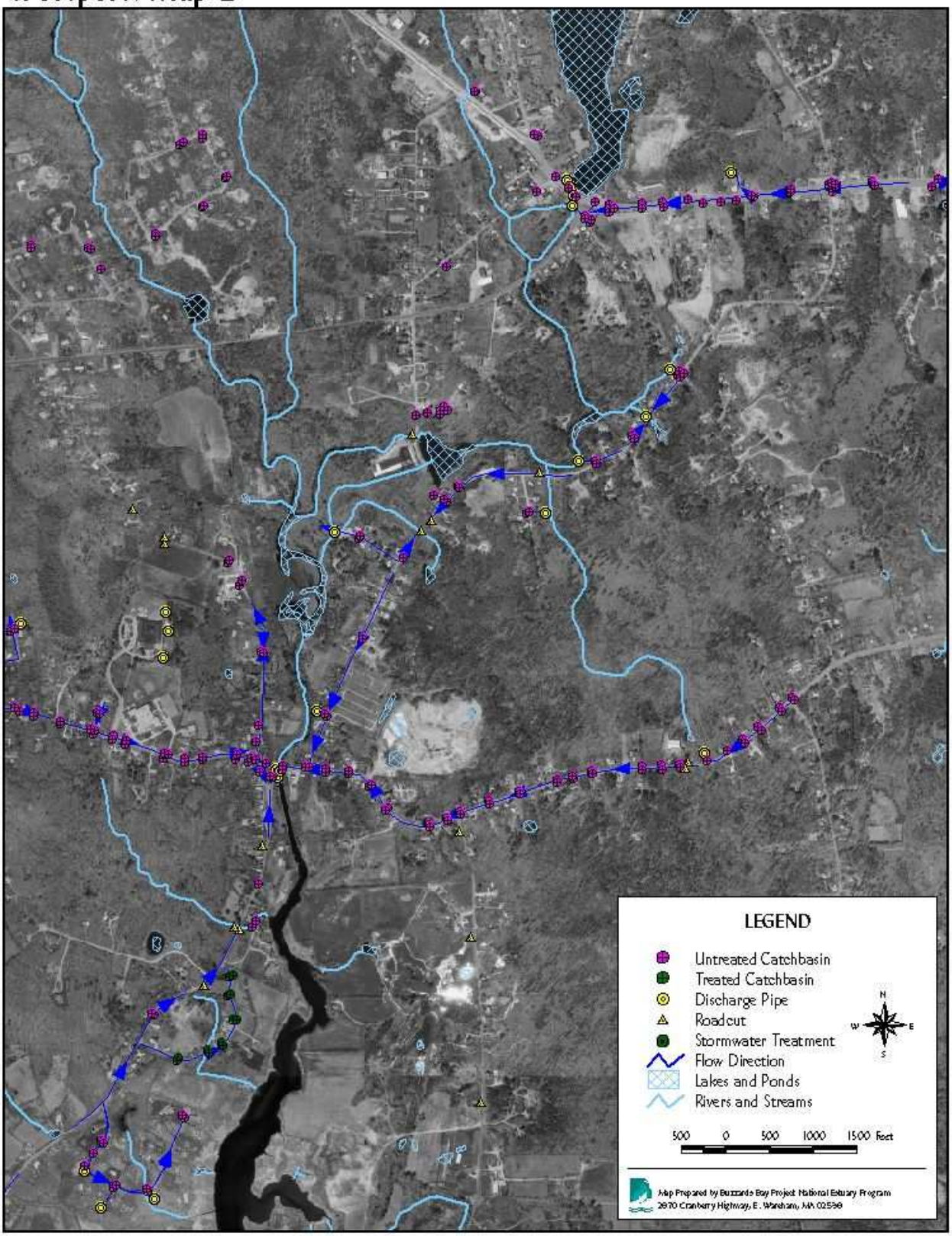
Appendix A

Atlas of Stormwater Discharges in the Buzzards Bay Watershed (MACZM 2003).

Highlight Maps Specifically Related to Bacteria Impaired Segments in This TMDL.

Also available for download at http://www.buzzardsbay.org/stormatlas.htm

Westport: Map 2



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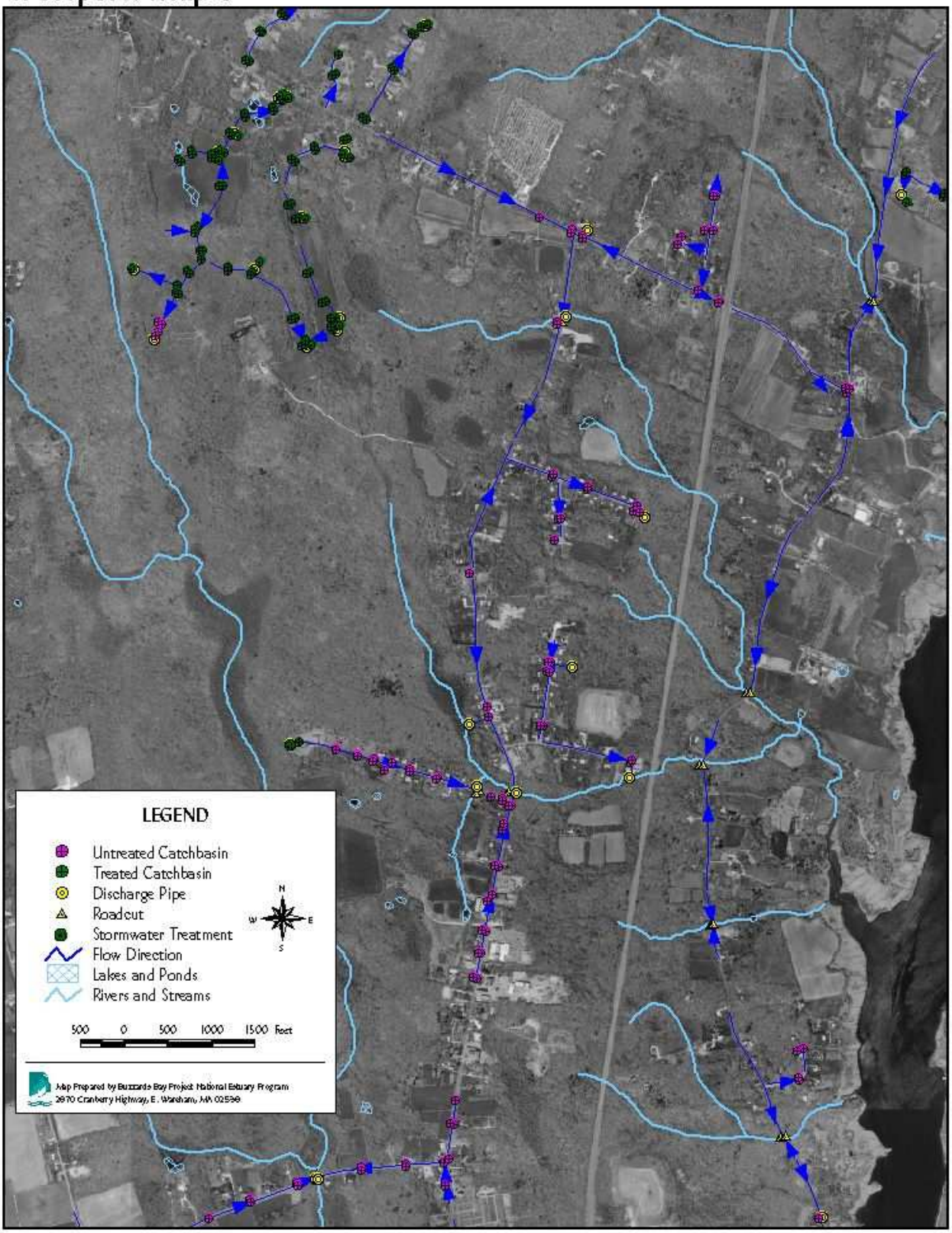

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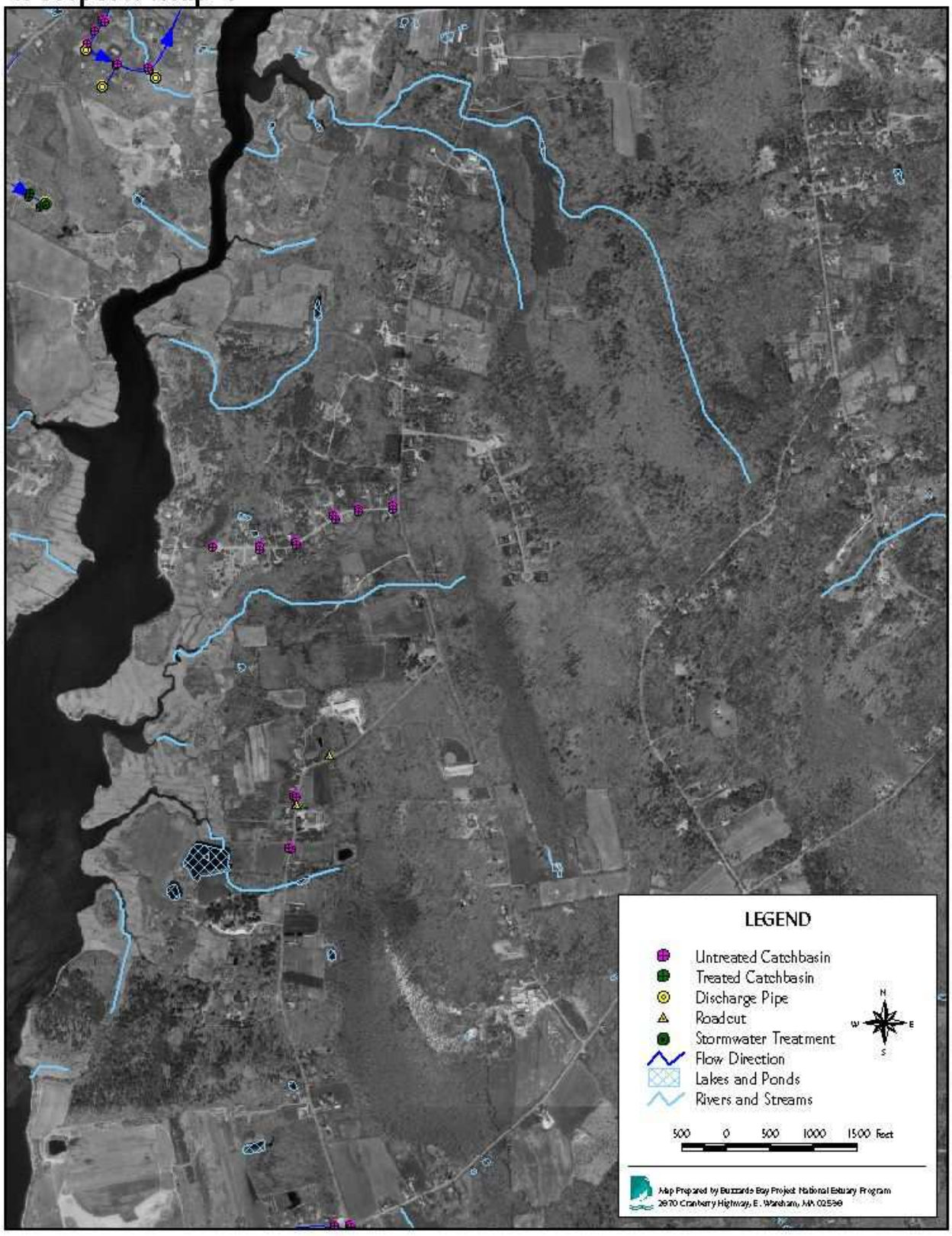

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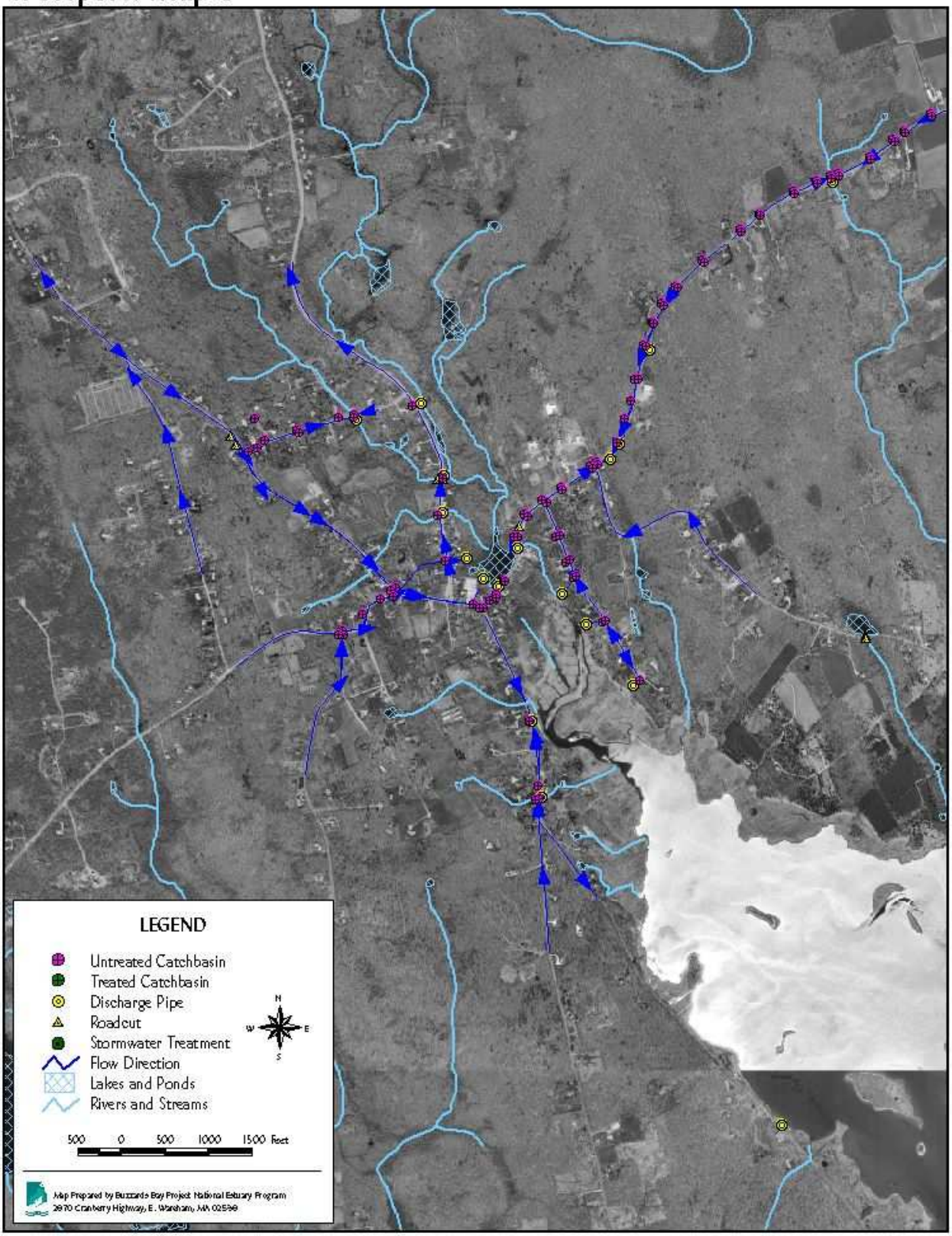

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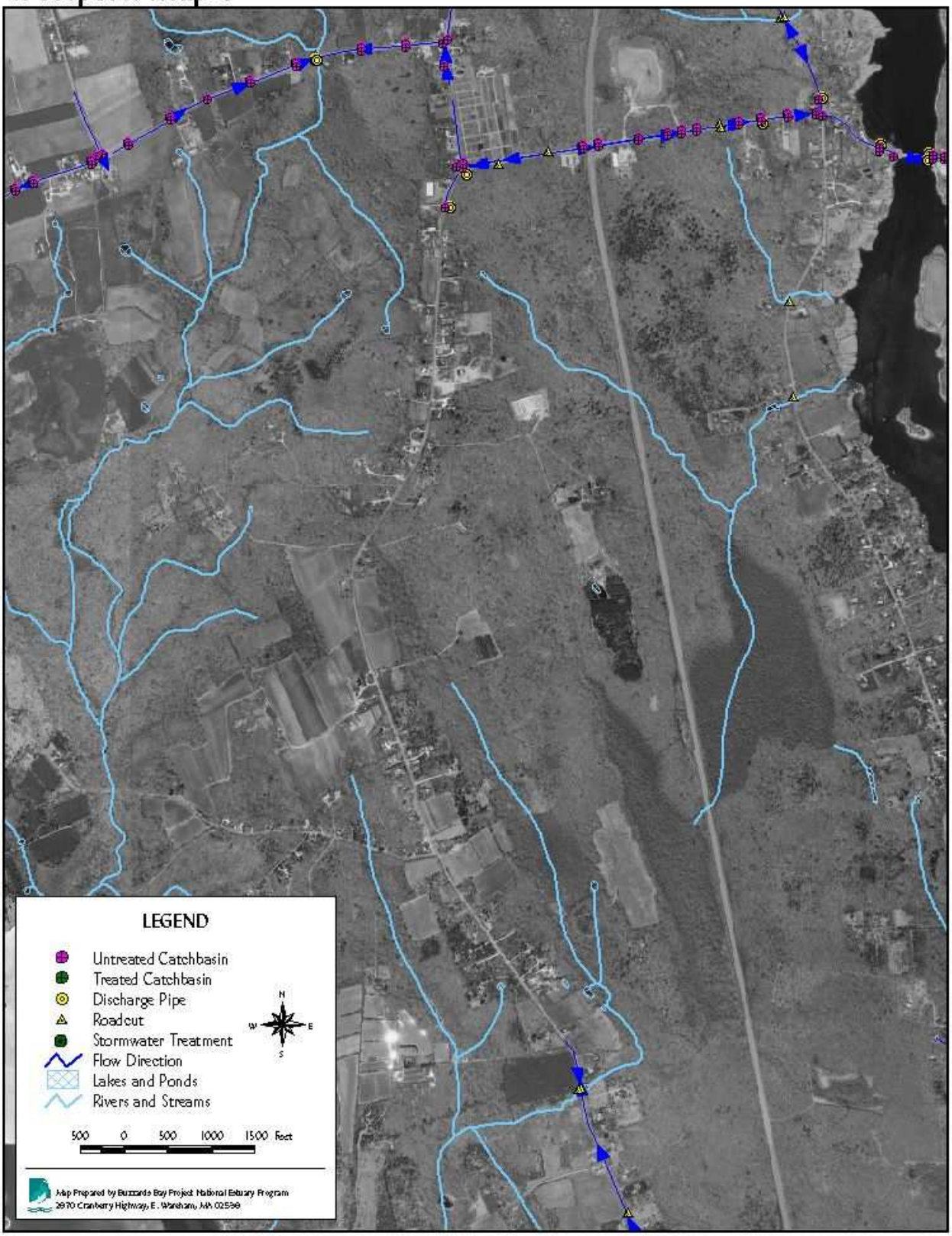

