Potential Refinements to the Load Reduction Methodology

TOC Meeting

November 30, 2004

Background

- At the May 25, 2004 TOC meeting, four areas of the TOC-adopted methodology were identified as requiring refinement:
  - clarification of “low-flow water supply deliveries”
  - clarification of “extreme hydrological events”
  - revision of the annual phosphorus limit (presently at 76 ppb)
  - recognition that applicability of the methodology is contingent on flows through the STAs being within the range contemplated in the design of STAs 1E, 1W, 2, 3/4, and 6 consistent with the amended Settlement Agreement

- Related issues
  - Which 12-month period should be used for compliance?
  - When to consider “low-flow water supply deliveries” and “extreme hydrological events”?

Update

- Some concepts for refinement were discussed at the August 26 TOC meeting
- Technical folks met several times to explore alternatives
- Not recommending revisions to TOC, but available to answer technical questions

Clarifying “low-flow water supply deliveries”

1. Establish a threshold stage in each WCA that represents a reasonable canal level that minimizes impacts to interior of the WCA marshes; e.g., 0.5 ft above the floor of the regulation schedule
   - For WCA-1, the floor is 14.0, so the threshold stage would be 14.5;
   - For WCA-2, the floor is 10.5, so the threshold stage would be 11.0; and
   - For WCA-3A, the floor is 7.5, so the threshold stage would be 8.0.

- Alternative: compare canal stage with marsh stage in lieu of threshold stage

Clarifying “low-flow water supply deliveries”

2. All pass-through deliveries of water when canal stage is at or below the threshold stage, regardless of whether the original source is Lake Okeechobee or stormwater runoff, should be considered low-flow water supply deliveries. The basis for considering all sources is that treated EAA runoff has had lower TP than untreated Lake water, and hence is more desirable for delivery to the WCAs.

Clarifying “low-flow water supply deliveries”

3. Calculate the net phosphorus load to the WCAs of the pass-through water
   - (P load at the inflow – P load at the discharge)

4. Suggest the TOC examine the regional regulation schedules to ensure that operations protocols consider water quality, not just water quantity.

Clarifying “extreme hydrological events”

