Wallkill River

Floodplain Bench Project – Phase 1

October 2016

Orange County

OCSWCD

Kevin Sumner

Barton & Loguidice, D.P.C.

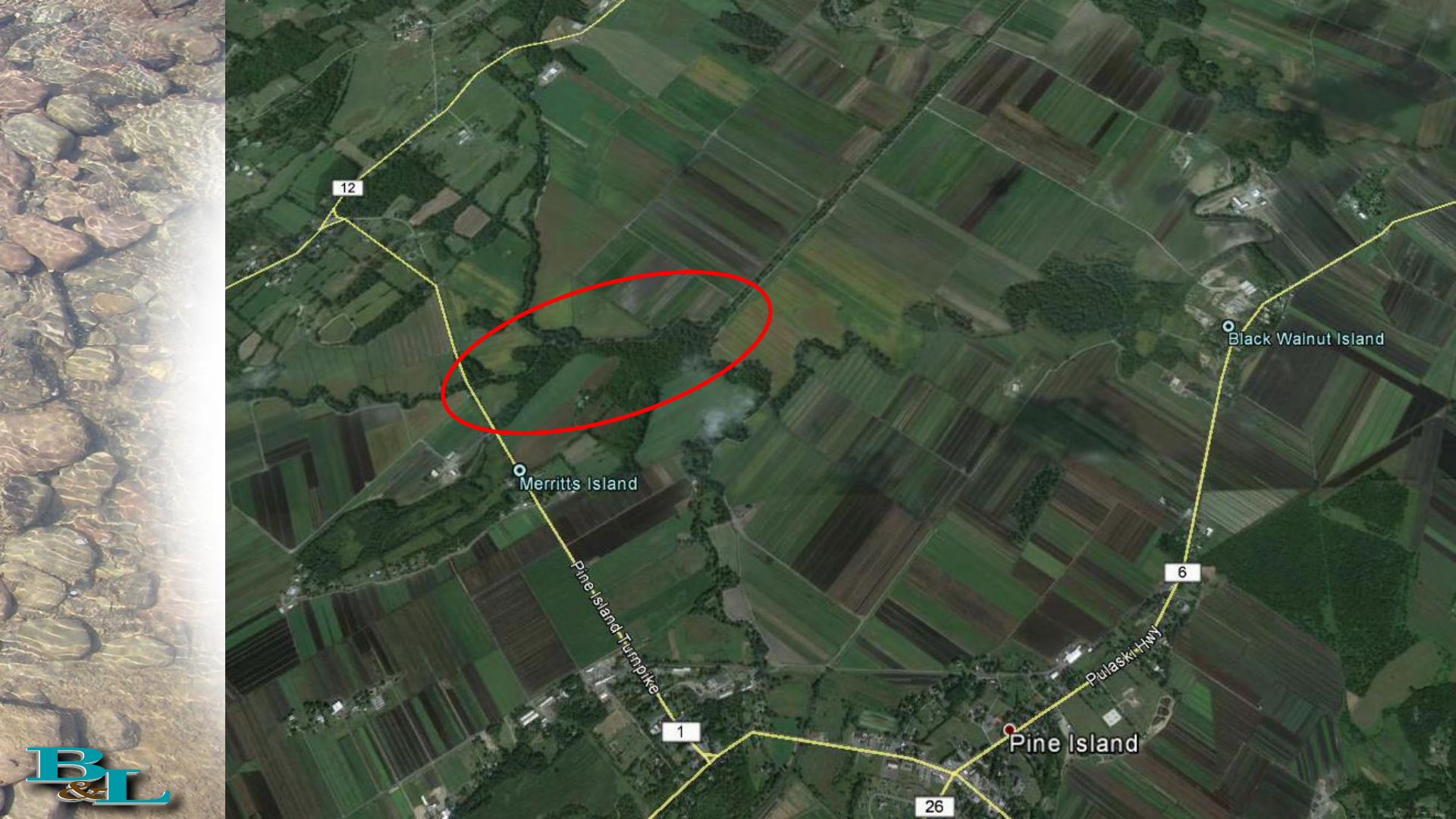
Engineers • Environmental Scientists • Planners • Landscape Architects

