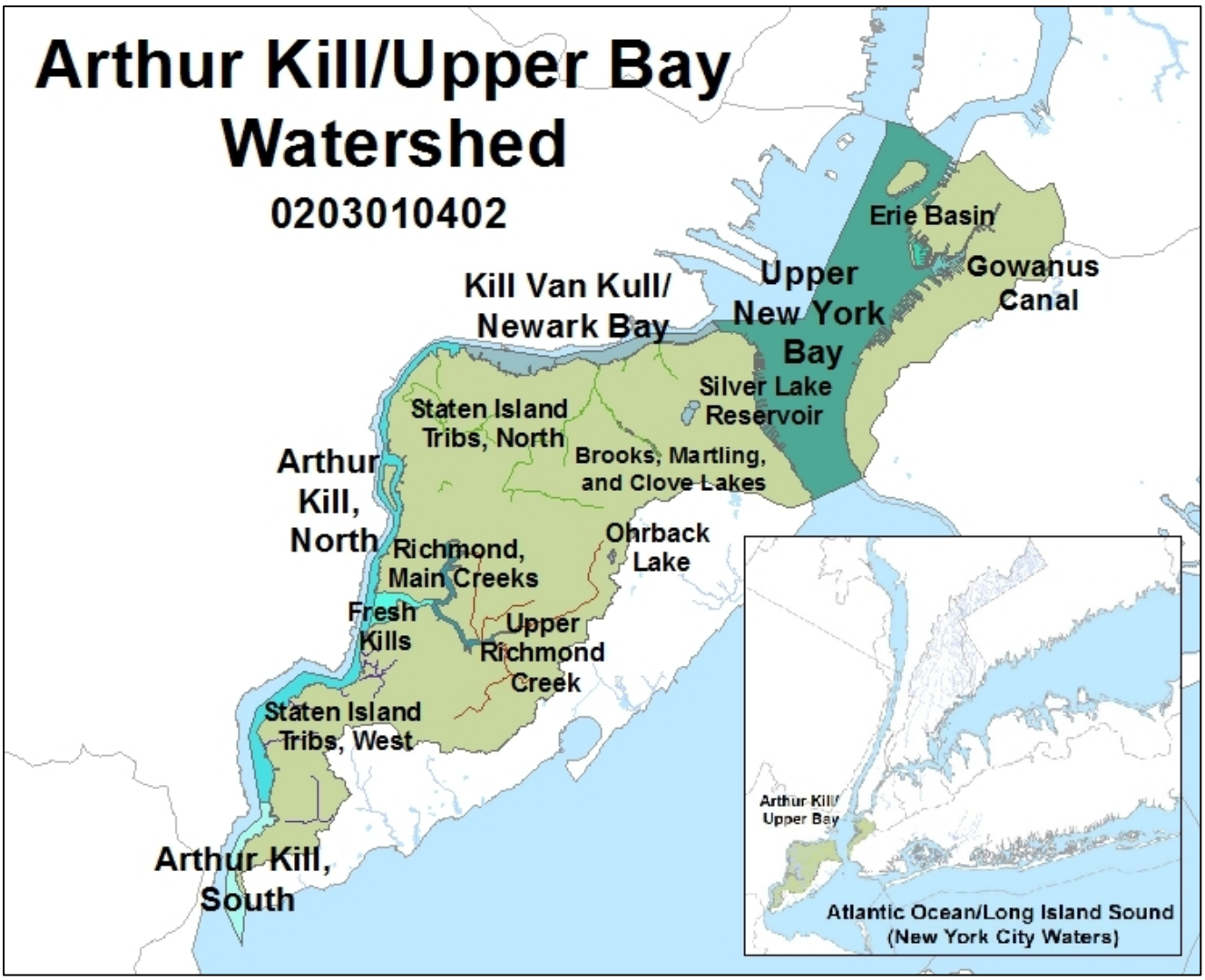

Arthur Kill/Upper Bay Watershed
(0203010402)

Water Index Number	Waterbody Segment	Category
(MW1.2) SI (portion 1)	Arthur Kill, South, and minor tribs (1701-0010)	Impaired
(MW1.2) SI (portion 2)	Arthur Kill, North, and minor tribs (1701-0182)	Impaired
(MW1.2) SI (portion 3)	Kill Van Kull/Newark Bay (1701-0183)	Impaired
(MW1.2) SI- 6 thru 7e	Minor Staten Island Tribs, West (1701-0190)	Minor Impacts
(MW1.2) SI- 8 (portion 1)	Fresh Kills (1701-0012)	Minor Impacts
(MW1.2) SI- 8 (portion 2)	Richmond/Main Creeks and tribs (1701-0150)	Minor Impacts
(MW1.2) SI- 8 (portion 3)	Richmond Creek, Upper, and tribs (1701-0043)	Impaired
(MW1.2) SI- 9 thru 16	Minor Staten Island Tribs, North (1701-0192)	Impaired
(MW1.2) SI- 8-5-P1069b,P1073	Ohrback Lake (1701-0358)	Unassessed
(MW1.2) SI-14-P1072 thru 74	Brooks, Martling and Clove Lakes (1701-0405)	Unassessed
(MW1.2) SI-14-1-P1076	Silver Lake Reservoir (1701-0359)	Needs Verification
(MW1.3) UB	Upper New York Bay (1701-0022)	Impaired
(MW1.3) UB-EB	Erie Basin (1701-0185)	Impaired
(MW1.3) UB-EB- 1	Gowanus Canal (1701-0011)	Impaired

Arthur Kill, South, and minor tribs (1701-0010) Impaired

Waterbody Location Information

Revised: 12/29/2016

Water Index No: (MW1.2) SI (portion 1)
Hydro Unit Code: Arthur Kill-Upper Bay (0203010402)
Water Type/Size: Estuary Waters 245.6 Acres
Description: river from mouth to Outerbridge Crossing

Water Class: I
Drainage Basin: Atlantic-Long Island Sound
Reg/County: 2/Richmond (43)

Water Quality Problem/Issue Information

Uses Evaluated	Severity	Confidence
Shellfishing	N/A	-
Public Bathing	N/A	-
Recreation	Impaired	Known
Aquatic Life	Fully Supported	Suspected
Fish Consumption	Impaired	Known
Conditions Evaluated		
Habitat/Hydrology	Fair	
Aesthetics	Fair	

Type of Pollutant(s) (CAPS indicate Major Pollutants/Sources that contribute to an Impaired/Precluded Uses)

Known: OTHER POLLUTANTS (floatable debris), PRIORITY ORGANICS (PCBS), PRIORITY ORGANICS (dioxin), Oil and Grease
Suspected: Pathogens, Nutrients (nitrogen), Low D.O./Oxygen Demand
Unconfirmed: - - -

Source(s) of Pollutant(s)

Known: URBAN/STORM RUNOFF, COMBINED SEWER OVERFLOW (CSOs), TOXIC/CONTAMINATED SEDIMENT
Suspected: Other/Non-Permitted Sanitary Discharge, Municipal Dicharges, Chemical Leak/Spill
Unconfirmed: Landfill/Land Disposal

Management Information

Management Status: Strategy Implementation Scheduled or Underway
Lead Agency/Office: Other/NYCDEP
IR/305(b) Code: Impaired Water Requiring a TMDL (IR Category 5)

Further Details

Overview

This portion of the Arthur Kill is assessed as an impaired waterbody due to recreational uses and fish consumption that are considered to be impaired by floatable debris, as well as PCBs and other toxics. Urban stormwater runoff, combined sewer overflows (CSOs), contaminated sediment, and the industrial use of the waterway result in conditions that negatively impact recreational use. Fish consumption is restricted by health advisories due to PCB and other toxic contaminants. Aquatic life had previously been assessed as impacted by low dissolved oxygen levels, but recent data shows D.O. in this reach typically meets applicable water quality standards for support of aquatic life.

Use Assessment

This portion of the Arthur Kill is a Class I waterbody, assessed for general recreation use and support of aquatic life, but not as a water supply or for public bathing.

Recreation uses are considered to be impaired due to floatable debris and other aesthetic concerns. Marine traffic and industrial use of the waterway result in occasional oil and other pollutant spills. CSOs along with suspected illegal

wastewater discharges contribute pathogens and oxygen demanding substances. Pathogen criteria in the waterways are generally met during dry weather, but can be exceeded during wet-weather events. The most recent sampling results indicate dissolved oxygen levels are adequateto support aquatic life.

Fish consumption is considered to be impaired due to NYS DOH a health advisory that recommends eating no American eel, gizzard shad, or white perch, and no more than one meal per month of Atlantic needlefish, bluefish, rainbow smelt or stiped bass taken west of Wolfe's Pond Park because of elevated PCB and dioxin levels. Additional advisories are also in place regarding consumption of all other fish and blue crab meat due to PCBs and dioxin. However, these advisories recommend limiting consumption to no more than one meal per week which is no more stringent than the general statewide advisory for all New York waters and does not result in significant impact to uses. The source of this contamination is considered to be contaminated sediment, the result of past industrial activity/discharges. For some species the advisories are related to the habits and characteristics of these species, specifically the wide migratory range, predatory nature and high lipid/fat content that make them more likely to accumulate contaminants. Health advisories regarding the consumption of fish are revised regularly; for the most current advisories, go to www.nyhealth.gov/environmental/outdoors/fish/fish.htm. (NYS DOH Health Advisories and DEC/FWMR, Habitat, January 2014)

Water Quality Information

Water quality evaluations have been conducted through both the NYCDEP City-Wide Long-Term CSO Control Planning Program as well as the long-standing NYCDEP Harbor Survey Sampling Program. Previous sampling of The Kills (Arthur Kill, Kill Van Kull and a portion of Newark Bay) conducted through the CSO Program indicated that the impact of CSOs, stormwater discharges and dry weather sanitary flows cause some isolated occurrences of low dissolved oxygen and elevated pathogen levels. Modeling of water quality in these waters also show that dissolved oxygen standards in the Arthur Kill are not met occasionally in some locations. Pathogen levels in The Kills typically meet applicable criteria, although standards are occasionally exceeded during wet-weather events. (NYCDEP, City-Wide Long-Term CSO Control Planning Program, June 2016)

The NYCDEP Harbor Survey Program uses primarily four indicators of water quality: fecal coliform bacteria, dissolved oxygen, chlorophyll a and water clarity. Significant improvements have been noted in all of these parameters since the 1970s and 80s. These improvements have coincided with considerable upgrades to the City's wastewater treatment facilities. Sites along the Kills are currently sampled as part of the network. The most recent Harbor Survey data (2015 and 2016) indicates very good dissolved oxygen levels and low fecal coliform levels except during wet weather. (NYCDEP, Harbor Survey, 2016)

An extensive effort to monitoring toxic substances in New York Harbor waters was undertaken in the late 1990s. The Contaminant Assessment and Reduction Program (CARP) effort was a response to the implementation of more restrictive guidelines for the disposal of dredged materials from New York Harbor. These guidelines eliminated ocean disposal as a viable option for much of the dredged material related to port maintenance. As a result, the assessment and reduction of contaminated sediments became a critical priority for the Harbor. Strong regional multi–agency support and a $30 million commitment – primarily from the NYNJ Port Authority – led to the formation of CARP in 1997. The objectives of the effort were to identify sources of contaminants to the harbor/estuary, establish baseline levels of contaminants in waters, fish tissue and sediments, and evaluate future conditions under various contaminant reduction scenarios. The monitoring component which began in 1999 and continued through 2001 provided input to contaminant fate and transport models and guided trackdown and remediation and restoration efforts. Planning to undertake a follow-up sampling effort are currently underway. (NY-NJ HEP, December 2016)

Source Assessment

Urban stormwater runoff, sanitary sewer overflows and illegal (unpermitted) sanitary discharges, as well as the overall industrial use of the waterway are sources of pollutants. Additionally CSOs (from western shore; there are no direct CSO discharges from New York) also influence water quality in this reach. NYC municipal wastewater discharges also contribute to overall nutrient load in the harbor waters. Impacts to fish consumption are due to elevated PCBs from contaminated sediment, primarily the result of historic (past) discharges. For some fish species with a wide migratory

range some contamination is picked up in other waters.

Management Actions

Combined sewer overflows (CSOs) represent a significant source of pollutants to New York Harbor waters and tributaries. In 2005 NYSDEC issued a Consent Order requiring New York City to address the over 400 CSOs of the NYCDEP municipal wastewater system. In 2012, the CSO Order was modified to including the integration of green infrastructure, the substitution of more cost-effective grey infrastructure, and agreed to fixed dates for submittal of the Long-Term Control Plans. Under the 2005/2012 Orders, NYCDEP developed 11 Waterbody/Watershed Facility Plans (WWFPs) and is currently developing Long Term Control Plans (LTCPs) to bring CSO-impacted waters into compliance with water quality standards. The Arthur Kill, Kill Van Kull and a portion of Newark Bay in New York are included within the Open Waters waterbodies, for which LTCPs are being developed. The Order requires post-construction monitoring to verify modeling projections and actual water quality compliance, inform decisions regarding SPDES permit renewal at five-year intervals, and evaluate future management actions, including additional CSOs controls if necessary. (DEC/DOW, BWC, August 2016)

Efforts to address issues and impacts from failing and/or inadequate residential onsite wastewater (septic) systems through sewering projects are ongoing. Additional infrastructure improvements to address stormwater runoff control are proposed as a part of the Staten Island Bluebelt program. This effort preserves natural drainage corridors, called Bluebelts, including streams, ponds, and other wetland areas and allows them to perform their functions of conveying, storing, and filtering stormwater, while providing an alternative to more costly traditional storm sewer infrastructure. In addition, the Bluebelts provide important community open spaces and diverse wildlife habitats. Although the Bluebelt program is substantially complete along the south shore, projects in Mid-Staten Island are ongoing. (NYCDEP, December 2016)

These waters are included within the core area of the New York/New Jersey Harbor Estuary Program (HEP). The HEP is a National Estuary Program authorized in 1987 by the U.S. Environmental Protection Agency. The program is a continuing multi–agency effort to develop and implement a plan to protect, conserve, and restore the estuary. Participants in the program include representatives from local, state, and federal environmental agencies, scientists, citizens, business interests, environmentalists, and others. (DEC/DOW, BWAM, December 2010)

Section 303(d) Listing

The Arthur Kill, South is included on the current (2016) NYS Section 303(d) List of Impaired Waters due to floatables, low dissolved oxygen, PCBs, dioxin and other toxics. The waterbody is included on Part 1 of the List as an impaired water requiring a TMDL to address these pollutants. The listing notes the NYCDEP CSO and floatables capture efforts but also recognizes that restoration of this shared water will involve New Jersey efforts as well. Current sampling data indicates that it is appropriate to consider delisting dissolved oxygen. The waterbody also appears on Part 2b of the List for PCBs and other toxics, and dioxin. This waterbody was first listed on the 2002 Section 303(d) List. (DEC/DOW, BWAM/WQAS, January 2016)

Segment Description

This segment includes the tidal waterway and minor tidal tribs from the mouth at the southwestern tip of Staten Island to the Outerbridge Crossing. The waters of this segment are Class I. This reach includes the Class I portion of Raritan Bay, which had previously been listed as a separate segment.

