Yakima River Basin Water Storage Feasibility Study

Feasibility Analysis & NEPA/SEPA EIS: Phase Initiation Checkpoint Roundtable: Synthesis

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Introduction

This Synthesis report consolidates and summarizes substantive findings, products, and other results of the three-meeting stakeholder Roundtable process during April and May, 2007, initiated by the Bureau of Reclamation and Washington State Department of Ecology, and facilitated by John Petrovsky Associates and CH2M Hill. The emphasis is on outcomes that contribute directly to accomplishing the work of the Yakima River Basin Water Storage Feasibility Study (Storage Study) and "helping to ensure [its] completeness, effectiveness, efficiency and acceptability." While this Synthesis is intended to stand on its own, further insight on all points discussed can be obtained by reviewing the three meeting summaries.

The Roundtable process was structured around six objectives that emerged from review of input received by Reclamation/Ecology at the December 2006 stakeholder meetings held with specific stakeholder groups (Yakima Basin Storage Alliance (YBSA), irrigation districts, Yakama Nation staff, and Yakima Basin Fish and Wildlife Recovery Board) and through the January 2007 National Environmental Policy Act/State Environmental Policy Act (NEPA/SEPA) scoping activities. These objectives were:

1. Review the relative importance of Storage Study goals and help specify measures of success in achieving these goals.
2. Provide input on the role and treatment of primary and secondary benefits.
3. Review and comment on alternatives being considered.
4. Help refine criteria, tools, and techniques for alternatives comparison.
5. Comment on findings of alternatives comparison.
6. Provide input to factors, methods, and level of detail in upcoming analysis.

For clarity and consistency, the following discussions are organized according to these objectives.

Key Roundtable Process Results

1. Review the relative importance of Storage Study goals and help specify measures of success in achieving these goals.

This objective encompasses two questions:

- Are any of the Storage Study water supply goals more or less important than others?
- What are the measures or benchmarks that will be used to determine if alternatives are capable of meeting the goals?

In addressing these questions, an important distinction was made between Storage Study purposes and any corresponding, quantified water supply benchmarks/targets (terms used interchangeably) established to measure success in achieving these purposes. Federal and State legislation authorizing the Storage Study does not set specific, quantified water supply goals. Instead, the legislation places emphasis on "the benefit of additional storage to endangered and threatened fish, irrigated agriculture, and municipal water supply" as the basis for studying potential new storage options in the Yakima basin (these purposes

encompass and take precedence over the specific intent to study the feasibility of Black Rock reservoir). Therefore, the three Storage Study purposes were established as:

- **Improve anadromous fish habitat**
- **Improve the water supply for proratable irrigation water rights**
- **Meet future municipal water supply needs**

Even though the authorizing legislation does not require potential projects or actions to meet specific water supply goals, Reclamation, Ecology, and Roundtable members understand that quantifying future water supply needs in the basin for each of the Storage Study purposes is fundamental in an effort to identify one or more alternatives to provide that water supply. The relevance of this distinction is explained later, in discussion of objectives 3-6; essentially, it centers on defining the alternatives that will be considered and how they will be analyzed and compared in Reclamation's feasibility analysis and the NEPA/SEPA Environmental Impact Statement (EIS).

Returning to the two questions embodied by Roundtable objective 1, little discussion of the first was necessary. No Storage Study purpose is more or less important that the others. In practical terms, this means that, when modeling and evaluating alternatives, each purpose (fish habitat, irrigation, and municipal supply) is equally important—must be met on an equal basis. Beyond in-place water rights, contracts, and/or instream flow requirements, no Storage Study purpose (or need) should be met first, followed by others.

Regarding the second question, a major contribution of the Roundtable was revisiting and solidifying specific water supply targets/benchmarks for assessing whether various alternatives could substantially meet the needs of each Storage Study purpose in the basin. In addition to the water supply goals, the Roundtable members expressed concerns that climate change could impact the water supply and make it harder for any alternative to meet the goals. Reclamation has included climate change as part of the water supply analysis.

Results for each Storage Study purpose, and for all in aggregate, are summarized below.

