

Brent Run Creek: A case study of stream relocation on a tributary of the Flint River in Michigan



**Presented by:
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GEI Consultants**

Brent Run Creek Relocation

- 4,000 ft of stream relocated in 2015
- Landfill was projected to reach capacity – needed to expand
- Permit requirements included 10 years of geomorphic stream monitoring
- 5 permanent monitoring stations established



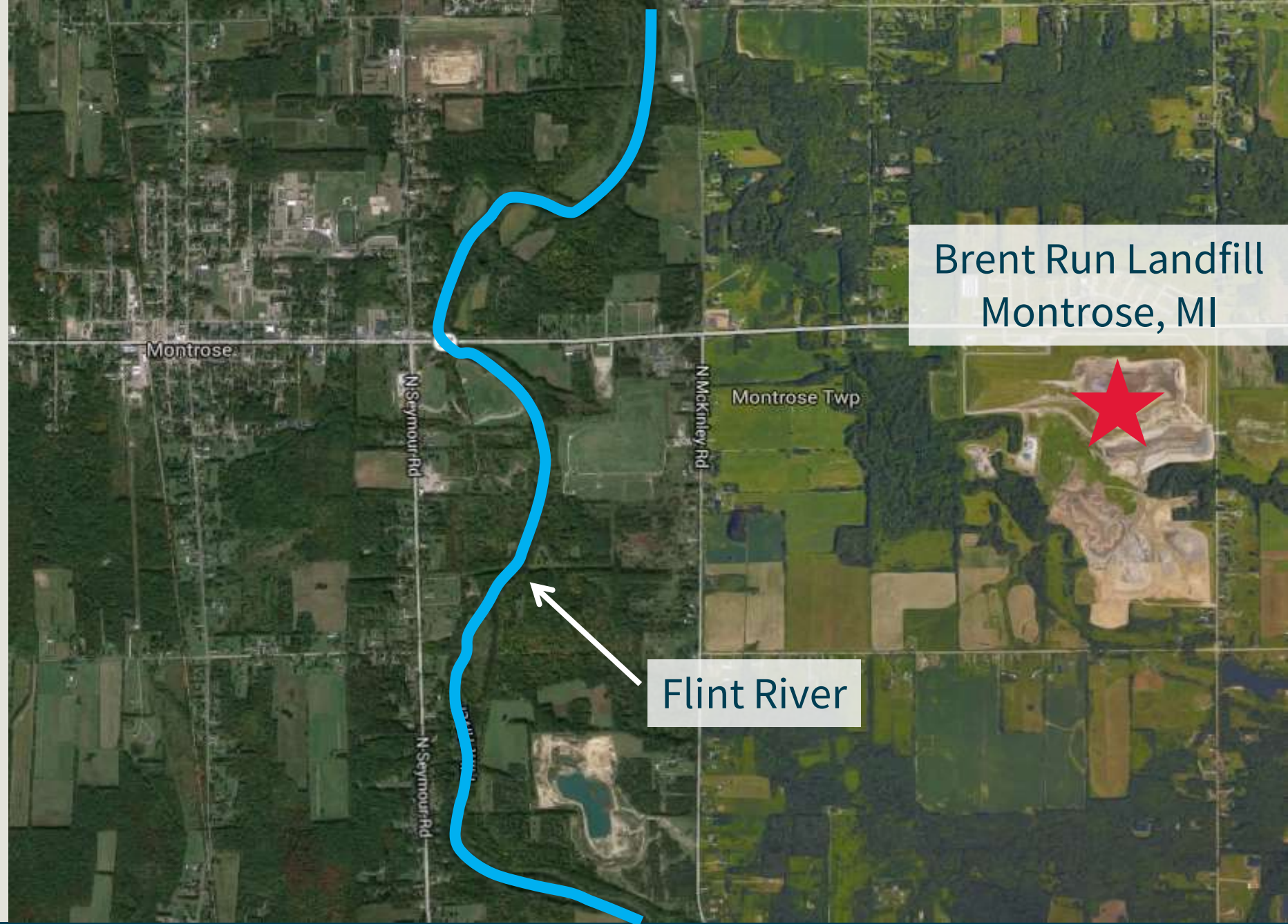