Arthur Kill, North, and minor tribs (1701-0182) Impaired

Waterbody Location Information

Revised: 12/29/2016

Water Index No: (MW1.2) SI (portion 2)
Hydro Unit Code: Arthur Kill-Upper Bay (0203010402)
Water Type/Size: Estuary Waters 1217.6 Acres
Description: river from Outerbridge Crossing to Newark Bay

Water Class: SD
Drainage Basin: Atlantic-Long Island Sound
Reg/County: 2/Richmond (43)

Water Quality Problem/Issue Information

Uses Evaluated	Severity	Confidence
Shellfishing	N/A	-
Public Bathing	N/A	-
Recreation	Impaired	Known
Aquatic Life	Fully Supported	Suspected
Fish Consumption	Impaired	Known
Conditions Evaluated		
Habitat/Hydrology	Fair	
Aesthetics	Fair	

Type of Pollutant(s) (CAPS indicate Major Pollutants/Sources that contribute to an Impaired/Precluded Uses)

Known: OTHER POLLUTANTS (floatable debris), PRIORITY ORGANICS (PCBS), PRIORITY ORGANICS (dioxin), Oil and Grease
Suspected: Pathogens, Nutrients (nitrogen), Low D.O./Oxygen Demand
Unconfirmed: - - -

Source(s) of Pollutant(s)

Known: URBAN/STORM RUNOFF, COMBINED SEWER OVERFLOW (CSOs), TOXIC/CONTAMINATED SEDIMENT
Suspected: Other/Non-Permitted Sanitary Discharge, Municipal Dicharges, Chemical Leak/Spill
Unconfirmed: Landfill/Land Disposal

Management Information

Management Status: Strategy Implementation Scheduled or Underway
Lead Agency/Office: Other/NYCDEP
IR/305(b) Code: Impaired Water Requiring a TMDL (IR Category 5)

Further Details

Overview

This portion of the Arthur Kill is assessed as an impaired waterbody due to recreational uses and fish consumption that are considered to be impaired by floatable debris, as well as PCBs and other toxics. Urban stormwater runoff, combined sewer overflows (CSOs), contaminated sediment, and the industrial use of the waterway result in conditions that negatively impact recreational use. Fish consumption is restricted by health advisories due to PCB and other toxic contaminants. Aquatic life had previously been assessed as impacted by low dissolved oxygen levels, but recent data shows D.O. in this reach typically meets applicable water quality standards for support of aquatic life.

Use Assessment

This portion of the Arthur Kill is a Class SD waterbody, assessed for general recreation use and support of aquatic life, but not for water supply or for public bathing use.

Recreational uses are considered to be impaired due to floatable debris and other aesthetic concerns. Marine traffic and

industrial use of the waterway result in occasional oil and other pollutant spills. CSOs along with suspected illegal wastewater discharges contribute pathogens and oxygen demanding substances. Pathogen criteria in the waterways are generally met during dry weather, but can be exceeded during wet-weather events. The most recent sampling results indicate dissolved oxygen levels are adequateto support aquatic life.

Fish consumption is considered to be impaired due to NYS DOH a health advisory that recommends eating no American eel, gizzard shad, or white perch, and no more than one meal per month of Atlantic needlefish, bluefish, rainbow smelt or stiped bass taken west of Wolfe's Pond Park because of elevated PCB and dioxin levels. Additional advisories are also in place regarding consumption of all other fish and blue crab meat due to PCBs and dioxin. However, these advisories recommend limiting consumption to no more than one meal per week which is no more stringent than the general statewide advisory for all New York waters and does not result in significant impact to uses. The source of this contamination is considered to be contaminated sediment, the result of past industrial activity/discharges. For some species the advisories are related to the habits and characteristics of these species, specifically the wide migratory range, predatory nature and high lipid/fat content that make them more likely to accumulate contaminants. Health advisories regarding the consumption of fish are revised regularly; for the most current advisories, go to www.nyhealth.gov/environmental/outdoors/fish/fish.htm. (NYS DOH Health Advisories and DEC/FWMR, Habitat, January 2014)

Water Quality Information

Water quality evaluations have been conducted through both the NYCDEP City-Wide Long-Term CSO Control Planning Program as well as the long-standing NYCDEP Harbor Survey Sampling Program. Previous sampling of The Kills (Arthur Kill, Kill Van Kull and a portion of Newark Bay) conducted through the CSO Program indicated that the impact of CSOs, stormwater discharges and dry weather sanitary flows cause some isolated occurrences of low dissolved oxygen and elevated pathogen levels. Modeling of water quality in these waters also show that dissolved oxygen standards in the Arthur Kill are not met occasionally in some locations. Pathogen levels in The Kills typically meet applicable criteria, although standards are occasionally exceeded during wet-weather events. (NYCDEP, City-Wide Long-Term CSO Control Planning Program, June 2016)

The NYCDEP Harbor Survey Program uses primarily four indicators of water quality: fecal coliform bacteria, dissolved oxygen, chlorophyll a and water clarity. Significant improvements have been noted in all of these parameters since the 1970s and 80s. These improvements have coincided with considerable upgrades to the City's wastewater treatment facilities. Sites along the Kills are currently sampled as part of the network. The most recent Harbor Survey data (2015 and 2016) indicates very good dissolved oxygen levels and low fecal coliform levels except during wet weather. (NYCDEP, Harbor Survey, 2016)

An extensive effort to monitoring toxic substances in New York Harbor waters was undertaken in the late 1990s. The Contaminant Assessment and Reduction Program (CARP) effort was a response to the implementation of more restrictive guidelines for the disposal of dredged materials from New York Harbor. These guidelines eliminated ocean disposal as a viable option for much of the dredged material related to port maintenance. As a result, the assessment and reduction of contaminated sediments became a critical priority for the Harbor. Strong regional multi–agency support and a $30 million commitment – primarily from the NYNJ Port Authority – led to the formation of CARP in 1997. The objectives of the effort were to identify sources of contaminants to the harbor/estuary, establish baseline levels of contaminants in waters, fish tissue and sediments, and evaluate future conditions under various contaminant reduction scenarios. The monitoring component which began in 1999 and continued through 2001 provided input to contaminant fate and transport models and guided trackdown and remediation and restoration efforts. Planning to undertake a follow-up sampling effort are currently underway. (NY-NJ HEP, December 2016)

Source Assessment

Urban stormwater runoff, sanitary sewer overflows and illegal (unpermitted) sanitary discharges, as well as the overall industrial use of the waterway are sources of pollutants. Additionally CSOs (from up/downstream reaches; there are no direct CSO discharges to this segment) also influence water quality in this reach. NYC municipal wastewater discharges also contribute to overall nutrient load in the harbor waters. Impacts to fish consumption are due to elevated PCBs from contaminated sediment, primarily the result of historic (past) discharges. For some fish species with a wide migratory

range some contamination is picked up in other waters.

Management Actions
Combined sewer overflows (CSOs) represent a significant source of pollutants to New York Harbor waters and tributaries. In 2005 NYSDEC issued a Consent Order requiring New York City to address the over 400 CSOs of the NYCDEP municipal wastewater system. In 2012, the CSO Order was modified to including the integration of green infrastructure, the substitution of more cost-effective grey infrastructure, and agreed to fixed dates for submittal of the Long-Term Control Plans. Under the 2005/2012 Orders, NYCDEP developed 11 Waterbody/Watershed Facility Plans (WWFPs) and is currently developing Long Term Control Plans (LTCPs) to bring CSO-impacted waters into compliance with water quality standards. The Arthur Kill, Kill Van Kull and a portion of Newark Bay in New York are included within the Open Waters waterbodies, for which a LTCP is being developed. The Order requires post-construction monitoring to verify modeling projections and actual water quality compliance, inform decisions regarding SPDES permit renewal at five-year intervals, and evaluate future management actions, including additional CSOs controls if necessary. (DEC/DOW, BWC, August 2016)

Efforts to address issues and impacts from failing and/or inadequate residential onsite wastewater (septic) systems through sewering projects are ongoing. Additional infrastructure improvements to address stormwater runoff control are proposed as a part of the Staten Island Bluebelt program. This effort preserves natural drainage corridors, called Bluebelts, including streams, ponds, and other wetland areas and allows them to perform their functions of conveying, storing, and filtering stormwater, while providing an alternative to more costly traditional storm sewer infrastructure. In addition, the Bluebelts provide important community open spaces and diverse wildlife habitats. Although the Bluebelt program is substantially complete along the south shore, projects in Mid-Staten Island are ongoing. (NYCDEP, December 2016)

These waters are included within the core area of the New York/New Jersey Harbor Estuary Program (HEP). The HEP is a National Estuary Program authorized in 1987 by the U.S. Environmental Protection Agency. The program is a continuing multi–agency effort to develop and implement a plan to protect, conserve, and restore the estuary. Participants in the program include representatives from local, state, and federal environmental agencies, scientists, citizens, business interests, environmentalists, and others. (DEC/DOW, BWAM, December 2010)

Section 303(d) Listing
The Arthur Kill, North is included on the current (2016) NYS Section 303(d) List of Impaired Waters due to floatables, low dissolved oxygen, PCBs, dioxin and other toxics. The waterbody is included on Part 1 of the List as an impaired water requiring a TMDL to address these pollutants. The listing notes the NYCDEP CSO and floatables capture efforts but also recognizes that restoration of this shared water will involve New Jersey efforts as well. Current sampling data indicates that it is appropriate to consider delisting dissolved oxygen. The waterbody also appears on Part 2b of the List for PCBs and other toxics, and dioxin. This waterbody was first listed on the 2002 Section 303(d) List. (DEC/DOW, BWAM/WQAS, January 2016)

Segment Description
This segment includes the tidal waterway and minor tidal tribs from the Outerbridge Crossing to Newark Bay.

Kill Van Kull/Newark Bay (1701-0183) Impaired

Waterbody Location Information

Revised: 12/29/2016

Water Index No: (MW1.2) SI (portion 3)
Hydro Unit Code: Arthur Kill-Upper Bay (0203010402)
Water Type/Size: Estuary Waters 300.1 Acres
Description: entire river/bay, within New York State

Water Class: SD
Drainage Basin: Atlantic-Long Island Sound
Reg/County: 2/Richmond (43)

Water Quality Problem/Issue Information

Uses Evaluated	Severity	Confidence
Shellfishing	N/A	-
Public Bathing	N/A	-
Recreation	Impaired	Known
Aquatic Life	Fully Supported	Suspected
Fish Consumption	Impaired	Known
Conditions Evaluated		
Habitat/Hydrology	Fair	
Aesthetics	Fair	

Type of Pollutant(s) (CAPS indicate Major Pollutants/Sources that contribute to an Impaired/Precluded Uses)

Known: OTHER POLLUTANTS (floatable debris), PRIORITY ORGANICS (PCBS), PRIORITY ORGANICS (dioxin), Nutrients (nitrogen), Oil and Grease
Suspected: Low D.O./Oxygen Demand, Pathogens
Unconfirmed: - - -

Source(s) of Pollutant(s)

Known: URBAN/STORM RUNOFF, COMBINED SEWER OVERFLOW (CSOs), TOXIC/CONTAMINATED SEDIMENT
Suspected: Other/Non-Permitted Sanitary Discharge, Municipal Dicharges, Chemical Leak/Spill
Unconfirmed: Landfill/Land Disposal

Management Information

Management Status: Strategy Implementation Scheduled or Underway
Lead Agency/Office: Other/NYCDEP
IR/305(b) Code: Impaired Water Requiring a TMDL (IR Category 5)

Further Details

Overview

The Kill Van Kull/Newark Bay is assessed as an impaired waterbody due to recreational uses and fish consumption that are considered to be impaired by floatable debris, as well as PCBs and other toxics. Urban stormwater runoff, combined sewer overflows (CSOs), contaminated sediment, and the industrial use of the waterway result in conditions that negatively impact recreational use and affect the fishery. Recent data shows D.O. in this reach typically meets applicable water quality standards for support of aquatic life.

Use Assessment

The Kill Van Kull/Newark Bay is a Class SD waterbody, assessed for general recreation use and support of aquatic life, but not for water supply or for public bathing use.

Recreational uses are considered to be impaired due to floatable debris and other aesthetic concerns. Marine traffic and industrial use of the waterway result in occasional oil and other pollutant spills. CSOs along with suspected illegal wastewater discharges contribute pathogens and oxygen demanding substances. Pathogen criteria in the waterways are

generally met during dry weather, but can be exceeded during wet-weather events. The most recent sampling results indicate dissolved oxygen levels are adequateto support aquatic life.