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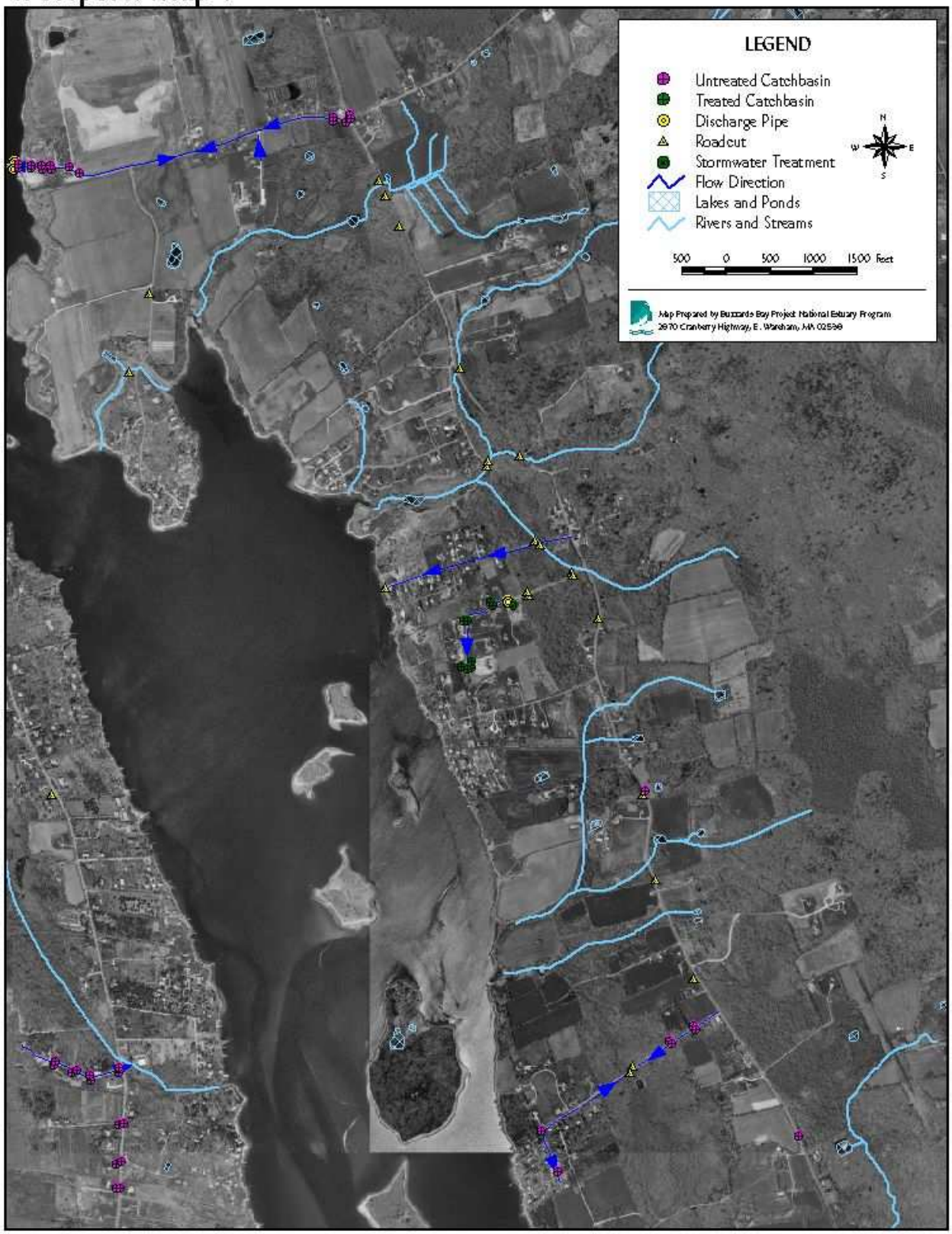

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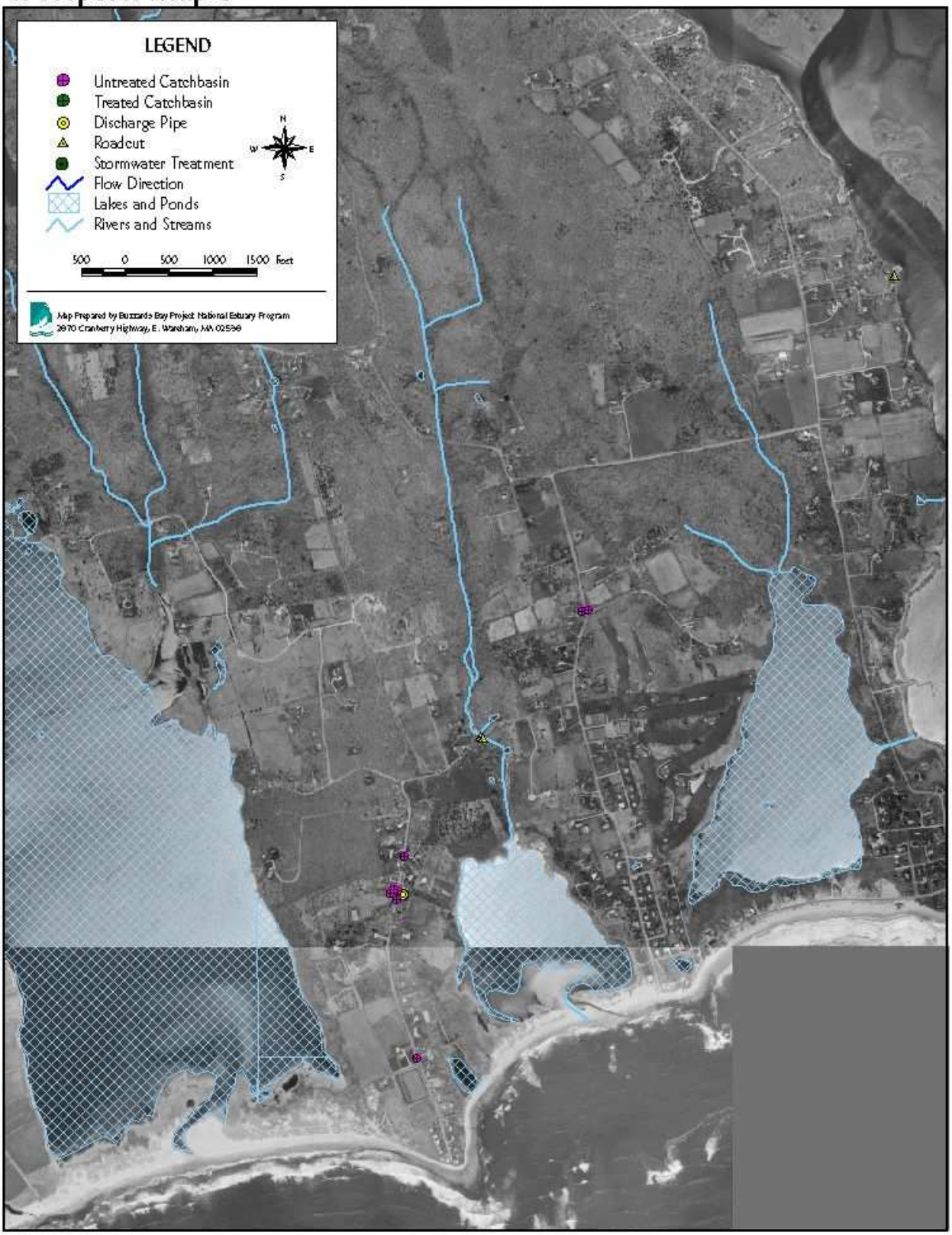

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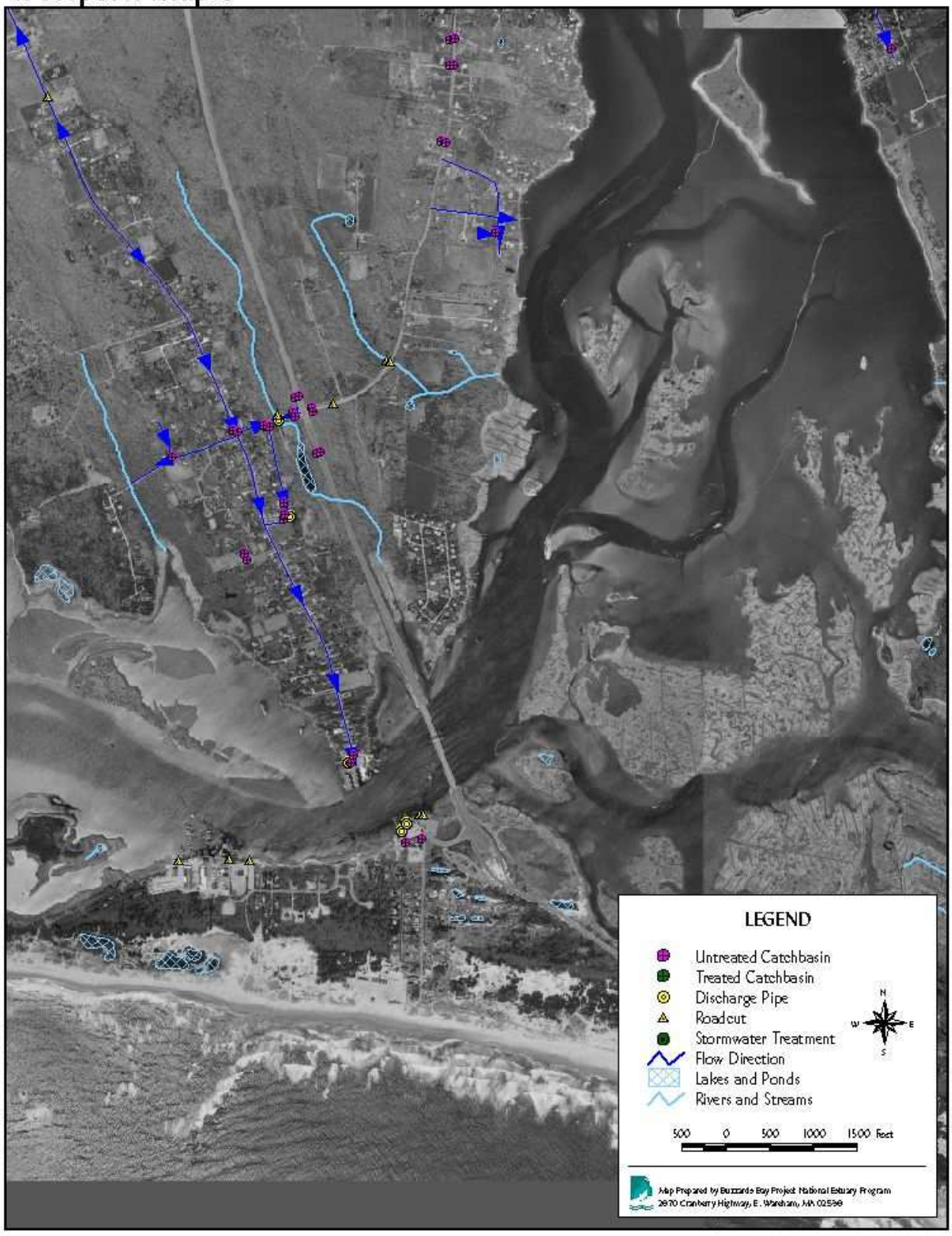

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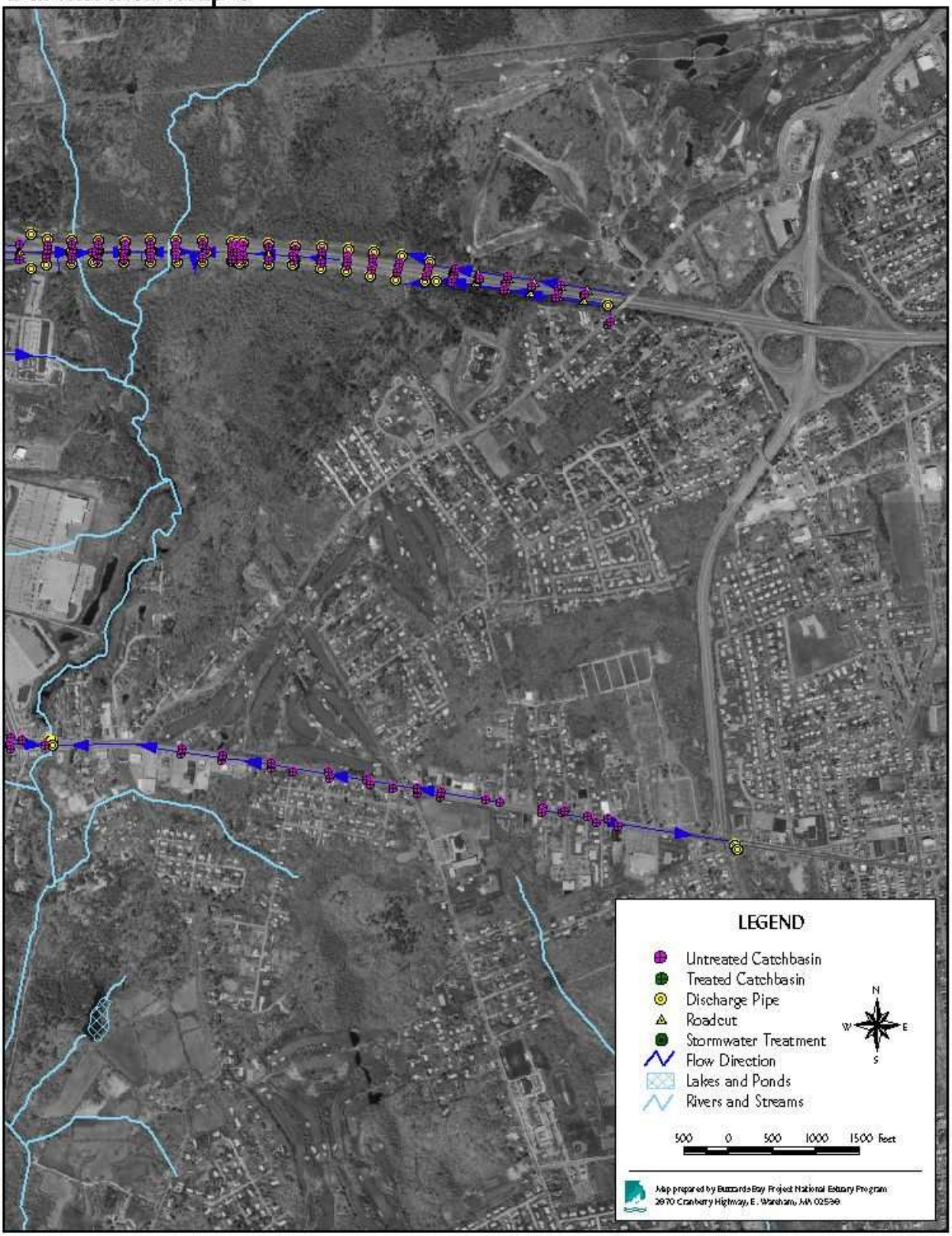

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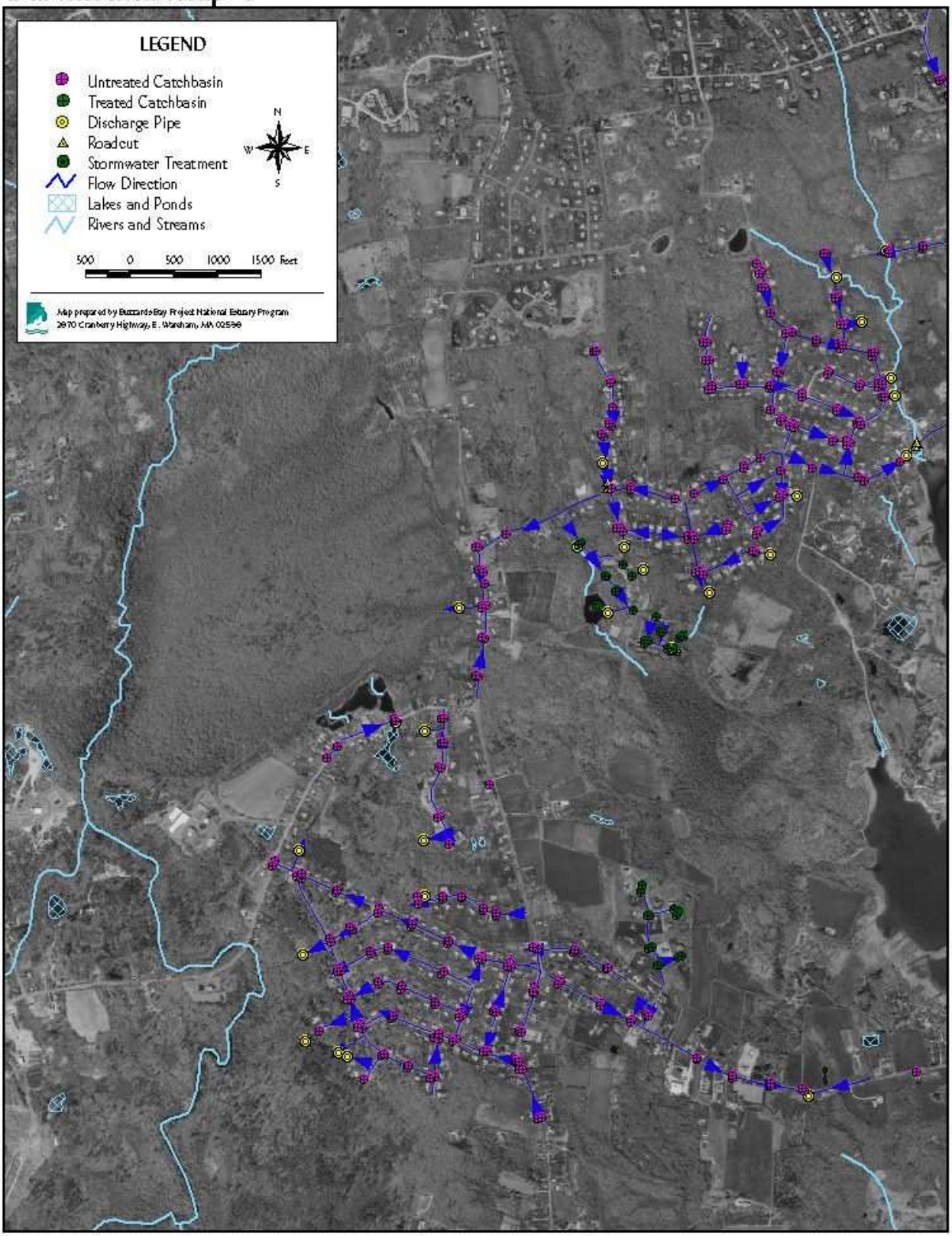