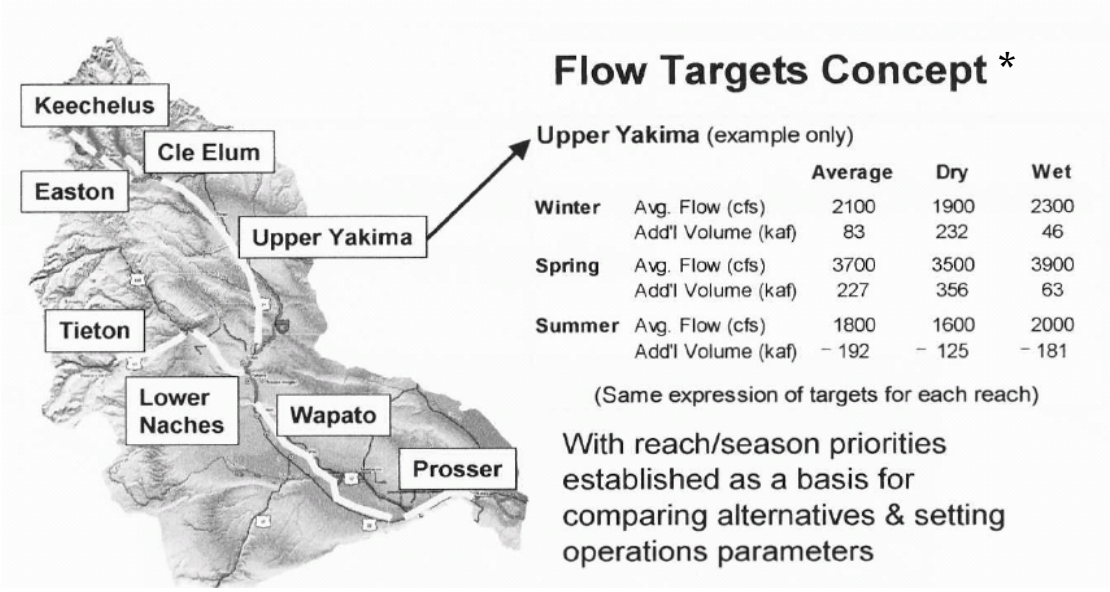
- **Anadromous fish habitat:** Input received during December 2006 stakeholder meetings and January 2007 scoping activities stressed that the benchmarks being used to date were too vague (i.e. "more closely resemble the natural hydrograph"), too few (measured at only two or three points in the system), and/or inconsistently applied to the alternatives. To address these concerns, a Technical Work Group comprised of agency and Roundtable specialists developed a more specific and comprehensive set of instream flow/supply volume targets for reaches of the mainstem Yakima and Naches Rivers. Figure 1 illustrates the results of this effort, including the river system reach breakdown and an example of the type of instream flow targets/water supply volumes defined for key reaches.

  Of particular note is the fact that the instream flow targets defined in this effort are aimed at approaching optimum conditions rather than just minimums[1]. This approach represents a significant improvement in the ability to measure the extent to which alternatives can provide major instream flow benefits, especially on priority reaches and in priority seasons.

  In developing this assessment tool, it was recognized that instream flow (and associated storage volume) is only part of the picture in improving/restoring fishery resources. Habitat conditions, fish passage, and other factors are also important and will need to be considered in more detailed analysis of alternatives.

[1] While noting that this work does not represent any form of legally binding instream flow requirements, Roundtable members stressed that the Storage Study should seek to understand optimum conditions and the relative ability of potential water supply alternatives to approach these optimums.

Figure 1: Goals/Achievement Benchmarks for Fish Habitat



* The Average Flow represents the desired seasonal (winter, spring, and summer) target flows. The Additional Volume (kaf) is the water volume (either added or subtracted) needed in addition to the No Action flow to achieve the seasonal flow target. (Note: Figure 1 was presented at RT meeting #2; refinements will be made as the Storage Study proceeds.)

