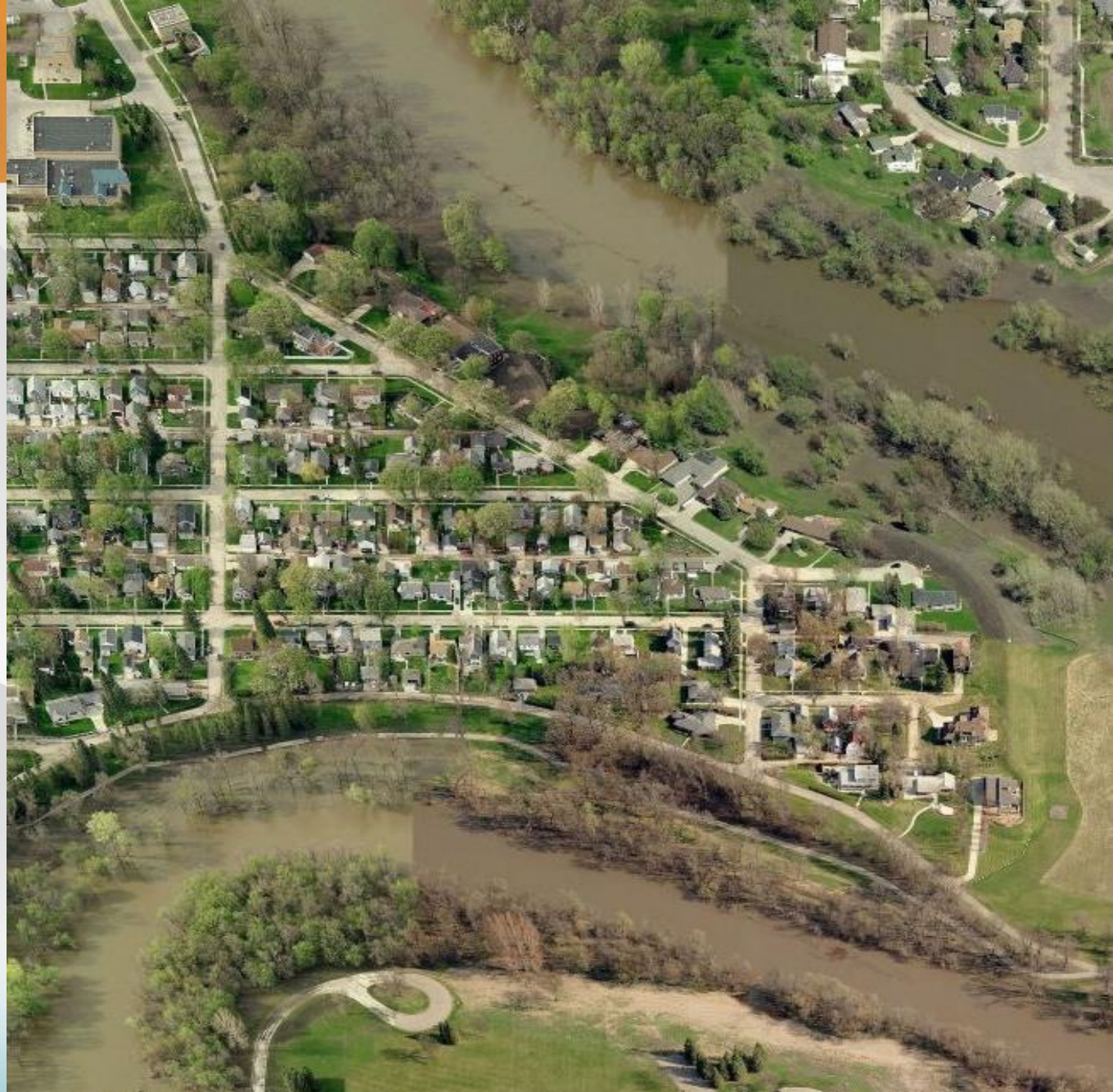