Brent Run Creek

- Tributary of Flint River
- Watershed Area: 21 mi²



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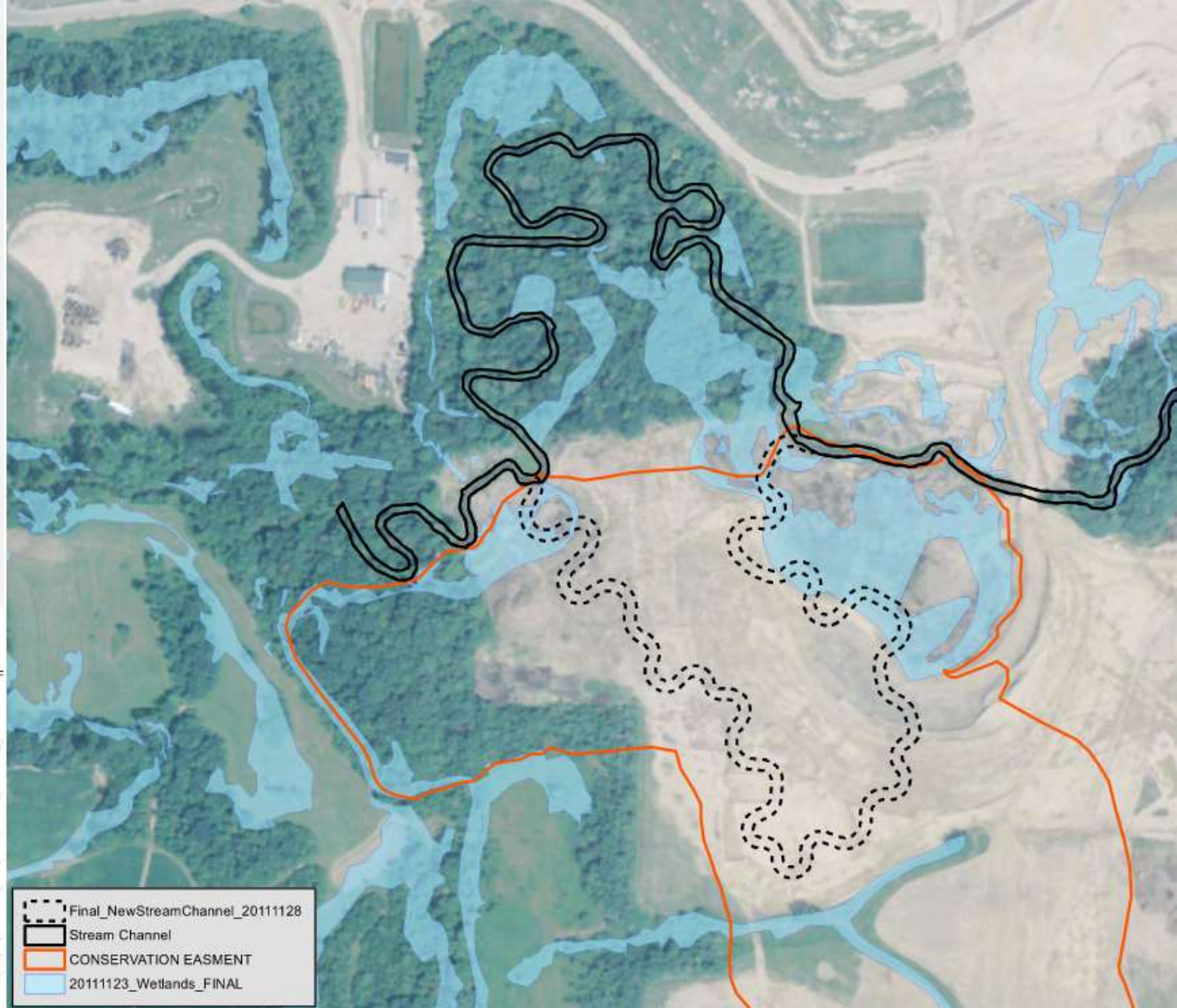
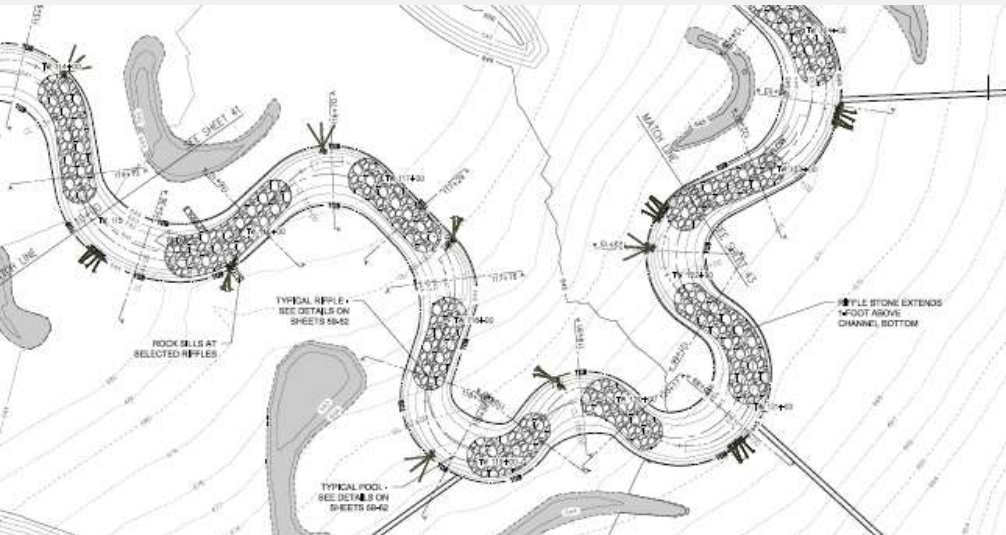
Existing Stream

