



**NY Power  
Authority**

**Canal  
Corporation**

# **The Earthen Embankment Integrity Program (EEIP)**

**Understanding the Embankment Management Guidebook  
and providing feedback on the program**

# Content

1. An introduction to the Earthen Embankment Integrity Program (EEIP) and key terminology
2. Overview of the need for embankment management
3. Closer look at earthen embankments on the NYS Canal System
4. Regulatory and Community Thresholds that trigger public engagement
5. Opportunities to inform the public engagement strategy in the EEIP

# Intro: The Earthen Embankment Integrity Program

# What is the Earthen Embankment Program?

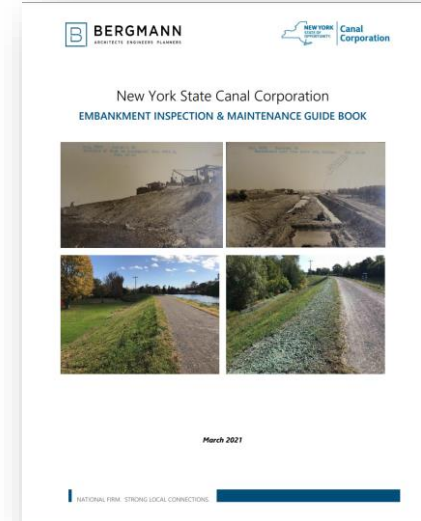
- The Earthen Embankment Integrity Program is also called the “**EEIP.**”
  - It is the Canal Corporation's initiative to create a programmatic approach to restore, maintain, and manage earthen embankments.
  - In certain circumstances, this may require some level of vegetation clearing.
  - An “**earthen embankment**” is an engineered structure or dam wall of the canal which is made from soil, rock, clay, and other “earthen material” *and* impounds (holds) water for a prolonged period above the adjacent land surface elevation

EEIP: The name of the program



# What is the Embankment Management Guidebook?

- The draft Embankment Management **Guidebook** (AKA the “Guidebook”) is a manual or playbook that the Canal Corp will use when it inspects, restores and maintains engineered embankments, including repairing seeps and managing vegetation on certain portions of the embankment.
- Chapter 9 of the Guidebook includes Canals’ planned approach to communicating with communities – and **this is a key area where feedback is needed.**



**Guide Book:**  
a manual for  
how Canals will  
administer the program

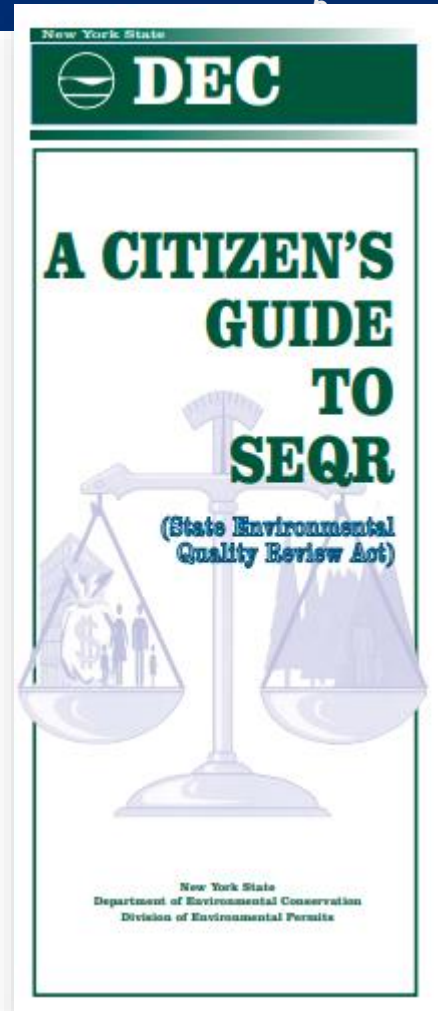


# What is the “SEQR” Process?

- The NYS Environmental Quality Review Act or “SEQR” is a NY Law which requires all state and local government agencies to consider environmental impacts *equally* with social and economic factors when making discretionary decision called an "Action" in SEQR language.
- The "Action" being taken by the Canal Corp is developing and implementing a programmatic approach on how to inspect and manage earthen embankments as set forth in the draft Guidebook. The Canal Corp's analysis of the Action is set forth in the Draft Generic Environmental Impact Statement or DGEIS.
- We call it the “generic” environmental impact statement because such analysis is done when an agency Action involves an entire program or plan having wide application (across the entire Canal System) or restricting the range of future alternatives.