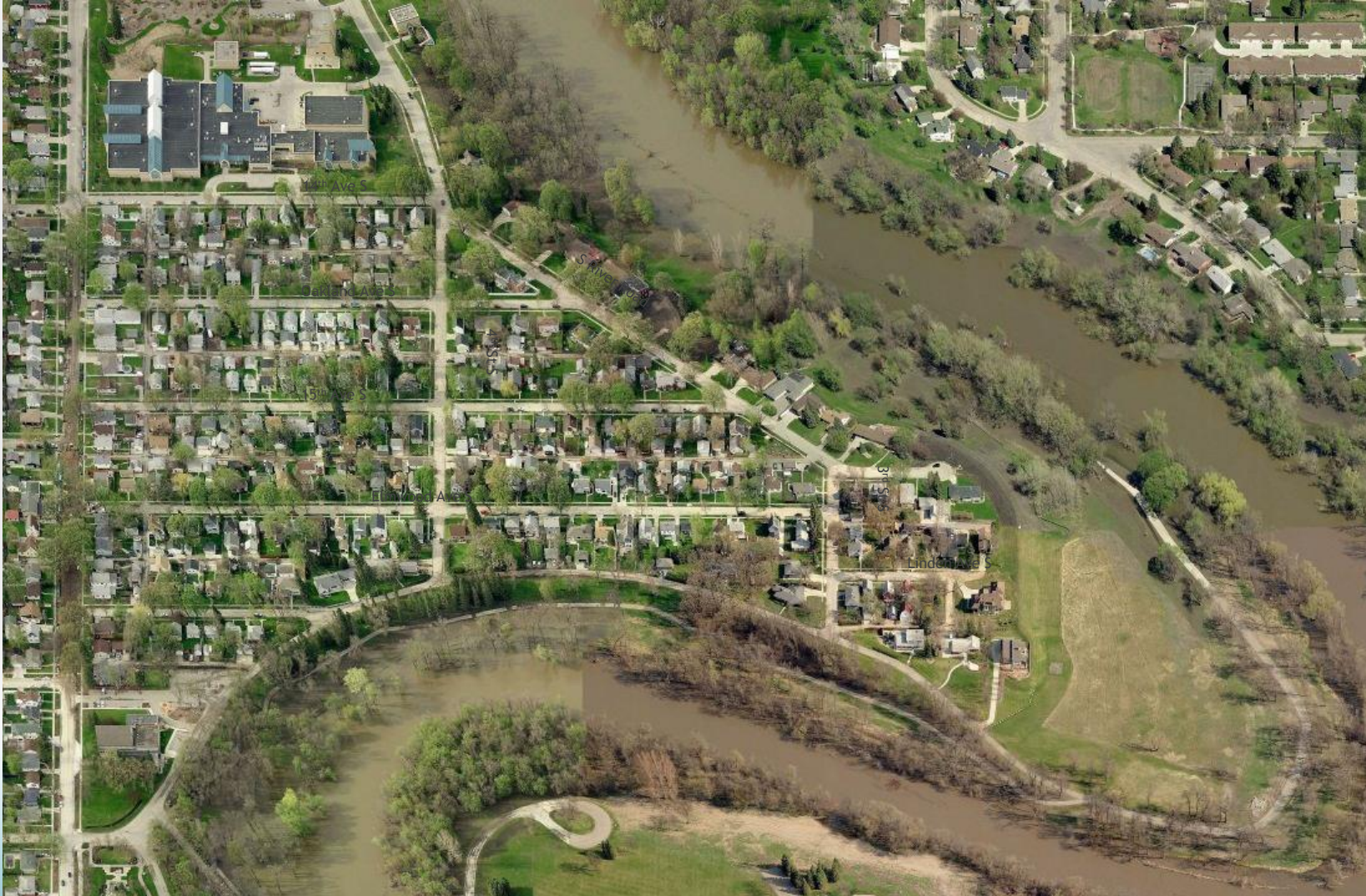


