

Dredging a Wet Detention Basin

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Land Use

Site History

- Pond originally constructed in 1960s as irrigation pond for golf course.
- Re-shaped in 1974 to current extent. Probably lined.
- Soils mapped as Houghton Muck. Actually Pella?
- No soil borings.
- Water table elevation was unknown: 5 feet bls?
- Pond receives runoff from ~ 34 acres, mostly County office campus. Serves as wet detention basin, with four infalls. Current surface area 1.2 acres.
- Discharge to unnamed tributary of Fox R., via City

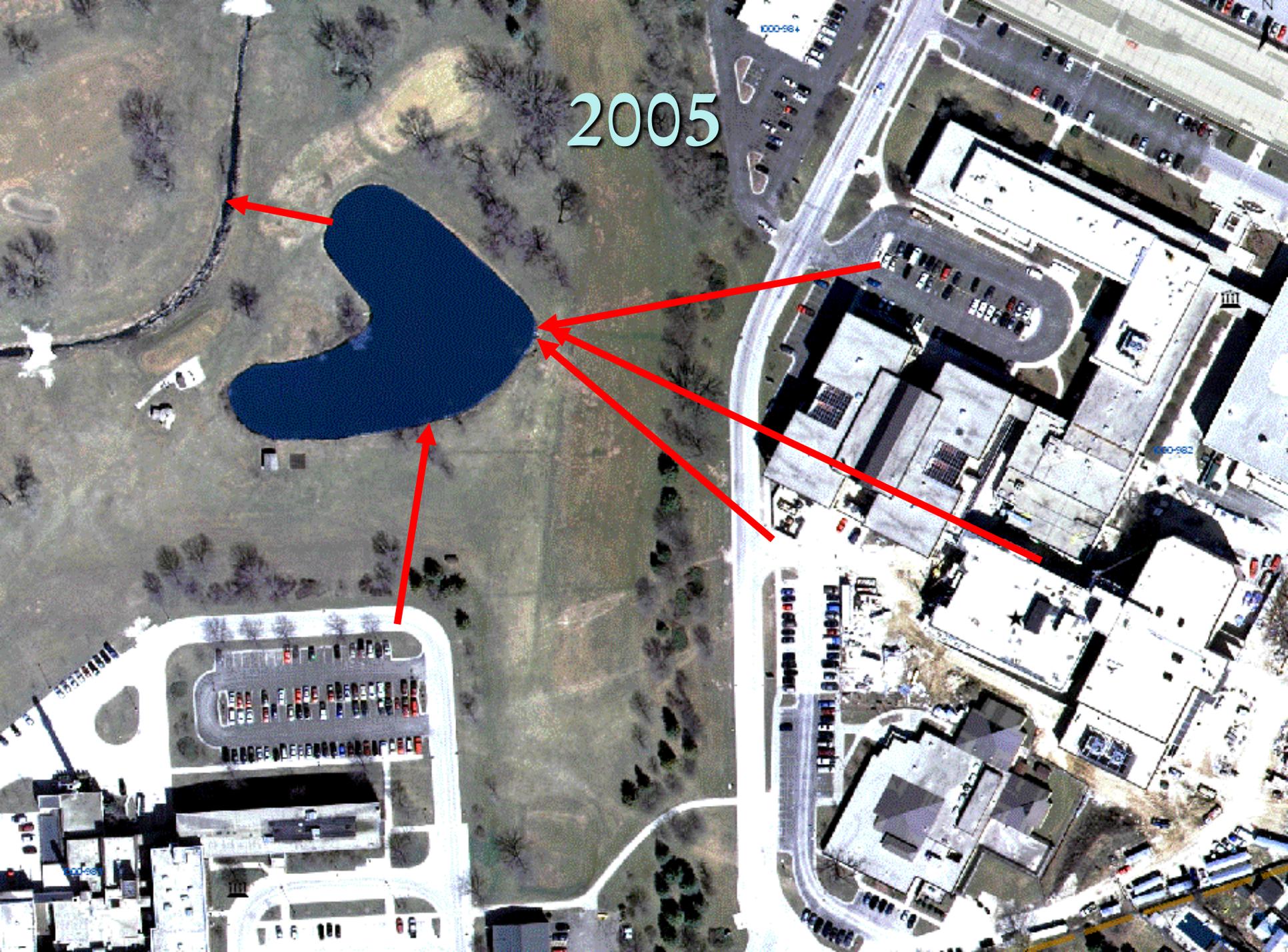
1963



1970



2005



1974 Liner



Soil Profile



Objectives

- Jail construction in 2004 produced large amount of sediment. Current depth uniformly 5 feet
- Increase available water storage for course irrigation during dry spells – 8 feet
- Meet liner requirement and safety shelf requirements per DNR 1001 standard.
- Prevent leakage, as water partially purchased from municipal source

Permitting

- No NR 216 NOI required: < 1 acre disturbed, pond doesn't count toward total because Waters of the State are not "land"
- No Chapter 30 permit required – not navigable
- County Storm Water permit – erosion control (> 3,000 sf disturbed)
- Filed exemption from the requirement to landfill the spoils as solid waste on the grounds that the dredge spoils qualify as a low-hazard waste under s. 289.43(8), Stats (NR 528 not yet in effect)

