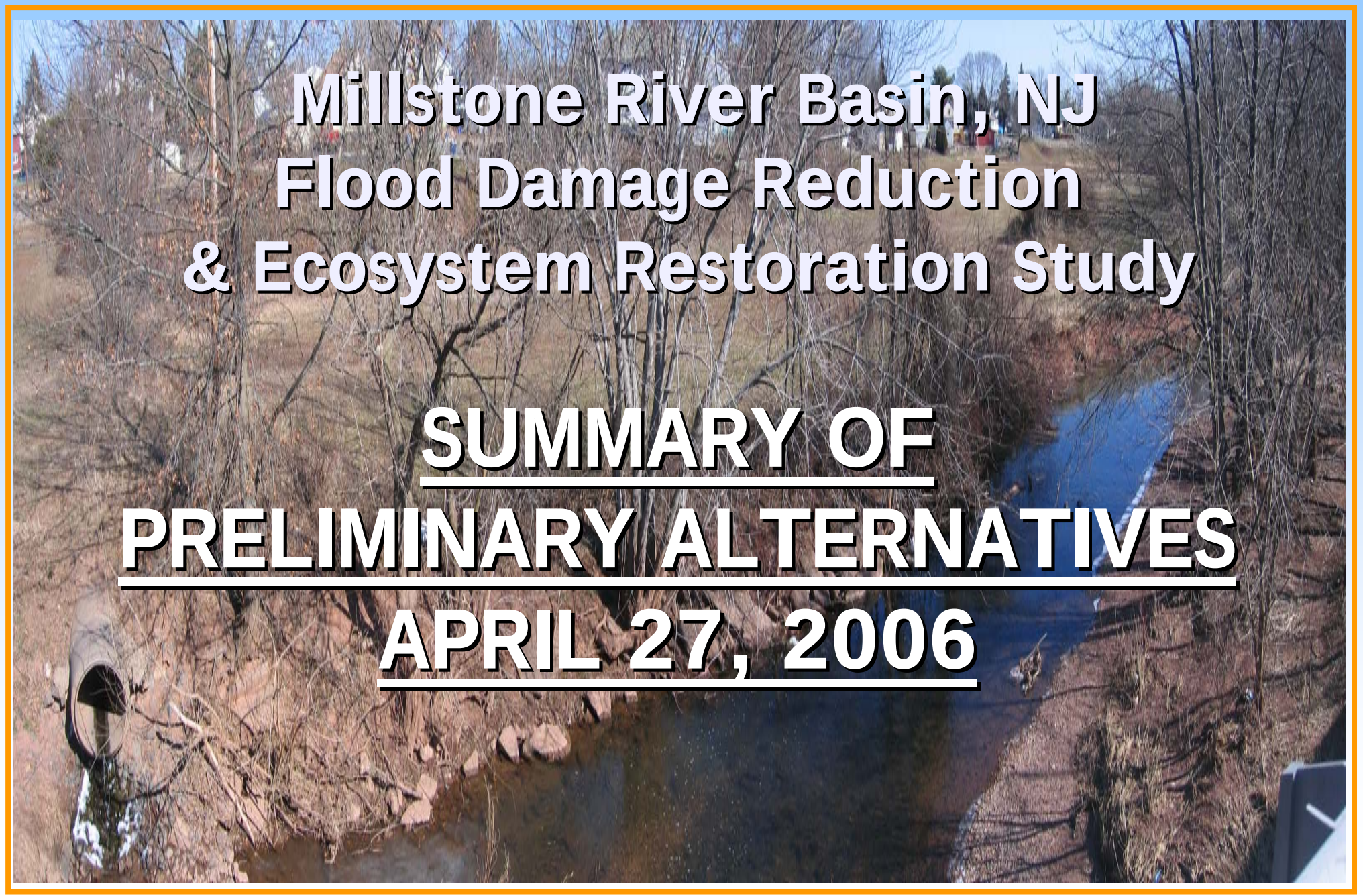
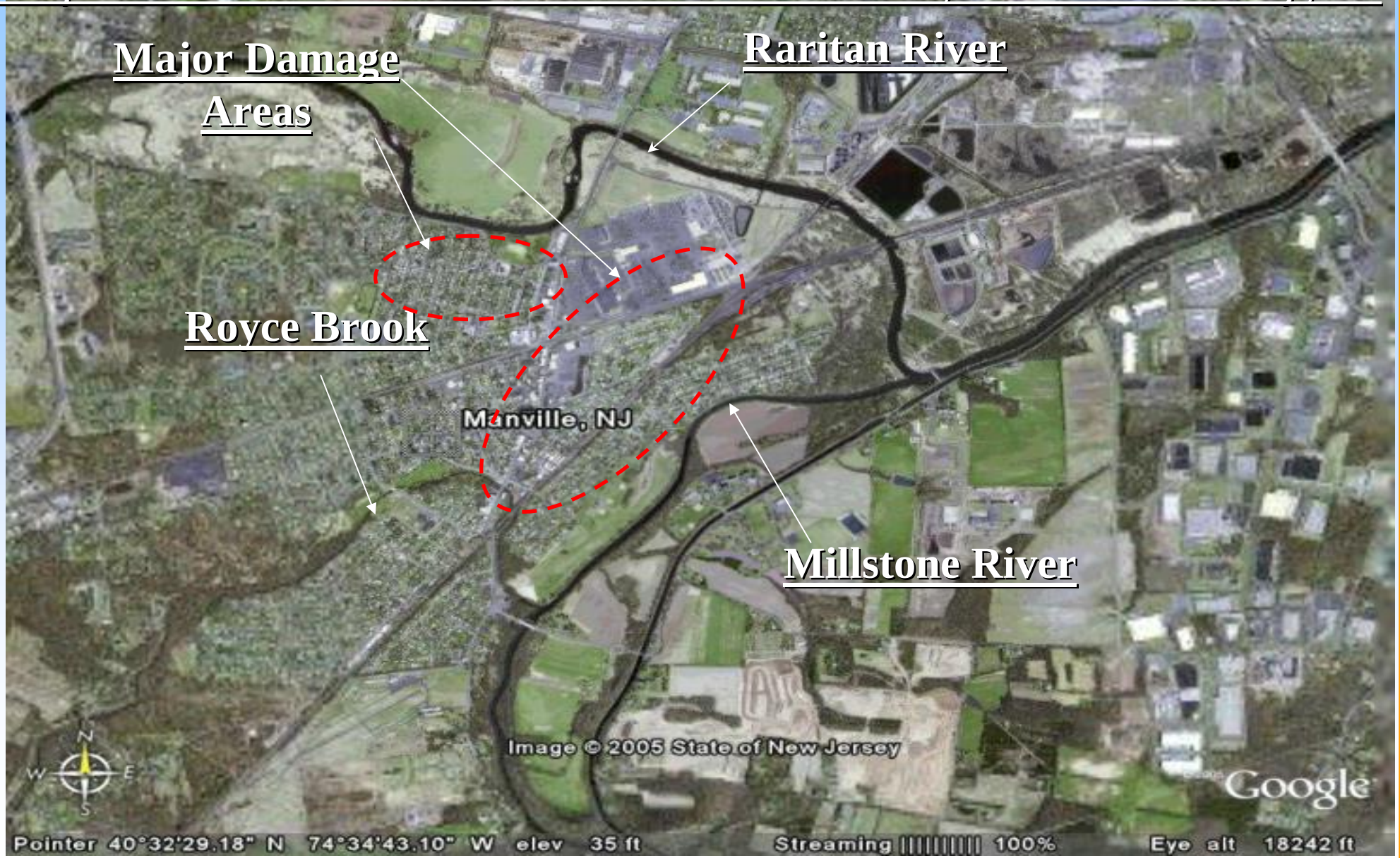


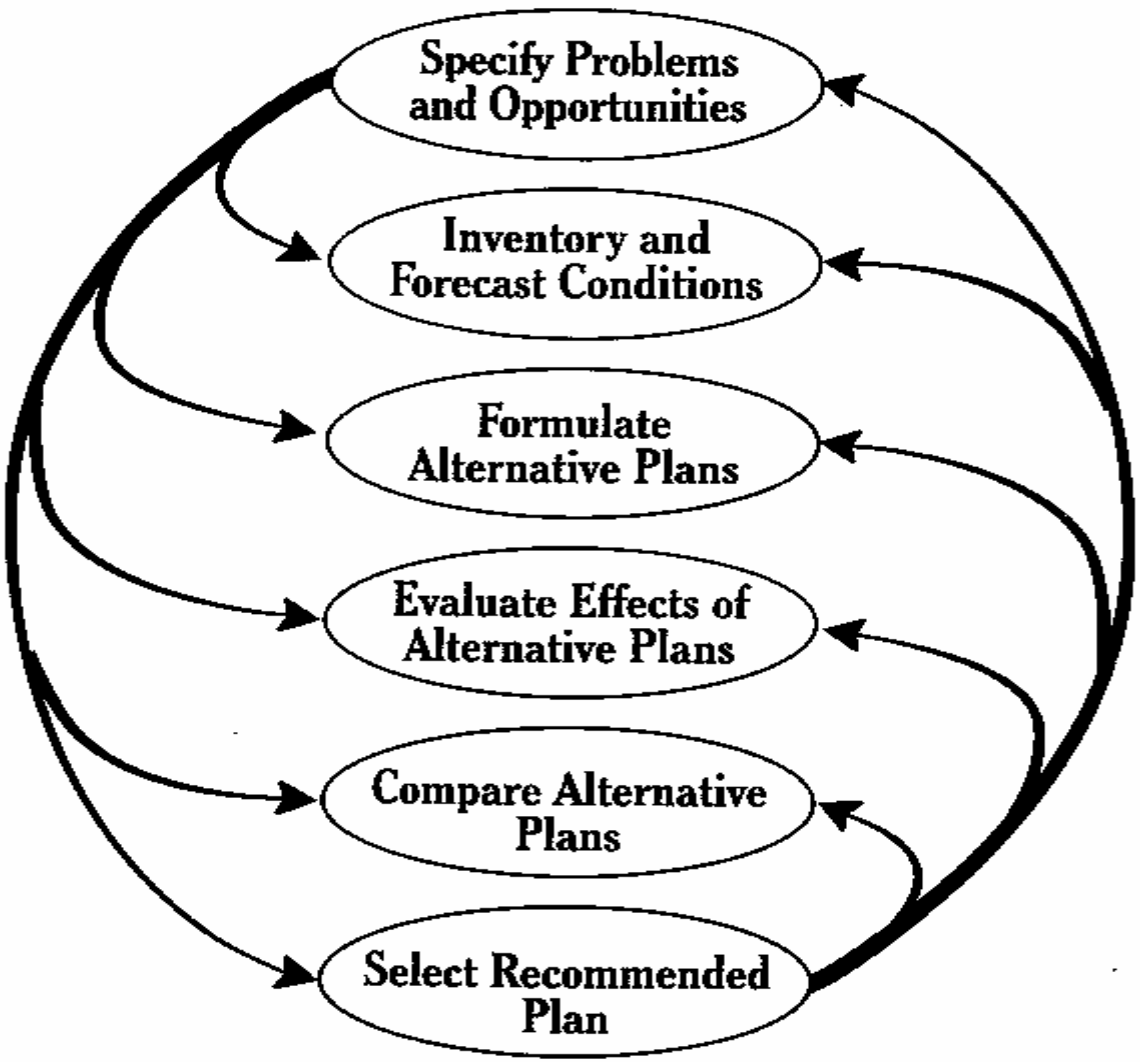
Millstone River Basin, NJ
Flood Damage Reduction
& Ecosystem Restoration Study

