

Pacific Northwest Project Technical Memorandum/Declaration

DATE: February 24, 2008

TO: Mr. Bart Gallant, President
Barker Ranch

FROM: Darryll Olsen, Ph.D.
Regional Planner/Resource Economist

SUBJECT: Estimated Economic Value/Water Market Price for Barker Ranch:
**Irrigation Water Subject to Gift Donation to the Trust Water Rights
Program, for Qualification as a Tax Deduction**

I. Introduction:

This technical memorandum/declaration reviews the estimated value of water placed into the Washington State Water Trust Program by the Barker Ranch, qualifying as a gift donation for tax deduction purposes. This estimate is based on two quantitative data/information sets, dealing with water quantity (Qa) and economic value (\$/acre-ft.):

- Water Quantity (Qa): The Water Resources Program, Washington State Dept of Ecology, has quantified the 2007 water quantity (Qa) donated to the Trust Program at 5,512.1 acre-ft. (hereafter referred to as 5,512 acre-ft.).¹
- Water Economic Value (\$/acre-ft.): The economic value of the water is based on multiple studies, appraisals, and recent empirical market value transactions for water that would be applicable to the Barker Ranch donation; with recognition for geographic location, potential buyers, and production agricultural uses.
 - Importantly, water values have moved upward during the past two years, as irrigated agriculture commodity/specialty crop and land values have responded to changing regional, domestic, and global market conditions.

It is further observed that:

- The Barker Ranch Trust Water Program donation best reflects a temporary, or leased, seasonal irrigation transfer to another irrigation user, where no permanent change/transfer is made to the existing right(s); nor is the water value assumed to reflect water transferred to a potable municipal supply (permanent transaction).

**3030 W. Clearwater, Suite 205-A, Kennewick, Washington, 99336
509-783-1623, FAX 509-735-3410, DOlsenEcon@AOL.com**

¹ Letter from Melissa Downes, Operations Unit Supervisor, Water Resources Program, CRO-WADOE, Yakima, Washington, dated February 4, 2008, to Mr. Bart Gallant, President, Barker Ranch, Trust Water Program Donation. See authority under RCW 90.42.080.

The objective is to provide a technically defensible estimate, or appraisal value, for the economic value of water per acre-ft. (direct net value), for agricultural irrigation or residential (seasonal) irrigation sectors. This estimate is suitable for establishing the economic value of the Barker Ranch donation to the Trust Water Program.

II. The Economic Value of Water:

The economic values offered below are expressed in terms of direct net value (National Economic Development values), consistent with the dominant standards established for valuing water resource projects and program actions.² As defined here, direct net value refers to dollars per acre-ft. measures based on: 1) buyers' *willingness-to-pay* or water market clearing price; or 2) the net income value derived from a water source that could be acquired by the agricultural sector (lease or capital values).

More specific to the Trust Water Program donation, direct net value pertains to the likely value (price) of new water resources, if the Barker Ranch were to sell (annual lease) some portion of their existing water rights. In most cases throughout the West, the value of new water supply reflects the marginal value of water from the agricultural irrigation sector, or supplying the agricultural sector--the municipal value being equal to or greater than the value of water to the agricultural sector, from which water is, or could be, purchased.

A. Water Value Estimates, the Historical 2000-2005 Period:

Table 1 displays several estimates for the economic value of water (\$/acre-ft.) relying on technical reports and reviews primarily focusing on the 2000-2005 period. Municipal water values usually exhibit the highest value for the use value sectors, because of the municipal sector's higher willingness-to-pay and ability-to-pay for water. As noted above, this value can be set at the marginal value of irrigation water transfers or the cost of new water supply sources.

For irrigated agriculture, the University of Washington (UW) prepared one estimate relying on enterprise budgeting, the net income received by owners/management. An estimate range of \$59-69/acre-ft. was determined. While enterprise budgeting is an acceptable method to pursue, it has been PNP's experience that this method can underestimate actual values. This occurs, in part, because 1) farm operators have a tendency to make rapid and creative adjustments to production costs, in order to maximize net returns at any given time; 2) analysts fail to use appropriate, site-specific data from which to base their estimates for high production areas; or 3) rapidly changing market conditions are not well captured by the budgeting analyses.

² All major economic valuation review studies—particularly those conducted by federal or state agencies—rely primarily on direct net values to assess economic impacts. This approach has its “roots” in the economic procedures established by the U.S. Water Resources Council, “Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies,” Washington, D.C., 1983.

Where data allow, a methodology that can provide a more explicit value of water for agricultural is the review of direct water (or land) purchases. Water marketing transactions do exist within Eastern Washington and the affected area.

