

# 2014 CAFM Annual Conference

## A Collaborative Approach to Facility Floodplain Mitigation

**October 29, 2014**

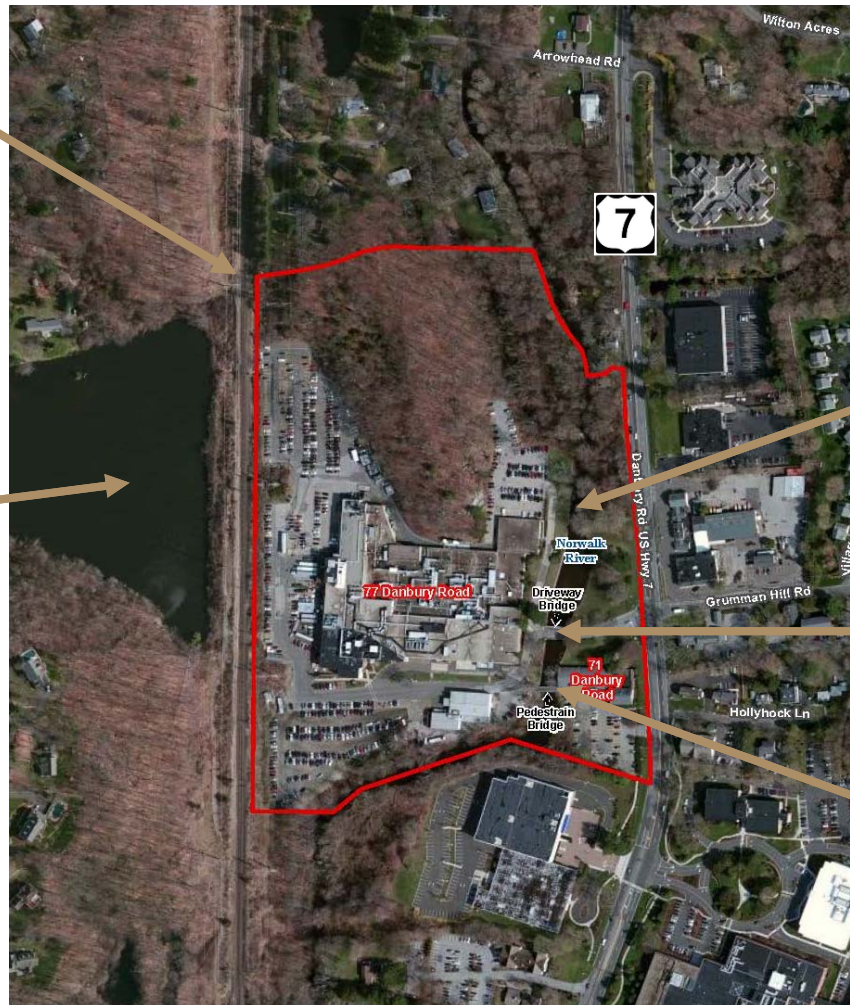
**Joseph Canas, PE, LEED AP, CFM,** Project Manager