A Citizen’s Guide to SEQR

[https://www.dec.ny.gov/docs/permits\\_ej\\_operations\\_pdf/seqrcitizen.pdf](https://www.dec.ny.gov/docs/permits_ej_operations_pdf/seqrcitizen.pdf)



# Why we need embankment management

# Canal Embankment Failures

## Maintenance and management used to prevent failures

- Embankment failures can cause significant and widespread impacts to surrounding areas and areas downstream of the dam which may include:
  - Loss of life
  - Property damage
  - Damage to critical infrastructure
  - Loss of benefits like hydroelectric generation, recreation, and water supply
- Environmental impacts including wildlife
- Financial impacts

“I watched from a window as trees, cars, and pieces of my neighbors’ home swept by my house.” – Betty Lou Commerton

A canal embankment failed in 1974 near Bushnell’s Basin. The resulting flood wave destroyed or severely damaged 69 homes on nine streets costing over \$1.2 million. It took over a year to rebuild the Canal and restore the impacted homes. The photo below shows some of the resulting devastation.

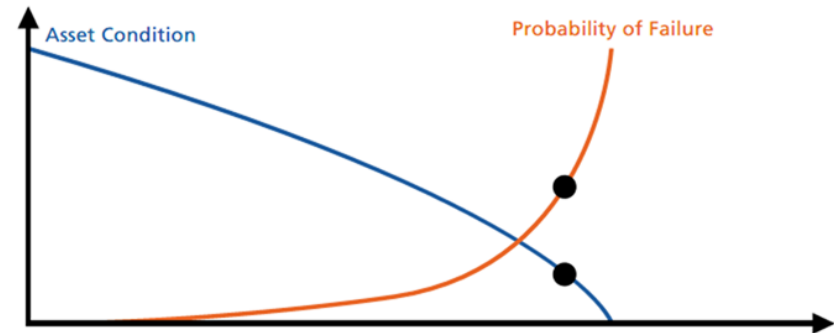




# The use of data to inform embankment management

## Inspection data and visualization of "asset" condition over time

1 - SERIOUS/EMERGENCY		Serious Deficiencies Exist, Repairs Needed Urgently, Consider Emergency Remedial Action. Dam Safety Review Warranted to Determine the Embankment Integrity. Enhanced Monitoring Required
2 - VERY POOR		Advanced Safety Deficiencies Exist. Begin Monitoring and Consider Interim Stabilization Measures.
3 - POOR		Safety Deficiencies Exist that Signify Potential Progression of Deterioration under Existing or Increased Loading Conditions. May Need Condition-Based Preventative Maintenance. Place in Priority Scheduling for Improvement.
4 - FAIR		Moderate Safety Deficiencies Exist. Improve as Part of Normal Scheduling.
5 - GOOD		Minor Safety Deficiencies Exist. Satisfactory but Shows Signs of Aging.
6 - VERY GOOD		Normal Aging.
7 - EXCELLENT/NEW		No Appreciable Deterioration or Deficiencies Exist.



As asset condition deteriorates over time, the probability of failure increases exponentially.

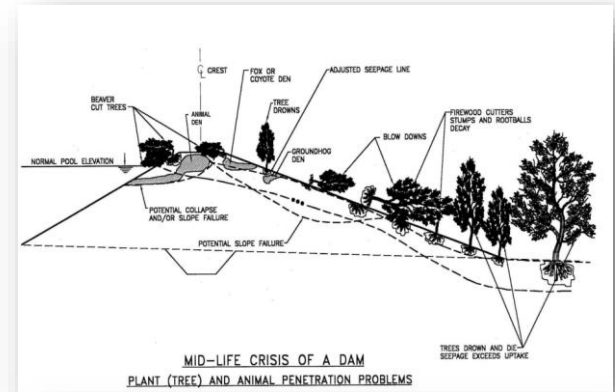
# The use of modeling for public safety and planning

## Inundation maps and modeling

- Flood inundation maps use many data points to create a "model" depicting the depth and area of a flood inundation, if one were to occur
- They help the Canal Corp and local emergency managers to:
  1. Understand local flood risks (depth, velocity, timing of impact) so they can prepare emergency plans
  2. Provide timely response if there is a flood
  3. Recover from a flood, including damage assessments
  4. Inform asset ratings and classifications: low, intermediate or high hazard risk

