C-139 Basin
A Regional Water Management Perspective

Quarterly Communications Meeting on the Long-Term Plan for Achieving Water Quality Goals for the Everglades Protection Area Tributary Basins

December 1, 2009

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The C-139 “Region”

- **C-139** - one of several Everglades western tributaries
- *Collectively known as the “Western Basins”*

**Current Tributary Basins**

- C-139 basin
- Feeder Canal basin
- L-28 Basin

**Potential Tributary Basin**

- S-4 basin (Industrial Canal)
Current Features
- 2nd largest discharging tributary to Everglades behind EAA
- Mandatory BMP source control program for landowners
- STA-5 & STA-6 treatment
- Dependency on groundwater for water supply

Challenges
- Further reduce total phosphorus (TP) loads in basin discharges
- STA performance has been impacted by high inflow TP loads
- Increase basin storage
- Land Use Intensification due to economic conditions
- Management of water supply to promote conservation and improve water quality
- Ensure flood protection is maintained
Features & Challenges: Feeder Canal Basin

**Current Features**
- 3rd largest discharging tributary to Everglades behind EAA
- **No** Mandatory BMP source control program for all landowners
- **No** STA treatment
- Dependency on groundwater for water supply

**Challenges**
- Further reduce TP loads in basin discharges
- Increase basin storage
- Management of water supply to promote conservation and improve water quality
- Discharge limits to be determined
Features & Challenges: L-28 Basin

Current Features
- 4th largest discharging tributary to Everglades behind EAA
- C-139 Annex diversion of flows to STA-6 w/ Mandatory BMPs
- Remaining landowners - No Mandatory BMPs & No STA treatment
- Dependency on groundwater for water supply

Challenges
- Further reduce TP loads in basin discharges
- Increase basin storage
- Management of water supply to promote conservation and improve water quality
- Discharge limits to be determined
Features & Challenges: S-4 Basin

Current Features
- Consists of S-4 and Industrial Canal
- Historically discharged to Lake Okeechobee and Caloosahatchee River
- Diversion Proposal - ~ 50% of basin discharge south to C-139 Region
- Mandatory BMPs, but No STA treatment currently in basin

Challenges
- Reduce TP loads to Lake Okeechobee by increasing load south
- Storage and treatment of diverted flows (water quality impacts)
- Integrated water management with C-139 Region (flood control)
- Avoid overloading existing STAs including upcoming expansion
- C-139 Region water supply - potential use
Basin Specific Projects: Existing & Currently Planned

Existing
- STA-5: Cells 1, 2 and 3
- STA-6: Sections 1 and 2
- C-139 Annex Pump Station

Planned
- Feeder Canal Basin: “Critical Project” (Tribe and ACOE)
- “Compartment C” in construction
- Potential S-4/Industrial Canal Diversion to the south
- Feeder Canal/L-28 CERP Projects
Develop an integrated regional approach beyond basin specific efforts to deal with these challenges.

- **Water Quality & Quantity**
  - EFA mandates – basins not meeting goals

- **Flood Control**
  - Most rain falls in short period decreasing percent retained within basins

- **Water Availability**
  - Reliance on groundwater is affected by rainfall patterns and soils

- **Coordination/Integration of Projects**
  - ECP/LTP, CERP, Land Practices
Evaluate the feasibility of ....

- **Regional Storage**
  - Benefit Water Quality, Water Availability

- **Canal / Infra-structure modifications**
  - Allow for more flexibility in movement of water for flood protection & regional storage/treatment
  - Develop interconnections between individual basins for water availability for irrigation

- **Operational Optimization**
  - Take advantage of infra-structure to better manage regional water resources
The Regional Feasibility Study (RFS) will:

- Identify solutions for C-139, Feeder Canal and L-28 Basins together as a “Region” and include potential S-4 basin diversions

**Phase 1 FY 2008-2010:**
- Gather existing information
- Identify additional data needs (and benefits to study)
- Collect additional data (Topography, Canal Cross-sections, Monitoring Wells)
- Develop Integrated Groundwater/Surface Water model for region

**Phase 2 FY2010:**
- Conduct RFS to develop alternatives and planning level costs
**Potential “alternatives”**

- Storage in above-ground impoundments
- Storage and treatment in above-ground impoundments
- Evaluation of potential S-4 Basin diversions
- Water management changes through infrastructure changes
- Water management changes through operational changes
- Potential shift of withdrawals from the Lower Tamiami Aquifer to other water resources
  - Canal surface water
  - Recycling of stormwater for irrigation
Potential alternatives continued

- Alternative water storage – excess water capture
- Alternative treatment technologies
- Regional/sub-regional scaling

As the RFS moves forward, there is always potential for shorter-term/interim solutions to be identified and developed
Overall Project Execution

- Phase I – Develop a baseline model for the C-139 Region
- Phase II – Identify potential solutions for region and quantify appropriate “Performance Measures”

Future Efforts
- Select Alternative
- Develop Basis of Design
- Development of solution (design, Operation Plan, etc.)
- Implementation of solution (construction, etc.)
- Operations and maintenance
Phase I – Current Efforts

- Existing data collection, data gaps identification & model selection
- Field data collection
- Baseline model development
- Identification of challenges within the region
- Identification of a range of possible alternatives
Phase II (FY 2010)

- Development of Performance Measures and several Alternatives
- Alternatives scenario modeling
- Review and analysis of proposed projects/water optimization strategies
- Conceptual design development
- Cost estimation
Phase 1 “Work Plan” and Schedule

- Task 1 - Various meetings throughout duration of contract
- Task 2 - Gather and assess relevant reports and data – produce summary reports
- Task 3 - Field Data Collection: Jul - Dec 2009
- Task 4 - Model Development, Calibration and Verification: Oct 2009 - Jan 2010
- Task 5 - Final Report and Work Plan for Phase 2: Feb 2010
- Commence with Phase 2: Mar 2010
Overall Project Layout
Current and Next Steps

- Begin Task 3 ("Fill in the Data Gaps"): Jul - Sep 2009
  - Ground-truth topography
  - Additional monitoring well installation and monitoring
  - Additional canal cross-sections
  - Meet with Landowners when/where appropriate

- Begin Task 4 Model Development: Aug – Nov 2009
### Phase I – current data needs

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Field Data Collection (Overall)
“Nested Pair” Monitoring Wells
Need an integrated surface water/groundwater model

Cost to modify existing models was considered cost prohibitive

Lack of “internal” water quality data represents a challenge

Selected the MIKE-SHE/MIKE-11 model with a “Spreadsheet” Water Quality analysis
Critical coordination

- Stakeholder Input
- Construction and Engineering issues
- Regional Modeling (integrated surface & groundwater)
- Land Management issues
- Operation of District facilities
- Regulatory issues
- Water Supply planning
- River of Grass restoration coordination
Questions/Comments?