

Appendix C4
Utah Water Demand
Scenario Quantification

Appendix C4 — Utah Water Demand Scenario Quantification

1.0 Introduction

This appendix summarizes the data sources used in scenario quantification for Colorado River demand¹ for the state of Utah and presents the results of quantification. As presented in figure C4-1, Utah is divided into a number of planning areas that align with Colorado River Basin (Basin) tributaries (Uintah, West Colorado River, Southeast Colorado River, and Kanab Creek/Virgin River) as well as adjacent areas that are served by Colorado River water. Data collection and development were completed at the planning area level.

The following sections present background information that summarizes the state's planning areas as well as data sources used to quantify demand scenarios by category. Following the background section, results of demand scenario quantification are presented. The results section is broken out into a Utah Study Area summary, followed by Colorado River demand by geography, and finally by category.

2.0 Background

The Utah Division of Water Resources (DWR) is responsible for regional and state-level water resource planning in Utah. DWR has led numerous water resource planning studies that include individual river basins (planning areas) as well as state-wide efforts. Information presented in this summary was largely obtained from DWR's planning studies.

DWR coordinated Utah's efforts to provide information for scenario quantification. These efforts largely relied on information previously generated through regional plans and demographic studies. However, new assumptions and/or data development were required where the assumptions of the Colorado River Basin Water Supply and Demand Study (Study) required information not developed as part of the regional planning effort.

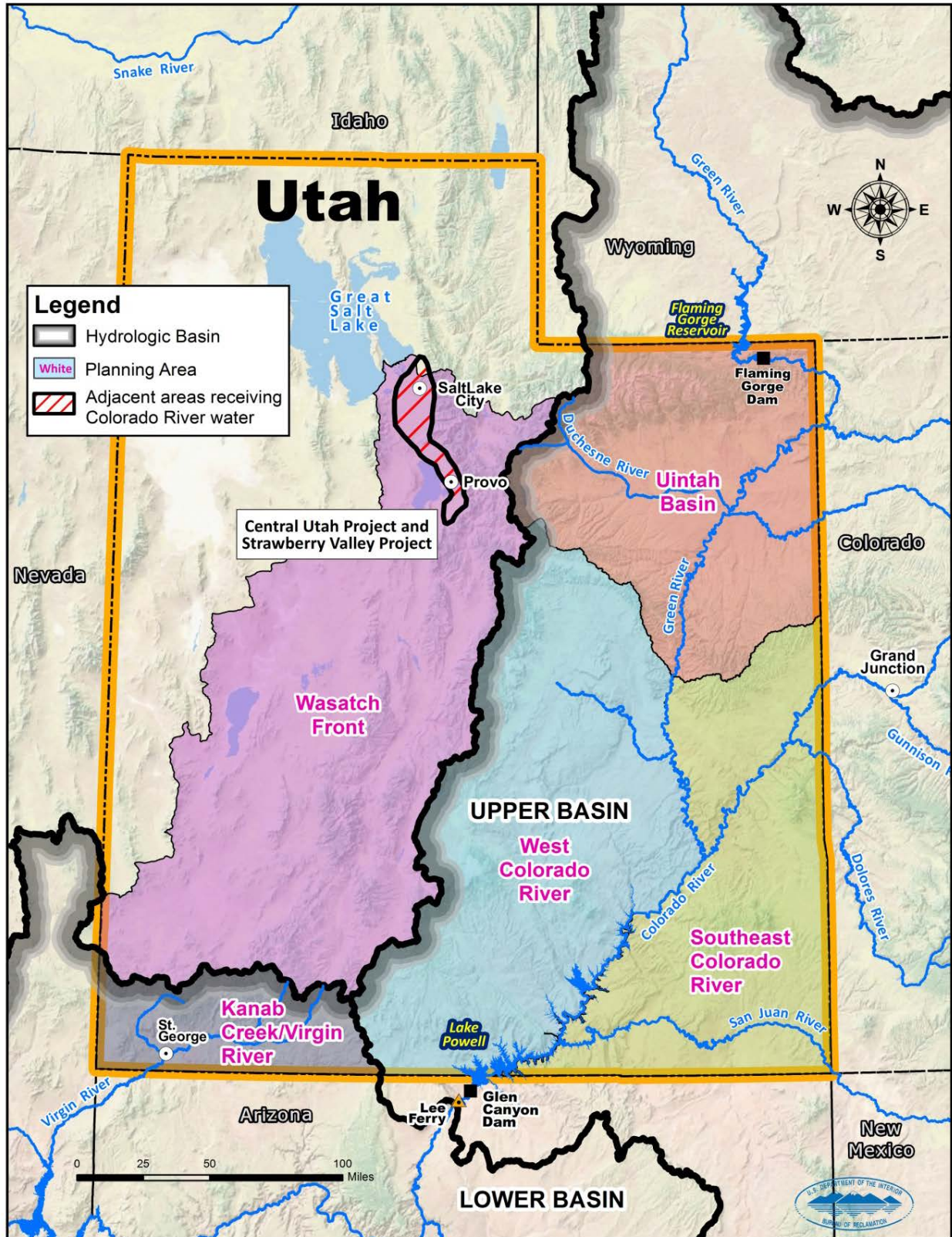
2.1 Data Sources for Quantification

This section discusses data sources for demand quantification by use category. Some category projections were based on relevant parameter data, while other category projections were developed directly as water demand. Sources include state, regional, and national agency reports.

- **Agricultural Demand:** Irrigated acreage and agricultural applied water use were derived from *Utah's Water Resources Planning for the Future* (DWR, 2001a). Consumptive demand is derived from Colorado River Simulation System (CRSS).

¹ Colorado River demand as computed by Study Area demand minus other supplies.

FIGURE C4-1
Colorado River Hydrologic Basin and Export Service Areas in Utah



- **Municipal and Industrial (M&I):** Population estimates for all planning areas were derived from the Governor’s Office of Planning and Budget’s 2008 baseline projections. For all planning areas, per capita usage was derived from Colorado River demands, population, and consumptive use factors derived from *State of Utah Municipal and Industrial Water Supply and Use Studies, Summary 2005* (DWR, 2009).

Consumptive demands for hydrologic basin planning areas, except Kanab Creek/Virgin River, were derived from CRSS, whereas Kanab Creek/Virgin River consumptive demands were derived from the *State Water Plan* (DWR, 2001b.). For Wasatch Front, diversion demands are derived from *Utah’s Water Resources Planning for the Future* (DWR, 2001a).

- **Energy:** Energy demands were derived from the 2007 Upper Colorado River Commission demand schedule.
- **Minerals:** Minerals demands were derived from the 2007 Upper Colorado River Commission demand schedule.
- **Fish, Wildlife, and Recreation:** Fish, wildlife, and recreation demands were derived from the 2007 Upper Colorado River Commission demand schedule.
- **Tribal:** Tribal demands were provided by the Ute Indian Tribe of the Uintah and Ouray Reservation and the Navajo Nation.

3.0 Results of Water Demand Scenario Quantification

This section summarizes Utah’s Colorado River water demand trends by category across the initial scenarios. The purpose of this section is to describe changes in demands, both temporally and geographically, parameters that influence changes in demands, and how the parameters and demands differ among scenarios.

Demands were first developed for areas that may be potentially served by Colorado River water (Study Area demands), independent of the source of supply. However, for areas outside of the hydrologic basin, a portion of the Study Area demand is satisfied from other supplies such as local groundwater and imports from the Sevier River Basin. The communities within the Colorado River Basin also rely on non-tributary groundwater for a portion of their supply. To develop estimates of the Colorado River demand, the Study Area demand was reduced by estimates of available supply from other sources. This appendix focuses on Colorado River demands, but includes discussion of the Study Area parameters that led to these demands. Lower Colorado River Basin demands are not included; CRSS would need to be extended and natural flow data sets would need to be developed in order to include the Lower Basin tributaries in the analysis.

The following sections summarize the results of demand scenario quantification, presenting Study Area demand and Colorado River water demand, Colorado River Demand for the state and individual planning areas across the six scenarios, and presenting Colorado River water demand by category across the six scenarios. Parameters and demands for all categories and all scenarios, along with references for data sources, are included.

3.1 Summary Results of Scenario Quantification

Values were developed for Study Area parameters to quantify Study Area demand for each of the scenarios. Colorado River demand was calculated as Study Area demand minus other supplies. Table C4-1 presents summary results for the demand scenarios considered in the Study. The table presents agricultural and M&I demand parameters for the entire Study Area that distinguishes the scenarios, the resulting Study Area demands, and finally the Colorado River demands by category. Because other supplies may vary among scenarios, trends observed in the parameters and Study Area demands may not be reflected identically in Colorado River demand trends.

Utah estimates that about 2.4 million people will be in Utah's Study Area by 2015. This number is expected to increase to 3.7 to 6.2 million by 2060. The greatest population growth is associated with the Rapid Growth (C1 and C2) scenarios. The Slow Growth (B) scenario has the lowest population growth of the scenarios (3.7 million by 2060), but still represents a growth of about 55 percent over 2015 estimates.

The growing municipal population, however, will continue to be more efficient in its per capita water use than today. Per capita water use, based solely on passive or existing conservation targets, is expected to be 14 to 25 percent less in 2060 than in 2015. Usage rates as well as per capita reductions vary across Utah's planning areas.

Irrigated acreage is projected to decrease through 2060 under all scenarios. Irrigated acreage decreases by between 66,000 acres (Current Projected [A], Slow Growth [B], and Enhanced Environment [D1 and D2] scenarios) and 113,000 acres (Rapid Growth [C1 and C2] scenarios), or 8 to 13 percent from 2015 irrigated acreage. Water delivery per acre decreases in all scenarios, with decreases ranging from less than 1 percent (Slow Growth [B] scenario) to 15 percent (Rapid Growth [C2] and Enhanced Environment [D2] scenarios). Water delivery per acre varies across planning areas, but reductions in water delivery per acre are consistent across most planning areas except the Wasatch Front, which has a greater reduction than the other planning areas.

Study Area demand for energy is projected to increase under all scenarios due to the growing need for electricity generation. The greatest increases in Study Area demand for energy are anticipated in the Uintah and West Colorado River planning areas, with a combined increase of about 11,500 to 12,500 acre-feet per year (afy) (25 percent) for all scenarios except the Rapid Growth (C1) scenario, which has an increase of about 18,500 afy (40 percent).

There is no reported projected Study Area demand for minerals under the scenarios considered in the Study.

Study Area demand for tribal use is projected to remain constant in the Current Project (A) and Enhanced Environment (D1) scenarios and increases under the remaining scenarios. Under Slow Rapid Growth (C1 and C2) and Enhanced Environment (D2) scenarios, demand increases by 24 percent. In the Slow Growth (B) scenario, tribal Study Area demand is projected to increase by 52 percent.

Figure C4-2 presents demands across the scenarios in three panels as follows: 1) Study Area demand with other supplies and Colorado River demand identified, 2) Colorado River demand, and 3) change in Colorado River demand by demand category.

