5.25 Social and Economic Resources

5.25.1 Introduction

This section considers the potential social and economic effects of implementing an alternative reservoir operations policy, as well as the Base Case. Section 4.25 provides a discussion of the five pathways influencing total economic effects, as well as their respective trends through 2030. The five pathways are navigation, power, water supply, recreation, and property values. An assessment of potential damages associated with flooding is not included in the economic analysis.

This section presents the changes in direct effects and total economic effects resulting from the Base Case and the policy alternatives for each year of the forecast period. The economic model used to estimate the total economic effects of policy alternatives is also briefly discussed.

5.25.2 Impact Assessment Methods

The discussion of impact assessment methods includes a description of the pathways for direct effects, the REMI economic forecasting model, and the total economic effects of policy alternatives.

Pathways for Direct Effects

TVA's operations are linked to the regional level of economic activity by five direct pathways. Changes in the reservoir operations policy would directly affect these five sectors in the following ways:

- Increased (decreased) consumer expenditures from new money coming into (leaving) the region;
- Changes in the cost of production in the region; and,
- Wealth-induced changes in consumer spending.

For any given policy alternative, direct effects associated with all five pathways would occur simultaneously. Direct effects can be either positive or negative. For instance, a policy alternative that extends the summer reservoir levels for an extra month may induce new or additional trips from outside visitors into the region, generating an increase in new money coming into the region. Simultaneously, this alternative policy may increase the costs of production to industries using the TVA system for navigation, water supply, or power generation purposes. Further, the value of shoreline properties may rise as the aesthetic and recreational benefits of living by the reservoirs increase. The implied rise in property-owner wealth may then result in an increase in consumer spending.

The direct economic effects of changes in the reservoir operations policy would then act as stimuli to enhance or decrease the economic growth in the regional economy, which was measured in this EIS as changes to population, employment, gross regional product (GRP), and total personal income (PI). Direct effects that increase new money coming into the region or wealth-induced consumer spending would increase the growth rate of regional employment, GRP, and income. This increase would induce in-migration to the region. Direct effects that change production costs would generally affect the regional economy in both demand-side and supply-side effects. An increase in production costs would increase the cost of doing business in the region and reduce market share, raising prices of final goods and services, and reducing regional consumer spending through a fall in disposable income. On the supply side, increases in production costs would affect local business operating margins. In either case, the region would experience a decline in business sales volume, employment, and income levels.

Changes in these economic variables would then generate further rounds of spending as the effects of the direct stimuli ripple through the economy—a phenomenon known as the multiplier effect. Each additional round of spending would have a smaller effect on the economy than the previous one, as part of the change in spending leaks from the region in the form of imports. The additional rounds of spending and the associated changes in the regional economy are termed secondary effects. These effects were calculated using the REMI economic model, which is discussed later in this section.

The final changes to employment, population, GRP, and PI are the total economic effects of a policy alternative. Total economic effects to the region are therefore the sum of direct and secondary effects. Both the direct effects associated with each of the five direct pathways and the total economic effects to the regional economy under the policy alternatives, including the Base Case, are reported in this section.

The direct effects of a change in the reservoir operations policy include changes in costs or expenditure levels within each of the five regional pathways. The following discussion addresses the direct effects of each policy alternative (including the Base Case), by year, for power supply, navigation, water supply, recreation, and property values.

Power Supply

Operational changes that alter the water availability and timing of hydropower generation would affect the cost of both fuel and generating capacity, changing electricity prices in the region (see Section 5.23, Power).

The direct effects of each alternative were measured by the difference between the power cost under the Base Case and the cost predicted under each policy alternative. TVA performed an analysis for each alternative to assess the effect of changes in demand, timing, and amount of generation by assessing the effect of the change on the current TVA power supply plan and financial forecast.

The power supply analysis used three computer models: the Weekly Scheduling Model (WSM) of TVA's hydrological and hydroelectric system; the PROSYM power production costing model; and RELY, a generation reliability model that is used to determine the capacity needed to maintain the reliability of the power system. The data and methodology used to estimate an impact on TVA's system-wide power supply cost were the same that TVA uses for operations and planning, as discussed in Section 5.23, Power.

Changes in power cost by alternative are presented for 2004 to 2030 (Table 5.25-01) as a percentage of TVA's total revenues. The Commercial Navigation Alternative is expected to slightly reduce power costs relative to the Base Case by 0.1 percent over the 2004 through 2030 period. The Summer Hydropower Alternative is expected to result in essentially no effect on power costs relative to the Base Case. Reservoir Recreation Alternative A, Reservoir Recreation Alternative B, the Equalized Summer/Winter Flood Risk Alternative, the Tailwater Recreation Alternative, the Tailwater Habitat Alternative, and the Preferred Alternative are each expected to increase power costs. The greatest increase in power costs relative to the Base Case would occur under the Tailwater Habitat Alternative, which is expected to increase power costs by an average of 3.3 percent for the period from 2004 to 2030.

Table 5.25-01 Power Cost Change as a Percent of TVA Total Revenue (2004 to 2030) (percent)

Alternative	2004	2005	2006	2007	2008	2009	2010	2030
Reservoir Recreation A	0.9	0.5	0.6	0.6	0.5	0.4	0.4	0.1
Reservoir Recreation B	1.3	0.8	0.9	0.9	0.9	0.7	0.8	0.5
Summer Hydropower	-0.3	-0.1	0.0	0.0	0.0	-0.1	0.0	0.0
Equalized Summer/ Winter Flood Risk	1.5	1.2	1.5	1.2	1.3	1.2	1.3	1.1
Commercial Navigation	0.1	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Tailwater Recreation	1.2	0.8	0.9	0.8	0.9	0.7	0.8	0.5
Tailwater Habitat	3.3	3.5	3.3	3.4	3.2	3.3	3.5	2.8
Preferred	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.1

Navigation

Navigation of the reservoir system is a key component to the operating costs of industries using the system for waterborne transportation. Navigable waterways reduce the cost of shipping bulky commodities such as grain, gravel, chemicals, coal, and petroleum products that are not transported by pipeline. Changes in channel depths would alter effective delivery loads and generate changes in transportation costs.

The direct effects are shown as shipper savings. For the navigation component of the reservoir operations policy, each alternative was expressed in terms of channel depth for each section of

the Tennessee River. Knowing channel depth and shipper savings per-foot depth for each section of the river allowed the estimation of total shipper savings by commodity. Under the 11-foot navigation component in the Base Case, shipper savings were forecast to increase to $597 million by 2030 (Table 5.25-02). Raising the channel depths to 13 feet was forecast to increase shipper savings by $60 million by 2030, increasing shipper savings to $657 million. Conversely, decreasing the channel depths to 10 feet would reduce shipper savings by $55 million to a new level of $542 million over the same period. Four of the policy alternatives would alter channel depths and therefore change shipper savings (Table 5.25-03). The Summer Hydropower Alternative and the Equalized Summer/Winter Flood Risk Alternative were forecast to reduce shipper savings by $17 million and $2 million by 2030, respectively, relative to the Base Case. Conversely, the Commercial Navigation Alternative and the Preferred Alternative were forecast to increase shipper savings by $24 million and $0.5 million, respectively, over the same period. Estimates of shipper savings do not include savings associated with the water-compelled rate effect. These effects are captured in the model used to estimate the total economic effects of the policy alternatives.

