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NELSON**

January 14, 2007

Yakima Basin Storage Alliance ("YBSA") and Interested Parties

LAND USE &  
COMMUNITY  
PLANNING

LANDSCAPE  
ARCHITECTURE

PROJECT  
MANAGEMENT

DEVELOPMENT  
STRATEGIES

**SUBJECT: Results of Recreation and Economic Development Analysis of  
Lands Around the Proposed Black Rock Reservoir**

Dear Ladies and Gentlemen:

In July of 2006 YBSA contracted with this firm to conduct the study indicated above, the purpose of which was to assess the potential economic benefits associated recreation and land development at Black Rock Reservoir. This letter will provide you with an overview of the results of the assessment.

The Recreation and Development Analysis was conducted by a multi-discipline team of specialists in land use planning, economic analysis, civil engineering, and real estate appraisal. Their assessment concluded that a long-range, comprehensive master plan, supported by jurisdictions having regulatory authority over land use, is the best method to guide development around the reservoir. A conceptual land use plan was developed as part of this assessment from which economic projections were derived.

With a long-range plan in use, many economic benefits will be experienced. These include new spending associated with water-oriented recreation and the development of real estate. Additional benefits include public access to new parks and open spaces and environmental protection.

Each team member expresses appreciation for the opportunity to provide the results of this assessment. We trust our findings and conclusions are informative and will be helpful in the process of making important decisions.

Sincerely,

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## EXECUTIVE SUMMARY

In late November 2006, the Bureau of Reclamation, US Department of the Interior, released the results of the Plan Formulation Phase of the Yakima River Basin Water Storage Feasibility Study (Storage Study). A cover letter provided information, from which excerpts are cited below, describing the purpose of the report:

In February 2003, Congress authorized the Secretary of the Interior, acting through the Bureau of Reclamation, to conduct the Storage Study. Reclamation is evaluating options to improve the reliability of Yakima Project water supply during dry years, improve anadromous fish habitat, and provide water to meet future municipal demands.

The purpose of this letter is to provide you with the results of the Plan Formulation Phase of the Storage Study and explain how Reclamation and the State of Washington, through the Department of Ecology (Ecology), intend to proceed. Through appraisal assessments, Reclamation identified two alternatives—the Black Rock Dam and Reservoir Alternative and the Wymer Dam and Reservoir Alternative—which warranted further analyses in the Plan Formulation Phase.

The two alternatives meet the goals of the Storage Study in varying degrees. However, both alternatives have high construction and annual operating costs and benefit/cost ratios considerably below 1. The benefit/cost ratio is one of the main factors used to determine the best alternative in the Federal feasibility analysis.

**The Yakima Basin Storage Alliance, in cooperation with the Port of Sunnyside and Yakima and Benton Counties, is sponsoring an independent assessment of potential recreational benefits from the Black Rock Alternative. Information from that assessment will be considered when it is available.**

This report on the economic benefits of Black Rock Reservoir is part of the independent assessment sponsored by the Yakima Basin Storage Alliance. The BOR document was thoroughly reviewed to ensure consistency with that agency's methodologies and procedures, but the scope of economic benefits was expanded to include a wider range of opportunities.

## FINDINGS

If Black Rock Reservoir is built the region can expect significant economic activity associated with land development and water-oriented recreation. Based on the cash flow analyses and reduced to NPV, the 20-year revenues from the various components of the project can bring total current values of:

Travel and Recreation	\$1.280 billion
Residential & Resort Development	\$1.977 billion
Commercial Development	<u>\$ .147 billion</u>
<b>Total 20-yr NPV of Revenue Stream</b>	<b>\$3.404 billion</b>
Additional Benefits	
Energy sales (40-yr NPV)	\$0.412 billion

### **Total Benefits**

**\$3.816 billion**

There are additional revenues that are more difficult to quantify or to project into the future. These include, for example, the value of maintaining agricultural production during periods of drought. It has been estimated that the 2001 drought in the Yakima Valley cost the agricultural sector \$250 million and a broader economic loss to the total economy of \$750 million. It is evident that alleviating even a few such crop disasters over the next 20 years could also reap benefits measured in the billions of dollars.

