

Progress Report May 18, 2011 SW IL Levee System By Jay Martin



- Design Activities – Progress Set
- Look Ahead
- Budget

- Internal team meeting to prioritize short-term targets to further evaluate, March 3.
- Developed list of priority areas and schedule
- Complete analysis on selected reaches
- Update drawings to reflect results
- Develop cost estimate

Value Engineering Considerations



Wood River Value Engineering/Design Optimization Items

Item	Description	Potential Benefits
1	Reduce berm slopes from 2% to max 1.33% or to actual berm shape (levee-wide)	Reduce volume of berm material required
2	Examine feasibility of moving cutoff wall to riverside toe of the levee. Stations 21+00 to 32+00 and 54+55 to 118+00	Reduce square footage of cutoff reducing cost.
3	UWR - Use 2D finite element modeling to examine alternatives to reduce or eliminate berms and relief wells at stations 213+00 to 222+50. (South of water treatment plant).	Reduce berm, culvert and relief well abandonment costs. Reduce potential wetlands impacts.
4	LWR - Use 2D modeling and assume that planned USACE relief wells are installed to reduce/eliminate berms. Sta. 195+00 to 207+00	Reduce berm sizes. Avoid abandoning wells. Avoid realigning and raising power lines.
5	LWR - Multi-phase approach to a high cost area. Deep Cutoff wall, Sta. 132+00 to 187+00.	Potential significant cost savings by reducing wall size.
5a	Use 2D modeling to reduce or eliminate wall.	
5b	Examine possibility of moving cutoff wall to toe of levee.	
6	LWR - Use 2D modeling to reduce/eliminate berms and relief wells 548+00 to 569+00	Reduce berm sizes. Potentially avoid installing new relief wells.
7	LWR - Reexamine flooding elevations, hydrology and hydraulics, and potentially use 2D modeling to reduce or eliminate clay cap from about 565+00 to 630+00.	Reduce or eliminate clay cap. Avoid some wetlands impacts.
8	LWR - Use 2D modeling to reduce /eliminate berm and new relief wells, stations 569+00 to 577+00.	Reduce berm size. Avoid construction limits/limits of disturbance impacting neighboring residences.
9	LWR - Use 2D modeling to eliminate/reduce large berm and 72" culvert. Sta. 595+00	Reduce berm and culvert cost Avoid or reduce wetlands impact.
10	LWR - Use 2D analysis to reduce/eliminate cost of ditch fill and new 72-inch culvert. Sta 594+00 to 608+00	Reduce cost of expensive culvert.

Significant Changes Wood River



- **UWR 213+00 - 222+50 (Area near City of Alton WWTP)** Sheets: CA-X118 – CA-X119
 - Removed seepage berm and 72” pipe culvert
 - Replaced with graded filter and small pump station

- **LWR 153+00 – 187+00 (WR Elbow Area)** Sheets: CA-W149 – CA-W152
 - Moved deep cutoff wall from the crest to the riverside toe of the levee (typical)

- **LWR 199+00 - 208+00** Sheets: removed from the set
 - Completely removed fill and pipe culvert with additional modeling
 - (No improvement needed)