Accordingly, if the market value for water for this period is assumed to be about \$500 to \$1,000 per acre-ft. (capital value), then estimates of annualized values can be made given various assumptions about cost of capital interest/discount rates and the time period for commercial lending. For example, using a capital value range of \$500-1,000, with a 7-8% interest/discount rate range, covering a conventional commercial farm loan period of 15 years, the estimated value range would be between \$54.90/acre-ft. to \$116.83/acre-ft. A mid-point estimate would be about **\$86.00/acre-ft.**

It further is noted that the water market sales approach can be verified by examining the value of agricultural lands, with and without irrigation.

**Table 1. The Economic Value of Water, 2000-2005³
Estimated Annual Values in 2002\$**

End-Use Sector	Annual \$/Acre-ft.
Municipal-1 (Eastern WA Low Range Values)	\$25-80 (UW-NRC Reports)
Municipal-2 (Eastern WA)	>\$86 (PNP 2003-2004)
Municipal-3 (Western U.S.)	>\$100 (PNP 1998)
Municipal-4 (Western U.S.)	\$230 (NRC Report)
Agriculture-1 (Vineyard Yakima Valley)	\$75 (PNP 2004)
Agriculture-2 (Yakima Valley, 2001 Leases)	\$107-127 (Cited in PNP 2003)
Agricultural-3 (Columbia River Mainstem Pumpers)	\$86 (PNP 2003-2004)
Agriculture-4 (Columbia River Mainstem Pumpers)	\$59-69 (UW Reports)

³ Sources: Pacific Northwest Project, Technical Memorandum to CRI Economics Review Team, University of Washington "Economic Analysis Methodology Illustration and Review: Estimating the Value of Water for Key Resource Sectors from the Mainstem Columbia River," October 13, 2003; D. Huppert, University of Washington, et al., "Economics of Columbia River Initiative," Final Report to the WA State Dept. of Ecology, January 2004; National Research Council, "Managing the Columbia River: Instream Flows, Water Withdrawals, and Salmon Survival," National Academies Press, Washington, D.C., 2004; Declaration of R. Henry Johnson (Chairman, Franklin County Water Conservancy Board) Regarding Assignment of the State of Washington, Dept. of Natural Resources, Dated May 11, 2002, Kennewick, WA; T. White, "Yakima River Storage Enhancement Initiative, Technical Paper, Water Sales, Leases, and Conservation." Prepared for the Washington Infrastructure Services by T. White, Consulting Economist, Portland, Oregon, January 2002; and water market values observed or estimated from regional transactions by Pacific Northwest Project and the Benton County Water Conservancy Board, 2000-2004.

Agriculture-5 General Eastern WA Area	\$100 (Cited in PNP 2003)
Agricultural-4 (Red Mt. Vineyards)	\$330 (BCWCB 2004)

B. Water Value Estimates, the 2006-2008 Period:

Much has changed in the past two years relative to irrigated agriculture commodity and specialty crop values, land values, and market conditions. The following summarize recent 2007-2008 conditions:

- Almost all irrigated crops in Eastern Washington have experienced significant price increases since 2006. The long-term trend toward “cheap food” has ended.⁴
- The price increases are tied to: 1) increasing demand from China and Asia for Western U.S. irrigated agricultural products (such as value-added frozen product and packaged product); 2) the “new” ethanol-agriculture market, forcing higher prices for grain corn and competition for ground for other agricultural production; and 3) an increasing demand for all types of “organic” agricultural products.
- Irrigated land values have escalated, with row-crop land sales in the \$4,000-\$7,000 range (depending on associated infrastructure); and tree-fruit and wine grape ground in the \$6,000-14,000 range. This suggests that the value of water associated with such lands exceeds \$1,000/acre-ft. (based on land values minus site water and irrigation capability).
- Some wine grape ground has been purchased at a higher price range, but these sales have been for very unique land and market conditions (for example, the Red Mt. area). Here, the land values are greater than \$14,000 per acre, with water (based on 2007 sales and lease arrangements).

These factors have influenced the economic value of water, where limited access to new water rights has forced most new or expanded irrigated agriculture development to turn to water right changes/transfers. The recent water market transactions described below, and highlighted in Table 2, provide an overview of economic values that are relative to the Barker Ranch water valuation issue:

- In the 2007-2008 period, the general range for water market values (irrigated agriculture or municipal irrigation values) has been about \$750-\$1,500/acre-ft.⁵ While there have been transactions in the \$2,500 range, this value was for a water right change/transfer to the Red Mt. area, and would not be readily applicable to a water change/transfer offered by Barker Ranch (although other high value

⁴ See the excellent feature article on this subject in The Economist, December 8, 2007, “The End of Cheap Food.”