TABLE C4-1
Summary Results of Utah Water Demand Scenario Quantification by 2060

Key Study Area Demand Scenario Parameters							
	2015¹	2060 Scenario Parameters					
		A	B	C1	C2	D1	D2
Population (millions)	2.4	4.9	3.7	6.2	6.2	4.9	6.2
Change in per capita water usage (%), from 2015	—	-14%	-14%	-14%	-21%	-23%	-25%
Irrigated acreage (millions of acres)	0.86	0.80	0.80	0.75	0.75	0.80	0.80
Change in per acre water delivery (%), from 2015	—	-3%	-0%	-3%	-15%	-3%	-15%
Study Area Demand (thousand acre-feet [kaf])							
	2015¹	2060 Scenario Demands					
		A	B	C1	C2	D1	D2
Ag demand	2,040	1,760	1,822	1,654	1,396	1,760	1,486
M&I demand	790	1,382	1,036	1,727	1,514	1,154	1,405
Energy demand	47	60	60	66	59	54	59
Minerals demand	0	0	0	0	0	0	0
FWR demand	0	0	0	0	0	0	0
Tribal demand²	170–272	259	259	337	337	259	337
Total Study Area Demand³	3,136	3,460	3,176	3,784	3,307	3,226	3,287
Colorado River Demand (kaf)							
	2015¹	2060 Scenario Demands					
		A	B	C1	C2	D1	D2
Ag demand	457	493	492	466	442	492	469
M&I demand	236	342	274	409	384	304	347
Energy demand	47	60	60	66	59	54	59
Minerals demand	0	0	0	0	0	0	0
FWR demand	0	0	0	0	0	0	0
Tribal demand²	170–272	259	259	337	337	259	337
Total Colorado River Demand³	911–1012	1,154	1,084	1,277	1,222	1,109	1,212

¹ If range across scenarios is less than 10 percent, Current Projected (A) is presented. Otherwise, range (min – max) is presented.

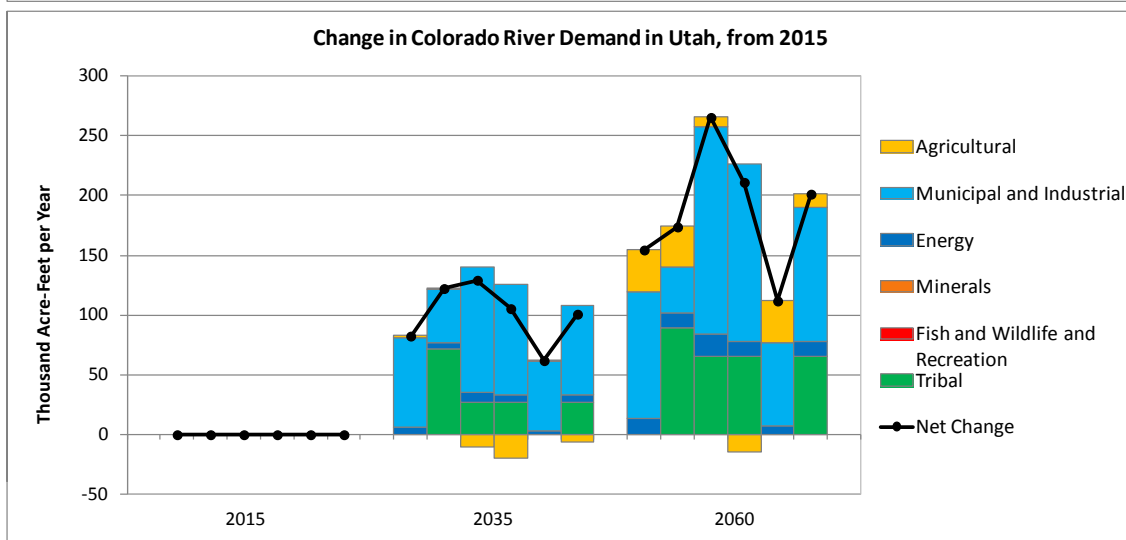
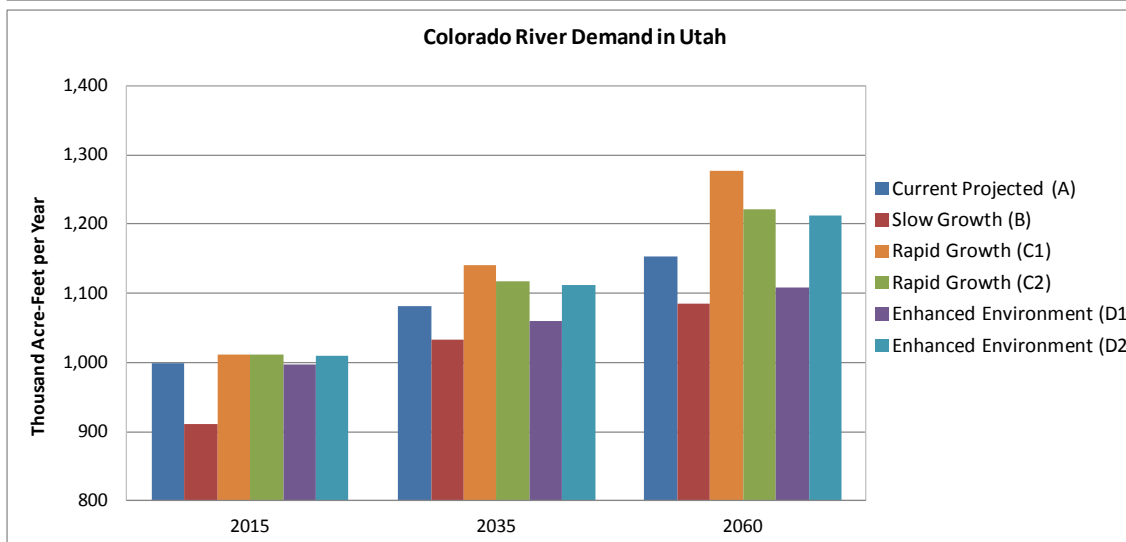
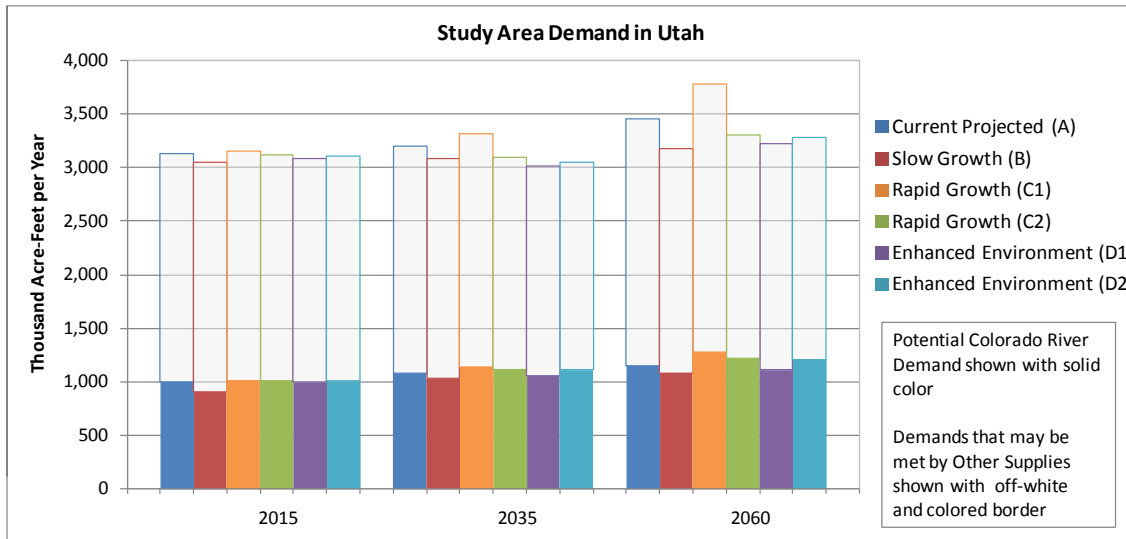
² The diversion and depletion associated with the demand for the Ute Indian Tribe of the Uintah and Ouray Reservation is dependent upon the re-ratification of the Revised Ute Indian Compact of 1990 by the Tribe and the state of Utah.

³ Excludes potential losses (reservoir evaporation, phreatophytes, and/or operational inefficiencies) that may be charged to state.

From panel one it can be seen that Study Area demand increases from about 3.0 million acre-feet (maf) in 2015 to between 3.2 and 3.8 maf in 2060. The range in Study Area demand growth across scenarios in 2060, however, is projected to be as low as 129 kaf or as high as 634 kaf. About 63 to 67 percent of the Study Area demand is expected to be met by other supplies.

Colorado River Basin
Water Supply and Demand Study

FIGURE C4-2
Study Area, Colorado River, and Change in Colorado River Demand

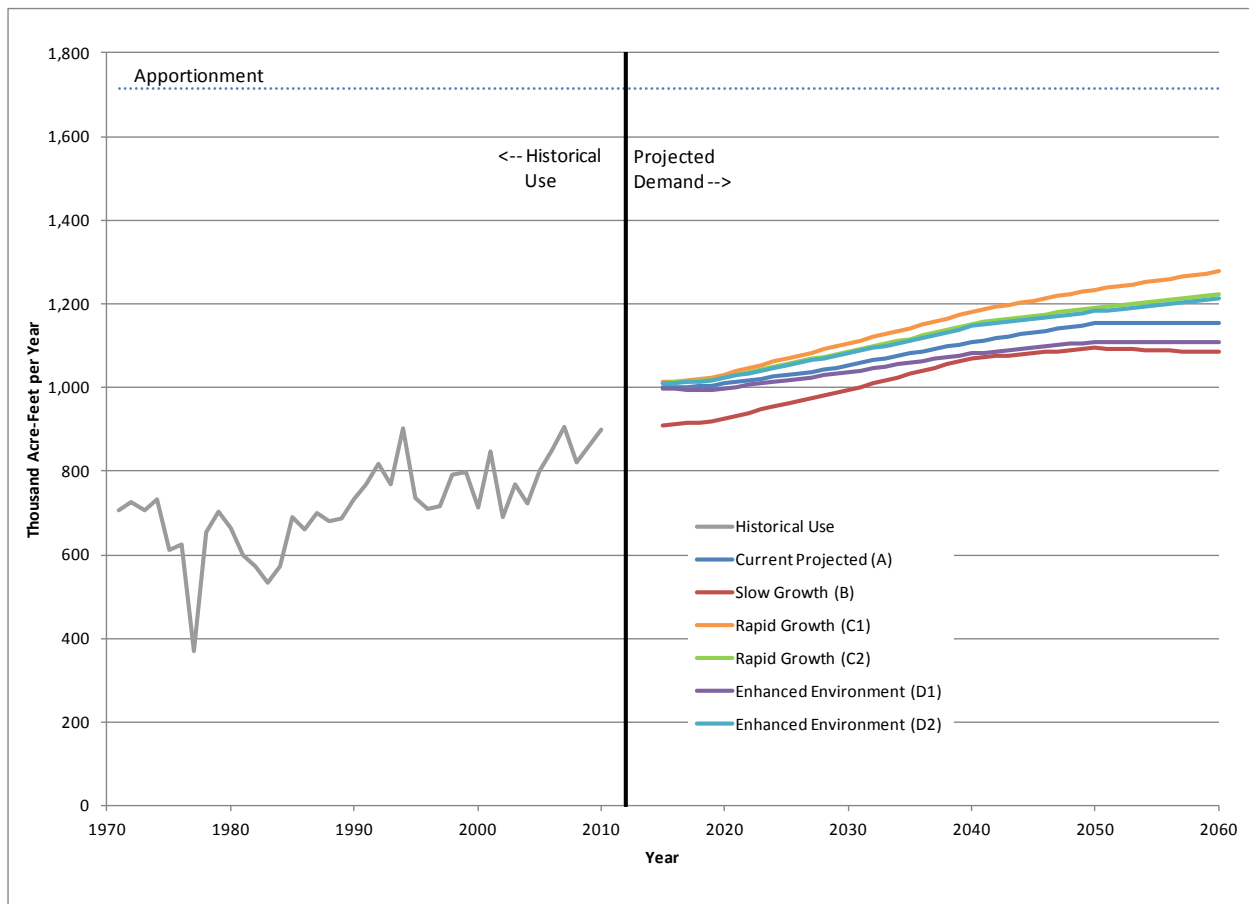


Panel two provides a view of the range across scenarios of Colorado River demand. Colorado River demand is calculated as Study Area demand minus other supplies. The Study and the results in this section focus on the resulting Colorado River demand. Colorado River demand² increases from 911 kaf in 2015 to between 1,084 and 1,277 kaf in 2060 (or 19 to 26 percent), depending on the scenario. This difference results in a Colorado River demand range of about 193 kaf across the scenarios in 2060 or about 18 percent.