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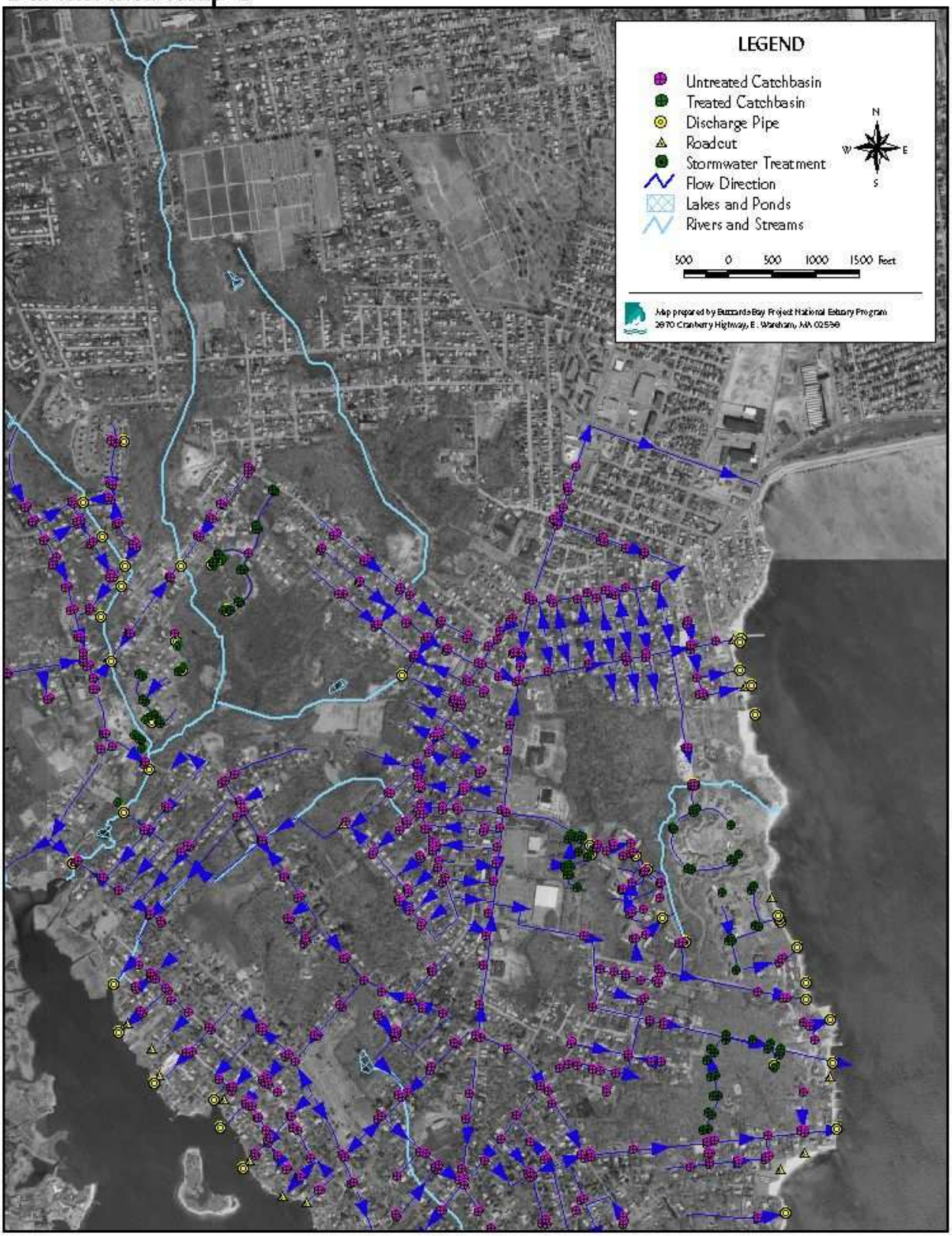

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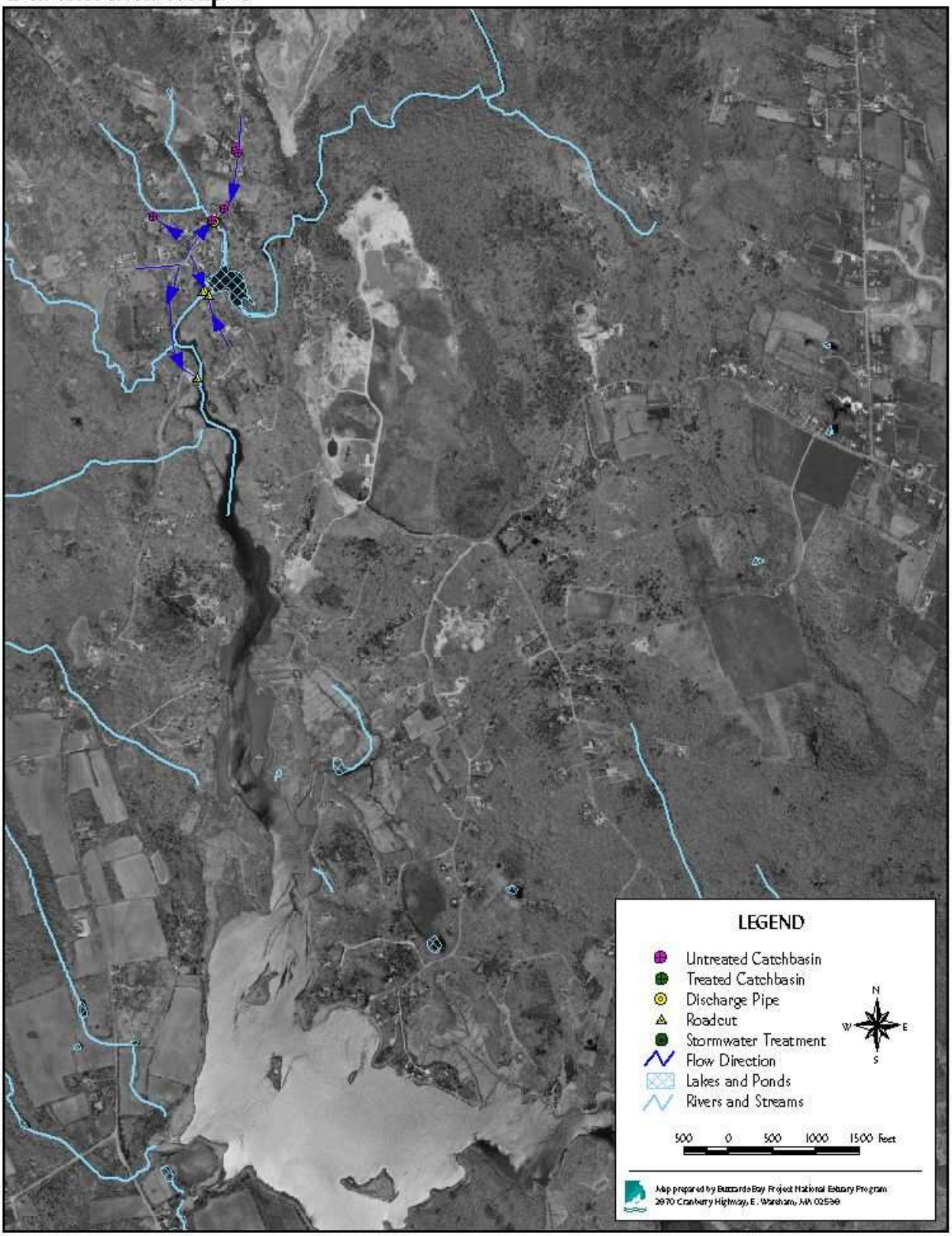

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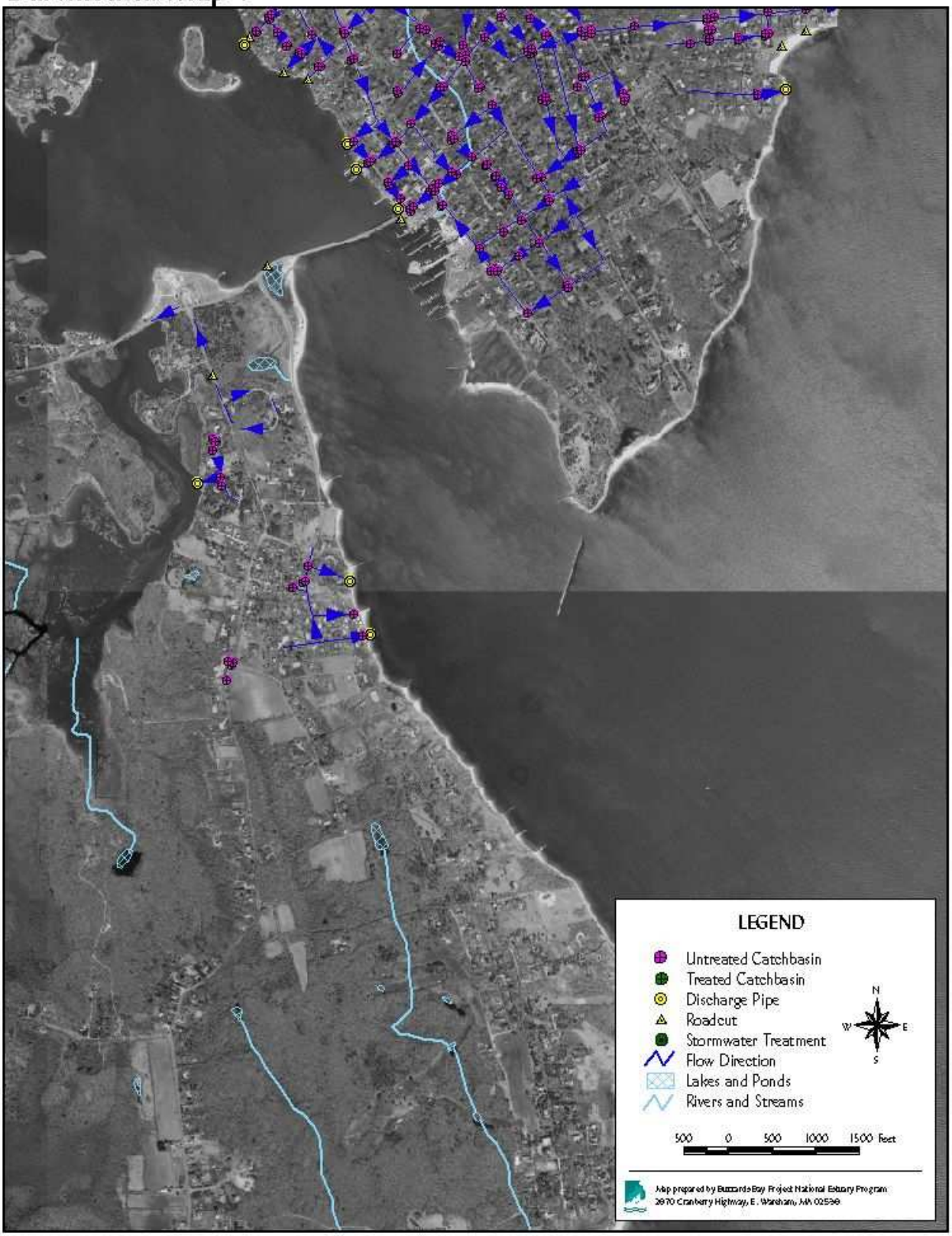

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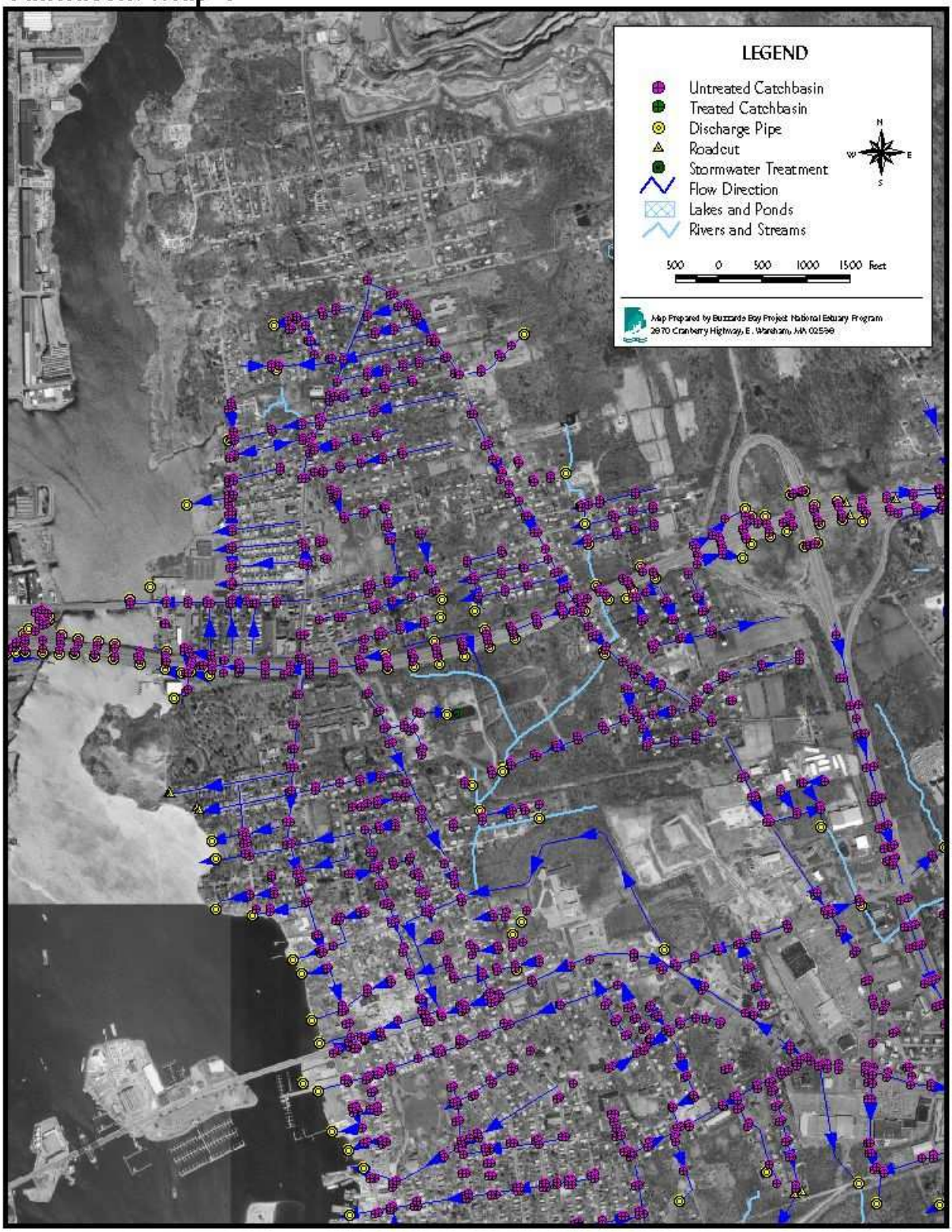
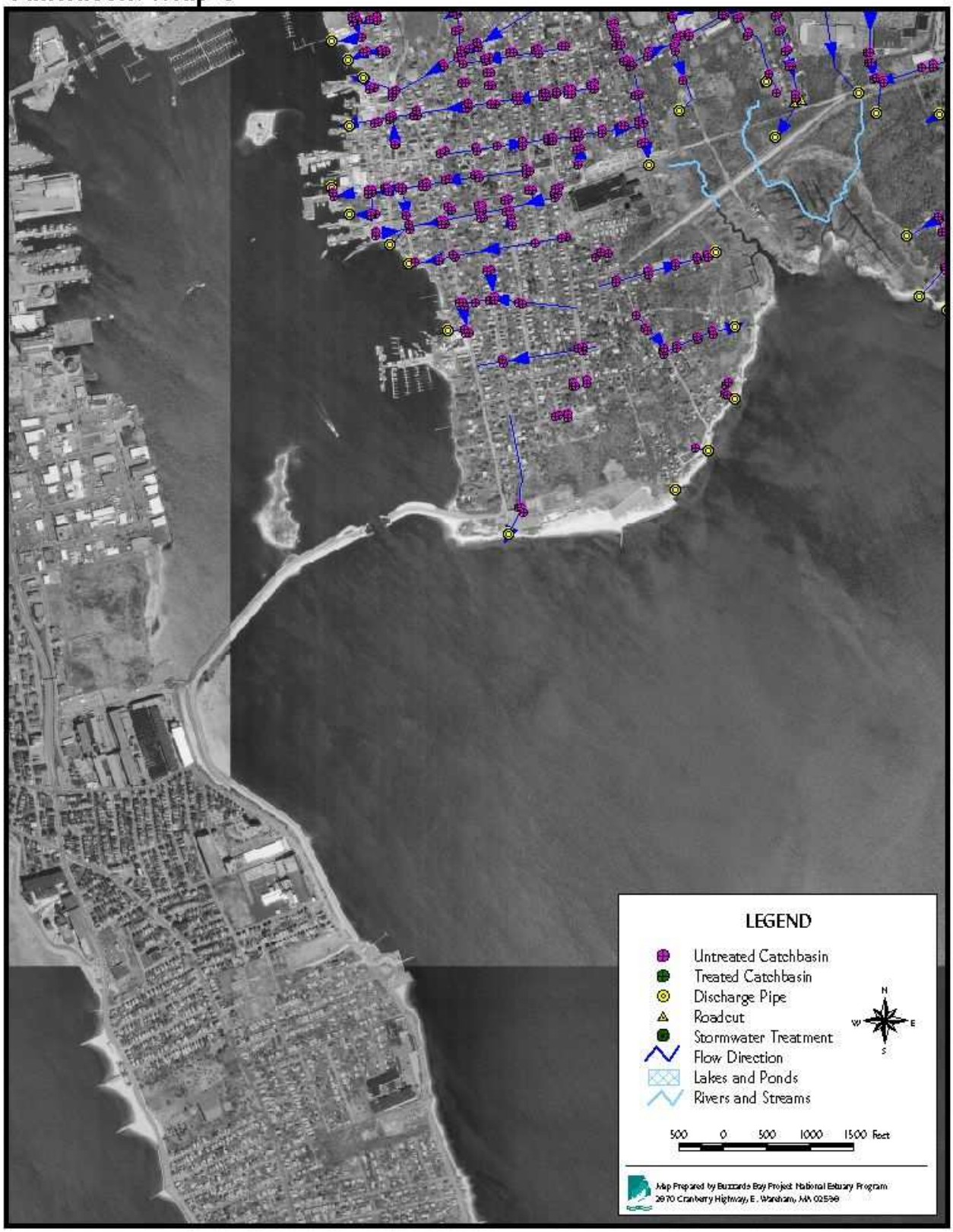
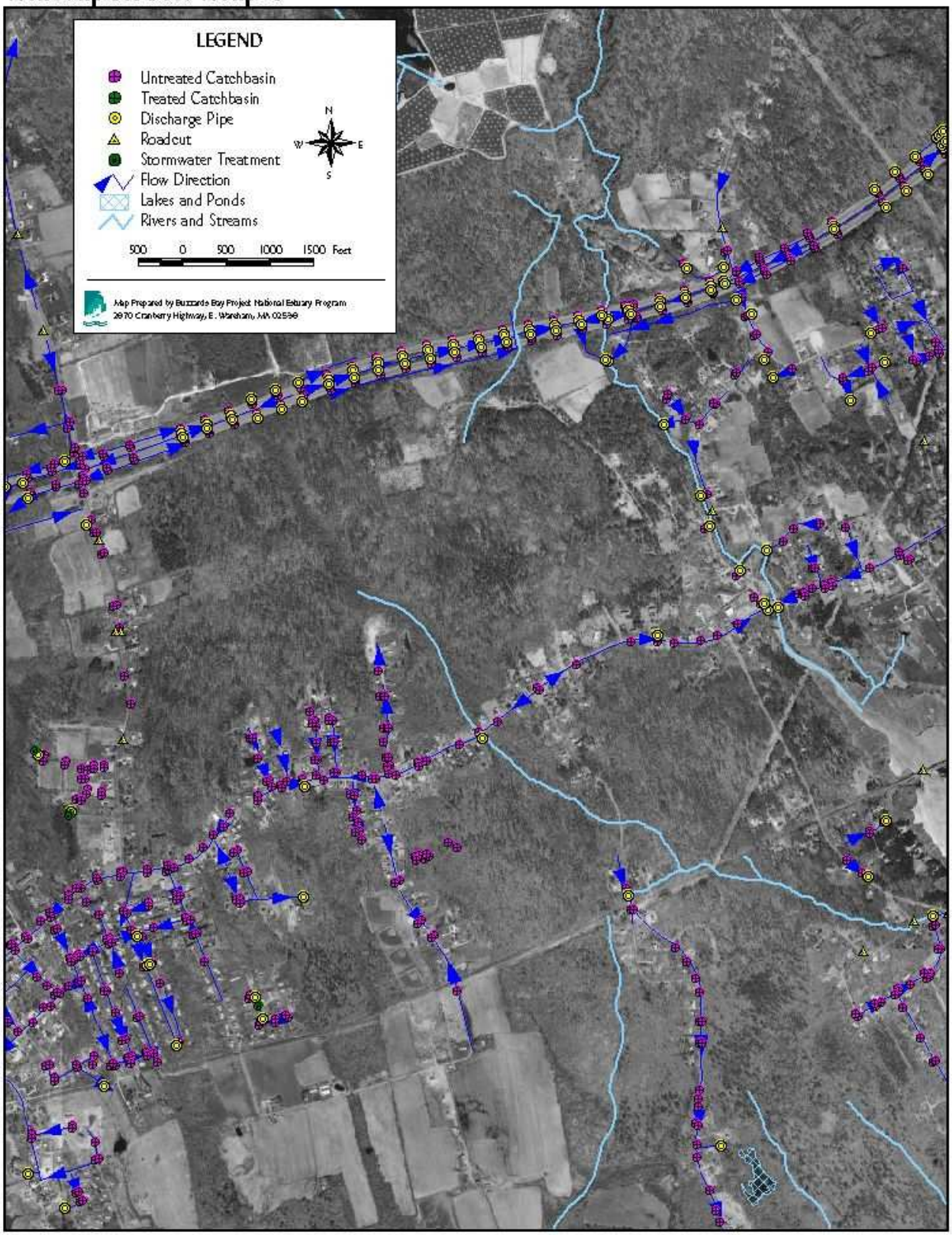


