

A Total Maximum Daily Load Analysis for Sasco Brook Fairfield and Westport, Connecticut

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INTRODUCTION

Section 303(d) of the Federal Clean Water Act (CWA) requires states to develop Total Maximum Daily Loads (TMDLs) for waters where current point and nonpoint source pollution controls are not stringent enough to attain or maintain compliance with State Water Quality Standards (WQS) ¹.

The TMDL represents the maximum pollutant loading that a waterbody can receive without exceeding the water quality criteria which have been adopted into the WQS for that pollutant. Federal regulations require that the TMDL analysis identify the portion of the total loading which is allocated to point source discharges (termed the Wasteload Allocation or WLA) and the portion attributed to nonpoint sources which contribute that pollutant to the waterbody (termed the Load Allocation or LA). In addition, TMDLs include a Margin of Safety (MOS) to account for uncertainty in establishing the relationship between pollutant loadings and water quality. Seasonal variability in the relationship between pollutant loadings and WQS attainment must also be considered in TMDL analyses.

TMDLs that have been established by the state are submitted to the Regional Office of the Federal Environmental Protection Agency (EPA) for review. EPA can either approve the TMDL or disapprove the TMDL and act in lieu of the state. TMDLs provide a scientific basis for developing and implementing a Water Quality Management Plan or TMDL Implementation Plan (Plan) which describes the pollution control actions necessary to achieve acceptable water quality conditions in the waterbody for which the TMDL was developed. Therefore, Plans derived from TMDLs typically include an implementation schedule and a description of ongoing monitoring activities to confirm that the TMDL has been effectively implemented and that WQS have been achieved. Public participation during development of the TMDL analysis and subsequent Plan is vital to the process' success in cleaning up water quality problems.

Sasco Brook was identified on Connecticut's *1998 List of Waterbodies Not Meeting Water Quality Standards* ² for which TMDLs are required under Section 303(d) CWA. This assessment was based primarily on fecal coliform bacteria monitoring data submitted to DEP by citizen monitors active in the basin ³. Supplemental water quality and streamflow information was provided by the U.S. Geological Survey (USGS) at two locations in the basin ⁴. The monitoring data indicate the levels of fecal coliform bacteria in Sasco Brook exceed State guidelines for general sanitary quality established in the WQS. Based on the high level of local citizen interest in the basin expressed during the public participation process leading to the adoption of the *1998 List of Waterbodies*, and the availability of sufficient monitoring data on which to base a TMDL analysis, Sasco Brook was identified by DEP as a high priority for TMDL development prior to April, 2000.

SASCO BROOK

The Sasco Brook watershed is located in southwestern Connecticut, encompassing portions of the Towns of Fairfield, Westport, and a small area of Easton (Figure 1). Approximately 78% of the watershed is located in Fairfield, 19% in Westport, and 3% in Easton. The brook drains a watershed of 10.2 square miles from its headwaters near the Easton/Fairfield



border to Long Island Sound. The brook forms the boundary between the Towns of Fairfield and Westport for the final third of its approximate six mile length prior to entering the Sound. The brook has numerous low run-of-river dams throughout its length, and one significant dam forming Buckley Pond immediately upstream of Route 1. This dam is partially breached and currently in disrepair, and the pond has been heavily sedimented reducing average water depths. Below Buckley Pond dam, Sasco Brook is commonly referred to as "Sasco Creek." Tidal exchange with saline Long Island Sound waters influences water quality from the base of the dam to the mouth of Sasco Creek. Waters south of the Buckley Pond dam represent the Sasco Brook estuary which is listed separately for TMDL development on Connecticut's *List of Waterbodies*.

Land cover / land use⁵ in the upper portions of the watershed is primarily open space with low density residential development including a number of estates and small farms on relatively large properties. To the south, land use gradually shifts to more dense residential development; two acre zoned areas progressing to quarter acre parcels. Land use in the southern most portion of the watershed consists of high density commercial development along the U.S. Route 1 / Interstate 95 corridor and high density residential development south of the commercial area to the shoreline of Long Island Sound. Most of the southern portion of the watershed is served by separate sanitary and storm sewer systems. Natural drainage patterns in this area have been altered as a result of an increase in impervious surfaces and major highway construction. For example, flooding of low lying areas is common in the Southport section of Fairfield following significant rain events.

