "if issuance of the license is in the best interest of the state, taking into account the varying ecological, economic, developmental, recreational and aesthetic values each application presents," NR S9-201(C). The Board issued a wetlands license for the revised work plans for the Watergate Village proposal on October 24, 1973 subject to a more or less standard set of conditions. A copy of this license is set out in Appendix 3.

Pursuant to Section 401 of Federal Water Pollution Control Act, 33 U.S.C. 1151, the state must certify that the proposed construction activities will not violate either ambient water quality standards or effluent discharge limitation, prior to the issuance of a Corps permit. In Maryland, the Water Resources Administration of the Department of Natural Resources is charged with issuance or denial of such a certificate. The Water Resources Administration initially refused issuance of such a certificate for the original Watergate Village

application on October 5,1973, on the grounds that the work would have resulted in the destruction of a marsh which helps to maintain and improve water quality in the Creek. To date this refusal has not been reversed even though the revised plan would not effect the marsh.

Pursuant to Title 8 of the Natural Resources Article, a review of the adequacy of the sediment control techniques to be used in the building and grading process is also mandated. NR S8-1103 generally requires approval by the appropriate soil conservation district of a grading and sediment control plan prior to issuance of any local grading and building permits, and NRS8-1208 specifically provides that the City of Annapolis issue a grading or building permit within the Severn River watershed only after the developer submits a plan of development approved by the Soil Conservation District. In order to obtain such approval, the developer is required to submit a certificate from a registered professional engineer stating that the developer's plan to control silt and erosion is adequate to contain the silt and erosion on the property covered by the plan.

C. Local

The Watergate Village proposal will be subject to a variety of review procedures under the Ordinances of the City of Annapolis. Section 10-14 of the Annapolis City Code requires a permit to be issued by the City Engineer with the approval of the Port Wardens of the City as a prerequisite to construction of any wharf, pier or improvement into the waters within the City. Pursuant to Section 10-19, the Port Wardens are charged with consideration of "preservation of free navigation on the waters, the avoidance of undue congestion or confinement, the rights and welfare of riparian owners and any other matters affecting the public health, safety and general welfare" in determining whether a permit should be granted at a particular location. See, Annapolis Charter

#36-40 for the procedures for appointment and review of decisions of the Port Wardens.

Other provisions of the Annapolis City Code would require the applicant to obtain both building and grading permits before embarking on construction of the proposed boat slips. Section 6-9 requires a permit from the Mayor and Alderman prior to building any structure; Section 6-40 requires a permit from the City Engineer prior to grading or excavation. Sections 6-41 through 6-52 go on to provide for development of sediment control plans and their approval by the Anne Arundel Soil Conservation District which become a part of such grading permits.

Finally, Section 22-14 of the Zoning Ordinance in the Annapolis City Code precludes construction of any structure, pier or marina within the banks of a watercourse, but then provides for waiver of the prohibition if the structure or fill is approved by the Corps of Engineers, state and local authorities.

The site of the Watergate Village project is in an R-4 zoning district. Since, pursuant to Section 22-29 of the Annapolis City Code, mooring slips and/or docks are conditional uses in R-4 districts, yet another permit procedure is required. Following review by the Annapolis Planning and Zoning Commission, such requests are sent to the Annapolis City Council for public hearing and approval or disapproval. Accordingly, on January 31, 1974, the Annapolis Planning and Zoning Office sent a memorandum to the Annapolis Port Wardens requesting that the Port Wardens delay consideration of the Watergate Village proposal pending completion of this review.

D. Private Rights

The law has long recognized a right of access to navigable waters as an incident to ownership of riparian land. But there are questions in determining the specific application of this general proposition. First, what type and

scale of structure may the riparian landowner construct to afford access? Second, in what geographical area must such be located? Since the second question is more readily resolved, it will be addressed first. The riparian landowner must exercise his right of access and construct any supporting facility in front of his lot. But the divisional line between riparian land is often difficult to establish. Over the years the Maryland courts have worked out rules of equitable apportionment in a series of cases. These rules are perhaps best described in a decision by a federal district court applying Maryland law. According to that court:

> If the shoreline is straight, the riparian lines are to be extended from the divisional lines of shore into the water, perpendicular to the shoreline. If on the other hand the shoreline is concave, converging lines shall run from the divisional shorelines to the line of navigability. If the shorelines are convex, the lines will be divergent to the line of navigability. Mutual Chemical Co. v. Baltimore, 33 F. Supp. 881, 887 (D.Md. 1940), reversed in part, 122 F. 2d 385 (4th Cir. 1941).

The principles enunciated by the court in Mutual Chemical Co. have been cited with approval a number of times by the Maryland Court of Appeals. See, e.g., Causey v. Gray, 250 Md. 380, 243 A.2d 575 (1968).

Within the territorial jurisdiction of Annapolis, the power to regulate access and to determine division lines has been delegated to the Port Wardens. Annapolis City Code, S10-19. And it has been held that the courts will only consider a dispute relating to the location of an access structure following a prior decision by the Port Wardens, and will only reverse their decision upon a showing of abuse of power. Fenudale v. Sarles, 190 Md. 244, 58 A.2d 248 (1948).

Looking at the design for the structure proposed by the Watergate Village applicant, it appears to be within the divisional lines for the applicant's tract which would be established by applying the equitable apportionment rules stated in the Mutual Chemical Co. case; moreover, if permission from the Port

Wardens is obtained, the applicant should be effectively insulated from an effort of a neighboring landowner to challenge the legality of the structure's location.

The substantive extent of the riparian landowner's right to access is more problematic. Generally, the common law said that riparian landowners were entitled to natural accretions, but lost their ownership of shorefront land eroded away. On the other hand, riparian landowners were entitled to reclaim land lost by avulsion (i.e., a sudden and rapid loss of land to the water). See, Harrision v. Sterett, 4 H & McH 540 (Md. 1774); Girand v. Hughes, 1 Gill & J. 249 (Md. 1829); Chapman v. Hoskens, 2 Md. Ch. 485 (1851). As to access, the common law was satisfied to say that the riparian landowner had a reasonable right of access. See, VanRuymbeke v. Patapsco Ind. Park, 261 Md. 470, 276 A. 2d 61 (1971). This, of course, raises more questions than it answers. In the Watergate Village instance, for example, does it mean one boat slip, or 608 (one per apartment), or some number in between.

Recent statutory modifications do little to clarify the rights extended riparian landowners. Section 9-201 of the new Natural Resource Article of the Maryland Code provides:

> 9-201. ACCRETION TO AND IMPROVEMENT IN FRONT OF LAND ON NAVIGABLE WATER
>
> A NATURAL PERSON WHO IS THE OWNER OF LAND BOUNDING ON NAVIGABLE WATER IS ENTITLED TO ANY NATURAL ACCRETION TO HIS LAND, TO RECLAIM FAST LAND LOST BY EROSION OR AVULSION DURING HIS OWNERSHIP OF THE LAND TO THE EXTENT OF PROVABLE EXISTING BOUNDARIES. HE MAY MAKE IMPROVEMENTS INTO THE WATER IN FRONT OF HIS LAND TO PRESERVE HIS ACCESS TO THE NAVIGABLE WATER OR PROTECT HIS SHORE AGAINST EROSION. AFTER AN IMPROVEMENT HAS BEEN CONSTRUCTED, IT IS THE PROPERTY OF THE OWNER OF THE LAND TO WHICH IT IS ATTACHED. A RIGHT COVERED IN THIS SUBTITLE DOES NOT PRECLUDE THE OWNER FROM DEVELOPING ANY OTHER USE APPROVED BY THE BOARD. THE RIGHT TO RECLAIM LOST FAST LAND RELATES ONLY TO FAST LAND LOST AFTER JANUARY 1, 1972, AND THE BURDEN OF PROOF THAT THE LOSS OCCURRED AFTER THIS DATE IS ON THE OWNER OF THE LAND.

It should be noted, however, that this section applies to "natural persons" only, and not to corporations. Hence the rights of the landowner in the Watergate case, a corporation, are governed by the even more amorphous common law.

EXISTING CONDITIONS

In order to evaluate the Watergate Village application, it is necessary to have a good understanding of existing conditions in the area of the proposed alteration. This section undertakes the task of developing and synthesizing information relating to: A) physical aspects of the site, B) physical aspects of the surrounding locality, C) water quality, D) biota, E) land use, and F) water use.

A. Description of site

The application site (Fig. 3) is near the mouth of a cove which is the first small arm of Back Creek (Fig. 4 and 5). The northern shore of the cove has a marina near the mouth with bulkheading. Then there are several private houses, each with a pier going out from a beach (no bulkheading), and finally a marina. Towards the head of the cove is one vacant plot and one small area of unfenced grassland going down to the wooded marsh through which runs a small stream. These are designated as permanent open space by the Annapolis Planning and Zoning Office. The southern shore of the cove has one large wooded property with a single house (Mr. Bowie Duckett). The woodland goes to the water's edge and there is no bulkheading. Between the bulkheaded lawn of Watergate Village and the Duckett property is the small area of marsh composed of *Spartina cynosuroides*, *Typha* and *Phragmites* in front of which is to be the proposed jetty. Watergate Village has a series of jetties with slips. Three moorings and 40 berths occur in the cove. Water depths range from 7-9 ft. at the mouth to 2 ft. at the marsh. At the site the range is 7.5-8.5 ft. There are 4 major street drains into the cove and three short local run-offs. The bottom of the cove appears to be a medium grained sand becoming finer grained toward the marsh at the head.