Panel three shows how specific categories affect the projected change in Colorado River demand by scenario. Growth in M&I and tribal demands results in the greatest increase in demand.

Figure C4-3 ties historical water use to the range of Colorado River demand in the quantified scenarios. The 193 kaf range across scenarios in 2060 is easily discernible, with a relatively even spread over the range across the scenarios. In addition, it appears that the quantified scenarios track well with the peaks in historical uses that likely represent the least supply-limited conditions or actual demand.

FIGURE C4-3
Historical Use and Future Projected Demand Excluding Reservoir Evaporation¹



¹Reservoir evaporation on the order of 190 kaf is not included in this plot.

² Losses to reservoir evaporation are not part of this total.

3.2 Colorado River Water Demand by Geography

Colorado River water demand for areas served by the Colorado River is presented in figures C4-4 and C4-5. These figures show two geographic levels: Study Area in Utah, and individual planning areas. Demands at each geographic level are shown across the scenarios. The columns to the right show the Colorado River demand at a point in time (2015, 2035, or 2060) by relative contribution of the categories.

When demands by category are examined in figure C4-5, the mix of demand categories in the hydrologic basin and adjacent areas are different, with agricultural and tribal demand dominating the hydrologic basin and M&I demand dominating the adjacent areas.

Figure C4-6 shows the change in Colorado River demand by category from 2015 across the scenarios. The change in both magnitude and percentage change of Colorado River demand³ in Utah varies considerably across the planning area. The Uintah Basin shows the greatest magnitude, rate, and variability of overall growth in Colorado River demand from 2015 to 2060 across the scenarios, with between 2 and 115 kaf making up between 1 and 66 percent of the total growth in Utah. This growth comes primarily from tribal demands, and is partially offset in some scenarios by a decrease in agricultural demands. Demands for the Kanab Creek/Virgin River planning area are projected to grow by 74 kaf across all scenarios, with the growth primarily coming from increased population. Demands for the Wasatch Front, which are primarily M&I, have variable changes through time, ranging from a decrease of about 33 kaf (Slow Growth [B] scenario) to an increase of about 90 kaf (Rapid Growth [C1] scenario), while Study Area M&I demand increases across all scenarios in the Wasatch Front (the portion that is Colorado River demand decreases in some scenarios due to changing assumptions of other supplies).

3.3 Colorado River Demand by Category

3.3.1 Agricultural

Agricultural water demand is driven by irrigated acreage and water delivery per acre. Water delivery per acre is the amount of water diverted per irrigated acre. Components of this use include transmission and delivery losses (surface evaporation, riparian demand, and seepage), and on-farm losses that are made up of evaporation, crop irrigation requirements, and tail water (return). Each of these factors will vary by location (precipitation, growing season, etc.), irrigation method, and crop type.

Figure C4-7 presents the following by scenario in 2015, 2035, and 2060:

- Change in agricultural demand for Colorado River water
- Change in agricultural demand for Colorado River water by planning area
- Agricultural demand as a portion of Colorado River water demand (right hand side of graph)

³ Potential Colorado River demand is based on changes in parameters such as population, and for the purpose of the Study, is not limited by apportionment.

