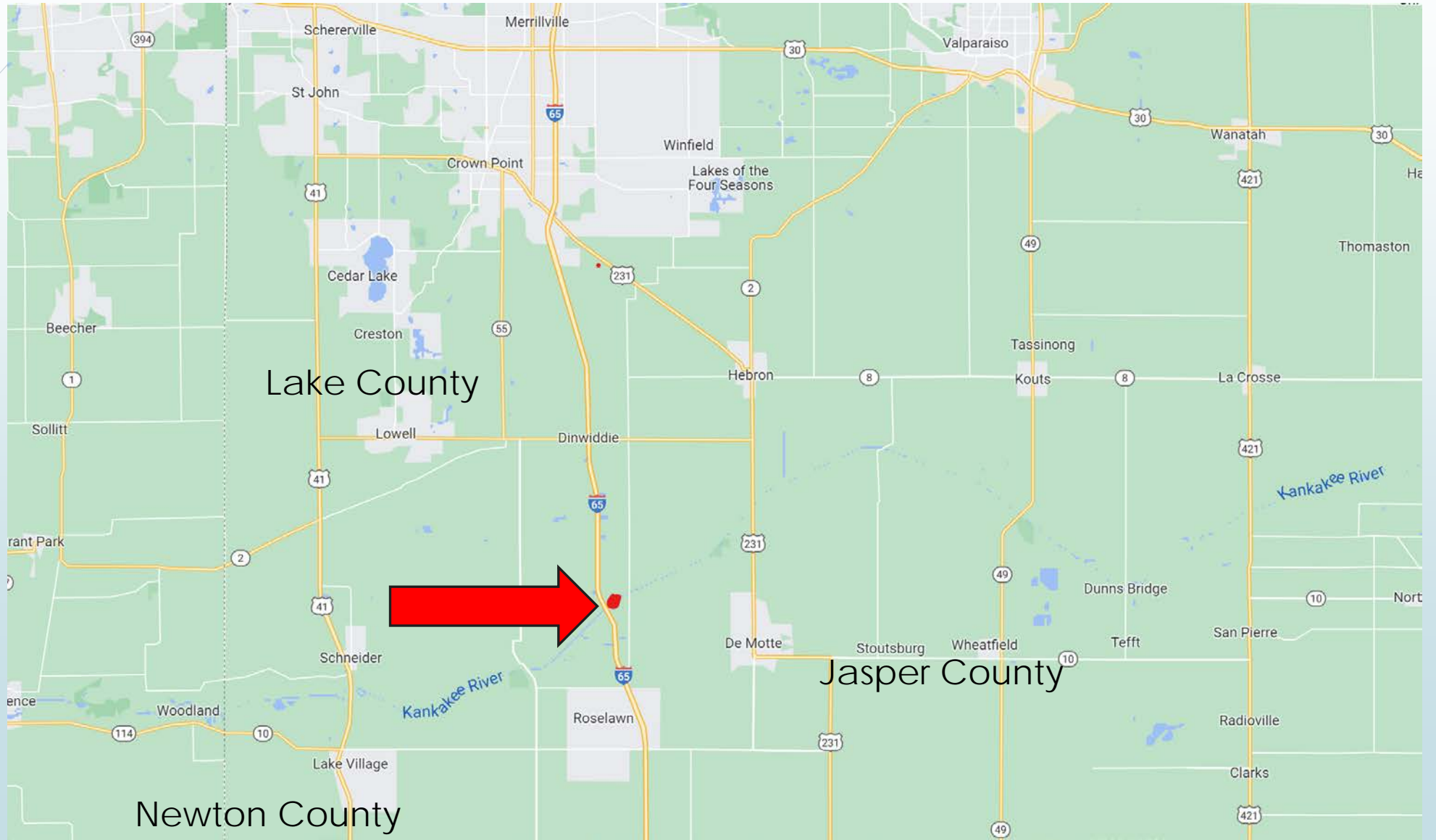


# Kankakee River Streambank Stabilization

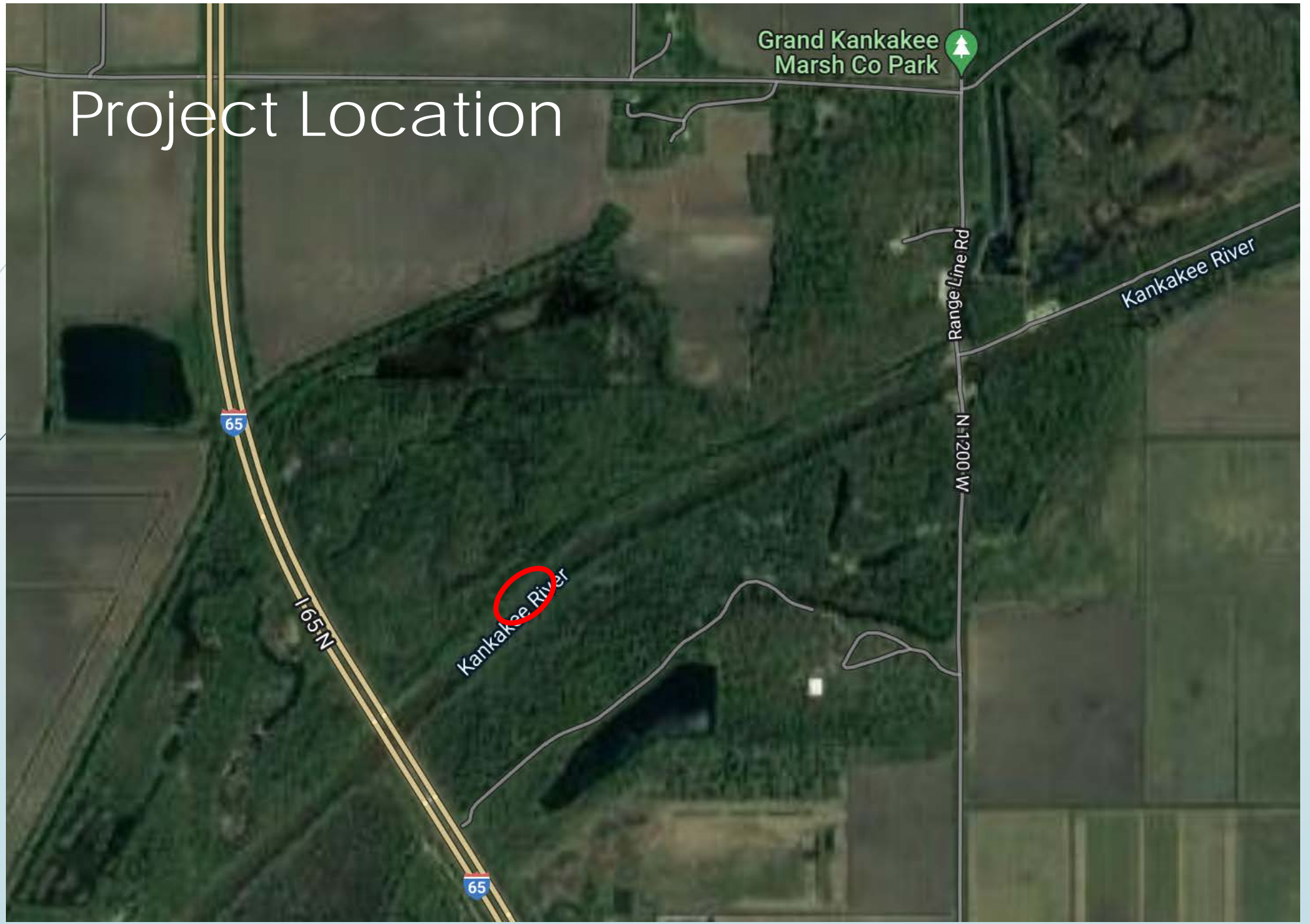
Presented by Bill Emerson, Jr, PE – Lake County Surveyor  
and Thomas Burke, Jr, PhD, PE – Christopher B. Burke Engineering, Ltd.