- **Proratable Irrigation:** At the outset of the Roundtable process, the benchmark being used to measure success in meeting the needs of irrigated agriculture was the most well-developed and accepted among the three Storage Study purposes. This benchmark was defined as a minimum of 70% supply to proratable water right holders in dry years. The Storage Study staff met with some of the proratable irrigation entities affected by this benchmark, with most confirming 70% to be the most appropriate goal. Two irrigation districts, Sunnyside and Yakima-Tieton, opted out of receiving additional water from the Storage Study process in dry years. Other adjustments, on an entity-specific basis, were discussed (e.g. a specified quantity of water v. a percentage of supply in dry years); however, these adjustments would not change the order of magnitude of the overall benchmark/target.
- **Municipal Supply**: A significant change was made to the municipal supply goal. Prior to the Roundtable process, Reclamation had been using a target of 10,000 acre-feet for future municipal supply goal, a target based on the projected needs of municipalities currently using surface water supplies. However, this target did not account for growth in the basin outside of the "surface water supply" municipalities (i.e. in areas currently using groundwater), and the possibility that mitigation (i.e. recharge/replacement of groundwater from surface water supplies) could be required for future groundwater usage. This potential groundwater use/mitigation requirement adds 72,000 acre-feet per year to the municipal supply target over the next 50 years. Thus, the Storage Study goal for municipal supply was changed from 10,000 acre-feet per year to 82,000 acre-feet per year to account for this potential groundwater mitigation component.

  During Roundtable consideration of this subject, two concerns were expressed, both suggesting that even the 82,000-acre-foot target could be too low. The first concern was that the need projection only goes out 50 years, in contrast to the 100-year planning horizon being used in the benefit/cost studies. The second concern is the potential for mitigation of existing groundwater usage. These

concerns could result in doubling (or more) the 82,000-acre-foot need. However, the general sense of the Roundtable was that going beyond the 82,000-acre-foot-target for future municipal needs would be too speculative and perhaps not defensible (see meeting summaries for further insight into these discussions).

- **Overall Basin Targets (all three Storage Study purposes):** Table 1 summarizes the quantity targets/benchmarks for all three Storage Study goals and shows the resultant total water supply augmentation target for the basin. These results represent an important assessment tool when comparing the relative merits/success of alternatives. However, as noted under objective 3, these goals do not represent absolute requirements for alternatives; other factors, such as benefit/cost ratio or other State or Federal geographic priorities, will ultimately need to be considered when deciding on a course of action for the basin.

Table 1: Preliminary Overall Basin Goals/Targets

Water Year	Storage Study Purposes: Annual Supply Goals (af)*			Total Basin Supply Goal (af)
	Instream Flows**	Irrigation Supply	Municipal Supply	
Average	400,000	NA	82,000	482,000
Wet	300,000	NA	82,000	382,000
Dry	500,000	391,000	82,000	973,000

* Before consideration of projected impact of climate change
** Preliminary estimates of flows approaching optimum conditions.

2. Provide input on the role and treatment of primary and secondary benefits.

Primary benefits are those benefits attributed to anadromous fish, irrigation and municipal water uses while the secondary benefits are those realized from power generation, recreation or other categories. Reclamation's Plan Formulation Analysis illustrated the potential for secondary benefits to represent a significant percentage of the overall benefits from (at least some) reservoir project alternatives. The example displayed to the Roundtable was the preliminary benefit/cost analysis for Black Rock, which showed that 41% of the total economic benefits were derived from recreation and power generation. The other 59% were derived from fish, irrigation and municipal uses. (This comparison of the percentages of benefits was not displayed in the Plan Formulation Analysis.) This finding raised the question of whether such secondary benefits should be considered at the same level of priority as the primary benefits defined by the Storage Study purposes. Specifically, should they have the same priority when specifying water supply goals, defining/configuring alternatives, and/or developing operational scenarios?

Little discussion or debate on this question occurred during the Roundtable process. The fact is that the authorizing legislation specifically focuses on fish habitat, irrigation, and municipal supply, thus establishing these three primary priorities. Because of this, potential benefits from such uses as power generation or recreation are not a driving factor in defining water supply goals or alternatives. However, those benefits will be relevant in exploring the most beneficial and cost effective alternatives.

3. Review and comment on alternatives being considered.

Considerable discussion occurred in the Roundtable of what alternatives would be considered and carried forward for detailed analysis in Reclamation's Planning Report/NEPA/SEPA EIS. Primary concerns, related discussion, and conclusions are summarized below.