There is value in enhancing the Yakima River fishery, as well as in preserving the recreational use of Cascade reservoirs by minimizing drawdowns during low water years.

Sales prices for land around lakes, rivers and reservoirs in the Pacific Northwest illustrate the potential value to Yakima and Benton Counties if Black Rock Reservoir is built. By planning the land resources surrounding the reservoir in a manner which balances new development with public open space and environmental protection, the region will realize economic benefits for generations to come.



*Rattlesnake Hills as seen from Black Rock Valley, looking southwest from SR 24. The lower slopes, adjacent to the future shoreline of Black Rock reservoir, offer feasible locations for new residential and commercial development, parks and boat launch ramps which are the subject of this report.*

## **DEVELOPMENT OPPORTUNITIES AROUND RESERVOIR**

Water-based recreation continues to grow in popularity as does the demand for residential and commercial building sites at or near inland lakes and rivers. The scarcity of sites for recreation and development continues to escalate land values throughout the western states.

Should Black Rock Reservoir be constructed the demand for commercial and residential building sites is highly probable. The local market has adequate size to accelerate the demand for lake front and view property, and the close proximity of the reservoir's west end to Interstate 82 and Yakima could stimulate additional development along SR 24. In the short term recreational development would likely take the form of marinas, parks, and new commercial establishments provided infrastructure is available. For purposes of establishing economic benefits from the increase in land value, three options have been developed.

## **DEVELOPMENT CONCEPTS FOR BLACK ROCK RESERVOIR**

Three development options are outlined below.

### **“Do Nothing”**

*Minimal economic benefit*

Allow land around the reservoir to develop “As-Is”. This will result in these densities:

- 1 dwelling unit/40 acres in Yakima County
- 1 Dwelling unit/20 acres in Benton County

Water and sanitary sewer service would not be available to the site. No commercial development would be allowed without a zone change. Currently this land is valued at \$500 per acre.

This option would result in lost opportunity for the region. Without guidance from county development regulations it is likely that any new development would be haphazard and disorganized. The potential to harm visual and environmental values are high.

It is assumed that recreation facilities would be built and would have positive public and economic benefit as described in “Part 2: Market Analysis” of the report.

### **Shoreline Perimeter Plan**

*Modest economic benefit*

In this option a 1-mile halo around the reservoir, beginning 200-feet landward from the mid-pool elevation of 1,721-feet, would be rezoned to allow residential development at two dwelling units per acre. All land within the halo would have

views of the water. The 200-foot wide buffer surrounding the reservoir would be set aside for public access, developed parks and open space.

Predicting future economic impact is based on the following formula and assumptions:

<i>Total amount of land within 1/2-mile of shoreline</i> <sup>1</sup> =	10,402 acres
<i>Less 10% for infrastructure</i>	<1,040 acres>
<i>Less 15% for steep slopes</i>	<1,560 acres>
<i>Less 20% set aside for public access, parks and open space</i>	<2,080 acres>
<i>Amount remaining</i>	5,722 acres
<i>Assume 90% - 10% split between residential and commercial uses</i>	
<i>90% of net inventory =</i>	5,150 acres
<i>10% of net inventory =</i>	572 acres
Assumed average residential raw land value (\$80,500/acre <sup>2</sup> )	\$414,575,000
Assumed average commercial raw land value (\$100,000/acre)	\$ 57,200,000
<b>TOTAL VALUE based on assumptions</b>	<b>\$459,700,000</b>

### **Comprehensive Plan**

*Greatest economic long-term benefit*

Requires:

- Definition of a geographic Sub-Area – this Option includes about 40,000 acres
- Adoption of a Comprehensive Plan and Zoning Code for the Sub-Area
- Joint Yakima and Benton County Agreement

Sub Area is made up of the following land uses:

1. Master planned residential areas with water views and access: 2.5 dwelling units per acre;
2. Master planned resort with water access, golf course and amenities: 4 dwelling units per acre;
3. Buffer residential areas: 1 dwelling unit per 5 acres
4. Remainder of Sub-Area: 1 dwelling unit per 10 acres
5. Commercial “Town Center” area in Benton County
6. Commercial “Convenience Retail area” in Yakima County
7. Parks, open spaces, and protection of important landscape features

This option would establish a new concentration of year-around population, second homes, recreation opportunities and a vast open space system offering recreation activities and landscape protection. Accordingly, it is assumed that the land use

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<sup>1</sup> Land having views of the water are included in this figure

<sup>2</sup> \$1.85/SF average; Part 3 sales history for unimproved land with appropriate zoning, near dry-region, rural reservoirs in Oregon vary from \$1.00/SF to over \$2.30/SF. Properties in California are significantly higher. Improved lots with all services available are located at planned resorts and are not considered appropriate for comparison purposes at this time.

regulatory process for both Yakima and Benton Counties would be amended to accommodate these needs. Both Counties should share in a process to develop plans that are aimed at the highest quality development in terms of land use, environmental protection, aesthetics, and public access.

Economic benefits are likely to be experienced in Benton County despite the relative scarcity of development sites having water access and views. As discovered at Diamond Valley Reservoir (Part Four) the Riverside County Appraisal Department indicated that property *sales were influenced by proximity to the reservoir* for recreational purposes. In the Comprehensive Plan, some land should be planned for residential and possibly commercial development in Benton County as it will be warranted in the years following a build-up of resident population in Yakima County.

In this concept it is assumed that 75% of the property would be absorbed in a 40-year timeframe. This compares favorably with Sunriver, Oregon which initiated lot sales in the 1970.

<i>Total amount of land within Sub-Area (does not include lake surface area)</i>	40,279 acres
<i>Less open space</i>	<14,536 acres>
<i>Amount remaining</i>	25,743 acres
<b>TOTAL VALUE (see breakdown of values in Table 1)</b>	<b>\$1,273,084,125</b>

### **Conclusion**

Land surrounding the reservoir will be attractive to land developers, home builders and commercial enterprises. This is likely to begin once the reservoir is filled and continue for decades. Land values will escalate, although it is difficult to predict how fast, as the demand for lake views and water access increases<sup>3</sup>. It is likely that a destination resort would be developed at this location especially under the terms of a comprehensive plan supported by both counties.

It is likely that land development at Black Rock Reservoir will be advanced by a comprehensive land-use plan that assures long-term value protection. If development at the reservoir establishes a widespread, high quality, reputation it is likely that investment will accelerate because of the scarcity of waterfront sites and because of a pricing advantage (established “name brand” developments are more expensive due to the scarcity of building lots). In this scenario Black Rock would indeed be unique in the Northwest as no direct comparables exist having water, sunshine, abundance of land and cooperative government promoting the merits of a comprehensive plan.

New development at the reservoir would take years of planning, inter-governmental cooperation, and a significant amount of public and private investment. Because of these steps a “vision” or long-range master plan is needed. Failing to take this step

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<sup>3</sup> Part 4 provides sales history and supports the theory of increased value even for property without water views

would likely result in a development pattern that is uncoordinated with reduced economic benefits

**ECONOMIC BENEFITS OF BLACK ROCK RESERVOIR:  
REVENUES FROM ALL SOURCES**

**INTRODUCTION AND METHODOLOGY**

Black Rock Reservoir is being proposed as a water storage reservoir primarily to benefit irrigators in the Yakima Valley along with some recreational uses. However, the proposed reservoir site is surrounded by privately-owned land that could be developed as a destination resort and new residential community comprising a variety of owner-occupied residences, vacation and part-time residences, as well as tourist rentals.

A detailed demographic and overall economic analysis was provided in a previous section of this report. In this section, the analysis is expanded to examine the potential economic benefits of developing the land around the reservoir for their value-enhancement capabilities as well as for revenue generation.