Fish consumption is considered to be impaired due to NYS DOH a health advisory that recommends eating no American eel, gizzard shad, or white perch, and no more than one meal per month of Atlantic needlefish, bluefish, rainbow smelt or stiped bass taken west of Wolfe's Pond Park because of elevated PCB and dioxin levels. Additional advisories are also in place regarding consumption of all other fish and blue crab meat due to PCBs and dioxin. However, these advisories recommend limiting consumption to no more than one meal per week which is no more stringent than the general statewide advisory for all New York waters and does not result in significant impact to uses. The source of this contamination is considered to be contaminated sediment, the result of past industrial activity/discharges. For some species the advisories are related to the habits and characteristics of these species, specifically the wide migratory range, predatory nature and high lipid/fat content that make them more likely to accumulate contaminants. Health advisories regarding the consumption of fish are revised regularly; for the most current advisories, go to www.nyhealth.gov/environmental/outdoors/fish/fish.htm. (NYS DOH Health Advisories and DEC/FWMR, Habitat, January 2014)

Water Quality Information

Water quality evaluations have been conducted through both the NYCDEP City-Wide Long-Term CSO Control Planning Program as well as the long-standing NYCDEP Harbor Survey Sampling Program. Previous sampling of The Kills (Arthur Kill, Kill Van Kull and a portion of Newark Bay) conducted through the CSO Program indicated that the impact of CSOs, stormwater discharges and dry weather sanitary flows cause some isolated occurrences of low dissolved oxygen and elevated pathogen levels. Modeling of water quality in these waters also show that dissolved oxygen standards in the Kill Van Kull/Newark Bay are not met occasionally in some locations. Pathogen levels in The Kills typically meet applicable criteria, although standards are occasionally exceeded during wet-weather events. (NYCDEP, City-Wide Long-Term CSO Control Planning Program, June 2016)

The NYCDEP Harbor Survey Program uses primarily four indicators of water quality: fecal coliform bacteria, dissolved oxygen, chlorophyll a and water clarity. Significant improvements have been noted in all of these parameters since the 1970s and 80s. These improvements have coincided with considerable upgrades to the City's wastewater treatment facilities. Sites along the Kills are currently sampled as part of the network. The most recent Harbor Survey data (2015 and 2016) indicates very good dissolved oxygen levels and low fecal coliform levels except during wet weather. (NYCDEP, Harbor Survey, 2016

An extensive effort to monitoring toxic substances in New York Harbor waters was undertaken in the late 1990s. The Contaminant Assessment and Reduction Program (CARP) effort was a response to the implementation of more restrictive guidelines for the disposal of dredged materials from New York Harbor. These guidelines eliminated ocean disposal as a viable option for much of the dredged material related to port maintenance. As a result, the assessment and reduction of contaminated sediments became a critical priority for the Harbor. Strong regional multi–agency support and a $30 million commitment – primarily from the NYNJ Port Authority – led to the formation of CARP in 1997. The objectives of the effort were to identify sources of contaminants to the harbor/estuary, establish baseline levels of contaminants in waters, fish tissue and sediments, and evaluate future conditions under various contaminant reduction scenarios. The monitoring component which began in 1999 and continued through 2001 provided input to contaminant fate and transport models and guided trackdown and remediation and restoration efforts. Planning to undertake a follow-up sampling effort are currently underway. (NY-NJ HEP, December 2016)

Source Assessment

Urban stormwater runoff, combined sewer overflows (CSOs), sanitary sewer overflows and illegal (unpermitted) sanitary discharges, as well as the overall industrial use of the waterway are sources of pollutants. NYC municipal wastewater discharges also contribute to overall nutrient load in the harbor waters. Impacts to fish consumption are due to elevated PCBs from contaminated sediment, primarily the result of historic (past) discharges. For some fish species with a wide migratory range some contamination is picked up in other waters.

Management Actions

Combined sewer overflows (CSOs) represent a significant source of pollutants to New York Harbor waters and

tributaries. In 2005 NYSDEC issued a Consent Order requiring New York City to address the over 400 CSOs of the NYCDEP municipal wastewater system. In 2012, the CSO Order was modified to including the integration of green infrastructure, the substitution of more cost-effective grey infrastructure, and agreed to fixed dates for submittal of the Long-Term Control Plans. Under the 2005/2012 Orders, NYCDEP developed 11 Waterbody/Watershed Facility Plans (WWFPs) and is currently developing Long Term Control Plans (LTCPs) to bring CSO-impacted waters into compliance with water quality standards. The Arthur Kill, Kill Van Kull and a portion of Newark Bay in New York are included within the Open Waters waterbodies, for which a LTCP is being developed. The Order requires post-construction monitoring to verify modeling projections and actual water quality compliance, inform decisions regarding SPDES permit renewal at five–year intervals, and evaluate future management actions, including additional CSOs controls if necessary. (DEC/DOW, BWC, August 2010)

Efforts to address issues and impacts from failing and/or inadequate residential onsite wastewater (septic) systems through sewering projects are largely complete in the northern portion of Staten Island. Additional infrastructure improvements to address stormwater runoff control are proposed as a part of the Staten Island Bluebelt program. This effort preserves natural drainage corridors, called Bluebelts, including streams, ponds, and other wetland areas and allows them to perform their functions of conveying, storing, and filtering stormwater, while providing an alternative to more costly traditional storm sewer infrastructure. In addition, the Bluebelts provide important community open spaces and diverse wildlife habitats. Although the Bluebelt program is substantially complete along the south shore, projects in Mid-Staten Island are ongoing. (NYCDEP, December 2016)

These waters are included within the core area of the New York/New Jersey Harbor Estuary Program (HEP). The HEP is a National Estuary Program authorized in 1987 by the U.S. Environmental Protection Agency. The program is a continuing multi–agency effort to develop and implement a plan to protect, conserve, and restore the estuary. Participants in the program include representatives from local, state, and federal environmental agencies, scientists, citizens, business interests, environmentalists, and others. (DEC/DOW, BWAM, December 2010)

Section 303(d) Listing:
Kill Van Kull/Newark Bay is included on the current (2016) NYS Section 303(d) List of Impaired Waters due to floatables, PCBs, dioxin and other toxics. The waterbody is included on Part 1 of the List for floatables as an impaired water requiring and TMDL. The listing notes the NYC DEP CSO and floatables capture efforts but also recognizes that restoration of this shared water will involve New Jersey efforts as well. The waterbody also appears on Part 2b of the List for PCBs and other toxics, and dioxin. This waterbody was first listed on the 2002 Section 303(d) List. (DEC/DOW, BWAM/WQAS, December 2010)

Segment Description:
This segment includes the tidal portion of the Kill Van Kull from its confluence with Upper New York Bat at the northeastern tip of Staten Island, to/including the portion of Newark Bay within New York State. Newark Bay had previously been listed as a separate segment.

Kill Van Kull (1701-0184) — Impaired

Waterbody Location Information — Revised: 6/20/2011

Water Index No: (MW1.2) SI (portion 4)
Water Class: SD
Hydro Unit Code: Arthur Kill Upper Bay (0203010402)
Drainage Basin: Atlantic Long Island Sound
Water Type/Size: Estuary Waters 372.1 Acres
Reg/County: 2/Richmond (43)
Description: entire river, within New York State

Water Quality Problem/Issue Information

Uses Evaluated	Severity	Confidence
Water Supply	Unassessed	
Shellfishing	Unassessed	
Public Bathing	Unassessed	
Recreation	Impaired	Known
Aquatic Life	Stressed	Known
Fish Consumption	Impaired	Known

Conditions Evaluated	
Habitat/Hydrology	Unassessed
Aesthetics	Fair

Type of Pollutant(s) (CAPS indicate Major Pollutants/Sources that contribute to an Impaired/Precluded Uses)

Known: AESTHETICS (FLOATABLES), PRIORITY ORGANICS (PCBS), Metals (cadmium), Nutrients (nitrogen), Oil and Grease
Suspected: PRIORITY ORGANICS (DIOXIN), Low D.O./Oxygen Demand, Pathogens, Temperature
Unconfirmed:

Source(s) of Pollutant(s)

Known: Chemical Leak/Spill, COMB. SEWER OVERFLOW, Industrial Discharges, Landfill/Land Disp., OTHER NON-PERMITTED SANITARY DISCH, TOX/CONTAM. SEDIMENT, URBAN/STORM RUNOFF
Suspected: Municipal Discharges
Unconfirmed:

Management Information

Management Status: Strategy Implementation Scheduled or Underway
Lead Agency/Office: ext/NYC
IR/305(b) Code: Impaired Water Requiring a TMDL (IR Category 5)

Further Details

Overview
Overview:
Fish consumption and recreational uses in the Kill Van Kull are known to be impaired due to PCBs and other toxics, floatables, and other pollutants from CSOs, urban stormwater runoff, contaminated sediment and illegal sanitary connections to storm sewers. These sources and the industrial use of the waterway result in conditions that negatively affect the fishery and recreational uses. Marine traffic, occasional oil spills from area oil terminals, and runoff from the Fresh Kills Landfill (now closed, see below) all impact water quality in the river by introducing oxygen demanding substances, heavy metals, other toxics and oil, grease to the waterway. Aquatic life is stressed by low dissolved oxygen levels periodically fail to meet applicable water quality standards along this reach. Fish consumption is restricted by health advisories in place for the waterway.

Water Quality Sampling:

New York City Department of Environmental Protection (NYCDEP) has operated a water quality monitoring program since 1909. The NYCDEP Harbor Survey Program uses primarily four indicators of water quality: fecal coliform bacteria, dissolved oxygen, chlorophyll a and water clarity. Significant improvements have been noted in all of these parameters since the 1970s and 80s. These improvements have coincided with considerable upgrades to the City's wastewater treatment facilities. Sites along the Kills are currently sampled as part of the network. (NYCDEP, Harbor Survey, 2009)

Water quality evaluations have also been conducted through the NYCDEP City Wide Long Term CSO Control Planning Project, including the Kills (Arthur Kill, Kill Van Kull and a portion of Newark Bay). The results of sampling conducted in 1993 and 2004 indicate that the impact of CSOs, stormwater discharges and dry weather sanitary flows cause periodic low dissolved oxygen and elevated pathogen levels. However attainment of dissolved oxygen standards in The Kills is typically met at most times. Similarly pathogen levels in The Kills typically meet applicable criteria. (NYCDEP, City Wide Long Term CSO Control Planning Program, June 2011)

Fish Consumption Advisories:
NYS DOH has issued health advisories recommending limiting consumption of no American eel, gizzard shad, striped bass, white perch or crab hepatopancreas and no more than one meal per month of Atlantic needlefish, bluefish or rainbow smelt from these waters due to possible elevated levels of PCBs and dioxin. The source of this contamination is considered to be contaminated sediment, the result of past industrial discharges. The advisory for this waterbody was first issued prior to 1998 99. Health advisories regarding the consumption of fish are revised regularly; for the most current advisories, go to www.nyhealth.gov/environmental/outdoors/fish/fish.htm. (2009 10 NYS DOH Health Advisories and DEC/DFWMR, Habitat, January 2010)

Water Quality Management (NYC CSO Order):
Combined sewer overflows (CSOs) represent a significant source of pollutants to New York Harbor waters and tributaries. In 2005 NYSDEC issued a Consent Order requiring New York City to address the over 400 CSOs of the NYCDEP municipal wastewater system. The Order follows the two phased approach identified in the USEPA CSO Control Policy which calls for Nine Minimum Control Measures to minimize overflows and CSO pollution and the development of Long Term Control Plans to address water quality issues not fully addressed by the nine minimum controls. As a result NYCDEP is undertaking projects totaling of $2 billion to capture about 75% of wet weather overflows. The Order also requires NYCDEP to develop 11 Waterbody/Watershed Facility Plans (WWFPs) to identify remaining water quality issues, evaluate CSOs contributions to these problems and form the basis of subsequent Long Term Control Plans (LTCPs) to bring these waters into compliance with water quality standards. The Arthur Kill, Kill Van Kull and a portion of Newark Bay in New York are included among East River and Open Waters WWFPs. The Order requires post construction monitoring to verify modeling projections and actual water quality compliance, inform decisions regarding SPDES permit renewal at five year intervals, and evaluate future management actions, including additional CSOs controls if necessary. (DEC/DOW, BWC, August 2010)

Water Quality Management (East River/Open Waters WWFP):
The current proposed East River/Open Waters Waterbody/Watershed Facility Plan (WWFP) to address water quality pollution looks at a wide range of CSO control alternatives. The plan oncludes alternatives projected to cost $140 million and include 1) regulator improvements 2) continuation of ongoing upgrades and a number of NYC WPCP, and 3) an enhanced Floatable Skimming Program. Construction to implement these components of the plan which are in addition to other adjoining watershed and city wide initiatives would be conducted concurrently with projects in other WWFPs throughout the New York Harbor area. A final WWFP for the East River/Open Waters has not yet been approved by NYSDEC. (NYCDEP, August 2011)

NY/NJ Harbor Estuary Program:
These waters are included within the core area of the New York/New Jersey Harbor Estuary Program (HEP). The HEP is a National Estuary Program authorized in 1987 by the U.S. Environmental Protection Agency. The program is a continuing multi agency effort to develop and implement a plan to protect, conserve, and restore the estuary. Participants

in the program include representatives from local, state, and federal environmental agencies, scientists, citizens, business interests, environmentalists, and others. (DEC/DOW, BWAM, December 2010)

Section 303(d) Listing:
The Kill Van Kull is included on the NYS 2010 Section 303(d) List of Impaired Waters due to floatables, PCBs, cadmium and other toxics. The waterbody is included on Part 1 of the List for floatables as an impaired water requiring and TMDL. The listing notes the NYC DEP CSO and floatables capture efforts and also recognizes that restoration of this shared water will involve New Jersey as well. The waterbody also appears on Part 2b of the List for PCBs and other toxic, cadmium and dioxin. However a more recent listing of fish consumption waters does not include cadmium and as a result a delisting for this pollutant should be considered. This waterbody was first listed on the 2002 Section 303(d) List. (DEC/DOW, BWAM/WQAS, December 2010)

Segment Description:
This segment includes the tidal portion of the waterway and tidal tribs from Newark Bay to the confluence with Upper New York Bay at the northeastern tip of Staten Island.

Minor Staten Island Tribs, Lower (1701-0189) Minor Impacts

Waterbody Location Information

Revised: 9/28/2011

Water Index No: (MW1.2) SI 7a thru 7e
Water Class: SD
Hydro Unit Code: Arthur Kill Upper Bay (0203010402)
Drainage Basin: Atlantic Long Island Sound
Water Type/Size: Estuary Waters 45.6 Acres
Reg/County: 2/Richmond (43)
Description: total area of selected tidal tribs

Water Quality Problem/Issue Information

Uses Evaluated	Severity	Confidence
Water Supply	Unassessed	
Shellfishing	Unassessed	
Public Bathing	Unassessed	
Recreation	Stressed	Known
Aquatic Life	Stressed	Suspected
Fish Consumption	Unassessed	

Conditions Evaluated	
Habitat/Hydrology	Unassessed
Aesthetics	Fair

Type of Pollutant(s) (CAPS indicate Major Pollutants/Sources that contribute to an Impaired/Precluded Uses)

Known: PATHOGENS, Aesthetics (floatables)
Suspected: Low D.O./Oxygen Demand, Metals, Oil and Grease
Unconfirmed:

Source(s) of Pollutant(s)

Known: OTHER NON-PERMITTED SANITARY DISCH, URBAN/STORM RUNOFF
Suspected:
Unconfirmed:

Management Information

Management Status: Strategy Implementation Scheduled or Underway
Lead Agency/Office: ext/NYC
IR/305(b) Code: Water Attaining All Standards (IR Category 1)

Further Details

Overview

Overview:

Recreational uses and aesthetics, in the tidal portions of these tribs experience impacts due to pathogens and other pollutants from various industrial activities, storm and urban runoff and other sources. Aquatic life support may also be affected by low dissolved oxygen. Various sewer and industrial discharges contribute to low dissolved oxygen and elevated water temperatures that affect fish survival. CSOs discharge to several tributaries. Significant industrial activity introduces oxygen demanding substances, heavy metals, other toxics and oil, grease to the waters. (DEC/DOW, Region 2, October 2000).

Water Quality Management:

Though considerable sewering has been completed over the past 10-15 years, much of South Richmond, as well as parts of Mid-Staten Island, continue to lack sanitary and/or storm sewers. Upgrades to area sewer systems, including Tottenville/West Branch and Oakwood Beach Interceptors, in the 1990s have a alleviated much of the historic problem. Additional improvements, including a Hyland Boulevard interceptor, are continuing, however progress has lagged behind schedule and economic conditions are likely to slow progress further.