Riparian vegetation is adequate to support a healthy biological community throughout most of the northern sections of the basin with the exception of localized reaches where vegetative buffers have been removed in the immediate vicinity of private residences or horse farms. The adequacy of natural vegetative buffers and unaltered riparian habitat is limited in the more heavily developed southern portions of the watershed.

SOURCES OF IMPAIRMENT

All known sources of pollution in Sasco Brook originate from nonpoint sources. No point source discharges of industrial or sanitary wastewaters are permitted or known to exist in the basin. Nonpoint sources of impairment to Sasco Brook generally fall into one of four categories; stormwater runoff from developed areas, domestic animal waste (horses, dogs), failed or inadequate septic systems, and natural sources such as birds and wildlife.

Existing pollution sources affecting water quality are directly related to land use within the basin. In the northern sections of the watershed, septic systems, poor domestic animal waste management, and natural sources are the predominate source of pollutant. In the lower basin, stormwater runoff, pet waste, and nuisance wildlife are more significant contributors to elevated indicator bacteria levels. In the lower basin, changes to the natural hydrology associated with development and large areas of impervious surface exacerbate the problem.

APPLICABLE SURFACE WATER QUALITY STANDARDS

Connecticut WQS establish criteria for bacterial indicators of sanitary water quality that are based on protecting specific water quality dependent uses such as drinking water supply, designated swimming areas, and shellfish growing areas. Sasco Brook is designated a Class A waterbody from its headwaters to the base of Buckley Pond Dam (head of tide) where the classification changes to Class SB/SA to reflect the tidal influence of the creek. Designated uses for Class A waters established in the WQS may include potential drinking water supply, fish and wildlife habitat, and recreational use. The adopted bacteria criteria for Class A waters include a total coliform indicator for protection of existing or potential drinking water supply and an enterococci indicator applicable to established bathing waters. However, neither designated use (drinking water supply nor established bathing water) is applicable to Sasco Brook. Therefore, the use of total coliform or enterococci criteria is inappropriate in this case.

Connecticut WQS incorporate a tiered classification system. It is implicit in the WQS that all designated uses and associated criteria from a lower classification be supported by the higher classification. Connecticut WQS have no bacteria criteria for general sanitary quality in Class A waters but include fecal coliform bacteria guidance for general sanitary quality of Class B waters. Historically, levels of fecal coliform bacteria in surface waters have been used by regulatory agencies as an indicator of potential for human illness. More recent research ⁶ has documented that fecal coliform density correlates poorly with human health risks. However, because fecal coliform bacteria can originate from natural sources such as soils and plant material, certain industrial processes, as well as any warm-blooded animals, they remain useful as a broad based indicator of nonpoint source pollution.

Fecal coliform bacteria are used as an indicator of nonpoint source pollution in Sasco Brook in this TMDL analysis. Fecal coliform provides a useful indicator because nonpoint source pollution in Sasco Brook originates from a variety of sources including stormwater, domestic animals, septic systems, and natural sources. In addition, fecal coliform has historically been used as an indicator for monitoring from both citizens groups and USGS thus providing a good baseline data set for comparison with future monitoring. Future trends in fecal coliform levels in Sasco Brook will provide a way to measure the effectiveness of nonpoint source pollution controls that will be implemented through this TMDL.

The fecal coliform bacteria indicator is useful in assessing both designated uses for which the TMDL is being adopted (aquatic life support /contact recreation). Elevated levels of indicator bacteria directly affect the contact recreation use by providing a numerical target to gauge the general sanitary quality of the brook. Fecal coliform density is not a direct determining factor in the ability of the watershed to support aquatic life. However, fecal coliform is present in all nonpoint sources of pollution that can impact aquatic life and therefore acts as a general surrogate for other pollutants that may exist in Sasco Brook.

TMDL

The TMDL for Sasco Brook was developed using a percent reduction approach rather than mass loading. TMDLs typically represent the maximum loading or mass of pollutant that a waterbody can assimilate without exceeding WQS. However, when elevated levels of indicator bacteria are the cause for listing, Federal regulations allow flexibility to express the TMDL in terms which are more meaningful with respect to achieving WQS objectives. Sources of bacteria to Sasco Brook are exclusively nonpoint and difficult to quantify. Monitoring of the brook confirms that short duration excursions above the fecal coliform guidelines occur on an irregular basis and cannot be correlated with reasonable precision to other water quality parameters or stream flow. Meaningful modeling of in-stream bacteria concentrations based on estimates of the volume and concentration of bacteria contributed by the diversity of nonpoint sources affecting the brook is not currently feasible.