# Project Location



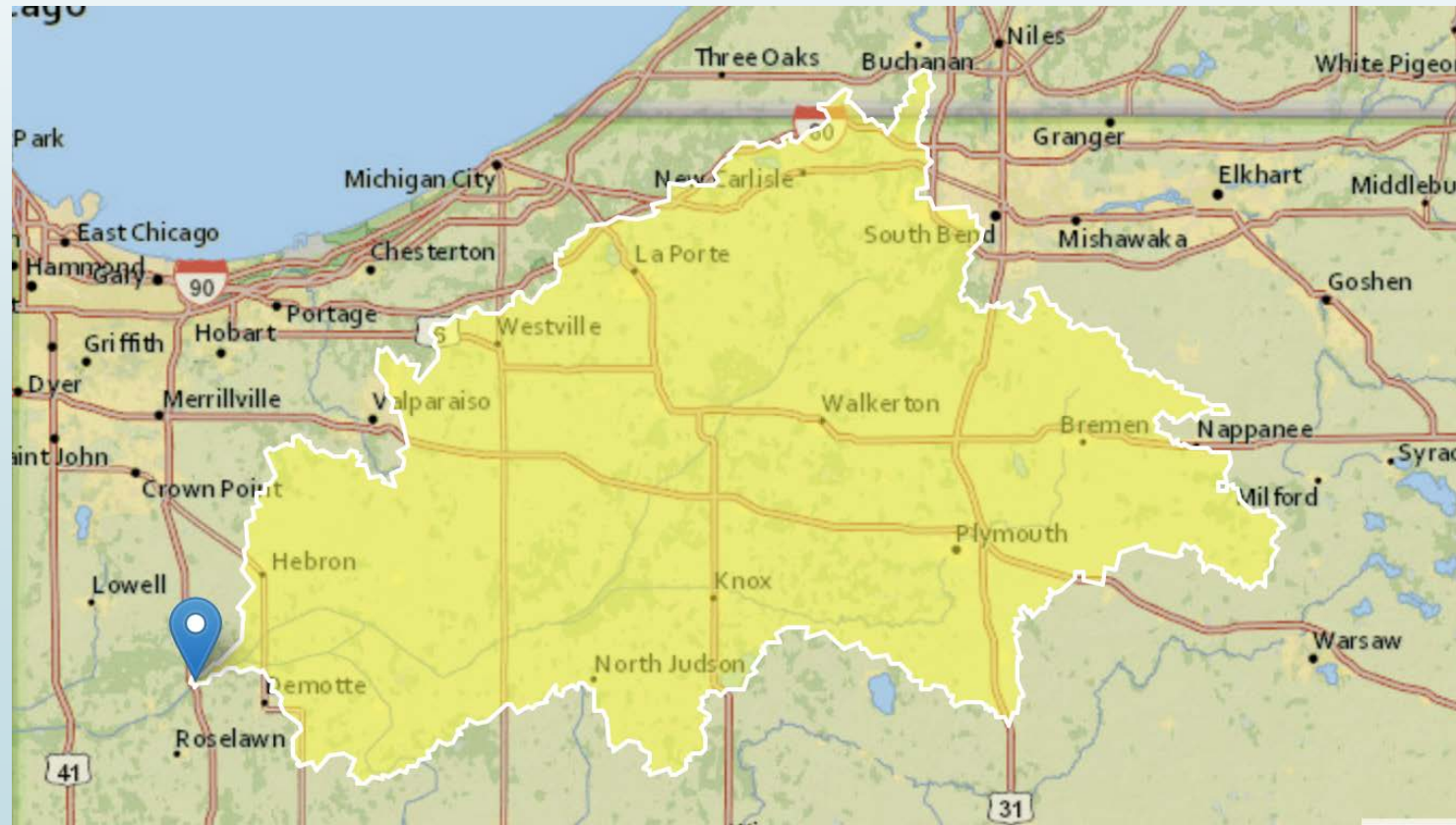
# Project Location





# Kankakee River Information

- ▶ Drainage Area = 1738 sq. mi.
- ▶ 10 year = 6020 cfs and 100 year = 7830 cfs (StreamStats)
- ▶ 10 year = 5550 cfs and 100 year = 7150 cfs (Lake Co. FIS)