FIGURE C4-4
Colorado River Demand in Utah

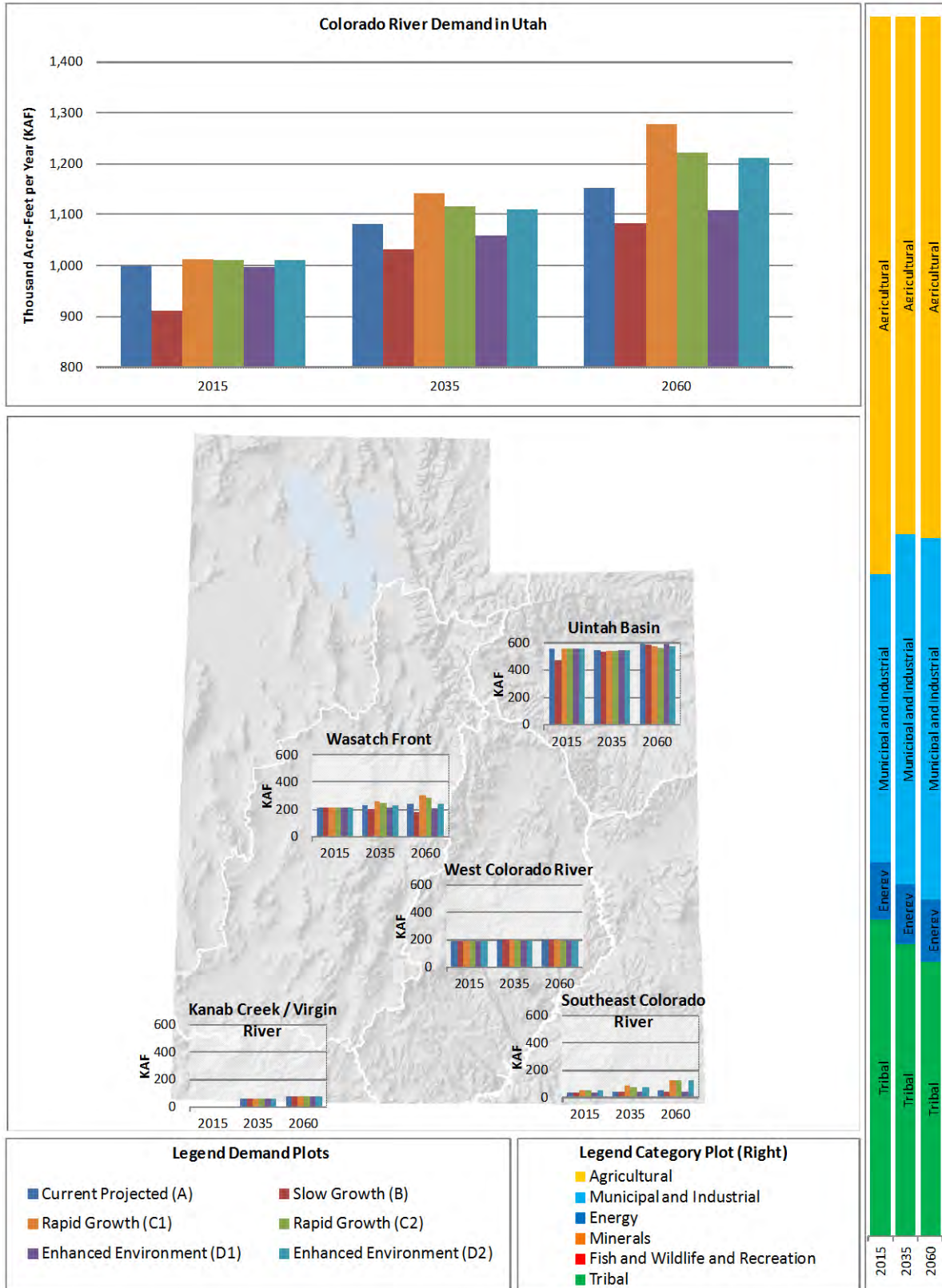


FIGURE C4-5
Colorado River Demand by Category

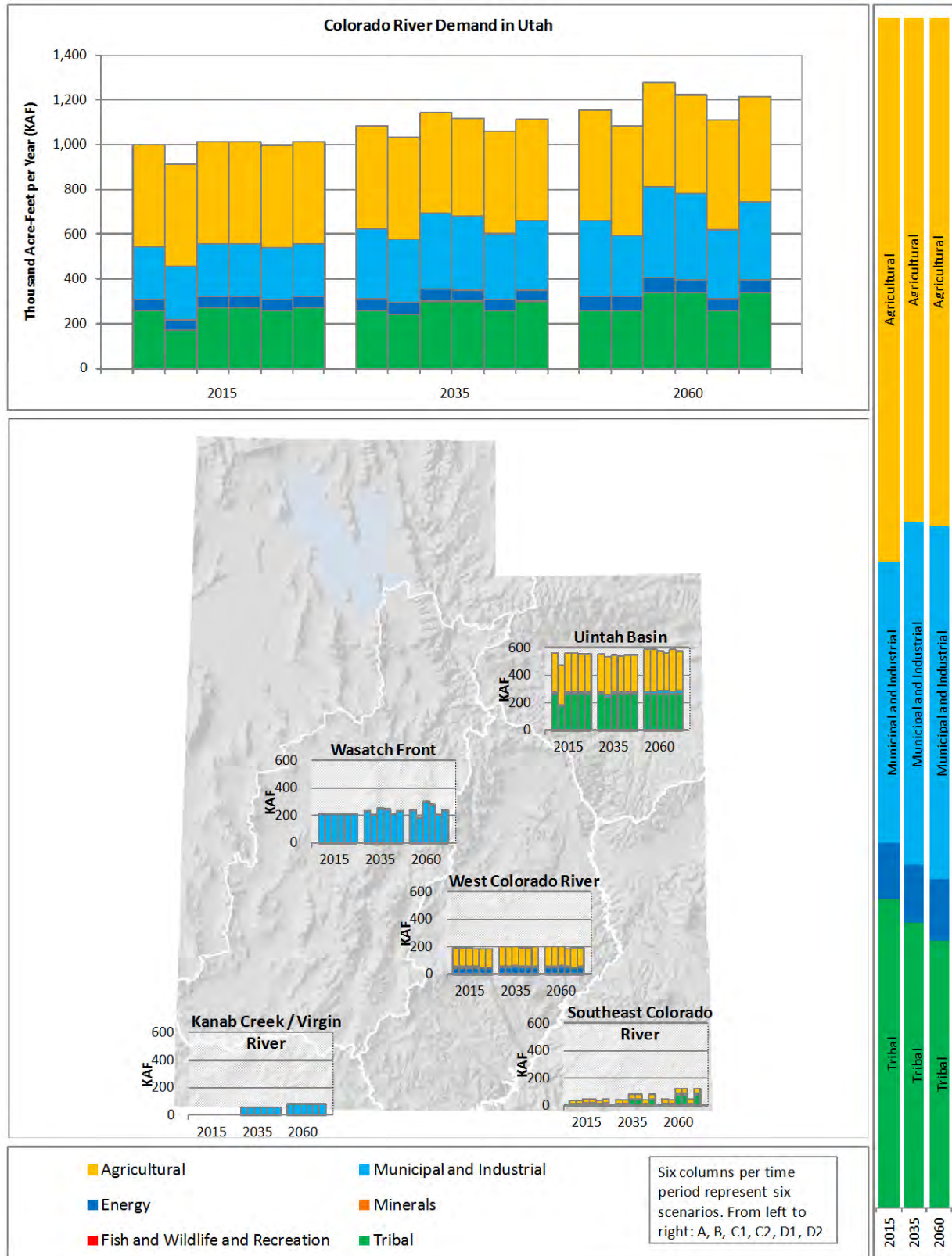


FIGURE C4-6
Change in Colorado River Demand in Utah from 2015 by Category

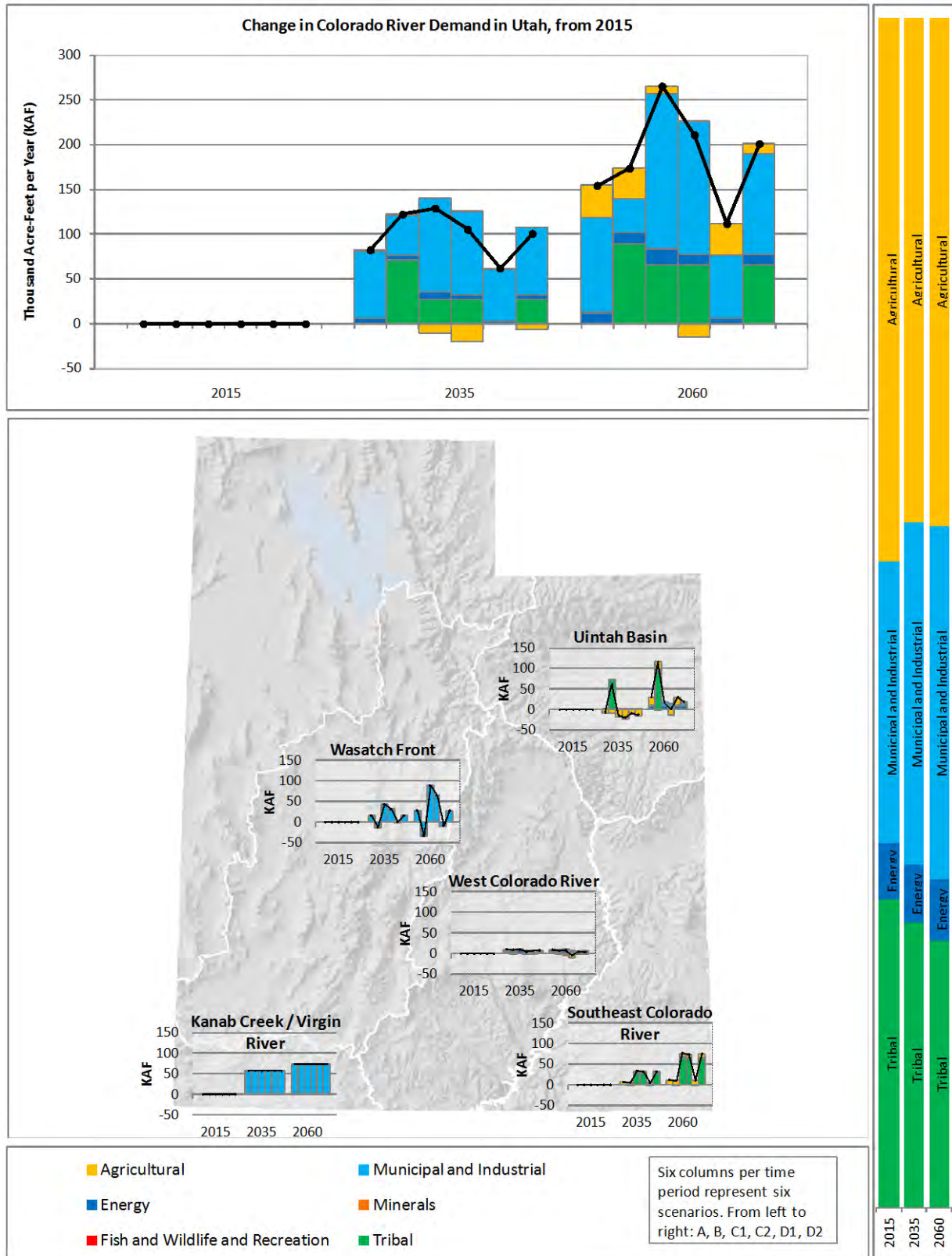
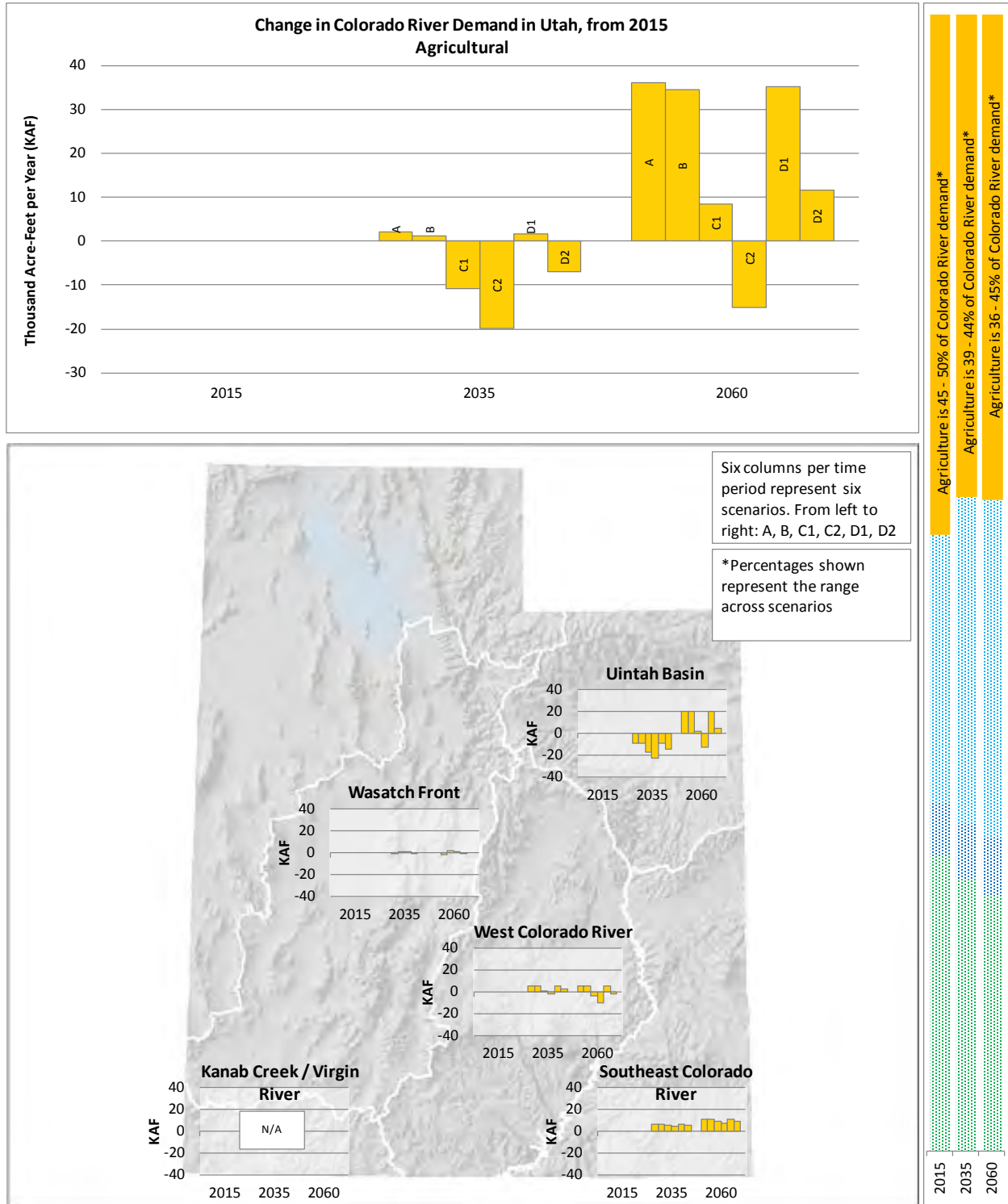


FIGURE C4-7
Change in Colorado River Demand in Utah from 2015 for Agriculture



As can be seen from figure C4-7, agricultural water demand is the largest component of Colorado River demand in Utah, dropping from about 50 percent in 2015 to between 36 and 45 percent of demand in 2060, depending on which scenario is considered. This drop results primarily from an increase in other categories of demand; agricultural demand increases or remains the same in all scenarios except the Rapid Growth (C2) scenario, in which it decreases.

For all scenarios, agricultural demand generally increases through time in Uintah and Southeast Colorado River planning areas. Agricultural demand increases or decreases depending on the scenario in the Wasatch Front and West Colorado River planning areas.

The drivers for change in agricultural demand vary across planning areas. Across all scenarios and all planning areas, irrigated acreage is forecast to decrease through time by varying amounts. In the Southeast Basin, the decrease in irrigated acreage is offset by an increase in applied water use, resulting in demand increasing through time across all scenarios. In the Uintah Basin, irrigated acreage increases by varying amounts across the scenarios. Increases in agricultural demand occur in the Current Projected (A), Slow Growth (B), Rapid Growth (C1), and Enhanced Environment (D1 and D2) scenarios due to increases in water delivery per acre. Decreased demand occurs in the Rapid Growth (C2) scenario where both irrigated acreage and water delivery per acre decrease.

A strong driver for loss of agricultural acreage is urbanization, leading to physical loss of acreage and market pressure for transfer of water rights. Increases in water delivery per acre are due to better delivery mechanisms or storage, allowing for more use of water on the same acreage in a given growing season.

3.3.2 Municipal and Industrial

M&I water demand can be estimated from population and M&I per capita water use; there is no self-served industrial demand in Utah in the scenarios examined. M&I per capita water use is a measure of the amount of water produced or diverted per person in a given municipality. Because this measure examines all water produced by a given municipality, it often includes industrial, commercial, and institutional demand as well as residential demand. A number of factors may influence the M&I per capita water use of a given community, including the amount of industrial demand, climate, number of institutional facilities, and number of visitors.