SUMMARY OF
PRELIMINARY ALTERNATIVES
APRIL 27, 2006

Project area: Millstone and Raritan River Basins, Somerset County, NJ



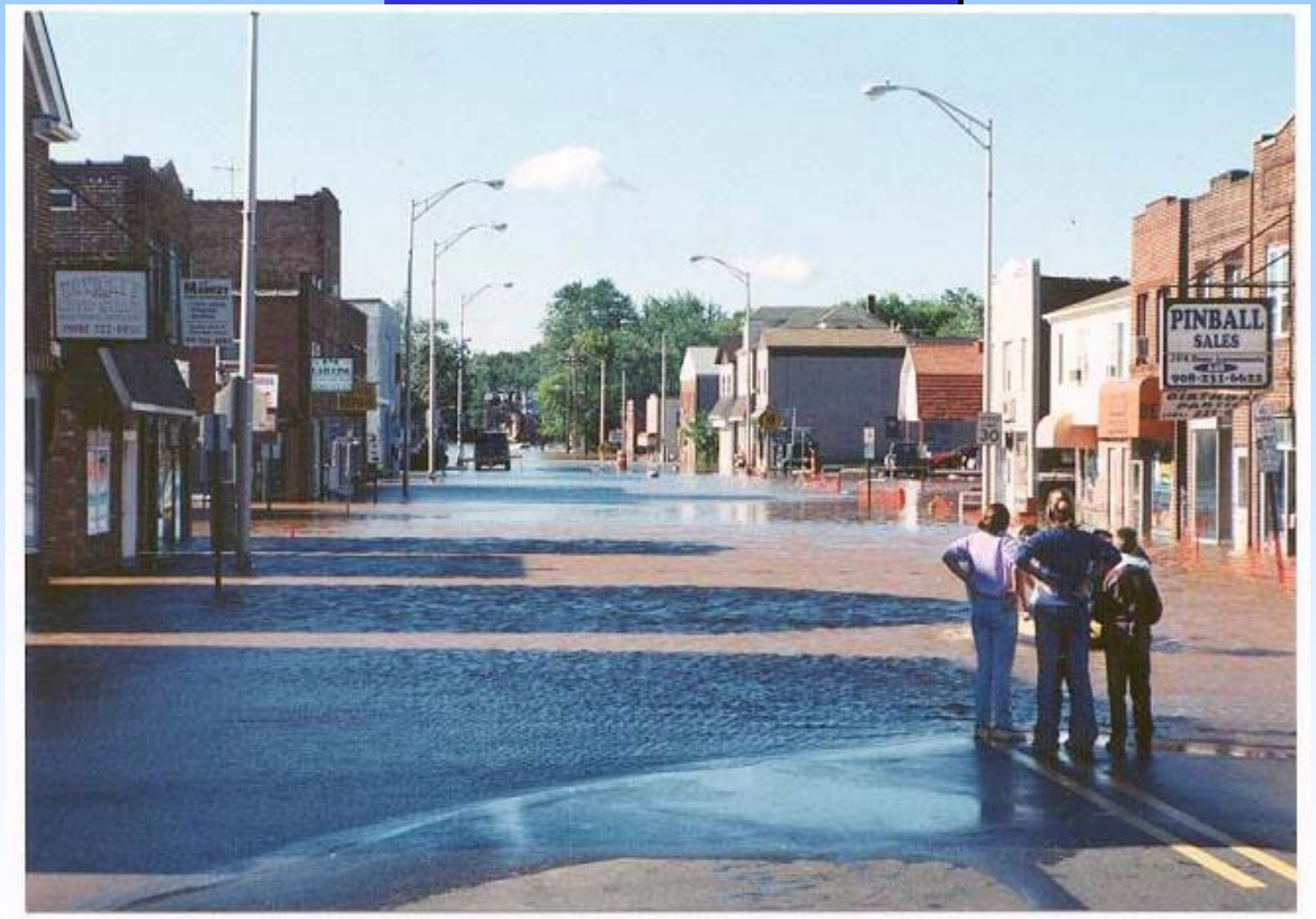
PLANNING PROCESS



Step 1: Specify Problems and Opportunities

Problems in the Millstone River Basin?

FLOODING!



South Main Street, Manville

AND MORE FLOODING!

John F Kennedy Blvd and South Main Street, Manville

Step 1: Specify Problems and Opportunities

Opportunities in the Millstone River Basin?

Reduce flood damages while optimizing potential ecosystem restoration elements.

Step 2: Inventory and Forecast Conditions

- Hydrologic and Hydraulic (H&H) Data
- Environmental Data
- Economic Data
- Structural Inventory
- Topographic Surveys
- Demographic Information
- Landuse/Zoning (present and future)

Step 3: Formulate Alternatives Plans

1. Levees/Floodwalls
2. Non-Structural Flood Measures (Floodproofing, Buyouts, Structure-raising, etc.)
3. Detention of Floodwaters
4. Flood Diversion Culvert
5. Channel Modifications, Dredging and Streambank Clearing
6. Modifications to existing Somerset County Flood Warning System
7. “No Action” Alternative

Constraints

- Proximity of structures to the river

Constraints

- Proximity of structures to one another
- General topography of the project area
- Environmental concerns
- Railroads

Step 4: Evaluate Effects of Alternative Plans

- Will it reduce flood damages and provide adequate protection?
- Socio-Economic impacts?
- Environmental outputs?
- Is it consistent with applicable policy, guidelines, and law?