- Steep banks
- Bank erosion, undercut banks
- Top of bank 1-2ft higher than bankfull elevation



Design & Construction

- Reference reach data
- Flow monitoring, sediment transport monitoring
- Calibrated hydraulic and sediment transport models
- Riffles, pools, LWD, oxbows
- 0.15% channel slope







2015

Aerial of relocated channel during construction



2016

Aerial of relocated channel



Google Earth

© 2018 Google



2018

Aerial of relocated channel



Google Earth

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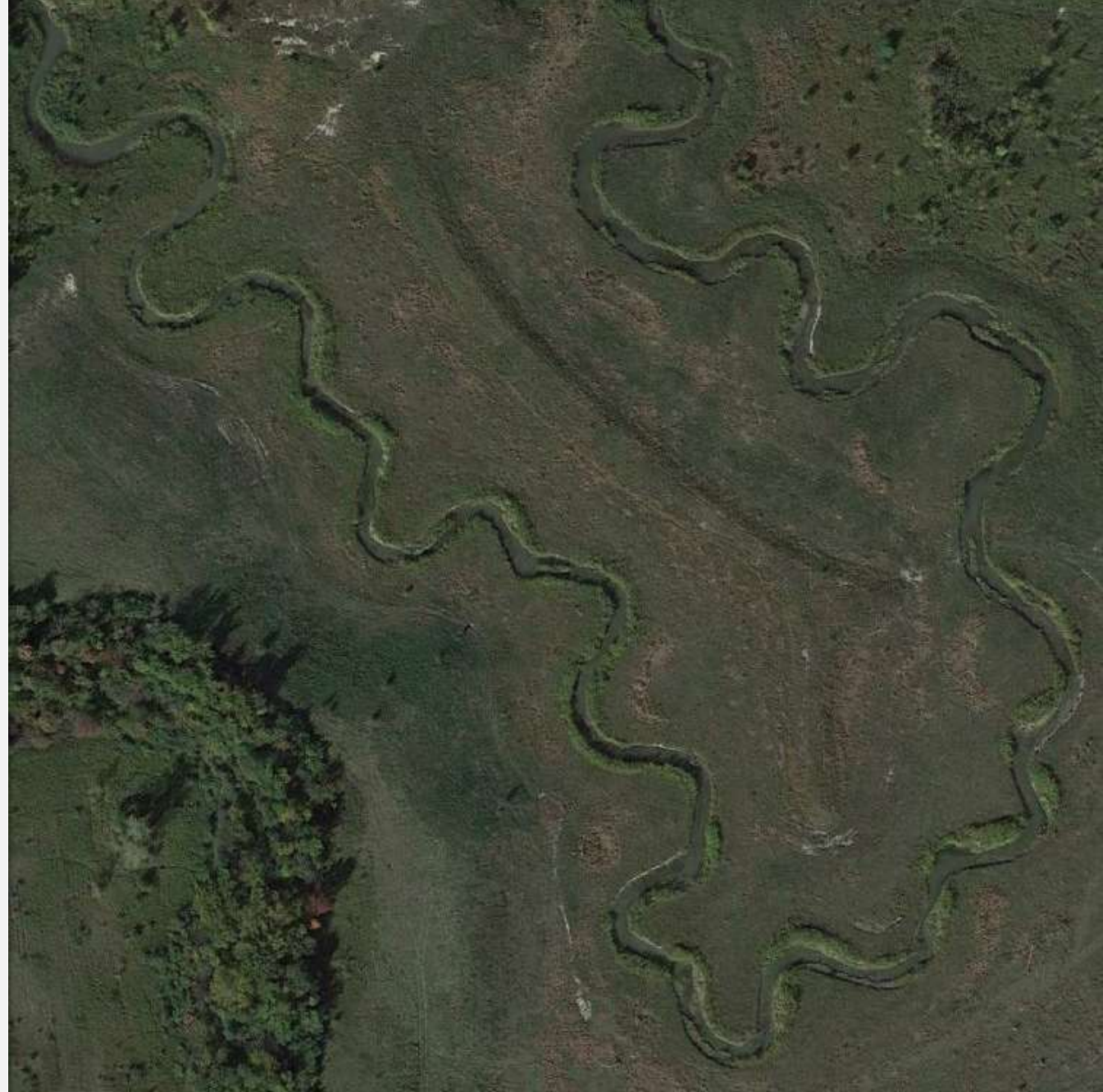
2020

Aerial of relocated channel



2022

Aerial of relocated channel





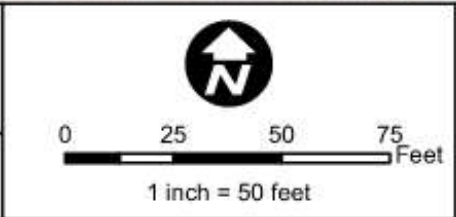
MONITORING STATIONS



- Photo Points
- ▲ Bankfull Indicator
- Monitoring Station Cross Section Monument
- + Monitoring Station Benchmark
- ◆ Monitoring Station Scour Chains

