RECLAMATION
*Managing Water in the West*

In cooperation with: Idaho Water Resource Board; Henry's Fork Watershed Council

# Henrys Fork Basin Study

# Meeting Summary:

# *Workgroup Meeting, May 8, 2012*

Copies of all PowerPoint presentations at the meeting are available at the Bureau of Reclamation website: http://www.usbr.gov/pn/programs/studies/idaho/henrysfork/index.html

## Henrys Fork Basin Study – Agenda, Schedule, Milestones *(Bob Schattin, Bureau of Reclamation)*

Bob Schattin presented the agenda for the session and reviewed study progress and schedule to-date.

Bob noted that, from an original 40 ideas for Henrys Fork alternatives, the reconnaissance level study has resulted in 17 major alternatives, supported by 6-8 draft Technical Memos (TMs). He advised that, in addition to TMs completed to-date, those for the Municipal-Industrial Conservation, Dam Raise, and Managed Recharge alternatives are now complete and available on the Reclamation website and that posting of TMs for Agricultural Conservation and Teton Dam was imminent. Bob stressed that the TMs: (1) are factual assessments, not vehicles for recommendations; (2) are in draft form; and (3) will likely raise operational questions that will need to be more fully explored during future phases of the study. He encouraged comment on any/all aspects of the TMs.

Next steps: Bob stated that, through the summer, small groups would meet to formulate appraisal scenarios through a creative process that more fully assesses the remaining alternatives and evaluates possible combinations from across all 17 main alternatives and all sub-alternatives. Results of and feedback on the small group process will be provided to the Henrys Fork Watershed Council, with presentation and discussion of potential scenarios at the Workgroup meeting scheduled for September 11, 2012.

Bob further stated that the completed appraisal report, with recommendations, is expected to be available by October 2013, ending the study process.

Bob reminded participants that, with completion of the appraisal reported, the study phase will end and that action on any alternatives or combinations thereof beyond the study phase has not been determined.

## Decision Analysis Process (*John Petrovsky, CH2M HILL team*)

John Petrovsky presented further explanation of the Decision Support System (DSS) tool being used to assess alternatives – more than 30 in all including sub-alternatives. John presented the latest refinements to the DSS for surface storage, noting that, per suggestions at the April 10, 2012 meeting:

- separate categories have been established for biophysical and sociocultural benefits and impacts; and
- residential land use impacts have been added to the infrastructure category for certain alternatives (e.g., Island Park Dam Raise).

John stressed that, rather than being determinant, the DSS is but one tool being used to assess alternatives for their further potential. The DSS is factual in nature, converting elements to common units of measure (i.e., best to worst [10 – 1 scale] or high, moderate, low for environmental benefits/impacts) and allows comparisons of study alternatives against each other on that basis.

John noted that application of the DSS tool allows examination of factors in groups and may lead to some ideas for possible combinations from among different alternatives. Though data used in the DSS are not yet final, results are beginning to emerge and further DSS analysis will be used in the continuing appraisal process. John presented the latest DSS iteration for surface storage alternatives and noted that, with future completion of DSS analysis for the groundwater storage and conservation alternatives, side-by-side assessments of combinations of elements will be possible. John mentioned that, when data are finalized, basic analysis results will be provided for use by all participants in the study.*

**Q**: Are factors and criteria used in the DSS "set in stone"? **Response**: Factors and criteria used in the DSS are adapted from the TMs and are somewhat limited by the types of data being collected and reported during the reconnaissance phase of the study.

**Comment**: Various involved agencies have complicated and very different regulations and limitations, with different methods of categorization (e.g., Bureau of Land Management defines areas of critical concern while US Forest Service has no such classification). **Response**: Acknowledge that such differences exist and will be addressed in future phases of study. Note that criteria are evolving.

***[*Note:** As requested by members of the workgroup, the current array of evaluation perspectives, categories, and factors is provided as Attachment 1 to this meeting summary]*

## Alternatives Highlights: Municipal and Industrial Conservation, Dam Raise and Managed Recharge Alternatives (*Mark Bransom and Brian Drake, CH2M HILL team*)

Mark and Brian described significant aspects of the recently completed TMs for these three alternative categories, which are now available on the Reclamation website. Mark noted some of the format and methodology similarities between these TMs and the surface storage TMs and suggested that reviewers concentrate in particular on the alternative-specific results sections that present benefits, impacts, and costs (e.g., Sections 3 and 4 in the Dam Raise TM).