# Belmont Park Area (South River Road & 3rd Street South)





# Project Location - Belmont Park Area Flood Mitigation



## Belmont Flood Mitigation Project - Phase 2

7 Additional  
Homes need to  
be purchased  
and demolitions  
completed in  
2017

## Belmont Flood Mitigation Project - Phase 3

Water Treatment  
Plant Red River  
Intake Structure  
Protection (500  
yr Protection)



# Alignment Options

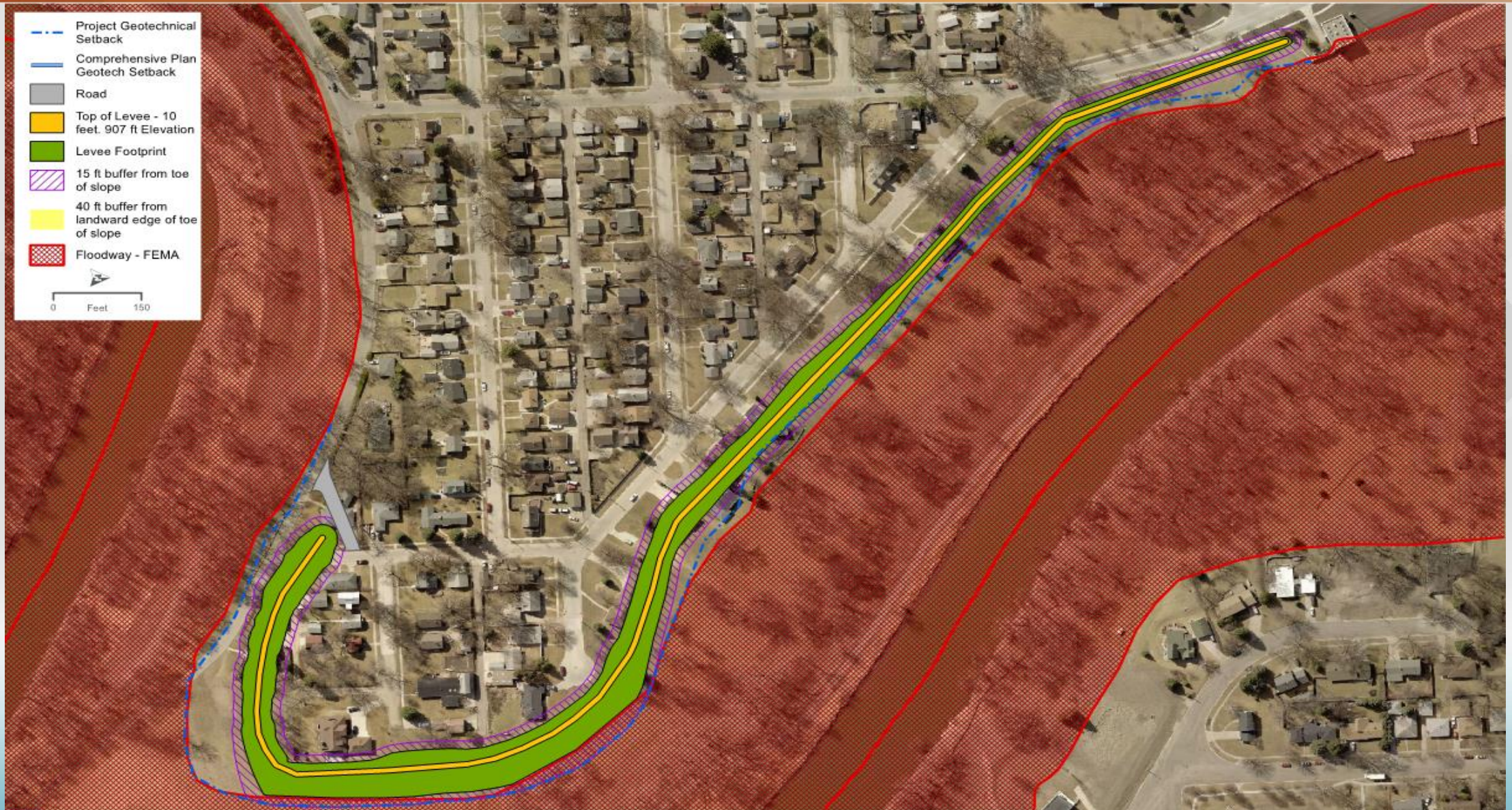








# Alignment Options





# Alignment Option - Recommended

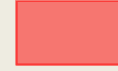




# Questionnaire Responses



= Support proposed plan



= Do not support proposed plan





# Additional Evaluation - 1458 South River Road



Minimal Disturbance Zone Setback (MDZS) and Floodway nearly coincidental location, about 26 feet from structure. The existing structure is within the Limited Disturbance Zone Setback (LDZS).

Anticipated floodwall footing width is 32 feet, 24 feet on river side and 8 feet on protected side. Edge of floodwall footing would be only 16 feet horizontally from foundation wall at a depth of 13 feet. Due to the close proximity, the use of metal sheet piling installation and removal would have a significant risk of damaging the structure.



# 1458 South River Road

| Floodwall Height* | Length | Cost per lineal ft | Cost per Segment |
|-------------------|--------|--------------------|------------------|
| (ft)              | (ft)   | (\$/ft)            | (\$)             |
| 9                 | 77     | \$2,600            | \$200,200        |
| 13                | 70     | \$3,500            | \$245,000        |
| 17                | 131    | \$5,000            | \$655,000        |

\*Height is top of footing to top of wall.

The costs are based on typical floodwall costs for the Fargo area. The total cost for the floodwall results in a cost of \$1,100,200.



