

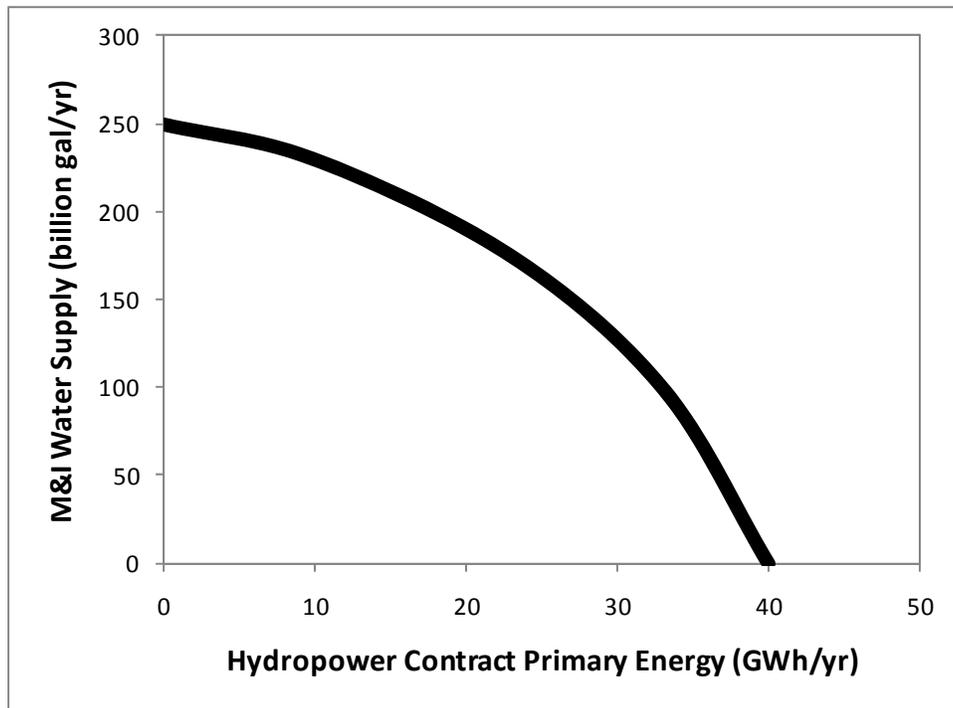
Name: _____

CVEN 664 – Water Resources Planning and Management
Fall Semester 2010
Dr. Kelly Brumbelow, Texas A&M University

Written Midterm Exam

Open-book, Open-notes; 3 questions; Time allowed: 60 minutes
Attach additional sheets as necessary with your answers.

1. A hydroelectric dam and reservoir is operated for the simultaneous objectives of hydropower and M&I water supply. The M&I water user withdraws water directly from the reservoir so that withdrawn water is not available for hydropower production. As part of a planning process, the tradeoff curve shown below has been determined for an average climatic year:



- How will this tradeoff curve change for a drought year?
- How will this tradeoff curve change if the dam is retrofitted with higher efficiency hydroelectric turbines and a successful demand management program is implemented by the M&I user?
- Can NOTATION used in this case be somehow improved to answer questions (a) and (b) better?

(33 points)

The following questions address the Missouri River Authorized Purposes Study (MRAPS) case study. Use systems theory concepts as appropriate in your answers.

2. Federal infrastructure in the Missouri River Basin was constructed and has been operated according to the “Pick-Sloan Plan.” This plan was actually an integration of two initially separate plans, the Pick Plan and the Sloan Plan, each of which was focused on specific water resources issues. What were the MODELS that formed the core of the two separate initial plans? (I.e., what was the MODEL in the Pick Plan, and what was the MODEL in the Sloan Plan?) What was the MODEL at the core of the Pick-Sloan Plan? Does the MODEL in the Pick-Sloan Plan appear to be valid in the year 2010? Does the history of the Pick-Sloan Plan from the 1940’s to the present conform to the GENERAL LAW OF COMPLEMENTARITY? (33 points)

3. A significant issue in the MRAPS is the role and value of waterborne navigation in the Missouri River Basin. In concise terms, state the MODELS on navigation that can be inferred from the documented comments of the following persons:

- (a) David Schorr (representing Missouri River Dredgers Group)
- (b) Kevin Keith (representing Missouri Department of Transportation)
- (c) Brent Stewart (representing Association of Missouri Electric Coops)
- (d) Carol Hinkelman (representing Sierra Club)

A recent analysis (GAO 2009) of navigation in the Missouri Basin found that 84% of all transported tonnage (i.e., weight of goods transported) was sand and gravel. Of that amount, about 54% was transported 1 mile or less, and 31% was transported 1 to 9 miles. In light of this data, comment on the validity of the MODELS you described for the persons named above. (34 points)