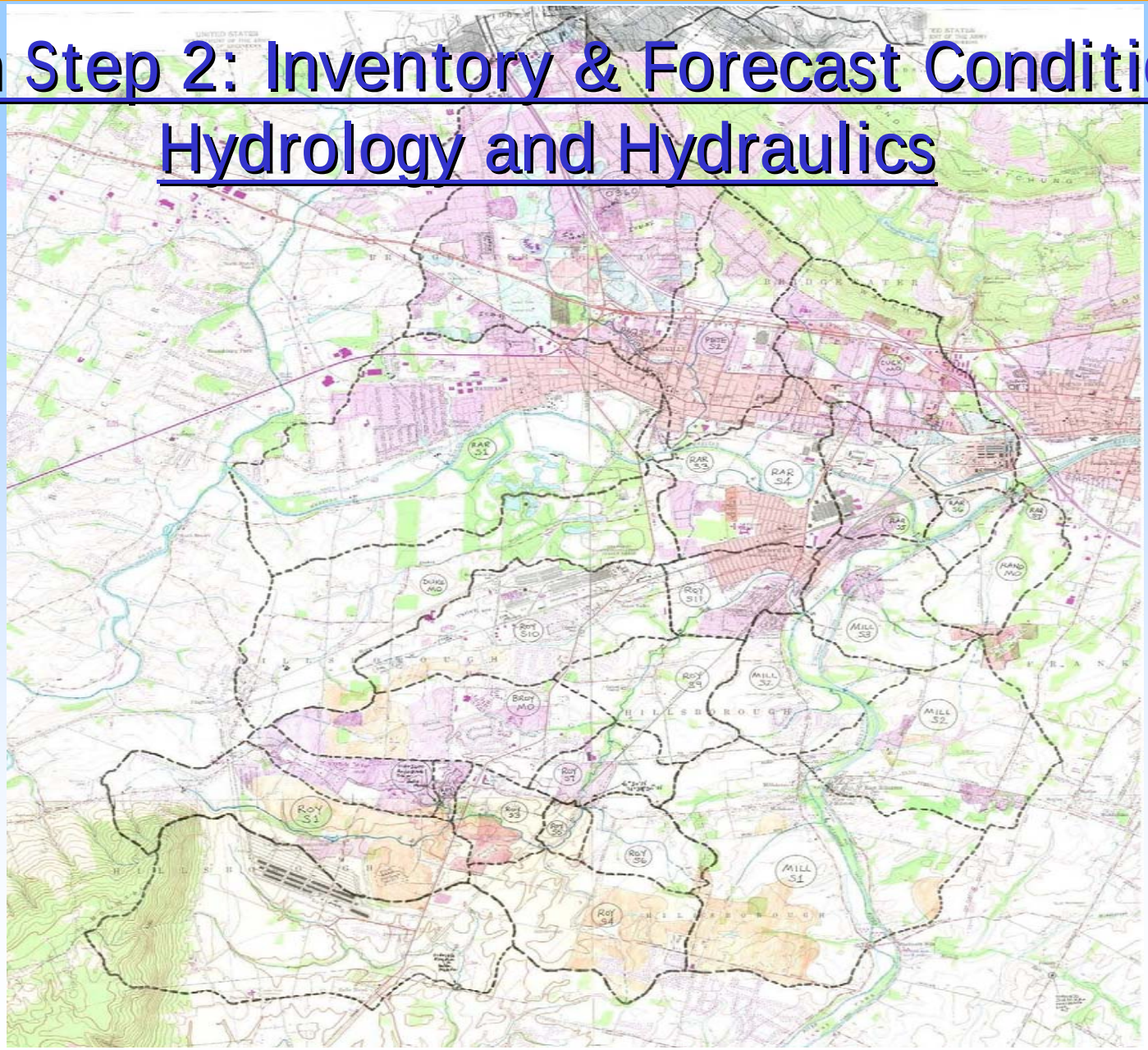
Step 5: Compare Alternative Plans

- Use data from Step 4 to evaluate plans' effectiveness
- Cost effectiveness

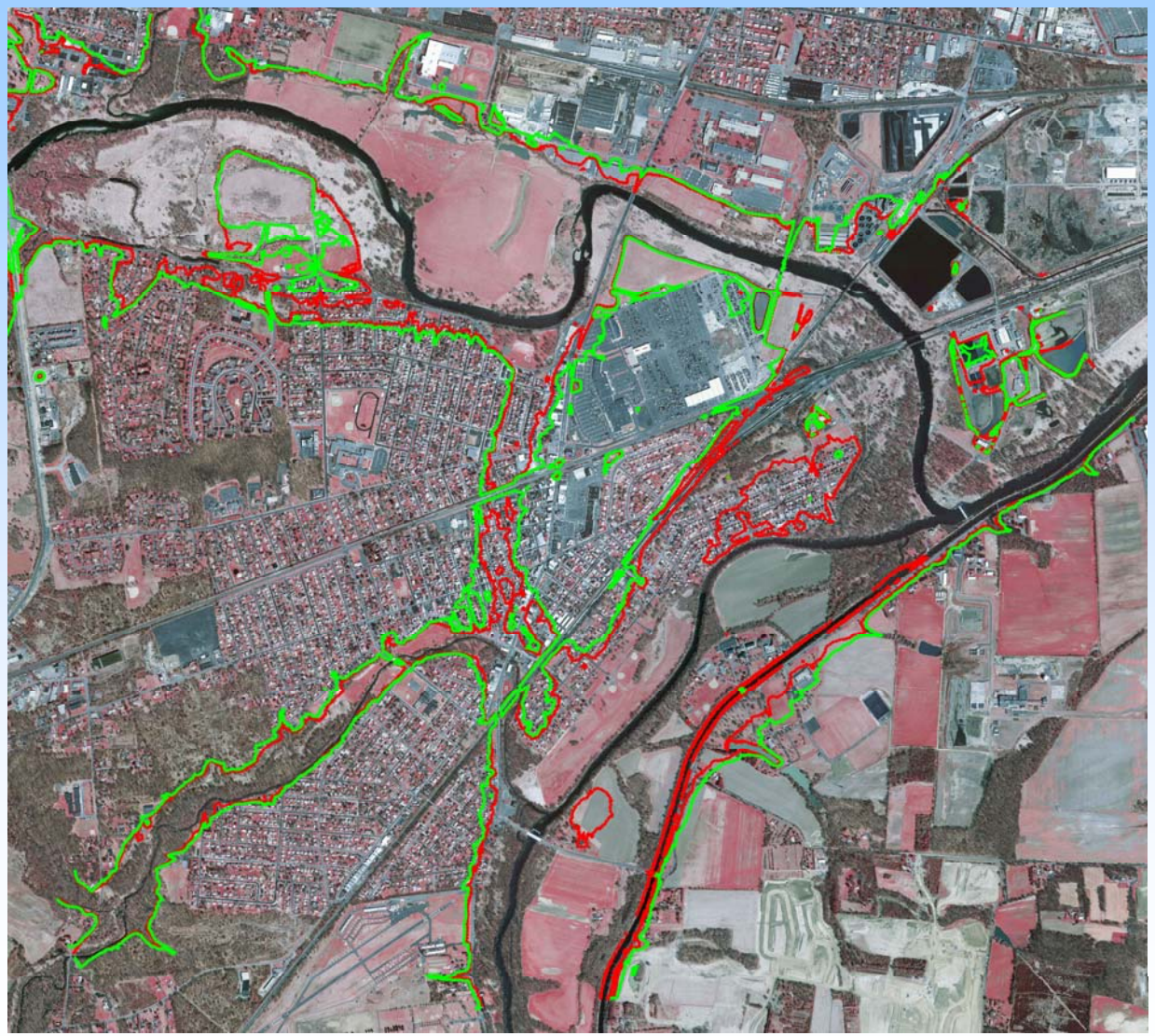
Step 6: Select Recommended Plan

From Step 2: Inventory & Forecast Conditions

From Step 2: Inventory & Forecast Conditions