Table 5.25-02 Forecast Shipper Savings under the Base Case (2004 to 2030) (2002 dollars in millions)

Channel Depth	Shipper Savings	2004	2005	2006	2007	2008	2009	2010	2030
11-foot channel	Existing	$378.5	$386.1	$393.8	$401.7	$409.7	$417.9	$426.3	$597.1

Table 5.25-03 Changes in Shipper Savings by Policy Alternative (2004 to 2030) (2002 dollars in millions)

Alternative	2004	2005	2006	2007	2008	2009	2010	2030
Reservoir Recreation A	$0	$0	$0	$0	$0	$0	$0	$0
Reservoir Recreation B	$0	$0	$0	$0	$0	$0	$0	$0
Summer Hydropower	-$11.0	-$11.2	-$11.4	-$11.7	-$11.9	-$12.1	-$12.4	-$17.3
Equalized Summer/ Winter Flood Risk	-$1.2	-$1.2	-$1.2	-$1.3	-$1.3	-$1.3	-$1.3	-$1.9
Commercial Navigation	$15.3	$15.6	$15.9	$16.3	$16.6	$16.9	$17.3	$24.2
Tailwater Recreation	$0	$0	$0	$0	$0	$0	$0	$0
Tailwater Habitat	$0	$0	$0	$0	$0	$0	$0	$0
Preferred	$0.3	$0.3	$0.4	$0.4	$0.4	$0.4	$0.4	$0.5

Note: Numbers shown are for the non-utility industry. Utility shipper savings were included in the power analysis.

Water Supply

There are potentially two direct effects of changes to the reservoir operations policy within the water supply pathway. The first is the impact on intake costs. If changes in the policy reduce the minimum reservoir elevations below the level necessary for both public supply and industrial

water intakes, capital expenditure would be required to alter the intakes. For each policy alternative, a hydrologic model using 100 years of historical data was used to estimate the occurrence, frequency, and duration of minimum elevation levels below the TVA-published minimum elevation levels for each reservoir where water intakes are located. The cost of restoring the existing reliability under the Base Case was then estimated for each policy alternative and was treated as an increase in the cost of local government, for input into the REMI model.

Under the Summer Hydropower Alternative (Table 5.25-04), the elevation of Cherokee Reservoir was predicted to be below the minimum elevation level of 1,020 feet for 125 weeks during the 100-year period and below 1,015 feet for 94 weeks of the 100 years. Based on the frequency and duration of these elevations, existing intakes could not be modified to provide water supply reliability. New intakes therefore would be required, estimated to cost about $5 million in capital expenditures. Four of the eight policy alternatives would require capital expenditures. The Summer Hydropower Alternative would incur the largest total intake costs of $12.5 million. The Commercial Navigation Alternative, the Tailwater Recreation Alternative, the Tailwater Habitat Alternative, and the Preferred Alternative would require expenditures of approximately $3.4 million, $22,500, $21,000, and $26,000, respectively.

The second potential impact would affect industries directly dependent on river flows in order to discharge wastewater. When river flow is too low or too high, affected industries would then need to curtail or shut down their operations, incurring lost production time. One TVA industry was also identified as being affected by changing reservoir operations. Hourly flow simulations were constructed for an 8-year period (1987 to 1994). The 8-year record contained dry, wet, and normal flow years and therefore represented the range of flows likely to be encountered in 100 years of flow record. According to these simulations, the annual average number of days the plant's wastewater storage capacity would be exceeded (and therefore production time would be lost) was estimated under each alternative. These estimates were transformed and entered into the REMI model as changes in output based on the number of days of production gained or lost under each policy alternative relative to the Base Case.

Water supply demands were projected into the future to identify those areas in the Valley where existing impoundments may not support future development and where water withdrawals could result in insufficient water for waste assimilation under low-flow conditions. These are discussed in the "Water Supply Inventory and Needs Analysis" report generated in support of the ROS. Areas of the Valley that are currently growth limited, or are projected to become growth limited in the future, are not expected to change as a result of modified reservoir operations.

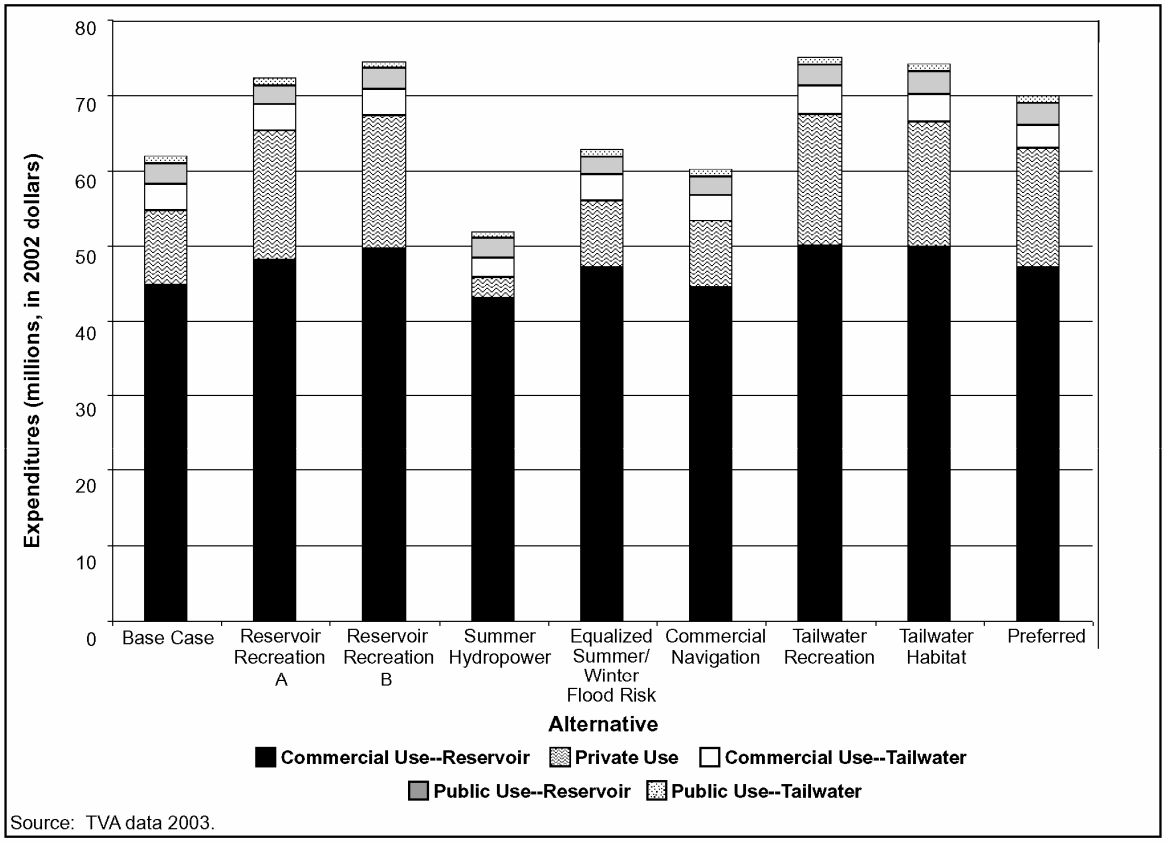
Table 5.25-04 Cost to Modify Intakes on Reservoirs with Pool Levels below TVA-Published Minimum Elevations by Policy Alternative (2002 dollars in thousands)