⁵ Water values observed by the Pacific Northwest Project, the Columbia-Snake River Irrigators Association, or the Benton County Water Conservancy Board, 2007-2008.

vineyards could conceivably purchased the Barker Ranch water, such as those along the Horse Heaven Hills, from the McNary-John Day Pools).

- The Benton County Water Conservancy Board (BCWCB) has recently approved a private sector surface water right change/transfer from the Okanogan County area to the McNary Pool area. The water right sale was for \$800/acre-ft. (capital value).
- The Benton County Water Conservancy Board (BCWCB) has recently received a water right change/transfer within the McNary Pool for irrigated agriculture. The associated water right sale was for \$750/acre-ft. (capital value).
- The Columbia-Snake River Irrigators Association (CSRIA) has prepared a water service agreement between two irrigation interests (Lower Snake River surface water rights), where water leases are involved for supplemental irrigation water rights. The lease agreement is based on a capital cost of \$1,125/acre-ft.
- The Columbia-Snake River Irrigators Association (CSRIA) is actively proving assistance to a regional Port District, to secure water resources for municipal and municipal irrigation purposes (Columbia River water rights). The Port District is seeking to purchase or lease the irrigation water rights for \$1,500/acre-ft.
- Though limited, other requests for water right transfers within the CSRIA membership are suggesting a willingness-to-pay for firm water rights at about \$750-\$1,000/acre-ft., for row crop and vineyard operations.

**Table 2. The Economic Value of Water, 2007-2008⁶
Estimated Annual and Capital Values in 2007\$**

End-Use Sector	Annual \$/Acre-ft.	Capital \$/Acre-ft.
Agriculture-1 (Red Mt.)	\$275 (BCWCB--Sale Pending Final Water Right Transfer)	\$2,500
Agriculture-2 (McNary Pool)	\$82 (BCWCB-Sale Pending)	\$750
Agriculture-3 (McNary Pool)	\$88 (BCWCB-Sale Completed)	\$800
Agriculture-4 (Lower Snake River-Ice Harbor Pool)	\$124 (CSRIA Water Service Agreement)	\$1,125
Agriculture-5 (McNary-John Day Pools)	\$82-110 (CSRIA Member Active Water Market Bid)	\$750-1,000
Agriculture-Municipal	\$165	\$1,500

⁶ Water values observed by the Pacific Northwest Project, the Columbia-Snake River Irrigators Association, or the Benton County Water Conservancy Board, 2007-2008.

Irrigation-1	(CSRIA Member Active Water Market Bid)	
--------------	--	--

C. Economic Value of Water for Barker Ranch Water Rights:

In considering the above changes to irrigated agriculture production prices, increasing land values, and water market prices driving new water right change/transfers, a reasonable value range pertinent to the Barker Ranch water rights would be about \$750-1,500/acre-ft. (capital value). A mid-point estimate would be about \$1,125/acre-ft. (capital value). On an annualized basis depicting a lease agreement, this would be about ***\$124/acre-ft.***⁷

Stated differently, for the 2007-2008 period, the Barker Ranch could have expected to receive about ***\$124/acre-ft.***, annually for leased water rights, given the water market conditions and prices. In turn, this represents the donation value of the water to the Trust Program fund. ***In total, the 5,512 acre-ft. have a donation value of about \$683,488.*** In summary:

- For the 2007-2008 period, a reasonable market value for the Barker Ranch water right(s) is about ***\$124/acre-ft.***, for an annual lease agreement; or about ***\$124/acre-ft.*** for an annual donation value to the Trust Water Program.

III. Declaration:

I hereby declare the above information and analysis to be correct and factual to the best of my knowledge, and would testify to the same in a court of law, legislative hearing, or other governmental proceeding.

Darryll Olsen, Ph.D.
Regional Planner/Resource Economist
The Pacific Northwest Project
Kennewick, WA

Date

Attachment: 1) Vita and Qualifications, Darryll Olsen, Ph.D.
2) IRS Form 8283, Non-cash Charitable Contributions (signed)

⁷ The annualized value would be based on a 15-year amortization period, with 7% interest.

Darryll Olsen, Ph.D.
Principal-in-Charge

*The Pacific Northwest Project
Regional Planning-Resource Economics
Policy Analysis*

3030 W. Clearwater, Suite 205-A, Kennewick, WA 99336
509-783-1623 FAX 735-3140 E-Mail DOlsenEcon@AOL.com

Affiliation:

Dr. Olsen is principal-in-charge for The Pacific Northwest Project (PNP), a regional planning-resource economics consulting firm. The firm specializes in water, energy, and natural resource management and development issues, and economic impact assessments. The firm conducts and manages technical evaluations, administrative and legislative projects, and complex litigation actions affecting resource management.