Hydrology and Hydraulics



From Step 2: Inventory & Forecast Conditions

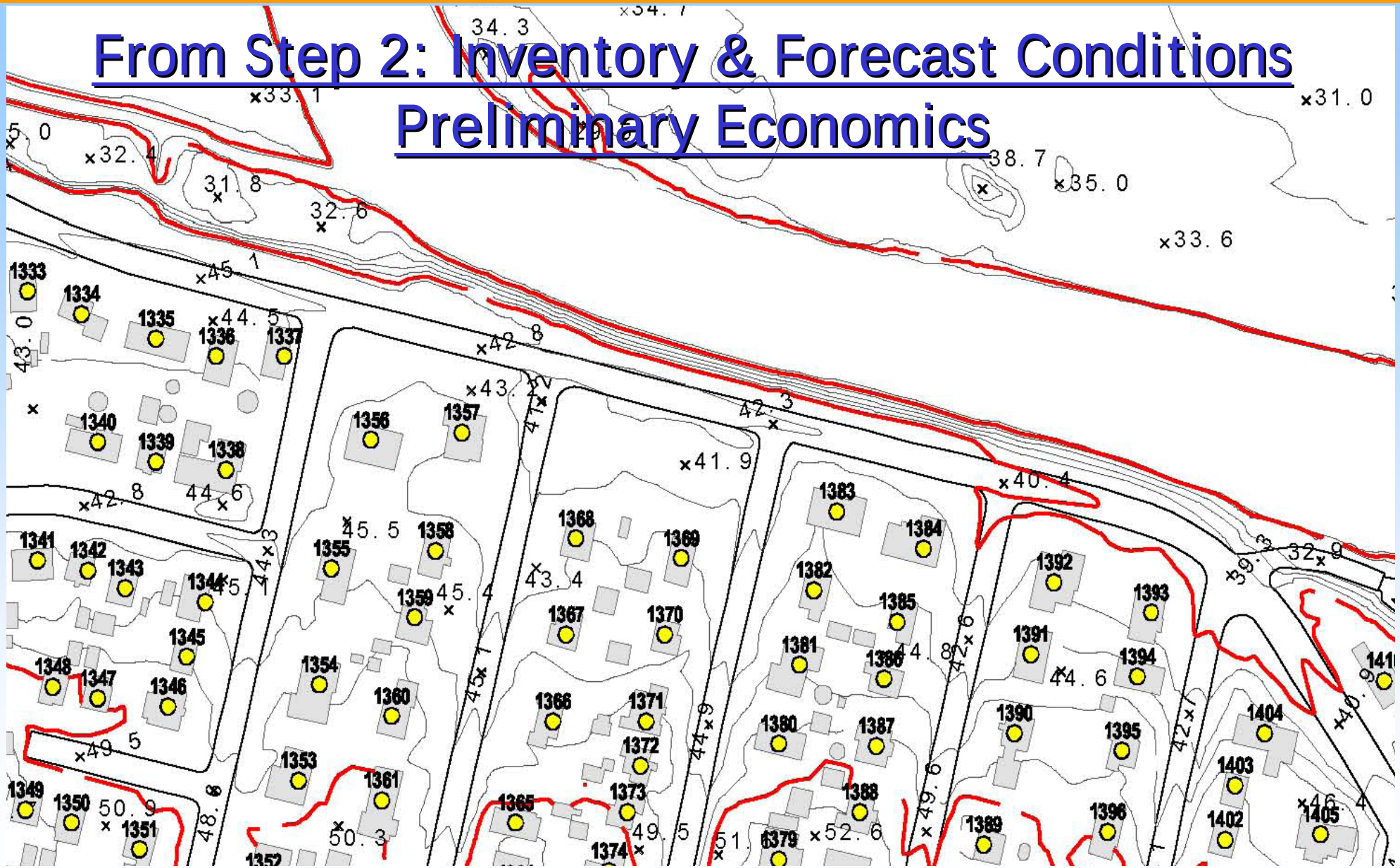


Floodplain

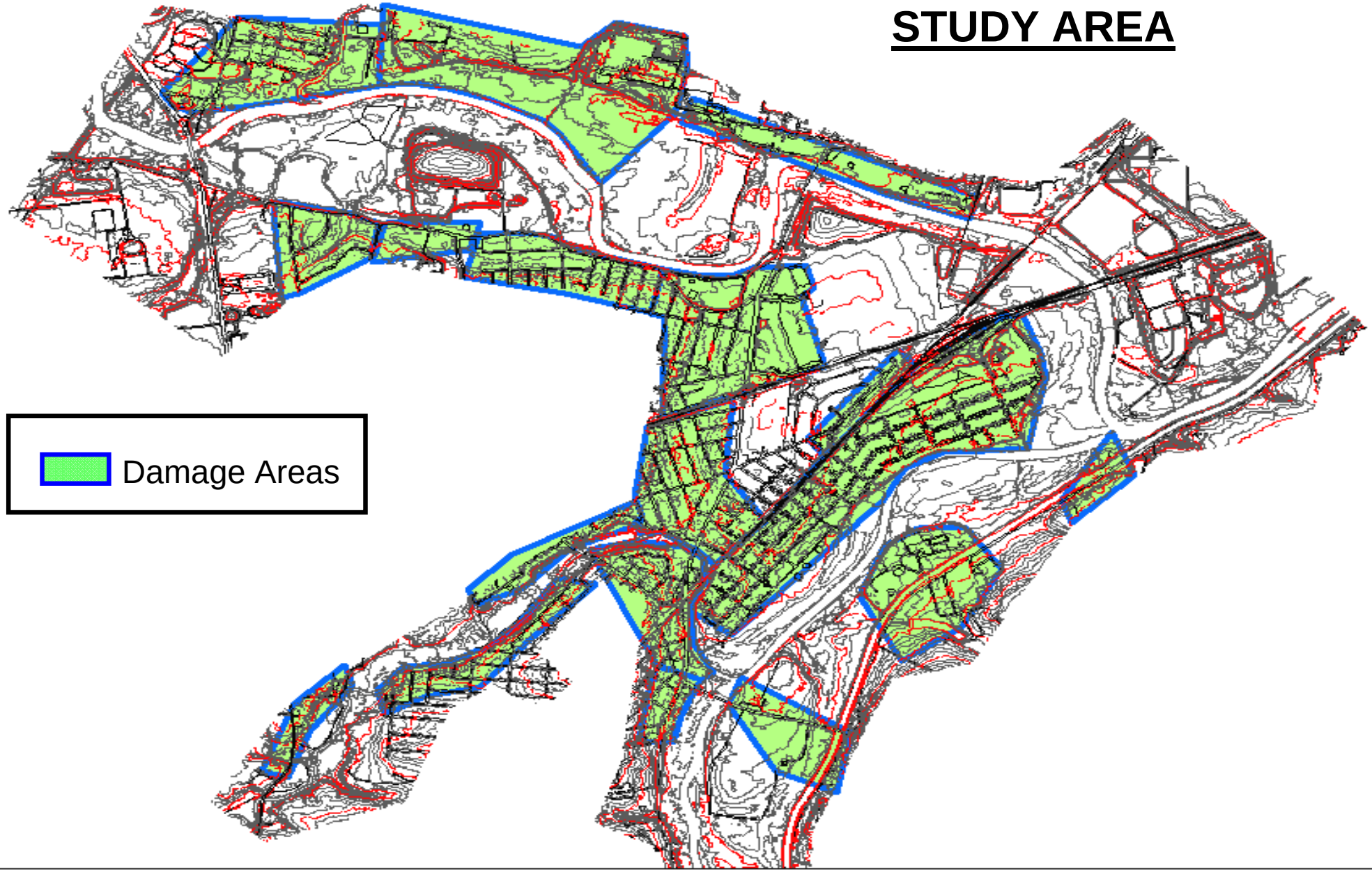
100 Year

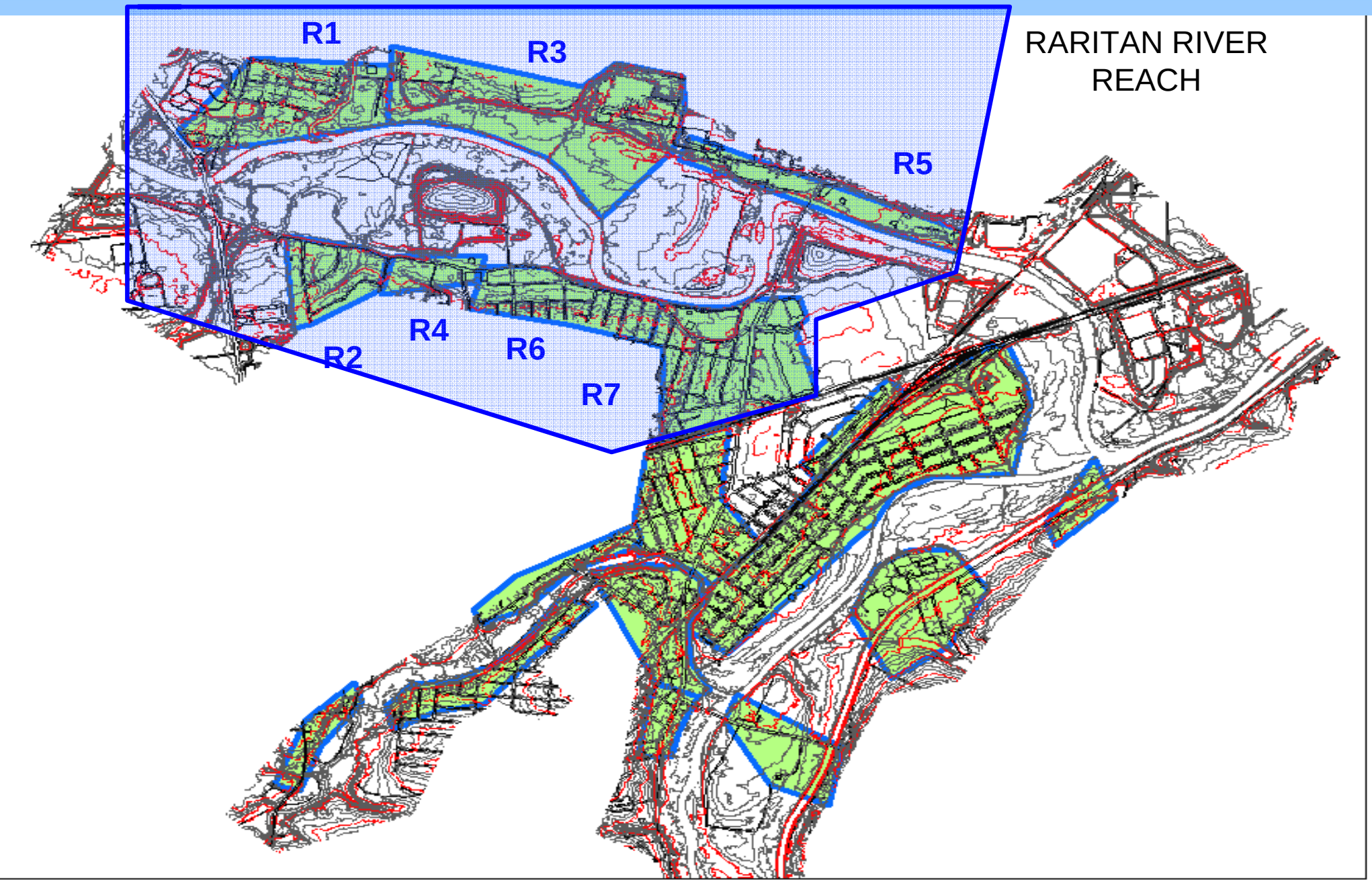
500 Year

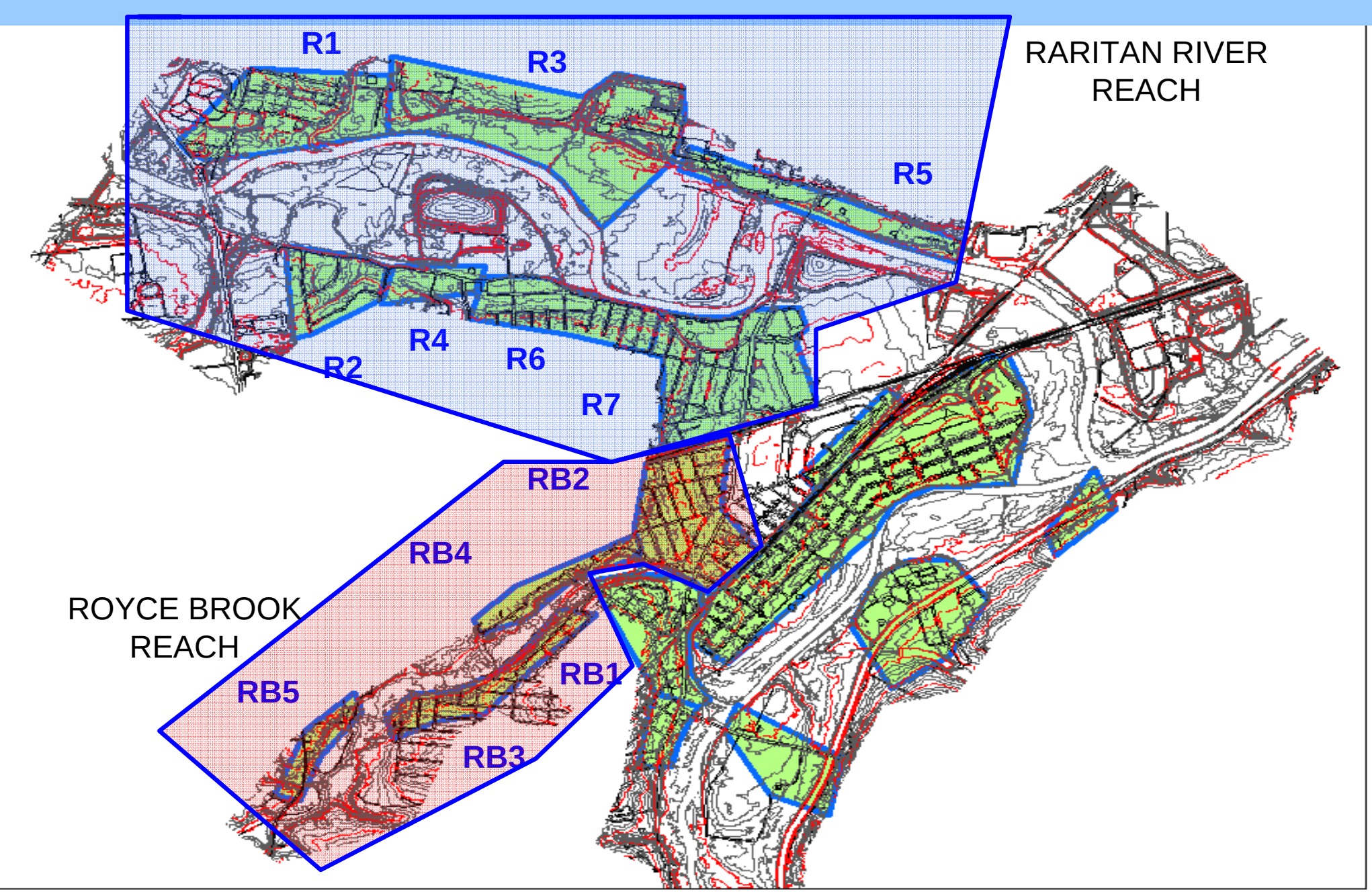
From Step 2: Inventory & Forecast Conditions
Preliminary Economics