The Sasco Brook TMDL establishes load reductions in terms of the percent reduction in nonpoint source loadings (relative to the current baseline condition) needed to achieve consistency with the WQS. This approach provides a quantifiable means to establish the relative magnitude of nonpoint source loadings within the watershed and helps set priorities for efforts to control these sources. This TMDL establishes two fecal coliform bacteria endpoints using the “general sanitary quality” guideline of geometric mean 200 colonies/100 ml and 90th percentile value 400 colonies/100 ml. Comparisons of the two TMDL endpoints with current baseline conditions were made at three locations in the Sasco watershed.

The Sasco Brook watershed was divided into three sub-watersheds (A-C) based on hydrology and land use patterns⁵. Fecal coliform data for monitoring sites located at the lowest point in each sub-watershed was used to establish the baseline condition for each sub-watershed. Baseline conditions were defined as the geometric mean and 90th percentile value of fecal coliform data collected over a continuous period of record of at least two years at each site⁷.

$$\text{TMDL} = \text{WLA} + \text{LA} + \text{MOS}$$

Total Maximum Daily Load:

For the annual geometric mean fecal coliform endpoint, TMDL = 200 colonies / 100 ml

For the annual 90th percentile fecal coliform endpoint, TMDL = 400 colonies / 100 ml

The fecal coliform indicator endpoints are expressed as both a maximum average value (geometric mean less than 200 colonies/100 ml) and a maximum frequency at which a higher value may be exceeded in individual samples (90% of samples less than 400 colonies /100 ml). Both endpoints were applied at the boundary of each sub-watershed. No specific averaging period is specified in the Connecticut WQS for calculation of the geometric mean indicator density or evaluating the frequency at which samples exceed 400 colonies/100ml. For purposes of this TMDL, an annual averaging period was used to calculate separate baseline conditions in each of the three sub-watersheds.

Waste Load Allocation to Point Sources:

There are no known point source discharges in the watershed. Connecticut WQS prohibit issuance of a permit to discharge pollutants from a point source to Class A waterbodies. Therefore no allocation is necessary for existing or future point sources in any of the three sub-watersheds.

The wasteload allocation to point sources is zero for each subwatershed: $WLA = 0$

Load Allocation to Nonpoint Sources:

Nonpoint sources (including natural background) account for 100% of the pollutant loading to Sasco Brook. 100% of the TMDL is allocated to nonpoint sources in each of the three sub-watersheds.

For the annual geometric mean fecal coliform endpoint, $LA = 200$ colonies / 100 ml

For the annual 90th percentile fecal coliform endpoint, $LA = 400$ colonies / 100 ml

Margin of Safety:

The TMDL uses conservative endpoints to establish the reduction in pollutant loadings from nonpoint sources. The TMDL fecal coliform endpoints were established at the “general sanitary quality” guideline of geometric mean 200/100 ml and 90th percentile value 400/100 ml. These were chosen as a reasonable goal which offers a high degree of assurance that acceptable water quality conditions will exist in Sasco Brook when these conditions are achieved.

Target reductions in fecal coliform indicator bacteria densities are established independently for each of three sub-watersheds. This approach provides for a margin of safety in that implementation of control actions in upstream sub-watersheds will reduce bacterial densities in Sasco Brook sub-watersheds located downstream. The TMDL analysis assigns this anticipated reduction in bacterial loadings in upstream sub-watersheds resulting from implementation of control actions to the implicit margin of safety.

In cases where monitoring data confirm that the current pollutant loading in a sub-watershed is below the TMDL, the difference between the current baseline condition and the TMDL is allocated as a numerical margin of safety. This allocation procedure does not allow for any increase in loadings from nonpoint sources to portions of the brook which currently meet or exceed the fecal coliform indicator bacteria guideline and TMDL endpoint of 200 colonies/100 ml (geometric mean) and 400 colonies/100 ml (90th percentile).