# Bank Conditions Pre-Project



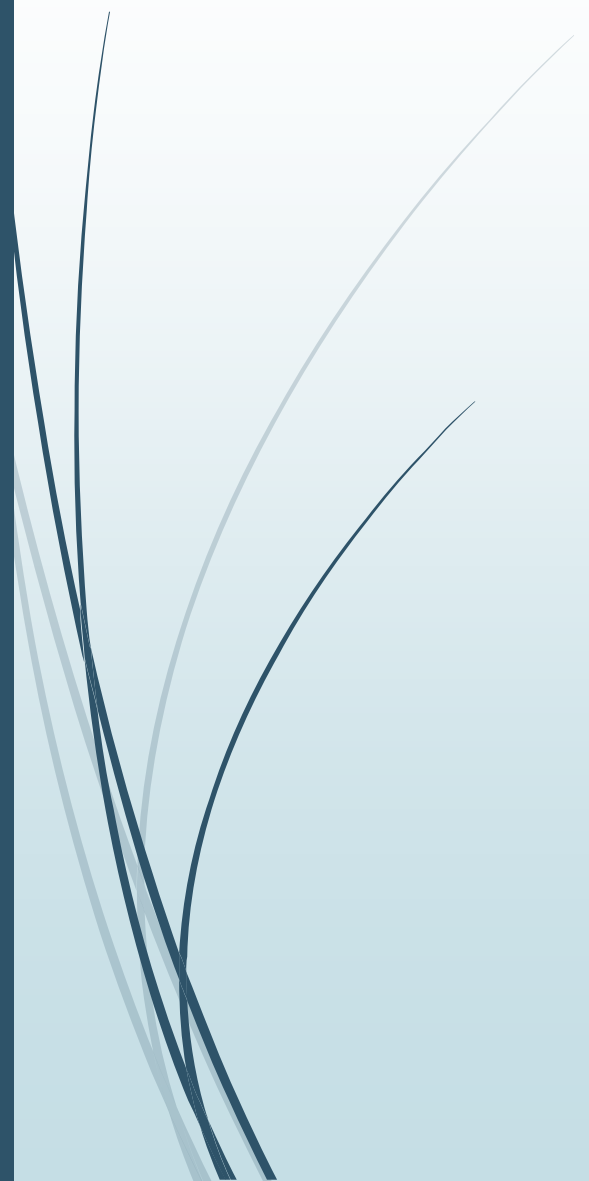
March 2018



# Site Visit – June 2019

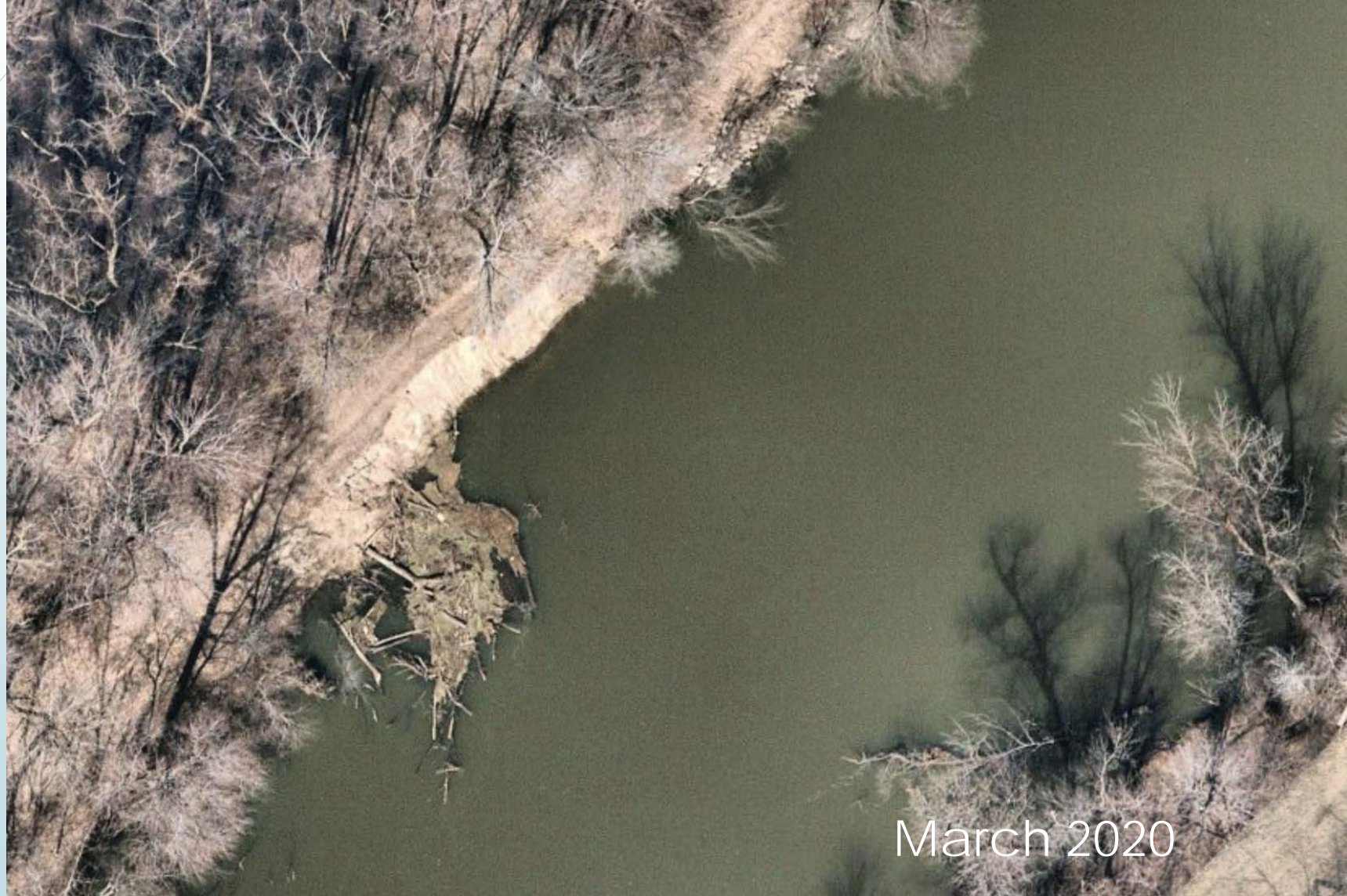








# Bank Conditions Pre-Project



March 2020



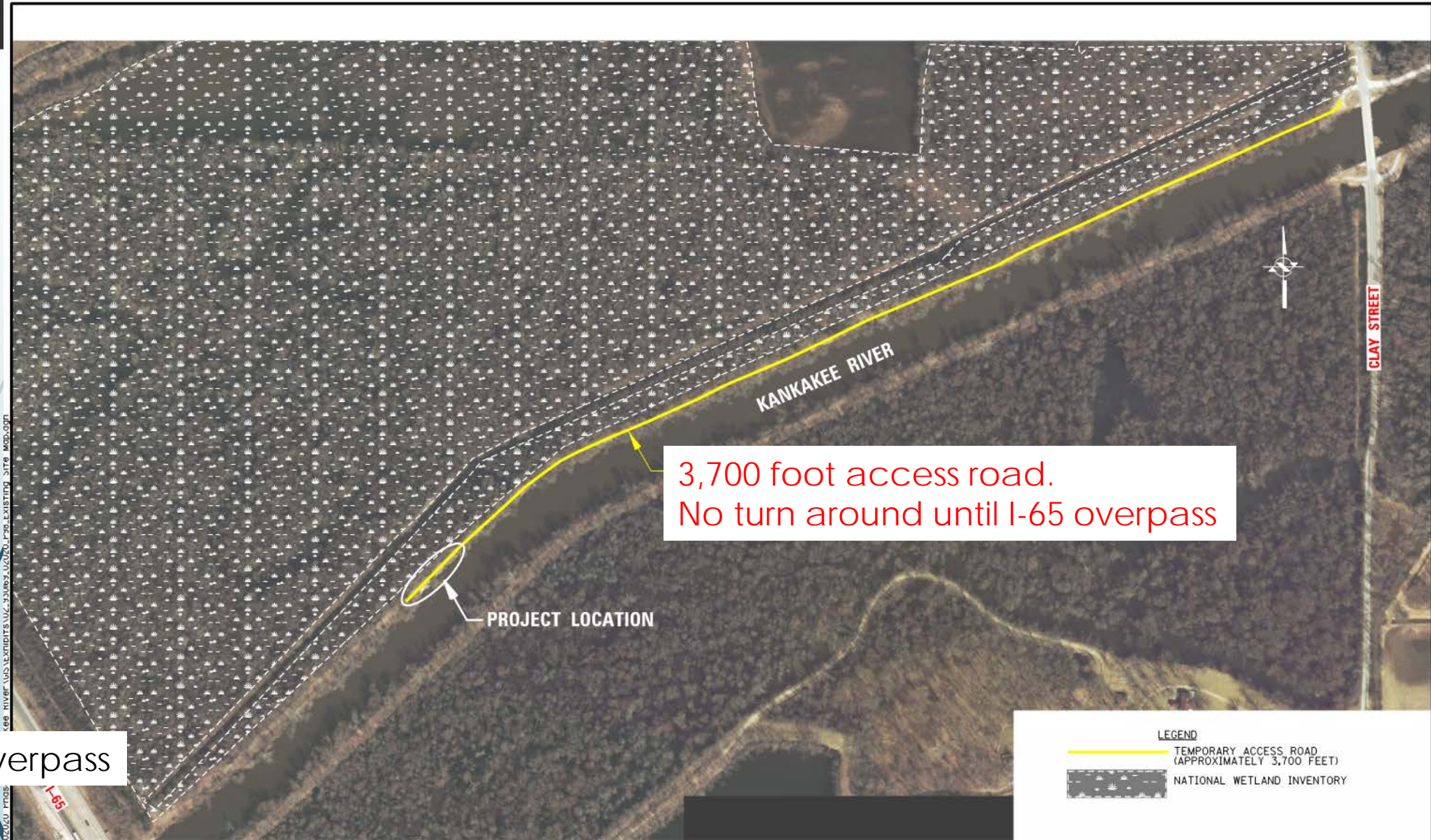