### Municipal and Industrial (M&I) Conservation

Mark reported that the M & I Conservation TM had been developed based on data provided by the cities of Driggs, Victor, Rexburg, and Idaho Falls and by the Anheuser-Busch and Grupo-Modelo companies in the Eastern Snake Plain Aquifer (ESPA) region, expressing appreciation for their participation. For purposes of comparisons among municipalities, data had also been obtained from the southwestern Idaho cities of Meridian, Caldwell, and Nampa. Mark explained that the ESPA cities used for the TM had varying histories of consumption data, from as little as one to as many as ten years of history.

Mark noted two promising areas of municipal conservation, although associated costs could be substantial: implementation of meters/metering programs, possibly including tiered rate structures; and replacement of shallowly-buried piping. Additional conservation through public education is also included in the TM, as are preliminary cost estimates for each conservation alternative.

Mark stated that 150 gallons is a generally-accepted industry estimate of per capita daily water usage and presented data for the four aforementioned cities showing consumption patterns generally substantially higher than this average. He noted that a variety of water billing systems exist in these cities, with instances of metered, tiered-rate billing; absence of meters; and flat-rate billing with installed meters. He explained that sometimes meters are missing or not functioning and that, when available, data may not be recorded/ used. Mark also showed data from the comparison southwestern Idaho cities, all of which have metered a majority of water service connections and use tiered-rate billing, demonstrating per capita daily consumption well below the 150-gallon national average.

Mark explained that aging and shallowly-buried distribution systems (stressed by freeze/thaw cycles) are leaking and contribute substantially to the high per capita daily water use in the cities analyzed. He discussed the possibility of dual-pipe systems for potable and non-potable water, including pressurized irrigation, for consumptive v. non-consumptive uses. He also noted that, although data from industrial users was harder to come by, Anheuser-Busch had set and realized water consumption reduction goals.

**Q**: Was consideration given to how much water is returned to the system? Consumptive use at Anheuser-Busch is very small, for example. Leaks stay in the basin; water is "not going over the Continental Divide."**Response**: Acknowledged, but the question on leakage is the cost of treatment and energy costs associated with distribution. Use of non-potable water (i.e., reuse and/or raw water [canals, surface storage]) avoids treatment costs.

**Comments**: Cities using dual-pipe systems, such as Meridian, have more need for lawn rather than agricultural irrigation--not the situation in the Basin. Cities that require pressurized irrigation from developers have found that it's not trouble-free and can be quite costly, causing some to move away from it. Furthermore, pressurized lawn irrigation conversion needs a critical mass of population to shift out of agriculture to be practical. Dual-pipe systems in the Basin would require more maintenance than those in southwestern areas of the state because climate is more extreme. **Response**: Cities will need to analyze conservation alternatives to determine what makes sense for each of them.

## Dam Raise

Brian presented highlights of the dam raise alternatives: modifications to the Island Park structure; and a new structure at Ashton, with sub-alternatives including expansion of the Crosscut Canal to provide inter-basin transfer of water from the Henrys Fork to the lower Teton.

Brian described the two scenarios assessed at Island Park: raising the existing 1-foot bladder to 2 feet; and adding 8 feet to the existing structure. These alternatives would result in estimated storage increases of 8000 and 74,000 acre feet (AF), respectively, retained in-basin.

Brian explained that to ensure structural integrity and accommodate freeboard requirements, construction of a new dam at Ashton Reservoir, located downstream of and outside the existing footprint, would be necessary. The existing structure could be retained for use as a coffer dam under this alternative. The new dam would have a crest elevation 43 feet higher than the current dam; freeboard requirements of 15 feet would reduce the effective raise to 28 feet. A storage increase of approximately 20,000 AF could be realized as the result of the new Ashton dam.

Brian presented preliminary costs, total and per AF, for these alternatives and noted that discussion of environmental impacts at both locations needs to be expanded to discuss rainbow trout, in addition to Yellowstone Cuthroat trout, per earlier comments from Idaho Fish and Game. Brian further advised that impacted federally- listed species total approximately 20 at Island Park and 10 at Ashton. He reported that the 8-foot raise at Island Park is estimated to inundate about 100 structures.