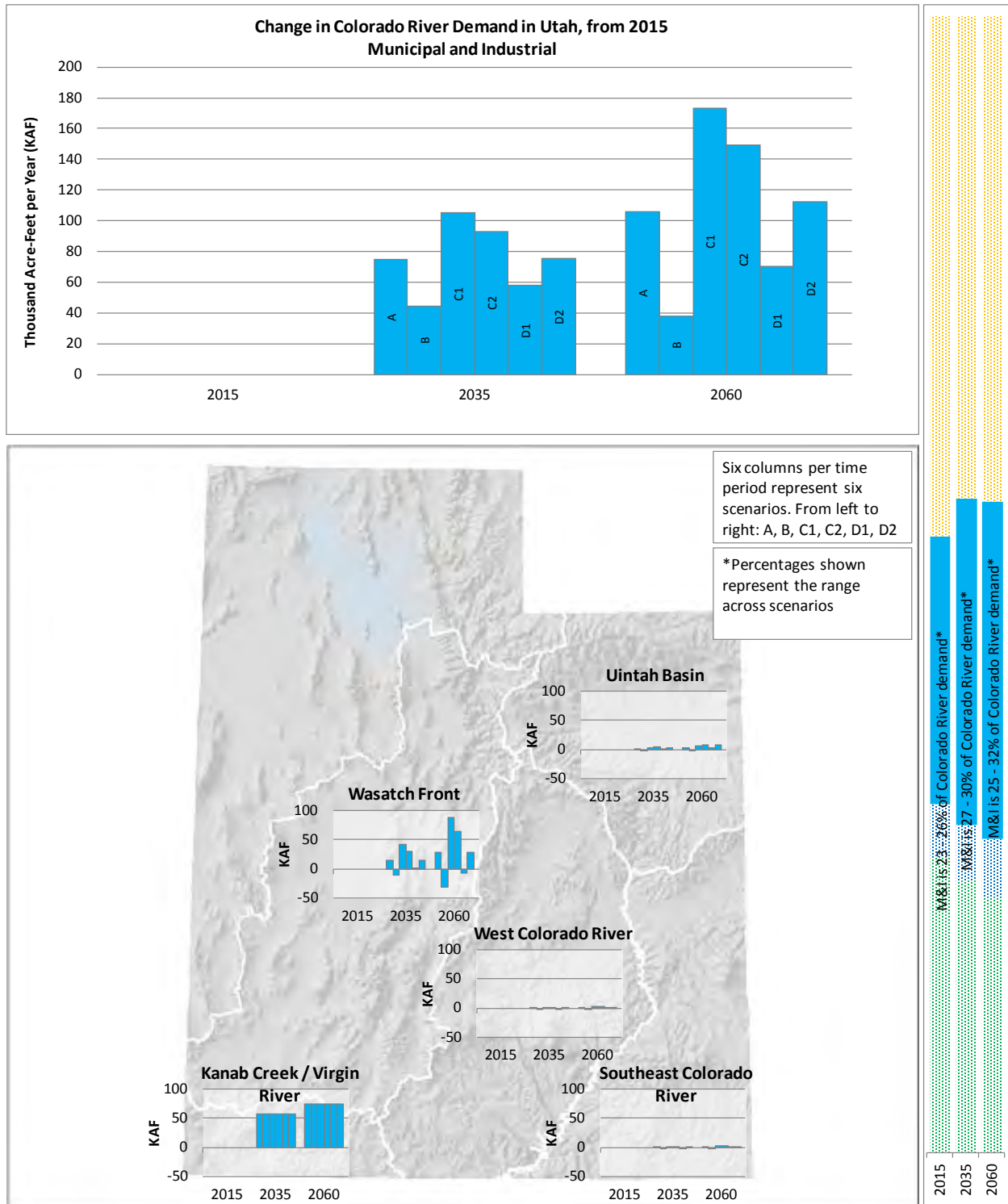
Figure C4-8 presents the following by scenario in 2015, 2035, and 2060:

- Change in M&I demand for Colorado River water in the Study Area
- Change in M&I demand for Colorado River water in individual planning areas
- M&I demand as a portion of Colorado River water demand (right hand side of graph)

As can be seen from figure C4-8, M&I water demand is the second largest component of Colorado River demand, changing from 26 percent in 2015 to between 25 and 32 percent of Colorado River demand in 2060, depending on which scenario is considered.

Colorado River demand for M&I use increases over time from 2015 to 2060 across all scenarios. The increase is primarily due to population increase as M&I per capita water use decreases over time across all scenarios.

FIGURE C4-8
Change in Colorado River Demand in Utah from 2015 for M&I



In examining the planning areas, the Kanab Creek/Virgin River and Wasatch Front planning areas make up the majority of increase in M&I demand for Colorado River water from 2015 to 2060. In the Kanab Creek/Virgin River planning area, the increase is relatively consistent across scenarios, and is primarily the result of increasing population. In the Wasatch Front planning area, population increases across all scenarios, but changes in assumptions of other supplies results in variable increases, and in some scenarios a decrease, in Colorado River demand.

Increases in population are somewhat tempered by decreases in M&I per capita water use in all scenarios, with reductions ranging from 14 to 25 percent by 2060.

3.3.3 Energy

Water demand for energy can be estimated through known plans for new power plants or through applying a per capita energy water use factor. Power facilities often serve areas remote from their locations and therefore potentially represent exports or imports of water from the Study Area to meet these distributed needs.

Figure C4-9 presents the following by scenario in 2015, 2035, and 2060:

- Change in energy demand for Colorado River water
- Change in energy demand for Colorado River water in individual planning areas
- Energy demand as a portion of Colorado River water demand (right hand side of graph)

As can be seen from figure C4-9, energy water demand is a relatively small fraction of Colorado River demand, making up about 5 percent of Colorado River demand through time, depending on which scenario is considered.

Energy demand for Colorado River water increases over time from 2015 to 2060 across all scenarios, with the greatest increase in the Rapid Growth (C1) scenario.

Energy demands are shown in the Uintah and West Colorado River planning areas. The Uintah Basin shows relatively consistent increases through time across scenarios of about 8 kaf. The West Colorado River planning area shows increases through time of 4 kaf for all scenarios except the Rapid Growth (C2) scenario, which shows an increase through time of 9 kaf.

3.3.4 Minerals Extraction

Minerals extraction is included in Utah's estimate of M&I demand discussed above. Utah's State Water Plan (DWR, 2001b), suggests that about 1,000 afy of the M&I demand is for minerals extraction.

3.3.5 Fish, Wildlife, and Recreation

There are no reported consumptive fish, wildlife, and recreation demands on Colorado River water in Utah under the scenarios analyzed for the Study.

3.3.6 Tribal

Tribal water demands were provided by the Ute Indian Tribe of the Uintah and Ouray Reservation and the Navajo Nation. The projected Navajo Nation demands were provided by the Navajo Nation Department of Water Resources and modified to fit the storyline narratives regarding tribal use under each scenario.

FIGURE C4-9
Change in Colorado River Demand in Utah from 2015 for Energy

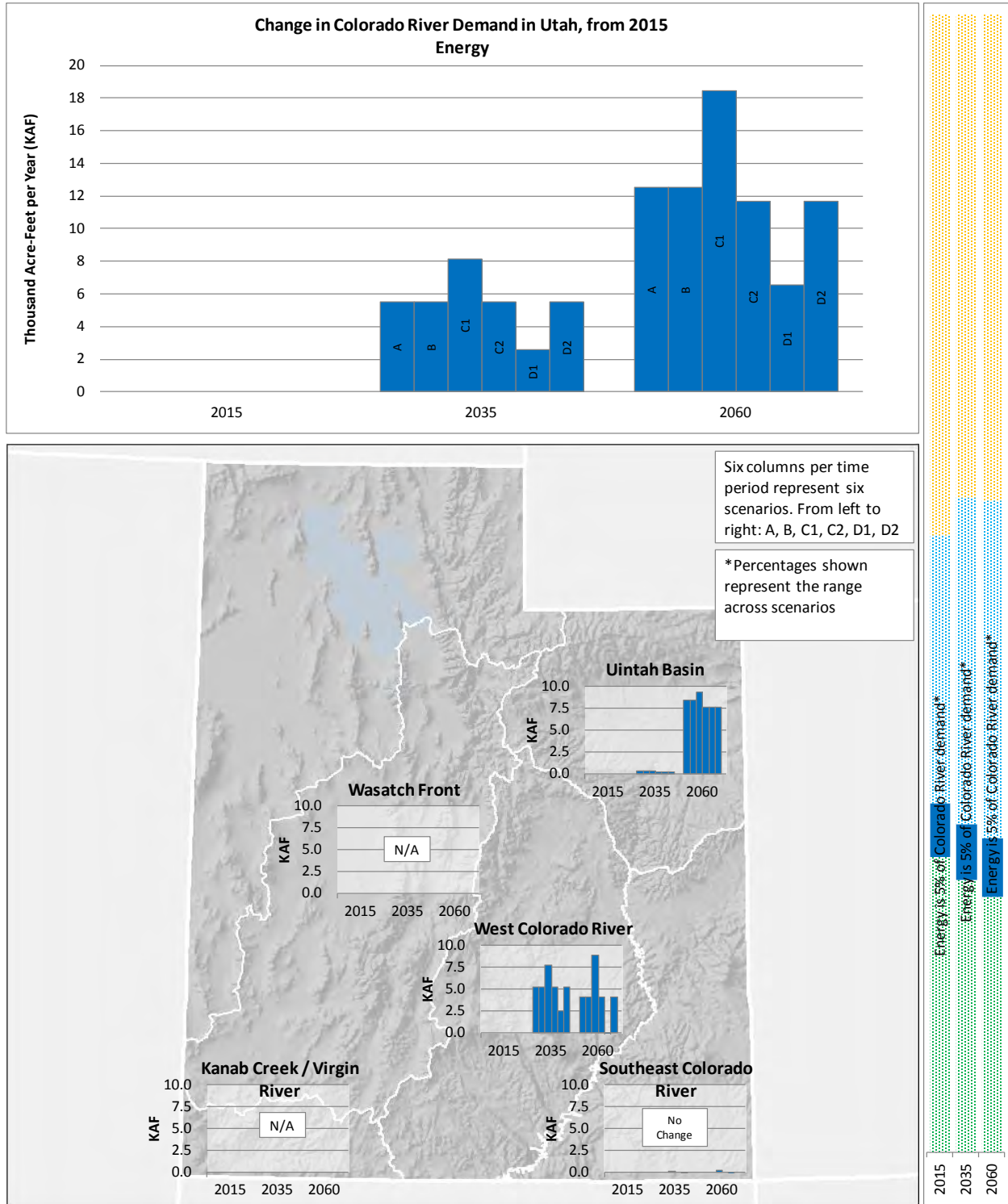


Figure C4-10 presents the following by scenario in 2015, 2035, and 2060:

- Change in tribal demand for Colorado River water
- Change in tribal demand for Colorado River water in individual planning area
- Tribal demand as a portion of Colorado River demand (right hand side of graph)

As can be seen from figure C4-10, tribal water demand slightly decreases as a component of Colorado River demand in Utah, from 27 percent in 2015 to between 22 and 28 percent of Colorado River demand in 2060, depending on which scenario is considered.