Fairhaven: Map 3



Mattapoisett: Map 3



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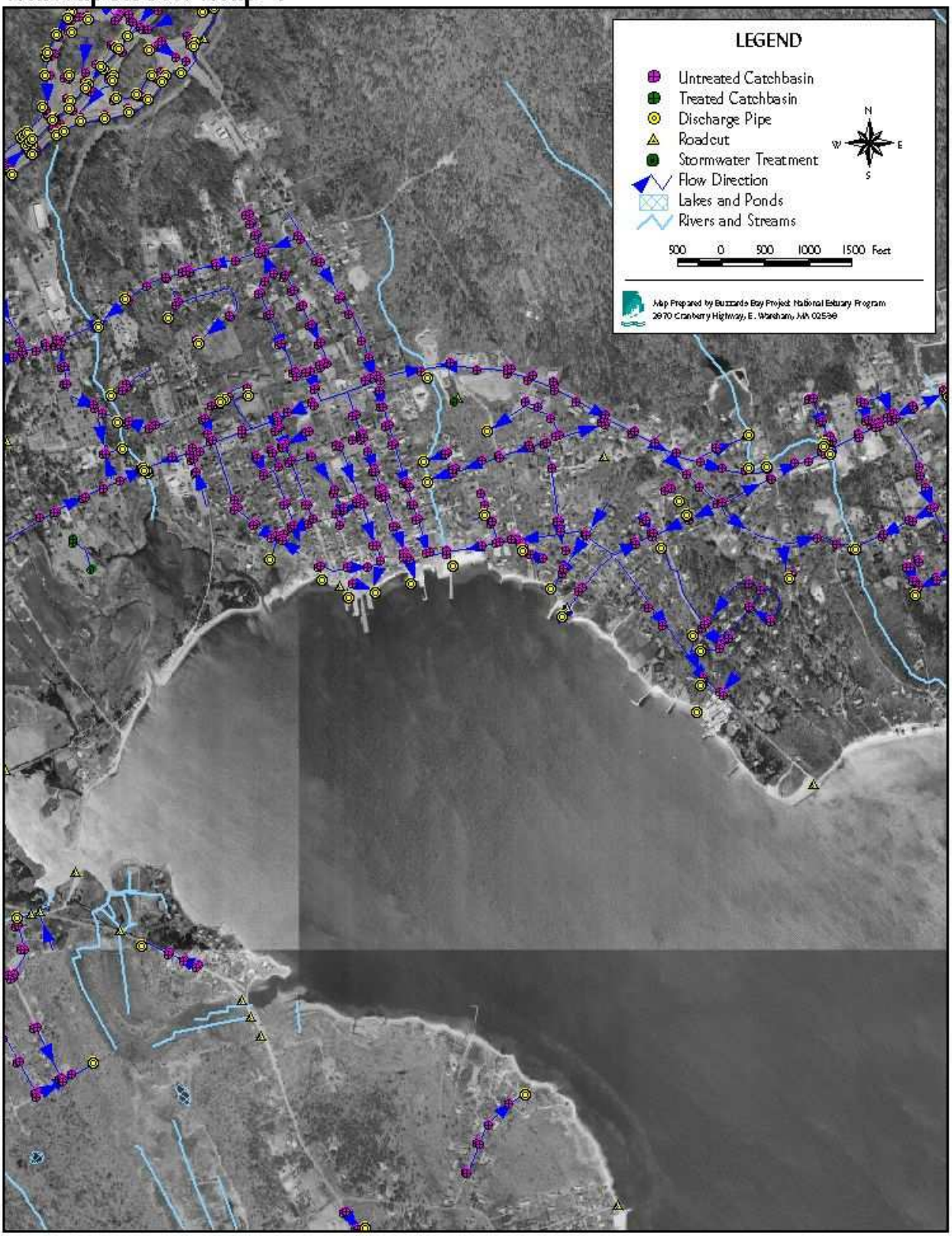

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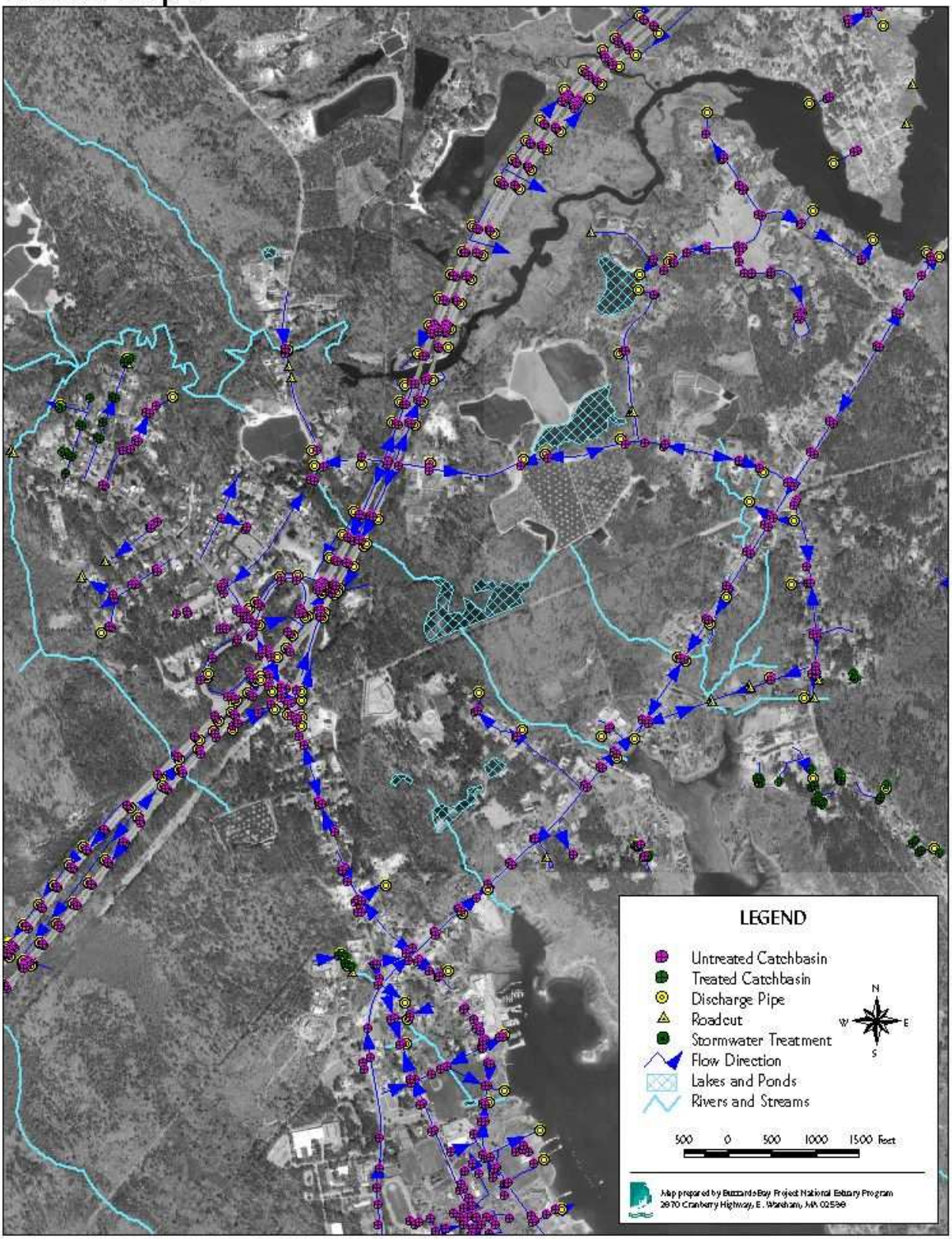
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Map prepared by Buzzards Bay Project National Estuary Program
2870 Cranberry Highway, E. Wareham, MA 02538

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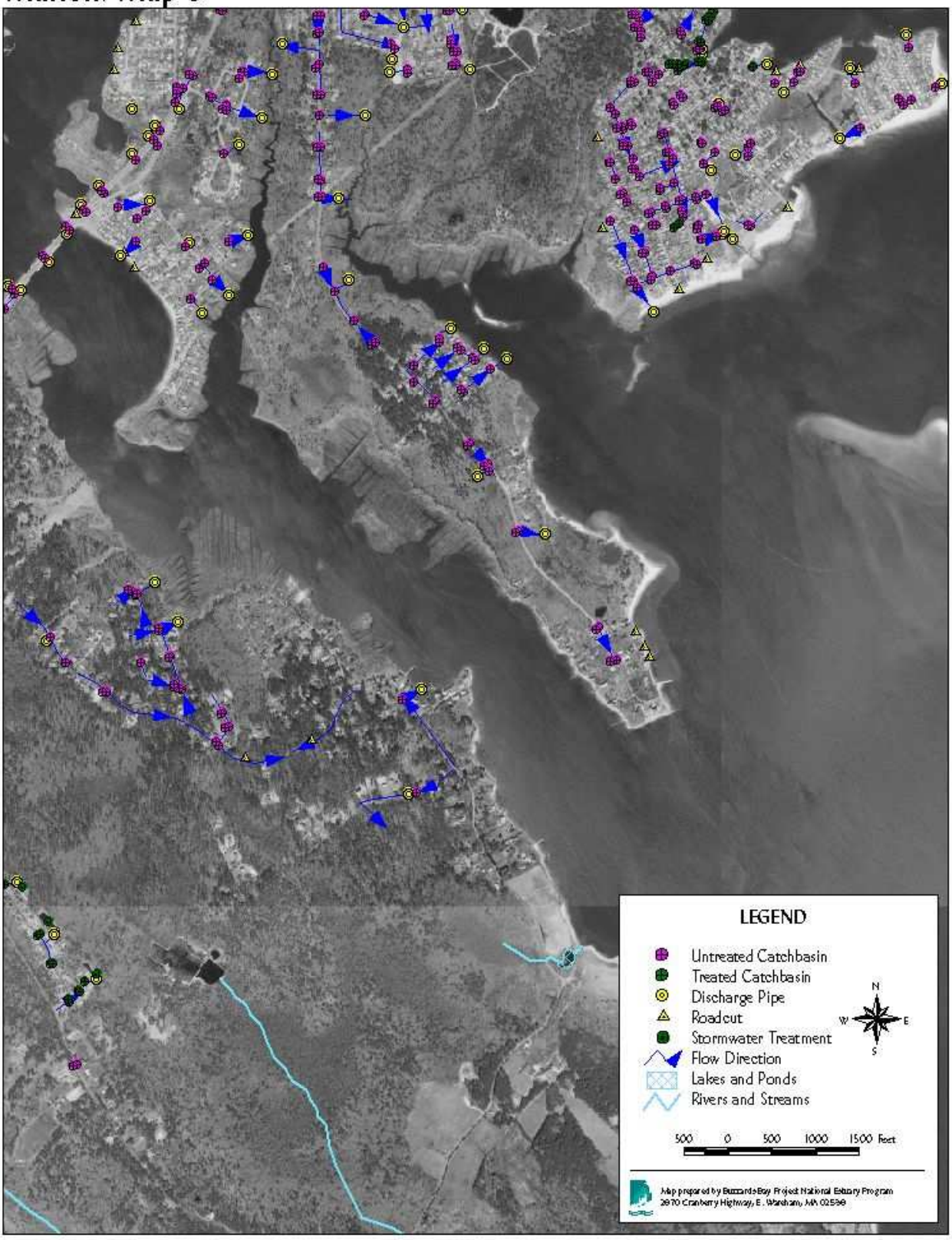
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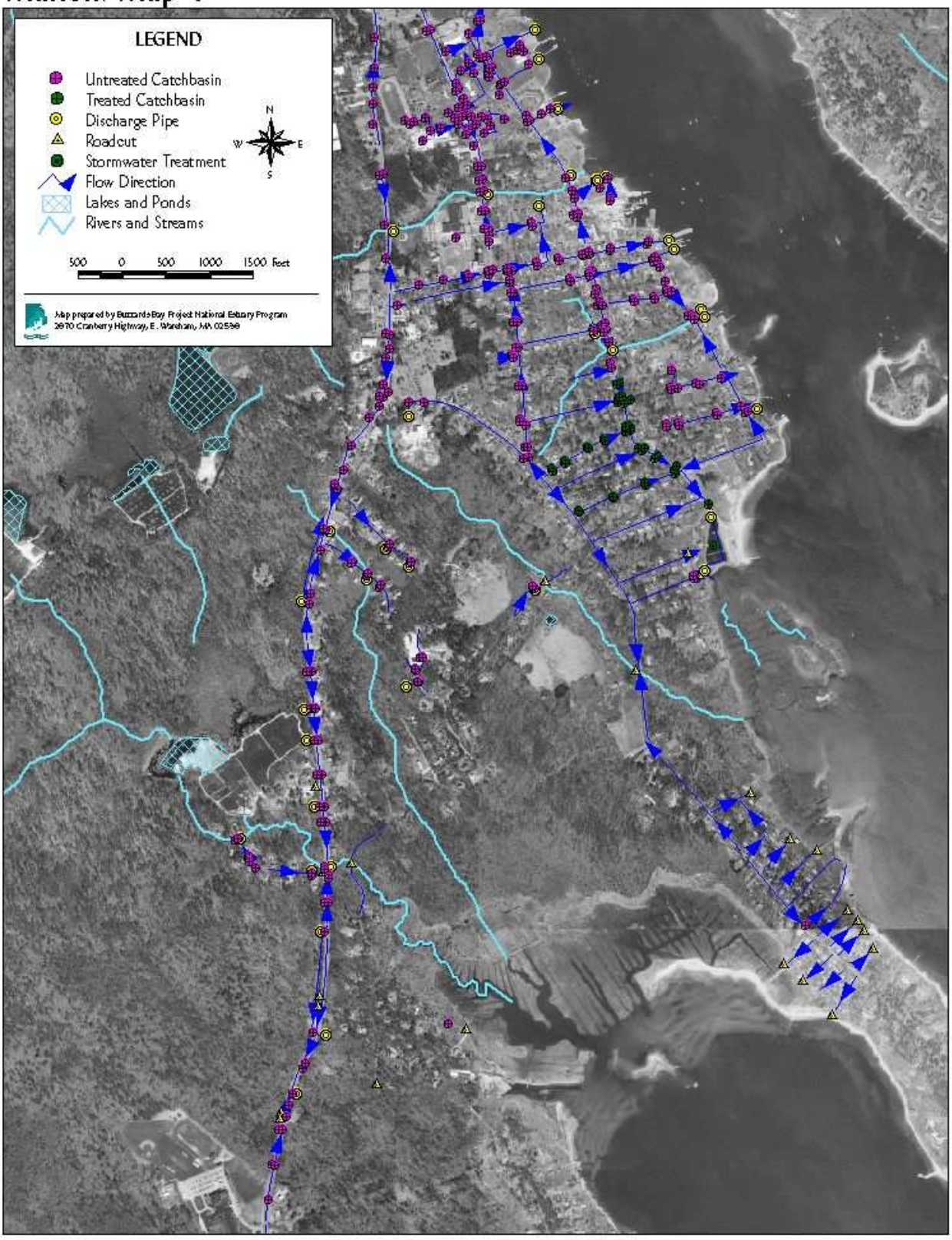
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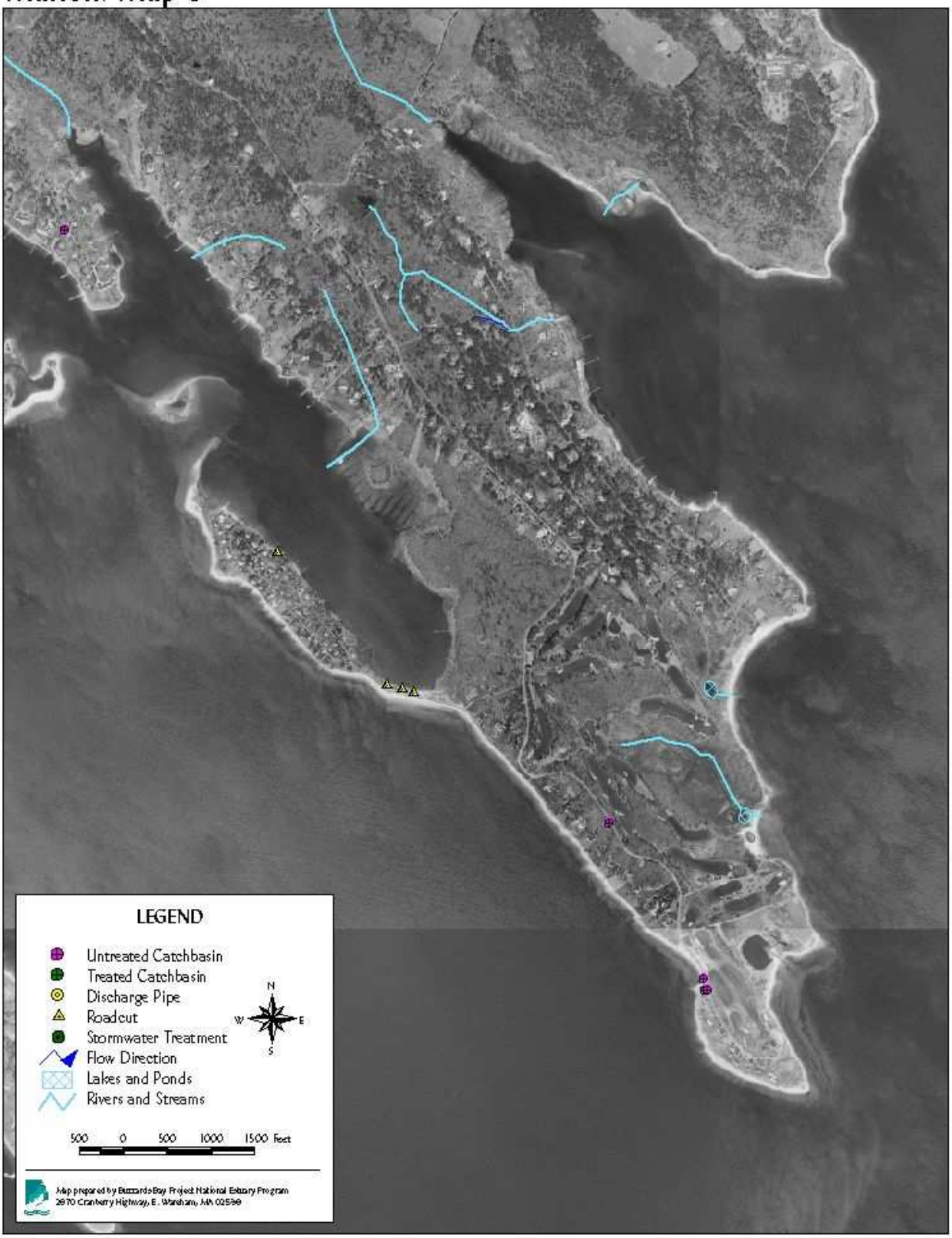
Marion: Map 5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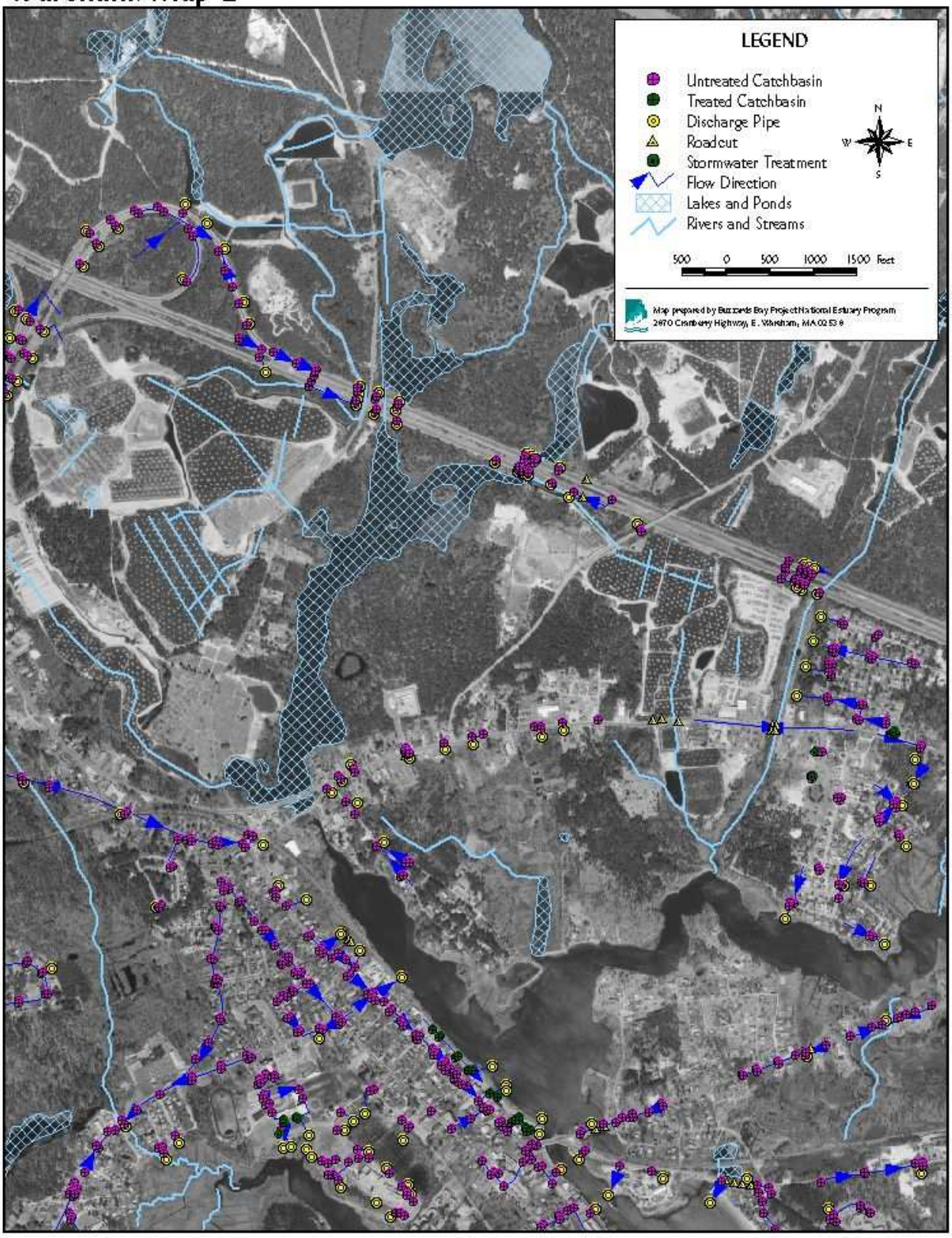
Map prepared by Buzzards Bay Project National Estuary Program
2870 Cranberry Highway, E. Wareham, MA 02538