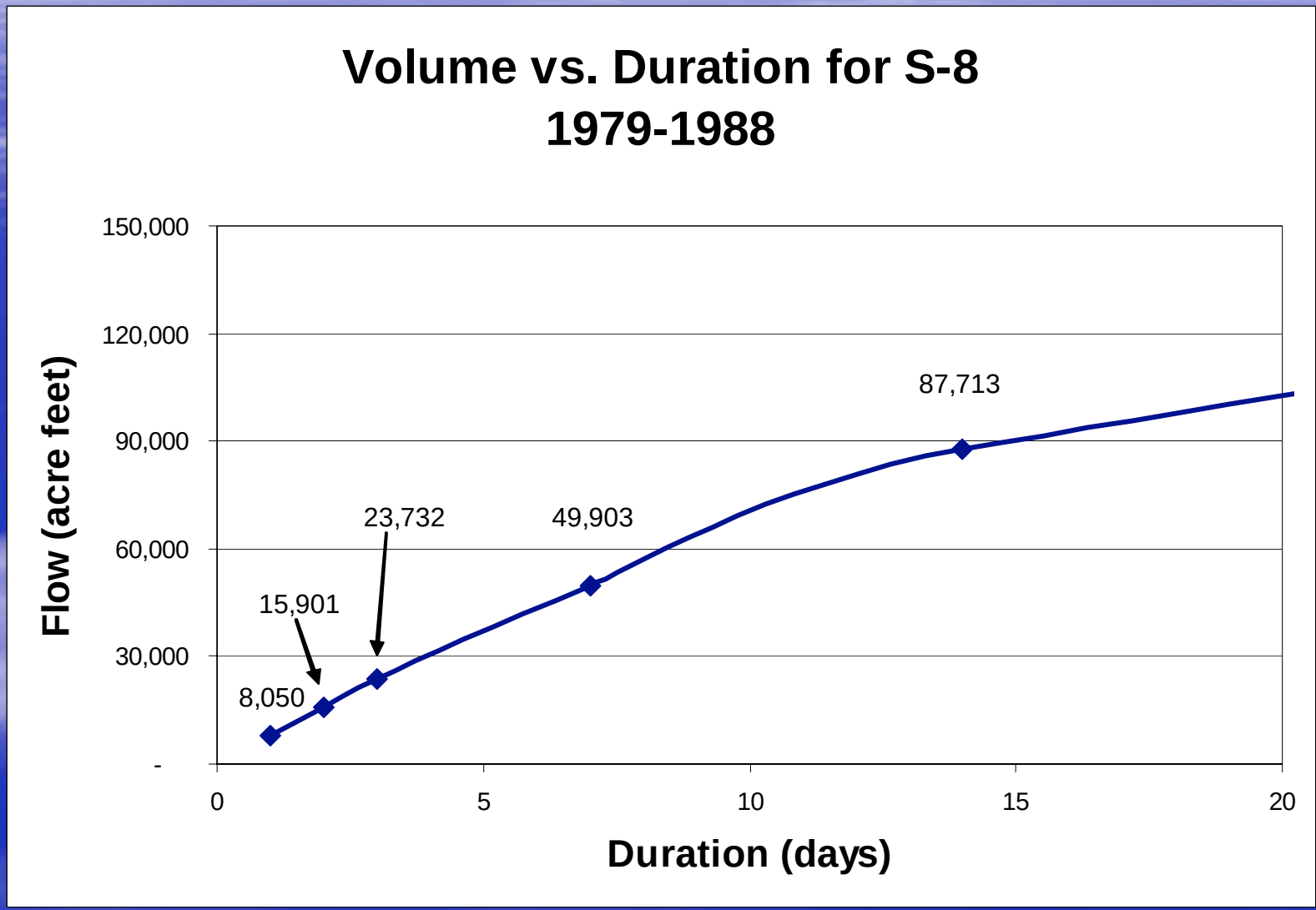
Relative to 1979-88 Base Period

Option 1. Volume-based approach:

Step 1. Using the 10-yr baseline period (October 1978-September 1988), determine the maximum volume for a given duration at the S-A, S-6, S-7 and S-8 pump stations

Duration (days)	S-5A	S-6	S-7	S-8
1	10,984	5,789	5,673	8,050
2	20,045	11,222	11,006	15,901
3	29,204	16,397	16,479	23,732
7	58,984	34,690	37,386	49,903
14	95,326	51,841	70,041	87,713
maximum	155,834	58,762	127,875	289,295

Clarifying “extreme hydrological events”



Clarifying “extreme hydrological events”

Step 2. During the subject water year, identify if any storm event produced an inflow volume greater than the corresponding baseline period for the 1-day, 2-day, 3-day, 7-day and 14-day durations

STA	Inflow Structure	Baseline Structure
STA-1E	N/A	N/A
STA-1W	G-302 (S-5A)	S-5A
STA-2	S-6 + G-328	S-6
STA-3/4	G-370	S-7
	G-372	S-8
STA-5	N/A	N/A
STA-6	N/A	N/A

Clarifying “extreme hydrological events”

- Option 2: rainfall-based approach

1. Establish frequency exceedence curves for the rainfall that occurred in the EAA sub-basins for 1-day, 3-day, 7-day and 14-day durations
2. Determine the maximum return frequency of rainfall amounts that occurred in the 10-yr baseline period for 1-day and 3-day durations
3. During the subject water year, identify if any storm event had a rainfall amount in excess of the maximum return frequency of rainfall that occurred in the 10-yr baseline period for 1-day and 3-day durations

- Option 3. Some combination of options 1 and 2

Revision of the annual phosphorus concentration limit (presently at 76 ppb)

- Include all the STA outflow data and determine the annual limit using method of Walker 1996
  - Calculate the observed yearly flow weighted mean concentration
  - Calculate Cs=rescaled yearly flow-weighted mean concentration (50 ppb)
  - Calculate annual limit value for P=0.10
- 64 ppb

Consideration of flows within the design range

- Concentration-based method is contingent on flows through the STAs being within the range contemplated in the design of STAs 1E, 1W, 2, 3/4, and 6 consistent with the amended Settlement Agreement

Consideration of flows within the design range

- Concept – add annual rainfall-adjusted ***target load***
  - Load anticipated to occur if average annual design flows (adjusted for rainfall) discharged at annual concentration limit of 64 ppb.
  - Compare compliance year's load to ***target load***
  - Factor results into assessment methodology

Consideration of flows within the design range

- Currently compiling rainfall-runoff relationships for individual basins consistent with previous efforts, e.g., EAA and C-139 BMP Rule
- Developing method to calculate rainfall adjusted load targets for each STA

Related Issues

- Which 12-month period should be used for compliance?
  - Periodic reporting and annual compliance (May-April)
- When to consider “low-flow water supply deliveries” and “extreme hydrological events”?
  - seems reasonable as a 2nd tier assessment if targets and limits are not met without considering these factors

Next Steps

- Technical folks continuing to evaluate alternatives for refining methodology
- Will be happy to answer any questions from the TOC