Colorado River tribal demand occurs in the Uintah Basin and Southeast Colorado River planning areas, and increases over time from 2015 to 2060 across all scenarios.

For additional information on tribal demands, see appendix C9.

3.4 Summary Tables of Parameters and Demands by Category

Tables C4-2 to C4-7 present the specific parameter data collected by planning area. Each table is a complete set of data for a given scenario. These data were used to develop Study Area demands and subsequently Colorado River demands once other supplies were considered. These tables provide the specific information used in the creation of the summary and category plots previously discussed and provide reference information for the data provided.

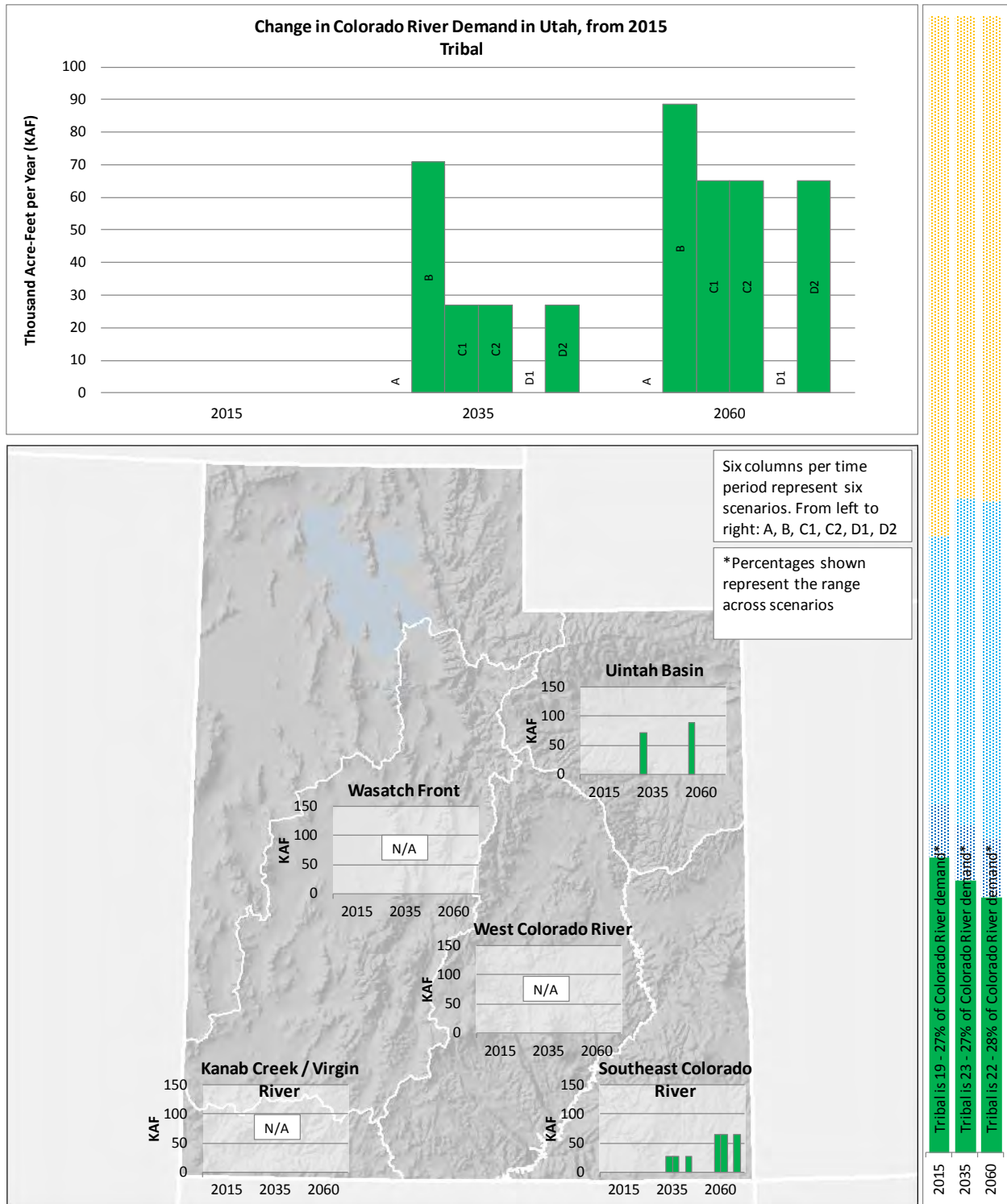
4.0 References

Utah Department of Natural Resources, Division of Water Resources (DWR). 2001a. *Utah's Water Resources Planning for the Future*.

Utah Department of Natural Resources, Division of Water Resources (DWR). 2001b. *State Water Plan*.

Utah Department of Natural Resources, Division of Water Resources (DWR). 2009. *State of Utah Municipal and Industrial Water Supply and Use Studies, Summary 2005*.

FIGURE C4-10
Change in Colorado River Demand in Utah from 2015 for Tribal



Colorado River Basin
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TABLE C4-2
Total Demand within Study Area under Current Projected (A) Scenario

		LEGEND: 999 From States 999 From State Plans 999 Calculated 999 From Study Team																		
Units are thousand acre feed per year, unless otherwise noted																				
Planning Area		Uintah Basin			Southeast Colorado River			West Colorado River			Kanab Creek / Virgin River			Wasatch Front			STATE TOTAL			
Hydrologic Basin	Year	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	Notes
Agricultural	Irrigated Acreage [thousands]	198	197	197	19	18	18	83	83	83	19	18	15				319	317	312	1
	Per-Acre Water Delivery (Diversion) [af/ac/yr]	2.90	2.82	3.12	2.93	3.61	4.20	3.27	3.41	3.42	4.56	4.36	4.55				3.10	3.10	3.33	
	Consumptive factor [%]	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%				50%	50%	50%	
	Demand (Consumptive)	287	278	307	27	33	38	137	142	142	43	39	33				494	491	520	3
Municipal and Industrial (M&I)	Population [thousands]	53	69	89	27	32	38	42	48	55	260	511	825				382	660	1,007	4
	M&I Per Capita Use (Diversion) [gpcd]	308	265	220	337	315	284	250	229	201	284	240	223				287	246	224	5
	Consumptive factor [%]	73%	73%	73%	56%	56%	56%	69%	69%	69%	44%	44%	44%				52%	50%	48%	6
	M&I Demand (Consumptive)	13	15	16	6	6	7	8	8	9	36	60	91				64	90	122	7, 8
Self Served Industrial Demand (Consumptive)		0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	
	Demand (Consumptive)	13	15	16	6	6	7	8	8	9	36	60	91				64	90	122	8
Energy	Demand (Consumptive)	0	0.3	8	2	2	2	45	50	49	0	0	0				47	53	60	9
Minerals	Demand (Consumptive)	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	10
Fish, Wildlife, and Recreation	Demand (Consumptive)	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	11
Tribal	Demand (Consumptive)	259	259	259	0	0	0	0	0	0	0	0	0				259	259	259	12
Total Hydrologic Basin	Demand (Consumptive)	560	552	590	35	42	47	189	200	199	79	99	124				864	893	960	
Adjacent Areas																				
Agricultural	Irrigated Acreage [thousands]													543	514	484	543	514	484	13
	Per-Acre Water Delivery (Diversion) [af/ac/yr]													2.85	2.62	2.56	2.85	2.62	2.56	
	Consumptive factor [%]													50%	50%	50%	50%	50%	50%	2
	Demand (Diversion)													1,547	1,349	1,240	1,547	1,349	1,240	14
	Demand (Consumptive)													773	675	620	773	675	620	
Municipal and Industrial (M&I)	Population [thousands]													2,006	2,837	3,941	2,006	2,837	3,941	15
	M&I Per Capita Use (Diversion) [gpcd]													323	303	285	323	303	285	16
	Consumptive factor [%]													59%	59%	59%	59%	59%	59%	17
	M&I Demand (Diversion)													726	963	1,260	726	963	1,260	
Self Served Industrial Demand (Diversion)														0	0	0	0	0	0	
	Demand (Diversion)													726	963	1,260	726	963	1,260	18
	Demand (Consumptive)													428	568	743	428	568	743	
Energy	Demand (Diversion)													0	0	0	0	0	0	
Minerals	Demand (Diversion)													0	0	0	0	0	0	
Fish, Wildlife, and Recreation	Demand (Diversion)													0	0	0	0	0	0	
Tribal	Demand (Diversion)													0	0	0	0	0	0	
Total Adjacent Areas	Demand (Diversion)													2,273	2,312	2,499	2,273	2,312	2,499	
Total Demand in the Study Area		560	552	590	35	42	47	189	200	199	79	99	124	2,273	2,312	2,499	3,136	3,206	3,460	19
Demand that may be met by Other Supplies		0	0	0	0	0	0	0	0	0	79	42	50	2,058	2,082	2,257	2,137	2,124	2,306	20
Potential Colorado River Demand		560	552	590	35	42	47	189	200	199	0	57	74	215	230	243	999	1,082	1,154	21
Agricultural	Colorado River Demand	287	278	307	27	33	38	137	142	142	0	0	0	6	6	6	457	459	493	22
Municipal and Industrial	Colorado River Demand	13	15	16	6	6	7	8	8	9	0	57	74	209	224	237	236	311	342	
Energy	Colorado River Demand	0	0.3	8	2	2	2	45	50	49	0	0	0	0	0	0	47	53	60	
Minerals	Colorado River Demand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Fish, Wildlife, and Recreation	Colorado River Demand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Tribal	Colorado River Demand	259	259	259	0	0	0	0	0	0	0	0	0	0	0	0	259	259	259	

Notes

- 1) No changes from Current Projected.
- 2) No changes from Current Projected per the regional trends matrix.
- 3) A 25 percent population decrease from Current Projected by 2060 was estimated based on regional trends (per census data).
- 4) No changes from Current Projected.
- 5) No changes from Current Projected.
- 6) No changes from Current Projected.
- 7) No changes from Current Projected.
- 8) No changes from Current Projected.
- 9) CRSS Demand Input Tool (DIT), 2011. Water users were delineated into UT basin planning areas based on location relative to CRSS nodes in DIT to obtain depletions. Demands based on Upper Colorado River Commission schedule dated 1/11/08.
- 10) No changes from Current Projected.
- 11) A two percent increase in 2035 and a five percent increase in 2060 from Current Projected was used per the regional trends matrix.
- 12) A 25 percent population decrease from Current Projected by 2060 was estimated based on regional trends (per census data).
- 13) No changes from Current Projected.
- 14) No changes from Current Projected.
- 15) No changes from Current Projected.
- 16) No changes from Current Projected.
- 17) No changes from Current Projected.
- 18) No changes from Current Projected.
- 19) Assume other sources are unchanged from Current Projected.
- 20) For Kanab/Virgin, all potential Colorado River demand is M&I (Lake Powell pipeline). For Wasatch Front, all Potential Colorado River Demand is M&I, except for one agricultural export. M&I is computed as total export minus agricultural user schedule.

