### **Sugar Creek Restoration Project**







By:

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### Living Waters Consultants, Inc.

- Eco-Engineers, Hydrologists, Ecologists
- Stream, Lake & Wetland Restoration
- 17 Project Awards (Local, State, National and International)
- Grant Acquisition Services
- Environmentally Sound Solutions





# Outline

- Past Pond Conditions
- Existing Impacts
- Sugar Creek Restoration Concept Plan
- Example Future Conditions
- Options for Grant Funding



### **1990 Shoreline Erosion**



Early Shoreline Erosion (1990)
Pond Built in 1975

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# **Sheet Pile Installed 1992**





# Sheet Pile (2700 Linear Feet of Shore)





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#### 2005: Sheet Pile Heaving



Sheet Pile Heaving
2700 Linear Feet



### **2015: Some Sheet Pile Failure**



- Holes # 1 and # 2 (300+ Linear Feet)
- Rusting and Corrosion



# 2010: Algae Blooms



- Algae Blooms
- Aesthetic Impacts



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# 2013: Silt Impacts

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# August 2013

• Exposed Mud Flats (2013)

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# **Shallow Water Depths (2011)** (Water Level Lowered 0.7 Foot)



• Loss of Water Irrigation Volume (2011)

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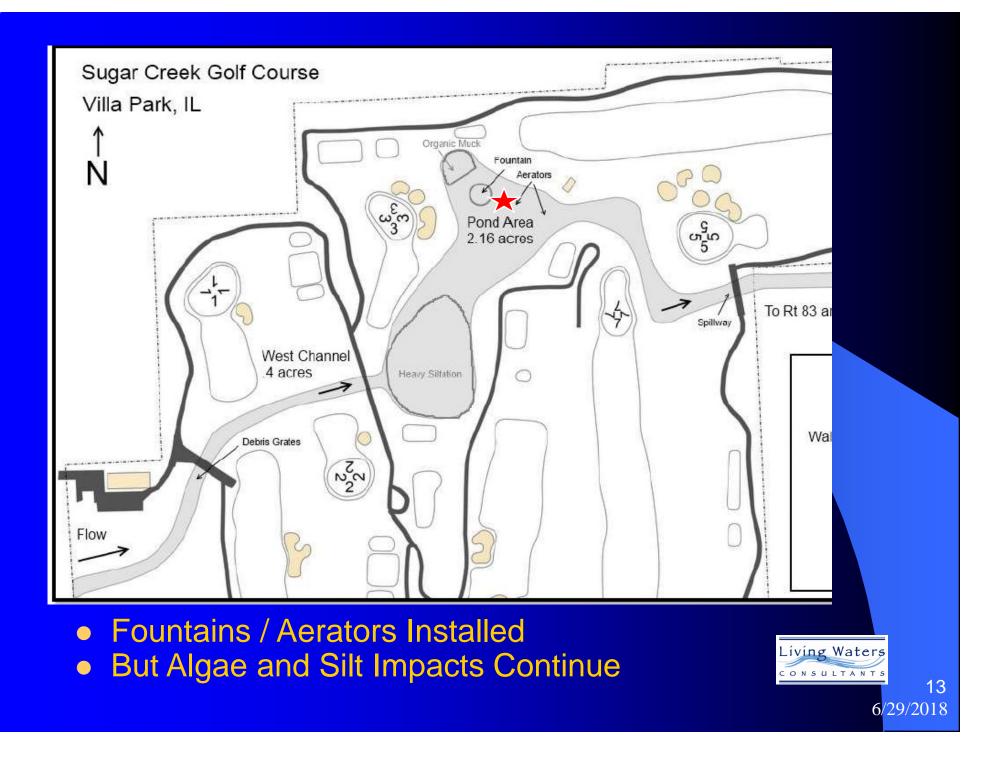
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# 2017: Exposed Mud Flats



• Expansion of Mud Flats (2017)

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## **Future Options**

- Sheet Pile Repair?
- Dredging?
- Costly & Temporary.
- (Sediment Must Pass IEPA Standards. If Standards Not Met, Dredging Is Exorbitantly Expensive.)
- Versus Environmentally Sound Solutions
- Long-Term
- Cost-Effective
- Possible Grant Funding (Environmentally Sound Solutions)





# Sugar Creek Restoration Plan

OPTION FOR EQUALIZATION PIPE WITH VALVE OR IN-LINE WATER LEVEL CONTROL STRUCTURE PROP. CLAVID BE BERM TO BE CONSTRUCTED (ROCK LINED). DEPRESS CENTER OF BERM FOR OUTSTRUCTED (ROCK LINED). WETLAND INTO POND AREA.