Reservoir	Alternative							
	Reservoir Recreation A	Reservoir Recreation B	Summer Hydropower	Equalized Summer/ Winter Flood Risk	Commercial Navigation	Tailwater Recreation	Tailwater Habitat	Preferred
Watauga	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Cherokee	$0.0	$0.0	$5,000.0	$0.0	$1,000.0	$0.0	$0.0	$0.0
Douglas	$0.0	$0.0	$3,000.0	$0.0	$26.0	$0.0	$0.0	$26.0
Norris	$0.0	$0.0	$77.0	$0.0	$57.0	$0.0	$0.0	$0.0
Fontana	$0.0	$0.0	$4.5	$0.0	$4.5	$0.0	$0.0	$0.0
Chatuge	$0.0	$0.0	$2,200.0	$0.0	$69.5	$19.5	$19.5	$0.0
Nottely	$0.0	$0.0	$2,250.0	$0.0	$2,250.0	$1.5	$1.5	$0.0
Hiwassee	$0.0	$0.0	$1.5	$0.0	$1.5	$1.5	$0.0	$0.0
Tims Ford	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Total	**$0.0**	**$0.0**	**$12,500.0**	**$0.0**	**$3,400.0**	**$22.5**	**$21.0**	**$26.0**

Note: The numbers shown in Table 5.25-04 do not directly correspond with those in Table 5.5-06. Table 5.5-06 includes changes in intake modification capital costs and pumping costs. Table 5.25-04 includes only the capital costs of intake modification. The input to the REMI model to predict economic impacts also includes lost days of production to meet wastewater discharge requirements, which is not included in Table 5.25-04.

Recreation

Changes in the reservoir operations policy are expected to alter water-based recreational use across the TVA region. Water-based recreational expenditures resulting from proposed changes in operations in the TVA reservoir system were estimated for the forecast period (see Section 5.24, Recreation). Three user groups were included in the recreation analysis: public access site users, commercial patrons, and shoreline property owners. The economic analysis is concerned with "new" or external money, either brought into the economy by individuals who live outside the TVA region or by permanent residents of the region who reallocated travel days normally spent outside the TVA region. Any transfers of spending from one use to another within the TVA region, resulting in zero net benefit to the region, were not considered in the analysis. For each alternative, changes in recreational expenditures in August through October were estimated. The changes are shown in Figure 5.25-01.



Source: TVA data 2003.

Figure 5.25-01 Projected External Recreation Expenditures by Policy Alternative (August through October 2004)

A constructed on-site survey scheme, involving mail surveys to commercial providers and shoreline property owners on 13 reservoirs, was used to estimate a baseline of recreation visitor days. Variables from these analyses were used to estimate changes in recreation visitor days based on the various alternatives. TVA's population projections for 2003 to 2030 were then

used to forecast trends in recreational use from 2003 to 2030. Estimates of percent change in the number of visitor trips or days lived at a TVA reservoir or tailwater residence in response to proposed changes in the reservoir operations policy were used to forecast changes in recreational use from 2003 to 2030. Mean expenditures per person, per user day were then applied to the projected changes in recreational use in order to calculate the projected change in expenditures from 2003 through 2030 as a result of changes in operations.

Projected changes in recreational expenditures by alternative are presented for the years 2004 to 2030 (Table 5.25-05). Reservoir Recreation Alternative A, Reservoir Recreation Alternative B, the Equalized Summer/Winter Flood Risk Alternative, the Tailwater Recreation Alternative, the Tailwater Habitat Alternative, and the Preferred Alternative are expected to provide greater total expenditures than under the Base Case. The Summer Hydropower Alternative and the Commercial Navigation Alternative are expected to result in reduced external recreational expenditures. The greatest increase in external expenditures is expected for the Tailwater Recreation Alternative, which would increase expenditures by $17 million by 2030. The Summer Hydropower Alternative would generate the largest decline in external recreational expenditures, reducing spending by almost $13 million by 2030.

Table 5.25-05 Changes in Recreational Expenditures from outside the TVA Region (August through October) (2002 dollars in millions)

Alternative	Spending	2004	2005	2006	2007	2008	2009	2010	2030
Base Case	Existing	$61.2	$61.9	$62.5	$63.2	$63.8	$64.5	$65.1	$79.6
Reservoir Recreation A	Change	$10.6	$10.7	$10.9	$11.0	$11.1	$11.2	$11.3	$14.0
	New level	$71.9	$72.6	$73.4	$74.1	$74.9	$75.7	$76.4	$93.6
Reservoir Recreation B	Change	$12.9	$13.1	$13.2	$13.3	$13.5	$13.6	$13.8	$17.0
	New level	$74.2	$74.9	$75.7	$76.5	$77.3	$78.1	$78.9	$96.6
Summer Hydropower	Change	-$9.8	-$9.9	-$10.0	-$10.1	-$10.2	-$10.3	-$10.4	-$12.8
	New level	$51.5	$52.0	$52.5	$53.1	$53.6	$54.2	$54.7	$66.8
Equalized Summer/ Winter Flood Risk	Change	$1.3	$1.3	$1.3	$1.3	$1.3	$1.3	$1.3	$1.4
	New level	$62.5	$63.2	$63.8	$64.4	$65.1	$65.7	$66.4	$81.1
Commercial Navigation	Change	-$1.0	-$1.0	-$1.0	-$1.0	-$1.1	-$1.1	-$1.1	-$1.3
	New level	$60.2	$60.9	$61.5	$62.1	$62.8	$63.4	$64.0	$78.3
Tailwater Recreation	Change	$13.2	$13.3	$13.4	$13.6	$13.7	$13.9	$14.0	$17.3
	New level	$74.4	$75.2	$76.0	$76.8	$77.6	$78.3	$79.2	$97.0
Tailwater Habitat	Change	$12.2	$12.4	$12.5	$12.6	$12.8	$12.9	$13.0	$16.2
	New level	$73.5	$74.2	$75.0	$75.8	$76.6	$77.4	$78.2	$95.8
Preferred	Change	$8.6	$8.7	$8.7	$8.8	$8.9	$9.0	$9.1	$11.3
	New level	$69.8	$70.5	$71.3	$72.0	$72.8	$73.5	$74.2	$90.9

Property Values

Changes in the reservoir operations policy have the potential to affect the value of waterfront properties on TVA reservoirs. Recreational and aesthetic benefits of living adjacent to the TVA reservoirs are capitalized into the values of property adjacent to the water. Changes in the existing policy that alter pool levels would alter amenities at reservoir properties and, thus, change property values. For instance, policy alternatives that would maintain summer pool levels for an additional month would increase the amenity benefits of living by the water. Adjacent property values should then rise in response.