Wendell Buckman

Introduction

- Location
- Define the Problem
- History


NEWBURGH
MIDDLETOWN
PROJECT
Orange
Rockland
© 2016 Google
Google earth

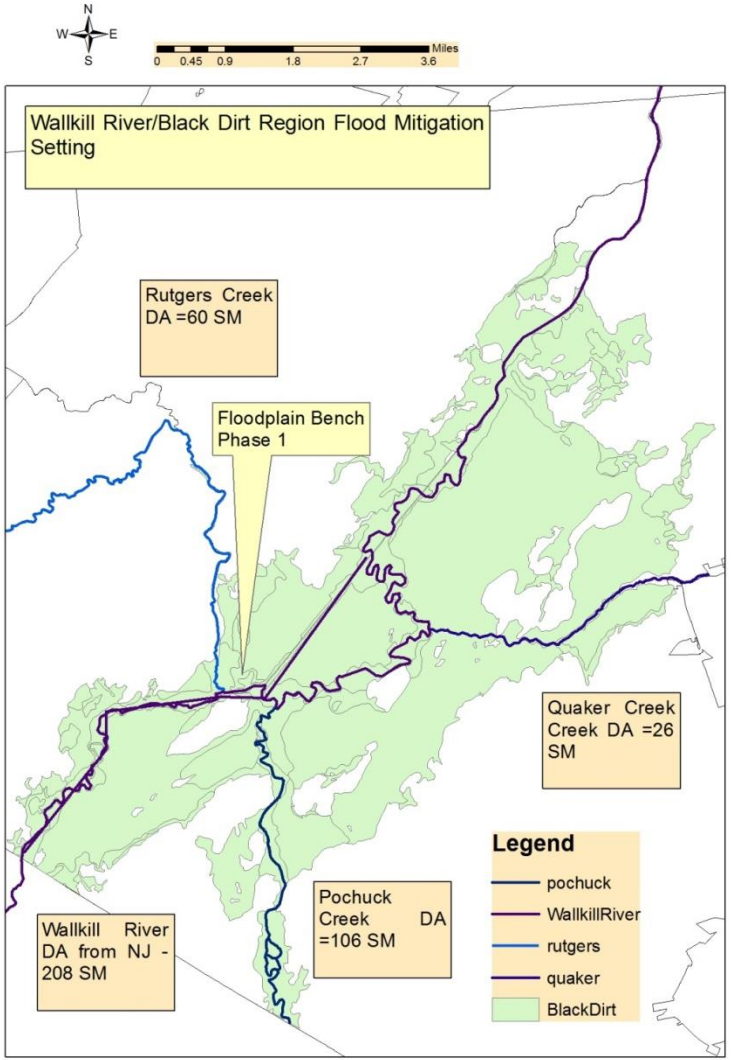

12
Merritts Island
Pine Island Turnpike
1
Black Walnut Island
6
Pulaski Hwy
Pine Island
26

Define the Problem

- Extremely flat topography
- Less than 25 feet of elevation drop in the main channel through the 12.5 mile Black Dirt region
- Farm fields supply produce to New York City
- Minimize time lost on fields

History

- **Black Dirt**
  - What is it?
  - Why is it significant?
- **Drainage District**
- **1930's ACoE Project**
- **1980's ACoE Project**



History

- **Current Project**
  - Grant obtained to address flooding after Irene
  - Created Committee of local farmers to administer
  - Alternative Analysis
  - Implementation of Priority Projects