As part of the infrastructure plan for this part of Staten Island, the Department of City Planning (DCP) developed a 1989 report and proposal entitled "South Richmond's Open Space Network, An Agenda for Action: Stormwater and Open Space Management." The report recommends that wetlands be used for stormwater management and open space. The key stream corridors and wetlands found in South Richmond and other areas of Staten Island to be used for stormwater management are collectively called "the Bluebelt." DEP began to implement the recommendations of the 1989 report in 1993. In response, the City has proceeded to acquire property containing wetlands and streams while also developing management plans for selected drainage basins. (NYCDEP, January 2010)

In addition to these efforts, the ongoing NYCDEP Catch Basin Hooding Program and other efforts to reduce floatables throughout the harbor also reduces discharges to these creeks and Raritan Bay. (NYCDEP, October 2000)

Segment Description:
This segment includes the total length of selected/smaller tidal portion of Staten Island tribs to Arthur Kill. Tribs within this segment, including Tappans Creek (7a), Sleight Creek (7d), Benedic Creek (7e), are Class I. Upstream/freshwater portions of these creeks, is listed as a separate segment.

Minor Staten Island Tribs, West (1701-0190) Minor Impacts

Waterbody Location Information

Revised: 12/29/2016

Water Index No: (MW1.2) SI- 7a thru 7e
Hydro Unit Code: Arthur Kill-Upper Bay (0203010402)
Water Type/Size: River/Stream 1.4 Miles
Description: total length of selected tribs

Water Class: C
Drainage Basin: Atlantic-Long Island Sound
Reg/County: 2/Richmond (43)

Water Quality Problem/Issue Information

Uses Evaluated	Severity	Confidence
Water Supply	N/A	-
Public Bathing	N/A	-
Recreation	Stressed	Known
Aquatic Life	Stressed	Known
Fish Consumption	Stressed	Suspected
Conditions Evaluated		
Habitat/Hydrology	Unknown	
Aesthetics	Fair	

Type of Pollutant(s) (CAPS indicate Major Pollutants/Sources that contribute to an Impaired/Precluded Uses)

Known: Pathogens, Other Pollutant (floatable debris)
Suspected: Low D.O./Oxygen Demand, Metals
Unconfirmed: - - -

Source(s) of Pollutant(s)

Known: Urban/Storm Runoff, Other/Non-Permitted Sanitary Discharge, Onsite/Septic Systems
Suspected: Industrial Discharges
Unconfirmed: - - -

Management Information

Management Status: Strategy Implementation Scheduled or Underway
Lead Agency/Office: Other/NYCDEP
IR/305(b) Code: Water Attaining All Standards (IR Category 1)

Further Details

Overview

These Staten Island tribs are assessed as having minor impacts due to recreational uses and aquatic life that are considered to be stressed by pathogens, low dissolved oxygen and other pollutants from urban stormwater runoff, possible sanitary overflows, failing or inadequate onsite (septic) systems, various industrial activities, and other urban sources. Fish consumption impacts are due to health advisories in adjacent waters limiting the consumption of certain species due to elevated PCB levels. These advisories are the primarily result of the contaminanted sediment; the migratory range of some fish species is also a factor. This assessment is based on sampling conducted at one trib and is thought to be representative of the larger waterbody segment but water quality conditions have not been verified in all tribs within the segment.

Use Assessment

This waterbody is a Class C waterbody, assessed for general recreation use and support of aquatic life, but not as a water supply or for public bathing.

Recreation use and aquatic life are considered to be supported but stressed due to pathogens, low dissolved oxygen and other pollutants and conditions attributed to highly developed and urban watersheds. Overall aesthetic conditions of the

waters are considered to be poor as well. (DEC/DOW, BWAM/LMAS, July 2013)

Fish consumption is considered to be stressed due to NYS DOH issued health advisories recommending limiting consumption of some species in adjacent waters. This waterbody is not included among the waterbody-specific health advisories for fish consumption, but since fish can migrate to this waterbody from other waters where such advisories are in place fish consumption is evaluated as stressed. Health advisories regarding the consumption of fish are revised regularly; for the most current advisories, go to www.nyhealth.gov/environmental/outdoors/fish/fish.htm. (NYS DOH Health Advisories and DEC/FWMR, Habitat, January 2014)

Water Quality Information

A biological (macroinvertebrate) assessment of Mill Creek in Richmond Valley (south of Route 440) was conducted as part of the RIBS biological screening effort in 2013. Sampling results reflect fair water quality, with the macroinvertebrate community altered from what is expected under natural conditions and indications of municipal sources. Some expected sensitive species are not present and overall macroinvertebrate species richness is lower than expected. Some changes in community composition have occurred due to replacement of sensitive ubiquitous taxa by more tolerant taxa, but overall there is still balanced distribution of all expected taxa. In spite of these minor impacts, aquatic life is considered to be supported. Sampling at this site in 2008 found moderate to severe conditions, so additional sampling to verify conditions is recommended. (DEC/DOW, BWAM/SBU, January 2015)

Source Assessment

Based on the biologic community composition, surrounding land use and other knowledge of the waterbody, residential wastewater discharges – failing and/or inadequate onsite (septic) systems or illegal (unpermitted) connections to storm sewers – and urban storm runoff are the most likely sources of impacts to the waterbody.

Management Actions

Much of the historic issues and impacts from failing and/or inadequate residential onsite wastewater (septic) systems have been addressed through sewering projects along the southern shore portion of Staten Island. The sewer systems improvements include a number of interceptor projects (Tottenville/West Branch, Oakwood Beach, Hylan Blvd) that now serve previously unsewered areas. Additional infrastructure improvements to address stormwater runoff control have been undertaken through the Staten Island Bluebelt program. This effort preserves natural drainage corridors, called Bluebelts, including streams, ponds, and other wetland areas and allows them to perform their functions of conveying, storing, and filtering stormwater, while providing an alternative to more costly traditional storm sewer infrastructure. In addition, the Bluebelts provide important community open spaces and diverse wildlife habitats. Along the south shore, the Bluebelt program is substanitally complete, however efforts in Mid-Staten Island are ongoing. (NYCDEP, December 2016)

Section 303(d) Listing

Western Staten Island Tribs is not included on the current (2016) NYS Section 303(d) List of Impaired/TMDL Waters. There appear to be no impacts/impairments that would justify the listing of this waterbody. (DEC/DOW, BWAM/WQAS, January 2016)

Segment Description

This segment includes the total length of selected/smaller freshwater portion of Staten Island tribs to Arthur Kill. Tribs within this segment, including Mill Creek (-6), Tappans Creek (-7a), Sleight Creek (-7d), Benedic Creek (-7e), are Class C, with downstream tidal reaches designated Class I and SD.

Fresh Kills (1701-0012) Minor Impacts

Waterbody Location Information

Revised: 12/29/2016

Water Index No:	(MW1.2) SI- 8 (portion 1)	**Water Class:**	SD
Hydro Unit Code:	Arthur Kill-Upper Bay (0203010402)	**Drainage Basin:**	Atlantic-Long Island Sound
Water Type/Size:	Estuary Waters 200.3 Acres	**Reg/County:**	2/Richmond (43)
Description:	reach fr mouth to Richmond/Main Cr confluence (tidal)		

Water Quality Problem/Issue Information

Uses Evaluated	Severity	Confidence
Shellfishing	N/A	-
Public Bathing	N/A	-
Recreation	Stressed	Known
Aquatic Life	Stressed	Known
Fish Consumption	Stressed	Suspected
Conditions Evaluated		
Habitat/Hydrology	Unknown	
Aesthetics	Fair	

Type of Pollutant(s) (CAPS indicate Major Pollutants/Sources that contribute to an Impaired/Precluded Uses)

Known:	Pathogens, Other Pollutant (floatable debris)
Suspected:	Low D.O./Oxygen Demand, Metals
Unconfirmed:	- - -

Source(s) of Pollutant(s)

Known:	Urban/Storm Runoff, Other/Non-Permitted Sanitary Discharge, Onsite/Septic Systems
Suspected:	Private/Comm/Inst Discharges, Industrial Discharges
Unconfirmed:	Landfill/Land Disp.

Management Information

Management Status:	Strategy Implementation Scheduled or Underway
Lead Agency/Office:	Other/NYCDEP
IR/305(b) Code:	Water Attaining All Standards (IR Category 1)

Further Details

Overview

Fresh Kills is assessed as having minor impacts due to recreational uses and aquatic life that are considered to be stressed by pathogens, low dissolved oxygen and other pollutants from urban stormwater runoff, possible sanitary overflows, failing or inadequate onsite (septic) systems, small private wastewater treatment plant discharges, various industrial activities, and other urban sources. Runoff from the Fresh Kills Landfill (now closed) and industrial activity in the area have also been noted as contributing to water quality impacts. Fish consumption impacts are due to health advisories in adjacent waters limiting the consumption of certain species due to elevated PCB levels. These advisories are the primarily result of the contaminanted sediment; the migratory range of some fish species is also a factor. This assessment is based on sampling conducted at one trib and is thought to be representative of the larger waterbody segment but water quality conditions have not been verified in all tribs within the segment.

Use Assessment

Fresh Kills is a Class SD waterbody, assessed for general recreation use and support of aquatic life, but not for water supply or for public bathing.

Recreation use and aquatic life are considered to be supported but stressed due to pathogens, low dissolved oxygen and

other pollutants and conditions attributed to highly developed and urban watersheds. Overall aesthetic conditions of the waters are considered to be poor as well. (DEC/DOW, BWAM/LMAS, July 2013)

Fish consumption is considered to be stressed due to NYS DOH issued health advisories recommending limiting consumption of some species in adjacent waters. This waterbody is not included among the waterbody-specific health advisories for fish consumption, but since fish can migrate to this waterbody from other waters where such advisories are in place fish consumption is evaluated as stressed. Health advisories regarding the consumption of fish are revised regularly; for the most current advisories, go to www.nyhealth.gov/environmental/outdoors/fish/fish.htm. (NYS DOH Health Advisories and DEC/FWMR, Habitat, January 2014)

Water Quality Information

Water quality evaluations have been conducted through the NYCDEP City-Wide Long-Term CSO Control Planning Program as well as the long-standing NYCDEP Harbor Survey Sampling Program. The results of this sampling 2004 indicate that the impact of CSOs, stormwater discharges and dry weather sanitary flows cause periodic low dissolved oxygen and elevated pathogen levels. Modeling of water quality in these waters also show that dissolved oxygen standards in the Arthur Kill is not met at all times. Pathogen levels in The Kills typically meet applicable criteria. (NYCDEP, City-Wide Long-Term CSO Control Planning Program, June 2011)

The NYCDEP Harbor Survey Program uses primarily four indicators of water quality: fecal coliform bacteria, dissolved oxygen, chlorophyll a and water clarity. Significant improvements have been noted in all of these parameters since the 1970s and 80s. These improvements have coincided with considerable upgrades to the City's wastewater treatment facilities. In The Kills, including Fresh Kills, standards for bacteria and dissolved oxygen are typically met. (NYCDEP, Harbor Survey, 2014)

Source Assessment

Based on the surrounding land use and other knowledge of the waterbody, residential wastewater discharges – failing and/or inadequate onsite (septic) systems or illegal (unpermitted) connections to storm sewers – and urban storm runoff are the most likely sources of impacts to the waterbody.

Management Actions

Much of the historic issues and impacts from failing and/or inadequate residential onsite wastewater (septic) systems have been addressed through sewering projects along the southern shore portion of Staten Island. The sewer systems improvements include a number of interceptor projects (Tottenville/West Branch, Oakwood Beach, Hylan Blvd) that now serve previously unsewered areas. Additional infrastructure improvements to address stormwater runoff control have been undertaken through the Staten Island Bluebelt program. This effort preserves natural drainage corridors, called Bluebelts, including streams, ponds, and other wetland areas and allows them to perform their functions of conveying, storing, and filtering stormwater, while providing an alternative to more costly traditional storm sewer infrastructure. In addition, the Bluebelts provide important community open spaces and diverse wildlife habitats. Along the south shore, the Bluebelt program is substanitally complete, however efforts in Mid-Staten Island are ongoing. (NYCDEP, December 2016)

The Fresh Kills Landfill, widely considered the largest solid waste landfill in the world, operated from the 1940s until it was closed in March 2001. However, after the September 11, 2001 attacks on the World Trade Center, the landfill was temporarily reopened to receive and process much of the debris from the destruction. Various controls are in place at the facility to address leachate and other water quality issues. These include nine miles of cut–off walls and collection piping around the two largest landfill mounds which blocks direct flow to surface waters; capping of other mounds with impermeable geomembranes and pumping of leachate. The NYC Department of Sanitation treats the leachate at a complex known as the Fresh Kills Leachate Treatment Plant. This facility has a total capacity to treat of just over 1.0 MGD of landfill leachate. While in operation, the City had also installed a series of booms at the landfill to contain floatables and settleables from moving off site. However with the closing of the landfill, the site is not expected to be a source of floatables to the waterway. The site is now planned to be developed into a city park with reclaimed wetlands, recreational facilities and landscaped public parkland. The Fresh Kills Park project is planned to take place over a thirty–

year period. (DEC/DSHM and NYC DEP, April 2010)

Section 303(d) Listing
Fresh Kills is not included on the current (2016) NYS Section 303(d) List of Impaired/TMDL Waters. There appear to be no impacts/impairments that would justify the listing of this waterbody. (DEC/DOW, BWAM/WQAS, January 2016)

Segment Description
This segment includes the portion of the creek and tribs from the mouth to the confluence of Richmond and Main Creeks. The waters of the creek are designated Class SD.