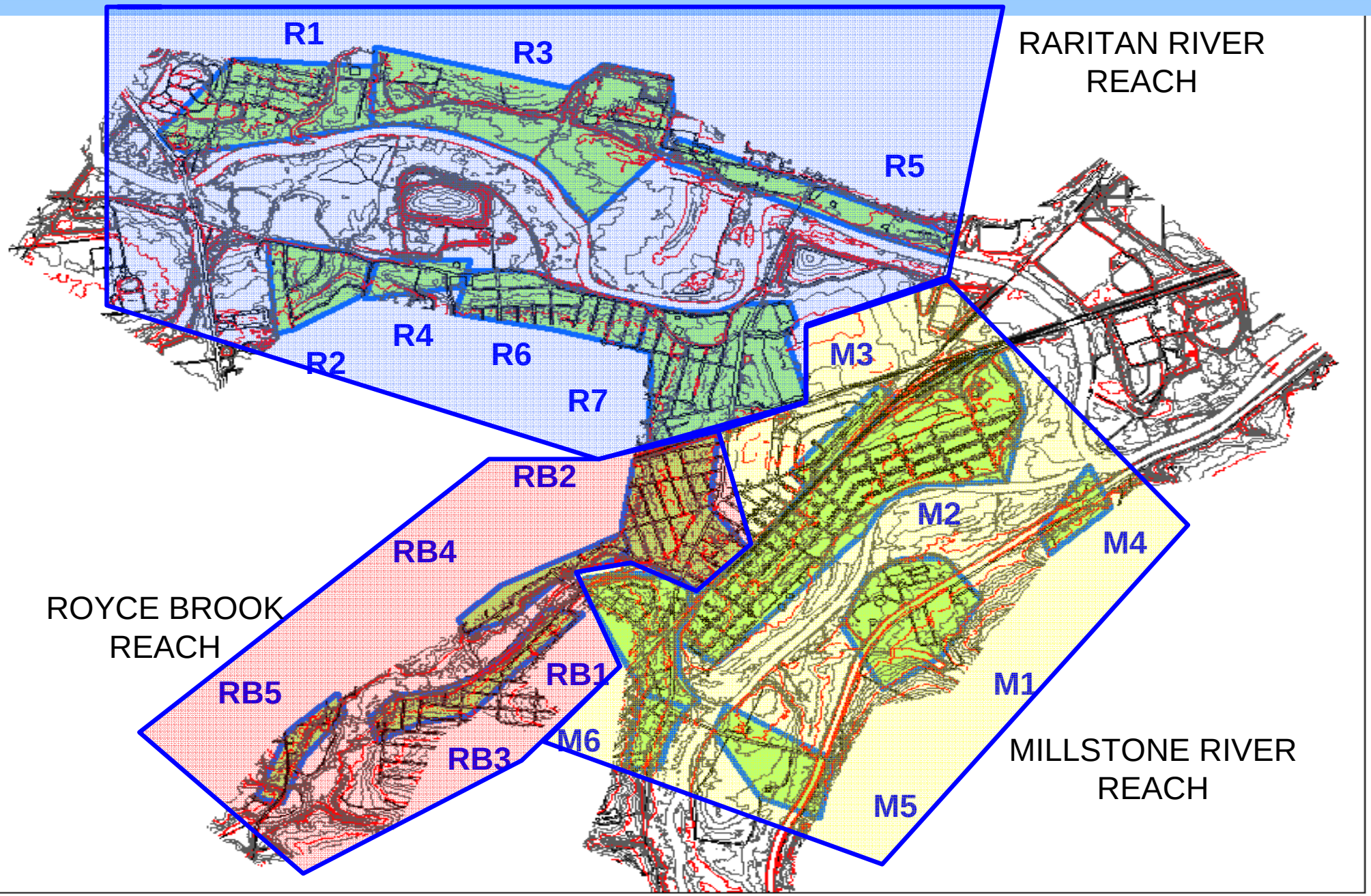


STUDY AREA




RARITAN RIVER
REACH
R1
R2
R3
R4
R5
R6
R7


R1
R3
RARITAN RIVER
REACH
R5
R4
R6
R2
R7
RB2
RB4
ROYCE BROOK
REACH
RB1
RB5
RB3


R1
R3
RARITAN RIVER
REACH
R5
R4
R6
R2
R7
M3
RB2
M2
RB4
M4
ROYCE BROOK
REACH
RB1
RB5
M1
M6
RB3
MILLSTONE RIVER
REACH
M5

From Step 2: Inventory & Forecast Conditions Preliminary Economics

Municipality	Structures within 100yr. Floodplain	Structures within 500yr. Floodplain
Manville	320	786
Zarephath SCC*	20	20
Zarephath*	1	3
Somerville	14	19
Bridgewater	7	10
Franklin	4	9
Hillsborough	10	25
Total	376	872

Area	Structures within 100yr. Floodplain	Structures within 500yr. Floodplain
Lost Valley	165	336
Total	165	336

From Step 3: Alternatives Plans

1. Levees/Floodwalls
2. Non-Structural Flood Measures (Floodproofing, Buyouts, Structure-raising, etc.)
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From Step 3: Alternatives Plans

1. Levees/Floodwalls ✓
2. Non-Structural Flood Measures ✓ (Floodproofing, Buyouts, Structure-raising, etc.)
3. ~~Detention of Floodwaters~~
4. ~~Flood Diversion Culvert~~
5. ~~Channel Modifications, Dredging and Streambank Clearing~~
6. Modifications to existing Somerset County Flood Warning System
7. "No Action" Alternative