Wareham: Map 2



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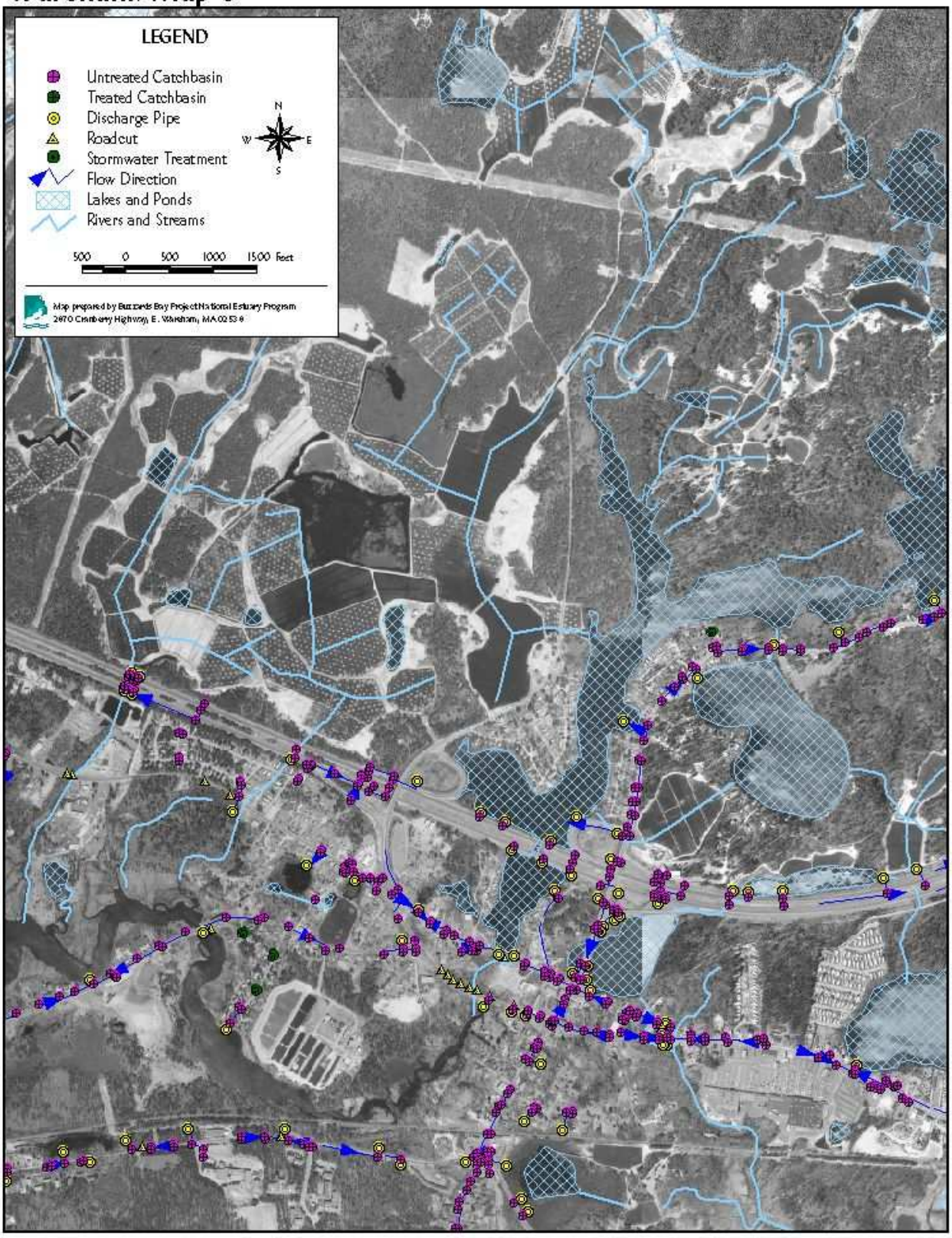

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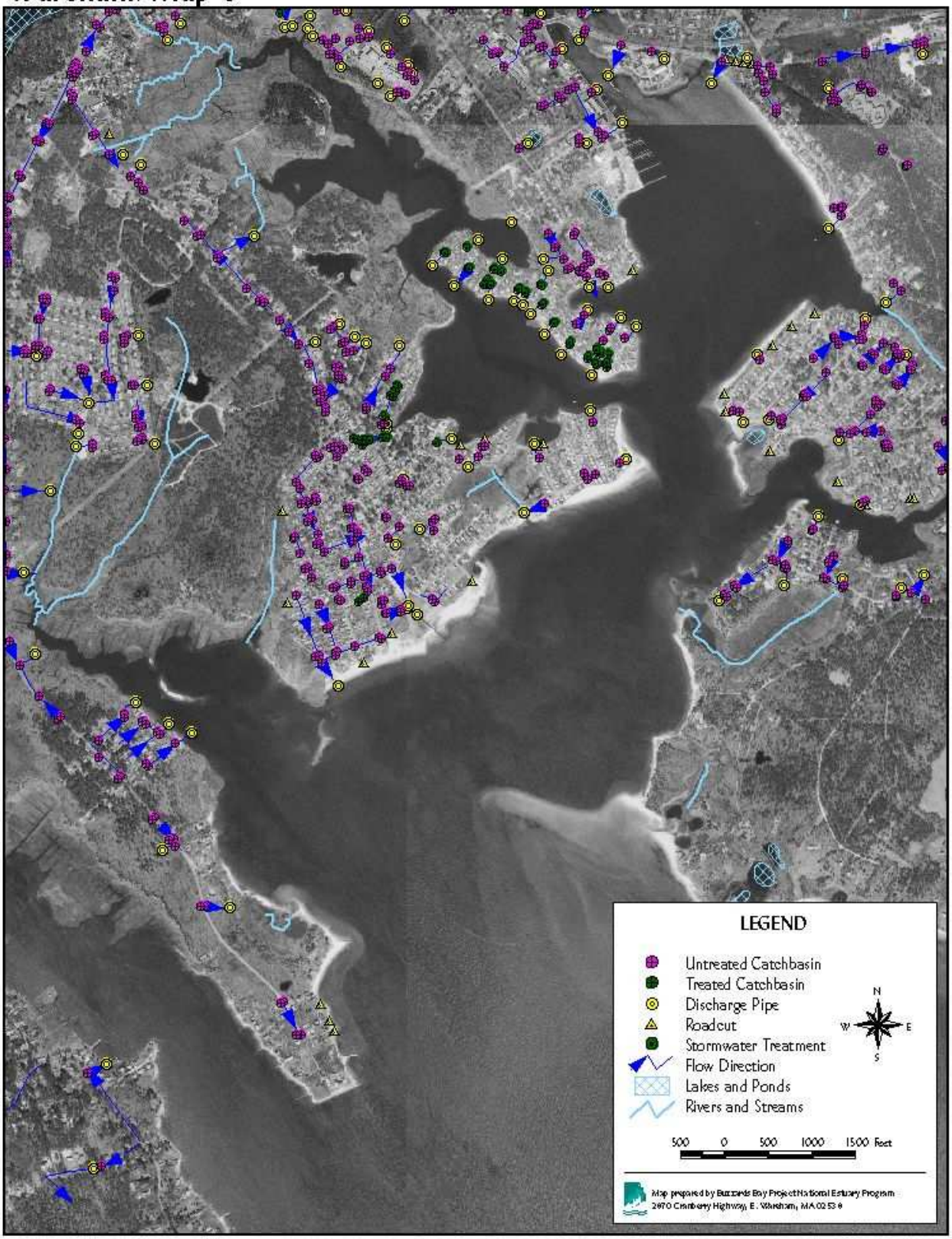

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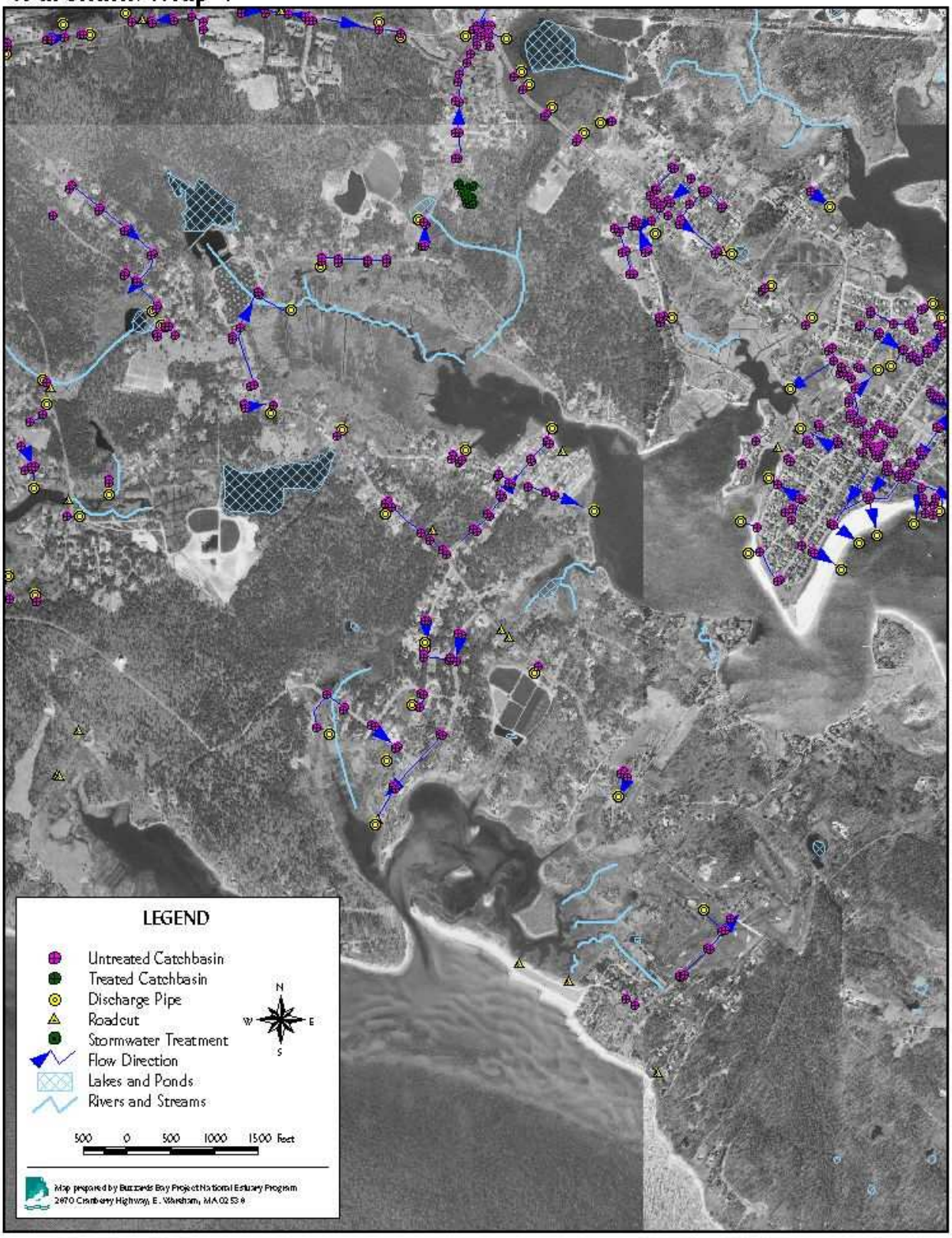