<i>Table 1. SASCO BROOK TMDL SUMMARY</i>							
Sub-watershed	Guideline Indicator	Baseline Condition	TMDL Endpoint	WLA	LA	MOS	TMDL OBJECTIVE
A	geometric mean	78	200	0	78	122	Antidegradation
	90th percentile	388	400	0	388	12	Antidegradation
B	geometric mean	124	200	0	124	76	Antidegradation
	90th percentile	614	400	0	400	Implicit	35% reduction in baseline
C	geometric mean	376	200	0	200	Implicit	47% reduction in baseline
	90th percentile	3328	400	0	400	Implicit	88% reduction in baseline

Baseline Condition = Baseline condition for sub-watershed based on Sasco Brook monitoring data (col/100ml).
TMDL Endpoint = Total Maximum Daily Load, maximum indicator density (col/100ml) to support designated uses.
WLA = Wasteload Allocation to point source discharges of pollutants (col/100ml).
LA = Load Allocation to combined natural and nonpoint sources of pollutants (col/100ml).
MOS = Margin of Safety established to address uncertainty in the analysis (col/100ml).
TMDL Objective = Change in baseline condition as a result of implementing control actions required to achieve TMDL.

Sub-watershed A

Monitoring data indicate that the geometric mean TMDL endpoint is currently being achieved in sub-watershed A. The baseline geometric mean condition is approximately 50% of the TMDL endpoint. The 90th percentile condition in sub-watershed A is nearly equal to the TMDL endpoint suggesting that no capacity to accommodate additional loadings exists. The TMDL objective for both endpoints is to implement control actions consistent with antidegradation (i.e. maintain or reduce the existing loading with no allowance for increased loading from any source).

Sub-watershed B

Monitoring data establishes a geometric mean baseline condition for sub-watershed B which is below the TMDL endpoint. However, the monitoring baseline for the 90th percentile TMDL endpoint exceeds the endpoint. The TMDL objective for this sub-watershed is to achieve a 35% reduction in the baseline condition. Control actions targeted at reducing occasional extreme high values are projected to be most effective in meeting the objectives for sub-watershed B since long term average conditions currently meet the TMDL endpoint.

Sub-watershed C

Both baseline monitoring conditions (geometric mean and 90th percentile) for sub-watershed C exceed the TMDL endpoint. The geometric mean baseline is approximately double the endpoint value and the 90th percentile baseline condition is approximately eight times the endpoint value. The TMDL objective for this sub-watershed is to achieve an 88% reduction in the baseline monitoring condition. Similar to sub-watershed B, greater reductions in the frequency of bacteria loadings greater than 400 colonies / 100 ml are needed to meet the TMDL endpoint than are required to meet the geometric mean endpoint.

Seasonal Analysis

The TMDL analysis establishes loading reductions which are quantified and evaluated on an annual basis. Elimination of sources (such as failed septic systems), treatment of sources (e.g. end-of-pipe stormwater treatment), or implementation of regulatory control actions (e.g. vegetative buffers, “pooper scooper” laws, animal waste management plans) are not designed to result in seasonally variable loadings. For this TMDL analysis, calculations are independent of environmental conditions and no adjustment to the TMDL to account for seasonal differences in loadings is proposed or desirable.

Although potential human exposure to pathogenic bacteria during recreational activities is more likely during the summer months, this TMDL employs fecal coliform bacteria density as a broad-based indicator of general quality which should be maintained throughout the year. Consistency with the fecal coliform indicator guideline for frequency of exceedance of a maximum density of 400/100 ml was also evaluated on an annual basis.

Antidegradation Requirements

The TMDL analysis indicates that portions of the Sasco Brook Watershed currently meet the TMDL endpoint for fecal coliform indicator bacteria. Activities requiring a permit issued by DEP which has the potential to affect water quality in these areas are subject to the anti-degradation provisions of the WQS. These provisions require that where existing water quality meets or exceeds state standards, the existing high quality will be maintained. Watershed management activities, including implementation of the control actions identified in this TMDL, are applicable to all areas within the watershed to the extent that they will be effective in protecting and maintaining the existing high water quality conditions.