A conceptual plan has been developed that shows approximately 33,497 acres available for potential uses outside of the reservoir storage surface area. Of that, the plan shows the following acreages developed for specific types of uses, net of infrastructure and amenities, along with densities expressed in numbers of dwelling units (DU) per acre:

Open Space	14,536 Acres	0.0 DU / Acre	N/A
Low Density Residential	5,714 Acres	1.0 DU / 5 Acres	1,143 DU
Medium Density Residential	4,360 Acres	2.0 DU / Acre	8,720 DU
Master Plan Residential	2,444 Acres	2.5 DU / Acre	6,111 DU
Master Planned, Mixed Use Resort	1,150 Acres	4.0 DU / Acre	4,600 DU
Commercial	434 Acres	N/A	<u>N/A</u>
			20,574 DU

Current average values per acre are provided for each of the categories, along with total values for the acreages by category and their total value. These are:

Open Space	N/A	
Low Density Residential	\$25,000 / Acre	\$
28,568,500		
Medium Density Residential	\$50,000 / Acre	\$ 435,975,000
Master Plan Residential	\$65,000 / Acre	\$ 397,190,625
Master Planned, Mixed Use Resort	\$80,000 / Acre	\$ 368,000,000
Commercial	\$100,000 / Acre	<u>\$ 26,010,000</u>
		\$1,273,084,125

These values per acre, as well as the total values, reflect values at current rural sites (not developed resorts) with similar amenities. This is also reflected by the numbers of dwelling units per acre, which are substantially lower than they would be in urban or suburban settings. They are considered to be conservative, and therefore realistic.

The analysis of revenue streams assumes that all development would occur over a 40-year period with the project developed in phases. However, the revenue streams are shown for only the first 20 years representing a 50% buildout of the total. This is consistent with the experience of other mixed-use destination resort and mixed-density housing developments in rural areas of Washington and Oregon.

To the highest extent possible, the revenue streams are based on solid historical data showing trends over several recent years. These historical trends are then used to project changes in markets over the next 20 years.

The 20-year cash flow analyses developed in this report are more conservative than the 100-year cost-benefit analyses used by the Bureau of Reclamation. The 100-year model reflects the life expectancy of the dam and reservoir and measures its costs and benefits over that full period. However, real estate development requires a more fluid model. While 20-year trends can be projected with reasonable reliability, it can be expected that changes in market conditions and consumer preferences will alter the model in the longer term. For example, increased rates of population growth in South Central Washington could accelerate market demand.

These cash flows also do not assess the National Economic Benefit of the Black Rock project as is found in BOR and other federal studies. That is a macroeconomic model that assumes economic benefits from expansions in traded sectors of the economy, such as agriculture. The economic impacts of the Black Rock project are assumed to be primarily regional in scope. Applying multipliers to output, employment and incomes can demonstrate that the sum of the project is greater than its individual components, but the benefits are expected to remain within the region and are not projected to the national economy.

Spread sheets were developed for each of the potential revenue sources associated with this project. These include:

#### Black Rock Cash Flows

##### **Recreation** – RV parks, campgrounds, boat ramps, marinas, supplies

- Construction
- Operation of facilities
- Visitor spending

##### **Energy** – Sale of electricity

- Construction
- Operations
- Electric power sales

##### **Residential** – Low density, medium density, master plan residential

- Construction



Homeowner spending  
Taxes

### **Mixed-Use Resort**

Construction  
Operation  
Visitor spending

### **Commercial**

Construction  
Operation

The 20-year revenue streams were reduced to a Net Present Value (NPV) by applying a 3% discount rate for inflation. That figure is consistent with recent trends. However, because this is primarily a public capital investment, no discount rate was assumed for alternative rates of return as would normally be done in a private-sector NPV or IRR (Internal Rate of Return) analysis. The NPVs shown in this analysis only indicate the current value of the 20-year revenue streams.