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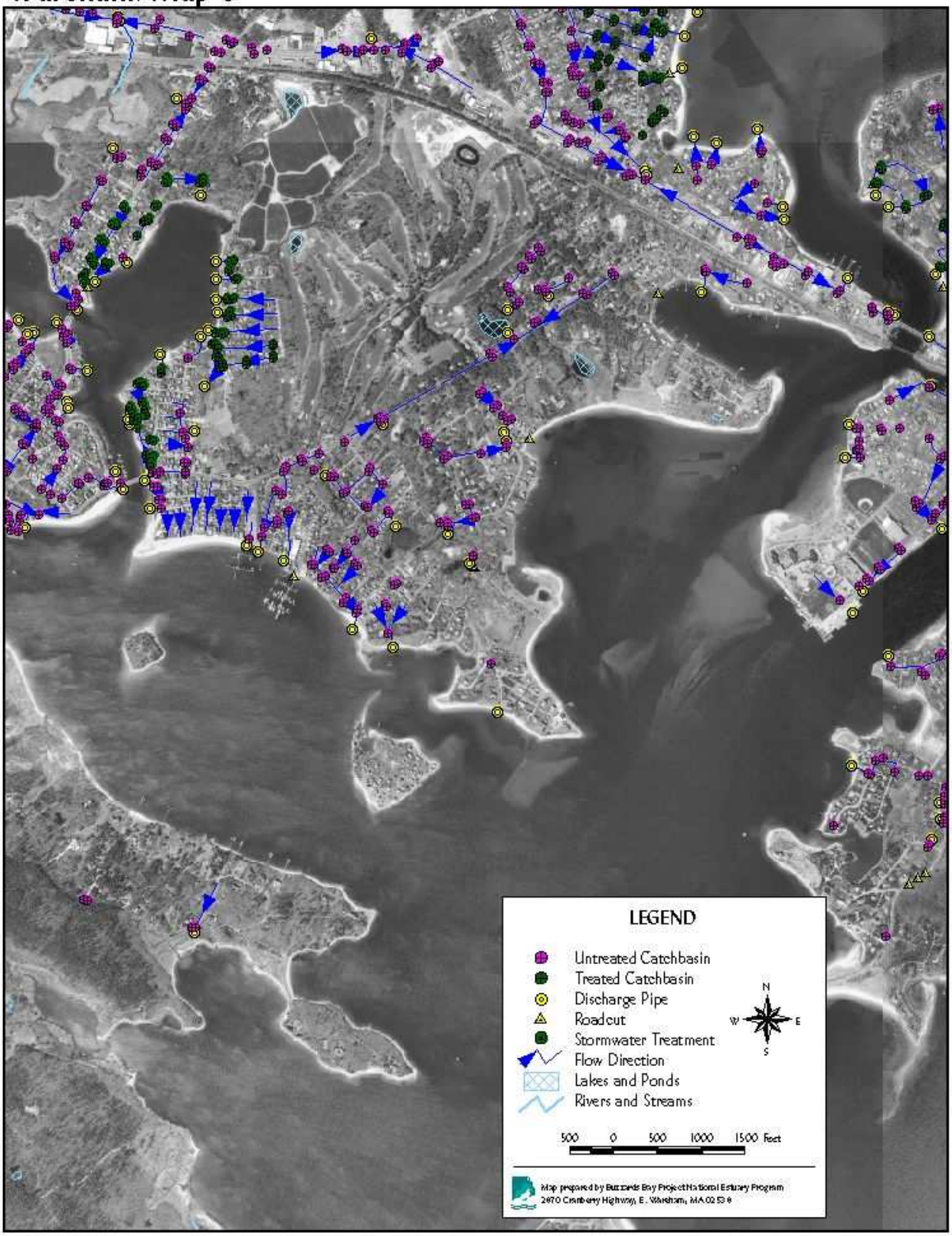

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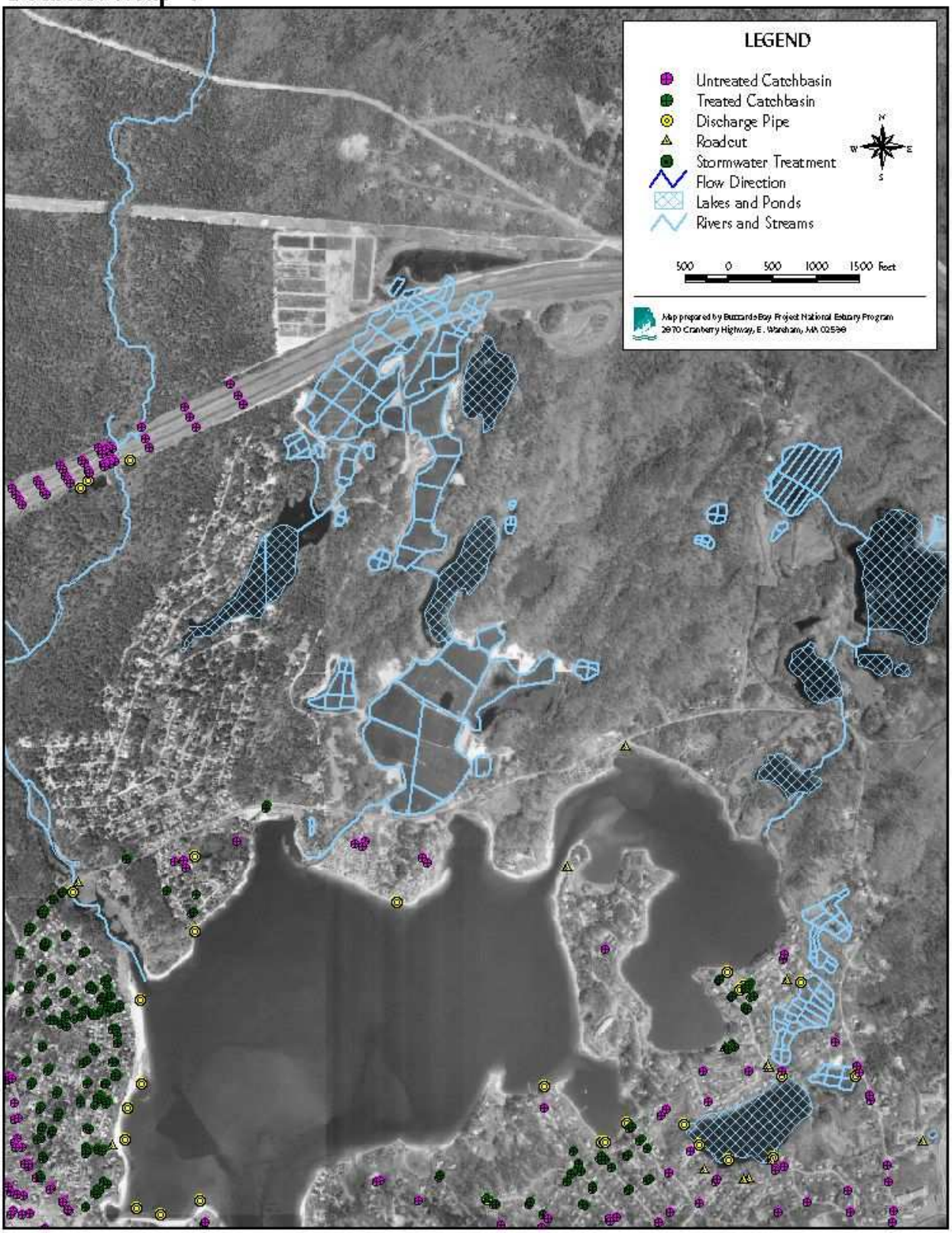
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Map prepared by Buzzards Bay Project National Estuary Program
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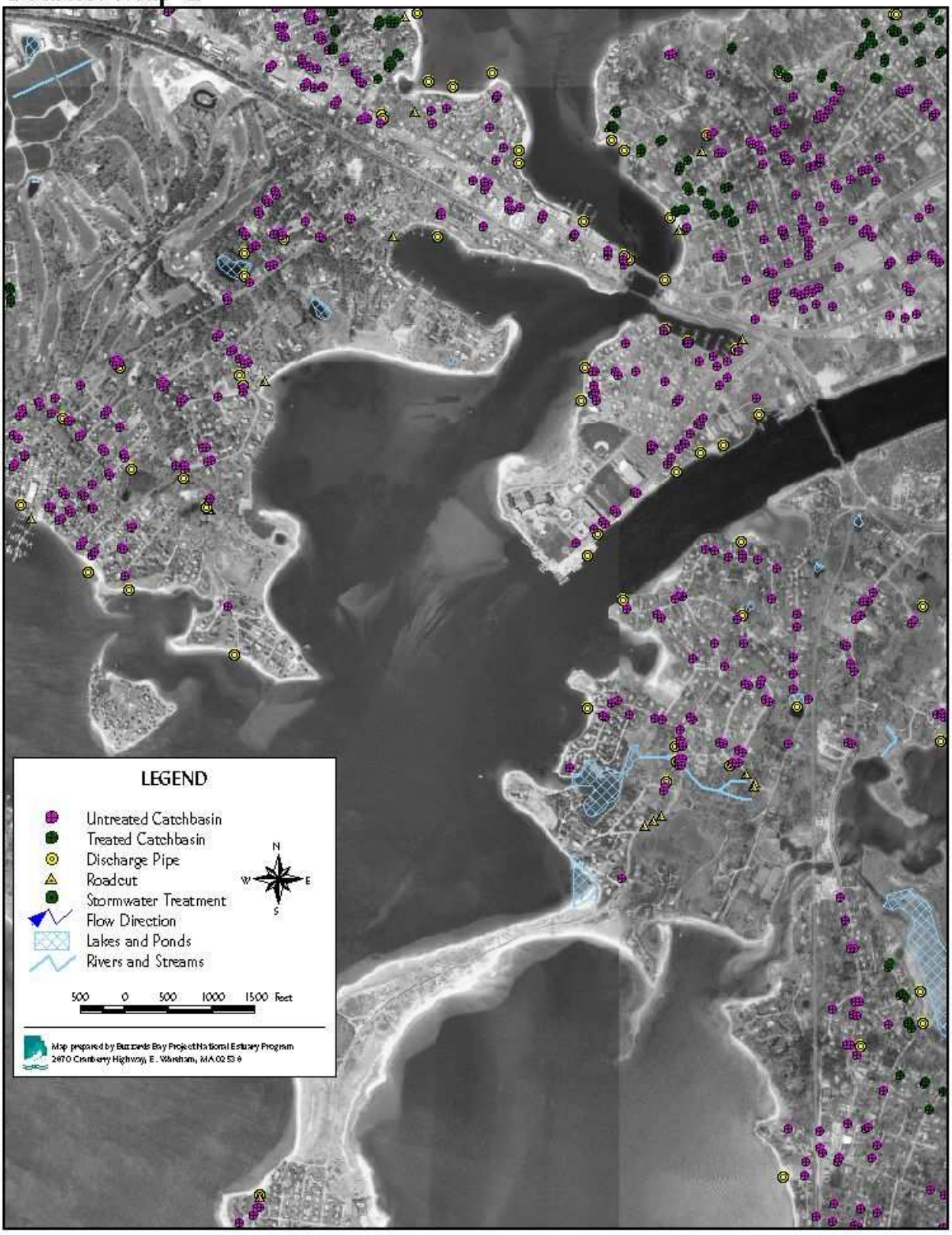
Bourne: Map 2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Appendix B
Public Participation

RESPONSE TO COMMENTS ON THE DRAFT PATHOGEN TMDL FOR THE BUZZARDS BAY WATERSHED

Public Meeting Announcement Published in the Monitor	7/23/2005
Date of Public Meeting	8/10/2005
Location of Public Meeting	DEP-SERO, Lakeville
Times of Public Meeting	3 P.M. and 7 P.M.

BUZZARDS BAY WATERSHED DRAFT PATHOGEN TMDL PUBLIC MEETING ATTENDEES

Date 8/10/2005 Time 3 PM

Name	Organization
1. Ben Bryant	Coalition for Buzzards Bay
2. A. Antoniello	DPW Scituate
3. Jason Burtner	CZM
4. Mike Hill	EPA
5. Bill Fitzgerald	DPW Franklin/Citizen Taunton
6. Cathal O'Brien	DPW Water Taunton
7. Lawrence Perry	Lakeville Health Agent
8. Newton Newman	Lloyd Center Dartmouth

Date 8/10/2005 Time 7 P.M

Name	Organization
1. Sara Grady	NSRWA/Mass Bays
2. Steve Silva	EPA

This appendix provides detailed responses to comments received during the public comment process. MassDEP received many comments/questions that were of a general nature (i.e. related to terminology, statewide programs, the TMDL development process and regulations, etc.) while others were watershed specific. Responses to both are presented in the following sections.

General Comments:

1. Question: On the slide titled "components of a TMDL" what does "WLA" and "LA" stand for.

Response: Waste load allocation (WLA) refers to pollutants discharged from pipes and channels that require a discharge permit (point sources). Load allocation refers to pollutants entering waterbodies through overland runoff (non point sources). A major difference between the two categories is the greater legal and regulatory control generally available to address point sources while voluntary cooperation added by incentives in some cases is the main vehicle for addressing non-point sources.

2. Question: What is the Septic System Program?

Response: Cities and Towns can establish a small revolving fund to help finance repairs and necessary upgrades to septic systems. The initial funding is from the Commonwealth's State, Revolving Fund Program (SRF). These programs generally offer reduced interest rate loans to homeowners to conduct such improvements. Many communities have taken advantage of this effort and on Cape Cod Barnstable County has proposed its own version of this aid. A discussion of the septic system programs may be seen in the TMDL companion document "A TMDL Implementation Guidance Manual for Massachusetts" under Section 3.2.

3. Question: What is the WQS for non-contact recreation in terms of bacteria?

Response: EPA does not have specific guidance for a bacteria criterion for secondary contact. The agency recommended states use 5 times the swimming standard in the case of fecal coliform. Based on EPA's recommendation Massachusetts adopted a class "C" standard of 1000 organisms per 100 ml. Class C waters are designated as a habitat for fish, other aquatic life and wildlife, and for secondary contact recreation such as fishing and boating. In 2007 the State of Massachusetts revised its standards for certain waters from fecal coliform to e-coli or enterococcus

4. Question: On the topic of DNA testing for bacterial source tracking what is MassDEP doing or planning to do?

Response: DNA testing is a promising but as yet not fully reliable tool in distinguishing between human and other sources of fecal bacteria. When perfected, this tool will be extremely valuable in helping target sources of pathogens and remedial actions. At the same time, one needs to recognize that even if the source of the bacteria is identified as non-human, any concentrations exceeding the criteria still impair the use, such as swimming or shellfishing, associated with those criteria. MassDEP is already working with our Wall Experiment Station to help develop reliable techniques to address this issue. Once developed MassDEP will include those techniques into our sampling programs however we hope local monitoring programs will also benefit from them.

5. Question: What is the current thought on e coli / entero bacteria survival and reproduction in the environment, especially in wetlands ?

Response: There are reports that indicator bacteria can survive in sediment longer than they can in water. This may be a result of being protected from predators. Also, there is some indication that reproduction may occur in wetlands, but until wildlife sources can be ruled out through, for example, a reliable DNA testing, this possibility needs to be treated with caution. Also, die off of indicator bacteria tends to be more rapid in warm water than in cold.

6.**Question:** For the implementation phase of TMDLs who will do the regular progress reporting and who will pay for it?

Response: In most cases, MassDEP is relying on existing programs for TMDL implementation. Reporting will also depend on the action being taken. Phase I and Phase II municipalities already do regular reporting and provide annual status reports on their efforts. Any additional information can be coupled with existing reporting requirements and monitoring results to determine the success and failure of implementation measures. For non-Phase II municipalities it gets more difficult and MassDEP may have to work directly with each community or possibly add communities with known impairments to the phase II list. The TMDL does not require volunteer groups, watershed organizations or towns to submit periodic reports - it is not mandatory. The MassDEP is relying on self interest and a sense of duty for communities to move ahead with the needed controls facilitated by some state aid. The MassDEP feels that the cooperative approach is the most desirable and effective but also believes that we possess broad regulatory authority to require action if and when it is deemed appropriate. .

7. Question: How does the Phase II program and TMDL program coordinate with each other?

Response: The NPDES Stormwater Phase II General Permit Program became effective in Massachusetts in March 2003. The permit requires the regulated entities to develop, implement and enforce a stormwater management program (SWMP) that effectively reduces or prevents the discharge of pollutants into receiving waters to the Maximum Extent Practicable (MEP). Stormwater discharges must also comply with meeting state water quality standards. The Phase II permit uses a best management practice framework and measurable goals to meet MEP and water quality standards. A requirement of the permit is that if a TMDL has been approved for any water body into which the small municipal separate storm sewer system (MS4) discharges, the permittee must determine whether the approved TMDL is for a pollutant likely to be found in stormwater discharges from the MS4. If the TMDL includes a pollutant waste load allocation, best management practices (BMPs) or other performance standards for stormwater discharges, the permittee must incorporate into their SWMP the recommendations in the TMDL for limiting the pollutant contamination. The permittee must assess whether the pollutant reduction required by the TMDL is being met by existing stormwater management control measures in their SWMP or if additional control measures are necessary. As TMDLs are developed and approved, permittees' stormwater management programs and annual reports must include a description of the BMPs that will be used to control the pollutant(s) of concern, to the maximum extent practicable. Annual reports filed by the permittee should highlight the status or progress of control measures currently being implemented or plans for implementation in the future.

Records should be kept concerning assessments or inspections of the appropriate control measures and how the pollutant reductions will be met.

8. Question: Will communities be liable for meeting water quality standards for bacteria at the point of discharge?

Response: No. While this is the goal stated in the TMDL, compliance with the water quality standards is judged by in-stream measurements. For instance, in an extreme case, it could be possible for a community to meet this criterion in their storm drains and yet still be responsible for reducing the impacts of overland runoff if the in-stream concentrations of bacteria exceeded the water quality standard. So no matter how the TMDL is expressed, compliance is measured by the concentrations in the ambient water.

This approach is also consistent with current EPA guidance and regulations. As stated in the 2002 Wayland/Hanlon memorandum, "WQBELs for NPDES-regulated storm water discharges that implement WLAs in TMDLs may be expressed in the form of best management practices (BMPs) under specified circumstances. See 33 U.S.C. 1342(p)(3)(B)(iii); 40 C.F.R. 122.44(k)(2)&(3)" (Wayland/Hanlon memo, page 2; See Attachment A. This memorandum goes on to state:
"...because storm water discharges are due to storm events that are highly variable in frequency and duration and are not easily characterized, only in rare cases will it be feasible or appropriate to establish numeric limits for municipal and small construction storm water discharges. The variability in the system and minimal data generally available make it difficult to determine with precision or certainty actual or projected loadings for individual dischargers or groups of dischargers. Therefore, EPA believes that in these situations, permit limits typically can be expressed as BMPs, and that numeric limits will be used only in rare instances" (Wayland, Hanlon memorandum, November 22, 2002, page 4).

The TMDL attempts to be clear on the expectation that an adaptive management approach utilizing BMPs will be used to achieve WQS as stated in the Wayland/Hanlon memorandum: "If it is determined that a BMP approach (including an iterative BMP approach) is appropriate to meet the storm water component of the TMDL, EPA recommends that the TMDL reflect this." (Wayland, Hanlon memorandum, page 5). Consistent with this, the Massachusetts' pathogen TMDLs state that an iterative approach using an illicit connection detection and elimination program and utilization of non-structural BMPs be used initially to meet WQS followed by structural BMPs where necessary. The actual WLA and LA for storm water will still be expressed as both a concentration-based/WQS limit and daily load which will be used to guide BMP implementation. The attainment of WQS, however, will be assessed through ambient monitoring.

In storm water TMDLs, the issue of whether WQSs will be met is an ongoing issue and can never be answered with 100% assurance. MassDEP believes that the BMP-based, iterative approach for addressing pathogens is appropriate for storm water. Indeed, "the policy outlined in [the Wayland/Hanlon] memorandum affirms the appropriateness of an iterative, adaptive management BMP approach, whereby permits include effluent limits (e.g., a combination of structural and non-structural BMPs) that address storm water discharges, implement mechanisms to evaluate the

performance of such controls, and make adjustments (i.e., more stringent controls or specific BMPs) as necessary to protect water quality" (Wayland, Hanlon memorandum, page 5).