Richmond/Main Creeks and tribs (1701-0150) Minor Impacts

Waterbody Location Information

Revised: 12/21/2016

Water Index No: (MW1.2) SI- 8 (portion 2)
Hydro Unit Code: Arthur Kill-Upper Bay (0203010402)
Water Type/Size: Estuary Waters 191.5 Acres
Description: reach and tribs above confluence (tidal)

Water Class: SC
Drainage Basin: Atlantic-Long Island Sound
Reg/County: 2/Richmond (43)

Water Quality Problem/Issue Information

Uses Evaluated	Severity	Confidence
Shellfishing	N/A	-
Public Bathing	N/A	-
Recreation	Stressed	Suspected
Aquatic Life	Stressed	Suspected
Fish Consumption	Fully Supported	Unconfirmed
Conditions Evaluated		
Habitat/Hydrology	Unknown	
Aesthetics	Fair	

Type of Pollutant(s) (CAPS indicate Major Pollutants/Sources that contribute to an Impaired/Precluded Uses)

Known: Pathogens, Other Pollutant (floatable debris)
Suspected: Low D.O./Oxygen Demand, Nutrients
Unconfirmed: - - -

Source(s) of Pollutant(s)

Known: Urban/Storm Runoff, Other/Non-Permitted Sanitary Discharge, Onsite/Septic Systems
Suspected: Private/Comm/Inst Discharges, Industrial Discharges
Unconfirmed: - - -

Management Information

Management Status: Strategy Implementation Scheduled or Underway
Lead Agency/Office: Other/NYCDEP
IR/305(b) Code: Water Attaining All Standards (IR Category 1)

Further Details

Overview

Richmond/Main Creeks is assessed as having minor impacts due to recreational uses and aquatic life that are considered to be stressed by pathogens, low dissolved oxygen and other pollutants from urban stormwater runoff, possible sanitary overflows, failing or inadequate onsite (septic) systems, small private wastewater treatment plant discharges, various industrial activities, and other urban sources. Runoff from the Fresh Kills Landfill (now closed) and industrial activity in the area have also been noted as contributing to water quality impacts. Fish consumption impacts are due to health advisories in adjacent waters limiting the consumption of certain species due to elevated PCB levels. These advisories are the primarily result of the contaminanted sediment; the migratory range of some fish species is also a factor. This assessment is based on sampling conducted at one trib and is thought to be representative of the larger waterbody segment but water quality conditions have not been verified in all tribs within the segment.

Use Assessment

Richmond/Main Creeks is a Class SC waterbody, assessed for general recreation use and support of aquatic life, but not for water supply or for public bathing.

Recreation use and aquatic life are considered to be supported but stressed due to pathogens, low dissolved oxygen and other pollutants and conditions attributed to highly developed and urban watersheds. Overall aesthetic conditions of the

waters are considered to be poor as well. (DEC/DOW, BWAM/LMAS, July 2013)

There are no health advisories in place limiting the consumption of fish from this waterbody (beyond the general advice for all waters). Fish consumption is considered to be fully supported based on the absence of any waterbody-specific advisory, but is noted as unconfirmed since routine monitoring of contaminants in fish is limited. (NYS DOH Health Advisories and DEC/DOW, BWAM, January 2014)

Water Quality Information

Water quality evaluations have been conducted through the NYCDEP City-Wide Long-Term CSO Control Planning Program as well as the long-standing NYCDEP Harbor Survey Sampling Program. The results of this sampling 2004 indicate that the impact of CSOs, stormwater discharges and dry weather sanitary flows cause periodic low dissolved oxygen and elevated pathogen levels. Modeling of water quality in these waters also show that dissolved oxygen standards in the Arthur Kill is not met at all times. Pathogen levels in The Kills typically meet applicable criteria. (NYCDEP, City-Wide Long-Term CSO Control Planning Program, June 2011)

The NYCDEP Harbor Survey Program uses primarily four indicators of water quality: fecal coliform bacteria, dissolved oxygen, chlorophyll a and water clarity. Significant improvements have been noted in all of these parameters since the 1970s and 80s. These improvements have coincided with considerable upgrades to the City's wastewater treatment facilities. In The Kills, including Fresh Kills (just below this segment), standards for bacteria and dissolved oxygen are typically met. (NYCDEP, Harbor Survey, 2014)

Source Assessment

Based on the surrounding land use and other knowledge of the waterbody, residential wastewater discharges – failing and/or inadequate onsite (septic) systems or illegal (unpermitted) connections to storm sewers – and urban storm runoff are the most likely sources of impacts to the waterbody.

Management Actions

Much of the historic issues and impacts from failing and/or inadequate residential onsite wastewater (septic) systems have been addressed through sewering projects along the southern shore portion of Staten Island. The sewer systems improvements include a number of interceptor projects (Tottenville/West Branch, Oakwood Beach, Hylan Blvd) that now serve previously unsewered areas. Additional infrastructure improvements to address stormwater runoff control have been undertaken through the Staten Island Bluebelt program. This effort preserves natural drainage corridors, called Bluebelts, including streams, ponds, and other wetland areas and allows them to perform their functions of conveying, storing, and filtering stormwater, while providing an alternative to more costly traditional storm sewer infrastructure. In addition, the Bluebelts provide important community open spaces and diverse wildlife habitats. Along the south shore, the Bluebelt program is substanitally complete, however efforts in Mid-Staten Island are ongoing. (NYCDEP, December 2016)

The Fresh Kills Landfill, widely considered the largest solid waste landfill in the world, operated from the 1940s until it was closed in March 2001. However, after the September 11, 2001 attacks on the World Trade Center, the landfill was temporarily reopened to receive and process much of the debris from the destruction. Various controls are in place at the facility to address leachate and other water quality issues. These include nine miles of cut–off walls and collection piping around the two largest landfill mounds which blocks direct flow to surface waters; capping of other mounds with impermeable geomembranes and pumping of leachate. The NYC Department of Sanitation treats the leachate at a complex known as the Fresh Kills Leachate Treatment Plant. This facility has a total capacity to treat of just over 1.0 MGD of landfill leachate. While in operation, the City had also installed a series of booms at the landfill to contain floatables and settleables from moving off site. However with the closing of the landfill, the site is not expected to be a source of floatables to the waterway. The site is now planned to be developed into a city park with reclaimed wetlands, recreational facilities and landscaped public parkland. The Fresh Kills Park project is planned to take place over a thirty–year period. (DEC/DSHM and NYC DEP, April 2010)

Section 303(d) Listing

Richmond/Main Creeks is not included on the current (2016) NYS Section 303(d) List of Impaired/TMDL Waters. There

appear to be no impacts/impairments that would justify the listing of this waterbody. (DEC/DOW, BWAM/WQAS, January 2016)

Segment Description

This segment includes the tidal portion of both Richmond and Main Creeks above their confluence at Fresh Kills and all tidal tribs. The waters of this portion of the streams and the tribs are Class SC. Freshwater portions of the creeks as well as larger lakes in the watershed are listed separately.

Richmond Creek, Upper, and tribs (1701-0043) Impaired

Waterbody Location Information

Revised: 12/29/2016

Water Index No:	(MW1.2) SI- 8 (portion 3)	**Water Class:**	B
Hydro Unit Code:	Arthur Kill-Upper Bay (0203010402)	**Drainage Basin:**	Atlantic-Long Island Sound
Water Type/Size:	River/Stream 7.6 Miles	**Reg/County:**	2/Richmond (43)
Description:	stream and tribs abv Richmond Hill culvert (freshwater)		

Water Quality Problem/Issue Information

Uses Evaluated	Severity	Confidence
Water Supply	Unassessed	-
Public Bathing	Impaired	Known
Recreation	Impaired	Known
Aquatic Life	Precluded	Known
Fish Consumption	Unassessed	-
Conditions Evaluated		
Habitat/Hydrology	Unknown	
Aesthetics	Fair	

Type of Pollutant(s) (CAPS indicate Major Pollutants/Sources that contribute to an Impaired/Precluded Uses)

Known:	- - -
Suspected:	OTHERPOLLUTANTS (biological impacts), Nutrients (phosphorus), Pathogens, Low D.O./Oxygen Demand,
Unconfirmed:	- - -

Source(s) of Pollutant(s)

Known:	URBAN/STORM RUNOFF
Suspected:	ONSITE/SEPTIC SYSTEMS, OTHER/NON-PERMITTED SANITARY DISCHARGES
Unconfirmed:	Industrial Discharges

Management Information

Management Status:	Strategy Implementation Scheduled or Underway
Lead Agency/Office:	Other/NYCDEP
IR/305(b) Code:	Impaired Water Requiring a TMDL (IR Category 5), PROPOSED LISTING

Further Details

Overview

This (freshwater) portion of Richmond Creek is assessed as an impaired waterbody due to public bathing and other recreation uses, and aquatic life that are known to be precluded/impaired by nutrient enrichment, pathogens contamination and other pollutants from discharges from failing and/or inadequate onsite septic systems in unsewered areas and improper/illegal connections of household sanitary lines to storm sewers and failing privately owned sewage pumping stations. Urban stormwater runoff is also a contributing source. Odors and visible domestic waste have been noted in Richmond Pond, located just upstream of the tidal/freshwater separation weir which forms this pond.

Use Assessment

Upper Richmond Creek is a Class B waterbody, assessed for public bathing, general recreation use and support of aquatic life, but not as a water supply.

Recreation use and public bathing are considered to be impaired due to elevated nutrients (phosphorus) and suspected pathogen contamination. Aquatic life is evaluated as precluded based on biological sampling that shows significant impacts. (DEC/DOW, BWAM/SBU, July 2016)

Fish Consumption use is considered to be unassessed. There are no health advisories limiting the consumption of fish from this waterbody (beyond the general advice for all waters). However due to the presence of impacts/contaminants in the stream and the uncertainty as to whether the lack of a waterbody-specific health advisory is based on actual sampling, fish consumption use is noted as unassessed, rather than fully supported but unconfirmed. (NYS DOH Health Advisories and DEC/DOW, BWAM, December 2014)

Water Quality Information

A biological (macroinvertebrate) assessment of Richmond Creek in Richmond (at Aultman Avenue) was conducted as part of the RIBS biological screening effort in 2013. Sampling results indicated severely impacted conditions. In such samples the fauna is extremely altered and comprised of tolerant species. Diversity and abundance of organisms is significantly reduced. The nutrient biotic index indicates elevated enrichment and impact source determination reveals the fauna to be most similar to communities influenced by and nonpoint municipal, industrial sources. Water quality is considered to be very poor and aquatic life is not supported in the stream. This segment is considered to be impaired. Results from sampling at this site in 2008 and 2003, and at a site on Springville Creek in New Springville (at Travis Road) in 2003 found moderately impacted conditions. (DEC/DOW, BWAM/SBU, July 2016)

Source Assessment

Based on the biologic community composition, surrounding land use and other knowledge of the waterbody, residential wastewater discharges – failing and/or inadequate onsite (septic) systems or illegal (unpermitted) connections to storm sewers – and urban storm runoff are the most likely sources of impacts to the waterbody.

Management Actions

Much of the historic issues and impacts from failing and/or inadequate residential onsite wastewater (septic) systems have been addressed through sewering projects along the southern shore portion of Staten Island. The sewer systems improvements include a number of interceptor projects (Tottenville/West Branch, Oakwood Beach, Hylan Blvd) that now serve previously unsewered areas. Additional infrastructure improvements to address stormwater runoff control have been undertaken through the Staten Island Bluebelt program. This effort preserves natural drainage corridors, called Bluebelts, including streams, ponds, and other wetland areas and allows them to perform their functions of conveying, storing, and filtering stormwater, while providing an alternative to more costly traditional storm sewer infrastructure. In addition, the Bluebelts provide important community open spaces and diverse wildlife habitats. Along the south shore, the Bluebelt program is substanitally complete, however efforts in Mid-Staten Island are ongoing. (NYCDEP, December 2016)

Section 303(d) Listing

Upper Richmond Creek is not included on the current (2016) NYS Section 303(d) List of Impaired/TMDL Waters, although Springville Creek – which was listed separately but has since been moved into this segment – is listed. This updated assessment suggests it is appropriate to include this waterbody on the next List. It is recommended that this waterbody be added to Part 3b of the List as an impaired waterbody for which TMDL development may be deferred pending verification of pollutants causing the impairment. The proposed listing of this waterbody would replace the current listing for Springville Creek, which is now included as a trib to Upper Richmond Creek. (DEC/DOW, BWAM/WQAS, January 2016)

Segment Description

This segment includes the freshwater portion of Richmond Creek and all freshwater tribs. The waters of this portion of the stream and its tribs, including Springville Creek (-1) are Class B. Tidal portions of the creek are listed separately.

Springville Creek, Upper, and tribs (1701-0186) Impaired

Waterbody Location Information

Revised: 12/14/2009

Water Index No: (MW1.2) SI-8-1-1
Water Class: B
Hydro Unit Code: Arthur Kill-Upper Bay (0203010402)
Drainage Basin: Atlantic-Long Island Sound
Water Type/Size: River/Stream 2 Miles
Reg/County: 2/Richmond (43)
Description: streams and tribs above tidal waters (freshwater)

Water Quality Problem/Issue Information

Uses Evaluated	Severity	Confidence
Water Supply	Unassessed	
Shellfishing	Unassessed	
Public Bathing	Unassessed	
Recreation	Impaired	Known
Aquatic Life	Impaired	Known
Fish Consumption	Unassessed	

Conditions Evaluated

Habitat/Hydrology	Unassessed
Aesthetics	Unassessed

Type of Pollutant(s) (CAPS indicate Major Pollutants/Sources that contribute to an Impaired/Precluded Uses)

Known: UNKNOWN TOXICITY
Suspected: Low D.O./Oxygen Demand, Nutrients
Unconfirmed:

Source(s) of Pollutant(s)

Known: URBAN/STORM RUNOFF
Suspected:
Unconfirmed: On-Site/Septic Syst

Management Information

Management Status: Verification of Problem Severity Needed
Lead Agency/Office: DOW/Reg2
IR/305(b) Code: Impaired Water Requiring a TMDL (IR Category 5)

Further Details

Overview
Overview:
Aquatic life and recreational uses in Springville Creek are impaired by unknown toxicity. Organic impacts from municipal or other sources are suggested. Discharges from failing and/or inadequate onsite septic systems in unsewered areas and improper/illegal connections of household sanitary lines to storm sewers and failing privately owned sewage pumping stations are likely sources; urban storm runoff is also an assumed contributing source.

Water Quality Sampling:
A biological (macroinvertebrate) assessment of Springville Creek in New Springville (at Travis Road) was conducted as part of the RIBS biological screening effort in 2003. Sampling results indicated moderately impacted conditions. In such samples sensitive species are markedly reduced or missing and the distribution of major groups is significantly unbalanced relative to what would be expected. Samples are dominated by more tolerant species. The nutrient biotic index indicates highly elevated enrichment and impact source determination reveals a community that is most similar to those influenced by municipal discharges and organic wastes. Water quality is considered to be poor and aquatic life is not fully supported in the stream. This segment is considered to be impaired. (DEC/DOW, BWAM/SBU, December

2009)

Water Quality Management:
Though considerable sewering has been completed over the past 10-15 years, much of South Richmond, as well as parts of Mid-Staten Island, continue to lack sanitary and/or storm sewers. Upgrades to area sewer systems, including Tottenville/West Branch and Oakwood Beach Interceptors, in the 1990s have a alleviated much of the historic problem. Additional improvements, including a Hyland Boulevard interceptor, are continuing, however progress has lagged behind schedule and economic conditions are likely to slow progress further.