An important part of the analysis is the recognition that cash outflows listed as costs on the expense side of the balance sheet may also be shown as revenues on the income side. For example, the construction of facilities involves capital outlays but those costs also represent income for workers employed in the construction as well as purchases of goods and services from local businesses and tax revenues for local governments. Standard multipliers can be used to estimate the total benefits of a construction project, which may result in the revenues exceeding the initial costs.

## **RECREATION CASH FLOWS**

Most cash flows associated with recreation are generated after the fact and reflect actual usage of facilities for various types of activities. Usage data are normally obtained by surveys with dollar figures attached from applicable models. Several of these models were examined for this report, especially the extensive models developed for the relicensing of the Oroville Dam operation in California.

However, Black Rock Reservoir is not yet built so any estimates of actual participation in specific recreational activities can only be speculative.

For that reason, the impacts of recreational activities at Black Rock were estimated from the extensive surveys done by Dean Runyon Associates for the State of Washington. These provide details on travel spending patterns by county that include spending on recreation as well as for other categories such as accommodations, food services, etc. Following is a description of the categories used by DRA for their impact analyses:

Expenditures: Purchases by traveler during their trip, including lodging taxes and other

applicable local and state taxes, paid by the traveler at the point of sale.

Industry Earnings: The earnings (wage and salary disbursements, earned benefits, and proprietor income) of employees and owners of businesses that receive travel expenditures. Only the earnings attributable to travel expenditures are included; this typically is only a portion of all business receipt.

Employment: Employment associated with the above earnings; this includes both full-and part-time positions of wage and salary worker and proprietor

Local Tax Receipts: Tax receipts collected by counties and municipalities levied on applicable travel-related purchases: Includes local sales taxes, auto rental taxes, and all transient occupancy taxes, including the 2% state shared tax, additional hotel/motel taxes, and the King County Convention Center tax which is technically a state tax.

State Tax Receipts: State excise taxes such as sales, auto rental, and gasoline taxes attributable to travel expenditures and business taxes levied on travel industry firms (i.e., B&O taxes).

In the primary market area (Yakima & Benton Counties), travel spending in 1991 was a total of \$275.9 million, rising to \$480.1 million in 2004. That represented a trend increase of 4.25% per year.

Spending by industry sector was included in the DRA analysis but is itemized here only for the earnings report.

The 20-year projections, based on a continuing trend of 4.25% annual increase, produce a cumulative total of \$17.3 billion that would be spent in the two counties over that period. Applying the 3% discount rate, the NPV for total travel spending over that period would be \$12.4 billion in current dollars.

In addition, Black Rock Reservoir is expected to provide travel benefits in six adjacent counties (Chelan, Douglas, Franklin, Kittitas, Klickitat, and Walla Walla) although at a lower level. The 1991 and 2004 totals of travel spending in those six counties were \$431.1 million and \$690.4 million respectively for an annual growth rate of 3.7%. Projecting that growth rate over a 20-year period results in a cumulative total of \$23.0 billion and a NPV of \$16.5 billion.

This analysis assumes that Black Rock Reservoir would contribute as much as 10% of the growth in travel spending in the primary market and 2.5% in the secondary market. **The values resulting from that assumption indicate that Black Rock Reservoir could have travel spending impacts of \$1.28 billion over the next 20 years, with \$1.24 billion of that being spent in Yakima and Benton counties and \$0.4 billion being spent in the secondary markets.**

In terms of industry earnings, defined above, this would generate approximately \$388.5 million to wage earners and owners of businesses that receive income from the travel industry, out of total travel earnings of \$9.5 billion in both the primary and secondary markets.

In examining employment data, it was found that employment in the travel sector actually declined between 1991 and 2004 although it generally held close to 6,400 workers. For that reason, there was no established trend to use in making 20-year projections.

## ENERGY SALES

Increasing demand for electric power in the Pacific Northwest has reached the limits of generating capacity in the Columbia River power system. Bonneville Power Administration is renegotiating all power contracts with its customers, with new contracts to take effect in 2011.