Plan Development

- County hired RSV as engineer
- Plans addressed:
 - Spoils quantity and staging
 - Construction methodology
 - Erosion control and restoration
 - Site utilities
 - Dewatering
 - Excavation (Mechanical or hydraulic)
 - Liner (Clay or HDPE)
- All items bid as lump sums due to issues with quantification

Bids

- Range \$61k - \$162k. Median \$98,500, Average \$107,000
- Quantity estimation largely left to contractors
- Spoils volume estimated = actual = 4,000 cy
- Low bidder was simultaneously excavating satisfactory liner material from a cut site in Shorewood

Bid Tabulation for 1.2 ac. Pond

Item	Low Bid	Ave. Bid	Factor to Low Bid	Ave. Low Bid	Cost/ac. of Pond
Pond Dewatering	\$2,537	\$7,649	0.57	\$4,400	\$3,667
Excavation	\$8,302	\$31,032	0.57	\$17,700	\$14,750
2-ft Clay Liner	\$38,335	\$46,444	0.57	\$26,400	\$22,000
Topsoil strip, stock, placement	\$2,226	\$3,596	0.57	\$2,000	\$1,667
Handling exc. mat.	\$5,605	\$11,118	0.57	\$6,300	\$5,250
Site rest.	\$2,192	\$3,999	0.57	\$2,300	\$1,917
Erosion control	\$1,824	\$3,374	0.57	\$1,900	\$1,583
Totals	\$61,020	\$107,214		\$61,000	\$50,833

Weather

- Golf course closure
- Dewatering did not start until mid-November
- Handling water in single-digit temperatures
- Frozen soils
- Snow
- Restoration issues