As part of the infrastructure plan for this part of Staten Island, the Department of City Planning (DCP) developed a 1989 report and proposal entitled "South Richmond's Open Space Network, An Agenda for Action: Stormwater and Open Space Management." The report recommends that wetlands be used for stormwater management and open space. The key stream corridors and wetlands found in South Richmond and other areas of Staten Island to be used for stormwater management are collectively called "the Bluebelt." DEP began to implement the recommendations of the 1989 report in 1993. In response, the City has proceeded to acquire property containing wetlands and streams while also developing management plans for selected drainage basins. (NYCDEP, January 2010)

In addition to these efforts, the ongoing NYCDEP Catch Basin Hooding Program and other efforts to reduce floatables throughout the harbor also reduces discharges to these creeks and Raritan Bay. (NYCDEP, October 2000)

Section 303(d) Listing:
Springville Creek is included on the 2010 NYS Section 303(d) List of Impaired Waters. It is included on Part 3b of the List due to aquatic toxicity, as a waterbody for which TDML development may be deferred pending the verification of the cause/pollutant causing the impairment. (DEC/DOW, BWAM, WQAS, July 2010)

Segment Description:
This segment includes the entire stream above the tidal portion and all tribs. The waters of the stream are Class B. Tribs to this reach/segment are also Class B.

Minor Staten Island Tribs, Lower (1701-0191) Minor Impacts

Waterbody Location Information

Revised: 1/21/2011

Water Index No: (MW1.2) SI 9 thru 16
Water Class: SD
Hydro Unit Code: Arthur Kill Upper Bay (0203010402)
Drainage Basin: Atlantic Long Island Sound
Water Type/Size: Estuary Waters 10 Acres
Reg/County: 2/Richmond (43)
Description: total area of selected tidal tribs

Water Quality Problem/Issue Information

Uses Evaluated	Severity	Confidence
Water Supply	Unassessed	
Shellfishing	Unassessed	
Public Bathing	Unassessed	
Recreation	Stressed	Known
Aquatic Life	Stressed	Suspected
Fish Consumption	Unassessed	

Conditions Evaluated	
Habitat/Hydrology	Unassessed
Aesthetics	Fair

Type of Pollutant(s) (CAPS indicate Major Pollutants/Sources that contribute to an Impaired/Precluded Uses)

Known:
Suspected: UNKNOWN TOXICITY, Low D.O./Oxygen Demand, Nutrients
Unconfirmed: Pathogens

Source(s) of Pollutant(s)

Known: URBAN/STORM RUNOFF
Suspected: Comb. Sewer Overflow
Unconfirmed: Industrial Discharges, On-Site/Septic Syst

Management Information

Management Status: Strategy Implementation Scheduled or Underway
Lead Agency/Office: ext/NYC
IR/305(b) Code: Water Attaining All Standards (IR Category 1)

Further Details

Overview
Overview:
Aquatic life and recreational uses, in the tidal portion of these tribs experience impacts from unknown toxicity. Urban stormwater runoff is the likely source. Discharges from failing and/or inadequate onsite septic systems in unsewered areas and improper/illegal connections of household sanitary lines to storm sewers and failing privately owned sewage pumping stations are possible additional sources, although many of these previously cited sources have been addressed.

Water Quality Management:
Sewer system build-out throughout the Port Richmond drainage, which encompasses the northern third of the Staten Island, has been completed by NYCDEP. Corresponding to this effort, Regional DEC staff report that they no longer receive complaints regarding failing septic systems from locations in the Port Richmond drainage area. These circumstances suggest that previously cited water quality impacts to the north shore tribs from failing septic systems have been addressed. (DEC/DOW, Region 2, January 2011)

As part of the infrastructure plan for this part of Staten Island, the Department of City Planning (DCP) developed a 1989

report and proposal entitled "South Richmond's Open Space Network, An Agenda for Action: Stormwater and Open Space Management." The report recommends that wetlands be used for stormwater management and open space. The key stream corridors and wetlands found in South Richmond and other areas of Staten Island to be used for stormwater management are collectively called "the Bluebelt." DEP began to implement the recommendations of the 1989 report in 1993. In response, the City has proceeded to acquire property containing wetlands and streams while also developing management plans for selected drainage basins. (NYCDEP, January 2010)

In addition to these efforts, the ongoing NYCDEP Catch Basin Hooding Program and other efforts to reduce floatables throughout the harbor also reduces discharges to these creeks and Raritan Bay. (NYCDEP, October 2000)

Segment Description:
This segment includes the total length of selected/smaller tidal portion of Staten Island tribs along the north shore. Tribs within this segment, including Neck Creek (- 9), Sawmill Creek (- 9a), Old Place Creek (- 9d), Bridge Creek (- 9e), Bodine Creek (- 14), are Class SD. The upstream/freshwater portions of these creeks, is listed as a separate segment.

Minor Staten Island Tribs, North (1701-0192) Impaired

Waterbody Location Information

Revised: 12/29/2016

Water Index No: (MW1.2) SI- 9 thru 16
Hydro Unit Code: Arthur Kill-Upper Bay (0203010402)
Water Type/Size: River/Stream 9.1 Miles
Description: total length of selected tribs

Water Class: B
Drainage Basin: Atlantic-Long Island Sound
Reg/County: 2/Richmond (43)

Water Quality Problem/Issue Information

Uses Evaluated	Severity	Confidence
Water Supply	N/A	-
Public Bathing	Impaired	Known
Recreation	Stressed	Known
Aquatic Life	Impaired	Known
Fish Consumption	Unassessed	-
Conditions Evaluated		
Habitat/Hydrology	Unassessed	
Aesthetics	Fair	

Type of Pollutant(s) (CAPS indicate Major Pollutants/Sources that contribute to an Impaired/Precluded Uses)

Known: - - -
Suspected: OTHERPOLLUTANTS (biological impacts), Nutrients (phosphorus), Pathogens, Low D.O./Oxygen Demand
Unconfirmed: - - -

Source(s) of Pollutant(s)

Known: URBAN/STORM RUNOFF
Suspected: ONSITE/SEPTIC SYSTEMS, OTHER/NON-PERMITTED SANITARY DISCHARGES
Unconfirmed: Industrial Discharges

Management Information

Management Status: Strategy Implementation Scheduled or Underway
Lead Agency/Office: ext/NYC
IR/305(b) Code: Impaired Water Requiring a TMDL (IR Category 5), PROPOSED LISTING

Further Details

Overview

These Staten Island tribs are assessed as an impaired waterbody due to public bathing and other recreation uses, and aquatic life that are known to be impaired by nutrient enrichment, likely pathogens contamination and other pollutants; urban stormwater runoff is the likely source. Discharges from failing and/or inadequate onsite septic systems in unsewered areas and improper/illegal connections of household sanitary lines to storm sewers and failing privately owned sewage pumping stations are possible additional sources, although many of these previously cited sources have been addressed.

Use Assessment

This trib segment is a Class B waterbody, assessed for public bathing, general recreation use and support of aquatic life, but not as a water supply.

Recreation use and public bathing are considered to be impaired due to elevated nutrients (phosphorus) and suspected pathogen contamination. Aquatic life is evaluated as impaired based on biological sampling that shows significant impacts. (DEC/DOW, BWAM/SBU, July 2016)

Fish Consumption use is considered to be unassessed. There are no health advisories limiting the consumption of fish from this waterbody (beyond the general advice for all waters). However due to the presence of impacts/contaminants in the stream and the uncertainty as to whether the lack of a waterbody-specific health advisory is based on actual sampling, fish consumption use is noted as unassessed, rather than fully supported but unconfirmed. (NYS DOH Health Advisories and DEC/DOW, BWAM, December 2014)

Water Quality Information

A biological (macroinvertebrate) assessment of Bodine Creek in Port Richmond (at Forest Avenue) was conducted as part of the RIBS biological screening effort in 2013. Sampling results indicated moderately impacted conditions. In such samples sensitive species are markedly reduced or missing and the distribution of major groups is significantly unbalanced relative to what would be expected. Samples are dominated by more tolerant species. The nutrient biotic index indicates highly elevated enrichment and impact source determination reveals the fauna to be most similar to communities influenced by point and nonpoint municipal, industrial sources. Water quality is considered to be poor and aquatic life is not fully supported in the stream. This segment is considered to be impaired. These sampling results are consistent with results found at the site in 2008. Results from sampling at Richmond Terrace in 2008 and 2003 found severely impacted conditions. (DEC/DOW, BWAM/SBU, July 2016)

Source Assessment

Based on the biologic community composition, surrounding land use and other knowledge of the waterbody, residential wastewater discharges – failing and/or inadequate onsite (septic) systems or illegal (unpermitted) connections to storm sewers – and urban storm runoff are the most likely sources of impacts to the waterbody.

Management Actions

Although isolated incidences of impairments still exist, much of the historic issues and impacts from failing and/or inadequate residential onsite wastewater (septic) systems have been addressed through completion of the sewer system build-out in the northern portion of Staten Island. Additional infrastructure improvements to address stormwater runoff control have been undertaken through the Staten Island Bluebelt program. This effort preserves natural drainage corridors, called Bluebelts, including streams, ponds, and other wetland areas and allows them to perform their functions of conveying, storing, and filtering stormwater, while providing an alternative to more costly traditional storm sewer infrastructure. In addition, the Bluebelts provide important community open spaces and diverse wildlife habitats. Along the south shore, the Bluebelt program is substanitally complete, however efforts in Northern and Mid-Staten Island are ongoing. (NYCDEP, December 2016)

Section 303(d) Listing

Northern Staten Island Tribs is not included on the current (2016) NYS Section 303(d) List of Impaired/TMDL Waters. However this updated assessment suggests it is appropriate to include this waterbody on the next List. It is recommended that this waterbody be added to Part 3b of the List as an impaired waterbody for which TMDL development may be deferred pending verification of pollutants causing the impairment. (DEC/DOW, BWAM/WQAS, December 2016)

Segment Description:

This segment includes the total length of selected/smaller primarily freshwater portion of Staten Island tribs along the north shore. Tribs within this segment, including Old Place Creek (-9d) and Bodine Creek (-14), are primarily Class B and C, with downstream tidal reaches designated Class I and SD.

Ohrback Lake (1701-0358) Unassessed

Waterbody Location Information

Revised: 12/20/2016

Water Index No: (MW1.2) SI -8-5-P1069b
Hydro Unit Code: Arthur Kill-Upper Bay (0203010402)
Water Type/Size: Lake/Reservoir 13.4 Acres
Description: entire lake

Water Class: B
Drainage Basin: Atlantic-Long Island Sound
Reg/County: 2/Richmond (43)

Water Quality Problem/Issue Information

Uses Evaluated	Severity	Confidence
Water Supply	N/A	-
Public Bathing	Unassessed	-
Recreation	Unassessed	-
Aquatic Life	Unassessed	-
Fish Consumption	Unassessed	-
Conditions Evaluated		
Habitat/Hydrology	Unknown	
Aesthetics	Unknown	

Type of Pollutant(s) (CAPS indicate Major Pollutants/Sources that contribute to an Impaired/Precluded Uses)

Known: - - -
Suspected: - - -
Unconfirmed: - - -

Source(s) of Pollutant(s)

Known: - - -
Suspected: - - -
Unconfirmed: - - -

Management Information

Management Status: Unassessed
Lead Agency/Office: DOW/BWAM
IR/305(b) Code: Water with Insufficient Data (IR Category 3)

Further Details

Overview
Currently there is inadequate data/information to evaluate uses and determine a water quality assessment for this waterbody.

Use Assessment
This waterbody segment is a Class B waterbody, assessed for public bathing and general recreation use as well as support of aquatic life, but not as a water supply.

Water Quality Information
There is currently no water quality information available upon which to base an assessment.

Source Assessment
Specific sources of pollutants to the waterbody have not been identified.

Management Actions
No specific management actions have been identified for the waterbody. Baseline sampling to evaluate conditions in this

waterbody segment is needed.

Section 303(d) Listing
This waterbody is not included on the current (2016) NYS Section 303(d) List of Impaired/TMDL Waters. There is insufficient information to make a listing decision. (DEC/DOW, BWAM/WQAS, January 2016)

Segment Description
This segment includes the total area of the entire lake. The segment is designated Class B. Ohrback Lake was previously combined in a single waterbody segment with Martling Lake (P1073), but the lakes have since been separated.

Brooks, Martling and Clove Lakes (1701-0405) Unassessed

Waterbody Location Information

Revised: 12/20/2016

Water Index No: (MW1.2) SI-14-P1072 thru P1075
Hydro Unit Code: Arthur Kill-Upper Bay (0203010402)
Water Type/Size: Lake/Reservoir 13.4 Acres
Description: total area of all lakes

Water Class: B
Drainage Basin: Atlantic-Long Island Sound
Reg/County: 2/Richmond (43)

Water Quality Problem/Issue Information

Uses Evaluated	Severity	Confidence
Water Supply	N/A	-
Public Bathing	Unassessed	-
Recreation	Unassessed	-
Aquatic Life	Unassessed	-
Fish Consumption	Unassessed	-
Conditions Evaluated		
Habitat/Hydrology	Unknown	
Aesthetics	Unknown	

Type of Pollutant(s) (CAPS indicate Major Pollutants/Sources that contribute to an Impaired/Precluded Uses)

Known: - - -
Suspected: - - -
Unconfirmed: - - -

Source(s) of Pollutant(s)

Known: - - -
Suspected: - - -
Unconfirmed: - - -

Management Information

Management Status: Unassessed
Lead Agency/Office: DOW/BWAM
IR/305(b) Code: Water with Insufficient Data (IR Category 3)

Further Details

Overview
Currently there is inadequate data/information to evaluate uses and determine a water quality assessment for this waterbody.

Use Assessment
This waterbody segment is a Class B waterbody, assessed for public bathing and general recreation use as well as support of aquatic life, but not as a water supply.

Water Quality Information
There is currently no water quality information available upon which to base an assessment.

Source Assessment
Specific sources of pollutants to the waterbody have not been identified.

Management Actions
No specific management actions have been identified for the waterbody. Baseline sampling to evaluate conditions in this

waterbody segment is needed.

Section 303(d) Listing
This waterbody is not included on the current (2016) NYS Section 303(d) List of Impaired/TMDL Waters. There is insufficient information to make a listing decision. (DEC/DOW, BWAM/WQAS, January 2016)

Segment Description
This segment includes the total area of Brooks Lake (P1072), Martling Lake (P1073), Clove Lake (P1074) and Valley Lake (P1075). The segment is designated Class B. Martling Lake was previously combined in a single waterbody segment with Ohrback Lake (P1069b), but the lakes have since been separated.