SHORELING RE-SHAPING AND STABILIZATA CUT AND REMOVE EXIST. SHEET PILE RETAINING WAI INSTALL NATIVE PLANTIN

PROPOSED WETLAND (0.4 ACRE). EV. 1.0 FT ABOVE POND WATER LEVEL

SHORELING RE-SHAPING AND STABILIZATION. CUT AND REMOVE EXIST. SHEET PLE RETAINING WALL-INSTALL PATIVE PLANTINGS

REGULATORY FLOOD

IGAR CREEK INL

PROPOSED SEDIMENT FOREBAY (0.27 ACRES)

DIFY / LOWER DAM ELEV DIFY DAM OUTLET CONFI

PROP. POND

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PROP. VETLAND

PROP. RESTORED STREAM CHANNEL

BE ROCK LINING OVER CLAY CORE

PROP. ROCK RUFFLE STRUCTURE

1-FOOT TOPOGRAPHY PARCEL BOUNDARIES

DAM OUTLET MODIFICATION

EX. STORM INLET

----- FLOODPLAIN BOUNDARY ------ FLOODVAY BOUNDARY

EX. STORM FES

REAR RE-SHAPE SLOPE INOT REPICTEDS

PROF, ROCK TOE

ROCK POINT STRUCTURE

TYP 15 FT

PROP. STREAM RIFFLE STRUCTURE SHORELING RE-SHAPING AND STABILIZATIO CUT AND REMOVE EXIST. SHEET PILE RETAINING WAL INSTALL NATIVE PLANTING

WELL INLET PIPE RELOCATION (ca. 652.5 ft)

OFFSHORE CLAY CORE BERM TO BE CONSTRUCTED (ROCK-LINED)

PROP. RESTORED STREAM CHANNEL. WATER ELEV. MAY VARY (PER PROP. RIFFLE STRUCTURES) FROM ABOVE PO WATER LEVEL AT UPSTREAM SIDE OF CREEK CHANNEL TO BELOW POND ELEV. AT DOWNSTREAM SIDE OF CHANNE

OPTION 1 STATISTICS: - POND AREA = 0.75 ACRE - WETLANDS = 0.53 ACRE

- SEDIMENT FOREBAY = 0.27 ACRE

- STREAM CHANNEL AND BERM = 0.59 ACRE

- TOTAL POND AREA = 2.15 ACRE

- CUT AND REMOVE EXIST. SHEET PILE (2700 LF)

- SHORELINE RE-SHAPING W/ NATIVE PLANTS (2700 LF)

## Sugar Creek Restoration Plan

PROPOSED POND (0.75

EGULATORY FLOODPLAIN-

OPTION FOR EQUALIZATION PIPE WITH VALVE OR

PROP. CLAY CORE BERM TO BE CONSTRUCTED (ROCK LINED). DEPRESS CENTER OF BERM FOR OUTFLOW FROM PROPOSED WETLAND INTO POND AREA.

> PROPOSED WETLAND (0.4 ACRE). TYP. ELEV. 1.0 FT ABOVE POND WATER LEVEL

SHORELING RE-SHAPING AND STABILIZATION. CUT AND REMOVE EXIST. SHEET PILE RETAINING WALL INSTALL NATIVE PLANTINGS

REGULATORY FLOODWAY-

PROPOSED SEDIMENT FOREBAY (0.27 ACRES)

SUGAR CREEK INLET-

- STREAM OVERFLOW STRUCTURE W/ DISCHARGE INTO POND

SHORELING RE-SHAPING AN CUT AND REMOVE EXIST. SHEET PILE F INSTALL N/

ROP. STREAM RIFFLE

OFFSHORE CLAY CORE BERM TO BE CONSTRUCTED (ROCK-LINED)

- PROP. RESTORED STREAM CHANNEL WATER ELEV. MAY VARY (PER PROP. RIFFLE \$ WATER LEVEL AT UPSTREAM SIDE OF CREEK CHANNEL TO BELOW POND ELEV. AT (

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- CUT AND REMOVE EXIST. SHEET PILE (27)
- SHORELINE RE-SHAPING W/ NATIVE PLAN





## Before: Aesthetic & Safety Impairment, Debris Jams, Poor Water Quality, Erosion





# **Bank Stabilization**, Trail Aesthetics





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### **Before – Partially Vegetated**



- **Partially Vegetated Sediment Deposits**
- Carp Habitat / Carp Population
- Water Quality Impacts
- Odors
- **Dying Mussels**



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#### After - Wetlands



- Narrow Channel
- Floodplain Connectivity
- Water Quality Filtration
- Wildlife Diversity
- Less Carp Habitat
- Sediment Stabilization



# Wetlands: Off-Bank Rock Toe





#### **County Stormwater Community of the Year**





# **Detention Basin Naturalization**



#### **Project Team**

Living Waters
 Consultants, and
 Bedrock Earthscapes



# Silt Impacts





# **Construction & Stabilization**





# **Post Construction Channel**





# Year 1 Native Plant Growth





# Restoration (Bedrock Base)





# Wetland Habitat





# **Rock Riffle Structures - Examples**





# **Dam Modification Project**





## Before: Mud Flats, Flooding, Poor Water Quality, Carp





#### After: Fish migration, mussel survival, lower water levels, better water quality, sediment control, aesthetics, reduced odors, flood storage.





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## **Prairie / Wetland Streambanks**



-Rock **Points** - Off-Bank Rock Toe



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# **Off-Bank Rock Toe / Wetland**





# After: Fish Species Increased 55%





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#### Federal Grant Funding:

- Illinois EPA Section 319 (60% Grant)
- Illinois Clean Energy
- U.S. Fish & Wildlife Grants





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#### Local Grant Funding:

- DuPage County WQIP Grant
- Soil & Water Conservation District SSRP





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# **Natural Stream Channel Benefits**

- Recreational Enhancement
- Alternative to Dredging
- Aesthetic Benefits
- Grant Funding Opportunities
- Water Quality
- Protects Property Value
- Protects Pond Irrigation Volume
- Reduced Flooding
- Shoreline Stability Increases Over Time
- Habitat Restoration
- Wildlife Diversity
- Reduced Sediment Maintenance



# **Questions?**



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