A more detailed discussion / explanation of this response can be found in Attachment C, a memorandum titled “Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs” by Robert H. Wayland and James A. Hanlon of EPA (11/22/02) which is appended to this Response To Comments Document.

9. Question: What are the regulatory hooks for this TMDL in regards to non-point sources?

Response: In general, the MassDEP is pursuing a cooperative approach in addressing non-point sources of contamination by bacteria. A total of 237 cities and towns in Massachusetts do have legal requirements to implement best management practices under their general NPDES storm-water permits. In addition, failing septic systems are required to be corrected once the local Board of Health becomes aware of them and at the time of property transfer should required inspections reveal a problem. Other activities, such as farming involving livestock, are the subject of cooperative control efforts through such organizations as the Natural Resources Conservation Service (NRCS) which has a long history of providing both technical advice and matching funds for instituting best management practices on farms. While MassDEP has broad legal authority to address non-point source pollution and enforcement tools available for use for cases of egregious neglect, it intends to fully pursue cooperative efforts which it feels offer the most promise for improving water quality.

In addition to the above, the Massachusetts Department of Environmental Protection's proposed new "Stormwater Management Regulations," that would establish a statewide general permit program aimed at controlling the discharge of stormwater runoff from certain privately-owned sites containing large impervious surfaces.

The proposed regulations would require private owners of land containing five or more acres of impervious surfaces to apply for and obtain coverage under a general permit; implement nonstructural best management practices (BMPs) for managing stormwater; install low impact development (LID) techniques and structural stormwater BMPs at sites undergoing development or redevelopment; and submit annual compliance certifications to the Department.

10. Question: Why is there little mention in the draft TMDL reports on incorporation of LID (Low Impact Development) principles as a way through implementation to control Bacteria pollution?

Response: Part of the Statewide TMDL project was to produce an accompanying TMDL implementation guidance document for all the TMDL reports, “ Mitigation Measures to Address Pathogen Pollution in Surface Waters: A TMDL Implementation Guidance Document for MA”. There is an entire section in that document (Section D.4) that discusses LID principles and TMDL implementation in detail.

11. Question: What about flow issues and TMDL requirements?

Response: TMDLs must be developed for each "pollutant" causing water quality impairments. Although "flow" can impact pollutant concentrations and loadings, flow is not a "pollutant" as defined in federal regulations and is therefore not subject to TMDL development.

12. Question: Is there a way that the TMDL can be integrated with grants, and can the grants be targeted at TMDL implementation?

Response: The 319 Grant program is a major funding program providing up to $2 million per year in grants in MA. TMDL implementation is a high priority in that program. In fact, projects designed to address TMDL requirements are given higher priority points during project evaluation.

The 319 grant program RFP Includes this language: "Category 4a Waters: TMDL and draft TMDL implementation projects – The 319 program prioritizes funding for projects that will implement Massachusetts' Total Maximum Daily Load (TMDL) analyses. Many rivers, streams and water bodies in the Commonwealth are impaired and thus do not meet Massachusetts' Surface Water Quality Standards. The goal of the TMDL Program is to determine the likely cause(s) of those impairments and develop an analysis (the TMDL) that lists those cause(s)."

Several comments were also directed towards the complications associated with applying for and reporting that are required elements state grant programs. The MassDEP is sympathetic to the paper work requirements of State and Federal grant programs. The MassDEP periodically reviews the body of requirements to assess what streamlining may be possible. At the same time, the MassDEP underscores that accountability for spending public funds continues to be an important and required component of any grant program.

13. Question: How will implementation of the TMDL address the major problem of post- construction run-off?

Response: It is anticipated that proper design and implementation of stormwater systems during construction will address both pre and post-construction runoff issues and thus eliminate future problems. Post-construction runoff is also one of the six minimum control measures that Phase II communities are required to include in their stormwater management program in order to meet the conditions of their National Pollutant Discharge Elimination System (NPDES) permit. In short, Phase II communities are required to :

a. Develop and implement strategies which include structural and/or nonstructural best management practices (BMPs);

b. Have an ordinance or other regulatory mechanism requiring the implementation of post-construction runoff controls to the extent allowable under State or local law;

c. Ensure adequate long-term operation and maintenance controls;

d. Determine the appropriate best management practices (BMPs) and measurable goals for their minimum control measure.

The general permit implementing the phase 2 requirements also contains requirements for permittees that discharge into receiving waters with an approved TMDL. In summary, municipalities covered under phase II are required to incorporate and implement measures and controls into their plans that are

consistent with an established TMDL and any conditions necessary for consistency with the assumptions and requirements of the TMDL.

14. Question: How does a pollution prevention TMDL work?

Response: MassDEP recommends that the information contained in the pathogen TMDLs guide management activities for all other waters throughout the watershed to help maintain and protect existing water quality. For non-impaired waters, Massachusetts is proposing “pollution prevention TMDLs” which are also known as “preventative TMDLs” consistent with CWA s. 303(d)(3). Pollution prevention TMDLs encourage the Commonwealth, communities and citizens to maintain and protect existing water quality. Moreover it is easier and less costly in the long term to prevent impairments rather than retrofit controls and best management practices to clean up pollution problems. The goal of this approach is take a more proactive role to water quality management.

The analyses conducted for the pathogen impaired segments in this TMDL would apply to the non-impaired segments, since the sources and their characteristics are equivalent. The waste load and/or load allocation for each source and designated use would be the same as specified in the TMDL documents. Therefore, the pollution prevention TMDLs would have identical waste load and load allocations based on the sources present and the designated use of the waterbody segment.

The TMDLs may, in appropriate circumstances, also apply to segments that are listed for pathogen impairment in subsequent Massachusetts CWA s. 303(d) Integrated List of Waters. For such segments, this TMDL may apply if, after listing the waters for pathogen impairment and taking into account all relevant comments submitted on the CWA s. 303(d) list, the Commonwealth determines with EPA approval of the CWA s. 303(d) list that this TMDL should apply to future pathogen impaired segments.

Pollution prevention best management practices form the backbone of stormwater management strategies. Operation and maintenance should be an integral component of all stormwater management programs. This applies equally well with the Phase II Program as well as TMDLs. A detailed discussion of this subject and the BMPs involved can be found in the TMDL companion document “Measures to Address Pathogen Pollution in Surface Waters: A TMDL Implementation Guidance Document for Massachusetts” in Section 3.

15. Comment: The TMDL methodology uses concentrations based on water quality standards to establish TMDL loads, not traditional “loads”.

Response: Concentration-based limits are consistent with EPA regulations. Clean Water Act Section 130.2(i) states that “TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure”. The TMDL in this case is set at the water quality standard. Pathogen water quality standards (which are expressed as concentrations) are based on human health, which is different from many of the other pollutants. It is important to know immediately when monitoring is conducted if the waterbody is safe for human use, without calculating a “load” by multiplying the concentration by the flow – a complex function involving variable storm flow, dilution, proximity to source, etc.

The goal to attain water quality standards at the point of discharge is conservative and thus protective, and offers a practical means to identify and evaluate the effectiveness of control measures. In addition, this approach establishes clear objectives that can be easily understood by the public and individuals responsible for monitoring activities.

MassDEP believes that it is difficult to provide accurate quantitative loading estimates of indicator bacteria contributions from the various sources because many of the sources are diffuse and intermittent, and flow is highly variable. Thus, it is extremely difficult to monitor and accurately model. bacteria are less accurate than a concentration-based approach and do not provide a way to quickly verify if you are achieving the TMDL. Regardless, MassDEP has included a daily load for each segment in this TMDL in addition to the concentration-based approach.

16. **Comment**: There is concern with the “cookie-cutter” nature of the draft TMDL. Particularly the lack of any determination about the causes and contributions to pathogen impairment for specific river and stream segments.

Response: The draft TMDL, although generic in nature, provides a framework and foundation for actions to address bacteria pollution statewide. The MassDEP feels the pathogen TMDL approach is justified because of the commonality of sources affecting the impaired segments and the commonality of best management practices used to abate and control those sources.

Many existing programs such as the Federally mandated stormwater program and combined sewer overflow (CSO) Long-term Control Plans, once implemented, will dramatically reduce or eliminate many sources of bacteria and serve as an important first step in an adaptive management approach to eliminate sources. At the same time however MassDEP agrees that it will be important for not only the state, but more importantly local monitoring programs to develop and incorporate source identification and tracking programs to achieve long-term water quality goals.

It should also be noted that based on public input MassDEP has conducted additional research to try to identify sources where information was available. This includes the addition of information developed by the Buzzards Bay Project National Estuary Program (BBP) as presented in the ““Atlas of Stormwater Discharges in the Buzzards Bay Watershed”. Based on this additional information MassDEP added additional tables and maps to help identify and prioritize important segments and sources. Also, MassDEP revised Section 7 of this TMDL to include segment-by-segment daily load allocations necessary to meet water quality standards. All of the above noted actions were intended to provide additional guidance on potential sources and areas of concern and to help target future remediation activities.

17. Comment: While Table 7-1 of each TMDL lists the Tasks that the agencies (MassDEP/EPA) believe need to be achieved, it isn’t clear exactly how these tasks line up with and address the eight sources of impairment listed in Table 6-1. CZM recommends that the final TMDL be more specific and couple the Implementation Plan tasks with the known or expected sources of contamination. This would make the document more useful to a community

Response: All of the sources of impairments listed in Table 6-1 are addressed in either Table 7-1, the text of Section 7, or both. Because Table 6-1 and 7-1 serve slightly different purposes it was not intended that the tasks needed to align with and exactly address the eight sources of impairment.

18. Comment: While the text in sections 7.1-7.7 of each TMDL describe some actions that can address the sources in Table 6-1, the issue of failing infrastructure is only mentioned in a sub-section title and in the text, but not addressed in any detail.

Response: Failing infrastructure is a very broad term, and is addressed, in part in such discussions as those on leaking sewer pipes, sanitary sewer overflows, and failed septic systems. It is outside of the scope of the TMDL documents to detail every possible type of infrastructure failure. Nonetheless, additional information is provided in the TMDL companion document titled: "Measures to Address Pathogen Pollution in Surface Waters: A TMDL Implementation Guidance Document for Massachusetts."

19. Comment: There is a need for more specific information about what individual communities are currently doing and how much more effort is required (e.g., how many more miles of pipe need to be inspected for illegal connections in a specific community).

Response: MassDEP and the EPA recognize that the municipalities have done, and are continuing to do, a tremendous amount of work to control bacterial contamination of surface waters. The TMDL provides some examples of that overall effort. The TMDL however is not designed nor intended to include an exhaustive listing of all the work required by each municipality to finalize this effort and provide a status of that work. However, some of the programs, such as Phase II Storm water, require such status reports, and those will be very valuable in assessing priorities and future work. Phase II reports for each community are available through each City or Town and can be viewed at MassDEP.

20. Comment: There are no milestones to which individual communities should aim (e.g., all stormwater lines upstream of known contamination inspected for illegal connections in five years). As another example, Section 7.0 of each TMDL states that "The strategy includes a mandatory program for implementing storm water BMPs and eliminating illicit sources" but it is not clear over what timeframe a community should be acting.

Response: The timeframe for implementing corrective measures depends highly on the extent and source of the problem within each community, as such, it would be impossible to identify individual timelines within the TMDL. With that said however many timelines are established through the implementation of existing programs. For instance, the Phase II stormwater program required all communities to submit an application and plan in 2003. That plan must address the six minimum control measures and establish regulatory mechanisms to implement those measures by 2008. Status reports are developed annually to report their progress on achieving that goal. Actual implementation however will likely take many years. A second example would be the control of combined sewer overflows (CSO's). Most municipalities are already under enforcement orders by EPA and/or MassDEP to develop and implement initial measures (commonly referred to as the Nine Minimum Controls (NMCs) and long-term control plans to address the issue. Since CSO discharges are defined as a point source under the Clean Water Act an NPDES permit must be jointly issued by EPA and MassDEP for

those discharges. The permit sets forth the requirements for implementation and assessment of the EPA mandated NMCs and the requirement for developing a long-term CSO control strategy. Either the permit or an enforcement order will typically contain the schedules for completing that work.

MassDEP recognizes that the addition of timelines in the TMDLs would appear to strengthen the documents, however, the complexity of each source coupled with the many types of sources which vary by municipality simply does not lend itself to the TMDL framework and therefore must be achieved through other programmatic measures.

21. Comment: Under “Control Measures” does “Watershed Management” include NPDES permitting?

Response: “Watershed Management” is a general term used to assess and address water quality impacts associated with both point and nonpoint sources throughout an entire watershed. NPDES permitting is a primary tool used to address point source pollution such as permitted discharges from municipal wastewater treatment and industrial discharges. Stormwater is considered a point source if it comes from a pipe or other discrete conveyance system. Sheet flow of stormwater however is considered a nonpoint source. Additional tools used to address nonpoint sources include, but are not limited to, local education, and the use of best management practices like those outlined in this report. The Department also operates varies grant and loan programs to address both point and nonpoint sources of pollution. Application of these tools is considered part of the watershed management approach.

22. Comment: Absent from each report under “Who should read this document ?” are the government agencies that provide planning, technical assistance, and funding to groups to remediate bacterial problems.

Response: The introduction was edited to include these groups in a general sense. It is beyond the scope of the TMDL to provide an exhaustive list of agencies that provide funding and support. Chapter 8.0 however provides a link to this information, which is provided in the Massachusetts Nonpoint Source Strategy.

23. Comment: For coastal watersheds the section that describes funding sources should include grant programs available through the Massachusetts Office of Coastal Zone Management.

Response: Please refer to comment #22 above

24. Comment: Table ES-1 and the similar tables throughout the report do not list B (CSO) or as a surface water classification – this classification and its associated loadings allocations are missing. Although the footnote to the table refers to Long term CSO Control Plans, the relationship between the TMDL, LTCP, and the B(CSO) water classification are unclear.

Response: The 1995 revisions to the MA Water Quality Standards created a B (CSO) water quality category by establishing regulatory significance for the notation “CSO” shown in the “Other Restriction” column at 314 CMR 4.06 for impacted segments. The B (CSO) designation was given, after public review and comment, to those waters where total elimination of CSO’s was not economically feasible

and could lead to substantial and widespread economic and social impact and the impacts from remaining CSO discharges were minor. Although a high level of control must be achieved, Class B standards may not be met during infrequent, large storm events.

The goal of the TMDL and the long-term control plan is to minimize impacts to the maximum extent feasible, attain the highest water quality achievable, and to protect critical uses. Given this, the TMDL establishes in Table ES-1 (as well as other tables) the goal of meeting class B standards in CSO impacted waters but recognizes that this criteria cannot be met at all times and therefore defers to the EPA and MassDEP approved long-term control CSO plan to define the infrequent occasions when the criteria may not be met.

25. Comment: The implementation of new bacteria water quality criteria into NPDES permits should be determined during the permit writing process rather than by the TMDL process – and that should be made clear in the TMDL document.

Response: MassDEP agrees that implementation of new bacteria water quality criteria should be incorporated into the permitting process as well as the state Water Quality Standards. This is already the case. The criteria are also being included in the TMDL because it is a required element of the TMDL process. Readers / users of the bacteria TMDL reports should be aware that new water quality standards were recently developed in 2007 and are included in this final TMDL.

26. Comment: Coastal resources are significantly impacted from the storm water run-off from Mass Highway roads. This goes beyond the control of municipalities to upgrade and is often beyond the capability of local groups to monitor. MHD (Massachusetts Highway Department (Mass Highway)) continues to evade storm water standards and it is thus our opinion that MHD deserves special recognition, complete with implementation strategy to upgrade the drainage systems along its web of asphalt.

Response: Mass Highway is included in the Storm water Phase II Program, and as such will be responsible for completing the six minimum controls mandated by that program, i.e., public education and outreach, public involvement and participation, illicit discharge detection and elimination, construction site storm water runoff control, post construction storm water management, and good housekeeping in operations.

27. Comment: The current 303d list of impaired waters – is it the 2002 or the 2004 list ?

Response: Since the draft of this report was produced, the final 2006 list was approved and MassDEP is awaiting final EPA approval of the 2008 list. All of the pathogen TMDLs apply to the current 2006 303d list and all future EPA approved 303d lists.

28. Comment: Does the NPDES nondelegated state status of Massachusetts affect the TMDLs in any way ?

Response: No. The MassDEP and EPA work closely together and the nondelegated status will not affect the TMDLs. The EPA has not written any of the pathogen TMDLs but has helped fund them.

29. Comment: The TMDL report does not tell the watershed associations anything they didn't already know.

Response: True. The MassDEP is taking a cooperative approach and by working together as a team (federal, state, local, watershed groups) we can make progress in addressing bacterial problems – especially storm water related bacterial problems. Establishment of the TMDL however provides higher priority points in MassDEP funding programs to issue grants and loans for qualified projects to address priority areas.

30. Comment: What will the MassDEP do now for communities that they have not already been doing ?

Response: Grants that can be used for implementation (such as the 319 grants) will be targeted toward TMDL implementation. Also, the more TMDLs a state completes and gets approved by EPA the more funding it will receive from EPA and thus the more TMDL implementation it can initiate.

31. Comment: The State Revolving Fund (SRF) should support municipalities with TMDLs and Phase II status a lot more.

Response: As with any grant/loan program, there are some very competitive projects looking for funds from the SRF. A lot of these are the traditional sewage treatment plants and sewering projects which are very expensive. The SRF currently does allocate funds to storm water related projects as well and additional priority points are awarded in the SRF program where a project addresses waters identified on the state 303d list as well as where TMDLs have been established by either MassDEP or EPA..

32. Comment: Who will be doing the TMDL implementation ?

Response: Each pathogen TMDL report has a section on implementation which includes a table that lists the various tasks and the responsible entity. Most of the implementation tasks will fall on the authority of the municipalities. Probably two of the larger tasks in urban areas include implementing storm water BMPs and eliminating illicit sources. The document "Mitigation Measures to Address Pathogen Pollution in Surface Water: A TMDL Implementation Guidance Manual for Massachusetts" was developed to support implementation of pathogen TMDLs. The MassDEP working with EPA and other team partners shall make every reasonable effort to assure implementation of the TMDLs.

Watershed Specific Comments / Responses

33. Comment: Several watershed groups believe that active and effective implementation and enforcement is essential to carry out the objectives in the pathogen TMDLs. They define effective implementation as the MassDEP partnering with them and municipalities to identify funding opportunities to develop stormwater management plans, implement Title 5 upgrades, and repair failing sewer infrastructure. The groups define effective enforcement as active MassDEP application of Title 5 regulations and implementation of Stormwater Phase II permitting requirements for Phase II municipalities.

Response: The MassDEP has every intention of assisting watershed groups and municipalities with implementing the high priority aspects of the pathogen TMDLs, including identification of possible funding sources. With respect to Title 5 regulations and the Phase II program requirements, the MassDEP will continue to emphasize and assist entities with activities that lead to compliance with those program requirements.