# Bank Conditions Pre-Project



March 2021



# Access to Project Site





# Access to the Project Site





Grand Kankakee Marsh Co Parking Lot



I-65



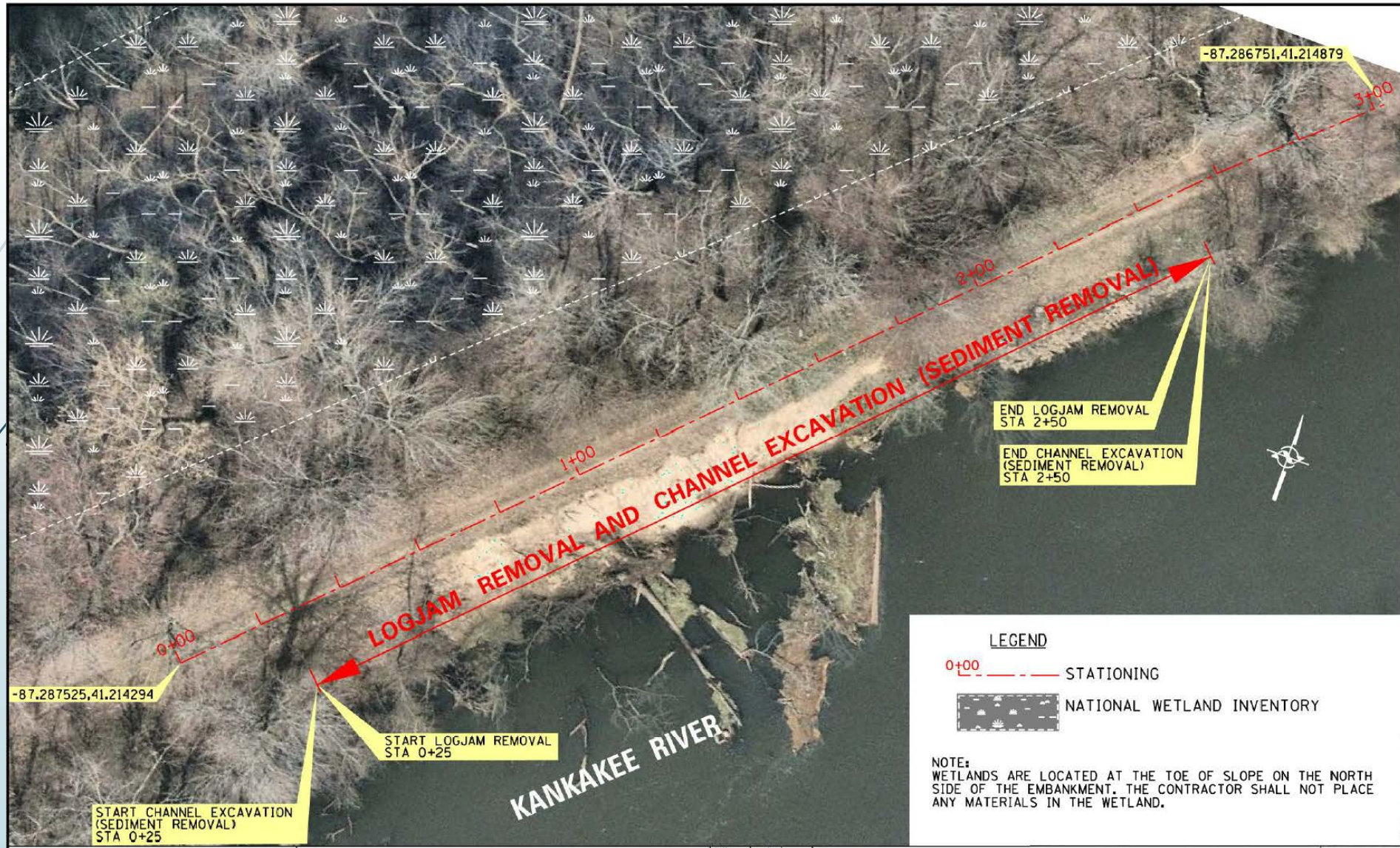


# Kankakee River Design Considerations



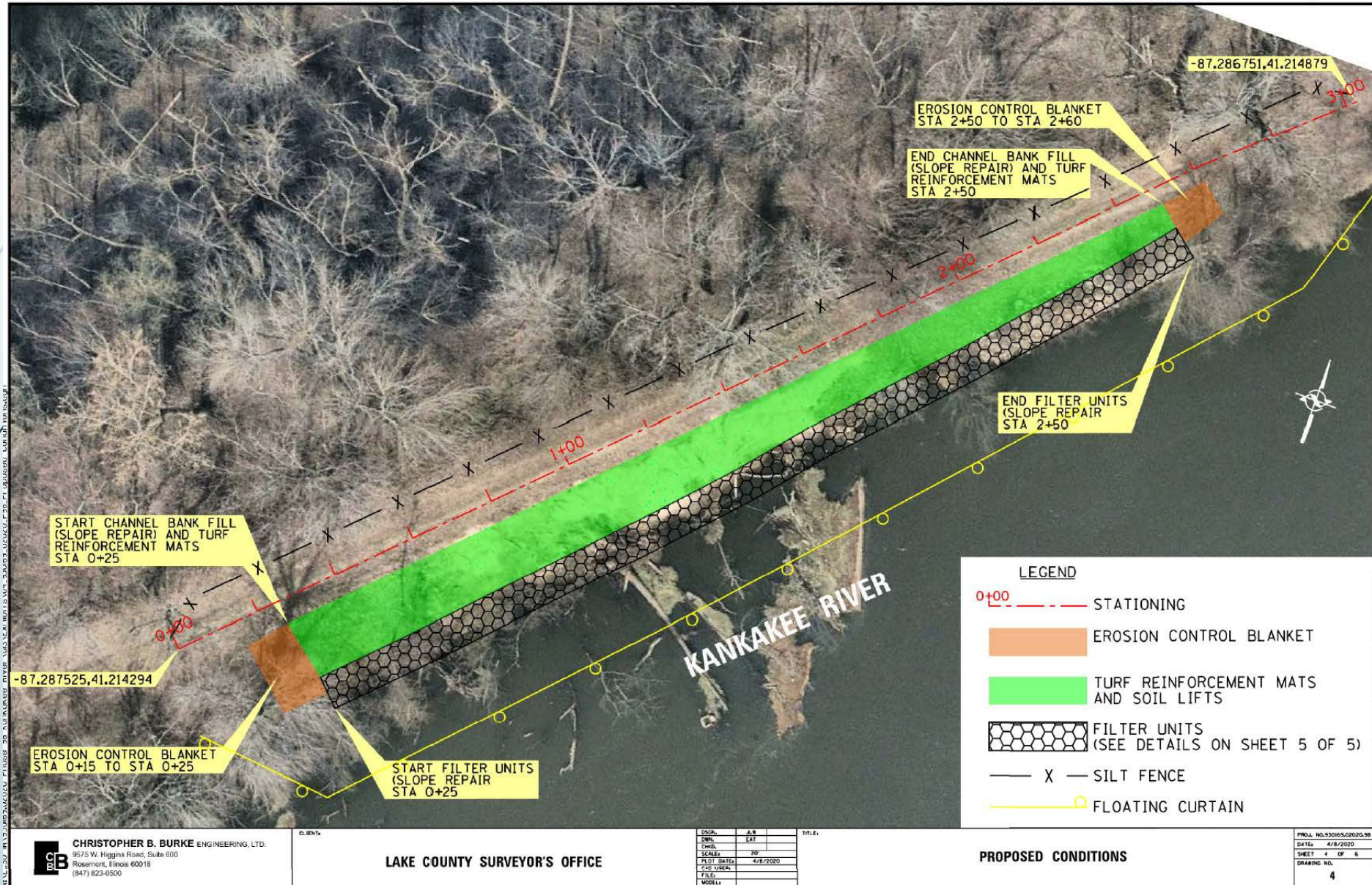