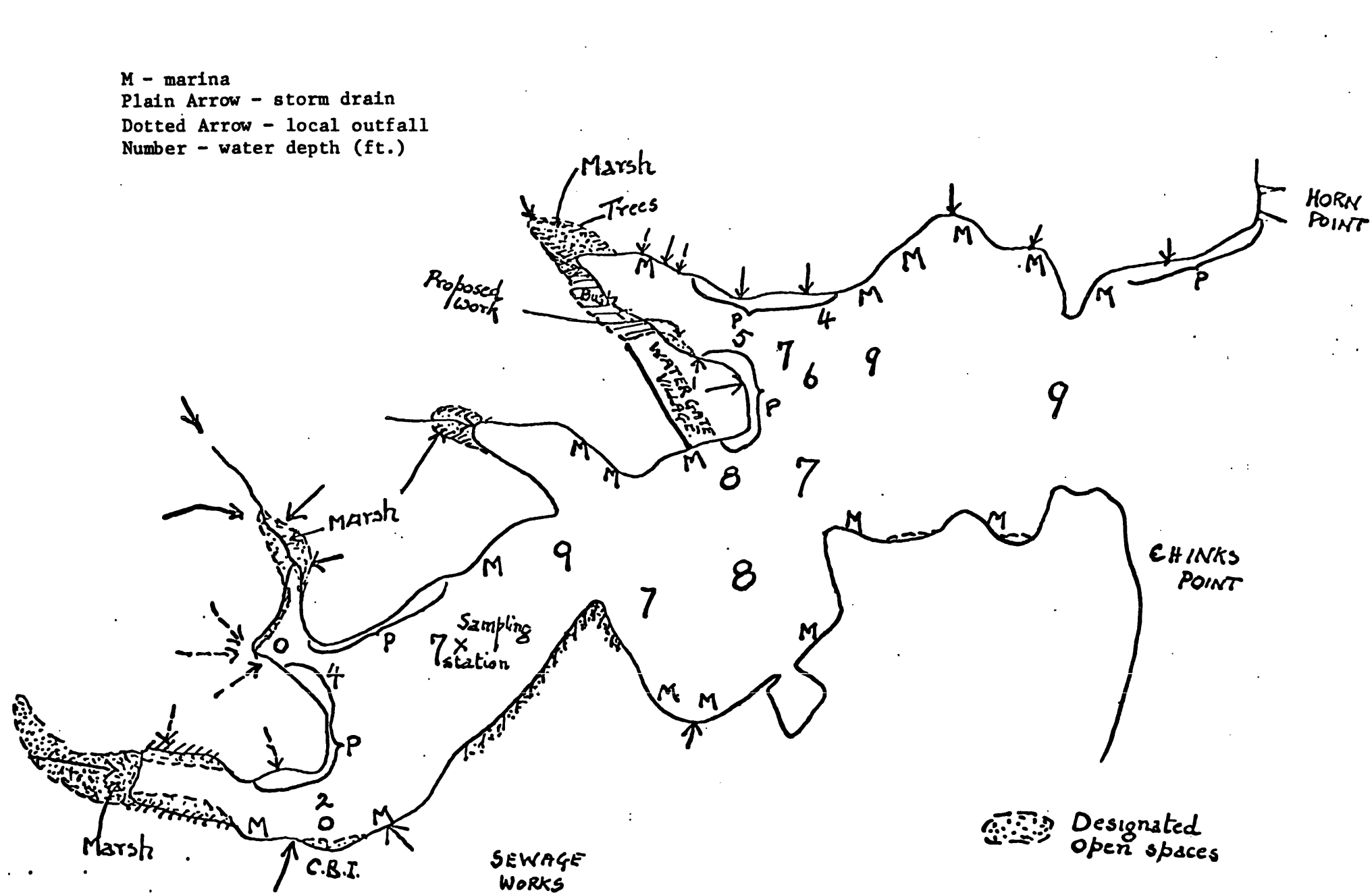


Figure 3. Back Creek

Action Program

This report has identified a need, analyzed existing conditions and noted a deficit. In order to meet this deficit of park and recreational land, Annapolis must have an effective organization, a rational program and reliable funding. If organization, program and funding are addressed in a forthright manner, success is inevitable. If any one is neglected, Annapolis will lose its chance to retain its special quality.

City-Wide Program

Parks
- Street-end Parks
1. Truxton Park Addition
2. City Marina
3. Bywater Athletic Field

Existing Community Centers
4. YMCA
5. Salvation Army
6. Recreation Center

Proposed Community Centers
7. Stanton Center
8. Recreation Center
9. Salvation Army

Parole Center (location to be determined)

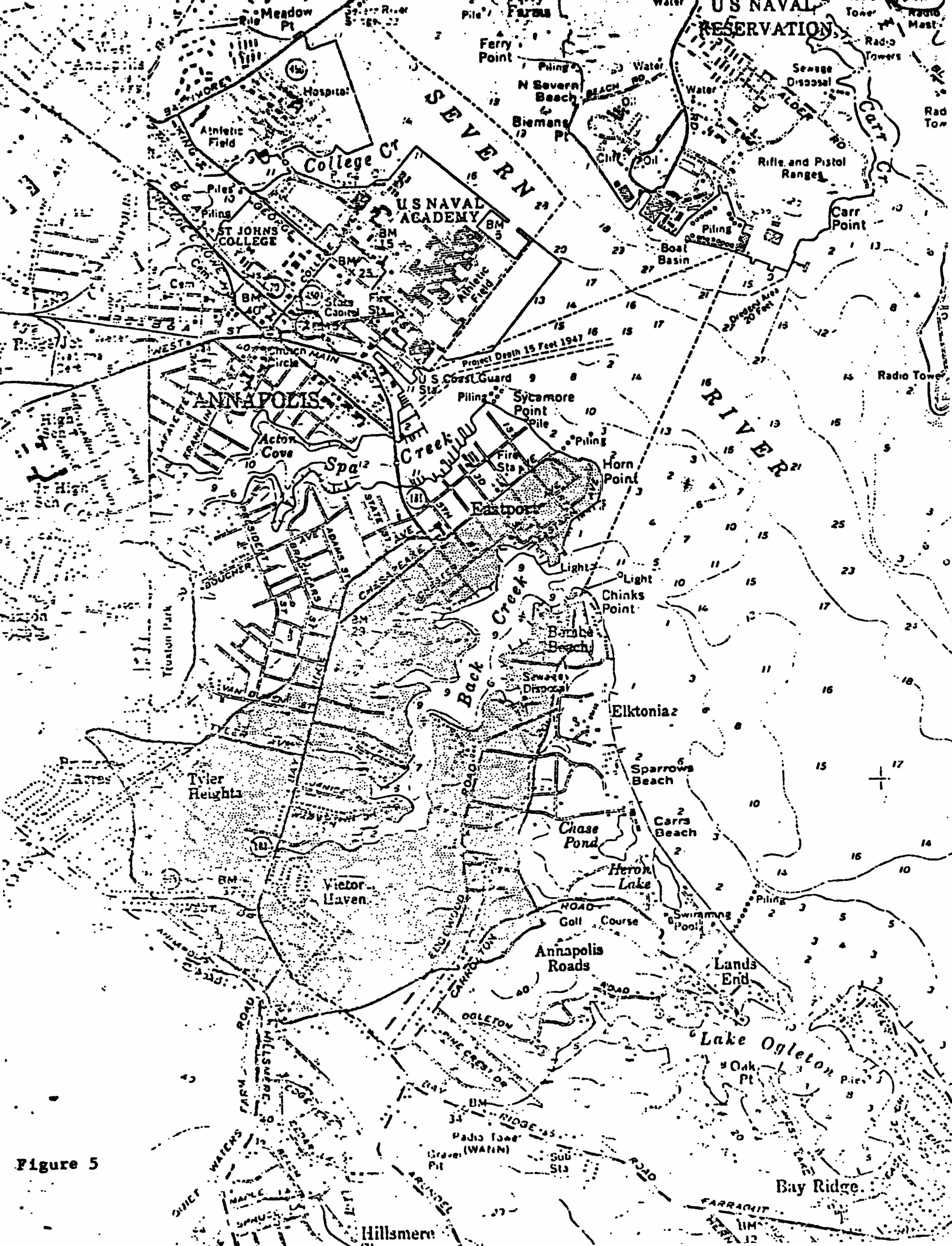
Bicycle Trails
—— First priority
— — Second priority
---- Third priority

Note: Some use of streets is inevitable, separate bikeways to be provided where possible.