**Q**: Is the cost of displaced private property included in estimates? Ancillary costs such as these are huge at Island Park compared to greenfield construction at Lane Lake. **Response**: Impacts on land use are included in the DSS, which ensures consideration of impacts to private property when comparing alternatives.**Response**: Not at this stage. Costs are undoubtedly real but, for consistency, all estimates are based strictly on capital costs.

**Q**: How were federally-listed species defined? **Response**: Footnotes on the relevant "Red-Yellow-Green" chart explain these designations.

**Q**: How would the Crosscut Canal be expanded? **Response**: It would be widened to increase capacity to approximately 1,000 cfs (current capacity is approximately 600 cfs at the upstream end and 400 cfs at the downstream end); slope would remain unchanged.

**Q**: What freeboard requirements are in the 8-foot Island Park raise alternative? **Response**: Existing 8- to 9-foot freeboard requirements are retained.

## Managed Recharge

Brian presented highlights of the Managed Recharge TM, noting that two alternatives were addressed: Egin Lakes (West Egin Lakes site only) and a potential new site on Teton Island, east of Sugar City. Brian

noted that the TM addresses annual recharge of 5,000; 7,500; and 10,000 AF at each site and presented preliminary cost estimates per incremental AF of recharge at each location.

The Egin Lakes existing recharge baseline of 5,000 AF cited in the TM actually includes canal seepage, but the model represents all 5,000 AF being recharged at the West Egin Lakes site only. Results for increased recharge scenarios are "snapshot" results at the end of the modeled 20-year period, with values incremental to the 5,000 AF baseline. Modeling results at Egin Lakes show that only 22% of the recharge water captured would be retained in the ESPA; most water returns to the river. He further noted that additional information is needed from involved agencies to ascertain the status of a potential wilderness study area in the Egin Lakes area.

Brian stressed that the Teton Island site shown in the model is theoretical and representative only, not the final location. Brian advised that less than 10% of recharge at the site would remain in the ESPA, largely due to geological conditions.

In summary, Brian remarked that both Egin Lakes and Teton Island sites have "low residence time" (i.e., not retaining recharge water in the aquifer very long).

> **Q**: How does St. Anthony add upstream at Ashton? **Response**: The model estimates flow changes on a reach-scale basis as observed at the downstream end of the reach, so increased flow in the Ashton-Rexburg reach is reported at Rexburg.
>
> **Q**: Cost does not include input water? **Response**: Correct.
>
> **Q**: Using existing canal at Egin Lakes or adding new? **Response**: The existing canal would be expanded to increase conveyance capacity.
>
> **Q**: Flow increases reported in the TM do not seem to account for all the water flowing into the river. **Response:** Values reported are a snapshot at the end of the 20-year modeling period. The Team will considering using a different averaging period to better represent flow increases.

## Alternatives Highlights: Agricultural Conservation, Teton Dam *(Bob Schattin, Bureau of Reclamation)*

### Agricultural Conservation

Bob described methodology and highlights of the Agricultural Conservation TM, explaining the constructs of the Van Kirk model, which has been peer-reviewed and corroborated by an independent firm, Rocky Mountain Environmental Associates. He explained that the study defines four irrigated regions, comprising 88% of the Henrys Fork Basin, and at each location compares each alternative to the current situation.

Bob noted that data on "average daily diversions" are complete and encompass 30 years, while the "current" data are more representative of the past 10 years, reflecting comparatively recent developments such as some conversion to pressurized irrigation. Diversion data presented in the TM is in all cases displayed for three timeframes: annual; peak (May 15 to July 15); and off-peak. He remarked that the best/ideal hydrograph for these timeframes would be determined during future discussions. Bob also advised that ground and surface water interrelationships were relevant to all alternatives.

#### *Langemann Gates*

Bob reported that one alternative, the use of recent technology, was assessed to determine the benefits of better approaches to diversion for irrigation needs. (The proprietary Langemann gate technology was used because it is representative and information was readily available from the company.) Bob noted that systems such as this allow precise water management through accurate collection of real-time data.