# Kankakee River Plans

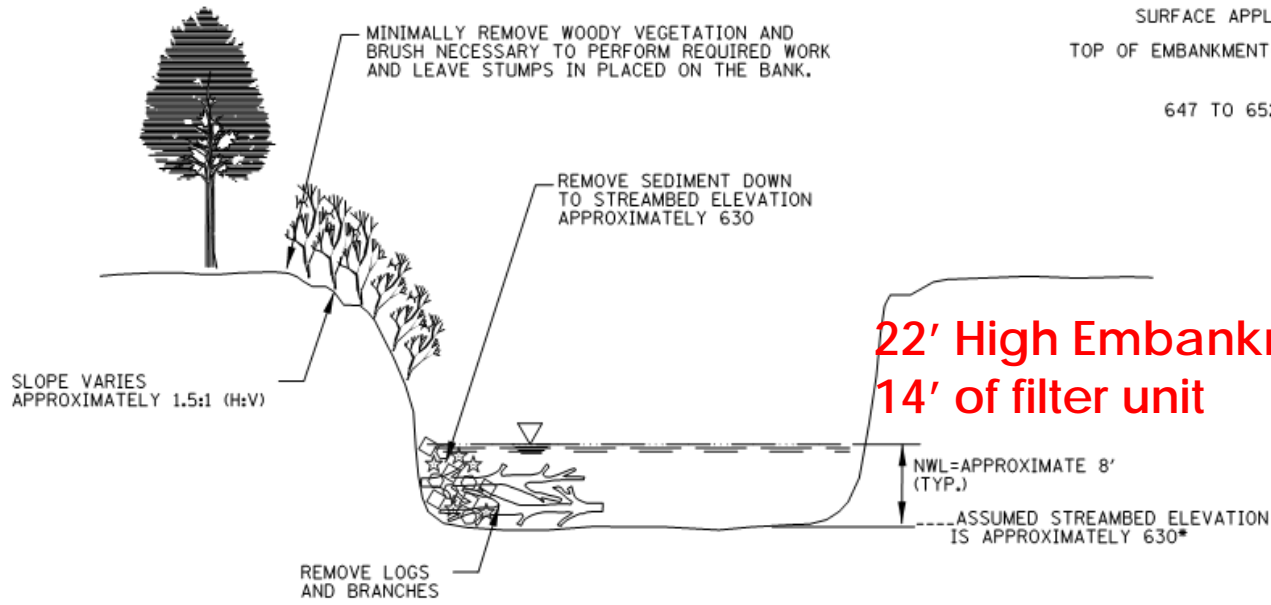




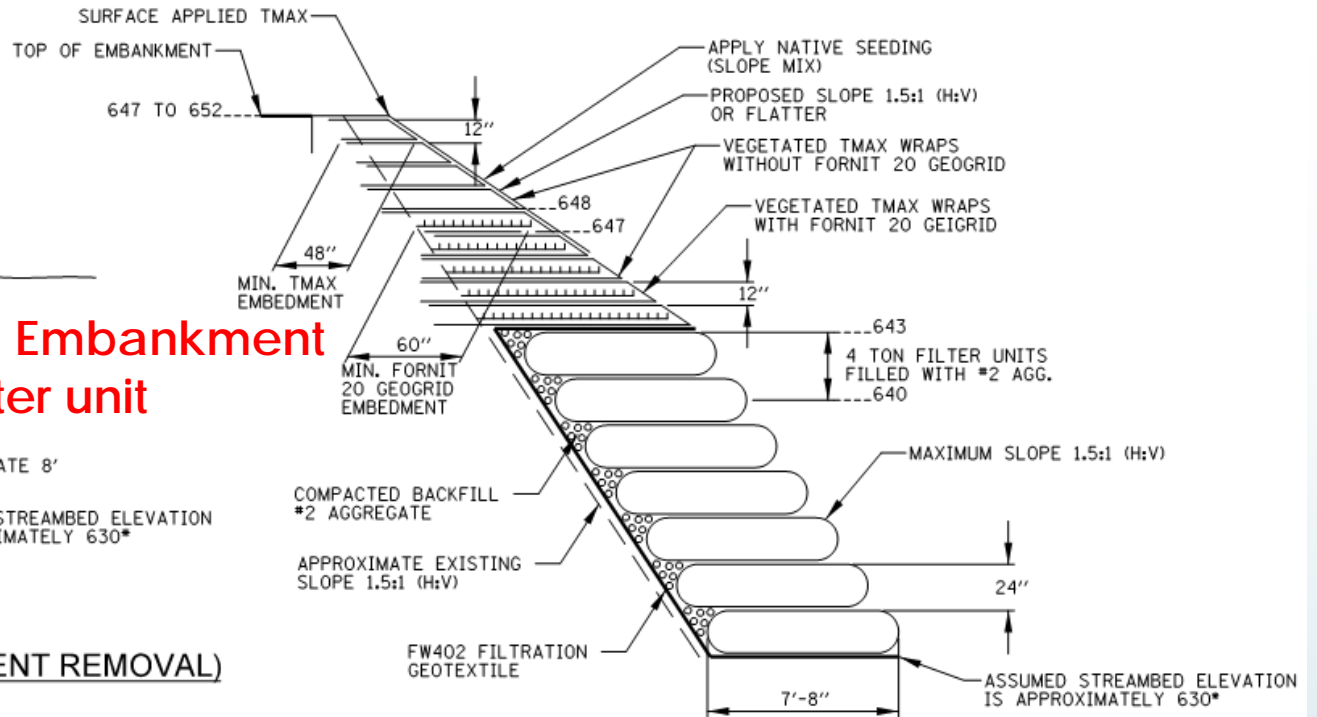
# Kankakee River Plans





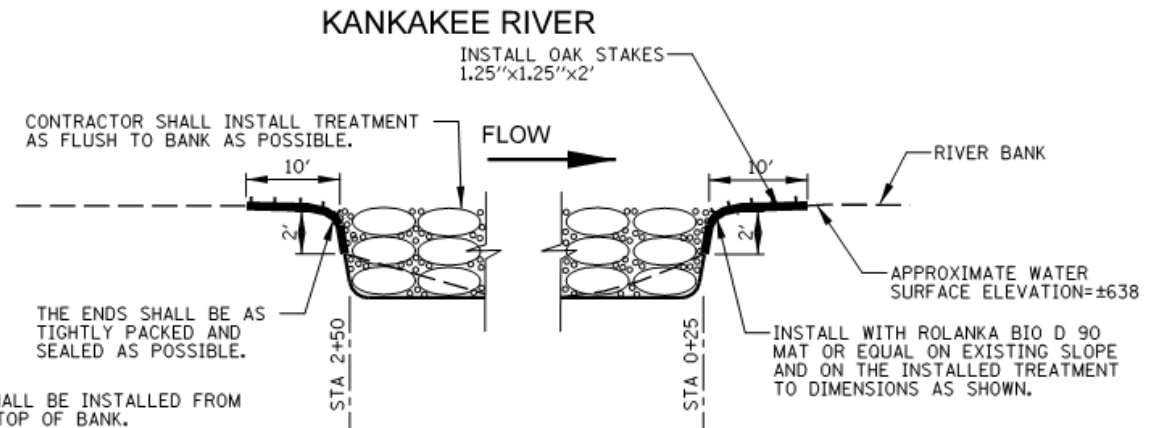


**CROSS-SECTION FOR LOG JAM AND CHANNEL EXCAVATION (SEDIMENT REMOVAL)**  
**STA 0+25 TO 2+50**



**TYPICAL CROSS-SECTION**

NOTE:  
 \*CONTRACTOR SHALL CONFIRM THE DEPTH PRIOR TO CONSTRUCTION BEGINNING AND REPORT THE FINDINGS TO THE OWNER/ENGINEER IF THEY ARE FOUND TO BE DIFFERENT.



**PLAN VIEW - PROPOSED CONDITIONS**

- NOTE:
1. MATS AND STAKES SHALL BE INSTALLED FROM ELEVATION ±638 TO TOP OF BANK.
  2. CONTRACTOR SHALL TUCK THE ROLANKA BIO D 90 MATS BEHIND THE FILTER UNITS. NO STAKES SHALL BE DRIVEN THROUGH THE FILTER UNITS.
  3. ABOVE THE WATER CONTRACTOR SHALL CUT EXISTING VEGETATION FLUSH TO GRADE.