Levees/Floodwalls

- Provides a structural line of protection

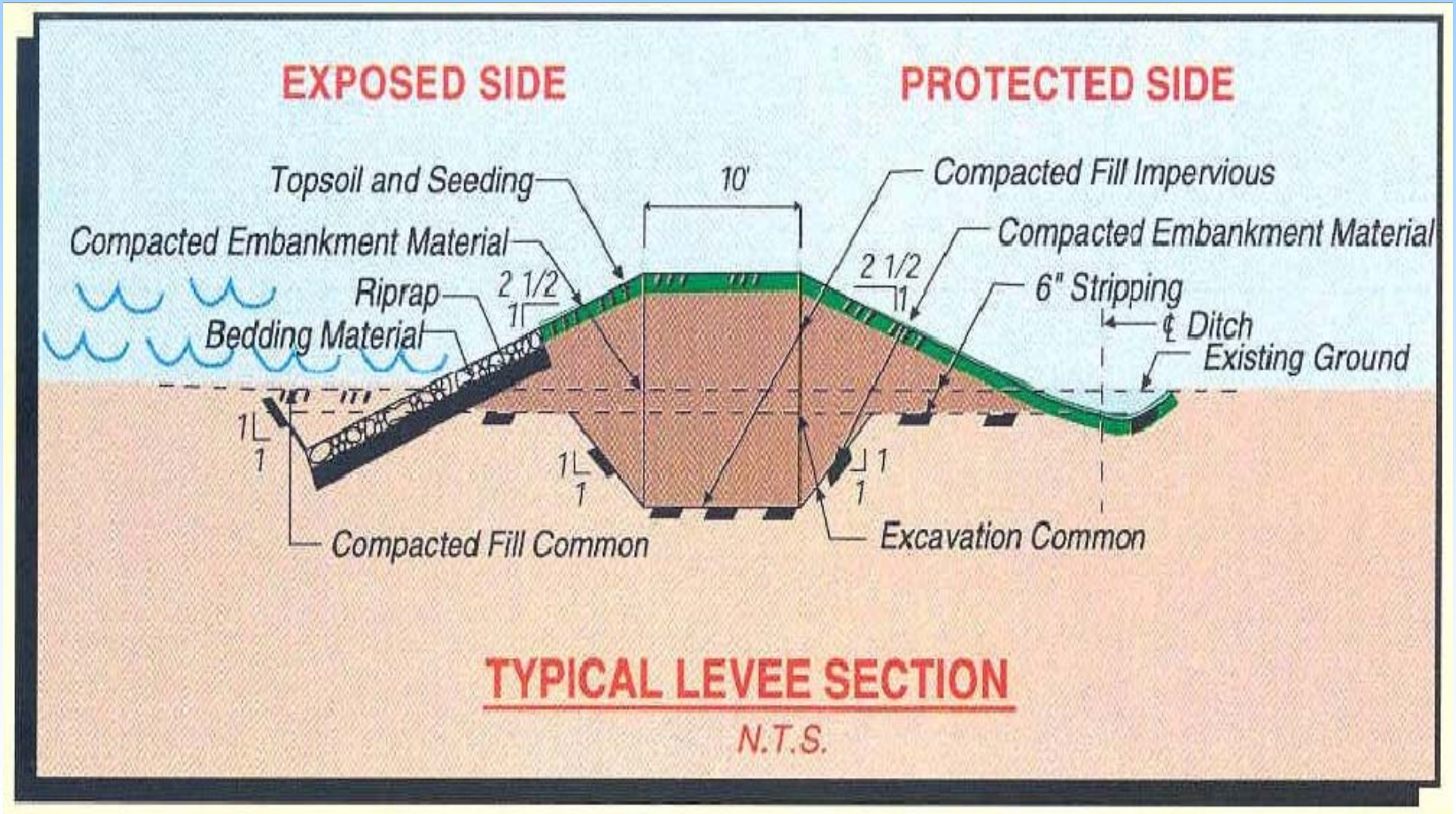
Levees/Floodwalls continued

Levees/Floodwalls continued

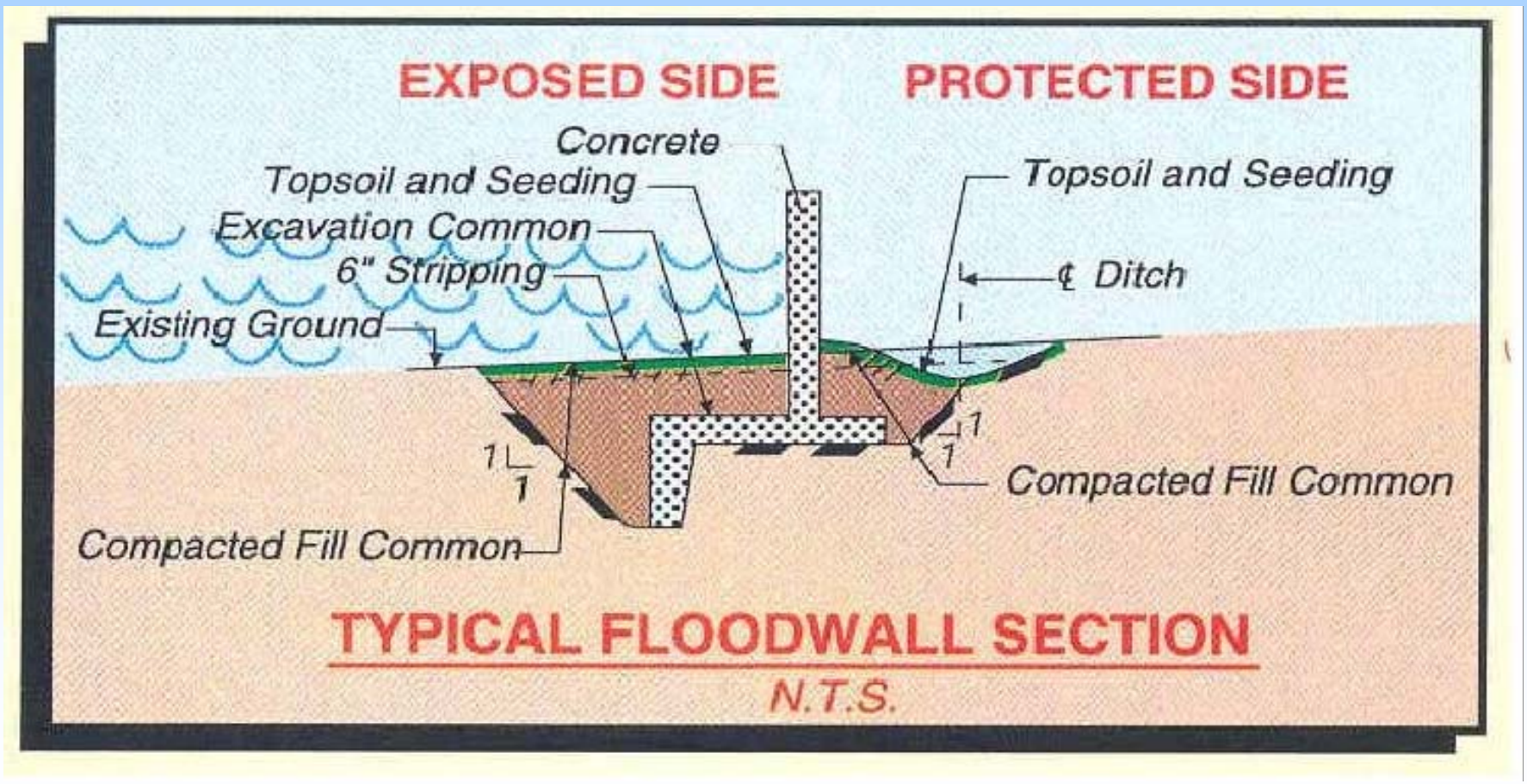
Levees/Floodwalls continued

Levees/Floodwalls continued

Levees/Floodwalls continued



Levees/Floodwalls continued



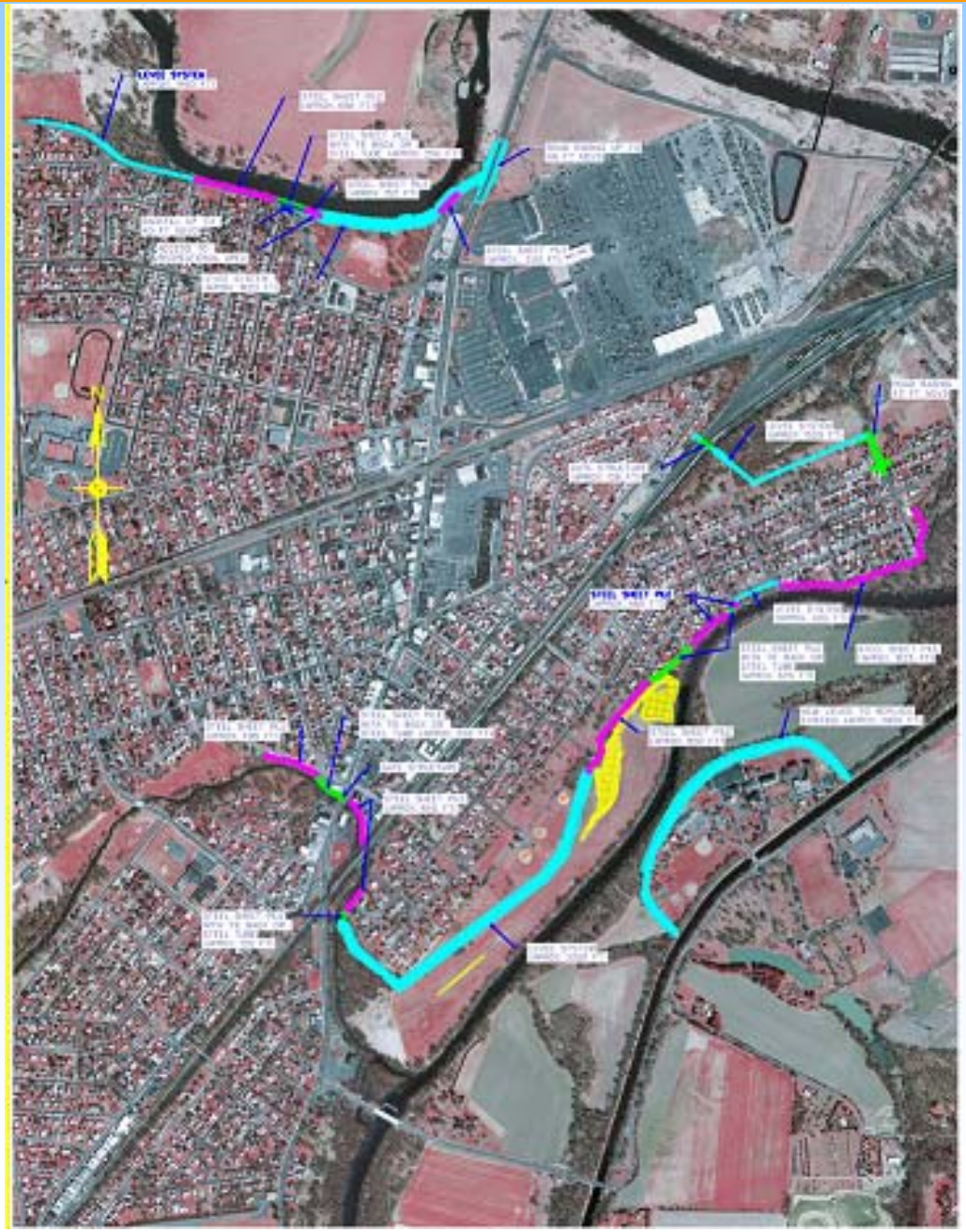
Non-Structural Plan

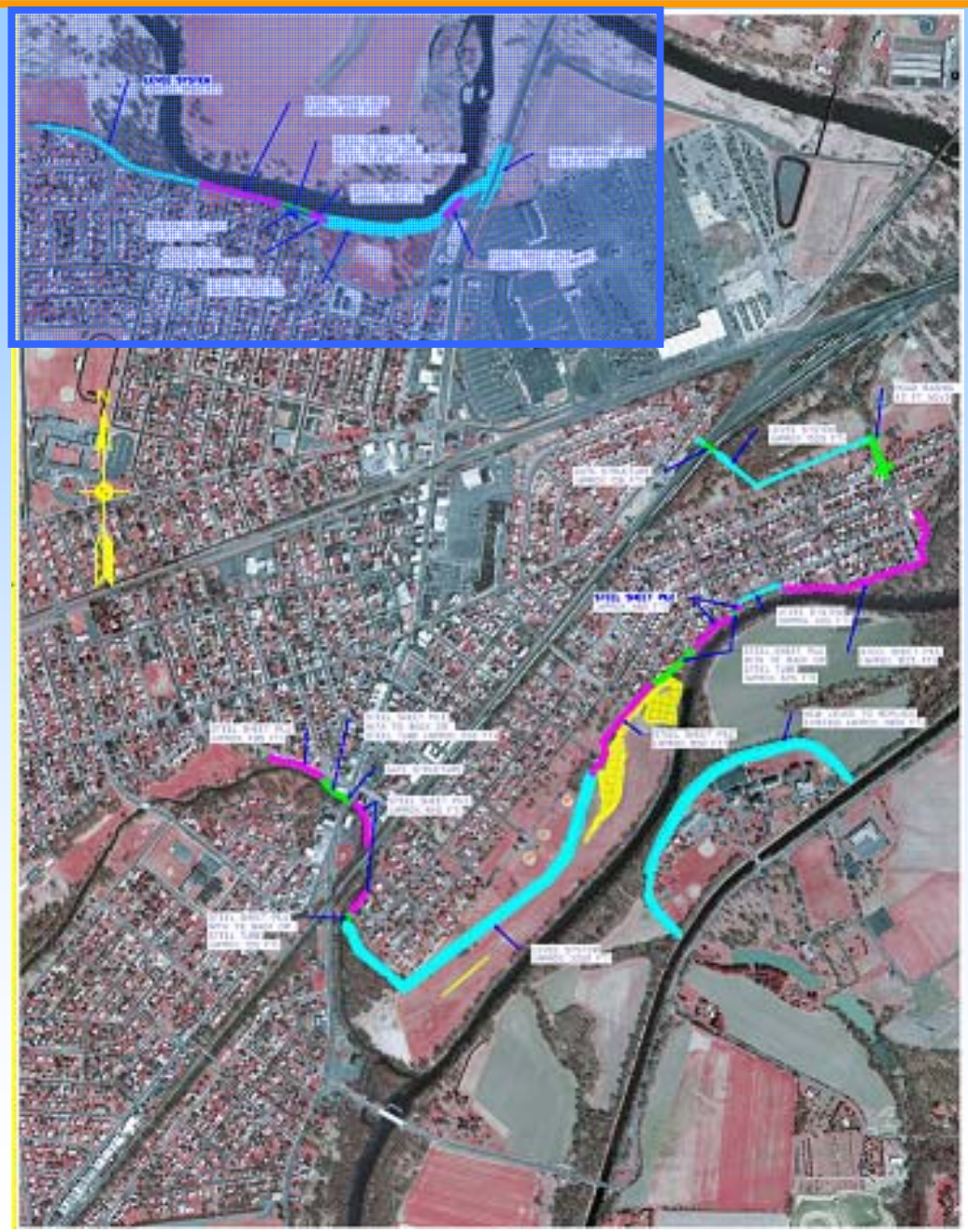
- Non-structural flood control alternatives generally consider the following flood proofing measures:
  - Buyout/relocation
  - Elevating the building
  - Constructing barriers that surround the building, but are not attached
  - Wet flood proofing, where basement utilities are relocated above ground
  - Dry waterproofing where exterior wall surfaces are designed to withstand extra loading
- The determination of which type of flood proofing is most appropriate for a structure will be determined on a case by case basis