CONSISTENCY WITH TMDLs IN ADJOINING WATERBODIES

This TMDL analysis for Sasco Brook is consistent with TMDL activities in the surrounding area such as Sasco Creek and Long Island Sound. The Sasco Brook Estuary (a.k.a. Sasco Creek) is currently listed on Connecticut's *List of Waterbodies Not Meeting WQS* due to restrictions on recreational shellfishing caused by stormwater, marinas, and wildlife contributed bacteria. The percent reduction in fecal coliform bacteria densities required by the Sasco Brook TMDL will improve water quality conditions downstream in Sasco Creek. The Long Island Sound TMDL⁸ calls for a 10% reduction in nitrogen from nonpoint sources for watersheds draining into Long Island Sound. Although directed at reducing fecal coliform bacteria, the BMPs implemented through the Sasco Brook TMDL can also reduce other inputs associated with nonpoint sources such as nutrients. Thus implementing control actions in this TMDL will result in lower nitrogen loading to Long Island Sound. The monitoring program associated with the TMDL is designed to confirm these reductions as the TMDL is implemented.

REASONABLE ASSURANCE

The DEP has approved allocation of sufficient CWA Section 319 grant funds to support priority activities recommended by the Sasco Brook Pollution Abatement Committee. Funds will be used to support continued citizen monitoring of water quality by the Harbor Watch/River Watch Program, and to provide technical assistance and educational outreach to targeted groups such as horse owners and riparian land owners. Analysis of water samples collected by the Town of Fairfield for purposes of evaluating progress towards attainment of TMDL objectives is being performed by the State Department of Public Health Laboratories. In addition, the DEP has proposed allocation of funds made available under CWA Section 104(b) to support capital improvements to the stormwater conveyance systems in Fairfield and Westport and to enhance town monitoring capabilities. DEP is further committed to providing ongoing technical assistance related to selection of appropriate Best Management Practices to address specific problems and to assist with coordinating watershed projects which cross town boundaries.

Both Westport and Fairfield have active programs to address nonpoint pollution from failing septic systems. Development is closely regulated throughout the watershed and new construction activities are required to address stormwater runoff issues. Citizen involvement in land use decision making is routine and most new development proposals are subject to one or more public hearings.

In response to concerns associated with establishing a TMDL for Sasco Brook, the First Selectman of the Town of Fairfield convened a Task Force to develop a water quality management plan for the watershed. The Task Force included representatives from the Town Departments of Health, Conservation, Public Works, and Planning and Zoning. Numerous meetings were held over a period of months during which various approaches to achieving improvements to water quality conditions were discussed. Final Task Force recommendations were presented to the full Board of Selectmen including a recommendation that a permanent Watershed Management Committee be appointed to oversee implementation of the TMDL and develop similar plans for adjacent watersheds within the Town. The *Sasco Brook Water Quality Management Plan*⁽⁹⁾ includes eleven action items addressing issues such as pet waste, storm drain retrofits, riparian buffers, Town sponsored demonstration projects, and distribution of educational materials related to septic system maintenance and land use stewardship. The *Sasco Brook Water Quality Management Plan*, which is appended to the TMDL, provides strong assurance that actions to improve water quality will be effectively implemented at the local level.

DEP representatives have also met with the Directors of Public Works, Health, and Conservation and the First Selectwoman for the Town of Westport to discuss TMDL implementation. Following these discussions, the Town has indicated a willingness to cooperate with Fairfield in efforts to mitigate existing nonpoint sources of pollutants entering Sasco Brook and assist with monitoring water quality in the brook. As noted below, previous cooperative efforts involving both Westport and Fairfield, coordinated through the Sasco Brook Pollution Abatement Committee, have been effective in addressing a number of nonpoint pollution problems in the watershed.

The Sasco Brook Pollution Abatement Committee was formed in 1991 and continues to coordinate local community-based efforts to address sources of contamination (“hot spots”) identified through citizen monitoring activities. Representatives from the Health and Conservation Departments of Fairfield and Westport, the DEP Watershed Management Program, the Fairfield County Soil and Water Conservation District, the Connecticut Department of Aquaculture, interested citizens, and volunteers associated with the Harbor Watch/ River Watch Program of the Nature Center of Westport typically participate in this process. Currently the Abatement Committee is chaired by the Director of the Westport Conservation Department. A number of the more significant localized sources of contamination have been eliminated or significantly reduced as a result of this effort. This program has been particularly effective in addressing contamination associated with readily identifiable sources such as horse farms, localized septic problems, and specific runoff issues. The Committee also supports a number of educational and outreach efforts to promote environmental awareness. A copy of the *1999 Sasco Brook Pollution Abatement Committee Action Plan*⁽¹⁰⁾ has been appended to the TMDL.