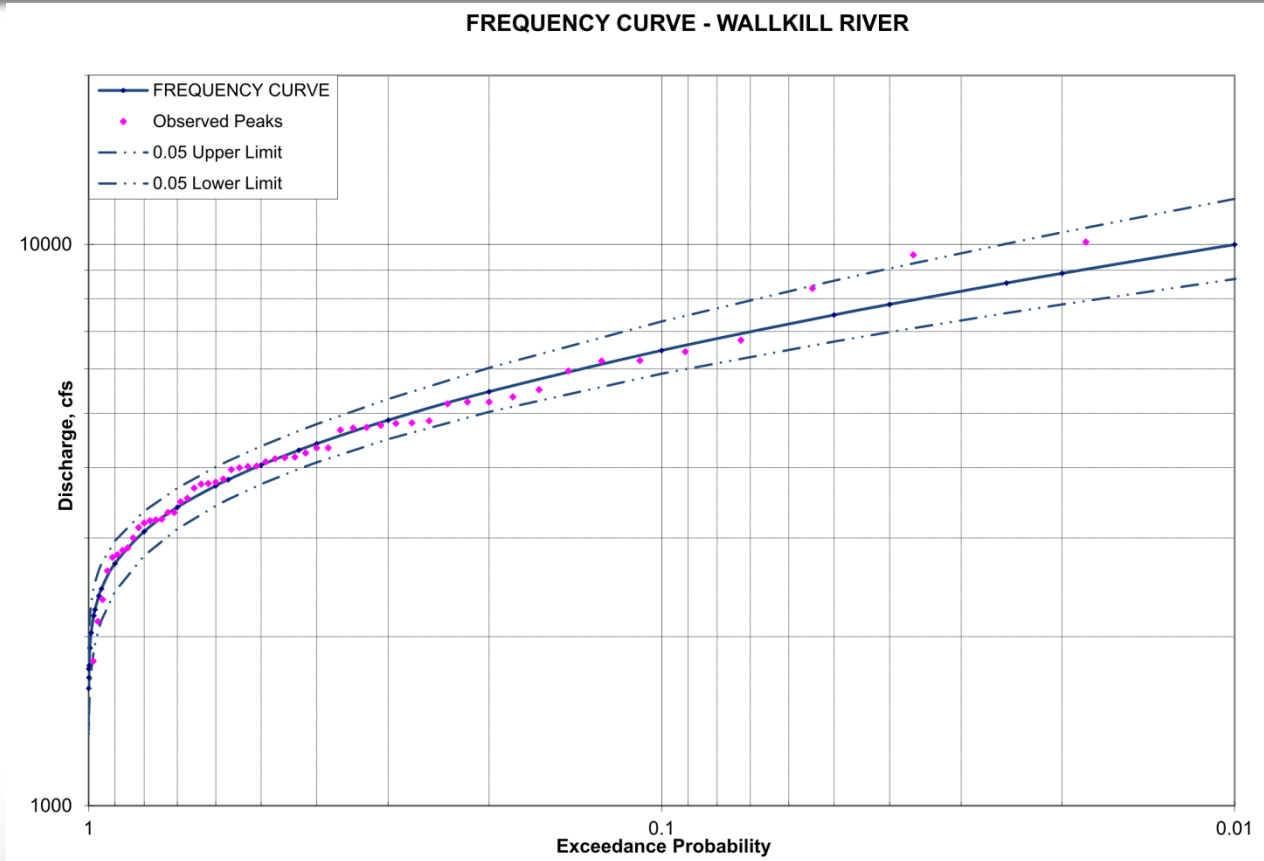
Alternative Analysis

- Hydrology
- HEC-RAS Model
- Priority Projects

Hydrology

- **Gage Station Data**
  - Wallkill River near Pellets Island Road
  - Pochuck Creek near Newport Bridge Road
  - Rutgers Creek near Carter Road
  - Quaker Creek in Florida, NY
- **Log Pearson Type III Frequency Analysis**
- **Hydrographs**