Important Natural Area
Designates areas to be considered for permanent open space.

Figure 4. Annapolis with Back Creek in the lower portion of the map. Water quality-sampling sites are designated. A - D.

Source: Green Annapolis (Annapolis Planning and Zoning Office 1973)



U S NAVAL RESERVATION
Ferry Farms
Ferry Point
Meadow Pt
Hospital
Athletic Field
College Cr
SEVERN
RIVER
U S NAVAL ACADEMY
ST JOHNS COLLEGE
State Capitol
Fire Sta
Church Circle
MAIN
WEST ST
ANNAPOLIS
Acton Cove
Spa Cr
Creek
N Severn Beach
Biemans Pt
Radio Towers
Sewage Disposal
Rifle and Pistol Ranges
Carr Point
Carr Cr
Boat Basin
Piling
Project Depth 15 Feet 1947
Dredged Area 20 Feet
U S Coast Guard Sta
Sycamore Point
Horn Point
Eastport
Light
Chinks Point
Back Creek
Barbe Beach
Sewage Disposal
Elktonia
Sparrows Beach
Carrs Beach
Chase Pond
Heron Lake
Truxton Park
Tyler Heights
Victor Haven
Golf Course
Swimming Pool
Annapolis Roads
Lands End
Lake Ogleton
Oak Pt
Radio Tower (WANN)
Gravel Pit
Sub Sta
Bay Ridge
Hillsmere
Radio Tower

Figure 5

B. Description of surrounding locality

The cove is part of Back Creek, the mouth of which is located at the point where the Severn River merges into Chesapeake Bay. The channel at the mouth is narrow (50 ft.) with a depth of 10 ft. This is important in relation to the number of boats using the creek. The creek is about 1 mile long with an area of 0.2 sq. miles and a drainage are of 1.045 sq. miles (Jarosinski, 1972). The average depth of the creek is 2.23 m. The mean low water area is 440,000 m^2 and mean low water volume 18,320,000 m^3. The normal tidal range of 0.29 m adds 127,600 m^3 to the creek (Cronin, 1971). This means only 0.7% increase in volume of water during high tide and very small exchange of water due to tidal action.

The run-off from local streets is probably very similar to an adjacent creek (Spa Creek) for which data is available, and in that case will be about 0.1% of the total volume of water in the creek. Adopting the paving criteria of Dimsdale (1973) 50% of the shoreline would have 55% paving and 50% would have 98% paving. The extent of paving affects the amount of surface water run-off. The entire creek is serviced by the municipal sewerage system and on the west shore there are 11 storm drain (plain arrows, Fig. 3) outfalls plus 7 local (dotted arrows, Fig. 3) outfalls. Four and two respectively of these drain into the Watergate Cove (Fig. 3). It is evident that the eastern shore will be progressively developed and this will cause increased run-off. Behind the very end of Back Creek a major new village development is nearing completion and this is symptomatic of what will happen in the future. The storm water from this new village will probably run into the head of the creek.

The western shore of Back Creek is primarily residential or marinas. There is one oyster dock. There are very few open spaces. The eastern shore is considerably less developed and much of the land is still private property with a few marinas interspersed. The field station of the Chesapeake Bay Institute is

near the head of the creek. A sewage treatment works is currently being constructed on this side but the out-fall will be to the Bay. The shore of the western bank is over 50% bulkheaded with much less (circa 20%) on the eastern bank. Salt marsh leading into tree-clad swamp occurs at the heads of all the small coves with marsh fragments in the bays. These are designated as permanent open space. These headwater swamps comprise substantial stands of Phragmites australis with Spartina cynosuroides and Scirpus americanus. Along the shoreline narrow bands of marsh, particularly on the eastern shore will include Spartina alterniflora, Spartina patens and Scirpus americanus. Along the high edges Iva frutescens is likely to be present.

C. Water Quality

Back Creek has been classified as Class II (group A) water use by the Maryland Department of Natural Resources; Water Resources Regulation 4.8. This means the creek can be used for shellfish harvesting. For this use the number of coliform organisms must be less than 70 MPN per 100 ml and the D.O. (Dissolved Oxygen) should not be less than 4 ppt at any one time. For swimming waters the coliform count must not exceed 240 MPN/100 ml. Using recommendations for the Potomac River (Dimsdale, 1973), maximum total phosphorus should not exeed 0.06 mg/l and inorganic nitrogen 0.5 mg/l.

Coliform counts are only available for one sampling station. Between Oct., 1970 and July 1973, 34 counts were made. On 16 occasions the count exceeded 240 MPN/100 ml (47% of time). On 6 of the 16 occasions the high coliform count occurred after rain, and the maximum count (4600) took place after flooding rain. The high coliform count would seem to be mainly attributable to storm water run-off.

Data for the other parameters were obtained from 5 sampling stations (Fig. 5, A-D) (Jarosinski, 1972).

Salinity - Very little variation was recorded between sites sampled and depth, therefore, only averages are given.

14 Apr.	20 Apr.	28 Apr.	5 May	(all 1973)
5.56 $^0/_{00}$	5.65 $^0/_{00}$	3.57 $^0/_{00}$	4.74 $^0/_{00}$	

There are no autumn figures.

Dissolved Oxygen

Station	April '73 Aver. ppm.	May '73 Aver. ppm.	June '73 Aver. ppm.	July '73 Aver. ppm.
a	10.76			
b	10.79			
c	10.60	[Range 7.9 - 12.7 ppm.]		
d	10.27			
e	10.09			
Sampling Station	[Range 8-20]	15.7	13.0	13.6

These values are significantly higher than those of an adjacent creek (Spa Creek) and are satisfactory in being well above the minimum safe limit of 4 ppm.

Inorganic nitrogen

Station	April Av. (mg/l) NO_2+NO_3	NO_3 (mg/l) May Aver.	June Aver.	July aver.	(all 1973)
a	.65				
b	.67				
c	.65	[Range .46 - .77]			
d	.64				
e	.63				
Sampling Station	[Range .04 - .55]	.32	.057	0.05	

Values are high at the end of winter, probably from street run-off and decomposing vegetation, and they decrease during summer with growth of phytoplankton. The April levels are above the maximum (0.5 mg/l) set for the Potomac River, but they rapidly fall below.

Ammonia nitrogen - mg/l (average for April)

Station a = .127; b = .138; c = .096; d = .105; e = .112.

Range .05 - .19. No significant conclusions can be drawn in the absence of data for other times of the year.

Inorganic phosphates

Station	April Av. (mg/l)	May Av. (mg/l)	June Av. (mg/l)	July Av. (mg/l) (all 1973)
a	.043			
b	.054			
c	.050	[Range .025 - .075]		
d	.046			
e	.040			
Sampling Station	[Range .01 - .17]	.06	.02	.025

With the exception of three samples from the sampling station and four from stations b-d (Fig. 4), all were below the maximum (.06 mg/l) recommended for the Potomac. Again there is a decrease with rising water temperatures and increasing phytoplankton.

Temperature (°C)

	14 Apr.	20 Apr.	28 Apr.	5 May (all 1973)
Aver. a-e & all depths	11.88	14.16	14.08	14.78

pH

Station	a	b	c	d	e	Sampling station
Apr. Aver. Surf	7.59	8.04	8.03	7.45	7.66	Aver. May 9.0
Apr. Aver. Sub-surf (3.5-4 ft)	7.4	7.6	7.44	7.92	7.36	Aver. June 8.75
						July 8.8

Chlorophyll a

Values are really only available for 28 Apr. and 5 May (Aver. 29.98 and 43.57 mg/l respectively) and are insufficient to justify comment.

Sediment

Appears to be a medium-grained sand, probably becoming finer-grained towards the head of each cove.

D. Biota of region

Based upon reports for this portion of Chesapeake Bay (U.S. Army Corps Report Appendix C), the following organisms should be present in Back Creek.

Phytoplankton

Dictyocha tripartita
Bacteriastrum delicatulum
Cerataula pelagiga var. elongata
Chaetoceros holsaticus
C. socialis
Coscirosira polychorda
Cyclotella striata
Ditylum brightwellii
Rhizosolenia calcar avis
Skeletonema costatum
Thalassionema nitzchioides
Ceratium fusca
Massartia rotundata
Peredinium triquetrum
Asterionella japonica
Biddulphia mobiliensis
Chaetoceros affinis
C. compressus
C. subtilis
Coscinodiscus marginatus
C. perforatus
Pleurosigma angulatum
Rhizosolenia fragilissima
Thalassiosira decipiens
T. nordenskioldii
Gonyaulax monacantha
G. polyedra
G. spinifera

Macroalgae

Ulva lactuca
Enteromorpha spp.