Brent Run Landfill
Genesee County, Michigan

Waste Connections, Inc.
Montrose Township, Michigan



Monitoring Station A

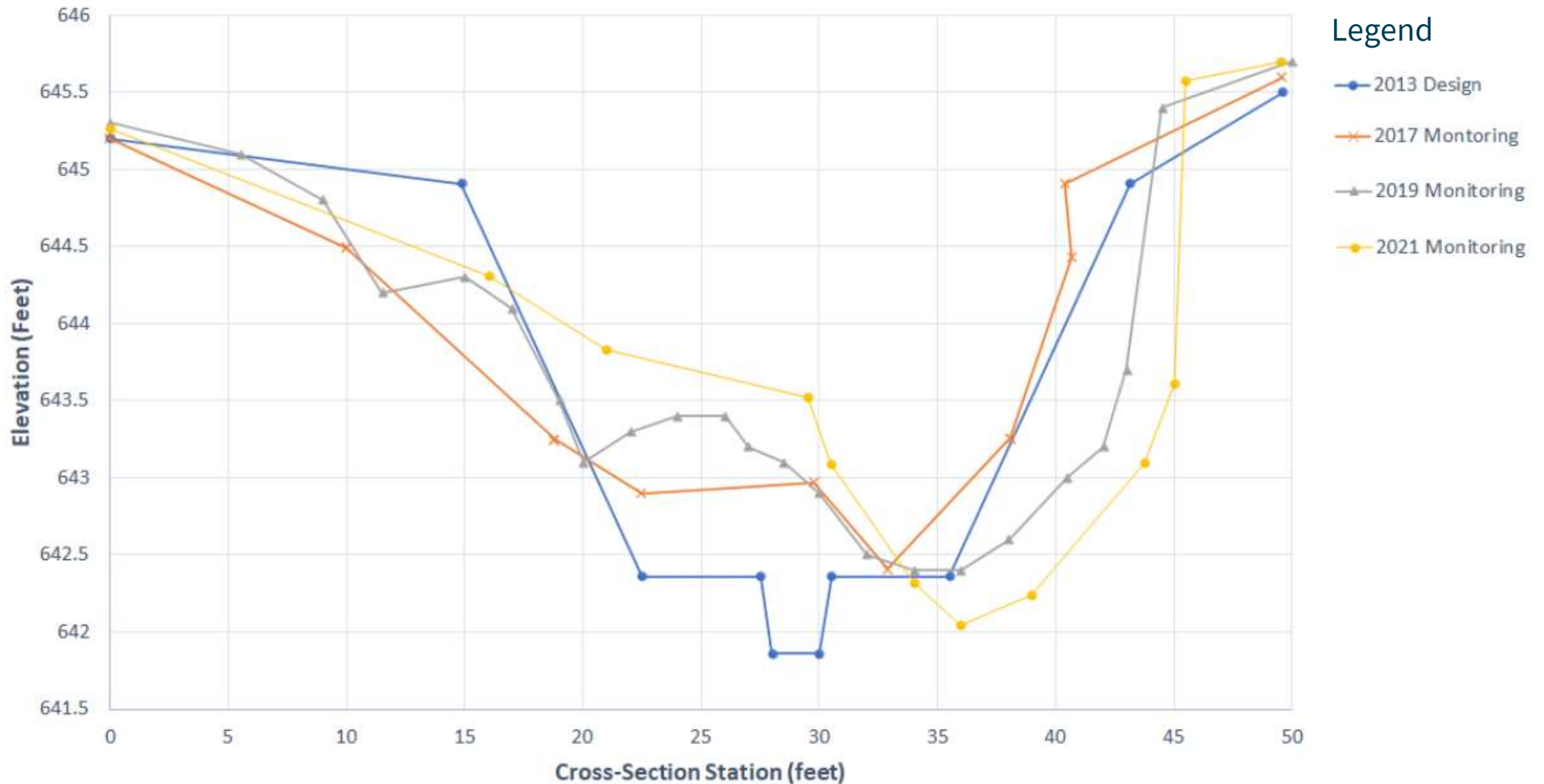
Project: 1904754 Figure: 5 Sheet 2 of 7



