Hurricane Irene Impacts
“One Year Later”

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Deputy Commissioner – Bureau of Water Supply
Outline

• Introduction
• Infrastructure Repairs
• Water Quality Issues & System Response
• Kensico Reservoir
• Moving Forward
Gilboa Dam
Gilboa Dam Repairs – channel step

- $10.7 million in repairs
BWS Infrastructure

• Tannersville Wastewater Treatment Plant
Ashokan Reservoir
Rondout Reservoir
Ashokan and Rondout Reservoir Diversion and Release Turbidity

Date

Aug-11  Sep-11  Oct-11  Nov-11  Dec-11  Jan-12  Feb-12  Mar-12  Apr-12  May-12  Jun-12  Jul-12  Aug-12  Sep-12

Turbidity (NTU)

0.1  1  10  100  1000  10000

- Catskill Diversion
- Catskill Release
- Rondout Diversion

Reservoir Water Quality
Water Supply System Response

• Alum Treatment on the Catskill Aqueduct
  • Started on 9/29/11
  • Ended on 5/15/12
  • Used approximately 2,778 dry tons
Ashokan Reservoir

2011-2012
New York City Ashokan Reservoir
Conditional Seasonal Storage Objective (CSSO)

Interim Operating Protocol in effect 10/17
Water Supply System Response

- Shaft 10 Chlorination
- Shaft 17 Dechlorination
Source Water Fecal Coliform

- Surface Water Treatment Rule for unfiltered systems requires:
  - No more than 10% of samples can exceed 20 cfu/100 mL
  - Rolling 6 month average
  - DEP source identification analyses indicated predominantly non-human (e.g. wildlife) sources
Fecal Coliform Issues

DEL18 Fecal Coliform Compliance

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<th>FC per 100 mL</th>
<th>% &gt;20 FC per 100 mL (6 month)</th>
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- MAX COUNT
- AVG COUNT
- SWTR Limit
- % >20 CFU/100mL
Fecal Coliform Issues

CATLEFF Fecal Coliform Compliance

MAX COUNT
AVG COUNT
SWTR Limit
% >20 CFU/100mL

FC per 100 mL
%>20 FC per 100 mL (6 month)
Kensico Reservoir Assessment Report

Fecal Coliform Occurrence, and Operational Response During and After Tropical Storms Irene and Lee

- DEP actions based on report:
  - Develop a Hurricane Preparation Protocol
  - Ensure flushing of the Delaware Aqueduct Bypass prior to hurricane season
  - Inspect and clean BMPs prior to hurricane season
  - Prepare contracts for chemical treatments in case needed
  - Developed protocol for Kensico storm event monitoring:
    - Implemented during significant rain events
    - Identify sources of fecal coliform
    - Identify areas of highest fecal coliform load
Moving Forward

• System operated in full compliance despite impacts
• Significant repairs made to system infrastructure
• Learn from response:
  • Completed study on fecal coliform issue at Kensico
  • AAR completed
  • Improvement plan developed
  • Ensure plans turn into actions