Submerged vascular plants

Vallisreria americana
Myriophyllum spicatum
Potamogeton perfoliatus
Najas guadeloupensis
Ruppia maritima
Zannichellia palustria

Emergent vascular plants

Spartina alterniflora
S. cynosuroides
S. patens
Distichlis spicata
Phragmites phragmites
Typha sp.
Scirpus americanus
Iva frutescens

Polychaetes

Should be abundant

Copepods

Acartia tonsa (c)
A. clausi (c)
Scottolana canadensis
Eurytemora affinis (c)
Oithona brevicornis
Podon polyphymoides

Jelly fish

Sea nettle, Winter & Moon Jelly Fish, Sea Walnut

Molluscs

Soft-shelled clam
American oyster
Melampus bidentalis
Littorina irrorata

Crustacea

Fiddler crabs, Blue crabs

Vertebrates

Herring (young), Eel, White Perch, Yellow Perch, Menhaden, Striped Bass, Blue Fish (young), Atlantic Silverside, Hogchoker, Bay Anchovey, Duck, Blue Heron, Snapping Turtle, Raccoon, Muskrat, Otter, Opossum.

Of the species that should be present in Back Creek, none are endangered. Also, Back Creek does not represent a unique habitat for any of the above listed species.

E. Land Use

1. Existing Use

The Back Creek Watershed is depicted in Fig. 5. The residential population, number of housing units, and acres of vacant land in this region are summarized below:

1970 Census Population:	5702
No. of Year-Around Housing Units:	1923
No. of Year-Around Single Family Units:	996
No. of Year-Around Multiple Family Units 10 or more/building:	568
No. of Year-Around Multiple Family Units Less than 10, More than 1 per building:	359
Number of Acres of Vacant Lots:	204.44
Number of Acres of Buildable Land	189.50
Maximum Number of Units Permitted on these vacant buildable acres:	533 Single-Family Units 1673 Multiple-Family Units.

Source: G. Latimer Schmidt, Annapolis Planning Office

There are also a number of marine-related commercial uses which border Back Creek. There are seven commercial marinas and two commercial oyster docks. In addition, the Annapolis Sewage Disposal Plant is located on Back Creek, but its outfall goes directly into the mouth of the Severn River. The locations of these uses are indicated in Fig. 3. A new sewage treatment plant is under construction on adjacent land, and when completed the existing plant will be decommissioned.

2. Zoning

The City of Annapolis Zoning District Map divides Back Creek and its shoreline into a variety of residential and maritime districts. See Fig. 6.

It will be noted that the cove of Back Creek into which the applicant proposes to construct the thirty boat slips is partly an R-4 zone and partly an R-2 zone. This division reflects existing land use patterns in the cove. The Watergate Village facility (located in the R-4 zone) is the only apartment complex fronting on the cove. In the adjoining R-2 zone there are eight existing single family residential lots fronting on the cove.

3. Comprehensive Plan

The existing Comprehensive Plan for Annapolis is out-of-date and of little utility. The Annapolis Planning and Zoning Office, however, is in the process of developing a new Comprehensive Plan to become effective January 1, 1975. Among its major features will be a "Forest Drive Corridor Plan." The Forest Drive Corridor is designed to include the Annapolis section of Forest Drive from Route 2 to Edgewood Road and adjacent land on either side including Chinks Point. Chinks Point is the eastern shore of Back Creek. This Corridor embraces the last major undeveloped land areas in Annapolis.

According to a Memorandum to the Mayor and Alderman from the Planning and Zoning Office, titled Comprehensive Planning Tasks for Early 1974 and dated

ZONING MAP FOR THE CITY OF ANNAPOLIS, MARYLAND

AUGUST 10, 1970

R1	SINGLE-FAMILY RESIDENCE DISTRICT
R2	SINGLE-FAMILY RESIDENCE DISTRICT
R3	GENERAL RESIDENCE DISTRICT
R4	GENERAL RESIDENCE DISTRICT
R5	GENERAL RESIDENCE DISTRICT
B1	CONVENIENCE SHOPPING DISTRICT
B2	COMMUNITY SHOPPING DISTRICT
B3	GENERAL COMMERCIAL DISTRICT
I1	INDUSTRIAL SERVICE DISTRICT
I2	GENERAL INDUSTRIAL DISTRICT
C1	CONSERVATION RESIDENCE DISTRICT
C2	CONSERVATION BUSINESS DISTRICT
M1	MARITIME SERVICE DISTRICT
M2	MARITIME INDUSTRIAL DISTRICT
P	PROFESSIONAL OFFICE DISTRICT

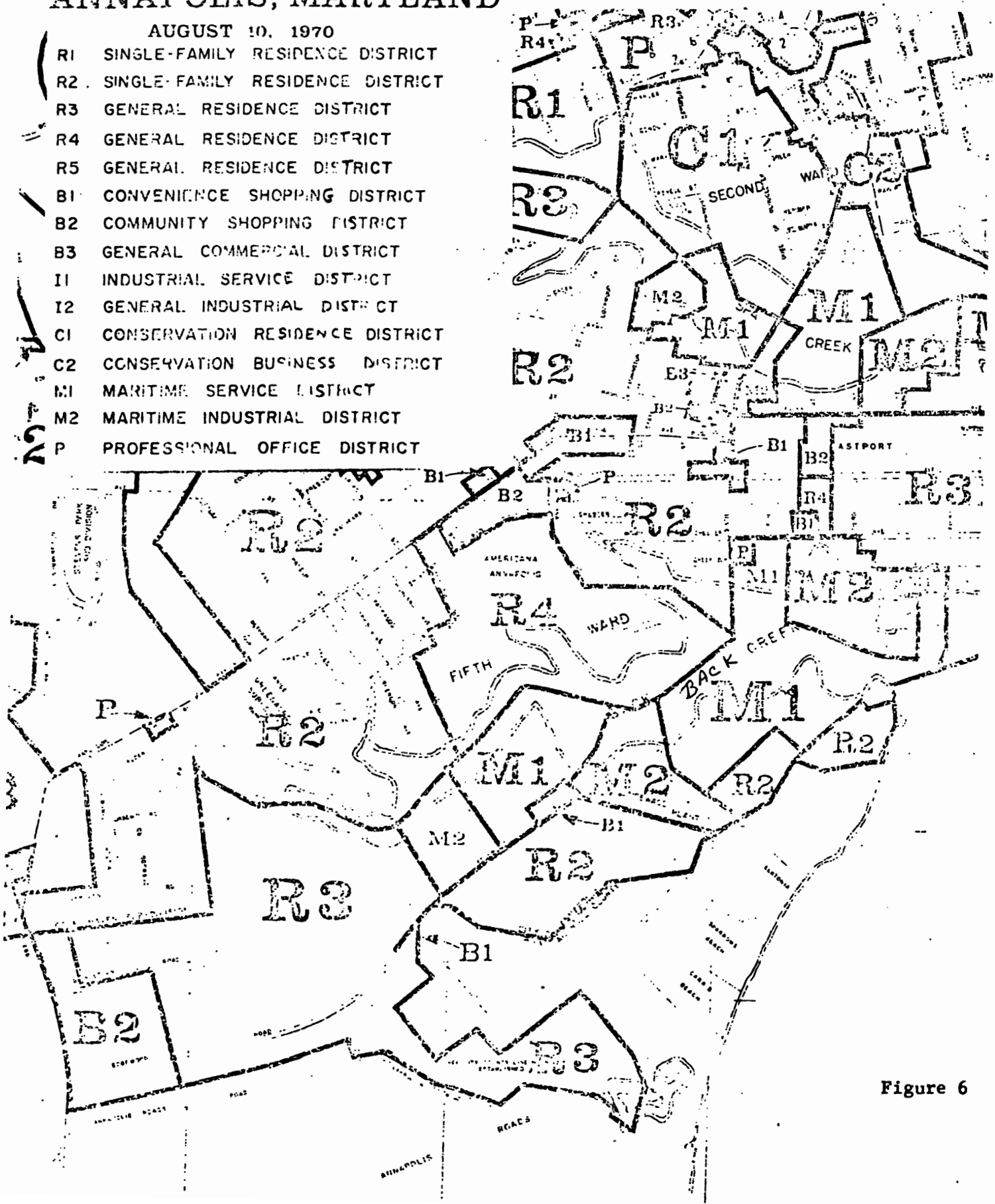


Figure 6

3 December 1973, the Forest Drive Corridor Plan will include the following:

1. Information collection and graphic presentation. The following information will be collected and presented for visual analysis:

   a. Land
      1) Vacant land
      2) Zoning
      3) Land values
      4) Parcel ownership patterns
      5) Natural environmental features

   b. Improvements
      1) Existing residential development
      2) Residential development proposals
      3) Existing commercial and business development
      4) Commercial and business development proposals

   c. Roads and traffic
      1) Existing traffic patterns
      2) Existing road capacities
      3) Proposed road improvements
      4) Potential road capacities

   d. Community facilities
      1) Existing community facilities
      2) School system capacities
      3) School plans
      4) Existing utilities (water and sewerage)
      5) Proposed utilities development

.2. Identification of alternative futures

   a. Identify three alternative future development forms for the area:
      1) Present trends continued with improved development control
         a) Improve Forest Drive
         b) Traffic engineering measures at intersection and along commercial strips
         c) Provision of needed community facilities and services
         d) Expanded site planning controls
      2) Major development measures
         a) New sewer interceptor
         b) Increased zoning densities
         c) Redesign of development parcels
         d) Patuxent Freeway
         e) Development controls to reserve open space for public facilities
      3) Major control measures
         a) Downzoning
         b) No new sewer or major infrastructure facilities
         c) Development timing controls
         d) Development limits and constraints

3. Development of alternatives in terms of:

    a. Amount of development of various types to be allocated
    b. Major infrastructure facilities required and general locations
    c. Potential allocation of development in the planning area
    d. Major political and administrative prerequisites (development controls, management policies, capital improvements) required.

