• Welcome to the 1st PDT meeting of 2017 for the Lake Okeechobee Watershed Project
• Attendance – CERP Team and Public
• Housekeeping Items:
  • Please keep phones on mute unless you are talking
  • Please state your name and who you are representing before making a statement or asking a question
  • REMINDER: This is a CERP PDT meeting and follows FACA Requirements as outlined in CGM 011.02. A Public Comment period has been established at the end of our agenda.
• Agenda Overview
<p>| | |</p>
<table>
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<tr>
<td>1.</td>
<td>Introduction (Tim Gysan, USACE) 9:00 – 9:10</td>
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<td>2.</td>
<td>90-day Look Ahead (Tim Gysan, USACE) 9:10 – 9:20</td>
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<td>3.</td>
<td>Sub-team Updates 9:20 – 10:30</td>
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<td>a)</td>
<td>Wetland Screening (Lisa Aley, USACE)</td>
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<td>b)</td>
<td>Reservoir Configuration/Preliminary Design (Matt Alexander, SFWMD)</td>
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<td>c)</td>
<td>Water Supply Update (Lisa Aley, USACE)</td>
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<td>d)</td>
<td>Deep Injection Well Application (Bob Verrastro, SFWMD)</td>
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<td>e)</td>
<td>Cultural Resource Update (Robin Moore, USACE)</td>
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<td>f)</td>
<td>Baseline Modeling (Clay Brown, SFWMD)</td>
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<td>4.</td>
<td>PDT Feedback – “What We’ve Heard” 10:30 – 10:40</td>
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<td>5.</td>
<td>Public Comment Period 10:40 – 10:55</td>
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<td>6.</td>
<td>Closing remarks and Adjourn 10:55 – 11:00</td>
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</tbody>
</table>
Top Wetland Sites
- Lake Okeechobee West: ~2,800 acres
- IP-10: ~3,500 acres
- Kissimmee River: ~3,300 acres
- Paradise Run: ~4,000 acres
DRAFT

K-05 North
7,600 acres
15 ft deep
114,075 acre-ft
K-05 Horizontal

9,625 acres

15 ft deep

144,375 acre-ft
K-42

9,984 acres

15 ft deep

149,760 acre-ft
Intake channel Opt. 2:
Approx. 3.5 miles, ~10 parcels

Intake channel Opt 1:
Approx. 4 miles, ~4 parcels

~2 parcels impacted by the reservoir footprint,

0% publicly owned land

Reservoir area: 13,379 acres
Water Supply Considerations

- LORS 2008 replaced the previous Lake Okeechobee regulation schedule known as WSE to manage lake elevations to reduce risk to the HHD and for environmental benefits.

- 2007 LORS SEIS: LORS 2008 would adversely impact water supply by generally lowering Lake O stages and increasing the frequency and severity of simulated drought events.

- LOWP stakeholder are seeking a return to “WSE-like” performance and request using the LOWP to capture a portion of the water loss.
Water Supply Considerations

• USACE and SFWMD had a meeting on January 13th to discuss water supply formulation in the LOWP

• The objectives as currently considered in the LOWP are ecosystem restoration based without an agricultural or municipal and industrial (M&I) water supply objective. However, the current plan formulation process has identified improving water supply as an opportunity of the study.

• Next steps: scheduling an In-Progress Review in late January/early February with the USACE vertical team to come to a consensus on how to incorporate water supply in the planning process (remain an opportunity or become a planning objective)
Deep Injection Wells in the Lake Okeechobee Watershed

Bob Verrastro
Lead Hydrogeologist
Water Supply Bureau
SFWMD

June Mirecki
Hydrogeologist
Geotechnical Branch
USACE
Presentation Outline

• Injection wells 101
• Hydrogeology
• Construction
• Implementation and siting strategies
  • Instantaneous capacity
  • Lake level control
Injection well benefits

- Simple design
- No land acquisition/cultural resources
- Keeps land on county tax rolls
- Higher capacities (30 cfs) relative to ASR
- Permitting is straightforward
- Can be built in advance of large reservoirs
- Can assist in estuary and dike protection
Injection well issues/risks/limitations

• Dependent upon local hydrogeology
• Relatively little geologic information in the LOWP area
• Relatively few drilling contractors
• Low flow rates (40-80 cfs) relative to surface features
• No water supply benefits – a “one-way” street
• Stigma associated with wastewater disposal wells
Where are Boulder Zone wells used?