The existence of a strong local community-based effort to address nonpoint sources of pollution in the Sasco Brook watershed provides assurance that progress will continue to be made in reducing localized sources of contamination. Public comments on the DEP’s proposal to include Sasco Brook on the 1998 *List of Impaired Waterbodies* was an important factor in assigning a high priority to development of the TMDL. The commitment of the local community to pollution abatement is the most important key to successful TMDL implementation.

SASCO BROOK TMDL IMPLEMENTATION PLAN

Pollutant loadings established in this TMDL can be achieved by implementing control actions that are designed to reduce nonpoint source pollution. Control actions include regulatory action by State or Local government, educational programs, and voluntary actions by citizen advocacy groups or individuals to promote effective watershed management in the Sasco Brook watershed.

State Responsibility

DEP's principal role in implementing the TMDL is to provide technical and financial assistance to the watershed Towns and local citizen watershed advocacy groups. DEP has reserved approximately \$60,000 from grants provided by the U.S. EPA to help implement water quality improvement projects for the Sasco Brook watershed. To secure these funds (and possibly additional future funding), specific projects must be identified and submitted to DEP for consideration. Actual use of the funds is contingent on acceptable project proposals. Because there are no point source discharges requiring permits, DEP's direct role in reducing pollutant loadings is somewhat limited. DEP permits are required for construction activities affecting inland and tidal wetlands, however, and proposed federal regulations addressing stormwater runoff may provide the authority for DEP to become more directly involved in regulating pollutants from that source in the future.

Town Responsibility

Responsibility to implement a comprehensive strategy to achieve the objectives identified in the TMDL for Sasco Brook rests primarily with the watershed Towns of Fairfield and Westport. Land use and local development patterns are responsible for a significant portion of the nonpoint source pollutant loading to Sasco Brook. Under Connecticut law, the authority to regulate land use rests with individual Town governments. Town government is also responsible for the design and maintenance of stormwater drainage systems, and mitigation of failed septic systems where such systems have been identified. Purchase of open space and implementation of programs to preserve or restore riparian buffer zones are also typically administered at the local level. Strategies to educate the public in responsible land use management are a key component of implementation of the TMDL. Efforts to educate citizens on environmental issues and encourage voluntary participation in programs to enhance environmental quality are often most effective when developed with an understanding of local concerns and attitudes.

Individual Responsibility

Ultimately, each individual must decide for themselves how to modify their behavior to benefit water quality in the watershed. Participation in local community-based watershed protection activities such as those sponsored by the Sasco Brook Pollution Abatement Committee ⁹ can do much to further the goal of enhanced water quality in Sasco Brook. Organizations such as the SBPAC are uniquely suited to assist Town governments in developing effective control strategies by fostering cooperation and communication between watershed towns and coordinating activities of volunteers throughout the watershed.

SASCO BROOK WATER QUALITY MONITORING PLAN

Monitoring in support of TMDL implementation is comprised of two separate elements; trend monitoring to assess attainment of TMDL endpoints, and surveillance monitoring to identify local sources of contamination for remediation. The extent of ongoing monitoring efforts is highly dependent upon the continued support by the federal EPA, state DEP, the watershed Towns, and local citizen volunteers.

Trend Monitoring

Routine monitoring of ambient water quality conditions in Sasco Brook will be performed by the Fairfield Department of Health at three monitoring locations in the basin which are representative of water quality conditions at the boundary of sub-watersheds A, B, and C ¹¹. Samples will be collected at a frequency of twice per month to establish annual geometric mean and 90th percentile fecal coliform values for comparison with TMDL endpoints. Samples will be analyzed for three bacterial indicators; fecal coliform, *E. coli*, and enterococcus. Samples will also be collected for other parameters (e.g. turbidity, nutrients) concurrent with bacteria sampling. Results of the trend monitoring program will be evaluated on an annual basis to track progress in achieving the reductions in bacterial loadings specified in the TMDL.