4. Impacts of alternative futures. Assessment of major impacts of alternative futures including the following:

    a. Population increase and characteristics
    b. Community facility requirements
    c. Local revenues and expenditures
    d. Development trends and patterns elsewhere on the Annapolis Peninsula
    e. Existing residential areas
    f. Natural environment
    g. Low and moderate income housing
    h. Local political and policy efforts and coordination required

5. Conclusions
    a. Alternatives will be analyzed and conclusions drawn regarding a recommended alternative or combination of alternatives
    b. Recommend policies and measures regarding site planning, community development, development controls, infrastructure facilities which should be adopted in support of recommended alternative.

A preview of the park and recreation features likely to be included in the Comprehensive Plan for 1975 may be obtained by looking back to Fig. 4 which is taken from a report of the Annapolis Planning and Zoning Office. It will be noted that it designates the headwaters of the tributaries leading into Back Creek (including an area adjacent to the Watergate Village site) as "areas to be considered for permanent open space." Also of significance is its proposal of a city marina on the eastern shore of Back Creek at the site of the existing sewage plant.

F. Water Use

Back Creek is presently used as a boat "driveway" - a way to get out onto the Bay. Very little use is made of the creek itself for swimming, fishing, or boating. There are about 1,350 boats kept on Back Creek during the warm months at the present time. Many of these boats are removed in the winter months. A

large percentage of these boats are kept in slips (perhaps 90 percent); the rest are at moorings. Most of the boats are sail boats (perhaps 2/3); the rest are power boats. Almost all of the sail boats have some form of engine power available for auxiliary use. On a peak summer weekend day, only about 50 percent of the boats are in use. During the peak usage days there are presently some problems with crowding. The crowding effect is felt most acutely at the mouth of the Creek, where traffic is maximum and the channel is most narrow. The narrowness of the channel at the mouth makes it very difficult to maneuver.

In addition to the Watergate Village proposal, eight other applications involving Back Creek are pending in the Baltimore Office of the Corps. Pertinent information relating to these applications appear in Appendix B. The most extensive project is for 1,450 feet of pier, 472 piles, 1,118 feet of bulkhead, 200 cubic yards of dredge, and 200 cubic yards of fill. If all of the permits were granted as applied for, approximately 600 additional boats would be permitted to berth on back Creek, bringing the total to about 2,100 and exacerbating the boat congestion problem.

There are no public access points on Back Creek. However, small boats may be launched for a fee from a ramp at one private site but one has to know the owner and make prior arrangements.

Interviews with several residents of the Back Creek area suggest that existing traffic does not present an unduly hazardous situation. But it was pointed out that they occasionally felt it necessary to avoid leaving or entering Back Creek during peak traffic periods. The Marine Police also recognize the problem of congestion. While concerned about the problem, they feel that they can only tangentially respond by establishing and enforcing speed limits.

ANALYSIS

For discussion purposes, the analysis will look at three aspects of the Watergate Village application. Attention first will be addressed to the construction activity necessary to carry out the project. Next, the effects of the resulting structure will be reviewed. Finally, the facility will be considered in relation to the overall development of the Back Creek waterway.

A. Construction Activity

The construction activities necessary to build the proposed 30 additional boat slips will not result in any significant environmental degradations. Assuming that all upland grading and excavation work is done pursuant to an approved sediment control plan (as is legally required), it will not damage water quality, nor will the construction incident to the revised proposal have any long term, deleterious effect on the marsh. The proposed dredging will result in some temporary disturbance while it is being conducted, but any impacts should be transient and the bottom fauna should gradually return to its present status.

B. Resulting Structure

Pursuant to the revised plans, no marshlands would be dredged or filled; access over the marsh would be by piering. Nor does it appear that the existence of the 30 new slips would result in the erosion or silting in of the marsh. Hence the structure does not appear harmful to the marsh.

The structure is well within the Corps' guidelines relating to obstructions to navigation: it does not exceed 1/3 the width of the waterway; it stays away from the deepest portion of the waterway; it is not built within 15 feet of a dredged channel. Whatever encroachments exist to navigation result from the pier on the other side of the mouth of the cove. This pier was constructed without obtaining the requisite permits and the owner has been ordered to reduce its length. The Watergate Village facility does not constitute an

obstruction to navigation.

The proposed facility seems aesthetically acceptable and structurally sound. The profile of the structure is low and will not impair the waterscape; its design seems compatible with adjoining landscape and should withstand the impact of storm tides.

Water quality at the site of the proposed structure is presently good, and the structure would not have any direct deleterious effects. The indirect effects are more troublesome. The structure would result in the mooring of additional boats. If persons living on these boats were required to use land toilets and not discharge waste or oil into the Creek, then no new water quality problems would be created. But these are big "ifs." There are not presently effective laws requiring boats to have holding tanks or sanitary waste treatment systems; there are presently laws prohibiting the discharge of oil, but such prohibitions are obviously difficult to monitor and police. Hence discharges from additional boats might combine with the discharges from boats presently moored at the site to create a "hot spot" of pollution, particularly at times of peak usage when a number of persons might be living on these boats.

C. Facility as an Increment to Overall Development of Back Creek

The preceding discussion has focused on the proposed facility, in and of itself, and it has been determined that it would have but negligible direct adverse effects on the Back Creek region. It is when the facility is viewed as an increment to the overall demands for development of the region that the portents of environmental degradation become significant.

The east shore of Back Creek (Chinks Point) is the last major undeveloped land area in Annapolis and according to existing zoning density limitations, up to 533 single family units and 1,673 multiple family units could be constructed on vacant but buildable lots in the region. Hence pressures already exist, and undoubtedly will become greater, for large scale land development.

Likewise, there are acute pressures for development in Back Creek itself. During the calendar year 1973 alone, the Corps received applications for establishment of or additions to five marinas, four on the west shore and one on the east. The total number of additional slips involved is 670; bulkheading associated with these applications covers 555 ft. on the west shore and 1,430 ft. on the east shore.

Viewed in this context, the Watergate Village facility would contribute to a variety of problems. Most immediate is boat traffic congestion on Back Creek. There are presently 1,350 boats on Back Creek during the warm months. If all of the applications currently pending before the Corps were to be issued, the boat population would increase to about 2,000. This would exacerbate existing congestion during peak usage periods. Complicating the problem is the fact that there are presently no public access facilities for Back Creek, which is, of course, a public waterway. Planning attention is being directed to the creation of a city marina on the east shore, but if approval of private facilities continues unabated, the proposed public facility might effectively be foreclosed. The traffic capacity of Back Creek for boats may be exceeded before the city marina could be constructed.

Overall development demands for the region also pose a real threat to the water quality in Back Creek. There is evidence that storm water run-off is a major contribution to deterioration of water quality. The west shore is probably as fully developed as it should be in view of its contribution to water pollution from storm drains; any increase in paved areas on the east shore will lead to increased pollution unless alternative provision is made for disposal of storm run-off.

The growing boat population also poses a threat to water quality. At the present time approximately 1,350 boats occupy and move about in a water area

of 440,000 m^2 or 326 m^2/boats. If 1,000 boats were added, the water area per boat would be reduced to 189 m^2 per boat. Although it is true that boating does not necessarily result in discharge of any waste into the water, in fact it does. There are no effective prohibitions on the discharge of human wastes, and oil spills, although prohibited, regularly occur. Intensive boating on Spa Creek in Annapolis has contributed to persistent violations of the water quality criteria set by the State during the late spring and summer (Dimsdale, 1973) and there is every indication that more intensive boat usage, when combined with storm water run off, would have a similar impact on Back Creek.

Hence, when viewed as one increment to the overall development of Back Creek, the Watergate Village project would contribute to two problems. First, if the number of boats moored in Back Creek continues to proliferate, the Creek will be overcrowded. Lost time costs will be imposed on the boaters, safety hazards will increase and, in general, the quality of their recreational experience will be diminished. Moreover, if private mooring slips are permitted to proliferate, this will work at cross purposes to provision of "public access" to Back Creek. Annapolis has tentative plans for construction of a city marina on the east shore. But it appears likely that capacity of the Creek to carry boat traffic will be exceeded by boats moored at private slips (before that facility could be constructed) unless constraints on further development are immediately imposed.