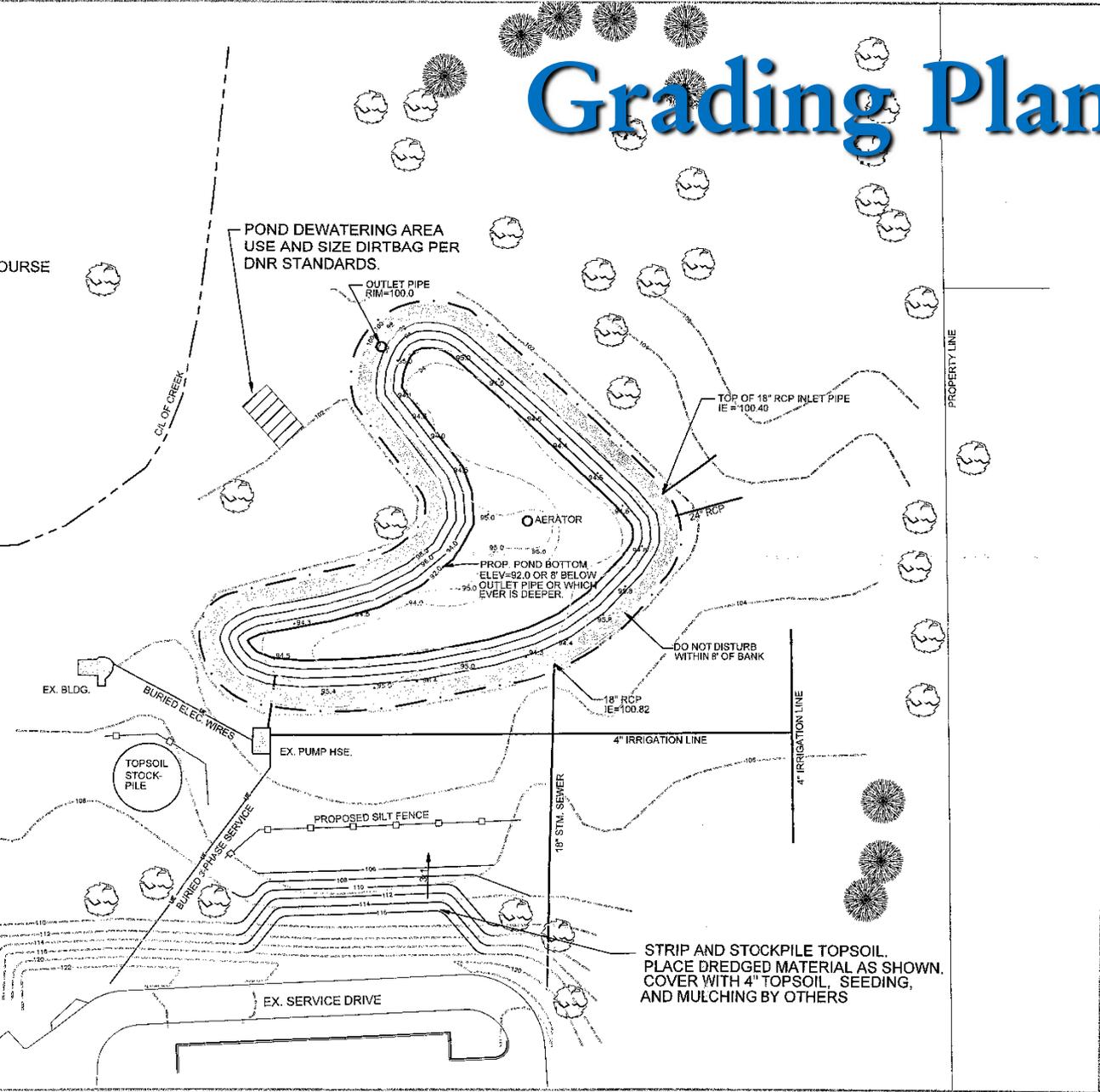
Tracking Pad



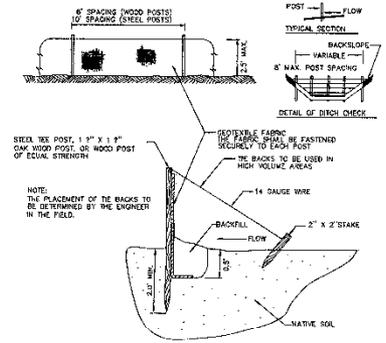
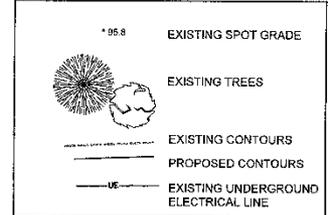
Erosion Control



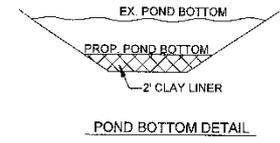
Grading Plan



LEGEND



TEMPORARY SILT FENCE, SPECIAL TOE-IN METHOD



POND BOTTOM DETAIL

NOTES:

- DO NOT DISTURB POND BOTTOM WITHIN 8 FEET OF POND SHORE.
- PLACE DREDGED SOILS ON SLOPE AS SHOWN.