Though preliminary cost estimates were presented for the Langemann system, including a variety of gate sizes to ensure maximum diversion over a 30-year period, no cost/AF is presented given the use of the three timeframes displayed in the analysis.

***Demand Reduction***

Bob remarked that the cost/AF of this alternative (i.e., retaining ownership of land but losing the associated water right) is highly controversial and very difficult to define.

***Piping and Lining***

Bob noted that conversion from flood to sprinkler irrigation is no longer being considered as a separate alternative. Piping and lining essentially serves the same purpose and produces the same results from a hydrology perspective, so the flood to sprinkler conversion was dropped from further evaluation. He reported that the impacts of piping and lining include both reduced in-stream flows and large costs.

***Recharge with Existing Canals***

Bob reported that this alternative show reductions in both peak and annual flows.

### Teton Dam

Bob reviewed previous reports on this alternative, including a 1991 Reappraisal document by Reclamation and a 1995 study by HDR focused primarily on hydropower production. The Reclamation document suggested the facility would provide a total storage volume of 288,000 additional AF, of which 55,000 AF would be available for irrigation.

**Q**: What's the basis for the 55,000 additional AF available for irrigation? **Response**: The study included recreation and flood control needs as well as hydropower.

**Q**: How does 55,000 AF lower on Teton Dam square with data higher in the Basin at locations such as Lane Lake? **Response**: This was only an appraisal level study. It's possible the study included consideration of storage water rights below the dam (e.g., American Falls).

**Q**: Is cost shown that for 288,000 or 55,000 AF? **Response**: Both are shown on the cost chart.

**Q**: How does Teton Dam cost compare with CH2M HILL alternatives? **Response**: Recognize these are not "apples to apples" alternatives but do not want to invest in getting information that may not be required. CH2M HILL study alternatives are still in draft.

**Q**: Can the Teton Dam alternative be integrated into CH2M HILL's model? **Response**: Some limitations exist but will get as close as possible. Reluctant to invest in precise comparisons for alternatives likely to be eliminated.

## Facilitated Discussion, Factual Feedback on Study Elements (*John Petrovsky, CH2M HILL team*)

**Comment**: Want access to DSS. Suggests portraying DSS as working document and note there's still plenty of time to comment. **Response**: Noted and agreed. DSS is getting close but is not there yet. Additional data will be incorporated.

**Q**: How much more effort will be given to looking at Aquifer Storage and Recovery (ASR)? **Response**: Uncertain at this time. Review comments indicating specific new or additional analyses are encouraged to guide the process.

**Q:** Good explanation of the hydrology behind the 8-foot Island Park dam raise. What's the prospect of filling it? **Response:** Will conduct more detailed stream stats and hydro analysis in next study level; will include water rights analysis.

**Q:** Assume Ashton Dam would be operated as a storage facility (which is different from how it's now operated as a run-of-river dam)? **Response:** Should be addressed in Section 2. Add comments if not covered adequately.

**Q:** Wouldn't it be worthwhile to look at Island Park dam raises at midpoints between 1 and 8 feet? Understand that it might be worthwhile to increase height of existing dam rather than build an entirely new dam but why not consider something at perhaps 4-foot level? **Response:** Current assessment meets the intent of the Study and provides a potential range of expansion options. Further refinement would occur at the next phase of the Study. Also possible "exclusion" factors might be developed to capture impacts that make an alternative infeasible.

**Q:** When does an alternative get eliminated? **Response**: The field of alternatives is narrower at every level of study. Island Park dam raise will include consideration of residential and wildlife impacts.

**Comment**: If it's true that American Falls water rights drive the estimate that only 55,000 of 288, 000 additional AF from Teton Dam is available for irrigation, that same assumption would apply to other alternatives and the costs of those alternatives. **Response**: Noted.

**Q**: How closely did crop needs get matched to water needs in the Agricultural Conservation alternative? **Response**: Current v. evapotranspiration (ET) shown in hydrograph.

**Q**: Were ET demands considered equally in the automation analysis? Would need to automate canals "head to tail" to match ET needs. **Response**: Yes; agreed.

**Comment**: Langemann gates don't work in all situations. Did you consider alternatives? **Response**: Information was readily available from Langemann vendor; cost data is comparative and relative.