A hedonic valuation model used to estimate the effect of reservoir levels on property values postulated that the value of residential property would be higher on lots where the winter drawdown exposes less area between the summer high pool and winter low pool elevations. In the hedonic model, the implicit price of each characteristic of the property was embedded in the market price of the property. A statistical model was used to estimate the value of the aesthetic and recreational benefits of living by the water. Changes in property values resulting from changes in reservoir elevations could then be measured.

An important relationship for the economic impact analysis concerns how changes in property values (a form of wealth) translate into changes in consumer spending. Direct economic effects in the regional economy occur via the estimate that 3 percent of the increase in household wealth is spent on “high-end” durable goods, holding constant the level of annual income. This assumption is consistent with both economic theory and empirical research. A central implication of economic theory is that people smooth consumption over their lifetime, and wealth is a key component of this consumption plan. A change in wealth will cause a rearrangement of the desired profile of consumption over time. Empirical research suggests that increases in wealth result in increases in consumer spending of between 3 and 5 percent. In this EIS, an increase in consumer spending of 3 percent of property value changes was assumed.

The results of the total change in spending for each alternative across the TVA region are presented in Table 5.25.06. Reservoir Recreation Alternative B would result in the largest increase in spending, with an estimated increase in property values leading to over $10 million annually by 2005 in additional spending on durable goods by residents in the region. Conversely, the Summer Hydropower Alternative, which would result in lower summer pool levels than under the existing policy, would cause an estimated decrease in property values, and therefore a decline in spending on durable goods of almost $12 million annually by 2005.

The REMI Model

The existing conditions and future trends through 2030 were forecast by TVA, using a system of models and forecasting processes of which the REMI model is an integral part (see Appendix C). REMI is a model widely used by federal agencies such as the USEPA and state governments such as Florida and Texas. TVA provided projections of total economic effects

under the Base Case for 2004 to 2030. The direct effects within the five pathways were then used as inputs into the REMI model. Total economic effects were estimated and represented as changes in GRP, PI, employment, and population levels.

Table 5.25-06 Estimated Impacts of Changes in Property Values on Consumer Spending across the TVA Region by Policy Alternative (2004 to 2030) (2002 dollars in millions)

Alternative	2004	2005	2006	2007	2008	2009	2010	2030
Reservoir Recreation A	$3.8	$7.7	$7.7	$7.7	$7.7	$7.7	$7.7	$7.7
Reservoir Recreation B	$5.1	$10.2	$10.2	$10.2	$10.2	$10.2	$10.2	$10.2
Summer Hydropower	-$5.9	-$11.8	-$11.8	-$11.8	-$11.8	-$11.8	-$11.8	-$11.8
Equalized Summer/ Winter Flood Risk	-$2.3	-$4.5	-$4.5	-$4.5	-$4.5	-$4.5	-$4.5	-$4.5
Commercial Navigation	$2.8	$5.6	$5.6	$5.6	$5.6	$5.6	$5.6	$5.6
Tailwater Recreation	$5.0	$10.0	$10.0	$10.0	$10.0	$10.0	$10.0	$10.0
Tailwater Habitat	$4.2	$8.4	$8.4	$8.4	$8.4	$8.4	$8.4	$8.4
Preferred	$0.9	$1.8	$1.8	$1.8	$1.8	$1.8	$1.8	$1.8

Total Economic Effects of Policy Alternatives

Tables 5.25-07 through 5.25-14 show the total economic effects for the policy alternatives. The results are presented by year for the first 7 years (2004 to 2010) of the forecast period. The economic effects throughout this period show the developing trend in the regional economy as the region adjusts to the direct effects of each policy alternative. Results for 2030 are also presented; however, any results after 2020 are subject to greater uncertainty.

Direct effects ripple across the economy to differing degrees, dependent on the interactions generated within the economy and the length of time that secondary impacts affect the region. The effects of the economic drivers do not occur in isolation; they occur simultaneously due to the system-wide linkage in TVA operations. For instance, a decision to hold water in upstream reservoirs to Labor Day in order to enhance recreation in those reservoirs could also reduce water releases for hydropower generation and channel depths for navigation. The cumulative effects of the changes in each pathway are of interest due to the dynamic and interconnected nature of the economy as expressed in the REMI model.

Direct effects, in terms of their impact on the economy, are shown in Table 5.25-15. For instance, under Reservoir Recreation Alternative A, an increase in recreation spending would result in a slightly beneficial effect on the economy whereas an increase in power costs would result in a slightly adverse effect on the economy. The magnitude of the impacts on the regional economy would be very small relative to the size of the regional economy as a whole. For example, a policy alternative that reduces GRP by $10 million in a given year would represent a decrease of less than one hundredth of a percent in the value of regional output.

Table 5.25-07 Total Economic Effects under Reservoir Recreation Alternative A (2004 to 2030 in 2002 dollars)

Variable	Spending	2004	2005	2006	2007	2008	2009	2010	2030
Gross regional product	Base Case (millions)	$301,338.1	$311,985.2	$322,356.6	$333,267.3	$345,346.3	$358,597.7	$372,681.4	$694,732.7
	Change (millions)	-$7.3	$1.1	-$9.1	-$10.3	-$14.4	-$14.6	-$13.6	-$3.7
	Percent change	-0.0024%	0.0004%	-0.0028%	-0.0031%	-0.0042%	-0.0041%	-0.0036%	-0.0005%
Total personal income	Base Case (millions)	$253,806.0	$260,528.1	$268,255.1	$276,114.6	$285,081.1	$294,394.1	$303,333.6	$529,834.9
	Change (millions)	-$2.1	$0.8	-$2.8	-$3.1	-$4.7	-$4.7	-$4.4	$2.1
	Percent change	-0.0008%	0.0003%	-0.0010%	-0.0011%	-0.0016%	-0.0016%	-0.0015%	0.0004%
Employment	Base Case (thousands)	5,553.8	5,648.3	5,727.8	5,811.8	5,909.4	6,000.4	6,095.2	7,483.0
	Change (thousands)	-.073	.067	-.049	-.047	-.081	-.066	-.043	.123
	Percent change	-0.0013%	0.0012%	-0.0009%	-0.0008%	-0.0014%	-0.0011%	-0.0007%	0.0016%
Population	Base Case (thousands)	9,595.4	9,701.5	9,806.4	9,911.0	10,015.4	10,121.4	10,227.2	12,476.3
	Change (thousands)	-.139	-.180	-.251	-.314	-.365	-.392	-.408	-.200
	Percent change	-0.0014%	-0.0019%	-0.0026%	-0.0032%	-0.0036%	-0.0039%	-0.0040%	-0.0016%