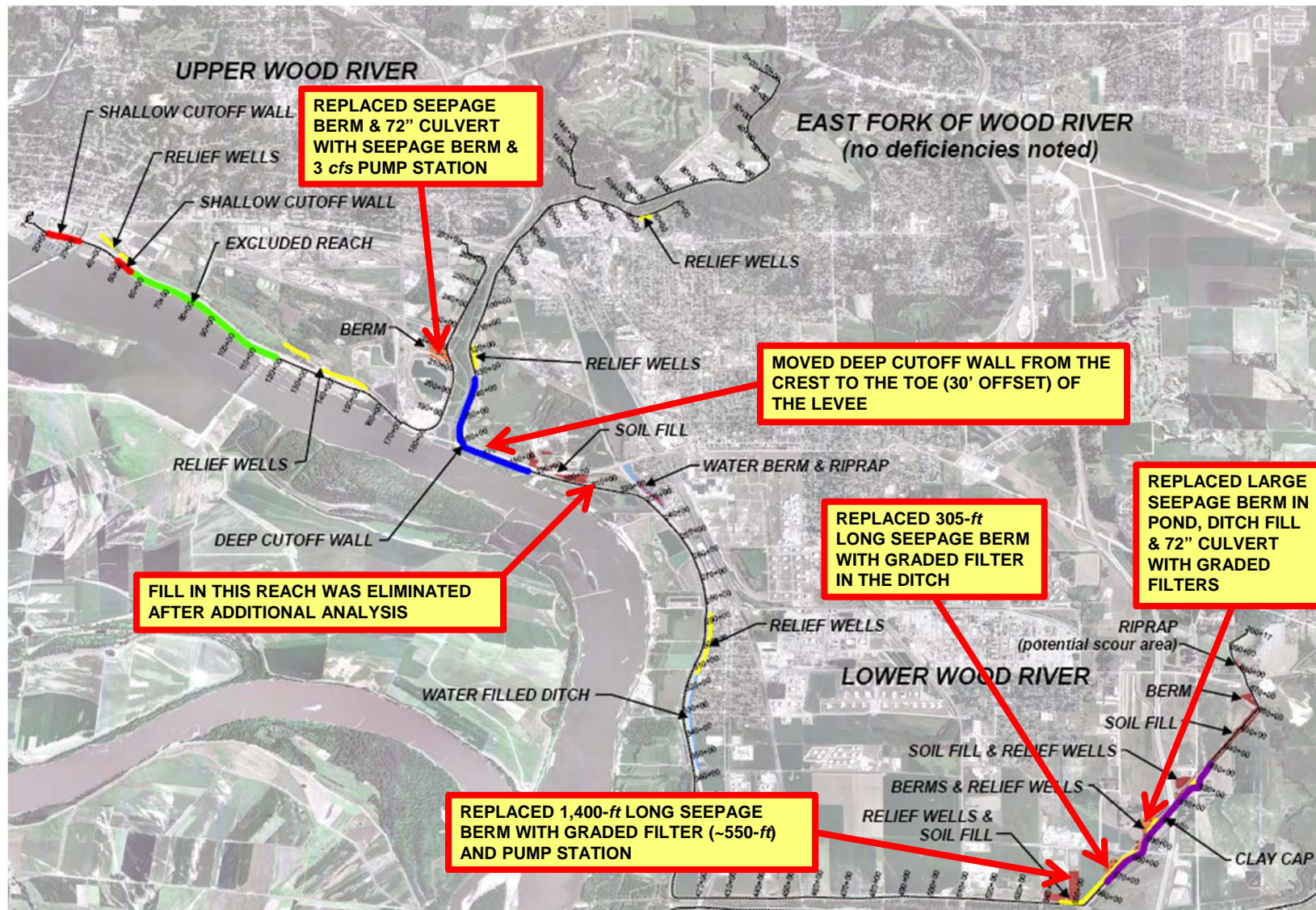
- **LWR 548+00 - 569+00 (Long Borrow Pit Area)** Sheet: CA-X182
 - Removed 1,400-ft long seepage berm in borrow pit
 - Replaced with ~550-ft of graded filter along one side of the pit and a pump station

- **LWR 569+00 - 579+00** Sheets: CA-X184 – CA-X185
 - Removed 305' long seepage berm
 - Replaced with graded filter in the ditch

- **LWR 592+00 - 599+00 (Pond Area)** Sheet: CA-X186
 - Removed large seepage berm
 - Replaced with graded filter

- **LWR 599+00 - 612+00 (Pond to I-255)** Sheets: CA-X186 – CA-X187
 - Removed ditch fill & 72" pipe culvert
 - Replaced with graded filter