Hydrology

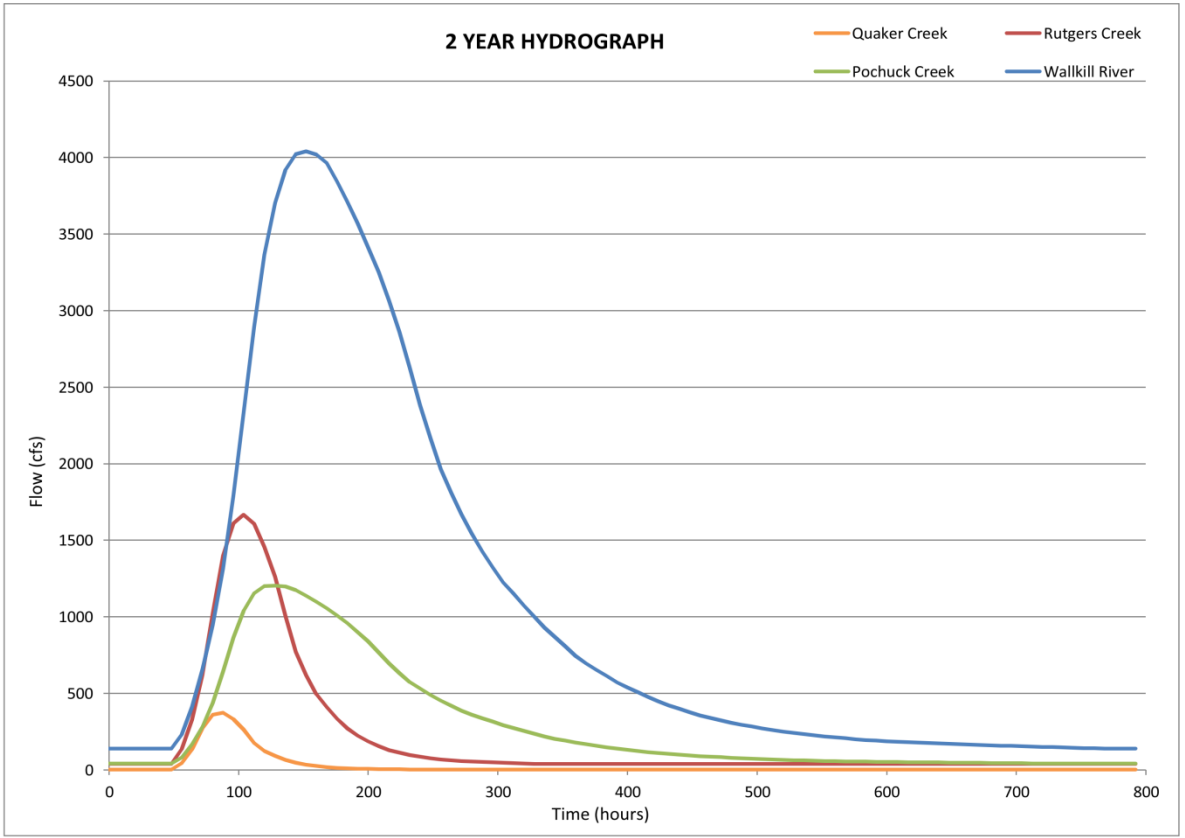

FREQUENCY CURVE - WALLKILL RIVER
FREQUENCY CURVE
Observed Peaks
0.05 Upper Limit
0.05 Lower Limit
10000
1000
Discharge, cfs
1
0.1
0.01
Exceedance Probability

Hydrology

Peak Discharges (cfs)

Event	Gage Station			
	Wallkill River	Pochuck Creek	Quaker Creek	Rutgers Creek
2 Year	4,045	1,207	376	1,667
5 Year	5,466	1,721	553	2,438
10 Year	6,473	2,109	684	3,037
25 Year	7,488	2,518	817	3,681
50 Year	8,882	3,105	1,005	4,627
100 Year	9,993	3,593	1,156	5,428
500 Year	12,811	4,901	1,547	7,640

Hydrology


2 YEAR HYDROGRAPH
Quaker Creek
Rutgers Creek
Pochuck Creek
Wallkill River
Flow (cfs)
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0
100
200
300
400
500
600
700
800
Time (hours)