# Why does Canal Corp seek to remove trees and brush?

- Tall grass, brush, and bramble make inspections more difficult and pose safety concerns for those performing inspections
- Tall grass can hide animal burrows
- Trees can blow over in high winds and severely damage the embankment
- Tree roots penetrate the embankment and impact structural integrity
- The roots can become pathways for seepage
- Seepage can cause trees to "drown" which makes them more likely to fall over



# Illustration: seep in Royalton, NY

## BEFORE



- A 2020 "**Bank Walk Inspection**" in Royalton, NY revealed a seep in a densely vegetated area
- Subsequently, an engineer went on site to assess the seep, located in the vicinity shown here (you can see the top of the embankment at the top of the photo)
- In order to address the seep, the embankment needed to be cleared of brush and small trees so that filter material could be applied

# Illustration: seep in Royalton, NY

AFTER



- The vegetation, including brush and trees less than 3" in diameter, was cleared in 2021 and a "filter blanket" was installed (pictured, left)
- **Many additional seeps were discovered that could not be seen through the brush**
- Those seeps are now formally monitored by engineers

Note: trees >3" were left at the top of the berm where vegetation is safe

*You can't manage what you don't measure, and you can't measure what you can't see.*

# Embankment management – industry impacts

## Western NY Canals support fisheries and farm irrigation

Concerns related to embankment integrity have led to lowering water levels in sections of the Canal.

Impacts of reduced depths:

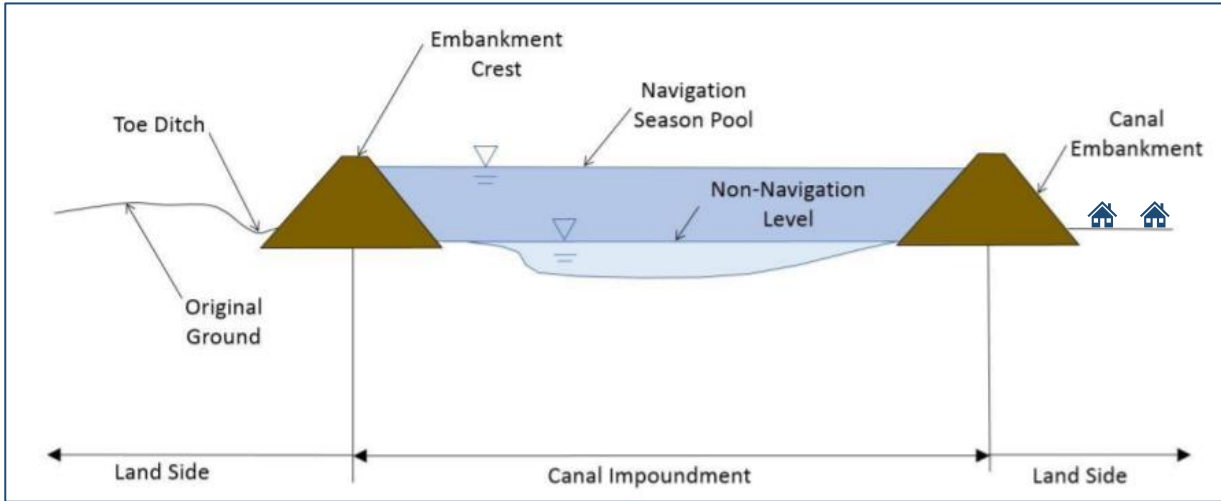
- Limits water available for agriculture – where water from the Canal supports thousands of acres of farmland
- Limits the ability to increase flows to support fisheries and the multimillion dollar angling industry that draws tourists from across the country



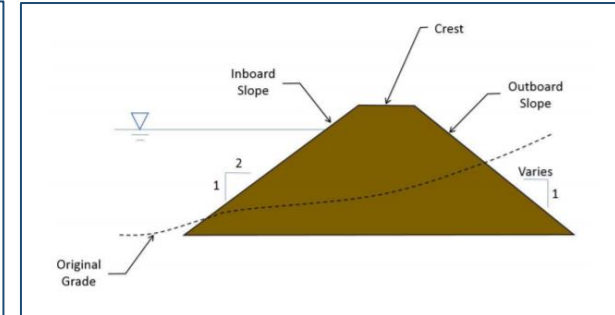
# Earthen embankments on the Canal System

# Components of a water-retaining earthen embankment

## Features of a Canal Embankment



## Features of an embankment



- Outboard Slope:** This refers to the landward side of the embankment beginning at the top, landward crest edge.
- Inboard Slope:** This refers to the water-ward side of the embankment, beginning at the top, water-ward crest edge.
- Crest:** This refers to the top, typically flat portion of the embankment.