Overview Wood River



Value Engineering Considerations



MESD Value Engineer/Design Optimization Items

Item	Description	Potential Benefits
1	Revised unit cost for Deep Cutoff Walls may be set to \$32/sf (Reference Line 6 of Cost Est.)	Reduce overall cost of cutoff walls in MESD by \$1.8M
2	Reduce berm slopes from 2% to max. 1.33% or to actual berm shape	Reduce volume of berm material required
3	Deep cutoff wall 781-791; evaluate with SEEP/W to see if gradients necessitate cutoff wall	Reduction in quantity of cutoff wall by 100,000 SF
4	Replace Deep cutoff wall between Stations 1209-1219 with a Berm/RW hybrid solution	Reduction in quantity of cutoff wall by 140,000 SF
5	Use 2D modeling to reduce the berm widths/depths at Dead Creek; Sta. 1291+40, 1298+09, 1304+55	Reduce volume of berm material required Reduce acreage of wetland impacts Reduce acreage of land acquisition Reduce or eliminate cost for relocation of Dead Creek Maintain water storage areas
6	Use 2D modeling to reduce the berm widths/depths between Sta. 1320 and 1349	Reduce volume of berm material required Reduce acreage of land acquisition Maintain water storage areas Eliminate/reduce need to put blue water ditch in a box culvert
7	Use 2D modeling to reduce the berm widths/depths between Sta. 1219 and 1239	Reduce volume of berm material required Reduce acreage of land acquisition Maintain water storage areas Reduce need to route surface water and remove need to relocate Phillips Pump Station Possibly eliminate need to relocate power poles