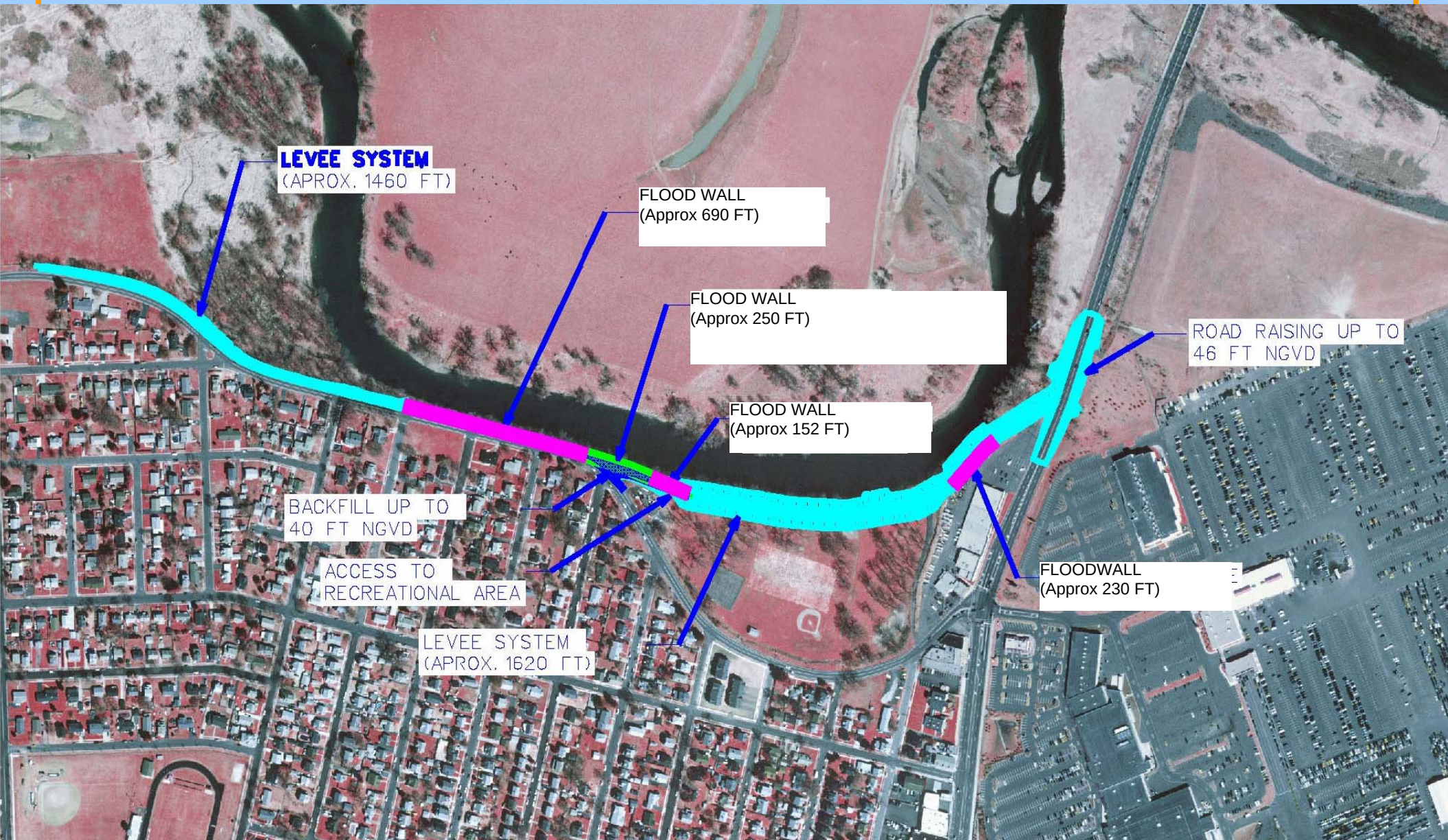
Elevating the Structure

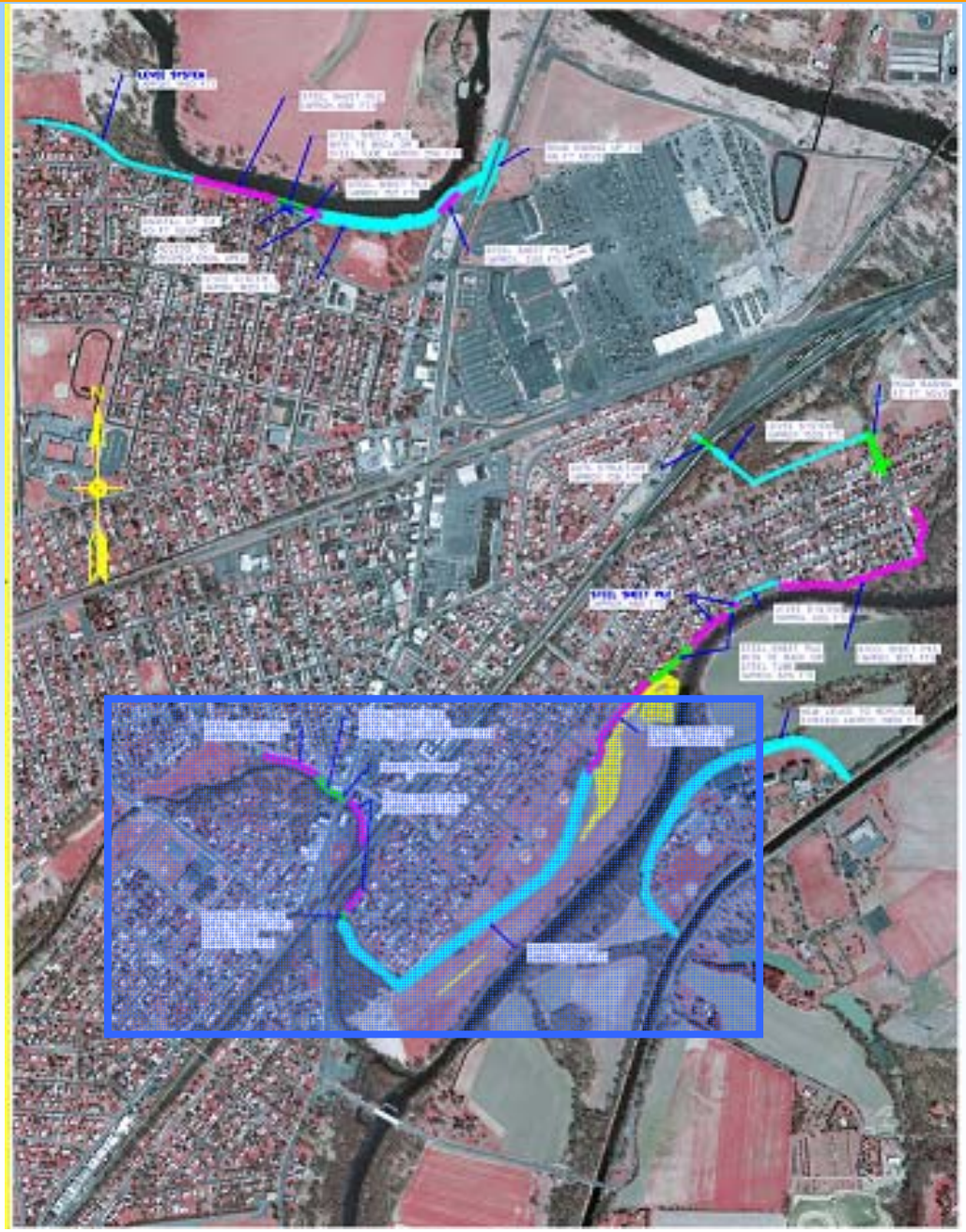
Creation of wetlands for storage capacity

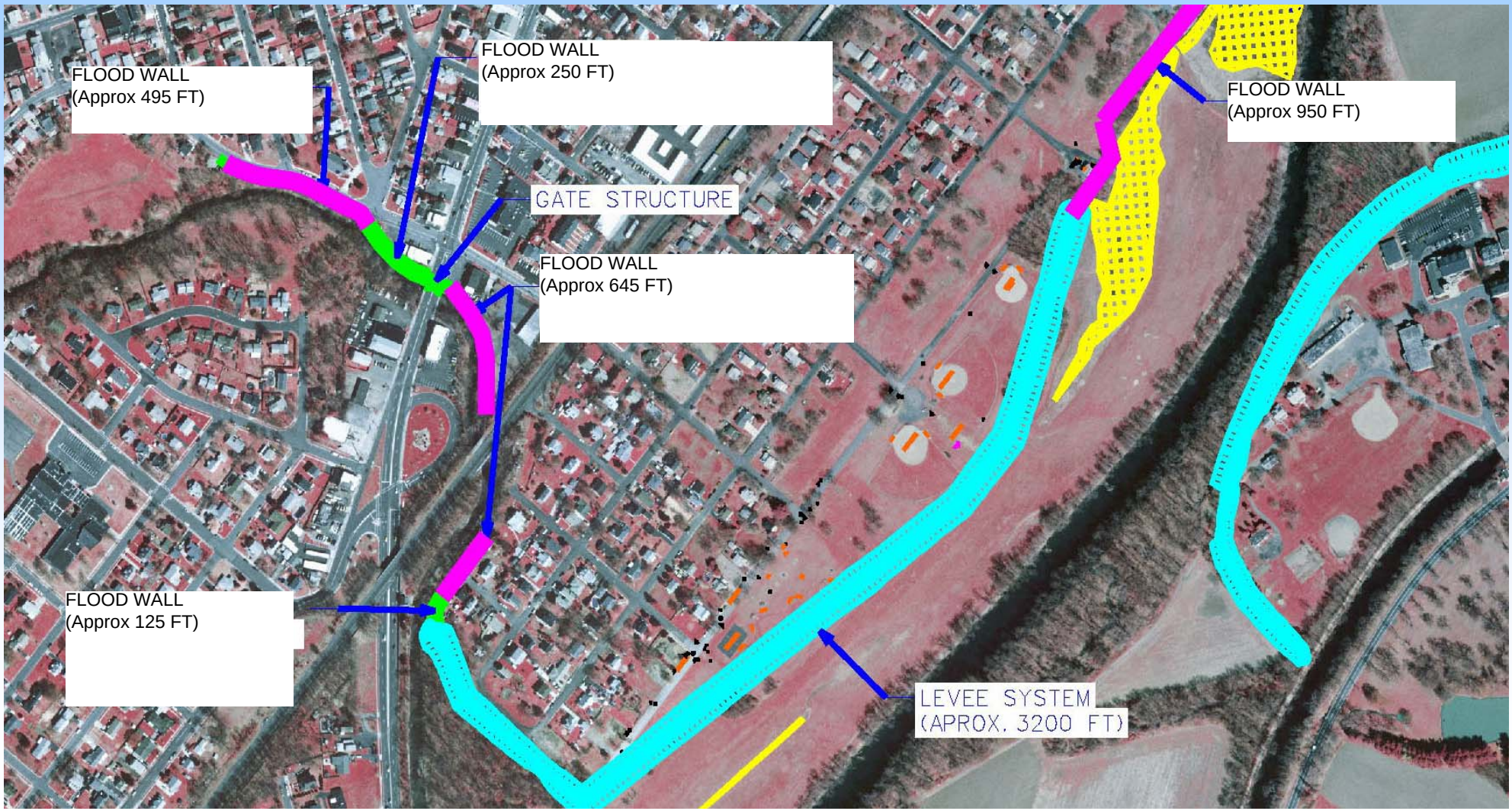
Across fields towards Royce Brook from Raritan Ave to Whalen St bridge