Surveillance Monitoring

Citizen monitoring for the purpose of identifying sources of elevated indicator bacteria in Sasco Brook such as that performed by the Harbor Watch/ River Watch Program¹⁰ will continue to be supported by DEP contingent upon the availability of CWA Section 319 grant funds. Results of this monitoring will be forwarded to the Sasco Brook Pollution Abatement Committee for referral to the appropriate Town or State agency for follow-up investigation and enforcement if warranted. DEP will provide technical assistance to this program with respect to training of citizen monitors, purchase of equipment, and implementation of electronic data management practices to facilitate dissemination and use of the data generated.

PROVISIONS FOR REVISING THE TMDL

The Department reserves the authority to modify the TMDL as needed to account for new information made available during the implementation of the TMDL. Modification of the TMDL will only be made following an opportunity for public participation and be subject to the review and approval of the U.S. EPA. New information which will be generated during TMDL implementation includes monitoring data collected by the Towns of Westport and Fairfield as described in the Monitoring Plan as well as any data collected by DEP. At a minimum, monitoring data collected during implementation of the TMDL will be reviewed by DEP annually. New information may also include new or revised State or Federal regulations adopted pursuant to Section 303(d) of the Clean Water Act, or the publication by EPA of national or regional guidance relevant to the implementation of the TMDL program. The Department will propose modifications to the TMDL analysis only in the event that a review of the available data indicates such a modification is warranted and is consistent with the anti-degradation provisions

in Connecticut Water Quality Standards. Sasco Brook will continue to be listed in *Connecticut Waterbodies Not Meeting Water Quality Standards* until such time as monitoring data confirms that beneficial uses are fully supported.

PUBLIC PARTICIPATION

The Sasco Brook TMDL was developed in consultation with technical experts representing the National Resource Conservation Service, the Fairfield County Soil and Water Conservation District, Connecticut Department of Aquaculture, professional staff and elected officials from the Towns of Fairfield and Westport, and interested citizens within the watershed ¹².

SUPPORTING DOCUMENTATION

- (1) Connecticut Department of Environmental Protection. 1997. *Connecticut Water Quality Standards*. Bureau of Water Management, 79 Elm Street, Hartford, CT 06106-5127.
- (2) Connecticut Department of Environmental Protection, Bureau of Water Management. 1998. *Connecticut Waterbodies Not Meeting Water Quality Standards*. Bureau of Water Management, 79 Elm Street, Hartford, CT 06106-5127.
- (3) Harris, R. 1997. *Quality Assurance/Quality Control Plan for Sasco Brook Sub-Watershed A,B,C,D*. The Nature Center for Environmental Activities.
- (4) Morrison, J. 1999. *Monitoring data for Sasco Brook*. U.S. Geological Survey, 101 Pitkin Street, East Hartford, CT, 06108.
- (5) Connecticut Department of Environmental Protection. 1999. *Land Cover/Land Use in the Sasco Brook Watershed*. Bureau of Water Management, 79 Elm Street, Hartford, CT 06106-5127.
- (6) United States Environmental Protection Agency. 1986. *Ambient Water Quality Criteria for Bacteria- 1986*. Office of Water Regulations and Standards, Washington, DC.
- (7) Connecticut Department of Environmental Protection. 1998. *Baseline Condition for Fecal Coliform Indicator Bacteria in the Sasco Brook Watershed*. Bureau of Water Management, 79 Elm Street, Hartford, CT 06106-5127.
- (8) Connecticut Department of Environmental Protection and New York State Department of Environmental Conservation. 1998. *A Total Maximum Daily Load Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound* (Draft Document). Bureau of Water Management, 79 Elm Street, Hartford, CT 06106-5127.
- (9) Town of Fairfield, 1999. *Sasco Brook Water Quality Management Plan*. (Attached)
- (10) Pierwola, F. 1999. *Sasco Brook Pollution Abatement Committee Action Plan 1999*. Sasco Brook Pollution Abatement Committee. (Attached)
- (11) Connecticut Department of Environmental Protection and Town of Fairfield Department of Health. 1999. *Monitoring Protocol: Sasco Brook TMDL Implementation*. Bureau of Water Management, 79 Elm Street, Hartford, CT 06106-5127.
- (12) Connecticut Department of Environmental Protection. 1999. *Public Participation Docket, Development of TMDL for Sasco Brook*. Bureau of Water Management, 79 Elm Street, Hartford, CT 06106-5127.