A “high water mark” demand will be established for each customer in 2010 that will be used to determine how much power they will be able to purchase from BPA at Tier one rates. Beyond that amount, they will either have to purchase or generate their own supplementary power. BPA will also purchase power on the open market and sell it to customers at higher, Tier two rates. This puts a premium on all measures to increase the supply of electric power, especially during peak demand periods and from lower cost hydroelectric facilities.

Hard figures for the generation of electric power at Black Rock Reservoir have not been established. Several options have been researched for pumping water from Priest Rapids Reservoir on the Columbia River during nighttime, off-peak hours and letting it flow back through generators during periods of peak demand. This system is used at the Oroville Reservoir in Northern California, using the Termalito Forebay-Afterbay complex to store and transfer water between the two facilities.

The best estimate of hydrogenation benefits is found in the report issued on the overall project by the US Bureau of Reclamation in November 2006. Section 4 of that report contains the following:

### Hydropower Generation Benefits

The Black Rock Alternative includes two potential hydropower generation facilities—the Black Rock powerplant at the Black Rock outlet facility at Roza Canal MP 22.6 and the Sunnyside powerplant near Sunnyside Canal MP 3.83 at the terminus of the delivery system from the Black Rock outlet facility. Average annual generation is estimated at about 109 million kilowatt hours at the Black Rock powerplant and 140 million kilowatt hours at the Sunnyside plant.

Average monthly pumping energy cost forecasts of the Bonneville Power Administration in its August 2003 rate case were used to represent the monetary value of the annual generation. These were applied to the average annual generation which was distributed by month for the April-to-October irrigation season when exchange water from Black Rock reservoir is being delivered to the Roza and Sunnyside Divisions.

The following table summarizes the monthly average mutual generation at the two powerplants and the monthly energy values used in estimating hydropower generation benefits.

### Hydropower Generation Values

Month	Combined Monthly	Energy Values	Annual Value (\$)
April	27,030	37.60	1,042,000
May	38,750	31.92	1,237,000
June	44,510	22.68	1,009,000
July	45,910	32.24	1,480,000
August	45,910	40.69	1,868,000
September	31,280	43.64	1,365,000
October	14,940	55.56	830,030
Total			8,831,000
Present Worth			171,200,000

Based on the assumptions, the BOR report cites the present worth of the 100-year cumulative value of the income stream from hydroelectric power generation of \$171,200,000 based on a discount rate of 6.126. Over the 20-year period the cumulative income stream, assuming a 4% annual growth rate, would be \$262,970,212. The 40-year cash flow produces cumulative revenue of \$576,200,103. **The Net Present Value of that income stream, assuming a 3% discount rate for inflation, equals \$412,483,262.** However, that assumes the power values remain constant over the period. In reality, the true NPV is likely to be much higher. Also, that NPV is based on gross revenues only and does not include the cost of producing the power.

### RESIDENTIAL DEVELOPMENT AND MIXED USE RESORT

The concept plan shows a total of 20,574 dwelling units among the low density, medium density, master plan residential, and master planned mixed use resort designations. It was estimated that the land value for these properties was approximately \$1.1 billion. Adding the commercial land values to that number brings the total land value to \$1.273 billion.

The concept plan did not go into details about the types or values of housing units that would be constructed on these properties. The first two types, low and medium density residential, are expected to be single-family homes. The master plan residential could contain a mix of town homes, condominiums, cottages around a golf course, or other types mixed in with single family residential. The master planned resort would be expected to contain mostly multi-family housing styles that could be used as overnight rentals, with some attached single-family units included, especially if they are sold as condominiums or townhouses under rental management.

Rather than speculating on the types of housing contained in each designation, this analysis simply assumes that 75% of the 20,574 total units would be constructed at full buildout in 40 years. That means approximately 7,715 units would be constructed over the first 20 years, for an average of about 386 housing units per year of all types. As with most such developments, it can be expected that absorption and construction rates would be lower in the initial years and would increase as the community becomes established.