Table 5.25-08 Total Economic Effects under Reservoir Recreation Alternative B (2004 to 2030 in 2002 dollars)

Variable	Spending	2004	2005	2006	2007	2008	2009	2010	2030
Gross regional product	Base Case (millions)	$301,338.1	$311,985.2	$322,356.6	$333,267.3	$345,346.3	$358,597.7	$372,681.4	$694,732.7
	Change (millions)	-$15.8	-$8.4	-$21.8	-$22.0	-$29.3	-$28.7	-$32.5	-$32.2
	Percent change	-0.0052%	-0.0027%	-0.0068%	-0.0066%	-0.0085%	-0.0080%	-0.0087%	-0.0046%
Total personal income	Base Case (millions)	$253,806.0	$260,528.1	$268,255.1	$276,114.6	$285,081.1	$294,394.1	$303,333.6	$529,834.9
	Change (millions)	-$5.1	-$2.7	-$7.6	-$7.7	-$10.4	-$10.2	-$11.5	-$5.3
	Percent change	-0.0020%	-0.0010%	-0.0028%	-0.0028%	-0.0036%	-0.0035%	-0.0038%	-0.0010%
Employment	Base Case (thousands)	5,553.8	5,648.3	5,727.8	5,811.8	5,909.4	6,000.4	6,095.2	7,483.0
	Change (thousands)	-.179	-.039	-.190	-.164	-.229	-.193	-.220	.012
	Percent change	-0.0032%	-0.0007%	-0.0033%	-0.0028%	-0.0039%	-0.0032%	-0.0036%	0.0002%
Population	Base Case (thousands)	9,595.4	9,701.5	9,806.4	9,911.0	10,015.4	10,121.4	10,227.2	12,476.3
	Change (thousands)	-.206	-.296	-.424	-.525	-.627	-.690	-.769	-.821
	Percent change	-0.0021%	-0.0031%	-0.0043%	-0.0053%	-0.0063%	-0.0068%	-0.0075%	-0.0066%

Table 5.25-09 Total Economic Effects under the Summer Hydropower Alternative (2004 to 2030 in 2002 dollars)

Variable	Spending	2004	2005	2006	2007	2008	2009	2010	2030
Gross regional product	Base Case (millions)	$301,338.1	$311,985.2	$322,356.6	$333,267.3	$345,346.3	$358,597.7	$372,681.4	$694,732.7
	Change (millions)	-$21.3	-$24.3	-$36.2	-$34.7	-$45.3	-$42.6	-$43.2	-$69.8
	Percent change	-0.0071	-0.0078%	-0.0112%	-0.0104%	-0.0131%	-0.0119%	-0.0116	-0.0100%
Total personal income	Base Case (millions)	$253,806.0	$260,528.1	$268,255.1	$276,114.6	$285,081.1	$294,394.1	$303,333.6	$529,834.9
	Change (millions)	-$4.8	-$4.3	-$10.6	-$10.4	-$14.7	-$14.1	-$14.6	-$23.7
	Percent change	-0.0019%	-0.0017%	-0.0040%	-0.0038%	-0.0052%	-0.0048%	-0.0048	-0.0045%
Employment	Base Case (thousands)	5,553.8	5,648.3	5,727.8	5,811.8	5,909.4	6,000.4	6,095.2	7,483.0
	Change (thousands)	-.186	-.171	-.376	-.346	-.460	-.417	-.413	-.496
	Percent change	-0.0033%	-0.0030%	-0.0066%	-0.0060%	-0.0078%	-0.0069%	-0.0068	-0.0025%
Population	Base Case (thousands)	9,595.4	9,701.5	9,806.4	9,911.0	10,015.4	10,121.4	10,227.2	12,476.3
	Change (thousands)	-.004	-0.34	-.111	-.178	-.251	-.307	-.372	-.922
	Percent change	0.0000%	-0.0004%	-0.0011%	-0.0018%	-0.0025%	-0.0030%	-0.0036	-0.0074%

Table 5.25-10 Total Economic Effects under the Equalized Summer/Winter Flood Risk Alternative (2004 to 2030 in 2002 dollars)

Variable	Spending	2004	2005	2006	2007	2008	2009	2010	2030
Gross regional product	Base Case (millions)	$301,338.1	$311,985.2	$322,356.6	$333,267.3	$345,346.3	$358,597.7	$372,681.4	$694,732.7
	Change (millions)	-$40.7	-$46.5	-$59.8	-$64.9	-$73.1	-$80.9	-$76.5	-$127.6
	Percent change	-0.0135%	-0.0149%	-0.0186%	-0.0195%	-0.0212%	-0.0226%	-0.0205%	-0.0184%
Total personal income	Base Case (millions)	$253,806.0	$260,528.1	$268,255.1	$276,114.6	$285,081.1	$294,394.1	$303,333.6	$529,834.9
	Change (millions)	-$14.9	-$17.8	-$23.3	-$25.7	-$29.1	-$32.5	-$31.1	-$39.8
	Percent change	-0.0059%	-0.0068%	-0.0087%	-0.0093%	-0.0102%	-0.0110%	-0.0103%	-0.0075%
Employment	Base Case (thousands)	5,553.8	5,648.3	5,727.8	5,811.8	5,909.4	6,000.4	6,095.2	7,483.0
	Change (thousands)	-.574	-.594	-.728	-.733	-.791	-.835	-.745	-.664
	Percent change	-0.0103%	-0.0105%	-0.0127%	-0.0126%	-0.0134%	-0.0139%	-0.0122%	-0.0089%
Population	Base Case (thousands)	9,595.4	9,701.5	9,806.4	9,911.0	10,015.4	10,121.4	10,227.2	12,476.3
	Change (thousands)	-.317	-.550	-.816	-1.024	-1.231	-1.409	-1.571	-2.755
	Percent change	-0.0033%	-0.0057%	-0.0083%	-0.0103%	-0.0123%	-0.0139%	-0.0154%	-0.0221%

Table 5.25-11 Total Economic Effects under the Commercial Navigation Alternative (2004 to 2030 in 2002 dollars)

Variable	Spending	2004	2005	2006	2007	2008	2009	2010	2030
Gross regional product	Base Case (millions)	$301,338.1	$311,985.2	$322,356.6	$333,267.3	$345,346.3	$358,597.7	$372,681.4	$694,732.7
	Change (millions)	$22.3	$37.7	$36.3	$42.1	$47.0	$49.2	$54.0	$87.4
	Percent change	0.0074%	0.0121%	0.0113%	0.0126%	0.0136%	0.0137%	0.0145%	0.0126%
Total personal income	Base Case (millions)	$253,806.0	$260,528.1	$268,255.1	$276,114.6	$285,081.1	$294,394.1	$303,333.6	$529,834.9
	Change (millions)	$3.2	$9.4	$8.8	$11.2	$13.0	$14.0	$15.8	$24.0
	Percent change	0.0013%	0.0036%	0.0033%	0.0041%	0.0046%	0.0048%	0.0052%	0.0045%
Employment	Base Case (thousands)	5,553.8	5,648.3	5,727.8	5,811.8	5,909.4	6,000.4	6,095.2	7,483.0
	Change (thousands)	.111	.320	.263	.320	.361	.369	.408	.466
	Percent change	0.0020%	0.0057%	0.0046%	0.0055%	0.0061%	0.0061%	0.0067%	0.0062%
Population	Base Case (thousands)	9,595.4	9,701.5	9,806.4	9,911.0	10,015.4	10,121.4	10,227.2	12,476.3
	Change (thousands)	.023	.112	.161	.220	.285	.344	.405	.974
	Percent change	0.0002%	0.0012%	0.0016%	0.0022%	0.0028%	0.0034%	0.0040%	0.0078%