- 180 Class I wells in currently in operation in Florida
- Mostly used for wastewater disposal by PWS utilities
- Largest cluster in south Florida is Miami-Dade South District WWTP (13 active wells)
- Identified in 2015 UF Study to reduce freshwater flows
- Evaluated during CERP ASR Regional Study Groundwater Modeling
Largest cluster in south Florida is Miami-Dade South District WWTP (13 active wells)
Wells are 700-800 ft apart on a 260 acre footprint
Surface facility is the injection wellhead and pad, linked via SCADA system to a central control facility that pressurizes the system.
Construction

• Initiated with an exploratory well
• 24” to 30” casing, to about 3,000 feet bls
• Often constructed in pairs
• Inlet structure on canal, lake, or reservoir
• Basic filtration and injection pump
• Some monitor wells will be needed
2007 Feasibility Report

• Conducted as a component of SFWMD Lake Okeechobee and Estuary Recovery initiative

• Proposed injection well system target capacities based on 1) “lake level control” requiring operation prior to excess capacity; or 2) “instantaneous discharge” requiring operation at the time when excess volume occurs
Wells for Lake O Level Control
Existing Injection Wells in the LOWP

- Multiple utility-owned systems successfully operated
- Earliest wells since 1990’s
- Monitoring data has shown confinement is substantial
- Wells demonstrate capacities of 1 to 10 MGD are possible around Lake O.
Themes for Subsurface Options

**Estuary Discharge Minimization**
- Moore Haven
- Port Mayaca

**STA Storage Enhancement**
- Taylor Creek STA
- Nubbin Slough STA
- Lakeside Ranch STA

**Lake Level Control**
- C-40 Canal Reach
- C-41 Canal Reach
- Kissimmee ASR System
- S-191 Reach
- Taylor Creek/L-63N Canal

**Wetland/Floodplain Restoration**
- Paradise Run

**Reservoir Storage Augmentation**
- Multiple locations to be determined
CERP ASR Regional Study Groundwater Model

• Constraints included:
  • Limited to state-owned locations
  • Rock fracturing
  • Upconing
  • Lateral salt water intrusion
  • Effects to existing users
  • Maintaining artesian conditions

- About 130 ASR wells possible – 80 at Lake O
- Model did not consider alternative locations
Groundwater Model – Boulder Zone Analysis

- Simulated 139 10 MGD wells recharging the Boulder Zone in the Lake Okeechobee Basin
  - 1.4 billion gallons per day capacity
  - To provide benefits that were lost by having fewer ASR wells
- Recharge pressures remained low in overlying storage zones
- No recovery – just injection
Questions and Discussion
Archaeological Survey

Objective

• Identify sites and assess their significance
• Refine a model for reliably identifying sites in the different environments within the LOWP

Methods

• Develop site expectations based upon historic research, previous archaeological work, analysis of prehistoric environmental conditions.
• Field strategies will sample the different environments within the LOWP area and the different probability zones within each environment.
### Cultural Features Identified on 19th and Early 20th Century General Land Office Survey Plats