# Additional Estimated Costs

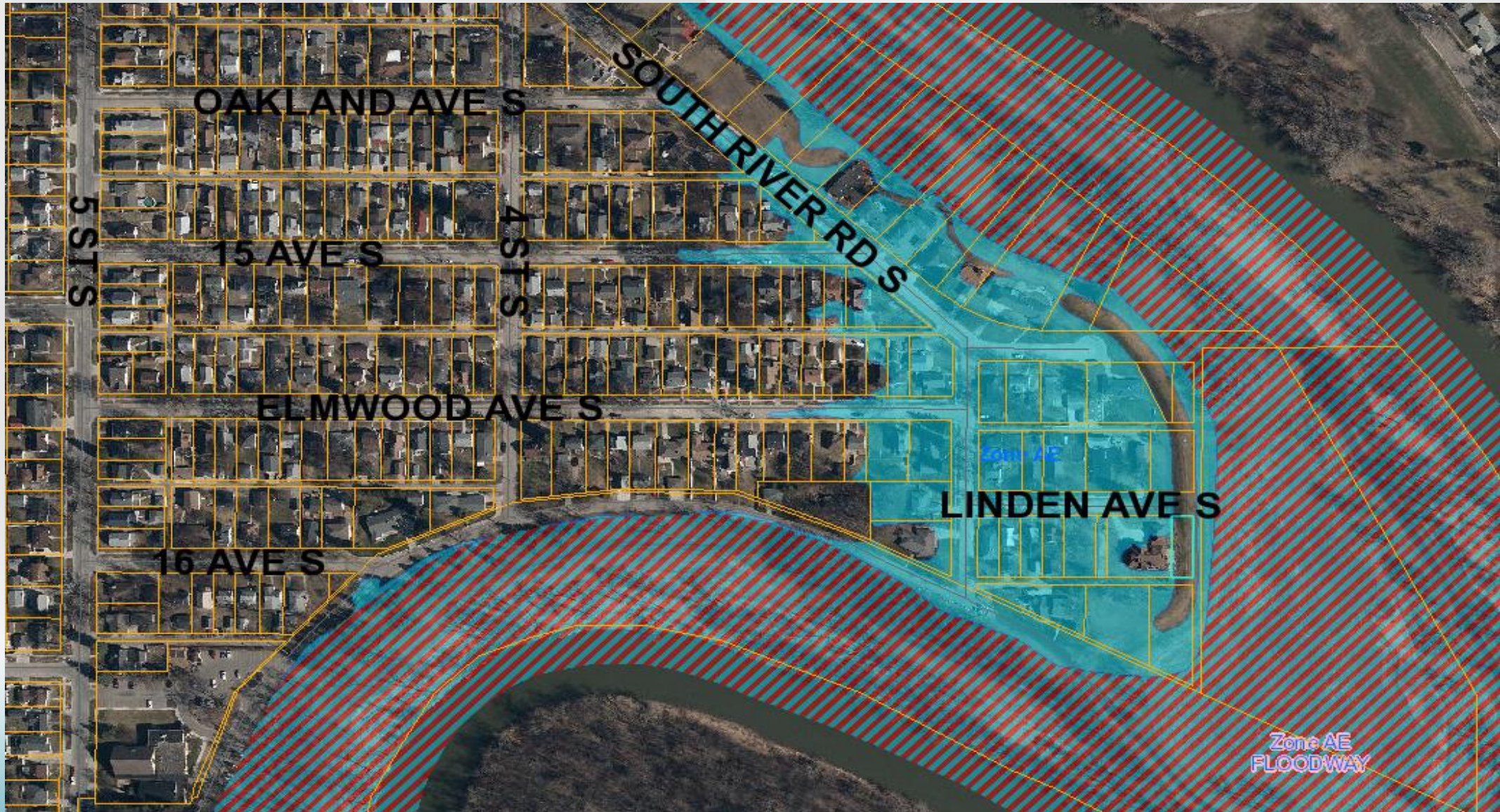
| Additional Costs  | Amount  | Rate       | Total     |
|---|---|------------|-----------|
| Demolition of retaining wall  | 100 ft  | Lump sum   | \$30,000  |
| Clearing and grubbing   | 200 ft*200 ft = 4444 sq yd                                  | Lump sum   | \$15,000  |
| Excavation  | 10 ft deep, 30 ft BW, 2:1 side slope, 278 ft long = 5148 cy | \$9/cy     | \$46,332  |
| Evaluation of structure and foundation of Stern's house to inform construction impacts            | 150 hrs   | \$180/hr   | \$27,000  |
| 100 lineal feet of sheet pile between house and floodwall since excavation results in a 1:1 slope | 100 ft * 30 ft = 3000 sq ft                                 | \$85/sq ft | \$255,000 |
| During construction pumping of flow trapped between the floodwall and residence                   |   | Lump sum   | \$15,000  |
| Permanent pumping of flow trapped between the floodwall and residence                             | sump pump   | Lump sum   | \$15,000  |
| Landscaping - topsoil, seeding, trees   | 199 ft*200 ft = 4444 sq yd                                  | \$8/sq yd  | \$35,554  |
| Engineering design  | 10% of construction   |            | \$153,908 |

The total of additional costs is \$592,908. The floodwall cost is \$1,100,200. The subtotal is \$1,692,994. Since this is planning level cost prior to design a 30% contingency should be added resulting is a **total cost through construction of \$2,200,892.**

Clay levee installation \$300/ft \*75 foot lot = \$22,500 (plus demolition and purchase)