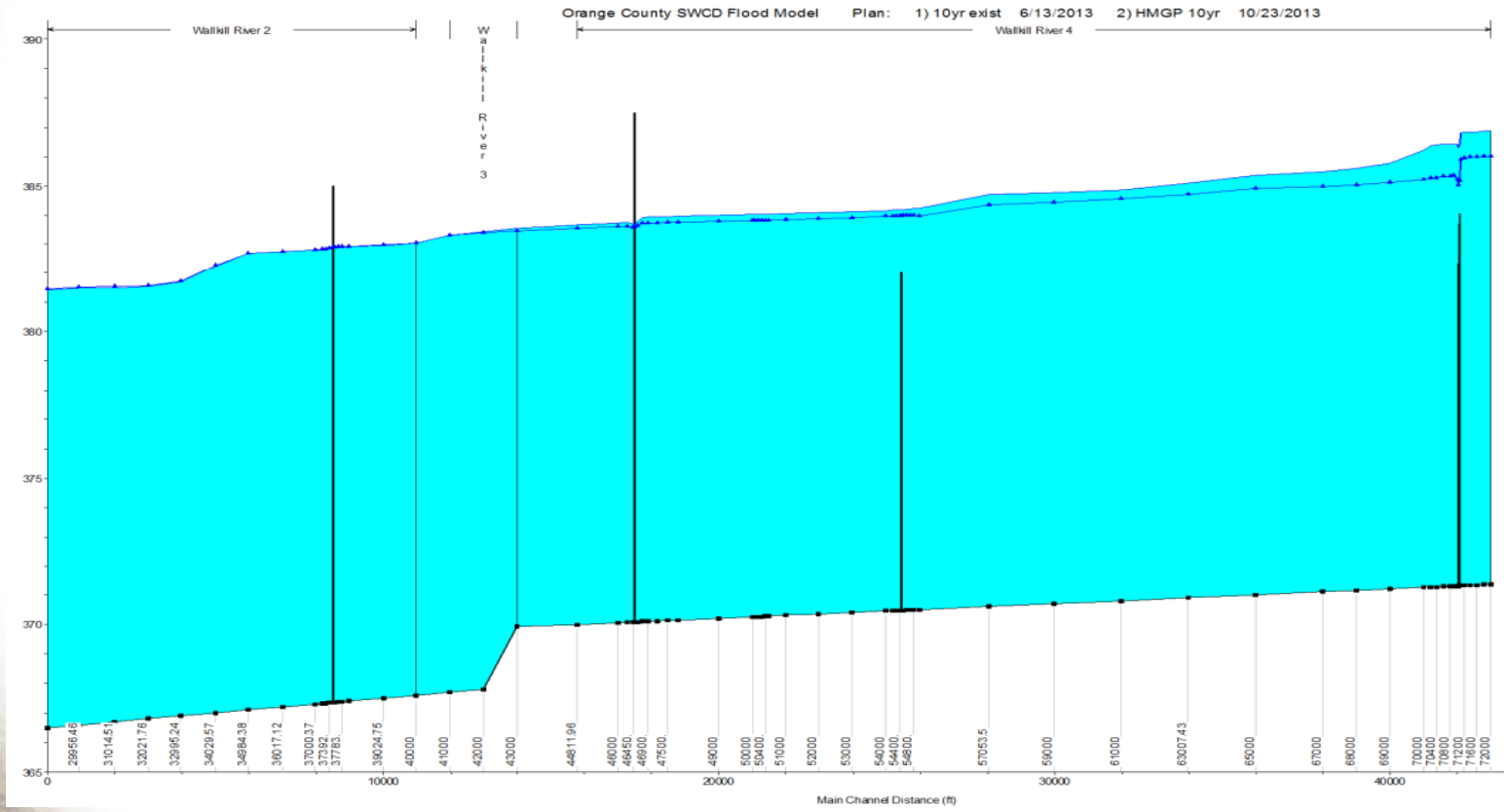
Hydraulics

- HEC-RAS – Army Corps of Engineers
- LIDAR Data
- Field Verification
- Existing Conditions Model (Baseline)
- Proposed Alternative Models

Hydraulics

- **Over 20 Alternatives evaluated**
- **3 Priority Projects Identified**
  - Pochuck Creek Rock Ledge
  - Celery Avenue Rock Ledge
  - Floodplain Bench Project