8	Use 2D modeling to reduce the berm widths/depths between Sta. 1268 and 1344	Reduce volume of berm material required Reduce acreage of wetland impacts Reduce acreage of land acquisition Maintain water storage areas
9	Use 2D modeling to reduce the berm widths/depths between Sta. 962 and 972	Reduce volume of berm material required Reduce acreage of wetland impacts Reduce acreage of land acquisition Maintain water storage areas
10	Re-evaluate using 2D finite element model the effectiveness of 40' cutoff between Stations 987 and 1013 in light of identified section of toe drain and new field data to confirm existence or absence of clay layer at 40'	Possible reduction in length of cutoff wall
11	Use 2D modeling to reduce the berm widths/depths at Sta. 1492	Eliminate need for berm to provide seepage control in this area
12	Use 2D or 3D modeling to reduce the number of relief wells at Sta. 1499+54	Reduce number of new relief wells required
13	Move cutoff wall from crest of levee to river side toe of levee between Sta. 1304 and 1319	Reduce quantity of deep cutoff wall quantity by approximately 37,500 SF

Significant Changes MESD



- **781+00 – 791+00 (Granite City depot area)** Sheets: CA-X124
 - Removed deep cutoff wall in this area
 - Replaced with blanket drain in the ditch; retain existing relief wells

- **1209+00 – 1220+00 (Conoco Phillips area)** Sheets: CB-W159 – CB-W160
 - Moved deep cutoff wall to the riverside toe of the levee

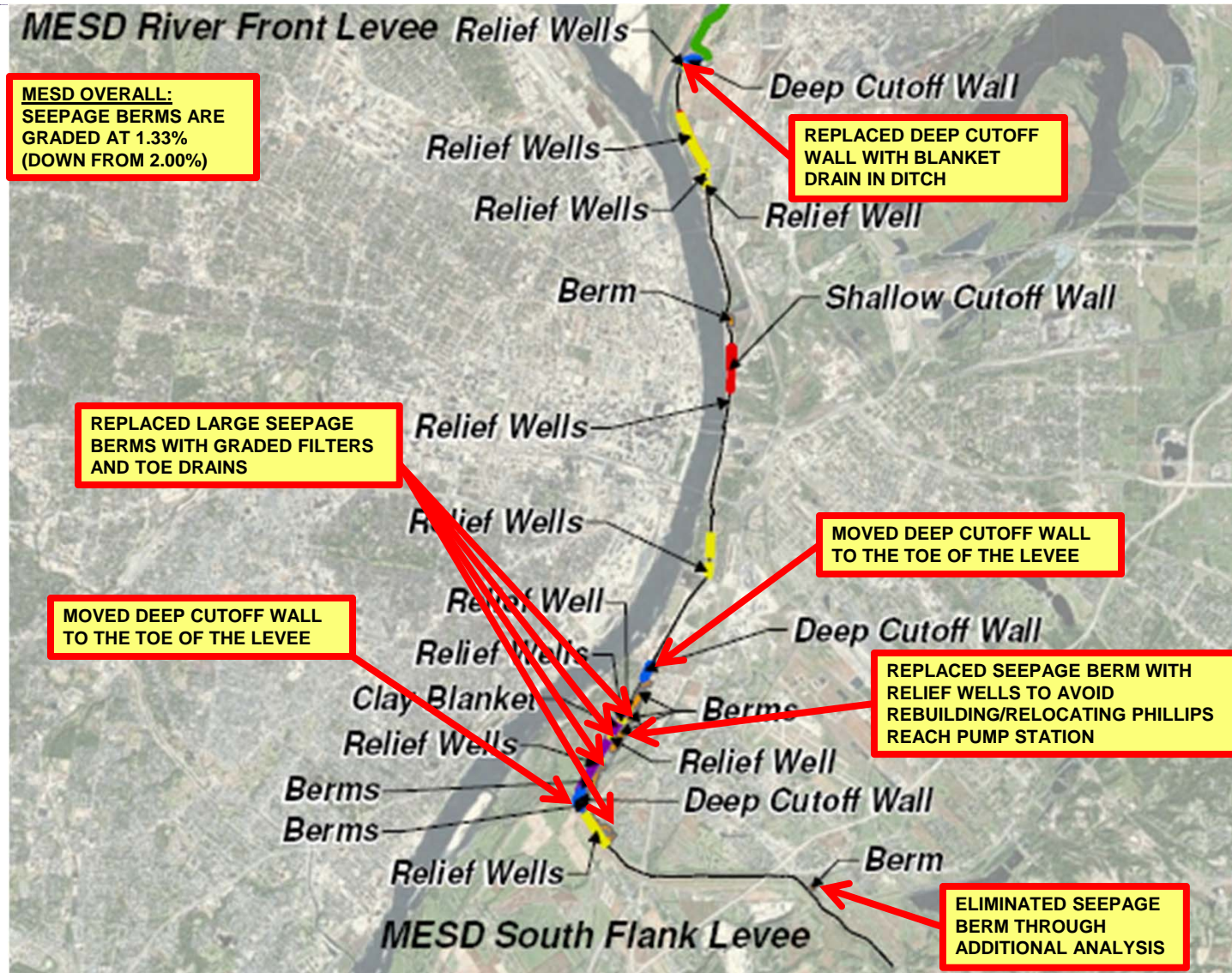
- **1222+00 – 1226+00 (Conoco Phillips pump station)** Sheets: CB-R160 – CB-R161
 - Removed seepage berm and replaced with relief wells to avoid rebuilding pump station