Table 5.25-12 Total Economic Effects under the Tailwater Recreation Alternative (2004 to 2030 in 2002 dollars)

Variable	Spending	2004	2005	2006	2007	2008	2009	2010	2030
Gross regional product	Base Case (millions)	$301,338.1	$311,985.2	$322,356.6	$333,267.3	$345,346.3	$358,597.7	$372,681.4	$694,732.7
	Change (millions)	-$14.5	-$7.2	-$20.5	-$20.7	-$27.9	-$27.1	-$30.8	-$29.7
	Percent change	-0.0048%	-0.0023%	-0.0064%	-0.0062%	-0.0081%	-0.0076%	-0.0083%	-0.0043%
Total personal income	Base Case (millions)	$253,806.0	$260,528.1	$268,255.1	$276,114.6	$285,081.1	$294,394.1	$303,333.6	$529,834.9
	Change (millions)	-$4.6	-$2.2	-$7.0	-$7.1	-$9.7	-$9.5	-$10.9	-$4.4
	Percent change	-0.0018%	-0.0008%	-0.0026%	-0.0026%	-0.0034%	-0.0032%	-0.0036%	-0.0008%
Employment	Base Case (thousands)	5,553.8	5,648.3	5,727.8	5,811.8	5,909.4	6,000.4	6,095.2	7,483.0
	Change (thousands)	-.162	-.023	-.173	-.147	-.211	-.174	-.201	.030
	Percent change	-0.0029%	-0.0004%	-0.0030%	-0.0025%	-0.0036%	-0.0029%	-0.0033%	0.0004%
Population	Base Case (thousands)	9,595.4	9,701.5	9,806.4	9,911.0	10,015.4	10,121.4	10,227.2	12,476.3
	Change (thousands)	-.200	-.287	-.410	-.510	-.608	-.671	-.745	-.784
	Percent change	-0.0021%	-0.0030%	-0.0042%	-0.0051%	-0.0061%	-0.0066%	-0.0073%	-0.0063%

Table 5.25-13 Total Economic Effects under the Tailwater Habitat Alternative (2004 to 2030 in 2002 dollars)

Variable	Spending	2004	2005	2006	2007	2008	2009	2010	2030
Gross regional product	Base Case (millions)	$301,338.1	$311,985.2	$322,356.6	$333,267.3	$345,346.3	$358,597.7	$372,681.4	$694,732.7
	Change (millions)	-$46.3	-$78.2	-$100.3	-$115.8	-$123.8	-$141.3	-$160.8	-$335.2
	Percent change	-0.0154%	-0.0251%	-0.0311%	-0.0347%	-0.0358%	-0.0394%	-0.0431%	-0.0482%
Total personal income	Base Case (millions)	$253,806.0	$260,528.1	$268,255.1	$276,114.6	$285,081.1	$294,394.1	$303,333.6	$529,834.9
	Change (millions)	-$17.2	-$30.2	-$39.4	-$45.8	-$49.4	-$56.2	-$63.7	-$105.3
	Percent change	-0.0068%	-0.0116%	-0.0147%	-0.0166%	-0.0173%	-0.0191%	-0.0210%	-0.0199%
Employment	Base Case (thousands)	5,553.8	5,648.3	5,727.8	5,811.8	5,909.4	6,000.4	6,095.2	7,483.0
	Change (thousands)	-.700	-1.027	-1.196	-1.291	-1.277	-1.390	-1.522	-1.699
	Percent change	-0.0126%	-0.0182%	-0.0209%	-0.0222%	-0.0216%	-0.0232%	-0.0250%	-0.0227%
Population	Base Case (thousands)	9,595.4	9,701.5	9,806.4	9,911.0	10,015.4	10,121.4	10,227.2	12,476.3
	Change (thousands)	-.592	-1.168	-1.704	-2.224	-2.659	-3.086	-3.518	-7.273
	Percent change	-0.0062%	-0.0120%	-0.0174%	-0.0224%	-0.0265%	-0.0305%	-0.0344%	-0.0583%

Table 5.25-14 Total Economic Effects under the Preferred Alternative (2004 to 2030 in 2002 dollars)

Variable	Spending	2004	2005	2006	2007	2008	2009	2010	2030
Gross regional product	Base Case (millions)	$301,338.1	$311,985.2	$322,356.6	$333,267.3	$345,346.3	$358,597.7	$372,681.4	$694,732.7
	Change (millions)	-$2.2	-$5.8	-$5.6	-$8.3	-$9.0	-$7.3	-$6.0	-$4.5
	Percent change	-0.0007%	-0.0019%	-0.0018%	-0.0025%	-0.0026%	-0.0020%	-0.0016%	-0.0007%
Total personal income	Base Case (millions)	$253,806.0	$260,528.1	$268,255.1	$276,114.6	$285,081.1	$294,394.1	$303,333.6	$529,834.9
	Change (millions)	-$0.4	-$1.8	-$1.8	-$2.7	-$3.0	-$2.3	-$1.9	$0.5
	Percent change	-0.0002%	-0.0007%	-0.0007%	-0.0010%	-0.0010%	-0.0008%	-0.0006%	0.0001%
Employment	Base Case (thousands)	5,553.8	5,648.3	5,727.8	5,811.8	5,909.4	6,000.4	6,095.2	7,483.0
	Change (thousands)	0.002	-0.027	-0.016	-0.044	-0.043	-0.016	0.002	0.061
	Percent change	0.0000%	-0.0005%	-0.0003%	-0.0008%	-0.0007%	-0.0003%	0.0000%	0.0008%
Population	Base Case (thousands)	9,595.4	9,701.5	9,806.4	9,911.0	10,015.4	10,121.4	10,227.2	12,476.3
	Change (thousands)	-0.063	-0.101	-0.130	-0.163	-0.184	-0.189	-0.191	-0.116
	Percent change	-0.0007%	-0.0010%	-0.0013%	-0.0016%	-0.0018%	-0.0019%	-0.0019%	-0.0009%