Second, the increase in boat traffic, which the Watergate Village facility would occasion, would contribute to a readily foreseeable degradation of water quality in Back Creek. Existing controls on the discharge of wastes are ineffective.

D. Existing Decision Process

Regulatory agencies have ample powers to review the Watergate Village

proposal and to determine whether it is in the "public interest." Indeed in the abstract the regulatory structure seems a labyrinth of duplicative and redundant decision-making. At the federal level, the Corps of Engineers is charged with overall review of the project's propriety and EPA and the Department of Interior have an effective veto on project approval. The State has authority to foreclose projects if it will have a deleterious effect on wetlands or water quality. At the local level the City Engineer is empowered to assure that sediment resulting from the construction process is controlled and that the facility will be structurally sound; the Port Wardens are to preserve navigation and prevent boat traffic congestion; and the City Council of Annapolis is to assure that the structure is compatible with the zoning plan for the City.

Notwithstanding the profusion of regulatory activity, the existing decision process seems inadequate to effectively evaluate the Watergate Village proposal. Present procedures are not well designed to permit analysis of the project as an increment to the overall development of Back Creek.

The Corps of Engineers has the power, in a sterile legal sense, to evaluate the effects of the proposal on the overall "public interest," but it lacks the capacity. The Baltimore District of the Corps received approximately 1,400 applications during 1973. The Watergate Village proposal is but one of these. With its limited staff, the most the Corps can do is process the applications, circulate them for comment and approve the applications which raise no substantial objections from other government agencies. It will, of course, make its own appraisal of the project's effect on navigation---its traditional area of expertise. Hence the Corps acts more as a clearing house for objections than as a lead review agency.

Even if the Corps had the staff and the budget to embark on an overall, in-house, substantive review of each permit application, it would be hard pressed to calculate the "public interest." Major societal decisions, which are a

prerequisite to its calculation, have not been made. The City of Annapolis has not yet crystallized a land use plan for the development of Chinks Point. Until decisions are made as to the density of development which will be allowed, and to the siting and construction of public facilities such as sewers, major infrastructures or public marinas, it is impossible to make rationalized decisions as to assimilative capacity of Back Creek for either additional wastes or additional boats. Likewise, a rigorous inquiry has not yet been made into optimum recreational boating usage of Back Creek (even assuming that wastes could be effectively controlled). The Annapolis Port Wardens have a mandate to make such an inquiry, but they are a lay group without staff or budget to undertake such an endeavor.

Hence, the present decision process consists, for the most part, of a series of narrow-focus, ad hoc, disjointed licensing determinations made without benefit of any clear notion of the plan for overall development of the region.

In only one respect does there appear to be an absence of sufficient regulation. Presently no constraints limit the discharge of human waste from boats. Although Section 312(h) of the Federal Water Pollution Control Act, (33 U.S.C. 1151 et seq.) provides:

> "After the effective date of standards and regulations promulgated under this section, it shall be unlawful... for a vessel ... to operate on navigable waters of the United States, if such vessel is not equipped with an operable marine sanitation device certified pursuant to this section."

The Coast Guard has not, to date, been able to produce the regulations which trigger the provision's effectiveness. A first attempt at such regulations (38 Federal Register 15918) provoked a hostile response and the Coast Guard is now attempting to revise the proposed regulations. Until such regulations are promulgated, human waste will continue to pour untreated into Back Creek.

RECOMMENDATIONS

The recommendations which follow are divided into four groups. First, Case Study Group recommendations concerning the Watergate Village application are presented. Second, a series of proposals for the Back Creek region are made. Third, general recommendations which have been developed as a result of the case study exercise are stated. Fourth, research which would fill information gaps which the exercise has disclosed is discussed.

A. Watergate Village Application

A moratorium should be imposed on the approval of permit applications for new structures on Back Creek and Watergate Village should be notified that their application will not be acted upon until the termination of the moratorium period. The moratorium should extend until January 1, 1975, the scheduled completion date of a new Comprehensive Plan for the city of Annapolis. The City should include in this Plan "coastal considerations" which are described in the next subsection. Once the Comprehensive Plan is completed, the Watergate Village proposal should be considered. A permit should be issued only upon a finding that it is consistent with the Plan.

B. Back Creek Region

1. A comprehensive Plan for Annapolis with adequate "coastal considerations" was judged to be essential for management decisions on both the Watergate Village proposal and other applications now pending for Back Creek. Accordingly, a "Plan for Back Creek" (emphasizing coastal considerations) was drafted and is included in this report as Appendix A.

2. The Maryland Department of Natural Resources should prohibit by regulation "all discharges" from boats in Back Creek. The Coast Guard has to date been

unable to develop procedures for certification of marine sanitation devices and until it does so there will be no effective federal regulation of the dumping of human waste into navigable waters. The Maryland Department of Natural Resources presently has the authority to prohibit "all discharges." It should do so for Back Creek since water quality problems in the spring and summer are in part a product of the discharge of raw sewage from boats. Because Back Creek is used primarily as a docking area and as a "driveway" into the Bay, a requirement that land toilets be used by persons on boats without holding tanks while in these waters seems feasible and reasonable.

3. The Annapolis City engineer should use his existing regulatory powers over excavation and construction to require that all new storm water outfalls into Back Creek, whether City or private, either go into a landward edge of marsh belt or irrigate into a belt of trees or shrubs forming a frontal zone to the Creek. The City also should alter its present outfalls to conform with this practice. Storm water run-off is the primary pollutant in Back Creek. This practice would permit the soil to act as a filter for bacteria before the water reaches the Creek.

C. General Recommendations

1. Administrative procedures should be developed to assure that decision-makers evaluating a specific application will be aware of and familar with other pending applications which may result in cumulative impacts; for example, there are obvious advantages in having a single Corps official review the eight applications that are presently pending for alterations on Back Creek.

2. The Corps should investigate the possibility of strenghtening working relationships with state and local authorities which have closely related licensing power; for example, there would seem to be demonstrable advantages to both the applicant and the regulators if the Corps, the Maryland Board of Public Works

and the Annapolis Port Wardens could agree on a common application form, and set of instructions, for their respective licensing functions.

3. In the consideration of applications for access structures, decision-makers should employ the following "guidelines";

a. piers or off-shore mooring are preferred to bulkheads or channels;

b. in congested areas individual docks should be discouraged and multiple-user facilities encouraged;

c. land toilets should be required for every 25 berths.

4. In the consideration of applications for bulkheads, decision-makers should employ the following guidelines:

a. the application will ordinarily be disallowed if the bulkhead is located at the leading edge of a marsh;

b. the application will be disallowed if the bulkhead is for purely "cosmetic" purposes;

c. the application will ordinarily be allowed if it is to control shore erosion but it should be located as close to the existing shoreline as is practicable;

d. bulkheads designed to give a pier a landward connection should be of the minimum length practicable.

D. Research Needed

Surprisingly little research has been done on the level of boat traffic which optimizes the recreational utilization of a water body. Thus, research to develop a model to be used in making this important determination was judged to be the most urgent and useful to management agencies in relation to the Watergate Village application.

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APPENDICES

A PLAN FOR LAND & COASTAL USE IN THE BACK CREEK AREA OF ANNAPOLIS

Origin and Purpose

Analysis of the decision process associated with permit application NABOP-P (Watergate Village) 73-673 leads to the conclusion that a primary obstacle to the Corps of Engineer's (C. E.) efforts to make a "decision in the public interest" stems from the expectation of unilateral action on specific permit applications. The present decision-structure provides neither opportunity nor informational capacity to consider the specific application of Watergate Village as it may be related to other actions and to a wider range of factors.

The foregoing report makes several recommendations bearing on improvements in the situation. Those of primary relevance to this Appendix may be summarized as follows:

1. It is recommended that the C. E. declare a one-year moratorium on approving applications for construction of projects that would provide additional boat slips in Back Creek. Accordingly, it is recommended that C. E. defer action on the Watergate Village application at this time.
2. It is recommended that the City of Annapolis direct its Planning and Zoning Office to prepare a comprehensive plan for land and coastal use in the Back Creek area of Annapolis.
3. It is recommended that, when the C. E. again activates consideration of applications for coastal construction in this area, it (a) consider all applications as a unit, and (b) approve only those which individually and as a group are consistent with the land and coastal use plan for the Back Creek area.

A land and coastal use plan is necessary because the Watergate Village proposal raises basic issues regarding growth vs environmental preservation. This area possesses some of the best possibilities for further coastal development and at the same time some of the greatest potential for rational environmental protection of any area in the jurisdiction of the City of Annapolis.

However, there is little understanding of future development alternatives, or the types of environmental impacts associated with each, and of what development policies are necessary to implement each future policy. The planning process in the community is the only vehicle that can deal directly and effectively with these kinds of interactions associated with the use and control of the land and water in the Back Creek area of the city. The choice of basic goals of development and protection, of density limitations and of criteria for directing development are basically the prerogative and responsibility of the city, and the planning process is the method by which the community can arbitrate the various value conflicts inherent in pursuing growth and environmental quality.