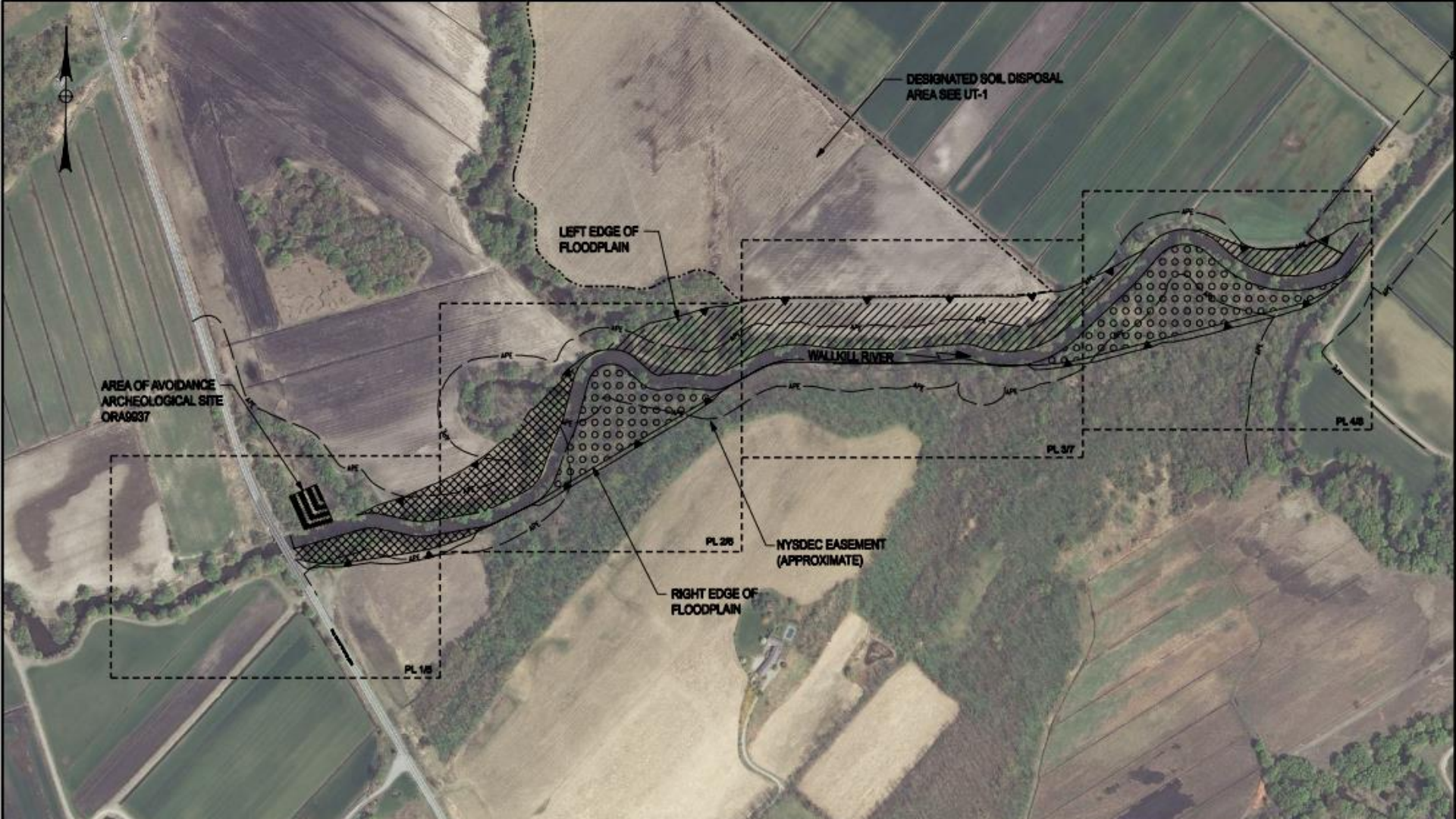
Hydraulics


Orange County SWCD Flood Model Plan: 1) 10yr exist 6/13/2013 2) HMGP 10yr 10/23/2013
Wallkill River 2
Wallkill River 3
Wallkill River 4
390
385
380
375
370
365
0
10000
20000
30000
40000
Main Channel Distance (ft)