- **Alternatives to be considered:** Reclamation's Plan Formulation Analysis addressed only two potential storage alternatives (Black Rock and Wymer Reservoir Plus Yakima River Pump Exchange) and, under the No Action Alternative, recognized only known, planned conservation measures. Concerns were expressed during the recent stakeholder and scoping processes that this range of alternatives was not sufficiently inclusive. Specifically,

- Other inbasin storage alternatives warranted additional study, especially Wymer Only and groundwater (aquifer) storage and recovery. Also, comments received in the scoping and Roundtable processes also indicated an interest in revisiting the idea for developing an enlarged Bumping Lake. Reclamation agreed to review the analysis for the Bumping Lake Enlargement and determine if there are reasons to reanalyze the idea or if there are still sufficient reasons (mostly environmental) to eliminate it from further consideration.
- Nonstorage/nonstructural options should be more comprehensively explored.
- Out-of-basin storage (i.e. Columbia River Off-Channel Storage) was also being studied and should be considered.

In response to these concerns, a focus of the Roundtable process was on solidifying (to the extent possible) the list of alternatives that would at least be considered, if not carried forward, into detailed analysis. In solidifying this list, an important clarification was made regarding differing emphasis/responsibility of Reclamation and Ecology. Specifically, Reclamation's responsibility under authorizing legislation is to study inbasin storage alternatives; it is these storage alternatives that will be addressed in Reclamation's Planning Report (PR), and they will be jointly addressed with Ecology in the NEPA/SEPA EIS (these are termed Joint Alternatives). Nonstructural/ nonstorage options and/or out-of-basin storage will be defined and addressed by Ecology in the EIS, pursuant to SEPA (these are termed Potential/SEPA Alternatives).

Reflecting this clarification, the list of alternatives is shown below. At the conclusion of the Roundtable process, all of these alternatives remain under consideration; however, further analysis may ultimately warrant eliminating some from detailed analysis in the Planning Report/EIS.

Joint Alternatives

- No Action
- Black Rock
- Wymer Only
- Bumping Lake Enlargement
- Wymer Plus Yakima River Pump Exchange
- Aquifer Storage and Recovery (ASR)

Potential/SEPA Alternatives

- Market-Based Reallocation of Resources (water leasing, land fallowing, water marketing)
- Entity and On-Farm Water Conservation Measures (in addition to the No Action Alternative)
- Columbia River Off-Channel Storage

- **Extent to which alternatives must meet specified water supply goals in order to be carried forward:** Given the magnitude of the water supply goals/needs defined under objective 1, and in light of the alternatives listed above, it was intuitively obvious to many (reinforced by findings under objective 5) that only [1] the larger project alternatives (e.g. Black Rock) or [2] a "combination" alternatives could approach meeting these goals (i.e. in a "combination" alternative, two or more of the smaller alternatives listed above would become "elements" in defining another alternative more capable of meeting the goals. This raised the question, to what extent does an alternative need to meet the defined quantity goals in order to be considered for detailed analysis in the Planning Report/EIS?

  The response to this concern was rooted in the above-noted fact that the authorizing legislation for the Storage Study does not specify water supply quantities or require that any specific targets be met. A decision on whether or not to pursue new water supply for the basin, whether through new storage or via nonstorage option(s) (or some combination) will be based on many factors (including benefit/cost ratios, other State or Federal geographic priorities, environmental impacts, or others).

One factor certainly will be the extent to which a proposed action could meet the quantity targets (goals) developed for the three Storage Study purposes. However, meeting these targets is not an absolute requirement (e.g. an acceptable alternative—given all considerations—may only partially meet these targets). Given this perspective, the Reclamation/Ecology approach in moving forward is to analyze all alternatives listed above on their own merits, including the extent to which they could meet the specified goals. Reclamation indicated that obvious, synergistic combinations of elements may be assessed and the results displayed.

4. Help refine criteria, tools, and techniques for alternatives comparison.

Response to this objective was encompassed within work on objective 1. The primary focus of the Roundtable in comparing alternatives was the extent to which they could meet specified water supply goals. The goals agreed upon under objective 1 will be used with Reclamation's system operation/simulation models to compare alternatives (or combinations of alternatives—see objective 3) in terms of their relative potential to meet the basin's water supply needs.