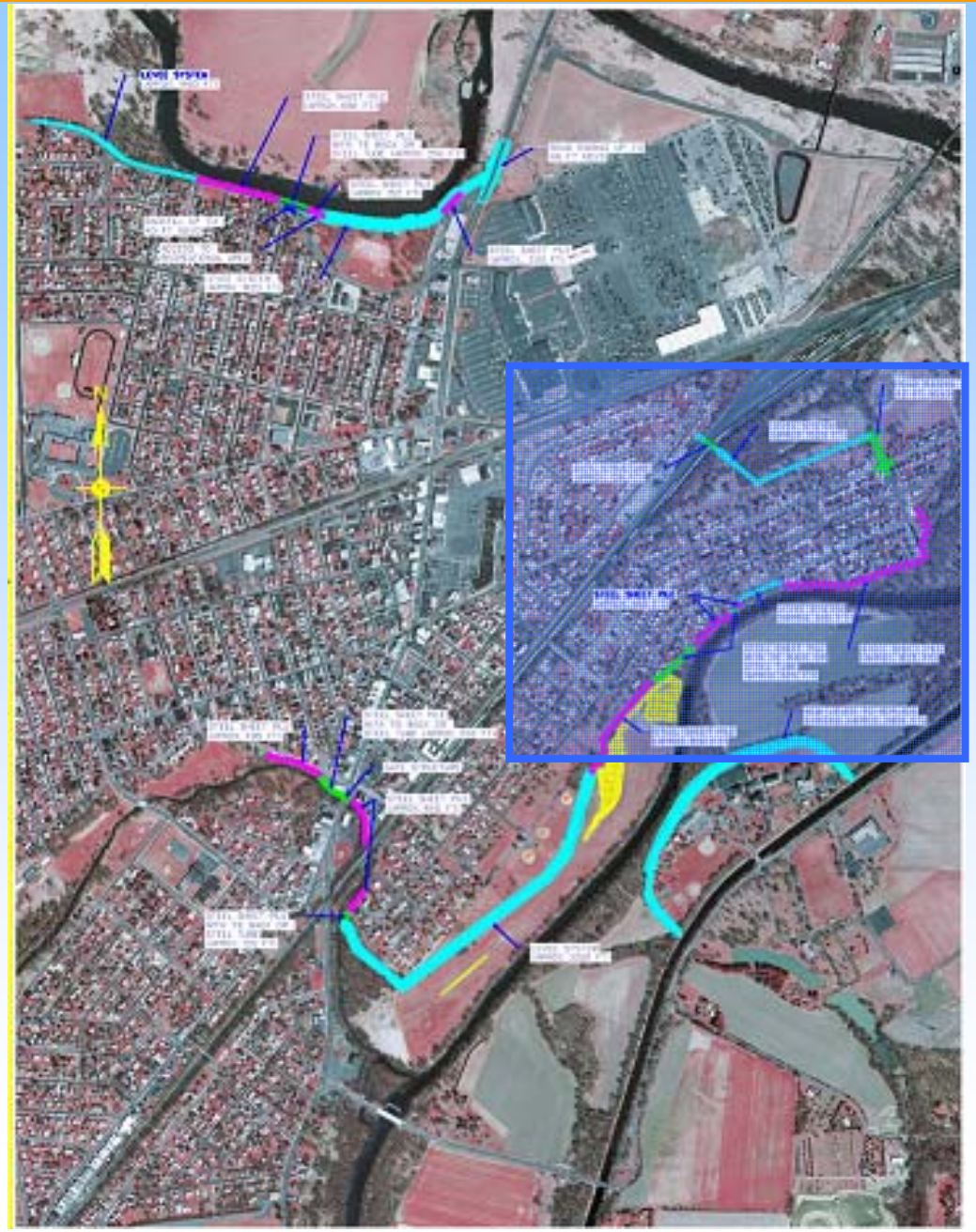



STEEL SHEET PILE

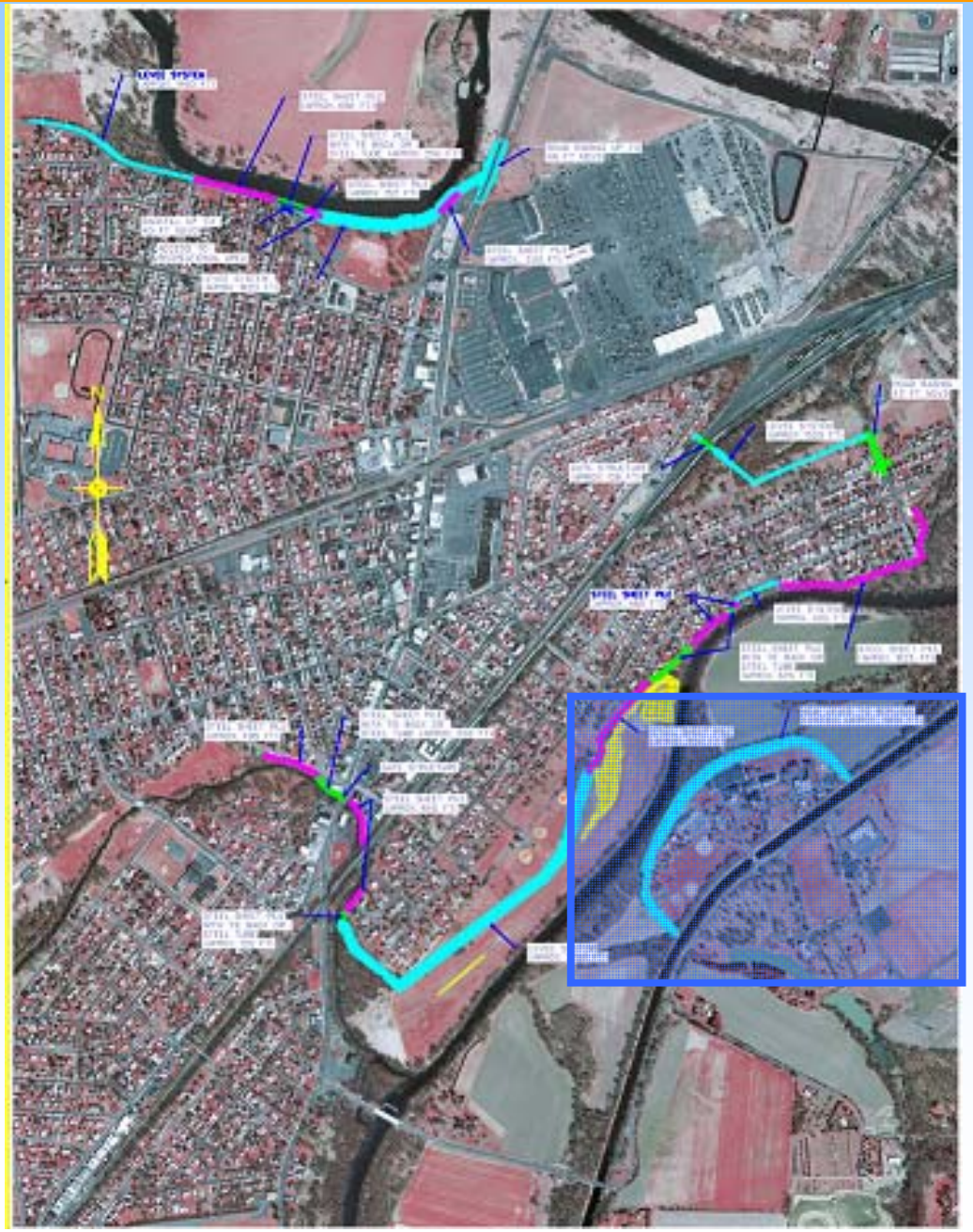

LEVEE SYSTEM
(APROX. 1460 FT)
FLOOD WALL
(Approx 690 FT)
FLOOD WALL
(Approx 250 FT)
FLOOD WALL
(Approx 152 FT)
ROAD RAISING UP TO
46 FT NGVD
BACKFILL UP TO
40 FT NGVD
ACCESS TO
RECREATIONAL AREA
LEVEE SYSTEM
(APROX. 1620 FT)
FLOODWALL
(Approx 230 FT)

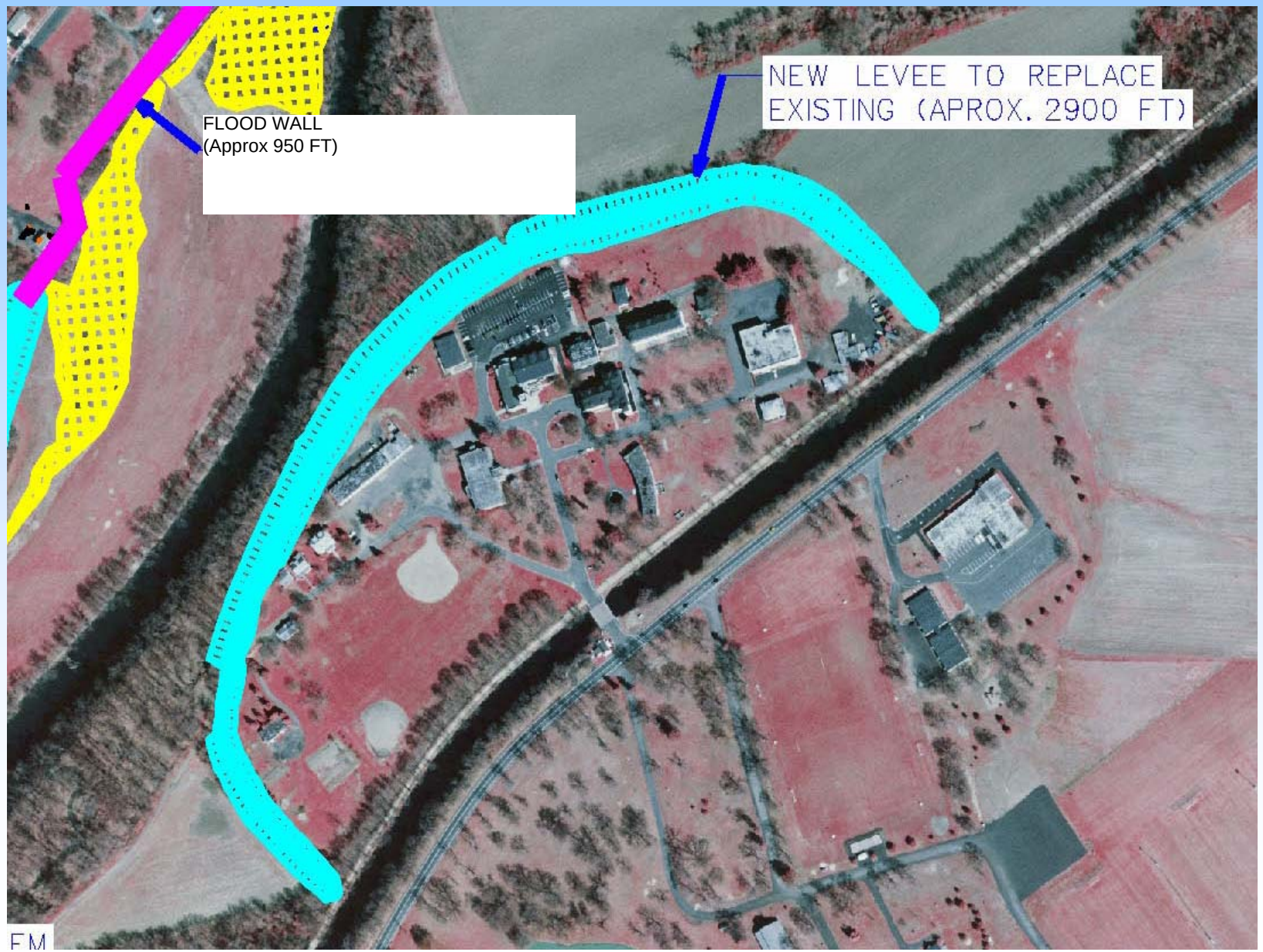



FLOOD WALL
(Approx 495 FT)
FLOOD WALL
(Approx 250 FT)
FLOOD WALL
(Approx 950 FT)
GATE STRUCTURE
FLOOD WALL
(Approx 645 FT)
FLOOD WALL
(Approx 125 FT)
LEVEE SYSTEM
(APROX. 3200 FT)



ROAD RAISING
42 FT NGVD
LEVEE SYSTEM
(APROX. 1520 FT)
GATE STRUCTURE
(APROX. 126 FT)
FLOOD WALL
(Approx 460 FT)
LEVEE SYSTEM
(APROX. 420 FT)
FLOOD WALL
(Approx 525 FT)
FLOOD WALL
(Approx 1625 FT)




FLOOD WALL
(Approx 950 FT)
NEW LEVEE TO REPLACE
EXISTING (APROX. 2900 FT)
FM

Preliminary Cost Estimates

NEXT STEPS

Step 3 - Formulate alternative plans (compare to “no action” alternative). Solicit input from locals.

Step 4 - Evaluate alternative plans. Optimization of chosen alternative

- Present study findings to public