Dr. Olsen has about twenty-five years of experience working on resource development and management projects for federal, state, and local agencies and private sector clients.

Education:

Dr. Olsen holds the degree of Ph.D. in Applied Energy Studies from Washington State University (1983). The degree is an inter-disciplinary degree sponsored by the Office of Applied Energy Studies, the Program in Environmental Science and Regional Planning, and The Departments of Agricultural Economics-Rural Sociology at WSU. Dr. Olsen received his M.A. (Quantitative Analysis-History) and B.A. degree from Central Washington University (History and Philosophy, double major, with Environmental Studies minor).

Professional History:

In previous years, Dr. Olsen has worked directly with: The Pacific Northwest Utilities Conference Committee (Portland, Oregon); Battelle Human Affairs Research Centers (Seattle, Washington); Argonne National Laboratory (Portland, Oregon); The Office Of Applied Energy Studies, WSU (Pullman, Washington); and the Agricultural Research Service, USDA (Yakima, Washington). Also received Adjunct Faculty appointment with WSU Tri-Cities for special presentations.

Selected Consulting Sponsors and Professional Positions:

- Kennewick Irrigation District—Alternative 5 Proposal, Columbia River Water Right Integration Plan for the KID Service Territory—Red Mt. and City of West Richland, WA (2006-07).
- Columbia-Snake River Irrigators Association (and Eastern Oregon Irrigators Association)--Principal Consultant for the Columbia-Snake River Irrigators Association and Eastern Oregon Irrigators Association, Water Related Economic-Technical Issues; Water Law Applications and Empirical Interpretations; Water Policy Legislation Development and Water Resources Management; Litigation Manager and Expert Witness (1994-2007).
- Subconsultant to Bonneville Power Administration Contract for Environmental Impact State (EIS) preparation for Chief Joseph Dam Hatchery Mitigation Project Review, Prepared Economic Impact Sections for Hatchery-Fish-Recreation Impacts (2005-2006).
- Northwest Irrigation Utilities—Bonneville Power Administration Rate Impacts to Northwest Irrigated Agriculture and Local/Regional Economies, (2005).
- Kennewick Irrigation District--Phase I and II Columbia River Water Right Integration Plan for the KID Service Territory—Red Mt. and City of West Richland, WA (2004-5).
- Benton County Commission--Washington State, Review of the Columbia River Initiative Proposed Rules with Investigation of the McNary-John Day Pools Water Right Reserves, Phase I Briefing Report (2004-5).
- MWH Engineers, Boise, Idaho--Consultant to, Central Utah Water Conservancy District, Inter-Basin Transfer and Delivery of Water for Secondary and Municipal Uses, Salt Lake, Utah (2003-4).
- Benton County Water Conservancy Board--Chairman, BCWCB, Reviewed and Processed over 80 Water Right Changes and Transfers for Public-Private Sector Entities (1998-2007). Note: Drafted Initial Legislation for the Development of State Water Conservancy Boards.
- Ag. Caucus of the Ag./Fish/Water Forum--(WA State Dept. of Ag. Project Funding)—Review of Economic Impacts to Agriculture from Potential Fish Protection Measures, Buffer Zones (with GEI Consultants) (2003-4).
- Montana Dept. of Natural Resources—Review of Irrigation Sector Ability to Pay for Increased Water Costs from USBR Projects, Economic Value of Water and Cost of Service Analyses (2003).