5. Comment on findings of alternatives comparison.

Using the water supply goals/targets indicated in objective 1, Reclamation conducted preliminary operation studies of selected alternatives (No Action, Wymer Only, and Black Rock) to assess goal achievement. These results were presented to the Roundtable.

Only Black Rock consistently met the irrigated agriculture and municipal supply targets; Black Rock also came closest to meeting high-priority instream flow targets. However, even the Black Rock Alternative did not meet all instream flow targets.

These results suggested to some that the interests of the basin would be best served with a large project, able to meet (or come close to meeting) the full range of needs identified. This could be especially true given the potential impact of climate change. However, based on discussion under objective 3, major questions remain regarding whether a large project is economically or politically feasible, especially given the need for similar types of water supply augmentations elsewhere in the State. Since this doubt exists, smaller, more modest projects should not be eliminated from consideration. The ultimate reality may be that a smaller project or combination of smaller, incremental actions is the best that can be achieved. In this regard, the potentially significant contribution that may be possible through less expensive, nonstructural, nonstorage approaches should be carefully considered. These approaches, including additional conservation and market-based reallocation, should be considered when developing solutions to meeting water supply needs.

6. Provide input to factors, methods, and level of detail in upcoming analysis.

Primary concerns and discussions under this objective centered on:

- **Equal treatment of all alternatives:** Some Roundtable members expressed concern that fair and equal consideration would not be achieved for alternatives that [1] are not included in Reclamation's Planning Report (i.e. the SEPA alternatives listed above) and/or [2] are actually being studied in other programs on different schedules (i.e. the USGS study of the interaction of groundwater and surface water in the basin, or the Columbia River SEPA alternative). Suggestions to address these concerns included Reclamation incorporating all alternatives in its Planning Report and/or an extension of the Storage Study schedule to wait for definitive results from the USGS groundwater/ surface water study and the Columbia River Off-Channel Storage Options Study.

  Reclamation and Ecology [1] reinforced the importance of maintaining the current Storage Study schedule, and [2] voiced confidence that the SEPA and ASR alternatives would be sufficiently well understood and defined to allow for credible and defensible comparative analysis in the EIS. In the latter regard:

- Ecology will conduct sufficient analysis of the nonstorage/nonstructural alternatives to provide a reasonable assessment of their feasibility and effectiveness;
- Reclamation will use the best information available regarding the ASR option in consultation with USGS and Yakama Nation staff and necessary order-of-magnitude estimates of storage capacity and economic implications should be achievable without the full USGS study report; and
- The Appraisal Assessment of Columbia River Off-Channel Storage Options is due to be completed by May or June of 2007. This assessment should provide most of the information needed if this option is considered in the Storage Study PR/EIS.

- **Selection of a preferred alternative or proposed project:** Some Roundtable members wanted clarification on when and how Reclamation and Ecology would identify a preferred alternative or proposed action. No clear answer could be provided within the timeframe of the Roundtable process. Until feasibility, environmental impacts, goals achievement and other analyses are conducted, it is not possible to be sure that a preferred alternative can be identified in the Draft PR/EIS. Comments from the Draft PR/EIS may provide guidance on selection of a preferred plan or action.

Conclusion & Follow-Up

The lead agencies (Reclamation and Ecology) and Roundtable members have expressed the view that the Roundtable process was a valuable and substantive collaboration at an important juncture in the Storage Study process. The Roundtable provided an opportunity to explore how the upcoming analysis and reporting phase would approach key questions and uncertainties highlighted by the December 2006 stakeholder meetings and the January/February 2007 scoping process. This collaboration will help assure that the Storage Study overall is complete, that "surprises" are avoided (or at least minimized), and that the schedule can be met.

Some Roundtable members suggested that the process should remain active, with quarterly follow-up meetings. Of particular interest and relevance would be [1] progress in defining the ASR and SEPA alternatives, [2] decisions to eliminate one or more Joint alternatives from detailed consideration (e.g. the Bumping Lake Enlargement), and/or [3] unforeseen schedule challenges. Reclamation and Ecology indicated that this option would be considered.