SURVEYING CROSS SECTIONS



Surveyed Cross Sections

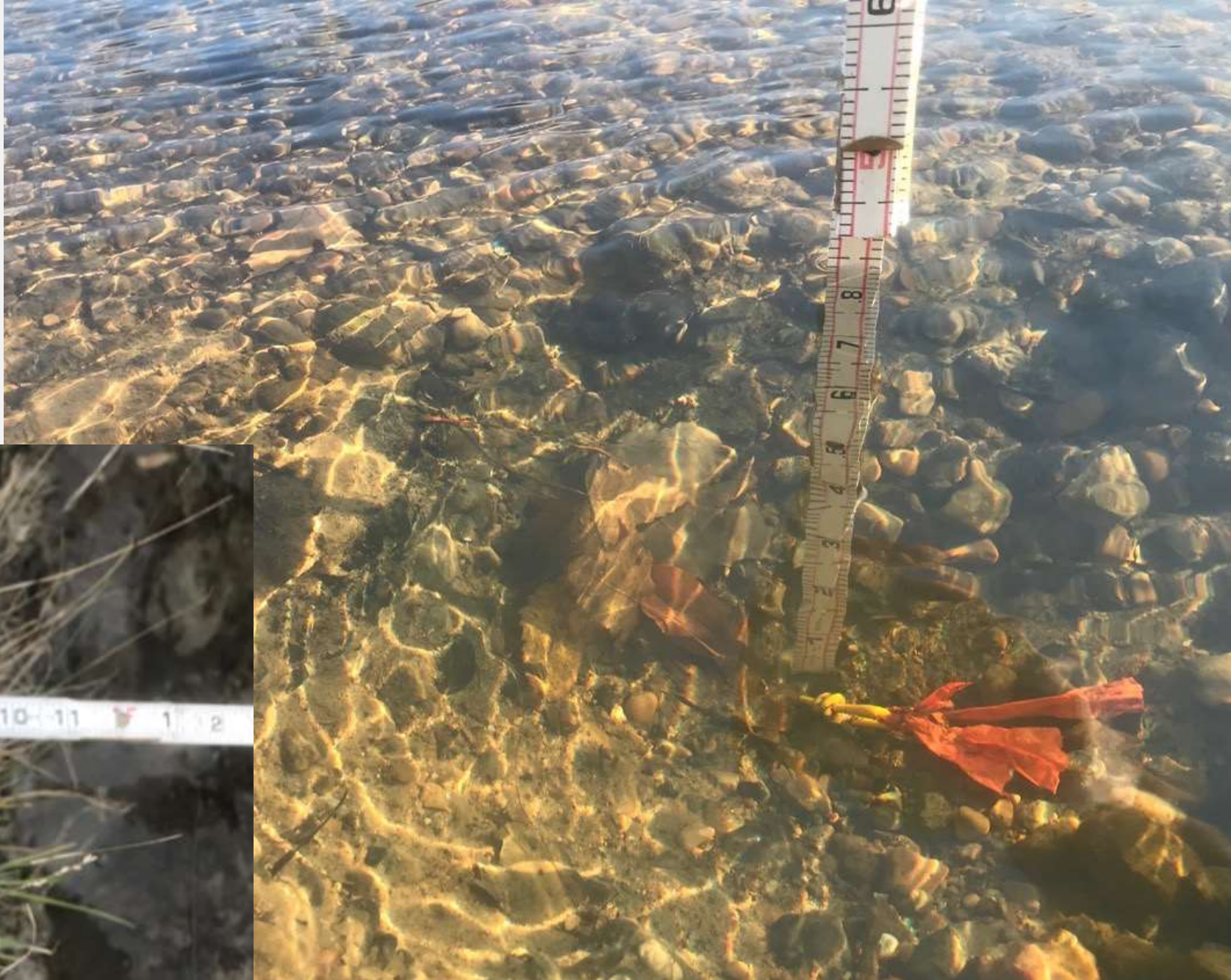




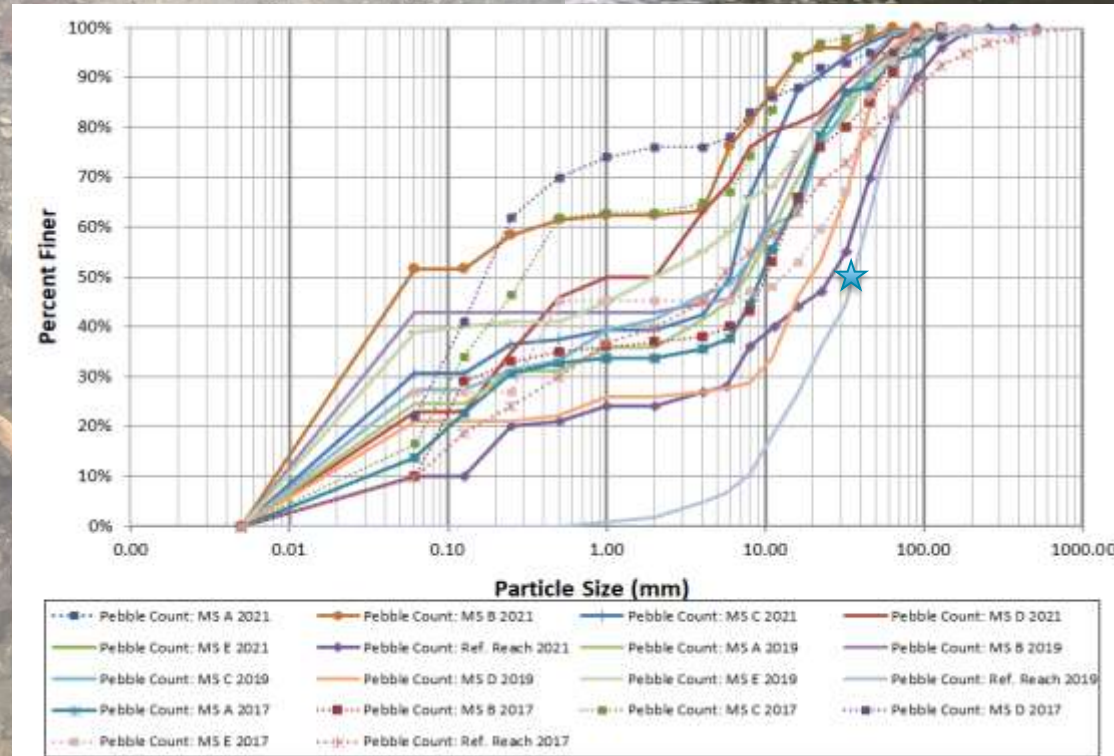
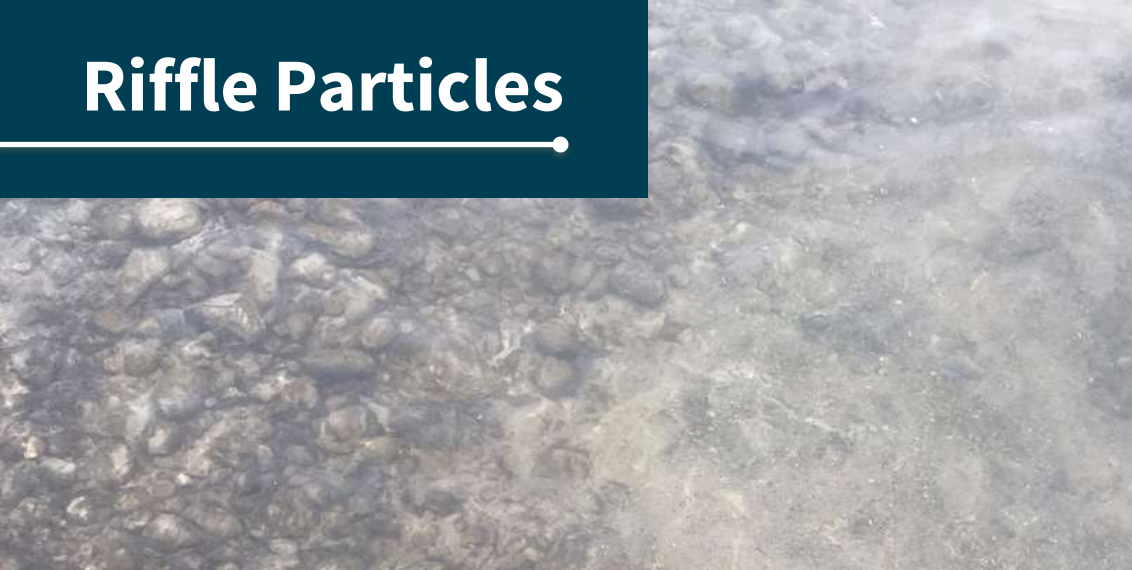
INNER BERM FORMATION AND BANK EROSION



Bed and Bank Stability



Riffle Particles





FLOODPLAIN CONNECTIVITY





STABLE OUTER BEND WITH VEGETATION ESTABLISHED





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