Table 5.25-15 Direct Effects by Policy Alternative

Alternative	Recreation Spending	Expenditures Associated with Property Values	Water Supply	Navigation Costs	Power Costs
Reservoir Recreation A	Slightly beneficial	Slightly beneficial	Slightly adverse	No change	Slightly adverse
Reservoir Recreation B	Slightly beneficial	Slightly beneficial	No change	No change	Slightly adverse
Summer Hydropower	Slightly adverse	Slightly adverse	Slightly adverse	Slightly adverse	Slightly adverse
Equalized Summer/ Winter Flood Risk	Slightly beneficial	Slightly adverse	Slightly adverse	Slightly adverse	Slightly adverse
Commercial Navigation	Slightly adverse	Slightly beneficial	Slightly adverse	Slightly beneficial	Slightly beneficial
Tailwater Recreation	Slightly beneficial	Slightly beneficial	Slightly beneficial	No change	Slightly adverse
Tailwater Habitat	Slightly beneficial	Slightly beneficial	Slightly adverse	No change	Adverse
Preferred	Slightly beneficial	Slightly beneficial	Slightly adverse	Slightly beneficial	Slightly adverse

Notes:

The narrative under the Water Supply column in Table 5.25-15 is not directly comparable to the figures presented in Table 5.25-04. Table 5.25-15 takes into account the combined impact of changes in costs to modify intakes and changes in lost days of production to industries affected by low river flow. Table 5.25-04 represents only the former.

Effects are based on the year 2010.

Tables 5.25-07 through 5.25-14 present the results for all policy alternatives as forecast changes in total economic effects relative to their forecast levels under the Base Case. The percentage of changes in total economic effects is also shown.

5.25.3 Base Case

Under the Base Case, TVA would maintain the existing reservoir operations policy. Under this policy, reservoir levels are generally held up as high as possible until August, when reservoirs are drawn down for power generation and are held low through the winter to provide flood storage for spring rains. In late spring, the reservoirs are filled to reach their peak volumes for

the year in April or May for the mainstem reservoirs, and in June for the tributaries. Maintaining existing operations implies no impact on the forecast trend of existing conditions.

5.25.4 Reservoir Recreation Alternative A

Reservoir Recreation Alternative A would increase recreational opportunities in the TVA region. Summer tributary reservoir levels would be maintained for an additional month through Labor Day. This alternative would increase recreation spending in the region as well as wealth-induced consumer spending by property owners on TVA reservoirs. This would positively affect the economy; however, power costs would rise, increasing the costs of production for many industries across the TVA region. Table 5.25-07 shows that the increase in power costs would more than offset the gains to the economy arising from the local areas of the reservoirs. All economic variables show an increasingly negative trend over the first 7 years of the forecast, with GRP decreasing by $14 million (0.0036 percent) by the year 2010 relative to its level under the Base Case. By 2030, GRP is forecast to have decreased by $4 million relative to the Base Case. Further, by 2030 both PI ($2 million) and employment (123 workers) would have recovered to positive levels relative to their levels under the Base Case.

5.25.5 Reservoir Recreation Alternative B

Reservoir Recreation Alternative B also would increase recreational opportunities in the region. This alternative would extend tributary and mainstem summer pool levels to Labor Day, and winter levels would be held higher. Again, recreation spending and wealth-induced spending would rise while higher power costs would result in a counteracting impact. The resulting impacts on the economy would be similar to those under Reservoir Recreation Alternative A, as there is a clear negative trend in the economic effects between 2004 and 2010; however, the magnitude of these effects under Reservoir Recreation Alternative B would be greater than under Reservoir Recreation Alternative A. GRP is forecast to decrease by $33 million by 2010 relative to its level under the Base Case (Table 5.25-08). Similarly, PI is forecast to decrease by $11.5 million, employment levels by 220 workers, and the population by 769 people. By 2030, the GRP is forecast to remain approximately $32 million below that forecast under the Base Case.

5.25.6 Summer Hydropower Alternative

The Summer Hydropower Alternative would maximize hydropower production by beginning an unrestricted drawdown of the tributary and mainstem reservoirs by June 1. This would leave summer pool levels lower than under the Base Case, and winter and spring levels would be higher. This alternative would not lower power costs measurably and would result in a neutral impact on the economy. The other direct effects would negatively affect the economy; navigation and water supply costs would rise, and spending levels would fall. Table 5.25-09 shows that forecast in economic activity measures continually decline relative to the Base Case. By 2030, the GRP and PI would have decreased by $70 million and $24 million, respectively, relative to their levels under the Base Case. Employment and population levels were also forecast to decrease under this alternative, with 496 fewer workers and 922 fewer residents.

5.25.7 Equalized Summer/Winter Flood Risk Alternative

The Equalized Summer/Winter Flood Risk Alternative would change flood guides so that tributary reservoirs would be generally higher in spring and winter but lower in summer compared to the Base Case. Power costs and selected waterborne freight costs would be raised, while reservoir recreational activity would be increased by a small amount. As a result, GRP (-$128 million) and PI (-$40 million) would show a continuing negative trend compared to their forecast levels under the Base Case (Table 5.25-10). Regional employment and population levels would also be below the forecast for the Base Case, with the level of employment shrinking by 664 workers and the population by 2,755 residents.

5.25.8 Commercial Navigation Alternative

The Commercial Navigation Alternative would enhance navigation. As expected, navigation costs would decrease as deeper channels relate to more efficient loads, providing a positive impact on the economy. Decreasing power costs would magnify this effect. Recreation spending levels would decrease but, as Table 5.25-11 shows, the economy would be positively affected by this policy alternative. All economic variables show an increasing trend over the 27-year forecast period relative to the Base Case. By 2030, the GRP and PI were forecast to increase by $87 million and $24 million, respectively, while 466 additional workers would be hired and 974 residents would migrate to the region.

5.25.9 Tailwater Recreation Alternative

The Tailwater Recreation Alternative would increase tailwater recreational opportunities by maintaining summer pool levels through Labor Day. Accordingly, recreation spending and wealth-induced spending would increase, but there are offsetting forces in the form of increasing power costs. Overall, the regional economy was forecast to contract compared to the Base Case. The GRP was forecast to decrease by $31 million by 2010 relative to the Base Case, while PI would decline by $11 million (Table 5.25-12). Employment and population levels were also forecast to be below their levels under the existing policy. Between 2010 and 2030, the economy (as measured by GRP) was forecast not to deviate further from its level under the Base Case, remaining at approximately $30 million under its forecast for the Base Case, while PI shows a recovery over this period toward its long-run growth rate.

5.25.10 Tailwater Habitat Alternative

The Tailwater Habitat Alternative would mimic natural flow conditions. The most substantial impact would result from an increase in power costs, caused by reduced peaking hydropower availability. As a result, TVA would need to replace the low-cost hydropower with higher cost purchased and generated power. The negative impact on the economy would be only partially offset by increased consumer spending driven by enhancements to recreational activities. This alternative has the most adverse implications for the regional economy. Table 5.25-13 shows the forecast trend in the economic variables being increasingly negative relative to the economic conditions under the Base Case. By 2030, relative to the forecast for the Base Case, the GRP

would have declined by $335 million and PI by $105 million; there would be 1,699 fewer employees, and out-migration would lead to 7,273 fewer residents.