Kyowa Filter Units



# Kyowa Filter Unit





# Kyowa Filter Unit

- 2 and 4 - Ton Capacity Bags for Stream/Lake use
  - +/- 2" minimum stone size
  - 7' 8" diameter (4-ton)
  - 2' height
  - Design to support vegetative growth
- 8 Ton Capacity Bags for Larger River/Ocean/Marine Use
  - +/- 3" minimum stone size
- UV Exposure rating of 30-years
- The Filter Units are manufactured in Japan
- **D2 Land and Water Resource**, a firm based in Indianapolis stocks the Units
  - If the Units are out of stock it takes about 3 weeks to be shipped from Japan
- Cost to install has been \$200 to \$350/cubic yard. Costs are highly dependent on cost of riprap

## PRODUCT SPECIFICATIONS

**3 types of products in a range of tonnages, suited for all hydraulic applications in river or maritime contexts**

➔ **Ecogreen type**(green) for all applications, durability under UV exposure 30 years

The *Ecogreen Filter Unit* is a double net in moss-green polyester which integrates perfectly into a natural setting and along watercourses. The unique flexibility of the *Ecogreen Filter Unit*, together with its ease of use, enable it to marry up perfectly into any type of space where construction is required, particularly since the interstices provided by its filler material encourage the creation of ecosystems and rapid re-growth of vegetation.

Technical specifications								
Ecogreen CE	Mesh size	Unit weight, FU empty	Dimensions in meters, FU installed			Resistance to currents without being moved		Reccomended granulometry of the stuffing material
			Height	Diameter	Vol	Unit	Grouped	
2 tons	25mm	6kg	0.4m	1.9m	1.25m <sup>3</sup>	3.1m/s	4.7m/s	50mm
4 tons	25mm	13kg	0.6m	2.4m	2.5m <sup>3</sup>	3.5m/s	5.3m/s	50mm

• Safety margin/weight= × 1.5 included  
 • Specific gravity of stuffing stones 2.6-2.65, it is possible to use maximum diameter 200mm for all types

➔ **S type**(green) for maritime applications, durability under UV exposure 30 years

Specifically adapted to extreme conditions and to marine environments, with double weaving and a restrain rope which assists in reducing rubbing from the contents, and thus wear to the net, by around 30%.

Technical specifications								
S Type CE	Mesh size	Unit weight, FU empty	Dimensions in meters, FU installed			Resistance to currents without being moved		Reccomended granulometry of the stuffing material
			Height	Diameter	Vol	Unit	Grouped	
8 tons	50mm	48kg	0.7m	3.0m	5.0m <sup>3</sup>	3.9m/s	5.9m/s	75mm

• Safety margin/weight= × 1.5 included  
 • Specific gravity of stuffing stones 2.6-2.65, it is possible to use maximum diameter 200mm for all types





## ➔ Hydraulics



### **Adapts perfectly to all soils**

- Highly efficient coverage
- Attenuation of energy

## ➔ Ecology



### **Supports natural vegetation**

- Encourages the development of fauna and flora

## ➔ Execution/Implementation



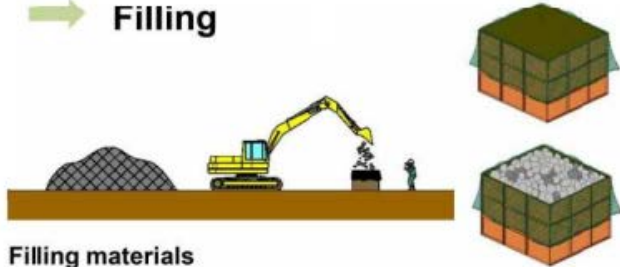
### **Speed of execution/Reduction in labor costs**

- Flexibility of the product and simple mechanization for installation
- Installed dry or underwater



# Kyowa Filter Units

## → Filling

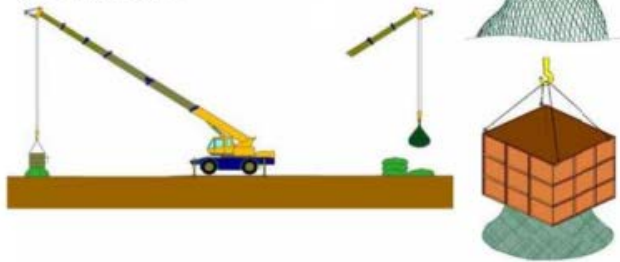


### Filling materials

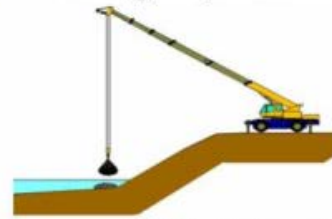
The **Filter Units** are filled in a production box, using any type of solid material: stones, pebbles, rubble, coal, etc.

### Procedure for filling

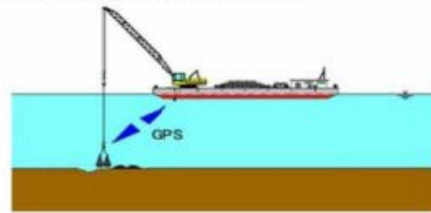
- Set **Filter Unit** in the production box
- Fill with material
- Close up the Filter Unit and attach the ring
- Lift off the caisson
- Lift the **Filter Unit** using the ring, and place in position



## → Placing in position



Highly maneuverable, **Filter Units** can be used easily and quickly, allowing for very rapid speed of positioning. This speed of execution significantly lowers costs of installation and labor.



## → Ring

Each **Filter Unit** is supplied with a cast-iron ring which connects the 6 fastening points of the net lifting rope.

This ring ensures that the **Filter Unit** is extremely easy to place in position, and also makes it possible to link nets together using a rope.



## → Production box

The **Filter Unit** are filled using a production box (to be constructed by the client). This pre-dimensioned production box serves too as filling measure.





# Construction in August 2021









April 2022





September 2022









September 2022









QUESTIONS?