# The Facility

Metro North  
Commuter Railroad

West Pond



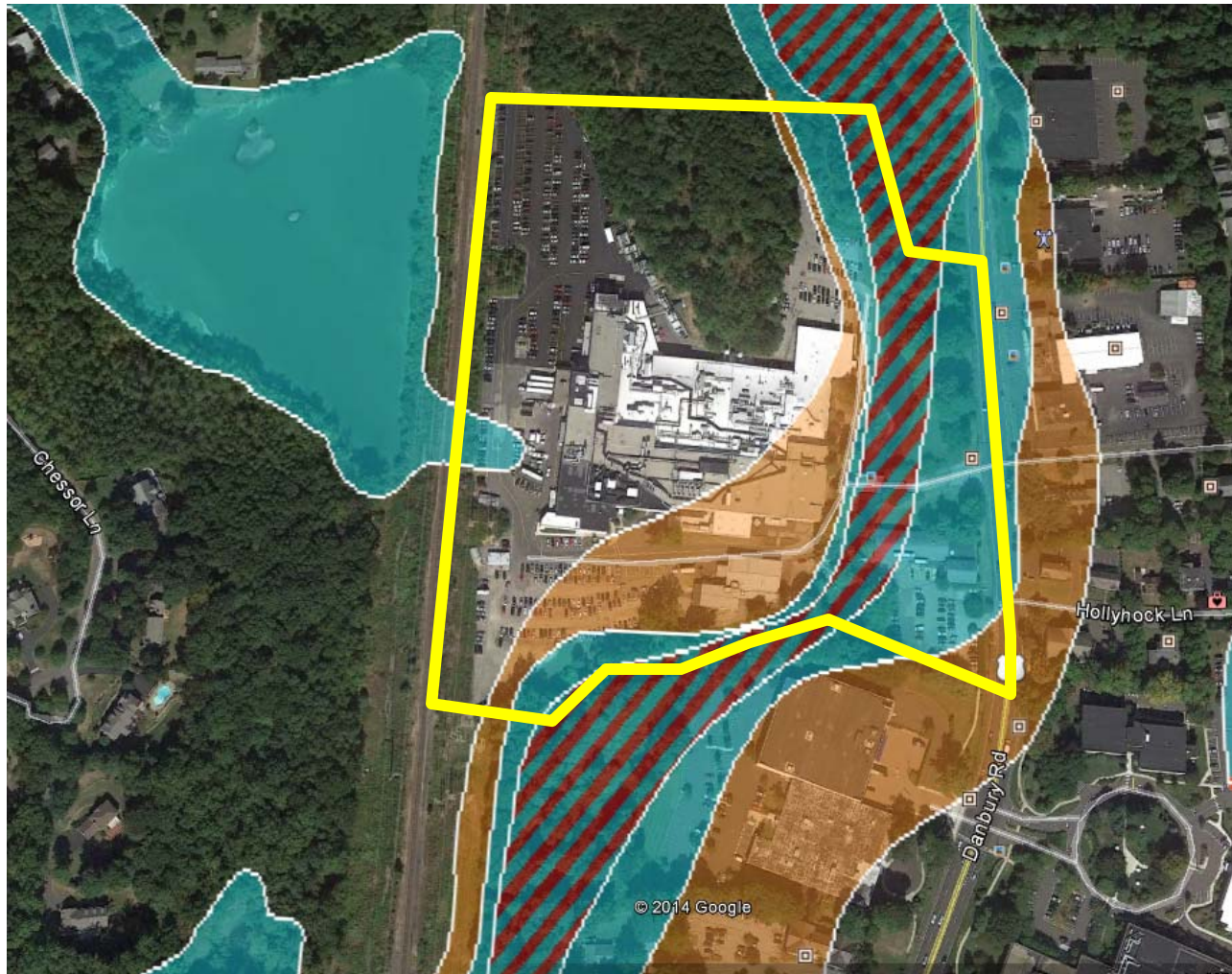
Norwalk River

Driveway Bridge

Pedestrian Bridge



# FEMA SFHAs



# Flooding Issues

- **Norwalk River had flooded the site in the past**
- **River came close to flooding facility on number of occasions**
- **Basement pump had failed, flooding basement**
- **Only a matter of time before it happens again!**