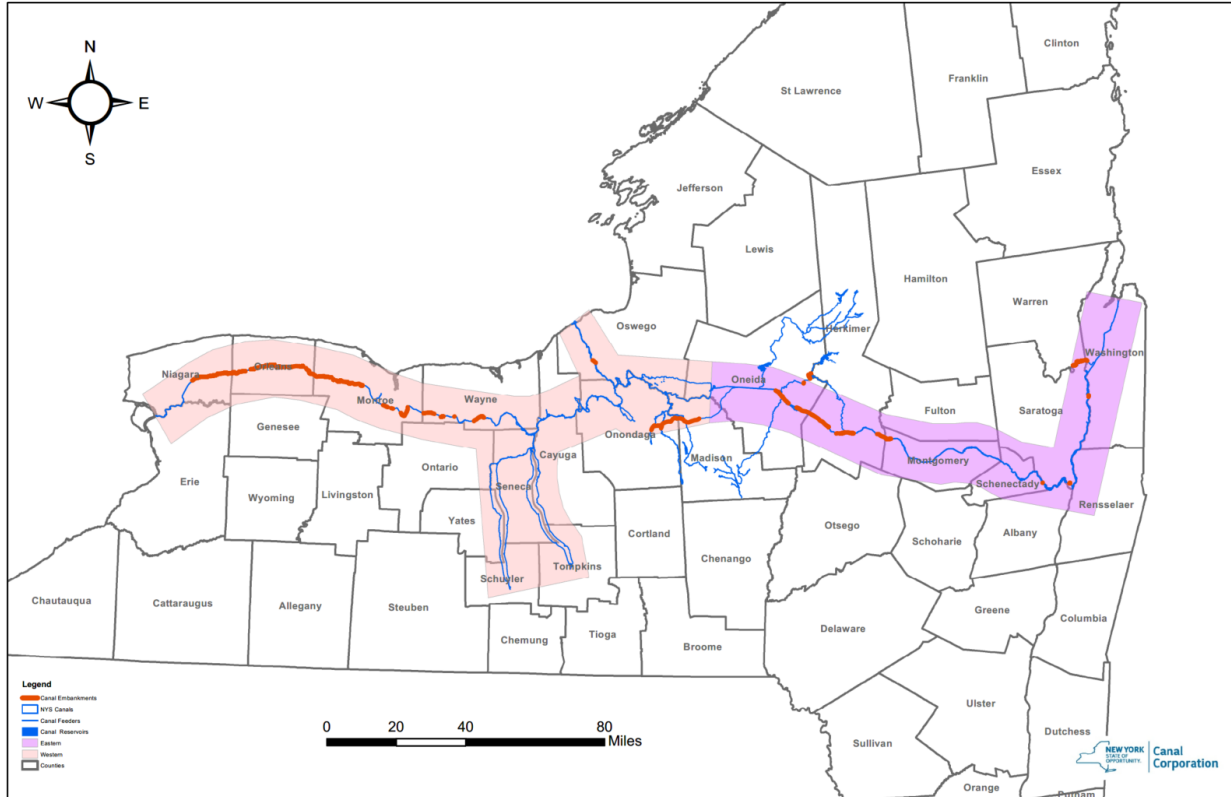


# How much of the Canal is an “earthen embankment?”

- The Canal System is 524 miles including the Erie, Champlain, Cayuga-Seneca and Oswego Canals
- Approximately 120 - 125 cumulative miles of the System is made of inventoried earthen embankments
- Earthen embankments are spread across various regions of the state, thus necessitating a statewide program

\*The portions of the canal system that traverse lakes, such as Onondaga, Oneida, Cayuga and Seneca Lakes and canalized portions of rivers such as the Mohawk, Seneca, and Clyde Rivers do not include man-made water retaining embankments and are therefore not included.

# Sections of Earthen Embankment



- Most of the earthen embankment sections of the Canal System are in the western portion of the Erie Canal
- Each “project” will identify a specific portion of earthen embankment for maintenance.