PRELIMINARY

NO.	REVISIONS	BY	DATE

DESIGNED TO	INCH
DRAWN BY	SCALE
CHECKED BY	PROJECT
	09-0
	SHEET
	1 of

Dewatering











Excavation





Haul Route









Liner Installation





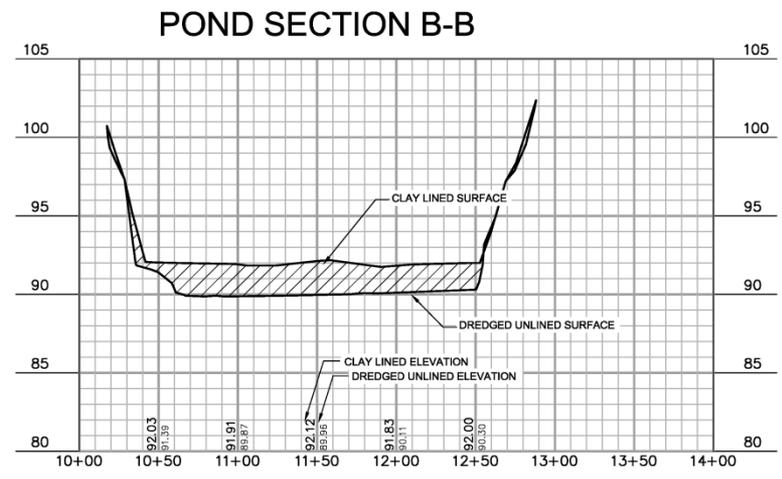
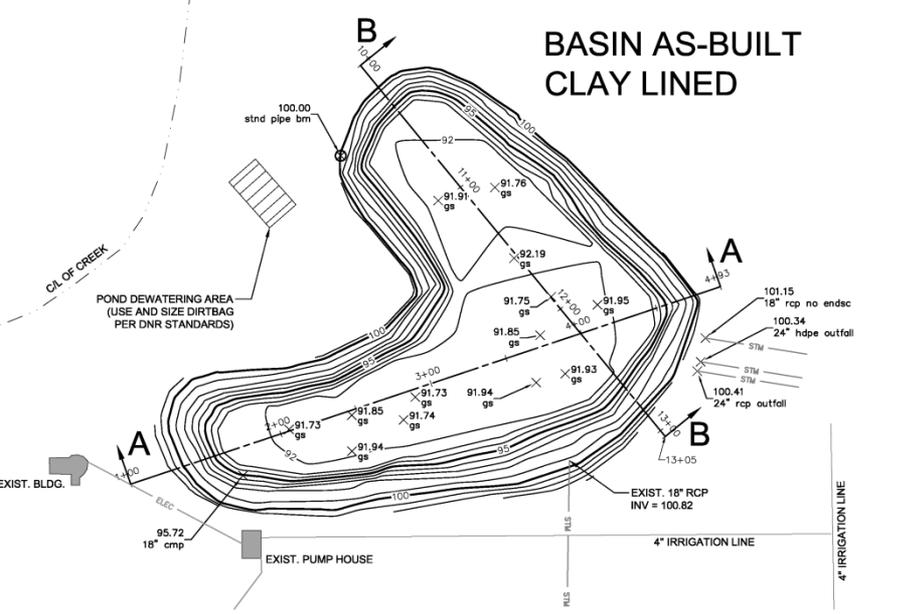
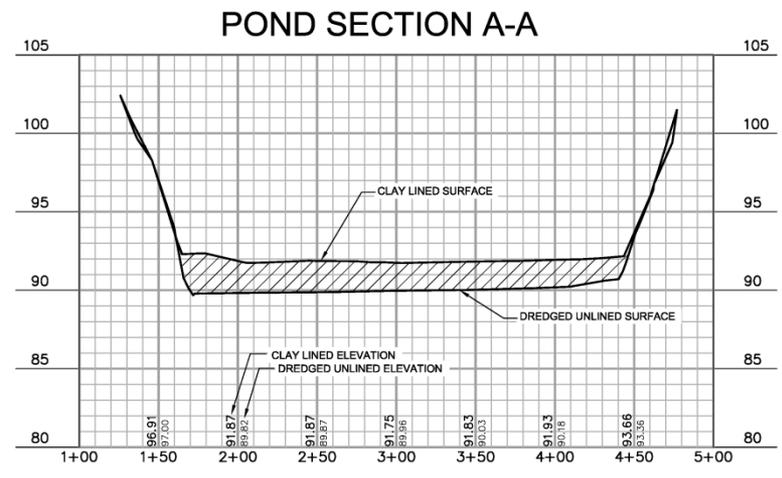
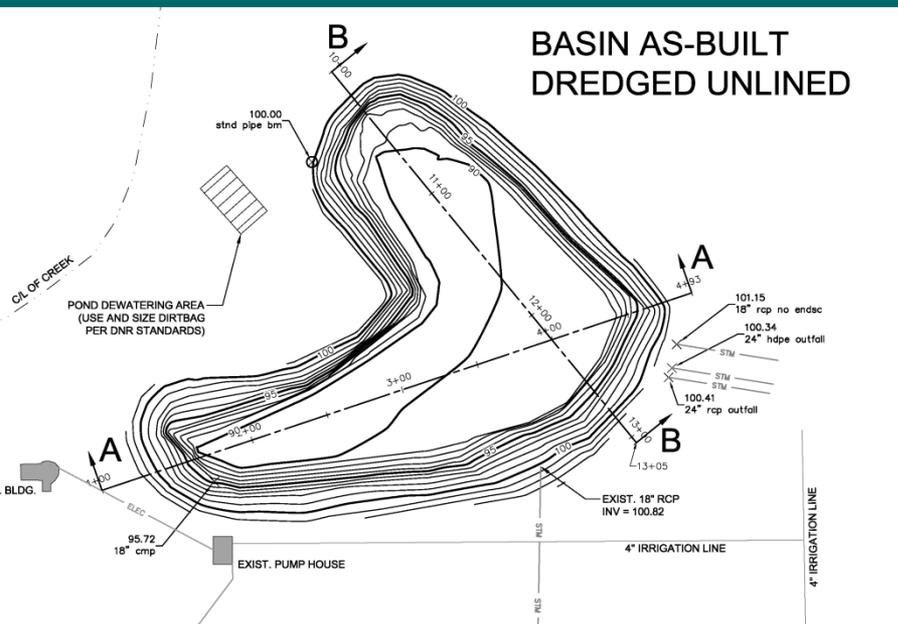


CATERPILLAR

G
815

As built survey / cross sections

- Used to evaluate liner thickness
- Record for future reference



NO.	REVISIONS	BY	DATE

MOOR DOWNS GOLF COURSE POND
AS-BUILT CROSS SECTIONS
WAUKESHA CO. #2009-MD 01
CITY OF WAUKESHA, WISCONSIN

DESIGNED	LTN	01/25/10
CHECKED	TCL	01/25/10
0 40' SCALE		
PROJECT NO. 09-079		
SHEET NO. 1 OF 1		

Infall Erosion



Tasks to Complete

- Repair infall erosion
- Verify liner thickness - sides
- Stabilization / restoration
- Sampling spoils for solid waste requirement

Lessons Learned

- Evaluate soils and water table in plan phase
- Oversize dewatering BMPs
- Dredge spoils are very liquid.
 - Cannot pile up or move off-site.
 - Important to provide for spoil staging areas in development plans.
 - Hydraulic excavation could address the expansive spoils area

Lessons Learned (continued)

- After de-watering, must prepare for infall erosion
- Important to verify liner thickness. Survey data?
- Keep as-built records for future reference
- Verification of material specs, compaction

Other Thoughts

- Aquatic invasive species control – yellow floating heart