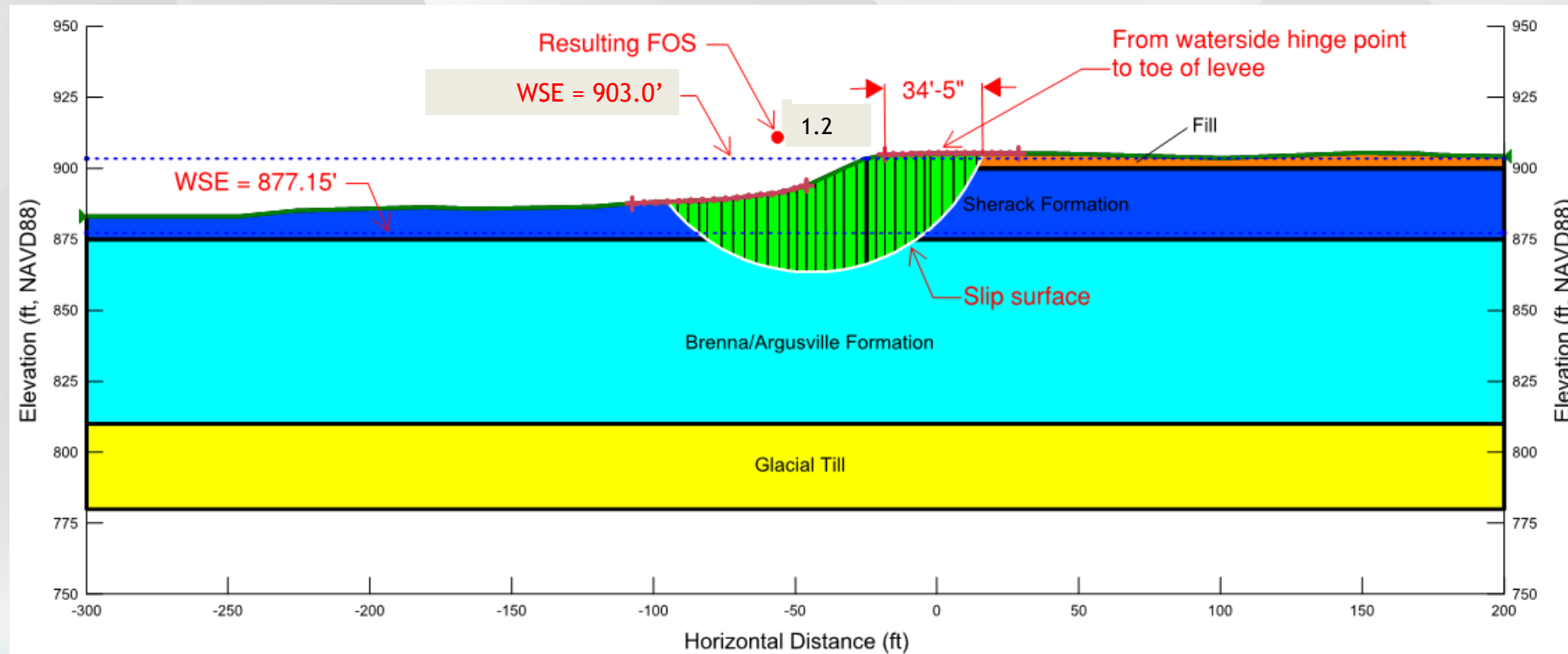
# Properties Removed from Floodplain





# Geotechnical Stability

## Belmont Levee Rapid Drawdown stability model results





# Estimated Project Cost

- Estimated project cost for recommended alignment\*:
  - Levee and floodwall recommended alignment - \$3.4 M
  - 1458 South River Drive Floodwall Option- \$5.6M





| Address                    | Owner(s)                     |
|----------------------------|------------------------------|
| 1422 South River Road      | Andrew and Nancy Froelich    |
| 1458 South River Road      | John and Sherian Stern       |
| 1502 South River Road      | Nancy Perkins                |
| 1514 South River Road      | Daniel and Edna Holm         |
| 1525 South River Road      | Thomas and Jacqueline Jabens |
| 245 Lindenwood Drive South | Neil Graf                    |
| 305 Lindenwood Drive South | Thomas Madsen                |
| 208 Linden Avesnue South*  | Douglas Anderson             |
| * = Easement only          |                              |