Floodplain Bench Project

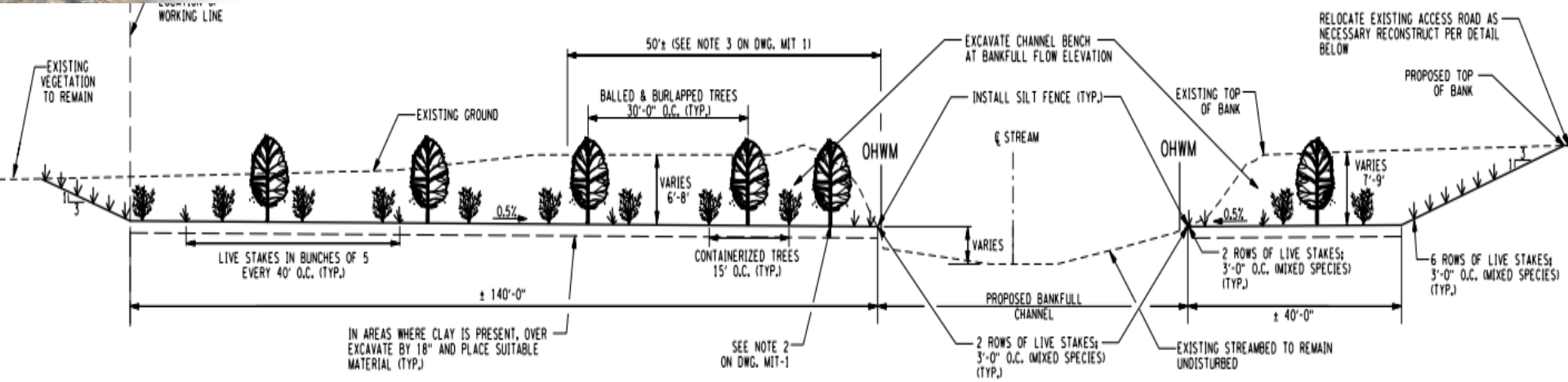
- **Objective:**

  Add conveyance while restoring and preserving the natural character of the stream.


DESIGNATED SOIL DISPOSAL AREA SEE UT-1
LEFT EDGE OF FLOODPLAIN
WALLKILL RIVER
AREA OF AVOIDANCE ARCHEOLOGICAL SITE ORA9937
APE
PL 4/8
PL 3/7
PL 2/8
PL 1/8
NYSDEC EASEMENT (APPROXIMATE)
RIGHT EDGE OF FLOODPLAIN