# Community Engagement in the Guidebook

# Embankment Inspections and Assessments

## The Canal Corp performs various types of embankment inspections

- **Bank Walk Inspections:** the minimum inspection required, where the Canal Corp representative performs a visual inspection to identify defects or changes in embankment condition
- **Informal Inspections and Enhanced Embankment Monitoring:** Conducted to monitor devices or conditions related to a seepage at the embankment (in addition to Bank Walks)
- **Formal Inspections:** Performed by a NYS licensed engineer and resulting in a report including the hazard class, risk rating, and recommended maintenance activities.
- **Special Inspections:** Conducted in relation to an emergency (I.e., flood or earthquake)

**Note:** it is the “assessment” that may trigger the design of a maintenance project.

# Regulatory and Community Thresholds

## Could EEIP activities negatively impact any of the following?



Sites with Federal or State rare, threatened, or endangered plant species



Occupied habitats of any rare, threatened or endangered species



Sites with Critical Environmental Areas designations



Wetlands in the Montezuma Marshes National Natural Landmark



The aesthetic, historic or recreational functions of any local parks



Sites on the State or National Registers of historic places that would be adversely affected by EEIP activity



The aesthetic character of priority sites for comprehensive plan or zoning projects



Sites of Statewide Significance according to NYS DEC's Policies



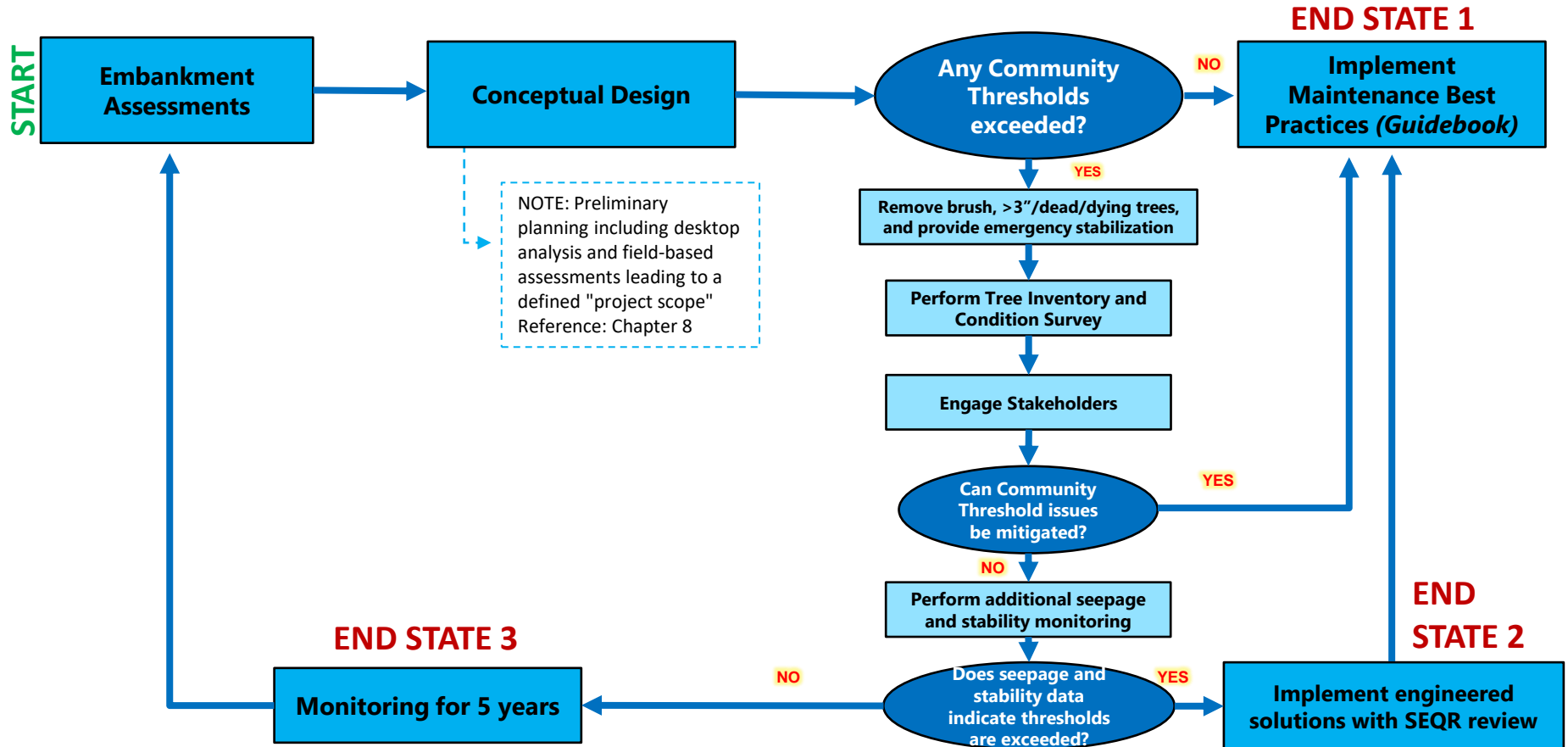
Inconsistency with Local Waterfront Revitalization Program (LWRP) sites