34. Comment: The MassDEP Division of Watershed Management (DWM) should network implementation planning efforts in the coastal watersheds with the Coastal Zone Management's (CZM) Coastal Remediation Grant Program and the EPA Coastal Nonpoint Source Grant Program. Also, the DWM should make the pathogen TMDL presentation to the Mass Bays Group, and network with them in regards to coordinating implementation tasks.

Response: The MassDEP DWM has every intent to coordinate efforts wherever possible including those identified by the commenter.

35. Comment: Why are specific segments or tributaries of watersheds addressed in the Draft TMDL but not all of the segments ?

Response: In accordance with the EPA regulations governing TMDL requirements, only segments that are included on the state's 303(d) list of impaired waterbodies (category 5 of the state Integrated List of Waters) need to be included in any TMDL. It should be noted, however, that addressing other segments which presently are not listed is appropriate as well.

36. Comment: When a TMDL is developed for waters impaired by both point and nonpoint sources, and the WLA is based on an assumption that nonpoint source reductions will occur, EPA's 1991 TMDL Guidance states that the TMDL should provide reasonable assurances that nonpoint source control measures can achieve expected load reductions in order for the TMDL to
be approvable.

Response: Section 9.0, Reasonable Assurances, provides these assurances. This section has been drastically expanded in the Final version of the Draft Pathogen TMDL reports. The revised section 9.0 describes all of the appropriate state programs and their enabling statutes and relevant regulations which actively address nonpoint source pollution impacting waters of the Commonwealth. Many of these programs involve municipalities as a first line of defense mechanism such as the Wetlands Protection Act (which includes the Rivers Protection Act).This expanded section also covers grant programs available to municipalities to control and abate nonpoint source pollution such as 319 grants, 604b grants, 104b(3) funds, 6217 coastal nonpoint source grants, low interest loans for septic system upgrades, state revolving fund grants, and many others.

37. Comment: The Draft TMDLs indicate that for non-impaired waters the TMDL proposes "pollution prevention BMPs". The term is not defined in any state regulation and the origin of the term is unclear.

Response: An explanation of pollution prevention BMPs can be found in the pathogen TMDL companion document "Mitigation Measures to Address Pathogen Pollution in Surface Waters: A TMDL Implementation Guidance Manual for Massachusetts". Section 3.1 of that manual describes pollution

prevention as one of the six control measures for minimizing stormwater contamination under the EPA Phase I or II Stormwater Control Program. Control Measure #6, “Pollution Prevention / Good Housekeeping” involves a number of activities such as maintenance of structural and nonstructural stormwater controls, controls for reducing pollutants from roads, municipal yards and lots, street sweeping and catch basin cleaning, and control of pet waste. Also the term “pollution prevention” can include a far wider range of pollution control activities to prevent bacterial pollution at the source. For instance, under Phase I and II, minimum control measures #4 and #5, construction site and post construction site runoff controls, would encompass many pollution prevention type BMP measures. Proper septic system maintenance and numerous agricultural land use measures can also be considered pollution prevention activities. Further information may be found in Sections 3.0, 4.0, and 5.0 in the Guidance Manual.

38. Comment: EPA regulations require that a TMDL include Load Allocations (LAs) which identify the portion of the loading capacity attributed to existing and future nonpoint sources and to natural background. Load allocations may range from reasonably accurate estimates to gross allotments (40 C.F.R. s.130.2(g)). Where possible, load allocations should be described separately for natural background and nonpoint sources. The Draft TMDL makes no such allocation. Also, EPA regulations require that a TMDL include Waste Load Allocations (WLAs) which identify the portion of the loading capacity allocated to individual existing and future point sources. The Draft TMDL makes no such allocation . Because it makes no estimate of the TMDL, it makes no WLA for point sources.

Response: This comment (and several others which addressed the same topic) relates to the establishment and allocation of an acceptable pollutant load so that water quality standards can be met and maintained. As touched upon elsewhere in this document, TMDLs can be expressed in a variety of ways so long as they are rational. Section 7 has been expanded to include load allocations in addition to the concentration based approach, however. MassDEP has chosen to use concentration as the primary metric for bacteria TMDLs for several reasons. First, there is a numeric standard that can be used. Second, and more important, bacteria, unlike some other pollutants, can increase with flow rather than decrease. As such, the bacteria load applicable at low flow (7Q10) would be very stringent if applied to higher flows. It is also constantly changing due to tidal action. In essence, this TMDL recognizes that higher loads are likely at higher flows and therefore the emphasis is on meeting the in-stream or embayment water quality rather than on meeting a load established for low flows as is done for most other constituents. Hence the TMDL is based on concentration rather than loads of bacteria expressed either as pounds or as daily loads. Again, in contrast to many other pollutants, higher flows may not mean more dilution in the case of bacteria. This approach for bacteria still accepts that site specific information can result in site specific control strategies that modify the general TMDL framework presented provided that water quality standards for bacteria are achieved. Nonetheless, MassDEP has included load allocations in the final TMDL based on the annual average precipitation anticipated in the Buzzards Bay/Cape Cod area and an estimate of the average daily runoff based on long-term precipitation records (see revised Section 7).

Watershed Specific Comments / Responses

1. **Question**: Why are there no lakes in the Buzzards Bay Watershed on the 303d list in light of the fact that there have been several beach closings due to bacteria ?

Response: The MassDEP relies on information from local Boards of Health and the Commonwealth's Department of Public Health for information on beach closures. This information is becoming more timely and readily available with the institution of a state wide reporting system required and facilitated by the passage of the National Beaches Act. This will permit much more recent information to be used in the listing of impaired waters in the future. It should be noted that beaches subject to chronic closures normally would be listed as impaired, but those reporting occasional closures in which bather density is suspected as a possible cause may not be listed.

2. CZM Comment

p. 51, Table 7-1, CZM was surprised to see that this table does not recognize the important role of the Buzzards Bay Project National Estuary Program (BBP). The BBP is a technical assistance unit of CZM whose mission is to implement the Buzzards Bay Comprehensive Conservation Management Plan. We recommend the following changes to Table 7-1. Next to the task "Organize and implement; work with stakeholders and local officials to identify remedial measures and potential funding sources" the BBP and not the Coalition for Buzzards Bay (CBB) should be listed. The CBB is a citizens group primarily focused on education and outreach. Likewise, next to the task "Write grant and loan funding proposals," the BBP should be listed and not CBB. Furthermore, the tasks "Organization, contacts with volunteer groups" and "Surface Water Monitoring" should include the BBP as a participating organization.

Response: The draft TMDL incorrectly cited the Coalition for Buzzards Bay rather than the Buzzards Bay Project. The changes have been made to Table 7-1 and text has been added to Section 7-1 to correct this error.

3. Comment- It is noted that there are quite a few segments on the Western end of the Cape in Falmouth and Bourne that are included in this report. Could you explain that?

Response- The MassDEP, beginning with the 2004 Integrated List of Impaired Waters, determined that 14 segments on the Western end of the Cape in Falmouth and Bourne most appropriately fit within the Buzzards Bay Watershed, as drainage from these segments discharges into Buzzards Bay. These segments include: MA95-14, Cape Cod Canal; MA95-48 Eel Pond; MA95-47 Back River; MA95-15 Phinneys Harbor; MA95-16 Pocasset River; MA95-18; Pocasset Harbor MA95-17; Red Brook Harbor; MA95-21 Herring Brook; MA95-46 Harbor Head; MA95-20 Wild Harbor; MA95-22 West Falmouth Harbor; MA95-23 Great Sippewisset Creek; MA95-24 Little Sippewisset Marsh; MA95-25 Quissett Harbor. These segments are now covered in the Buzzards Bay Bacteria TMDL Report rather than the Cape Cod TMDL report

Appendix C
EPA: Wayland Guidance

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

OFFICE OF WATER

MEMORANDUM

NOV 22 2002

SUBJECT: Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs

FROM: Robert H. Wayland, III, Director
Office of Wetlands, Oceans and Watersheds

James A. Hanlon, Director
Office of Wastewater Management

TO: Water Division Directors
Regions 1 - 10

This memorandum clarifies existing EPA regulatory requirements for, and provides guidance on, establishing wasteload allocations (WLAs) for storm water discharges in total maximum daily loads (TMDLs) approved or established by EPA. It also addresses the establishment of water quality-based effluent limits (WQBELs) and conditions in National Pollutant Discharge Elimination System (NPDES) permits based on the WLAs for storm water discharges in TMDLs. The key points presented in this memorandum are as follows:

NPDES-regulated storm water discharges must be addressed by the wasteload allocation component of a TMDL. See 40 C.F.R. § 130.2(h).

NPDES-regulated storm water discharges may not be addressed by the load allocation (LA) component of a TMDL. See 40 C.F.R. § 130.2 (g) & (h).

Storm water discharges from sources that are not currently subject to NPDES regulation may be addressed by the load allocation component of a TMDL. See 40 C.F.R. § 130.2(g).

It may be reasonable to express allocations for NPDES-regulated storm water discharges from multiple point sources as a single categorical wasteload allocation when data and information are insufficient to assign each source or outfall individual WLAs. See 40 C.F.R. § 130.2(i). In cases where wasteload allocations

are developed for categories of discharges, these categories should be defined as narrowly as available information allows.

The WLAs and LAs are to be expressed in numeric form in the TMDL. See 40 C.F.R. § 130.2(h) & (i). EPA expects TMDL authorities to make separate allocations to NPDES- regulated storm water discharges (in the form of WLAs) and unregulated storm water (in the form of LAs). EPA recognizes that these allocations might be fairly rudimentary because of data limitations and variability in the system.

NPDES permit conditions must be consistent with the assumptions and requirements of available WLAs. See 40 C.F.R. § 122.44(d)(1)(vii)(B).

WQBELs for NPDES-regulated storm water discharges that implement WLAs in TMDLs may be expressed in the form of best management practices (BMPs) under specified circumstances. See 33 U.S.C. §1342(p)(3)(B)(iii); 40 C.F.R. §122.44(k)(2)&(3). If BMPs alone adequately implement the WLAs, then additional controls are not necessary.

EPA expects that most WQBELs for NPDES-regulated municipal and small construction storm water discharges will be in the form of BMPs, and that numeric limits will be used only in rare instances.

When a non-numeric water quality-based effluent limit is imposed, the permit's administrative record, including the fact sheet when one is required, needs to support that the BMPs are expected to be sufficient to implement the WLA in the TMDL. See 40 C.F.R. §§ 124.8, 124.9 & 124.18.

The NPDES permit must also specify the monitoring necessary to determine compliance with effluent limitations. See 40 C.F.R. § 122.44(i). Where effluent limits are specified as BMPs, the permit should also specify the monitoring necessary to assess if the expected load reductions attributed to BMP implementation are achieved (e.g., BMP performance data).

The permit should also provide a mechanism to make adjustments to the required BMPs as necessary to ensure their adequate performance.

This memorandum is organized as follows:

(I). Regulatory basis for including NPDES-regulated storm water discharges in WLAs in TMDLs;

(II). Options for addressing storm water in TMDLs; and

(III). Determining effluent limits in NPDES permits for storm water discharges consistent with the WLA

(I). Regulatory Basis for Including NPDES-regulated Storm Water Discharges in WLAs in TMDLs

As part of the 1987 amendments to the CWA, Congress added Section 402(p) to the Act to cover discharges composed entirely of storm water. Section 402(p)(2) of the Act requires permit coverage for discharges associated with industrial activity and discharges from large and medium municipal separate storm sewer systems (MS4), i.e., systems serving a population over 250,000 or systems serving a population between 100,000 and 250,000, respectively. These discharges are referred to as Phase I MS4 discharges.

In addition, the Administrator was directed to study and issue regulations that designate additional storm water discharges, other than those regulated under Phase I, to be regulated in order to protect water quality. EPA issued regulations on December 8, 1999 (64 FR 68722), expanding the NPDES storm water program to include discharges from smaller MS4s (including all systems within "urbanized areas" and other systems serving populations less than 100,000) and storm water discharges from construction sites that disturb one to five acres, with opportunities for area-specific exclusions. This program expansion is referred to as Phase II.

Section 402(p) also specifies the levels of control to be incorporated into NPDES storm water permits depending on the source (industrial versus municipal storm water). Permits for storm water discharges associated with industrial activity are to require compliance with all applicable provisions of Sections 301 and 402 of the CWA, i.e., all technology-based and water quality-based requirements. See 33 U.S.C. §1342(p)(3)(A). Permits for discharges from MS4s, however, "shall require controls to reduce the discharge of pollutants to the maximum extent practicable ... and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." See 33 U.S.C. §1342(p)(3)(B)(iii).

Storm water discharges that are regulated under Phase I or Phase II of the NPDES storm water program are point sources that must be included in the WLA portion of a TMDL. See 40 C.F.R. § 130.2(h). Storm water discharges that are not currently subject to Phase I or Phase II of the NPDES storm water program are not required to obtain NPDES permits. 33 U.S.C. §1342(p)(1) & (p)(6). Therefore, for regulatory purposes, they are analogous to nonpoint sources and may be included in the LA portion of a TMDL. See 40 C.F.R. § 130.2(g).

(II). Options for Addressing Storm Water in TMDLs

Decisions about allocations of pollutant loads within a TMDL are driven by the quantity and quality of existing and readily available water quality data. The amount of storm water data available for a TMDL varies from location to location. Nevertheless, EPA expects TMDL authorities will make separate aggregate allocations to NPDES-regulated storm water discharges

(in the form of WLAs) and unregulated storm water (in the form of LAs). It may be reasonable to quantify the allocations through estimates or extrapolations, based either on knowledge of land use patterns and associated literature values for pollutant loadings or on actual, albeit limited, loading information. EPA recognizes that these allocations might be fairly rudimentary because of data limitations.

EPA also recognizes that the available data and information usually are not detailed enough to determine waste load allocations for NPDES-regulated storm water discharges on an outfall-specific basis. In this situation, EPA recommends expressing the wasteload allocation in the TMDL as either a single number for all NPDES-regulated storm water discharges, or when information allows, as different WLAs for different identifiable categories, e.g., municipal storm water as distinguished from storm water discharges from construction sites or municipal storm water discharges from City A as distinguished from City B. These categories should be defined as narrowly as available information allows (e.g., for municipalities, separate WLAs for each municipality and for industrial sources, separate WLAs for different types of industrial storm water sources or dischargers).

(III). Determining Effluent Limits in NPDES Permits for Storm Water Discharges Consistent with the WLA

Where a TMDL has been approved, NPDES permits must contain effluent limits and conditions consistent with the requirements and assumptions of the wasteload allocations in the TMDL. See 40 CFR § 122.44(d)(1)(vii)(B). Effluent limitations to control the discharge of pollutants generally are expressed in numerical form. However, in light of 33 U.S.C. §1342(p)(3)(B)(iii), EPA recommends that for NPDES-regulated municipal and small construction storm water discharges effluent limits should be expressed as best management practices (BMPs) or other similar requirements, rather than as numeric effluent limits. See *Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits*, 61 FR 43761 (Aug. 26, 1996). The Interim Permitting Approach Policy recognizes the need for an iterative approach to control pollutants in storm water discharges. Specifically, the policy anticipates that a suite of BMPs will be used in the initial rounds of permits and that these BMPs will be tailored in subsequent rounds.

EPA's policy recognizes that because storm water discharges are due to storm events that are highly variable in frequency and duration and are not easily characterized, only in rare cases will it be feasible or appropriate to establish numeric limits for municipal and small construction storm water discharges. The variability in the system and minimal data generally available make it difficult to determine with precision or certainty actual and projected loadings for individual dischargers or groups of dischargers. Therefore, EPA believes that in these situations, permit limits typically can be expressed as BMPs, and that numeric limits will be used only in rare instances.

Under certain circumstances, BMPs are an appropriate form of effluent limits to control pollutants in storm water. See 40 CFR § 122.44(k)(2) & (3). If it is determined that a BMP approach (including an iterative BMP approach) is appropriate to meet the storm water component of the TMDL, EPA recommends that the TMDL reflect this.

EPA expects that the NPDES permitting authority will review the information provided by the TMDL, see 40 C.F.R. § 122.44(d)(1)(vii)(B), and determine whether the effluent limit is appropriately expressed using a BMP approach (including an iterative BMP approach) or a numeric limit. Where BMPs are used, EPA recommends that the permit provide a mechanism to require use of expanded or better-tailored BMPs when monitoring demonstrates they are necessary to implement the WLA and protect water quality.

Where the NPDES permitting authority allows for a choice of BMPs, a discussion of the BMP selection and assumptions needs to be included in the permit's administrative record, including the fact sheet when one is required. 40 C.F.R.§§ 124.8, 124.9 & 124.18. For general permits, this may be included in the storm water pollution prevention plan required by the permit. See 40 C.F.R. § 122.28. Permitting authorities may require the permittee to provide supporting information, such as how the permittee designed its management plan to address the WLA(s). See 40 C.F.R. § 122.28. The NPDES permit must require the monitoring necessary to assure compliance with permit limitations, although the permitting authority has the discretion under EPA's regulations to decide the frequency of such monitoring. See 40 CFR § 122.44(i). EPA recommends that such permits require collecting data on the actual performance of the BMPs. These additional data may provide a basis for revised management measures. The monitoring data are likely to have other uses as well. For example, the monitoring data might
indicate if it is necessary to adjust the BMPs. Any monitoring for storm water required as part of the permit should be consistent with the state's overall assessment and monitoring strategy.

The policy outlined in this memorandum affirms the appropriateness of an iterative, adaptive management BMP approach, whereby permits include effluent limits (e.g., a combination of structural and non-structural BMPs) that address storm water discharges, implement mechanisms to evaluate the performance of such controls, and make adjustments (i.e., more stringent controls or specific BMPs) as necessary to protect water quality. This approach is further supported by the recent report from the National Research Council (NRC), *Assessing the TMDL Approach to Water Quality Management* (National Academy Press, 2001). The NRC report recommends an approach that includes "adaptive implementation," i.e., "a cyclical process in which TMDL plans are periodically assessed for their achievement of water quality standards"
. . . and adjustments made as necessary. *NRC Report* at ES-5.

This memorandum discusses existing requirements of the Clean Water Act (CWA) and codified in the TMDL and NPDES implementing regulations. Those CWA provisions and regulations contain legally binding requirements. This document describes these requirements; it does not substitute for those provisions or regulations. The recommendations in this memorandum are not binding; indeed, there may be other approaches that would be appropriate

in particular situations. When EPA makes a TMDL or permitting decision, it will make each decision on a case-by-case basis and will be guided by the applicable requirements of the CWA and implementing regulations, taking into account comments and information presented at that time by interested persons regarding the appropriateness of applying these recommendations to the particular situation. EPA may change this guidance in the future.

If you have any questions please feel free to contact us or Linda Boornazian, Director of the Water Permits Division or Charles Sutfin, Director of the Assessment and Watershed Protection Division.

cc:
Water Quality Branch Chiefs
Regions 1 - 10

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