<table>
<thead>
<tr>
<th>Description</th>
<th>Location</th>
<th>Recorded on FMSF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road from Fort Kissimmee to Fort Capen</td>
<td>T33S, R3E, Secs. 33, 36, T44S, R4E, Secs. 4, 5, 6, 9, 10, 11</td>
<td>No</td>
</tr>
<tr>
<td>Road to Fort Van Swearingen</td>
<td>T45S-R35E, Secs. 11, 14, 22, 23, 26, 27, 35</td>
<td>No</td>
</tr>
<tr>
<td>Camp Starvation</td>
<td>T25S-R35E/Sec. 27, NW1/4 of NW 1/4 of SW 1/4</td>
<td>No</td>
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<tr>
<td>Road segment</td>
<td>T35S-R35E, straddling Secs. 16 and 21</td>
<td>No</td>
</tr>
<tr>
<td>Mound</td>
<td>T6S, R28E, Sec. 35, SW 1/4 of NE 1/4 of NE 1/4</td>
<td>No</td>
</tr>
<tr>
<td>Indian Mound and Village</td>
<td>T6S-R28E/Sec. 1, NW 1/4, S of river</td>
<td>Daugherty/Williams Site, 8H6G3</td>
</tr>
<tr>
<td>Old Military Road</td>
<td>T6S, R28E, Secs. 3, 4, 10, 11, 12, T6S, R34E, Secs. 7, 17, 18, 20, 29, 32, T7S, R39E, Secs. 5, 5, 8, 16, 17, 27, 28, 33, 34, T44S, R33E, Secs. 1, 10, 11, 12, 13, 14, 17, 20. 29, 30, 31</td>
<td>No</td>
</tr>
<tr>
<td>Indian Old Field</td>
<td>T6S-R34E/Sec. 8, SE 1/4</td>
<td>Fort Bassinger Midden, 8H6G17</td>
</tr>
<tr>
<td>Fort Bassinger</td>
<td>T6S-R34E/Sec. 17, SE 1/4</td>
<td>Fort Bassinger, 8H669</td>
</tr>
<tr>
<td>Indian Village</td>
<td>T6S-R34E/Sec. 13, SE 1/4</td>
<td>Possibly Ship’s Camp, 8H619</td>
</tr>
<tr>
<td>Road from Fort Price and Capron to Ft. Bassinger</td>
<td>T6S, R35E, Secs. 2, 3, 9, 10, 16, 18, 20, 21</td>
<td>No</td>
</tr>
<tr>
<td>Indian Mound</td>
<td>T7S-R25E, Secs. 5, 8, 9, 9, 16, 22, 23, 26, 30, 33, 34 Secs. 7, 8, 17, 20, 21, 28, 33, 34 T7S-R34E, Sec. 19, straddling NE1/4 and SE 1/4 of SW 1/4</td>
<td>probable Meeks Mound, 8O68</td>
</tr>
<tr>
<td>P. Raulerson’s house and field</td>
<td>T2S-R35E straddling Secs. 21 and 22 S 1/2</td>
<td>No</td>
</tr>
<tr>
<td>James Clements’ house</td>
<td>T7S-R35E, Sec. 21, 8 1/4 of SW 1/4 of SE 1/4</td>
<td>No</td>
</tr>
<tr>
<td>H. Hancock house</td>
<td>T7S-R35E, Sec. 21, NW 1/4 of NW 1/4 of SE 1/4</td>
<td>No</td>
</tr>
<tr>
<td>Road from Bassinger to Jupiter’s segments</td>
<td>T7S-R35E, Sec. 24, S 1/4; T7S-R35E, Secs. 29, 32 T7S-R35E/Sec. 27, NE 1/4 of NW 1/4</td>
<td>No</td>
</tr>
<tr>
<td>Indian Mound</td>
<td>T7S-R35E/Sec. 27, NE 1/4 of NW 1/4</td>
<td>Taylor Creek Mound, 8O612</td>
</tr>
</tbody>
</table>

**Color Codes:**
- K42 T/R = Color = Paradise Run
- K05 Big T/R = Color = Boot T/R
- 101 T/R = Color = 101 T/R
Archaeological Survey Sampling

**Strategy**
Sample from each probability zone (high/medium/low) in each different environment

**Constraints**
Very little prior survey work to compare with in developing probability
Can only survey within State-owned lands
Baseline Modeling Update

Presented by: Clay Brown, SFWMD
PDT Feedback

'What We’ve Heard'

- Consider optimizing the Lake Okeechobee Regulation Schedule to maximize project performance and benefits
- Increase operational flexibility of the water management system
- Include water supply for agriculture, industrial, municipal and tribal use in project planning
- Dam Safety Concerns
  - Suggest including water quality improvements
  - Importance of Paradise Run wetland restoration site
  - Minimize agricultural land taken out of production and maximize use of publically owned lands
- Additional storage considerations
- Potential for cultural resources in project area
- Support for expedited SMART planning schedule
- ASR/Deep injection well operational concerns
- Concerns with impacts to fisheries at reservoir and ASR well intake structures
- Consider ecological values of land when siting reservoir features
- Support for in-lake restoration (littoral shelf)