- **1244+00 – 1353+00 (Elbow Area)** Sheets: CB-X162– CB-X171
 - Removed large seepage berms throughout
 - Replaced with graded filters and toe drains

- **1304+00 – 1319+00 (Elbow Area)** Sheets: CB-W167 – CB-W168
 - Moved deep cutoff wall to the riverside toe of the levee

- **1491+00 – 1495+00** Sheet: CB-B183 (Sheet Removed from the set)
 - Removed seepage berm.
 - Additional analysis shows that no improvement is needed

Overview MESD



PdP/FL Value Engineer/Design Optimization Items

Item	Description	Potential Benefits
1	Reduce berm slopes from 2% to max. 1.33% or to actual berm shape (levee-wide)	Reduce volume of berm material required
2	Use 2D finite element modeling to underseepage control in North/South Elbow and at Stations 467+95 - 471+25	Reduce volume of berm material required Reduce acreage of wetland impacts Reduce acreage of land acquisition Maintain water storage areas
3	Water berm solution from Station 560+00 to 620+00	Eliminate need for berm/well solution

Significant Changes PdP/FL



- **223+00 – 227+50** Sheet CC-B119
 - Removed seepage berm

- **Sta 278+00**
 - Pump station upgraded

- **310+00 - 318+00** Sheets CC-C126 and CC-C127
 - Removed clay cap

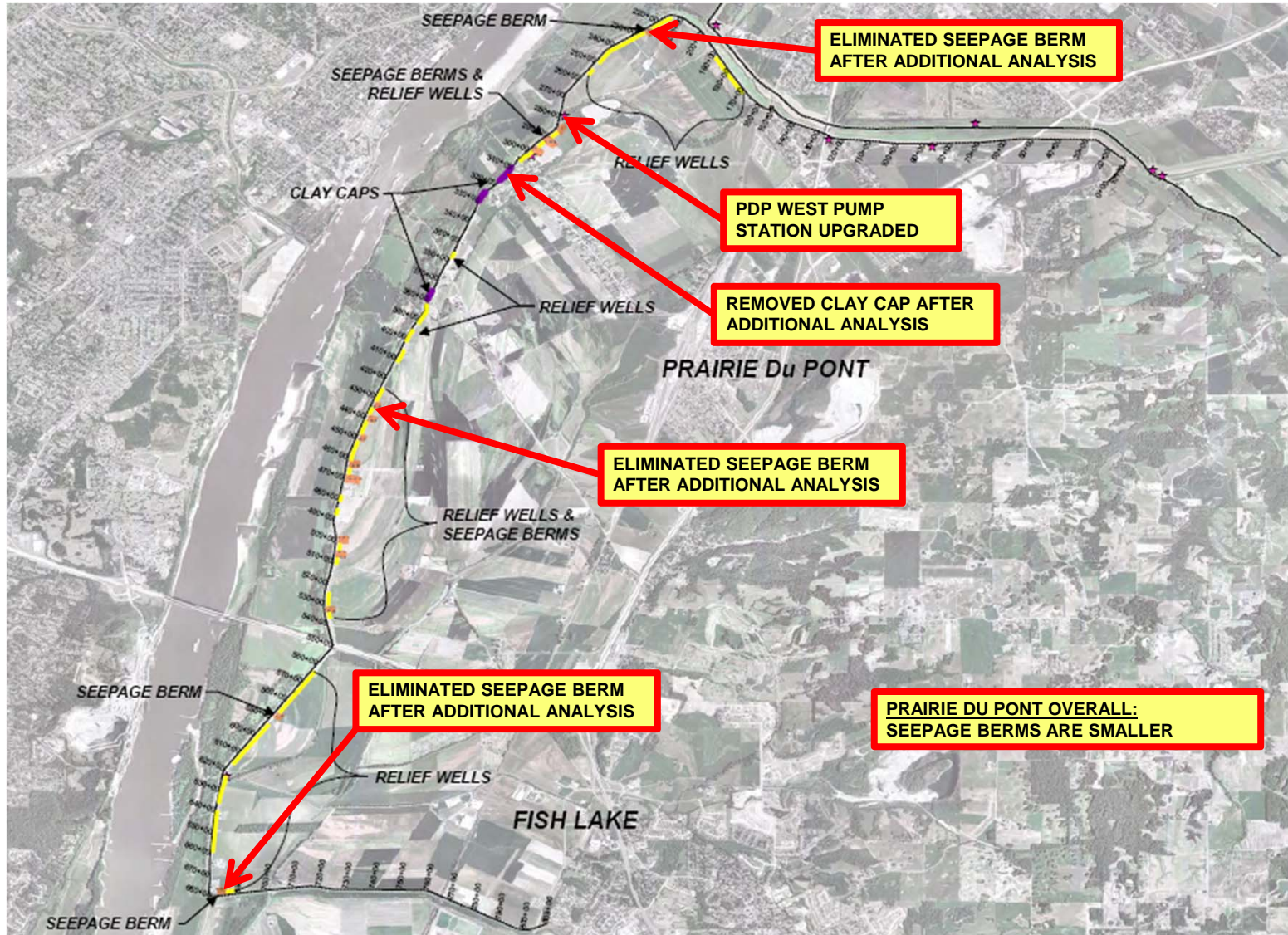
- **431+00 – 436+00** Sheets CC-B136 and CC-B137
 - Removed seepage berm

- **467+00 – 472+00** Sheets CC-B139 and CC-B140 removed
 - Removed seepage berm

- **681+50 – 686+50** Sheets CC-B157 and CC-B158 removed
 - Removed seepage berm

- **Overall berms are smaller**

Overview PdP/FL



Look Ahead

- Continue activities associated with TO #4
- Relief well and aquifer testing
- Cut off walls
- Interior drainage
- Water berms
- Other VE items (reduce clay cap thickness, berm material, modeling)