A land and coastal use plan is the keystone to a responsible exercise of C. E. authority to issue construction permits affecting the waters of Back Creek. Accordingly, this appendix undertakes to outline the critical issues and the planning questions which should be addressed if the plan is to serve adequately the national decision making requirements.

The Decision Issues

In the final analysis, the decision to approve or disapprove the Watergate Village proposal, primarily hinges upon two basic questions: (1) what affect will the project have upon water quality, and (2) what affect will the project have upon recreation?

Although it appears that no serious physical or biological degradation of the water presently exists, two trends signal danger for the near future. First, the growth of boating on the Back Bay estuary, with accompanying increases in human waste discharged to the waters, makes likely significant degradation of water quality. Watergate Village project would provide for 30 new boat slips and other similar applications now pending for Back Creek would add another 700 boat slips.

No effective practical means has been found to control waste discharges from recreation boats. Thus, regulation of facilities which provide boat access to the water becomes an important pollution control measure in such situations.

The second threat to water quality comes from any significant increase in storm water run-off such as is normally associated with development.

This suggests the importance of considering rates and patterns of development in the Bay Creek area as well as ways of mitigating the impact of run-off on the natural waters of the estuary.

Although its basic purpose is to provide more recreation boating opportunities, the Watergate Village proposal raises the question of the point at which boat congestion on Back Creek may in fact depreciate the enjoyment from boating more than the benefits gained by additional boats. Again, like pollution, this is a question which is not serious now but will be in the near future. Even though the 30 additional boats made possible by the Watergate Village proposal might not be the "straw that breaks the camels back," what about the 700 associated with other pending applications, and what about future applications that will be associated with potential developments on the east shore of the creek?

The number of boats to allow on Back Creek becomes a primary issue for the future of water quality and recreation quality. No one knows the optimum number of boats on Back Creek. What is optimum depends upon the choice of trade-offs between more boats and the greater chance of water and recreation degradation, and fewer boats and greater restrictions on the use of shore lands.

The number of boats on Back Creek is one of many variables in making local choices regarding the development of the area. Hopefully these choices will be made in the process of preparing a comprehensive plan for land and coastal use of the Back Creek area.

The Planning Questions

The remainder of this appendix will outline the primary planning questions underlying coastal use decisions such as those associated with the Watergate Village application for a construction permit. The questions will be developed under three major subjects: (1) carrying capacity of the water, (2) open space and scenic reserves, and (3) development character and control. Concomitant discussion will identify some of the major interactions, principal informational inputs and recommendations or guidelines for plan preparation.

A. The carrying capacity of Back Creek Water

As indicated above, in a general way carrying capacity becomes the basic specific issue in the Watergate Village case. In this case, the carrying

capacity will concern the capacity of the water for recreation boats. It is clear that a major planning task is to determine an optimum carrying capacity for Back Creek, a task that clearly requires balancing conflicting values held by the community and must be a dependent variable in the determination of community goals for development and environmental protection. Not only must the planning process: 1) arrive at a determination of carrying capacity, it 2) should determine excess capacity remaining, 3) provide criteria for its allocation, and 4) recommend institutional processes for making allocations.

It appears that the control of access structures is the most effective means of controlling boating impacts upon the water. Several kinds of consideration in regulating access structures are suggested:

(1) It may be possible to increase boat capacity by encouraging the design, installation and operation of multi-user dockages and ramps. Concentration of access at locations on the water that can tolerate high boat capacity may be preferable to a pattern of every water front owner providing dockage in his own front yard.

(2) Such multi-user facilities may well serve a large "regional" need, or conversely boat owners in the Back Creek area may better be served with regional dockage provided in larger estuaries. If Bembe Beach were converted to a town house development and a marina similar to that contemplated at Watergate were sought, channel congestion may increase many fold and a marina location elsewhere than at the residents door steps may have to be considered.

(3) In a given area like Back Creek, it is generally desirable to provide some balance between public and private access facilities. There is evidence of increasing concern of society to assure a wider distribution of benefits from the use of a natural resource than is likely to happen from full dependence on a laissez-faire land ownership and use policy. The goals of both multi-user and regional access facilities may be more effectively realized through public ownership and operation; however, that is not to rule out private facilities serving these needs under proper conditions.

(4) What ever the scale or ownership of access facilities, land toilet installations for every twenty-five berths should be provided at a reasonable distance from the berths.

(5) In permitting individual access, piers or off shore moorings are preferred to bulkheads. Often natural shorelines providing scenic and pollution abatement benefits may be preserved by avoiding bulkheading in this manner.

(6) Bulkheading should be: (i) prohibited if on the leading edge of a marsh, (ii) discouraged if on fastland but serves only cosmetic purposes, (iii) justified if it helps control erosion or sedimentation.

B. Open space and scenic reserves

Early determination of open space and scenic reserves may be a major tool in assuring a modulated development of the undeveloped lands in the area.[1] Modulated development, indirectly as well as directly, may have significant influences on the use and protection of the water of Back Creek. Open space and scenic reserves may profitably be designated in both land and water situations, especially as shoreline buffers and natural marsh areas. Not only can properly chosen reservations provide recreational and scenic benefits, but as a buffer zone between land and water they may serve as a pollution abatement measure for excessive run off by detaining suspended solids, by filtering out bacteria and by the utilization of nutrients in woodlands and grasslands of the buffer zone.[2] Some consideration of this purpose in determining the amount and distribution of shoreland reserves may go a long ways to preserving the water quality of Back Creek in the face of more development and use.

The wooded or undeveloped portions of the shore are a major asset to the scenic quality of Back Creek as compared to other more fully developed

---

[1] Proposals already made in Green Annapolis demonstrate the validity of open space to modulate density and outdoor recreation areas.

[2] Consideration should be given to making approval of sediment control plans in the area contingent upon an established vegetative strip at the mouth of the drainage.

areas, such as Spa Creek, for example. If these scenic portions are to be preserved the time is now. Applications are now pending for bulkheading 1400 ft. on the eastern shore and 530 ft. on the western shore (consider guidelines for use of bulkheads, Item A(6), above). The land and coastal use plan should designate segments possessing aesthetic value to Back Creek and its multiple users, and should evaluate these areas as pollution buffer zones and recreation areas as well. The coastal use plan should be able to establish a community benefit in shoreland reserves which avoid unnecessary bulkheads without inflicting reduction in boating access. Hopefully, Annapolis would take steps to assure that these shoreline areas be preserved before development pressures are irresistible. Measures short of buying fee simple may be adequate for purposes of shoreline reserves. The experience on Spa Creek with easements which give the city management control of the shorelands should be explored for its applicability on Back Creek.

C. Development character and control

A matter of major concern to planning and directing coastal use is the development that may take place in the Chinks Point sector of the Forest Drive Corridor. Determination of the scale, pace and character of this development will be a major determinant of many of the questions about carrying capacity raised in Section A above, and will play a reciprocal role in the questions of open space and shoreland reserves, Section B.

The planning and zoning process of the city is centrally concerned with the character and distribution of residential, commercial and industrial development, and collaterally concerned with the adequacy and distribution of such infra-structure facilities as highways, sewerage systems, public schools and recreation areas. Decisions made in the planning process regarding density, distribution and types of residences and commercial facilities (and conditions attached to their construction and use) in the Back Creek area will have direct implications upon the longer run concerns about recreation boating and water quality. Likewise, location, scale and conditions attached to the construction of highways, sewers, schools and recreation facilities may have important influence on use and protection of

the waters of the estuary. Specifically three types of interaction among these development parameters and coastal planning are of major concern.

(1) The amount of domestic sewage, the location and quality of treatment and the location of outfalls and probable consequences for water quality in Back Creek.

(2) The demand for boating access to Back Creek and the extent that demand can be satisfied by multiple user docks with adequate toilet facilities, thus minimizing marring water surfaces and shorelines with slips and moorings.

(3) The amount and distribution of storm water run-off and the extent that it can be filtered through buffer strips of appropriate size and character before it is discharged into Back Creek.

(4) The extent to which state or federal laws can effect some regulation of human waste discharges from boats moored or operating in the Back Creek estuary.

PENDING APPLICATIONS FOR BACK CREEK

Information concerning applications pending in the Baltimore Office of the Corps of Engineers for physical alterations of Back Creek appear on pages 54 - 61. Codes for the various informational categories are listed below (pages 50 - 53).

The following computer codes have been established for use in the U.S. Army Corps of Engineers (Baltimore District) permit application data bank.