Colorado River Basin
Water Supply and Demand Study

TABLE C4-3
Total Demand within Study Area under Slow Growth (B) Scenario

UTAH		LEGEND: 999 Input Parameter 999 Computed																		
Units are thousand acre-feet per year, unless otherwise noted		Planning Area			Southeast Colorado River			West Colorado River			Kanab Creek / Virgin River			Wasatch Front			STATE TOTAL			Notes
Hydrologic Basin	Year	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	
Agriculture	Irrigated Acreage [thousands]	198	197	197	19	18	18	83	83	83	19	18	15				319	317	312	1
	Per-Acre Water Delivery (Diversion) [af/ac/yr]	2.90	2.82	3.12	2.93	3.61	4.20	3.27	3.41	3.42	4.56	4.36	4.55				3.10	3.10	3.33	2
	Consumptive Factor [%]	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%				50%	50%	50%	
	Demand (Consumptive)	287	278	307	27	33	38	137	142	142	43	39	33				494	491	520	
Municipal and Industrial (M&I)	Population [thousands]	53	61	67	27	28	29	42	42	41	260	450	619				382	581	755	3
	M&I Per Capita Use (Diversion) [gpcd]	308	265	220	337	315	284	250	229	201	284	240	223				287	246	224	4
	Consumptive factor [%]	73%	73%	73%	56%	56%	56%	69%	69%	69%	44%	44%	44%				52%	50%	48%	
	M&I Demand (Consumptive)	13	13	12	6	6	5	8	7	6	36	53	68				64	79	91	
	Self Served Industrial Demand (Consumptive)	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	5
Demand (Consumptive)	13	13	12	6	6	5	8	7	6	36	53	68				64	79	91		
Energy	Demand (Consumptive)	0	0	8	2	2	2	45	50	49	0	0	0				47	53	60	6
Minerals	Demand (Consumptive)	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	7
Fish, Wildlife, and Recreation	Demand (Consumptive)	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	8
Tribal	Demand (Consumptive)	170	241	259	0	0	0	0	0	0	0	0	0				170	241	259	9
Total Hydrologic Basin	Demand (Consumptive)	471	533	586	35	41	45	189	199	197	79	92	101	0	0	0	775	865	930	
Adjacent Areas																				
Agriculture	Irrigated Acreage [thousands]										543	514	484				543	514	484	10
	Per-Acre Water Delivery (Diversion) [af/ac/yr]										2.85	2.68	2.69				2.85	2.68	2.69	11
	Consumptive factor [%]										50%	50%	50%				50%	50%	50%	
	Demand (Diversion)										1,547	1,376	1,302				1,547	1,376	1,302	
Demand (Consumptive)										773	688	651				773	688	651		
Municipal and Industrial (M&I)	Population [thousands]										2,006	2,497	2,955				2,006	2,497	2,955	12
	M&I Per Capita Use (Diversion) [gpcd]										323	303	285				323	303	285	13
	Consumptive factor [%]										59%	59%	59%				59%	59%	59%	
	M&I Demand (Diversion)										726	848	945				726	848	945	
	Self Served Industrial Demand (Diversion)										0	0	0				0	0	0	14
Demand (Diversion)										726	848	945				726	848	945		
Demand (Consumptive)										428	500	557				428	500	557		
Energy	Demand (Diversion)										0	0	0				0	0	0	15
Minerals	Demand (Diversion)										0	0	0				0	0	0	16
Fish, Wildlife, and Recreation	Demand (Diversion)										0	0	0				0	0	0	17
Tribal	Demand (Diversion)										0	0	0				0	0	0	18
Total Adjacent Areas	Demand (Diversion)	0	0	0	0	0	0	0	0	0	0	0	0	2,273	2,224	2,246	2,273	2,224	2,246	
Total Demand in the Study Area		471	533	586	35	41	45	189	199	197	79	92	101	2,273	2,224	2,246	3,048	3,089	3,176	
Demand that may be met by Other Supplies		0	0	0	0	0	0	0	0	0	79	35	27	2,058	2,021	2,065	2,137	2,056	2,092	19
Potential Colorado River Demand		471	533	586	35	41	45	189	199	197	0	57	74	215	203	181	911	1,033	1,084	
Agricultural	Colorado River Demand	287	278	307	27	33	38	137	142	142	0	0	0	6	6	5	457	458	492	20
Municipal and Industrial	Colorado River Demand	13	13	12	6	6	5	8	7	6	0	57	74	209	197	177	236	280	274	
Energy	Colorado River Demand	0	0	8	2	2	2	45	50	49	0	0	0	0	0	0	47	53	60	
Minerals	Colorado River Demand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Fish, Wildlife, and Recreation	Colorado River Demand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Tribal	Colorado River Demand	170	241	259	0	0	0	0	0	0	0	0	0	0	0	0	170	241	259	

Notes

- 1) No changes from Current Projected.
- 2) No changes from Current Projected per the regional trends matrix.
- 3) A 25 percent population decrease from Current Projected by 2060 was estimated based on regional trends (per census data).
- 4) No changes from Current Projected.
- 5) No changes from Current Projected.
- 6) No changes from Current Projected.
- 7) No changes from Current Projected.
- 8) No changes from Current Projected.
- 9) CRSS DIT, 2011. Water users were delineated into UT basin planning areas based on location relative to CRSS nodes in DIT to obtain depletions. Demands based on Upper Colorado River Commission schedule dated 1/11/08.
- 10) No changes from Current Projected.
- 11) A 2 percent increase in 2035 and a 5 percent increase in 2060 from Current Projected was used per the regional trends matrix.
- 12) A 25 percent population decrease from Current Projected by 2060 was estimated based on regional trends (per census data).
- 13) No changes from Current Projected.
- 14) No changes from Current Projected.
- 15) No changes from Current Projected.
- 16) No changes from Current Projected.
- 17) No changes from Current Projected.
- 18) No changes from Current Projected.
- 19) Assume other sources are unchanged from Current Projected.
- 20) For Kanab/Virgin, all potential Colorado River demand is M&I (Lake Powell pipeline). For Wasatch Front, all potential Colorado River demand is M&I, except for one agricultural export. M&I is computed as total export minus agricultural user schedule.

Colorado River Basin
Water Supply and Demand Study

TABLE C4-4
Total Demand within Study Area under Rapid Growth (C1) Scenario

UTAH		LEGEND: 999 Input Parameter 999 From Current Projected Data Sheet																		
Units are thousand acre-feet per year, unless otherwise noted																				
Hydrologic Basin	Planning Area	Uintah Basin			Southeast Colorado River			West Colorado River			Kanab Creek / Virgin River			Wasatch Front			STATE TOTAL			Notes
		2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	
Agriculture	Irrigated Acreage [thousands]	198	191	185	19	18	17	83	81	78	19	17	14				319	307	293	1
	Per-Acre Water Delivery (Diversion) [af/ac/yr]	2.90	2.82	3.12	2.93	3.61	4.20	3.27	3.41	3.42	4.56	4.36	4.55				3.10	3.10	3.33	2
	Consumptive Factor [%]	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%				50%	50%	50%	
	Demand (Consumptive)	287	270	289	27	32	36	137	137	133	43	37	31				494	477	489	
Municipal and Industrial (M&I)	Population [thousands]	53	77	111	27	36	48	42	53	68	260	572	1,031				382	739	1,258	3
	M&I Per Capita Use (Diversion) [gpcd]	308	265	220	337	315	284	250	229	201	284	240	223				287	246	224	4
	Consumptive factor [%]	73%	73%	73%	56%	56%	56%	69%	69%	69%	44%	44%	44%				52%	50%	48%	
	M&I Demand (Consumptive)	13	17	20	6	7	9	8	9	11	36	68	113				64	101	152	
	Self Served Industrial Demand (Consumptive)	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	5
	Demand (Consumptive)	13	17	20	6	7	9	8	9	11	36	68	113				64	101	152	
Energy	Demand (Consumptive)	0	0	9	2	2	2	45	53	54	0	0	0				47	55	66	6
Minerals	Demand (Consumptive)	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	7
Fish, Wildlife, and Recreation	Demand (Consumptive)	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	8
Tribal	Demand (Consumptive)	259	259	259	13	40	78	0	0	0	0	0	0				272	299	337	9
Total Hydrologic Basin	Demand (Consumptive)	560	546	577	48	82	125	189	199	198	79	105	144	0	0	0	877	932	1,044	
Adjacent Areas																				
Agriculture	Irrigated Acreage [thousands]													543	499	455	543	499	455	10
	Per-Acre Water Delivery (Diversion) [af/ac/yr]													2.85	2.62	2.56	2.85	2.62	2.56	11
	Consumptive factor [%]													50%	50%	50%	50%	50%	50%	
	Demand (Diversion)													1,547	1,309	1,165	1,547	1,309	1,165	
	Demand (Consumptive)													773	654	583	773	654	583	
Municipal and Industrial (M&I)	Population [thousands]													2,006	3,178	4,926	2,006	3,178	4,926	12
	M&I Per Capita Use (Diversion) [gpcd]													323	303	285	323	303	285	13
	Consumptive factor [%]													59%	59%	59%	59%	59%	59%	
	M&I Demand (Diversion)													726	1,079	1,575	726	1,079	1,575	
	Self Served Industrial Demand (Diversion)													0	0	0	0	0	0	14
	Demand (Diversion)													726	1,079	1,575	726	1,079	1,575	
	Demand (Consumptive)													428	637	929	428	637	929	
Energy	Demand (Diversion)													0	0	0	0	0	0	15
Minerals	Demand (Diversion)													0	0	0	0	0	0	16
Fish, Wildlife, and Recreation	Demand (Diversion)													0	0	0	0	0	0	17
Tribal	Demand (Diversion)													0	0	0	0	0	0	18
Total Adjacent Areas	Demand (Diversion)	0	0	0	0	0	0	0	0	0	0	0	0	2,273	2,388	2,740	2,273	2,388	2,740	
Total Demand in the Study Area		560	546	577	48	82	125	189	199	198	79	105	144	2,273	2,388	2,740	3,149	3,319	3,784	
Demand that may be met by Other Supplies		0	0	0	0	0	0	0	0	0	79	48	70	2,058	2,130	2,436	2,137	2,178	2,506	19
Potential Colorado River Demand		560	546	577	48	82	125	189	199	198	0	57	74	215	258	304	1,012	1,141	1,277	
Agricultural	Colorado River Demand	287	270	289	27	32	36	137	137	133	0	0	0	6	7	8	457	446	466	20
Municipal and Industrial	Colorado River Demand	13	17	20	6	7	9	8	9	11	0	57	74	209	250	296	236	341	409	
Energy	Colorado River Demand	0	0	9	2	2	2	45	53	54	0	0	0	0	0	0	47	55	66	
Minerals	Colorado River Demand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Fish, Wildlife, and Recreation	Colorado River Demand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Tribal	Colorado River Demand	259	259	259	13	40	78	0	0	0	0	0	0	0	0	0	272	299	337	

Notes

- 1) Estimates are within regional trends range, but less than twice the passive, Current Projected, rate.
- 2) No changes from Current Projected.
- 3) A 25 percent population increase from Current Projected by 2060 was estimated based on regional trends (per census data).
- 4) No changes from Current Projected.
- 5) No changes from Current Projected.
- 6) Assume 10 percent increase relative to Current Projected by 2060. Increased demand is not offset by new technology.
- 7) No changes from Current Projected.
- 8) No changes from Current Projected.
- 9) Uintah: No changes from Current Projected; Southeast Colorado: personal communication, Navajo Nation, Apr. 16, 2012.
- 10) Estimates are within regional trends range, but less than twice the passive, Current Projected, rate.
- 11) No changes from Current Projected.
- 12) A 25 percent population increase from Current Projected by 2060 was estimated based on regional trends (per census data).
- 13) No changes from Current Projected.
- 14) No changes from Current Projected.
- 15) Assume 10 percent increased demand from Current Projected by 2060 is not offset by new technology.
- 16) No changes from Current Projected.
- 17) No changes from Current Projected.
- 18) No changes from Current Projected.
- 19) Assume other sources are unchanged from Current Projected.
- 20) For Kanab/Virgin, all potential Colorado River demand is M&I (Lake Powell pipeline). For Wasatch Front, all potential Colorado River demand is M&I, except for one agricultural export. M&I is computed as total export minus agricultural user schedule.