- Harza Engineering, Portland Office, Bellevue, Washington--(Several Fish-Water Projects for the Bonneville Power Administration, Corps of Engineers, and Private Utilities)—Salmon Recovery Measure Cost-Effectiveness Analyses and Other Economic and Fish Production Reviews; Hydro Project Re-Licensing and EIS Preparation (2001-3).
- Yakima River Basin Commodity Coalition—Yakima River Water Issues and Water Management; Economic Impacts of Ag. to the Yakima River Basin, Implications for Firm Water Rights/New Water Storage (2003).
- Western States Irrigation Districts, Resource Economics--Project Economic Impacts; Focus on Irrigated Agriculture Economics Review for All Western States--Emphasis on California, Idaho, Oregon, and Washington (Crop Values, NED and RED, and Economic Value of Water Studies) (1998-99).
- Elephant Butte Irrigation District, New Mexico--USBR (NED) Review of Economic Benefits Study for Cost Allocations for Irrigation Projects--Power, Recreation, Fisheries, Flood Control (1999-2000).
- Port of Morrow, Oregon—Economic Benefits of Water Borne Transportation for the Port and Regional Area (NED and RED) (1999).
- Corps of Engineers—Salmon Recovery Analysis for Snake River Mitigation, Cost-Effectiveness and Fish Production Review Review (with Harza Engineering) (1996).
- The Northwest Irrigation Utilities--(BPA Rate Case Studies and Marginal Cost of Power Analyses) (1992-94); Technical Representation with Northwest Power Planning Council for Fish Issues (1992-1995).
- Oregon Dept. of Fish & Wildlife--Rogue Valley Council of Governments—Sport Fisheries Economic Benefits (NED and RED) (1994).
- Corps of Engineers—Inter-Basin Production Comparison Review—Impacts of Ocean Conditions on the Columbia River Salmon and Steelhead Production (Quantitative Analysis Review) (1994); and Economic Valuation of Salmon and Steelhead Recovery for the Columbia River System (1990-91).
- Argonne National Laboratory--(FERC Hydro Project Licensing and Re-Licensing)—Financial and NED/RED Analyses (Mid-Late 1980s).

Summary of Important Project Experience and Management:

Dr. Olsen has directed and participated in numerous technical projects, including:

- Co-author/developer of the new Columbia River Water Management legislation for Washington State—Developed the Voluntary Regional Agreement to secure new water rights via BMPs/hydropower mitigation fees/conservation projects.
- Active Review of Water Law Empirical Applications, including the Quantification of Water Rights Via Water Conservancy Board and Consulting Work.
- Review of Electric Power Rate Impacts to Irrigated Agriculture and Supporting Communities.
- Review of the Columbia River Initiative Technical and Economic Analysis Documents for Proposed Rule Making, for New Water Rights from the Mainstem Columbia River. Rule proposal for new and existing water rights.
- Economics Water Valuation Review and Irrigation Valuation Study for the Western U.S. (Special Focus on California, Idaho, Oregon, and Washington).
- Development of a Water Management Alternative/Policy for the Columbia River Basin—Recommendations to the Northwest Power Planning Council for the Fish and Wildlife Program.
- Development of Water Conservancy Boards for Washington State (Water Marketing and Water Right Transfers) and New Water Management Legislation for Washington State.
- Review of NMFS Flow Targets/Augmentation Program--Hydro Regulation and Economic Analyses Policy Recommendations.
- Economics Water Valuation Study for the Columbia Basin Project.
- Economic Impact and Cost-Effectiveness Evaluations for Snake River Salmon Recovery Planning.
- Member of the NMFS Economics Technical Committee, ESA Recovery Planning for the Columbia-Snake River System.
- Market and Non-Market Economic Evaluations of the Columbia River Fish Runs and the Rogue River Basin Salmon and Steelhead Fisheries.
- Inter-Basin Comparison Study of West Coast Salmon Production; and Life-Cycle Model Studies for Idaho Salmon Stocks--Reservoir Drawdown Options.

Technical Journal-Trade Association Articles and Publications:

Primarily in his university and national laboratory work, Dr. Olsen authored or co-authored articles and studies in technical journal and industry publications, including:

- Bulletin, The Magazine for Utility Management.
- Rivers, Studies in the Science, Environmental Policy, and Law of Instream Flow.
- Proceeding of the Water Resources Planning and Management Division, ASCE.
- Environmental Conservation.
- American Water Works Association Journal.
- Journal of Management Case Studies.
- Technological Forecasting and Social Change.
- Washington Public Policy Notes.
- American Indian Journal.
- Public Utilities Fortnightly.
- Numerous Technical Reports and Policy White Papers.

Personal Information:

Personal information includes:

- Age: 52.
- Family: Married to Tracy, with Teenage Daughter at Home.
- Residence: Unincorporated Benton County (Kennewick, WA Address); Born in Eastern WA (Yakima); WA State Resident for 47 Years, Lived and Worked in Portland, OR, Five Years.
- Civic Participation: Chairman, Benton County Water Conservancy Board; Past Treasurer, Benton-Franklin County Humane Society (9 Years); Past Board Member of Tri-City Chamber of Commerce, Member of TRIDEC and Participate in Agriculture and Water/Power Subcommittees; Participate in Many Local and Community Activities.
- Church Affiliation: Active Member of the Roman Catholic Church (Practicing Catholic), Benton City Parish and St. Joseph Parish, Kennewick Area (and visitor to Ellensburg Parish), Active in Several Church Projects, Including Grounds Maintenance and Service Lecturer.