Yakima County currently has the lowest median housing prices in the State of Washington, at \$139,100. However, Yakima County had the highest rate of increase in the median value from the 3<sup>rd</sup> quarter of 2005 to the 3<sup>rd</sup> quarter of 2006. It was one of only three counties in the state that showed an increase, with median prices declining in all other counties.

It can be expected that the types of housing that will be constructed at Black Rock will range from small vacation cottages to large “trophy” houses on five acres overlooking the reservoir and surrounding valleys. Those houses, in current dollars, would range in costs from about \$120,000 to more than \$1,000,000. With new construction only, the median price would be higher than the median price for all homes sold in the market.

For this analysis, an initial *average* value of \$175,000 is assumed in 2008, not including the value of the land. That represents a unit of approximately 1,400 square feet with construction costs of \$125 per square foot. These figures may be high or low and the actual numbers will be determined by the market.

The absorption assumptions are that 15% of the 20-year absorption will be achieved over the first five years of the project; 20% over the next five years; 30% over the third five years; and 35% over the remaining five years.

The 20-year projection shows the total value of all housing units built at Black Rock Reservoir reaching \$2,236,740,580 based on the assumption of a 4% annual escalation of values due to inflation. This is in addition to cumulative land values of \$734,296,698 being absorbed during that same period, for a combined total value of \$2,971,037,278 (this figure excludes values from a resort hotel and rental units, golf course, commercial marinas, and other income producing enterprises).

**The 20-year NPV of all cash flows for land and housing units, using a 3% discount rate, is \$1,977,004,547.**

Research shows that this figure is consistent with other fully built out resort communities in the Northwest. For example, there are 4,400 housing units in Sunriver, Oregon with a median value of \$650,000 for a total value of \$2.86 billion. Values of residential land (no structures) around Lake Coeur d’Alene are estimated at \$2.56 billion. Properly developed, the values of residential land and housing surrounding Black Rock Reservoir could also reach figures in excess of \$2.5 billion in today’s dollars.

Achieving that rate of buildout will require a master plan and the participation of a qualified developer who can bring together the resources to make it happen.

## COMMERCIAL DEVELOPMENT

Much of the economic benefit of commercial development has already been incorporated into the analysis through the projected increases in tourism spending. It is expected that much of the commercial development will be aimed at serving the tourism and recreation industry, as well as providing goods and services to residential and resort customers.

At full buildout, the projected 434 net acres of commercial land would support up to 3.8 million square feet of commercial building space at 20% site coverage. Using the same calculations of 75% buildout at the end of 40 years, and one-half of that over 20 years, the commercial land would contain 1,425,000 square feet of retail and commercial services space at the end of the 20-year period or 71,250 square feet per year of new construction. At an average cost of \$120 per square foot, that would represent about \$8,550,000 of new construction per year, with annual escalation for inflation.

Applying the national average figure of about 800 square foot of building space per employee produces an estimate of 90 new employees per year in the commercial sector or about 1,800 employees at the end of the 20-year period.

These figures calculate into a net present value of about \$121,000,000 for the value of new commercial construction over the 20-year period plus an additional \$26 million for the value of wages based on current wage rates in this sector.

## SUMMARY

Based on the cash flow analyses and reduced to NPV, the revenues from the various components of the project can bring total current values of:

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There are additional revenues that are more difficult to quantify or to project into the future. These include, for example, the value of maintaining agricultural production during periods of drought. It has been estimated that the 2001 drought in the Yakima Valley cost the agricultural sector \$250 million and a broader economic loss to the total economy of \$750 million. It is evident that alleviating even a few such crop disasters over the next 20 years could also reap benefits measured in the billions of dollars.

There is value in enhancing the Yakima River fishery, as well as in preserving the recreational use of Cascade reservoirs by minimizing drawdowns during low water years. There are also significant values in enhancing real estate assessments and tax revenues, as well as creating all the construction and operating jobs that will result from development.

This analysis provides only a framework for estimating the total economic value of the Black Rock Reservoir. By any measure, it will provide a very significant return on investment.