Jordan Lake Water Supply Allocation Guidelines

Section 3 – Current Water Supply

June 17, 2010

Questions & Issues From Last Week

- Are ecological flows going to be wrapped into the water supply safe yield question?
- How is yield calculated/ estimated in reservoir systems vs. run of river systems?
- Do assumptions include complete draw-down or do you assume an emergency reserve? What is the basis for those numbers?
- Fundamental concern is that allocations give holders a certain withdrawal- downstream users don't get that same assurance.
- What is the safe yield of a storage capacity? It can be calculated many different ways. Ecological flows will need to be wrapped into that question as well.
- Do discussions of water supply alternatives get limited by current regulations (DWQ/ DEH) or does it get opened up to include all feasible alternatives?
- Many questions about supply alternatives vs. future yield will need to be addressed in the model (will not be answered by applications alone).
- Should the demand pattern used for yield analysis be the same as for planning?

Round 3 Guidelines

- Ground Water
- Purchased Water
- Reservoirs
- Unregulated Streams
- Regulated Streams

Ground Water

- **Round 3 - For *ground water*, applicants will determine the available supply based on a pump test completed no earlier than 1996. The well yield is the maximum amount of water in gallons per minute that can be pumped from a well such that the water level achieves equilibrium (stabilizes) above the pump intake. Based on this well yield, the available supply is the amount of water that the well can provide during 12 hours of pumping.[1]**
- **Round 4 – Use the round 3 approach.**

[1] This is in accordance with the Rules Governing Public Water Systems, 15A NCAC 18C.0402(g).

Round 3 Guidelines

- Ground Water
- Purchased Water
- Reservoirs
- Unregulated Streams
- Regulated Streams

Purchased Water

- Round 3 - The applicant will use the contract maximum for purchased water. Only contracts for regular use (i.e., routine, continuous use; not emergency use) will be considered.
- Round 4 – Use the round 3 approach.

Round 3 Guidelines

- Ground Water
- Purchased Water
- Reservoirs
- Unregulated Streams
- Regulated Streams

Reservoirs

- Round 3 - For *reservoirs*, applicants will use the USGS Annual Mass Curve Analysis method, based on a 50-year return period, to determine the available supply.[1] This amount will be reduced by the amount required for minimum release, and will account for any reductions in available storage. The Division will provide assistance to estimate minimum releases for proposed reservoirs.
- Round 4 – Use the same basic approach. For Cape Fear and Neuse reservoirs use the OASIS models.

[1] The Annual Mass Curve Analysis method is described in *Storage Analyses for Water Supply* (Riggs, H.C. and Clayton H. Hardison. 1973. Techniques of Water-Resources Investigations of the United States Geological Survey. Washington, DC: United States Government Printing Office. Chapter B2).

Reservoir Questions & Issues From Last Week

- ***Use 50-year return period or period-of-record?***
- **Are ecological flows going to be wrapped into the water supply safe yield question? *Model existing instreamflow requirements.***
- **Do assumptions include complete draw-down or do you assume an emergency reserve? What is the basis for those numbers?**
- **What is the safe yield of a storage capacity? It can be calculated many different ways. *If the guideline methodology does not provide a yield estimate the applicant feels is accurate, DWR will work with the applicant to get an accurate estimate.***
- **Many questions about supply alternatives vs. future yield will need to be addressed in the model (will not be answered by applications alone). *Alternatives in the Cape Fear & Neuse should use the existing/update models.***
- **Should the demand pattern used for yield analysis be the same as for planning?**
- **Should the analysis be done including the WSRPs?**

Draft Jordan Lake Available Water Supply

Gage: B. EVERETT JORDAN DAM AND LAKE PROJECT
Storage: 45800 ac-ft Demand: 100 mgd
Analysis Period: 1983-01-01 to 2010-06-15

Period-Of-Record Mass Curve Analysis - Daily

Daily	Demand	Storage Required		Critical Periods: Maximum Storage			Critical Periods: Longest Period		
cfsd	mgd		ac-ft	mg	days		days		
154.70	100.00	29.2	39283.7	12802.4	305	2007-05-17 2008-03-16	305	2007-05-17	2008-03-16
169.43	109.52	31.9	45800.0	14926.0	324	2007-05-17 2008-04-04	324	2007-05-17	2008-04-04

Annual Mass Curve Analysis - Daily (year beginning 4/1)

Rank	R.I. years	Year	Demand supported by 45800 ac-ft cfsd	mgd	ac-ft/d	Maximum Storage ac-ft	days	Critical Period		Year End ac-ft
1	28.000	2007	169.43	109.52	336.07	45800.12	320	05/17/2007	03/31/2008	7658.68
2	14.000	1986	190.99	123.46	378.82	45800.41	293	04/04/1986	01/21/1987	0.00
26	1.077	2003	527.71	341.12	1046.70	45800.07	185	09/29/2003	03/31/2004	39326.29

Round 3 Guidelines

- Ground Water
- Purchased Water
- Reservoirs
- Unregulated Streams
- Regulated Streams

Run-Of-River

- Round 3
  - For *unregulated streams*, applicants will use an instream flow study, when such is available, to determine the available supply. If an instream flow study has not been published for a given source, the applicant's available supply will be the lesser amount of 20% of the 7Q10, or the minimum flow of record. In some cases, the available supply may be larger. Applicants that wish to explore the possibility of a larger available supply from an unregulated stream should contact the Division of Water Resources.
  - The Division has not yet determined the method for calculating the available supply from *regulated streams* (e.g., Cape Fear River). A technical work group has been constituted to help develop guidelines. DWR will provide applicants with the method as soon as possible.

Run-Of-River

- Round 4
  - For *unregulated and regulated streams*, applicants will use an instream flow study, when such is available, to determine the available supply. If an instream flow study has not been published for a given source, the applicant's available supply will be the lesser amount of 20% of the 7Q10*, or the minimum flow* of the base case (current conditions) model scenario.

Run-Of-River Questions & Issues From Last Week

- Are ecological flows going to be wrapped into the water supply safe yield question? *Model existing instreamflow requirements.*
- Many questions about supply alternatives vs. future yield will need to be addressed in the model (will not be answered by applications alone). *Alternatives in the Cape Fear & Neuse should use the existing/update models.*
- Should the demand pattern used for yield analysis be the same as for planning?
- Should the analysis be done including the WSRPs?

Round 3 Guidelines

- Ground Water
- Purchased Water
- Reservoirs
- Unregulated Streams
- Regulated Streams
- *Eno River*

Eno River

- Round 4 – Applicants whose source is the Eno River will base the yield analysis on the existing Eno River Voluntary Capacity Use Agreement.

Have the Questions & Issues From Last Week Been Answered?

- Are ecological flows going to be wrapped into the water supply safe yield question?
- How is yield calculated/ estimated in reservoir systems vs. run of river systems?
- Do assumptions include complete draw-down or do you assume an emergency reserve? What is the basis for those numbers?
- Fundamental concern is that allocations give holders a certain withdrawal- downstream users don't get that same assurance.
- What is the safe yield of a storage capacity? It can be calculated many different ways. Ecological flows will need to be wrapped into that question as well.
- Do discussions of water supply alternatives get limited by current regulations (DWQ/ DEH) or does it get opened up to include all feasible alternatives?
- Many questions about supply alternatives vs. future yield will need to be addressed in the model (will not be answered by applications alone).
- Should the demand pattern used for yield analysis be the same as for planning?
- New Questions/Issues?

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Questions

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