Silver Lake Reservoir (1701-0359) Needs Verification

Waterbody Location Information

Revised: 12/29/2016

Water Index No: (MW1.2) SI-14-1-P1076
Hydro Unit Code: Arthur Kill-Upper Bay (0203010402)
Water Type/Size: Lake/Reservoir 47.9 Acres
Description: entire lake

Water Class: AA
Drainage Basin: Atlantic-Long Island Sound
Reg/County: 2/Richmond (43)

Water Quality Problem/Issue Information

Uses Evaluated	Severity	Confidence
Water Supply	Fully Supported	Unconfirmed
Public Bathing	Fully Supported	Unconfirmed
Recreation	Fully Supported	Unconfirmed
Aquatic Life	Stressed	Unconfirmed
Fish Consumption	Fully Supported	Unconfirmed
Conditions Evaluated		
Habitat/Hydrology	Good	
Aesthetics	Good	

Type of Pollutant(s) (CAPS indicate Major Pollutants/Sources that contribute to an Impaired/Precluded Uses)

Known: LOW D.O./OXYGEN DEMAND
Suspected: Nutrients (phosphorus)
Unconfirmed: - - -

Source(s) of Pollutant(s)

Known: - - -
Suspected: URBAN/STORM RUNOFF
Unconfirmed: - - -

Management Information

Management Status: Reassessment Needed
Lead Agency/Office: DOW/BWAM
IR/305(b) Code: Impaired Water Requiring a TMDL (IR Category 5), PROPOSED FOR DELIST

Further Details

Overview
Silver Lake Reservoir is assessed as needing verification of minor impacts/possible impairment due to aquatic life that may be impacted by low hypolimnetic dissolved oxygen levels. However these conditions could be a result of the natural morphology of the lake, as other indicators and observations are indicative of good water quality. This evaluation is based on a single sampling event in 1999 and more current sampling is needed to verify conditions.

Use Assessment
Silver Lake Reservoir is a Class AA waterbody, assessed for water supply, public bathing and general recreation use, as well as support of aquatic life.

Public water supply use of Silver Lake Reservoir is thought to be fully supported. The waterbody is not currently used as a public supply; its use as part of the New York City water supply system was discontinued in 1971 and replaced by underground storage tanks.

There is no evidence of recreation use impacts in waterbody, consistent with relatively low lake productivity, acceptable water clarity, and the lack of invasive species and/or excessive aquatic vegetation. Depressed deep water oxygen levels

may potentially threaten the lake fishery, although no impacts have been measured or reported. The reservoir is known to support a warmwater recreational fishery, although no specific fishery or biological reports are included in this assessment. (DEC/DOW, BWAM/LCI, March 2016)

There are no health advisories in place limiting the consumption of fish from this waterbody (beyond the general advice for all waters). Fish consumption is considered to be fully supported based on the absence of any waterbody-specific advisory, but is noted as unconfirmed since routine monitoring of contaminants in fish is limited. (NYS DOH Health Advisories and DEC/DOW, BWAM, January 2014)

Water QualityInformation

Water quality of Silver Lake Reservoir was conducted through the NYSDEC Lake Classification and Inventory (LCI) Program in 1999. However sampling was limited to a single sampling visit to evaluate water quality conditions through standard limnological indicators. The sampling was conducted by NYSDEC Regional fisheris staff as part of a more comprehensive evaluation of fisheries management actions. Results of this sampling indicate that at the time the Lake was best characterized as mesotrophic, or moderately productive. Chlorophyll/algal levels were below criteria corresponding to impacted recreational uses, while phosphorus concentrations are typically also low. Lake clarity measurements indicate water transparency consistently meet the recommended minimum criteria for swimming beaches. The depth profile indicated the lake was thermally stratified and indicative of persistent deepwater anoxia. No invasive aquatic plants were observed, and submergent aquatic plant diversity was minimal. However it is not known if these conditions are representative of current lake conditions and additional sampling in recommended. (DEC/DOW, BWAM/LMAS, March 2016)

Source Assessment

There are no apparent sources of pollutants to the waterbody. The lake is located in a park setting within a large urban area.

Management Actions

No specific management actions have been identified or are deemed necessary for the waterbody. However additional sampling to verify conditions in this waterbody is recommended.

Silver Lake Reservoir is the featured attraction in Silver Lake Park, located on Staten Island's north shore and managed by NYC Department of Parks and Recreation. The original Silver Lake was a spring-fed body of water, and is now the south basin of the reservoir. The lake has a long history of recreational and commercial uses. In 1917 Silver Lake Reservoir became the endpoint of the city's Catskill water supply system. The reservoir was used for potable water until 1971, when an underground storage tank system was completed, the largest of its kind in the world. The reservoir is presently used as part of the drainage system for the tanks, although the Park continues to support other recreational activities, including fishing. (NYC/Parks and Rec, March 2016)

Section 303(d) Listing

Silver Lake Reservoir is included on the current (2016) NYS Section 303(d) List of Impaired Waters. The lake is included among the waters listed in Appendix B – Waters Not Meeting Dissolved Oxygen Standards. This part of the List recognizes waterbodies where low dissolved oxygen in lake bottom waters may be the result of morphology and other natural conditions in thermally stratified lakes. However because NYS water quality standards for dissolved oxygen do not include an explicit exception for natural conditions or averaging of dissolved oxygen over lake depth, USEPA requires that the Section 303(d) List recognize such waters. The waterbody should be considered for delisting due to the lack of data indicating a problem or justification for a listing. (DEC/DOW, BWAM/WQAS, December 2016)

Segment Description:

This segment includes the total area of the entire reservoir.

Upper New York Bay (1701-0022) Impaired

Waterbody Location Information

Revised: 12/29/2016

Water Index No: (MW1.3) UB
Hydro Unit Code: Arthur Kill-Upper Bay (0203010402)
Water Type/Size: Estuary Waters 6255.5 Acres
Description: entire bay, as described below

Water Class: I
Drainage Basin: Atlantic-Long Island Sound
Reg/County: 2/Kings (24)

Water Quality Problem/Issue Information

Uses Evaluated	Severity	Confidence
Shellfishing	N/A	-
Public Bathing	N/A	-
Recreation	Stressed	Suspected
Aquatic Life	Fully Supported	Suspected
Fish Consumption	Impaired	Known
Conditions Evaluated		
Habitat/Hydrology	Good	
Aesthetics	Fair	

Type of Pollutant(s) (CAPS indicate Major Pollutants/Sources that contribute to an Impaired/Precluded Uses)

Known: PRIORITY ORGANICS (PCBs), PRIORITY ORGANICS (dioxin), Aesthetics (floatable debris), Pathogens
Suspected: Oil and Grease
Unconfirmed: - - -

Source(s) of Pollutant(s)

Known: TOX/CONTAMINATED. SEDIMENT, Urban/Storm Runoff, Combined Sewer Overflow (CSOs),
Suspected: Other Source (migratory species), Municipal Discharges
Unconfirmed: - - -

Management Information

Management Status: Strategy Implementation Scheduled or Underway
Lead Agency/Office: Other/NYCDEP
IR/305(b) Code: Impaired Water Requiring a TMDL (IR Category 5)

Further Details

Overview

Upper New York Bay is assessed as an impaired waterbody due to fish consumption that is impaired by PCBs and dioxin in contaminated sediment, resulting in a health advisory for some species. Public bathing and other recreational uses are thought to experience minor impacts to from pathogens, floatable debris and various other pollutants from urban/storm runoff, CSOs, and other such sources. Lesser fish consumption impacts for additional species are due to contaminated sediment, but also the result of the migratory range of these fish species.

Use Assessment

Upper New York Bay is a Class I waterbody, assessed for general recreation use, and support of aquatic life, but not for shellfishing or for public bathing use.

Recreational uses are considered to be supported but stressed due to urban stormwater runoff of pathogens that result in periodic precautionary bathing beach closures in adjacent waters during heavy rain storm events. Beach monitoring revealed infrequent elevated bacteriological levels at beaches and the sampling resulted in few water quality-driven

closures. Occasional beach closures that do occur are typically pre-emptive closures during heavier rainstorms that are known to wash pollutants into the harbor. (NYSDOH BEACH Act monitoring results, 2013 and DEC/DFWMR, July 2015)

Aquatic life is considered to be fully supported. The harbor supports a healthy abundance and diversity of resident and migratory marine species, including striped bass, bluefish, winter flounder, fluke and weakfish. (DEC/DFW and Region 2, 2016)

Fish consumption is considered to be impaired due to NYS DOH a health advisory that recommends eating no American eel, gizzard shad, or white perch, and no more than one meal per month of Atlantic needlefish, bluefish, rainbow smelt or stiped bass taken west of Wolfe's Pond Park because of elevated PCB and dioxin levels. Additional advisories are also in place regarding consumption of all other fish and blue crab meat due to PCBs and dioxin. However, these advisories recommend limiting consumption to no more than one meal per week which is no more stringent than the general statewide advisory for all New York waters and does not result in significant impact to uses. The source of this contamination is considered to be contaminated sediment, the result of past industrial activity/discharges. For some species the advisories are related to the habits and characteristics of these species, specifically the wide migratory range, predatory nature and high lipid/fat content that make them more likely to accumulate contaminants. Health advisories regarding the consumption of fish are revised regularly; for the most current advisories, go to www.nyhealth.gov/environmental/outdoors/fish/fish.htm. (NYS DOH Health Advisories and DEC/FWMR, Habitat, January 2014)

Water Quality Information

Water quality evaluations have been conducted through the NYCDEP City-Wide Long-Term CSO Control Planning Program as well as the long-standing NYCDEP Harbor Survey Sampling Program. The NYCDEP Harbor Survey Program uses primarily four indicators of water quality: fecal coliform bacteria, dissolved oxygen, chlorophyll a and water clarity. Significant improvements have been noted in all of these parameters since the 1970s and 80s. These improvements have coincided with considerable upgrades to the City's wastewater treatment facilities. In the Upper New York Bay portion of the harbor, standards for bacteria and dissolved oxygen are typically met. Results show somewhat high levels of chlorophyll and acceptable but lower water clarity. (NYCDEP, Harbor Survey, 2014)

An extensive effort to monitoring toxic substances in New York Harbor waters was undertaken in the late 1990s. The Contaminant Assessment and Reduction Program (CARP) effort was a response to the implementation of more restrictive guidelines for the disposal of dredged materials from New York Harbor. These guidelines eliminated ocean disposal as a viable option for much of the dredged material related to port maintenance. As a result, the assessment and reduction of contaminated sediments became a critical priority for the Harbor. Strong regional multi-agency support and a $30 million commitment – primarily from the NYNJ Port Authority – led to the formation of CARP in 1997. The objectives of the effort were to identify sources of contaminants to the harbor/estuary, establish baseline levels of contaminants in waters, fish tissue and sediments, and evaluate future conditions under various contaminant reduction scenarios. The monitoring component which began in 1999 and continued through 2001 provided input to contaminant fate and transport models and guided trackdown and remediation and restoration efforts. (DEC/DOW, BWAM/Sediment Assessment, February 2010)

Source Assessment

Urban stormwater runoff, combined sewer overflows (CSOs), sanitary sewer overflows and illegal (unpermitted) sanitary discharges are sources of pollutants. NYC municipal wastewater discharges also contribute to overall nutrient load in the harbor waters. Impacts to fish consumption are due to elevated PCBs from contaminated sediment, primarily the result of historic (past) discharges. For some fish species with a wide migratory range some contamination is picked up in other waters.

Management Actions

Combined sewer overflows (CSOs) represent a significant source of pollutants to New York Harbor waters and tributaries. In 2005 NYSDEC issued a Consent Order requiring New York City to address the over 400 CSOs of the NYCDEP municipal wastewater system. In 2012, the CSO Order was modified to including the integration of green infrastructure, the substitution of more cost-effective grey infrastructure, and agreed to fixed dates for submittal of the

Long-Term Control Plans. Under the 2005/2012 Orders, NYCDEP developed 11 Waterbody/Watershed Facility Plans (WWFPs) and is currently developing Long Term Control Plans (LTCPs) to bring CSO-impacted waters into compliance with water quality standards. Upper New York Bay is included within the Open Waters waterbody, for which a LTCP is being developed. The Order requires post-construction monitoring to verify modeling projections and actual water quality compliance, inform decisions regarding SPDES permit renewal at five-year intervals, and evaluate future management actions, including additional CSOs controls if necessary. (DEC/DOW, BWC/NYCC, August 2016)

These waters are included within the core area of the New York/New Jersey Harbor Estuary Program (HEP). The HEP is a National Estuary Program authorized in 1987 by the U.S. Environmental Protection Agency. The program is a continuing multi–agency effort to develop and implement a plan to protect, conserve, and restore the estuary. Participants in the program include representatives from local, state, and federal environmental agencies, scientists, citizens, business interests, environmentalists, and others. (DEC/DOW, BWAM, December 2010)

Section 303(d) Listing

Upper New York Bay is included on the current (2016) NYS Section 303(d) List of Impaired Waters. The waterbody is included on Part 2b of the List as a fish consumption restricted water due to PCBs and other toxics. Based on current fish consumption health advisories, it may be appropriate to include an additional listing for dioxin. This waterbody was first listed on the 1998 Section 303(d) List. (DEC/DOW, BWAM/WQAS, December 2015)

Segment Description

This segment includes the estuary waters bounded to the south by the Verrazano Narrows Bridge, to the west by the Staten Island shoreline to Kill Van Kull mouth and then by the New York–New Jersey line, to the north by the mouths of the Hudson and East Rivers at the Battery, and to the east by the Brooklyn shoreline.

Erie Basin (1701-0185) Impaired

Waterbody Location Information

Revised: 12/29/2016

Water Index No: (MW1.3) UB-EB
Hydro Unit Code: Arthur Kill-Upper Bay (0203010402)
Water Type/Size: Estuary Waters 80.8 Acres
Description: entire basin, as described below

Water Class: SD
Drainage Basin: Atlantic-Long Island Sound
Reg/County: 2/Kings (24)

Water Quality Problem/Issue Information

Uses Evaluated	Severity	Confidence
Shellfishing	N/A	-
Public Bathing	N/A	-
Recreation	Stressed	Suspected
Aquatic Life	Fully Supported	Suspected
Fish Consumption	Impaired	Known
Conditions Evaluated		
Habitat/Hydrology	Good	
Aesthetics	Fair	

Type of Pollutant(s) (CAPS indicate Major Pollutants/Sources that contribute to an Impaired/Precluded Uses)

Known: PRIORITY ORGANICS (PCBs), PRIORITY ORGANICS (dioxin), Aesthetics (floatable debris), Pathogens
Suspected: Oil and Grease
Unconfirmed: - - -

Source(s) of Pollutant(s)

Known: TOX/CONTAMINATED. SEDIMENT, Urban/Storm Runoff, Combined Sewer Overflow (CSOs),
Suspected: Other Source (migratory species), Municipal Discharges
Unconfirmed: - - -

Management Information

Management Status: Strategy Implementation Scheduled or Underway
Lead Agency/Office: Other/NYCDEP
IR/305(b) Code: Impaired Water Requiring a TMDL (IR Category 5)

Further Details

Overview

Upper New York Bay/Erie Basin is assessed as an impaired waterbody due to fish consumption that is impaired by PCBs and dioxin in contaminated sediment, resulting in a health advisory for some species. Public bathing and other recreational uses are thought to experience minor impacts to from pathogens, floatable debris and various other pollutants from urban/storm runoff, CSOs, and other such sources. Lesser fish consumption impacts for additional species are due to contaminated sediment, but also the result of the migratory range of these fish species.