STRUCTURE (STRUC)

STRUCTURE TYPE

	New Structure	Repair or Maintenance
Aerial crossing	AECR	RPAE
Bouy	BOUY	RPBO
Building	BUIL	RPBL
Bulkhead	BULK	RPBU
Channelization	CHAN	RPCH
Dolphin	DOLP	RPDO
Dredge	DRED	RPDR
Duck blind	DUBL	RPDU
Fill	FILL	RPFI
Intake structure	INTK	RPIN
Jetty or groin	JETT	RPJE
Marine railroad	MARR	RPMA
Pier	PIER	RPPR
Pile	PILE	RPPE
Pipe, discharge	PIPD	RPPD
Pipe, intake	PIPI	RPPI
Pipeline	PIPL	RPPL
Ramp, boat	RAMP	RPRA
Rip rap	RRAP	RPRR
Spoils disposal	SPDI	RPSP
Submarine cable	SUCB	RPSU

THE JOHNS HOPKINS UNIVERSITY
APPLIED PHYSICS LABORATORY
SILVER SPRING MARYLAND

Coding Instructions - cont.

STRUCTURE EXTENT

Aerial crossing - Length (Feet).
Bouy - Number (Units).
Building - Area (Square feet).
Bulkhead - Length (Feet). Extent channelward (Feet)
Channelization - Volume (Cubic yards). Area (Acres)
Dolphin - Number (Units).
Dredge - Volume (Cubic yards). Area (Acres)
Duck blind - Length (Feet).
Fill - Volume (Cubic yards). Area (Acres)
Intake structure - Length (Feet).
Jetty or groin - Length (Feet).
Marine railroad - Length (Feet).
Pier - Total length new structure (Feet). Extent channelward (Fee
Pile - Number (Units).
Pipe, discharge - Length (Feet).
Pipe, intake - Length (Feet).
Pipeline - Length (Feet).
Ramp, boat - Length (Feet).
Rip rap - Length (Feet).
Spoils disposal - Volume (Cubic yards). Area (Acres)
Submarine cable - Length (Feet).

COORDINATES (COORD)

Latitude and longitude are coded in the same format. Each is coded in degrees, minutes, and tenths of minutes. Two examples of coding follow:

1) If latitude is 38° 54.5', it is coded as 3854.5

2) If longitude is 76° 11.2', it is coded as 7611.2

Coding Instructions - cont.

OWNERSHIP (OWNER)

Federal government - GFD
State of Maryland - GSM
State of Virginia - GSV
State of West Virginia - GSW
Local governmental jurisdiction (City) - GLO
County government - GCY
Private - PRI
Corporation - COR
Public Utility - PUU
State of Pennsylvania - GSP
State of Delaware - GSD
Unincorporated groups - UIG

SHORELINE TYPE (SHORE)

FASTLAND

Low Shore - LO
Moderately Low Shore - ML
Moderately High Shore - MH
High Shore - HI
Dune - DU

SHORE ZONE

Beach - BE
Fringing Marsh - MF
Extensive Marsh - MX
Embayed Marsh - MM

NEAR SHORE (To depth of six feet)

Less than 300 feet - XN
300-600 feet - NA
600-1200 feet - IN
More than 1200 feet - WI

The shoreline type is coded in the order of fastland, then shore zone, then near shore. Two examples of coding follow:

Coding Instructions - cont.

1) If the fastland is a low shore, the shore zone is a fringing marsh, and the near shore distance to a depth of six feet is about 900 feet, the coding is "LOMFIN".
2) If the fastland is a cliff (high shore), the shore zone is a beach, and the near shore distance to a depth of six feet is about 200 feet, the coding is "HIBEXN".

PURPOSE AND INTENDED USE (USE)

Residential - RES
Private - PRI
Commercial - COM
Industrial - IND
Recreational - REC
GOVERNMENTAL
Federal - GFD
State - GST
County - GCY
Local - GLO
Agriculture - AGR
Public Unility - PUU
Maritime - MAR

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   .ADDR2+ ANNAPOLIS MD. 21403
   .TOWN+ EASTPORT
   .COUNTY+ ANNE ARUNDEL
   .STATE+ MARYLAND
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   .TOWN* ANNAPOLIS
   .COUNTY* ANNE ARUNDEL
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.ADDR1◆ 700 WARREN DRIVE
.ADDR2◆ ANNAPOLIS MD. 21403
.TOWN◆ EASTPORT
.COUNTY◆ ANNE ARUNDEL
.STATE◆ MARYLAND
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  .ADDR1* 660 AMERICANA DRIVE
  .ADDR2* ANNAPOLIS MD 21403
  .TOWN* EASTPORT
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  .MANAGER* JNB
  .ADDR1* 408 CHESTER AVENUE
  .ADDR2* ANNAPOLIS MD 21403
  .TOWN* EASTPORT
  .COUNTY* ANNE ARUNDEL
  .STATE* MARYLAND
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Board of Public Works
Annapolis, Maryland

Louis L. Goldstein
Comptroller
J. Millard Tawes
Treasurer
Andrew Gentleck, Jr.
Secretary

LICENSE 74-23

APPENDIX C

Watergate Village

This refers to applications for "Wetlands License," dated the 25th of May, 1973. Upon the recommendation of the Wetlands Hearing Examiner of the Board of Public Works, and pursuant to the provisions of Article 66C, Section 718-721 (1970), entitled, "Wetlands" enacted to provide a State policy for the perservation of wetlands in the State and to regulate the filling and dredging of wetlands, and for other purposes, you are hereby authorized by the Board of Public Works for the State of Maryland to construct a bulkhead at or above mean high water line and another section of bulkhead within 10 ft. of mean high water, both depicted on the attached plans so revised; and to dredge in front of said bulkhead to the limits indicated on said plans to 4 ft. depth at mean low water and to deposit the spoil behind the bulkheads, Back Creek at Annapolis, Maryland , Anne Arundel County.

in accordance with the plans and drawings attached hereto as part of the application for wetlands license.

This license is issued subject to the conditions listed seriatum below and revocable or subject to modification prior to the completion of the subject project described above when such action is deemed to be in the State's interest.

A judgment as to whether or not a suspension, modification or revocation is in the best interests of the State involves a consideration of the impact that any such action or the absence of any such action may have on factors affecting the public interest. Such factors include, but are not limited to ecological, developmental, water quality, economic, aesthetic, recreational values.

Conditions

a. That this instrument does not authorize any injury to private property or invasion of private rights, or any infringement of Federal, State of local laws or regulations, nor does it obviate the necessity of obtaining assent from other State of local agencies required by law for the structure or work authorized.

b. That the structure or work authorized herein shall be in accordance with the plans and drawings attached hereto and construction shall be subject to the supervision and approval of the Water Resources Administration of the Department of Natural Resources.

c. The licensee shall comply promptly with any lawful regulations, conditions, or instructions affecting the structure or work authorized herein if and when issued by the State Water Resources Administration, which has jurisdiction to abate or prevent water pollution. Such regulations, conditions or instruction in effect or hereafter prescribed by the State Water Resources Administration are hereby made a condition of this license.

d. That a copy of this license and the plans and drawings attached hereto shall be available at the construction site.

e. The licensee will maintain the work authorized herein in good condition in accordance with the approved plans.

f. That this license may at any time be modified by the authority of the Board of Public Works, acting on its own or upon the recommendation of the Department of Natural Resources if it is determined that, under existing circumstances, modification is in the best interest of the State. The licensee, upon receipt of a notice of modification, shall comply therewith as directed by the Board of Public Works or its authorized representative.

g. That this license may be suspended or revoked by the authority of the Board of Public Works if the licensee fails to comply with any of its provisions or if the Board of Public Works, upon recommendation of the Department of Natural Resources, determines that, under the existing circumstances, such action is required in the best interest of the State.

h. That any modification, suspension or revocation of this license shall not be the basis for a claim for damages against the State of Maryland or any arm or agency of the State.

i. That the State of Maryland shall in no way be liable for any damage to any structure or work authorized herein which may be caused by or result from future operations undertaken by the State in furthering the interests of its citizens.

j. That no attempt shall be made by the licensee to forbid the full and free use by the public of all navigable waters at or adjacent to the structure or work authorized by this license.

shed Control Section, Water Resources Administration at least ten (10) days in advance of the time the construction or work will be commenced, and shall furnish written notification of the date of its completion.

l. That if the structure or work herein authorized is not completed on or before the _____ day of _____, 19____, this license, if not previously revoked or specifically extended, shall cease and be null and void.

m. That the legal requirements of all State, Federal and County agencies be met.

n. That all the provisions of this license shall be binding on any assignee or successor in interest of the licensee.

o. That the licensee agrees to make every reasonable effort to prosecute the construction or work authorized herein in a manner so as to minimize any adverse impact of the construction or work on fish, wildlife and natural environmental values.

p. That the licensee agrees that it will prosecute the construction of work authorized herein in a manner so as to minimize any degradation of water quality.

q. That the bulkhead alignment be changed so as to be at or above the mean high water as shown on the attached plan, except for the area behind Building 705 which could be up to 10 feet seaward of the mean high waterline.

r. No marshland be dredged or filled; that access over the marsh be by piering

s. That such work be completed in accordance with the Certification of Water Quality.

t. No marshland is to be dredged or filled.

the authority of the Board of Public Works:

ued for and in behalf of
e Members of the Board

Andrew Heubeck, Jr.
Secretary

The terms and conditions of this license are hereby accepted.

Date Oct 23rd 1973

Licensee

By