**NY Power Authority**

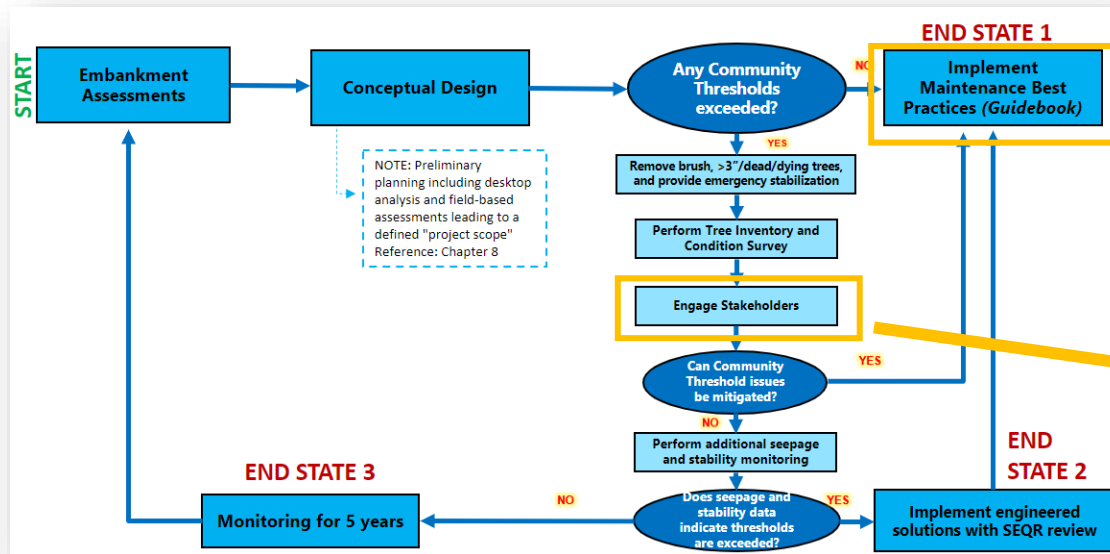
# Solution Decision Tree

Source: Figure 8.15-1: Maintenance Solutions Decision Tree



# Public Communications: Solutions Decision Tree

## Public communication can include notification or consultation



If a Community threshold is NOT MET, residents in proximity to the project will be simply notified of planned work

If a Community threshold IS MET, community members will be consulted about the planned work

Note: Canal Corp wants your feedback on how we can improve our plan for public engagement as the program is implemented.

# Public Outreach in the Guidebook

## How does Canal Corporation plan to perform community outreach?

1. Community Notifications
  - Nearby property owners
  - Municipal offices
  - Canals website and social media
  - Local signage (i.e., trail closure)
  - Boater communications (i.e., NTM)
2. Public Meetings
3. FAQ Sheets

### NOTICES TO INCLUDE:

- Timeline
- Description
- Alternate Routes
- Point of Contact





# Providing Comments on the Guidebook

# Public Information Sessions

- NOTE: these are not "public comment sessions"
- Sessions will include a brief overview and then Q&A

Session #	Location	Date	Time
1	Perinton Community Center, 350 Turk Hill Rd, Fairport, NY 14450	Monday, September 20, 2021	11:00 AM – 12:30 PM
2	Perinton Community Center, 350 Turk Hill Rd, Fairport, NY 14450	Monday, September 20, 2021	6:30 PM – 8:00 PM
3	Perinton Community Center, 350 Turk Hill Rd, Fairport, NY 14450	Tuesday, September 21, 2021	11:00 AM – 12:30 PM
4	Perinton Community Center, 350 Turk Hill Rd, Fairport, NY 14450	Tuesday, September 21, 2021	6:30 PM – 8:00 PM
5	VIRTUAL (with closed captioning)	Thursday, September 30, 2021	11:00 AM – 12:30 PM
6	VIRTUAL (with closed captioning)	Thursday, September 30, 2021	6:30 PM – 8:00 PM

# Providing your official feedback

There are **two ways** to submit written comments:

1. Email comments to: [NYSCC-Embankments@bergmannpc.com](mailto:NYSCC-Embankments@bergmannpc.com)

2. Mail written comments to:

**Canal Corporation c/o James Candiloro  
30 South Pearl Street  
Albany, NY 12207**

**Comment period has been extended:**

Comments must be received by midnight on **October 15, 2021**



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