# Formula for Success





# Identify Potential Flooding Sources

## ■ Groundwater

- Pump failure

## ■ Norwalk River

- Overtops banks

## ■ West Pond

- Culvert plugging
- Embankment breach


## ■ On-Site Storm Drains

- Pipe blockages
- Inlet blockages









# Selecting the Level of Protection

## ■ 1% Annual Chance Protection Not Enough

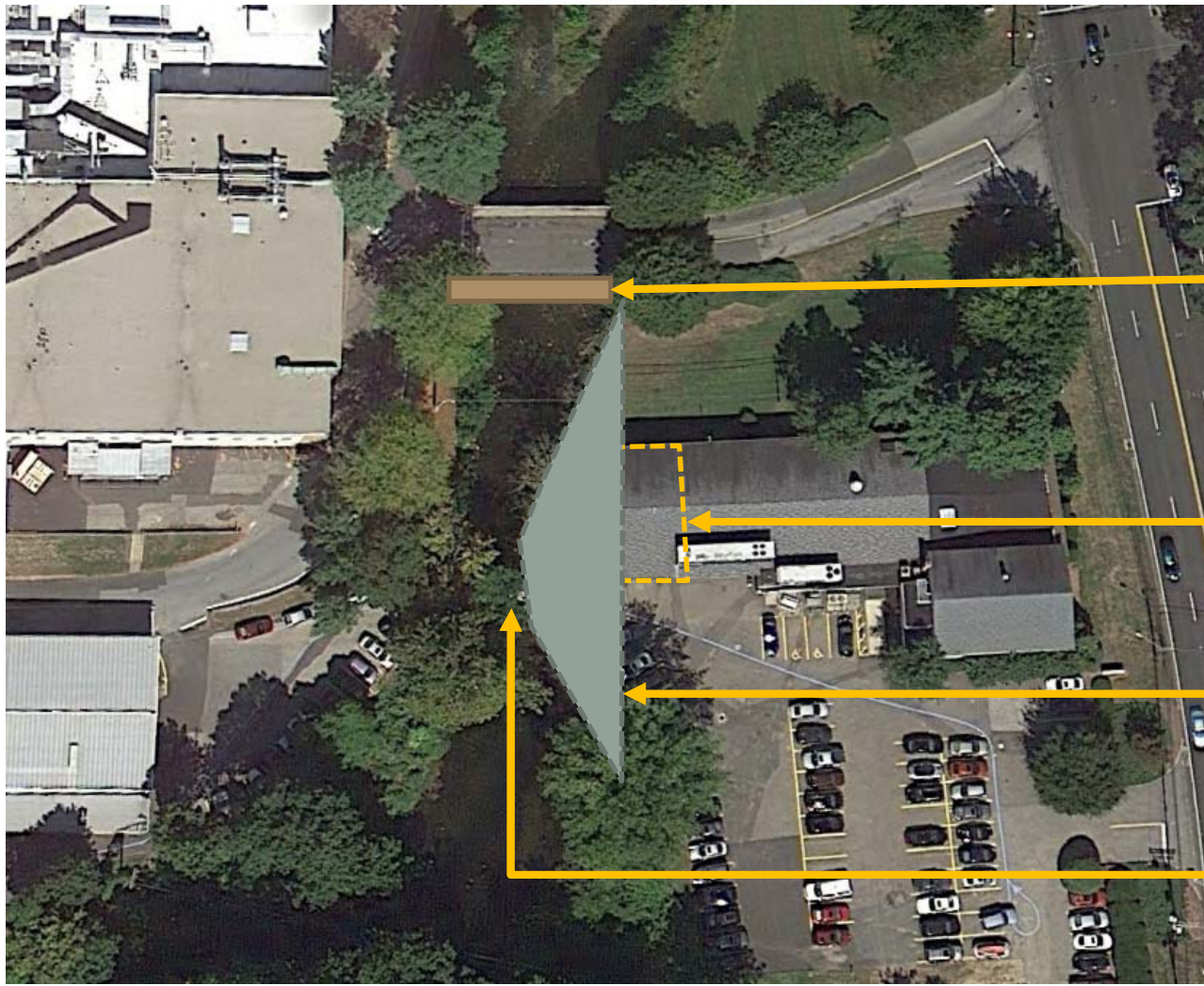
- Sensitive Equipment
- Loss of Productivity
- Financial Exposure of Flooding 
- Disruption to Supply Chain

## ■ Insurers Requested

- 2 Feet of Freeboard Along River  
- Regrading Parking Lot to Increase Pitch Away From Building  
- Draining the West Pond  



# Selected Mitigation Strategy



Cantilever New Walkway

Demolish Portion Of Building

Widen Channel

Remove Exist. Pedestrian Bridge





1% Chance WSEL Reduction

↓ 2.68 feet

↓ 1.23 feet

Upstream neighborhood

# Approval Agencies

## ■ Meet with approval agencies

- Town of Wilton DPW
- Town of Wilton Inland Wetlands
- CTDEEP Fisheries
- US Fish & Wildlife Service
- CTDEEP Inland Water Resources Division
- US Army Corps of Engineers



**US Army Corps  
of Engineers®**



# Approval Agencies

- **Meet early in process**
- **Identify concerns upfront**
- **Partnership for success**
- **Collaboration takes time!**





# Approval Timeline - 2013

Feb. 05

- Applications Submitted to Regulatory Agencies

May 15

- CTDEEP 401 Water Quality Certification

June 04

- USACOE CT PGP Approval

Aug. 08

- Town of Wilton Inland Wetlands Permit





# West Pond

- **Walked site, found two outlets**
- **Risk assessment assuming pond and spillway plugged**
  - 8 different scenarios
- **Consideration of other risks**
  - Embankment failure
  - Power transmission company modifications



# West Pond

- **Mitigation strategies limited**
- **Primary concern was railroad's maintenance**
- **Met onsite with Metro North and CTDOT**
- **ASML wanted easement to maintain pond culvert**
- **Force account for additional maintenance**





# Key Takeaways

- **Involve stakeholders**
- **Identify synergies and trade-offs**
- **Meet early with approval agencies**
- **Set appropriate level of risk**
- **Look beyond the FIRM to identify risks**
- **Collaboration takes time!**