Construction Cost Estimate



DETAILED SUMMARY - WOOD RIVER, MESD, PdP & FISH LAKE

Item #	Cost Item	Unit	Unit Cost	Contingency	Quantity	Total
1	Clay Cap/Clay Blanket Material - Haul On & Placement	CY	\$ 12	20%	268,311	\$ 3,863,678
2	Clear & Grub - Light Vegetation	AC	\$ 6,000	20%	185	\$ 1,332,072
3	Clear & Grub - Wooded	AC	\$ 21,625	20%	70	\$ 1,816,500
4	Cutoff Wall - Deep	SF	\$ 32	30%	957,418	\$ 39,828,589
5	Cutoff Wall - Hazardous Waste Premium	SF	\$ 28	20%	45,453	\$ 1,527,221
6	Cutoff Wall - Shallow	SF	\$ 12	30%	158,600	\$ 2,474,160
7	Cutoff Wall - Special Waste Premium	SF	\$ 11	20%	181,813	\$ 2,399,932
8	Dewatering	LF	\$ 51	20%	11,455	\$ 701,046
9	Drainage - Enclosed - 30" Pipe	LF	\$ 96	20%	569	\$ 65,549
10	Drainage - Inlet Structure	EA	\$ 2,200	20%	1	\$ 2,640
11	Drainage - Surface - Shallow Ditch	LF	\$ 141	20%	7,200	\$ 1,218,240
12	Excavation	CY	\$ 11	20%	191,485	\$ 2,527,603
13	Gravel Filter - D50=#4 Material - Haul On & Placement	CY	\$ 24	20%	47,161	\$ 1,358,237
14	Gravel Filter - D50=2" Material - Haul On & Placement	CY	\$ 29	20%	70,017	\$ 2,436,592
15	Gravel Filter - Geotextile - Material & Installation	SY	\$ 2	20%	709,631	\$ 1,703,114
16	Gravel Filter - Sand Material - Haul On & Placement	CY	\$ 12	20%	29,590	\$ 426,096
17	Haul Off of Excess Material	CY	\$ 6	20%	187,835	\$ 1,352,413
18	Mobilization (% varies)	LS	\$ 1,492,890		1	\$ 1,492,890
19	Pump Station - WR - New - 220+00 UWR	EA	\$ 605,500	20%	1	\$ 726,600
20	Pump Station - WR - New - 560+00 LWR	EA	\$ 699,500	20%	1	\$ 839,400
21	Pump Station - MESD - Improve Existing - Phillips Reach	EA	\$ 849,500	20%	1	\$ 1,019,400
22	Pump Station - PdP - Improve Existing - PdP West	EA	\$ 849,500	20%	1	\$ 1,019,400
23	Pump Station - Various Improvements	EA	\$ 600,000	20%	4	\$ 2,880,000
24	Pvmt - Curb & Gutter - Remove & Replace	LF	\$ 42	20%	1,247	\$ 62,849
25	Pvmt - Improved Roadway	LF	\$ 122	20%	3,522	\$ 515,621
26	Pvmt - Roads & Trails - Remove & Replace	SY	\$ 50	20%	8,388	\$ 503,280
27	Pvmt - Road Repair	LF	\$ 44	20%	15,840	\$ 836,352

CONTINUED ON NEXT SLIDE

Construction Cost Estimate



DETAILED SUMMARY - WOOD RIVER, MESD, PdP & FISH LAKE

Item #	Cost Item	Unit	Unit Cost	Contingency	Quantity	Total
28	Relief Well - Existing - Abandon	EA	\$ 2,000	20%	42	\$ 100,800
29	Relief Well - Existing - Convert to Type "T"	EA	\$ 6,000	20%	76	\$ 547,200
30	Relief Well - Existing - Hazardous Waste Premium	EA	\$ 48,700	20%	6	\$ 350,640
31	Relief Well - Existing - Rehabilitate	EA	\$ 12,000	20%	78	\$ 1,123,200
32	Relief Well - Existing - Special Waste Premium	EA	\$ 12,700	20%	24	\$ 365,760
33	Relief Well - Lateral Pipe (8-Inch)	LF	\$ 40	20%	3,588	\$ 172,224
34	Relief Well - Manifold Manhole	EA	\$ 3,000	20%	29	\$ 104,400
35	Relief Well - Manifold Pipe (12-Inch)	LF	\$ 50	20%	3,548	\$ 212,880
36	Relief Well - Manifold Pipe (18-Inch)	LF	\$ 64	20%	3,591	\$ 275,789
37	Relief Well - New - Hazardous Waste Premium	EA	\$ 61,950	20%	11	\$ 817,740
38	Relief Well - New - Special Waste Premium	EA	\$ 16,575	20%	51	\$ 1,014,390
39	Relief Well - New Type "D"	EA	\$ 32,500	20%	215	\$ 8,385,000
40	Relief Well - New Type "T"	EA	\$ 40,000	20%	67	\$ 3,216,000
41	RipRap Bank Protection	CY	\$ 120	20%	6,252	\$ 900,288
42	ROW Acquisition - Agricultural	AC	\$ 6,500	20%	135	\$ 1,053,000
43	ROW Acquisition - Commercial	AC	\$ 30,000	20%	9	\$ 324,000
44	ROW Acquisition - Governmental	AC	\$ 25,000	20%	12	\$ 360,000
45	ROW Acquisition - Industrial	AC	\$ 30,000	20%	68	\$ 2,448,000
46	ROW Acquisition - Residential	AC	\$ 18,000	20%	1	\$ 21,600
47	ROW Acquisition - Vacant/Undeveloped	AC	\$ 23,000	20%	79	\$ 2,180,400
48	Seeding	AC	\$ 1,650	20%	180	\$ 356,420
49	Seepage Berm Material - Haul On and Placement (Hauled)	CY	\$ 12	20%	583,346	\$ 8,400,183
50	Slip-Line - 12-Inch Pipe	LF	\$ 110	20%	175	\$ 23,100
51	Slip-Line - 15-Inch Pipe	LF	\$ 115	20%	60	\$ 8,280
52	Slip-Line - 18-Inch Pipe	LF	\$ 121	20%	2,340	\$ 339,768
53	Slip-Line - 24-Inch Pipe	LF	\$ 132	20%	2,870	\$ 454,608
54	Slip-Line - 27-Inch Pipe	LF	\$ 138	20%	960	\$ 158,976