5.25.11 Preferred Alternative

Under the Preferred Alternative, reservoir and tailwater recreation opportunities would increase. As a result, recreation spending and wealth-induced spending would increase under this alternative. Shipper savings would also increase, but rising water supply and power costs would offset this benefit. As Table 5.25-14 shows, under this alternative, the regional economy is expected to contract slightly compared to the Base Case. By 2010, GRP and PI are forecast to decrease by $6 million and $1.9 million, respectively. Population levels are forecast to fall by 191 residents, while little impact is expected on regional levels of employment. Between 2010 and 2030, the trend in decreasing levels of economic activity would be mitigated. By 2030, GRP is forecast to decline by $4.5 million, while personal income levels are forecast to increase by $0.5 million relative to their levels under the Base Case. Population levels are expected to decrease by 116 residents, and the impact on the level of regional employment is expected to be negligible.

5.25.12 Environmental Justice

Across the TVA region as a whole, none of the policy alternatives would likely raise environmental justice issues (i.e., adverse and disproportionate environmental or human health impacts on minority or low-income populations). Population demographics rule out disproportionate impacts on minorities or low-income populations when the point of comparison is the percentage of the population comprised of minorities and low-income individuals within the seven states in which TVA operates, or the nation as a whole. It is conceivable that disproportionate impacts on minorities could occur at a sub-regional level in the Mississippi and Western sub-regions and at isolated, local locations. With regard to low-income populations, demographics also allow for the possibility of a very slight disproportionate impact across the TVA region as whole. The greatest potential for disproportionate sub-regional impacts exists in the Mississippi sub-region because of the high proportion of those living below the poverty level in that area. However, the region-wide nature of TVA's proposed action makes it unlikely that, if disproportionate impacts occurred, they would be substantial.

Although not substantial, disproportionate impacts on property values and recreation could occur. While lake-front residential property values would rise under some of the alternatives, it would unlikely adversely affect low-income populations–given that those living below the poverty level are unable to purchase lake-front property at existing prices. Minority individuals who are in the market for lake-front property would be adversely affected by increased property values; however, it is unlikely that such adverse impacts would be borne disproportionately by minorities. This would require that minorities in the market for lake-front property represent a greater percentage of the population of individuals in this market than the minority population percentage as a whole, and there is no evidence of this.

Some of the alternatives would adversely affect recreation opportunities. However, recreation survey data indicate that any such adverse impacts would not be borne disproportionately by minorities or low income populations. Those living below the poverty level likely would not be adversely affected by the loss of boating and other high-cost recreational opportunities that might occur under some of the alternatives. It is also unlikely that minorities would be disproportionately affected by the loss of such opportunities. The greatest potential for adverse and disproportionate impacts exists with regard to informal recreational opportunities, such as fishing, under some of the alternatives. The risk of such impacts under TVA's Preferred Alternative is remote because this alternative would enhance recreational opportunities.

Adverse health impacts on subsistence anglers are not anticipated, given that no increase in contaminates that accumulate in fish flesh and could potentially cause human health concerns is expected to occur under any of the alternatives (see Section 5.4.1).

5.25.13 Summary of Impacts

All of the alternatives would entail tradeoffs. None of the alternatives would be uniformly beneficial or adverse for all economic pathways or output measures.

The results of the impact analysis show that only the Commercial Navigation Alternative would produce a positive economic impact on the region. Under this alternative, more efficient waterborne transportation loads and lower electricity prices would ripple across the region, creating both lower production costs for regional industries and higher levels of disposable income for consumers. These direct effects would translate into an expanding economy; therefore, the Commercial Navigation Alternative would be the most beneficial alternative with regard to social and economic resources. Under this alternative, the positive impact on the economy would be a small change in the aggregate, raising GRP levels by only less than one-tenth of a percent in any given year.

The Tailwater Habitat Alternative represents the least beneficial alternative in terms of impacts on social and economic resources. Designed to mimic natural flows, the alternative would substantially reduce TVA’s peaking hydropower availability, raising electricity prices for industry and households. This impact would overwhelm rising recreation spending and would create a contraction in the regional economy relative to the Base Case. The Equalized Summer/Winter Flood Risk Alternative also would result in adverse effects on the economy. Designed to enhance flood protection, the alternative would result in negative regional impacts associated with higher electricity and waterborne transportation costs.

Reservoir Recreation Alternative A and Reservoir Recreation Alternative B were designed to increase recreational activity, but both would create higher production costs that would offset these gains. The Summer Hydropower Alternative proposes to maximize hydropower availability but simultaneously would incur rising waterborne transportation costs and falling recreation spending. The Preferred Alternative would incur positive regional impacts of increased recreational activity, wealth-induced spending, and increased shipper savings; but these benefits would be more than offset by rising water supply and power costs. Under all

these alternatives, the direct effects would contract the regional economy relative to its forecast performance under the Base Case. Of these alternatives, the Preferred Alternative would result in the smallest deviation from the Base Case.

Table 5.25-16 provides a qualitative summary of the total economic effects by policy alternative and emphasizes that impacts under all alternatives would be very small relative to the Base Case.

Different standards can be used to summarize and evaluate the total economic effects of each alternative. For instance, the impact of each alternative could be measured as an average across the whole 27-year period, by the impact at the end of the forecast period (2030), or by impacts in some representative year. After careful consideration, the economic effect in 2010 was chosen to evaluate the impact of each alternative. The year 2010 was chosen because, by then, adjustments in the economy to the effects of each alternative would have largely been made; effects in 2010 are quite similar to those taken as an average; and use of 2010 is more accurate, avoiding the uncertainties associated with long-term projection to 2030.

Concerning environmental justice, demographics suggest the possibility of a very slight disproportionate impact for low-income populations across the ROS analysis area as a whole, with the greatest potential disproportionality occurring in the Mississippi sub-region.

Table 5.25-16 Summary of Economic Effects by Policy Alternative

Alternative	Variable			
	Gross Regional Product	Personal Income	Employment[1]	Population
Base Case	No change	No change	No change	No change
Reservoir Recreation A	Slightly adverse	Slightly adverse	Slightly adverse	Slightly adverse
Reservoir Recreation B	Slightly adverse	Slightly adverse	Slightly adverse	Slightly adverse
Summer Hydropower	Slightly adverse	Slightly adverse	Slightly adverse	Slightly adverse
Equalized Summer/Winter Flood Risk	Slightly adverse	Slightly adverse	Slightly adverse	Slightly adverse
Commercial Navigation	Slightly beneficial	Slightly beneficial	Slightly beneficial	Slightly beneficial
Tailwater Recreation	Slightly adverse	Slightly adverse	Slightly adverse	Slightly adverse
Tailwater Habitat	Adverse	Adverse	Adverse	Adverse
Preferred	Slightly adverse	Slightly adverse	No change	Slightly adverse

[1] Employment is summarized as having incurred "no change" under the Preferred Alternative because by 2010 the slight increase in regional employment is considered to be negligible.

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