**Comment**: From presenters: Study is a working document that will continue to be refined through the summer meetings with small groups. Will consider how to communicate with the full group but will "close the loop." September 11, 2012 Workgroup meeting will include results of summer process, including some "catch up."

**Q**: Has small group membership been defined? **Response**: Small groups will be composed of representatives of stakeholders (agencies, irrigators, cities, NGOs) in open, general meetings.

**Q**: How will you communicate with the people not chosen for small groups? Will the selected representatives be listed on the Reclamation website? Is the older information on representatives on the website still accurate? **Response**: Generally, the older information (on stakeholder representatives) is accurate.

**Q**: Will a published sequence of events be available? **Response**: Noted; will provide on website.

**Q**: Can those not in small groups provide input and feedback, say through the Reclamation website? **Response**: Yes; contact information is listed for both Bob Schattin and Lesa Stark.

**Comment**: Egin Lakes area is both migratory and winter range for wildlife. For the system above Falls River, rainbow trout, in addition to Yellowstone cutthroat trout, should be a species of concern. **Response**: Noted.

**Attachment 1**

# Henrys Fork Basin Study: DSS Evaluation Hierarchy

May 15, 2012

| Perspective ↓ | Categories | Factors | Criteria | Units of Measure |
|---|---|---|---|---|
| **A. Hydrology, Hydropower and Flood Control Benefits** | | | | |
| | Primary Benefits | Water Supply Volume | | Acre-Feet |
| | | Potential Water Supply Benefits | In–Basin Agriculture | Potential In–Basin Subareas Benefited: 0 (none) to 4 (all) = Worst to Best |
| | | | In–Basin M & I | Potential For Towns/Cities In or Downstream of Basin Subareas To Be Benefited: 0 (none) to 4 (all) = Worst to Best (basin subareas = agricultural subareas) |
| | | | State | Acre-Feet |
| | Secondary Benefits | Hydropower | | Kilowatt Potential |
| | | Flood Control | | Off-channel or managed groundwater site, no flood control potential = 0; Potential role in flood control, low capacity = 1; Potential role in flood control, moderate capacity = 2, Potential role in flood control, high-capacity = 3. [specify volume range for ratings of 1, 2 and 3] |
| **B. Implementation Costs and Legal/Regulatory Constraints** | | | | |
| | Cost | Development Cost | Total Cost | $ |
| | | | Cost Per Acre-Foot | $ |
| | Legal, Institutional, or Policy Constraints | | | Significant Constraint, Would/Could Make Action Infeasible = 1; High Constraint = 2; Moderate Constraint = 3; Low/No Constraint = 4 |
| **C. Biophysical Resources-Opportunities and Constraints** | | | | |
| | Wildlife Habitat | | Large Game Habitat Value | Winter Range = 1, Migration = 2, None = 3 |
| | Federal Listed Species | | | Federal Listed Aquatic Species and Prime Conservation Area = 1, Federally Listed Terrestrial Species and State Species of Greatest Conservation Need = 2, None = 3 |
| | Wetland/Habitat Value | | | Extensive Wetland Impact (> 200 Acres) = 1, Moderate Wetland Impact (>1 - 200 Acres) = 2, No/Minimal Impact (<1 Acre) = 3 |
| | State Species of Special Concern--Yellowstone Cutthroat Trout | | Presence in Affected Stream; Conservation Status If Present | Core Conservation Population = 1, Conservation Population = 2, Sport Fishery or Not Present = 3 |
| | Special Designation | | BLM/USFS Eligible Stream, State Natural River, State Recreational River, or Designated Wilderness | Federal Special Designation = 1, State Designation or Eligible for Federal Designation = 2, No Federal or State Special Designations = 3 |
| | Stream Connectivity | | | Adverse Impact = 1, No Significant Impact = 2; Beneficial Impact = 3 |
| **D. Socio-Cultural Resources-Opportunities and Constraints** | | | | |
| | Land Management | | Land Ownership or Special Designation | Federal, Conservation Easement = 1; State = 2, Private = 3 |
| | Recreation/Economic Value | | Relative Value and Potential for Significant Adverse Impact (qualitative rating) | High = 1; Moderate = 2, Low = 3 |
| | Infrastructure/Developed Land Use | | Relative Value and Potential for Significant Adverse Impact (qualitative rating) | High = 1; Moderate = 2, Low = 3 |