CONTINUED ON NEXT SLIDE

Construction Cost Estimate



DETAILED SUMMARY - WOOD RIVER, MESD, PdP & FISH LAKE						
Item #	Cost Item	Unit	Unit Cost	Contingency	Quantity	Total
55	Slip-Line - 36-Inch Pipe	LF	\$ 167	20%	835	\$ 167,334
56	Slip-Line - 42-Inch Pipe	LF	\$ 201	20%	580	\$ 139,896
57	Slip-Line - 48-Inch Pipe	LF	\$ 220	20%	3,190	\$ 842,160
58	Utility Relocation - High Tension Power (Raise)	EA	\$ 300,000	20%	5	\$ 1,800,000
59	Utility Relocation - Natural Gas Pipeline	LF	\$ 500	20%	12,190	\$ 7,314,000
60	Utility Relocation - Power Pole / Light Pole	EA	\$ 10,000	20%	42	\$ 504,000
61	Utility Relocation - Shield OE Power	LF	\$ 50	20%	4,048	\$ 242,880
62	Utility Relocation - Underground Communication	LF	\$ 100	20%	8,300	\$ 996,000
63	Utility Relocation - Underground Communications Pedestal	EA	\$ 10,000	20%	2	\$ 24,000
64	Utility Relocation - Various Buried Facilities	LF	\$ 250	20%	3,805	\$ 1,141,500
65	Wetland Mitigation	AC	\$ 25,000	20%	112	\$ 3,360,000
66	Construction Estimate					\$ 125,175,000
67	Construction Estimate Escalated to Mid-Point of 4 Yrs @ 3.44%					\$ 129,480,000

Budget for Estimate to Complete



Construction Estimate	Present Value	Escalated
Wood River	\$50,435,000	\$52,170,000
MESD	\$57,713,000	\$59,698,000
PdP/FL	\$17,027,000	\$17,612,000
Total Construction Estimate	\$125,175,000	\$129,480,000
Professional Services Completed to Date		
Program Management Services (Work Order #001)	\$392,000	\$392,000
Preliminary Design Services (Work Order #002)	\$2,700,000	\$2,700,000
Total Professional Services Completed to Date	\$3,092,000	\$3,092,000
Testing Construction Services Completed to Date	\$3,000,000	\$3,000,000
Professional Services Remaining		
Program Management Services (Work Order #001)	\$1,078,000	\$1,078,000
60%I Design Services (Work Order #004)	\$2,599,000	\$2,599,000
Final Design Services (Work Order #005)	\$2,500,000	\$2,500,000
Construction Phase Services (WO # 006)	\$5,183,000	\$5,183,000
Certification Services (WO#007)	\$325,000	\$325,000
PM Mod for Time duration Extension	\$750,000	\$750,000
Total Professional Services Remaining	\$12,435,000	\$12,435,000
Testing Construction Services Remaining	\$2,688,000	\$2,688,000
Project Total	\$146,390,000	\$150,695,000

Cost and Schedule Risks



- Hazwaste/special waste at select locations
- Obstructions within the depth of the cut off walls
- Permits (state, federal, USACE)
- Impacts of seepage volumes (interior drainage)
- Relief wells and aquifer results

QUESTIONS?