Floodplain Bench Project

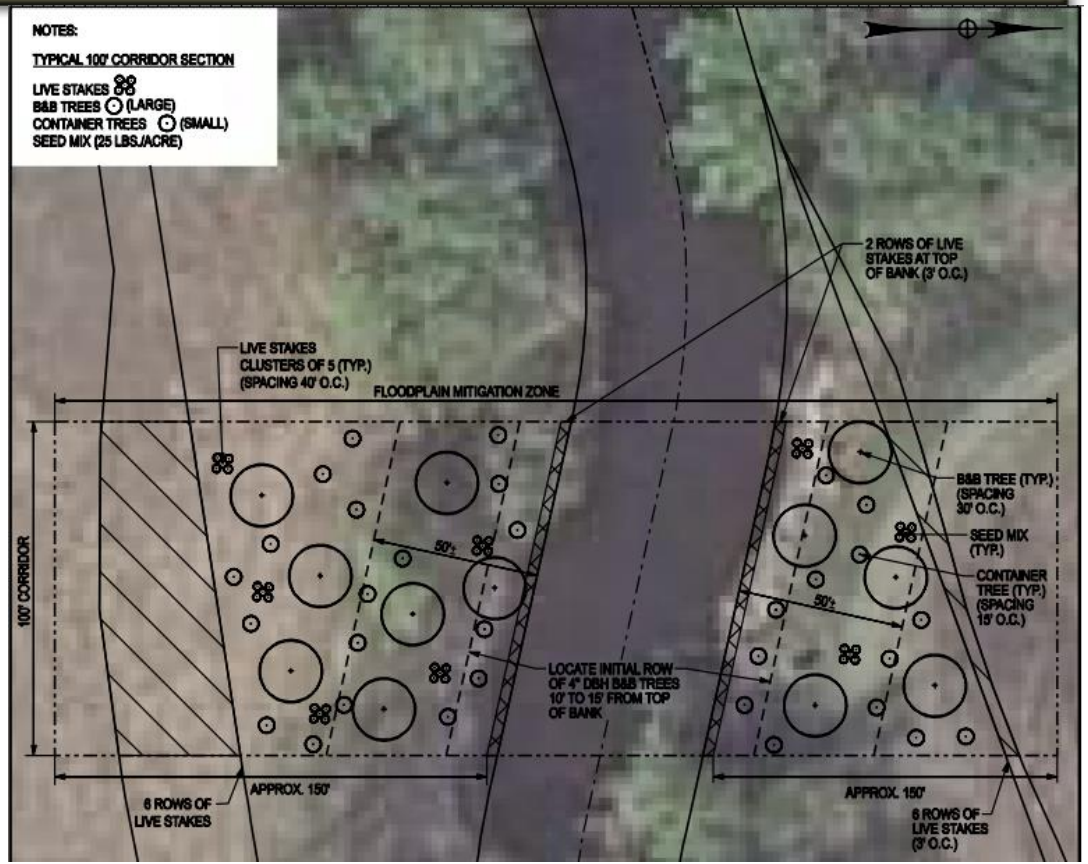
- **Typical Section**



Floodplain Bench Project

- **Planting Plan**

  2” versus 4” trees



Floodplain Bench Project

- **Benefits**
  - Reduce magnitude of flooding upstream
  - Reduce duration of flooding upstream (particularly smaller events)
  - Increased habitat along river

Floodplain Bench Project

- **Construction – Phase 1**
  - Began first week in August
  - Bench cut being completed this week
  - Planting beginning this week
- **Construction Photos**

Tree cutting before March 31st

Chipping April 2016

Large work force with articulating end dumps large capacity but not kind to soil

Large work force with articulating end dumps large capacity but not kind to soil

Wet working conditions, stabilization as work proceeds

Challenging soil conditions

GPS controlled grading

Acute erosion and sediment control concerns

Access road

Project starts at Rutgers Creek/Wallkill River confluence

Soil from excavation used to improve adjacent farm fields according to grading plan

Farm field grading plan includes chisel plowing before and after new soil placement

Complex soil layering including sedimentary peat

Complex soil layering including sedimentary peat

60,000 CY ~ 3,750 triaxle trips

200 foot wide floodplain bench construction proceeds

Truck traffic requires constant repairs to access roads

I hate when that happens

I hate when that happens

More E&SC

More E&SC

Segregating soil material

Next time-flotation equipment

Dealing with trees we are trying to keep

Wet bench issues

Trees laid out for planting

Quiz

1. *What statistical analysis was run to determine peak discharges?*

Quiz

1. *What statistical analysis was run to determine peak discharges?*

Log Pearson Type III

Quiz

2. *How many gage stations were utilized in the analysis?*

Quiz

2. *How many gage stations were utilized in the analysis?*

Four

- Wallkill River near Pellets Island Road
- Pochuck Creek near Newport Bridge Road
- Rutgers Creek near Carter Road
- Quaker Creek in Florida, NY

Quiz

3. *What were the benefits of the Floodplain Project?*

Quiz

3. What were the benefits of the Floodplain Project?

- Reduce magnitude of flooding upstream
- Reduce duration of flooding upstream (Particularly smaller events)
- Increased habitat along river

Quiz

4. *How many phases is the project being implemented in?*

Quiz

4. How many phases is the project being implemented in?

Three


Questions ?