Use Assessment

Upper New York Bay/Erie Basin is a Class SD waterbody, assessed for general recreation use, and support of aquatic life, but not for shellfishing or for public bathing use.

Recreational uses are considered to be supported but stressed due to urban stormwater runoff of pathogens that result in periodic precautionary bathing beach closures in adjacent waters during heavy rain storm events. Beach monitoring revealed infrequent elevated bacteriological levels at beaches and the sampling resulted in few water quality-driven

closures. Occasional beach closures that do occur are typically pre-emptive closures during heavier rainstorms that are known to wash pollutants into the harbor. (NYSDOH BEACH Act monitoring results, 2013 and DEC/DFWMR, July 2015)

Aquatic life is considered to be fully supported. The harbor supports a healthy abundance and diversity of resident and migratory marine species, including striped bass, bluefish, winter flounder, fluke and weakfish. (DEC/DFW and Region 2, 2016)

Fish consumption is considered to be impaired due to NYS DOH a health advisory that recommends eating no American eel, gizzard shad, or white perch, and no more than one meal per month of Atlantic needlefish, bluefish, rainbow smelt or stiped bass taken west of Wolfe's Pond Park because of elevated PCB and dioxin levels. Additional advisories are also in place regarding consumption of all other fish and blue crab meat due to PCBs and dioxin. However, these advisories recommend limiting consumption to no more than one meal per week which is no more stringent than the general statewide advisory for all New York waters and does not result in significant impact to uses. The source of this contamination is considered to be contaminated sediment, the result of past industrial activity/discharges. For some species the advisories are related to the habits and characteristics of these species, specifically the wide migratory range, predatory nature and high lipid/fat content that make them more likely to accumulate contaminants. Health advisories regarding the consumption of fish are revised regularly; for the most current advisories, go to www.nyhealth.gov/environmental/outdoors/fish/fish.htm. (NYS DOH Health Advisories and DEC/FWMR, Habitat, January 2014)

Water Quality Information

Water quality evaluations have been conducted through the NYCDEP City-Wide Long-Term CSO Control Planning Program as well as the long-standing NYCDEP Harbor Survey Sampling Program. The NYCDEP Harbor Survey Program uses primarily four indicators of water quality: fecal coliform bacteria, dissolved oxygen, chlorophyll a and water clarity. Significant improvements have been noted in all of these parameters since the 1970s and 80s. These improvements have coincided with considerable upgrades to the City's wastewater treatment facilities. In the Upper New York Bay portion of the harbor, standards for bacteria and dissolved oxygen are typically met. Results show somewhat high levels of chlorophyll and acceptable but lower water clarity. (NYCDEP, Harbor Survey, 2014)

An extensive effort to monitoring toxic substances in New York Harbor waters was undertaken in the late 1990s. The Contaminant Assessment and Reduction Program (CARP) effort was a response to the implementation of more restrictive guidelines for the disposal of dredged materials from New York Harbor. These guidelines eliminated ocean disposal as a viable option for much of the dredged material related to port maintenance. As a result, the assessment and reduction of contaminated sediments became a critical priority for the Harbor. Strong regional multi-agency support and a $30 million commitment – primarily from the NYNJ Port Authority – led to the formation of CARP in 1997. The objectives of the effort were to identify sources of contaminants to the harbor/estuary, establish baseline levels of contaminants in waters, fish tissue and sediments, and evaluate future conditions under various contaminant reduction scenarios. The monitoring component which began in 1999 and continued through 2001 provided input to contaminant fate and transport models and guided trackdown and remediation and restoration efforts. (DEC/DOW, BWAM/Sediment Assessment, February 2010)

Source Assessment

Urban stormwater runoff, combined sewer overflows (CSOs), sanitary sewer overflows and illegal (unpermitted) sanitary discharges are sources of pollutants. NYC municipal wastewater discharges also contribute to overall nutrient load in the harbor waters. Impacts to fish consumption are due to elevated PCBs from contaminated sediment, primarily the result of historic (past) discharges. For some fish species with a wide migratory range some contamination is picked up in other waters.

Management Actions

Combined sewer overflows (CSOs) represent a significant source of pollutants to New York Harbor waters and tributaries. In 2005 NYSDEC issued a Consent Order requiring New York City to address the over 400 CSOs of the NYCDEP municipal wastewater system. In 2012, the CSO Order was modified to including the integration of green infrastructure, the substitution of more cost-effective grey infrastructure, and agreed to fixed dates for submittal of the

Long-Term Control Plans. Under the 2005/2012 Orders, NYCDEP developed 11 Waterbody/Watershed Facility Plans (WWFPs) and is currently developing Long Term Control Plans (LTCPs) to bring CSO-impacted waters into compliance with water quality standards. Upper New York Bay is included within the Open Waters waterbody, for which a LTCP is being developed. The Order requires post-construction monitoring to verify modeling projections and actual water quality compliance, inform decisions regarding SPDES permit renewal at five-year intervals, and evaluate future management actions, including additional CSOs controls if necessary. (DEC/DOW, BWC/NYCC, August 2016)

These waters are included within the core area of the New York/New Jersey Harbor Estuary Program (HEP). The HEP is a National Estuary Program authorized in 1987 by the U.S. Environmental Protection Agency. The program is a continuing multi–agency effort to develop and implement a plan to protect, conserve, and restore the estuary. Participants in the program include representatives from local, state, and federal environmental agencies, scientists, citizens, business interests, environmentalists, and others. (DEC/DOW, BWAM, December 2010)

Section 303(d) Listing
Upper New York Bay is included on the current (2016) NYS Section 303(d) List of Impaired Waters. The waterbody is included on Part 2b of the List as a fish consumption restricted water due to PCBs and other toxics. Based on current fish consumption health advisories, it may be appropriate to include an additional listing for dioxin. This waterbody was first listed on the 1998 Section 303(d) List. (DEC/DOW, BWAM/WQAS, December 2015)

Segment Description:
This segment includes the portion of the Upper New York Bay northeast of peninsula separating the Basin from Gowanus Bay and Red Hook Channel, and southeast of a line from the northernmost point of the Basin peninsula to the point on the western shore of Brooklyn defined by the projection of Van Brunt Street.

Gowanus Canal (1701-0011) Impaired

Waterbody Location Information

Revised: 12/29/2016

Water Index No: (MW1.3) UB-EB- 1
Hydro Unit Code: Arthur Kill-Upper Bay (0203010402)
Water Type/Size: Estuary Waters 129 Acres
Description: entire canal

Water Class: SD
Drainage Basin: Atlantic-Long Island Sound
Reg/County: 2/Kings (24)

Water Quality Problem/Issue Information

Uses Evaluated	Severity	Confidence
Water Supply	Unassessed	-
Shellfishing	Unassessed	-
Public Bathing	Unassessed	-
Recreation	Impaired	Known
Aquatic Life	Fully Supported	Suspected
Fish Consumption	Impaired	Suspected
Conditions Evaluated		
Habitat/Hydrology	Poor	
Aesthetics	Poor	

Type of Pollutant(s) (CAPS indicate Major Pollutants/Sources that contribute to an Impaired/Precluded Uses)

Known: OTHER POLLUTANT (floatable debris), Oil and Grease, Silt/Sediment (sludge banks), Priority Organics (PCBs), Metals
Suspected: PATHOGENS, Low D.O./Oxygen Demand, Priority Organics (PCBs)
Unconfirmed: - - -

Source(s) of Pollutant(s)

Known: COMBINED. SEWER OVERFLOW (CSO), OTHER NON-PERMITTED SANITARY DISCHARGE, URBAN/STORM RUNOFF, Industrial Discharges
Suspected: Toxic/Contaminated Sediment
Unconfirmed: - - -

Management Information

Management Status: Strategy Implementation Scheduled or Underway
Lead Agency/Office: Other/NYCDEP
IR/305(b) Code: Impaired Water, Other Strategies in Place (IR Category 4b)

Further Details

Overview

Gowanus Canal is assessed as an impaired waterbody due to recreation uses that are known to be impaired by floatable debris and other pollutants from CSOs, urban stormwater discharges, illegal sanitary connections to storm sewers. These sources have caused sludge banks to build up at the head of the creekwhich discourage recreational uses. The canal has historically experienced low dissolved oxygen – particularly at the head of the canal – and other water quality issues due to poor circulation of canal waters. The recent upgrade and reactivation of the Gowanus Flushing Tunnel Coliform in early 2015 have significantly increased circulation and have greatly improved D.O. levels in the waterbody. The additional flushing also results in greater compliance with recreational criteria for bacteria, though periodic exceedences still occur. Fish consumption impacts are due to health advisories in adjacent waters limiting the consumption of certain species due to elevated PCB levels. Additional contaminants (heavy metals, PAHs) have been identified in canal sediments.

Use Assessment

Gowanus Canal is a Class SD waterbody, assessed for general recreation use, and support of aquatic life, but not for shellfishing or public bathing.

Recreational uses in Gowanus Canal experience impacts that may rise to the level of impairment due to elevated pathogen levels from CSOs and other discharges of sanitary wastewater from illegal connections. Urban stormwater runoff also contributes pollutants to the waterway. Recreational uses are also considered to be impacted by poor aesthetics due to floatable debris and the presence of sediment mounds in the creek. (DEC/DOW, BWC/NYCC, December 2016)

Aquatic life in the waterbody is considered to be fully supported. In previous assessments aquatic life was consider to be impaired by low dissolved oxygen in the canal. However the increased circulation from the flushing tunnel result in D.O. Levels that are meeting standards for the support of aquatic life. (DEC/DOW, BWC/NYCC and Region 1, December 2016)

Fish consumption is considered to be stressed due to NYS DOH issued health advisories recommending limiting consumption of some species in adjacent waters. This waterbody is not included among the waterbody-specific health advisories for fish consumption, but since fish can migrate to this waterbody from other waters where such advisories are in place fish consumption is evaluated as stressed. Health advisories regarding the consumption of fish are revised regularly; for the most current advisories, go to www.nyhealth.gov/environmental/outdoors/fish/fish.htm. (NYS DOH Health Advisories and DEC/FWMR, Habitat, January 2014)

Water Quality Information

Water quality evaluations have been conducted through the NYCDEP City-Wide Long-Term CSO Control Planning Project, including the Gowanus Canal Waterbody/Watershed Facility Plan Report. The results of sampling conducted in 1993, 2004 and 2014 indicated that the impact of CSOs, stormwater discharges and dry weather sanitary flows cause periodic low dissolved oxygen in the middle and upper portions of the canal during wet-weather. However Harbor Survey data for 2015 and 2016 indicate that the DO levels consistently meet or exceed the applicable water quality standards, due to the renewed operation of the Flushing Tunnel. In addition, the model projections developed under the Long-Term Control Plan program indicate that Gowanus Canal will fully attain the DO standard on an annual basis. Bacteria levels in the canal have also decreased due to the Flushing Tunnel, but periodic spikes remain during wet weather. The LTCP modeling projects that the waterbody will fully attain the primary contact recreational standard for pathogenic indicators during the recreational season and almost fully attain the standard during on an annual basis. (NYCDEP, City-Wide Long-Term CSO Control Planning Program, December 2016, NYCDEP, Harbor Survey, 2016).

Source Assessment

Urban stormwater runoff, combined sewer overflows (CSOs), sanitary sewer overflows and illegal (unpermitted) sanitary discharges are sources of pollutants. NYC municipal wastewater discharges also contribute to overall nutrient load in the harbor waters. Impacts to fish consumption are due to elevated PCBs from contaminated sediment, primarily the result of historic (past) discharges. For some fish species with a wide migratory range some contamination is picked up in other waters.

Management Actions

Combined sewer overflows (CSOs) represent a significant source of pollutants to New York Harbor waters and tributaries. In 2005 NYSDEC issued a Consent Order requiring New York City to address the over 400 CSOs of the NYCDEP municipal wastewater system. In 2012, the CSO Order was modified to including the integration of green infrastructure, the substitution of more cost-effective grey infrastructure, and agreed to fixed dates for submittal of the Long-Term Control Plans. Under the 2005/2012 Orders, NYC DEP developed 11 Waterbody/Watershed Facility Plans (WWFPs) and is currently developing Long Term Control Plans (LTCPs) to bring CSO-impacted waters into compliance with water quality standards. The Gowanus Canal LTCP was submittted in June 2015. The Order requires post-construction monitoring to verify modeling projections and actual water quality compliance, inform decisions regarding SPDES permit renewal at five-year intervals, and evaluate future management actions, including additional CSOs controls if necessary. (DEC/DOW, BWC/NYCC, August 2016)

Efforts by NYCDEP to address CSO discharges to Gowanus Canal include the rehabilitation of the Gowanus Flushing

Tunnel to enhance circulation, reconstruction of the Gowanus Pump Station to reduce the volume of CSO discharge and floatables controls at CSO outfall at the head of the canal, plus periodic skimming to remove floatables. (NYCDEP, December 2016)

In 2010, the Canal was designated a federal Superfund site under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) in light of the contamination of Canal sediments that occurred over the Canal's long history. The main goal of the CERCLA process is to remediate the contaminated sediments at the bottom of the Canal, though other water quality benefits from this work are expected. In 2013, EPA issued its Record of Decision (ROD) setting forth a final cleanup plan for the Canal that proposed specific CSO reduction targets and a conceptual plan to meet these targets by installing two large detention tanks. (USEPA, Region 2, December 2016)

These waters are included within the core area of the New York/New Jersey Harbor Estuary Program (HEP). The HEP is a National Estuary Program authorized in 1987 by the U.S. Environmental Protection Agency. The program is a continuing multi–agency effort to develop and implement a plan to protect, conserve, and restore the estuary. Participants in the program include representatives from local, state, and federal environmental agencies, scientists, citizens, business interests, environmentalists, and others. (DEC/DOW, BWAM, December 2010)

Section 303(d) Listing:
Gowanus Canal is not included on the current (2016) NYS Section 303(d) List of Impaired Waters. Although it is assessed as an impaired water, it is categorized as an IR Category 4b water that is not listed due to required control measures other than a TMDL – specifically, the USEPA-led CERCLA (Superfund) remediation effort – that are in place to address these impairments. (DEC/DOW, BWAM/WQAS, December 2016)

Segment Description:
This segment includes the entire tidal canal.