Colorado River Basin
Water Supply and Demand Study

TABLE C4-5
Total Demand within Study Area under Rapid Growth (C2) Scenario

UTAH		LEGEND: 999 Input Parameter 999 From Current Projected Data Sheet																		
Units are thousand acre-feet per year, unless otherwise noted																				
Hydrologic Basin	Planning Area	Uintah Basin			Southeast Colorado River			West Colorado River			Kanab Creek / Virgin River			Wasatch Front			STATE TOTAL			Notes
		2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	
Agriculture	Irrigated Acreage [thousands]	198	191	185	19	18	17	83	81	78	19	17	14				319	307	293	1
	Per-Acre Water Delivery (Diversion) [af/ac/yr]	2.90	2.76	2.97	2.93	3.54	3.99	3.27	3.34	3.25	4.56	4.27	4.33				3.10	3.04	3.16	2
	Consumptive Factor [%]	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%				50%	50%	50%	
	Demand (Consumptive)	287	264	274	27	31	34	137	135	127	43	37	29				494	467	464	
Municipal and Industrial (M&I)	Population [thousands]	53	77	111	27	36	48	42	53	68	260	572	1,031				382	739	1,258	3
	M&I Per Capita Use (Diversion) [gpcd]	301	263	220	325	284	258	234	204	186	284	240	223				284	242	222	4
	Consumptive factor [%]	73%	73%	73%	56%	56%	56%	69%	69%	69%	44%	44%	44%				52%	50%	48%	
	M&I Demand (Consumptive)	13	17	20	6	6	8	8	8	10	36	68	113				63	99	151	
	Self Served Industrial Demand (Consumptive)	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	5
	Demand (Consumptive)	13	17	20	6	6	8	8	8	10	36	68	113				63	99	151	
Energy	Demand (Consumptive)	0	0	8	2	2	2	45	50	49	0	0	0				47	53	59	6a, 6b
Minerals	Demand (Consumptive)	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	7
Fish, Wildlife, and Recreation	Demand (Consumptive)	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	8
Tribal	Demand (Consumptive)	259	259	259	13	40	78	0	0	0	0	0	0				272	299	337	9
Total Hydrologic Basin	Demand (Consumptive)	559	540	561	48	80	122	189	193	185	79	104	143				876	918	1,011	
Adjacent Areas																				
Agriculture	Irrigated Acreage [thousands]													543	499	455	543	499	455	10
	Per-Acre Water Delivery (Diversion) [af/ac/yr]													2.85	2.41	2.05	2.85	2.41	2.05	11
	Consumptive factor [%]													50%	50%	50%	50%	50%	50%	
	Demand (Diversion)													1,547	1,204	932	1,547	1,204	932	
	Demand (Consumptive)													773	602	466	773	602	466	
Municipal and Industrial (M&I)	Population [thousands]													2,006	3,178	4,926	2,006	3,178	4,926	12
	M&I Per Capita Use (Diversion) [gpcd]													311	273	247	311	273	247	13
	Consumptive factor [%]													59%	59%	59%	59%	59%	59%	
	M&I Demand (Diversion)													699	972	1,364	699	972	1,364	
	Self Served Industrial Demand (Diversion)													0	0	0	0	0	0	14
	Demand (Diversion)													699	972	1,364	699	972	1,364	
Energy	Demand (Diversion)													413	573	805	413	573	805	15
Minerals	Demand (Diversion)													0	0	0	0	0	0	16
Fish, Wildlife, and Recreation	Demand (Diversion)													0	0	0	0	0	0	17
Tribal	Demand (Diversion)													0	0	0	0	0	0	18
Total Adjacent Areas	Demand (Diversion)	0	0	0	0	0	0	0	0	0	0	0	0	2,246	2,176	2,296	2,246	2,176	2,296	
Total Demand in the Study Area		559	540	561	48	80	122	189	193	185	79	104	143	2,246	2,176	2,296	3,121	3,094	3,307	
Demand that may be met by Other Supplies		0	0	0	0	0	0	0	0	0	79	47	69	2,031	1,930	2,016	2,110	1,977	2,085	19
Potential Colorado River Demand		559	540	561	48	80	122	189	193	185	0	57	74	215	246	280	1,011	1,116	1,222	
Agricultural	Colorado River Demand	287	264	274	27	31	34	137	135	127	0	0	0	6	7	7	457	437	442	20
Municipal and Industrial	Colorado River Demand	13	17	20	6	6	8	8	8	10	0	57	74	209	239	273	235	328	384	
Energy	Colorado River Demand	0	0.2	8	2	2	2	45	50	49	0	0	0	0	0	0	47	53	59	
Minerals	Colorado River Demand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Fish, Wildlife, and Recreation	Colorado River Demand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Tribal	Colorado River Demand	259	259	259	13	40	78	0	0	0	0	0	0	0	0	0	272	299	337	

Notes

- 1) Estimates are within regional trends range, but less than twice the passive, Current Projected rate.
- 2) Five percent decrease from Current Projected by 2060 based on regional trends matrix.
- 3) A 25 percent population increase from Current Projected by 2060 was estimated based on regional trends (per census data).
- 4) Assume 12.5 percent reduction in 2020 and 25 percent reduction by 2050 (relative to actual 2011 use) and stable trends after 2050.
- 5) No changes from Current Projected.
- 6a) Uintah Basin: Assume 10 percent decreased demand from Current Projected by 2060 due to new technology.
- 6b) Assume increased demand from Current Projected is offset by new technology in the Southeast Colorado River and West Colorado River planning areas.
- 7) No changes from Current Projected.
- 8) No changes from Current Projected.
- 9) Uintah: No changes from Current Projected; Southeast Colorado: personal communication, Navajo Nation, Apr. 16, 2012.
- 10) Estimates are within regional trends range, but less than twice the passive, Current Projected rate.
- 11) Twenty percent decrease from Current Projected by 2060 based on regional trends matrix.
- 12) A 25 percent population increase from Current Projected by 2060 was estimated based on regional trends (per census data).
- 13) Assume 12.5 percent reduction in 2020 and 25 percent reduction by 2050 (relative to actual 2011 use) and stable trends after 2050.
- 14) No changes from Current Projected.
- 15) No changes from Current Projected.
- 16) No changes from Current Projected.
- 17) No changes from Current Projected.
- 18) No changes from Current Projected.
- 19) Assume other sources are unchanged from Current Projected.
- 20) For Kanab/Virgin, all potential Colorado River demand is M&I (Lake Powell pipeline). For Wasatch Front, all potential Colorado River demand is M&I, except for one agricultural export. M&I is computed as total export minus agricultural user schedule.

Colorado River Basin
Water Supply and Demand Study

TABLE C4-6
Total Demand within Study Area under Enhanced Environment (D1) Scenario

UTAH		LEGEND: 999 Input Parameter 999 From Current Projected Data Sheet																		
Units are thousand acre-feet per year, unless otherwise noted																				
Hydrologic Basin	Planning Area	Uintah Basin			Southeast Colorado River			West Colorado River			Kanab Creek / Virgin River			Wasatch Front			STATE TOTAL			Notes
	Year	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	
Agriculture	Irrigated Acreage [thousands]	198	197	197	19	18	18	83	83	83	19	18	15				319	317	312	1
	Per-Acre Water Delivery (Diversion) [af/ac/yr]	2.90	2.82	3.12	2.93	3.61	4.20	3.27	3.41	3.42	4.56	4.36	4.55				3.10	3.10	3.33	2
	Consumptive Factor [%]	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%				50%	50%	50%	
	Demand (Consumptive)	287	278	307	27	33	38	137	142	142	43	39	33				494	491	520	
Municipal and Industrial (M&I)	Population [thousands]	53	69	89	27	32	38	42	48	55	260	511	825				382	660	1,007	3
	M&I Per Capita Use (Diversion) [gpcd]	293	239	220	316	258	245	227	185	176	281	229	217				279	228	216	4
	Consumptive factor [%]	73%	73%	73%	56%	56%	56%	69%	69%	69%	44%	44%	44%				51%	49%	48%	
	M&I Demand (Consumptive)	13	14	16	5	5	6	7	7	7	36	58	88				61	83	118	
	Self Served Industrial Demand (Consumptive)	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	5
	Demand (Consumptive)	13	14	16	5	5	6	7	7	7	36	58	88				61	83	118	
Energy	Demand (Consumptive)	0	0	8	2	2	2	45	47	44	0	0	0				47	50	54	6a, 6b
Minerals	Demand (Consumptive)	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	7
Fish, Wildlife, and Recreation	Demand (Consumptive)	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	8
Tribal	Demand (Consumptive)	259	259	259	0	0	0	0	0	0	0	0	0				259	259	259	9
Total Hydrologic Basin	Demand (Consumptive)	559	551	590	35	40	46	189	196	193	79	96	121	0	0	0	861	883	950	
Adjacent Areas																				
Agriculture	Irrigated Acreage [thousands]										543	514	484				543	514	484	10
	Per-Acre Water Delivery (Diversion) [af/ac/yr]										2.85	2.62	2.56				2.85	2.62	2.56	11
	Consumptive factor [%]										50%	50%	50%				50%	50%	50%	
	Demand (Diversion)										1,547	1,349	1,240				1,547	1,349	1,240	
	Demand (Consumptive)										773	675	620				773	675	620	
Municipal and Industrial (M&I)	Population [thousands]										2,006	2,837	3,941				2,006	2,837	3,941	12
	M&I Per Capita Use (Diversion) [gpcd]										303	247	235				303	247	235	13
	Consumptive factor [%]										59%	59%	59%				59%	59%	59%	
	M&I Demand (Diversion)										681	785	1,037				681	785	1,037	
	Self Served Industrial Demand (Diversion)										0	0	0				0	0	0	14
	Demand (Diversion)										681	785	1,037				681	785	1,037	
	Demand (Consumptive)										402	463	612				402	463	612	
Energy	Demand (Diversion)										0	0	0				0	0	0	15
Minerals	Demand (Diversion)										0	0	0				0	0	0	16
Fish, Wildlife, and Recreation	Demand (Diversion)										0	0	0				0	0	0	17
Tribal	Demand (Diversion)										0	0	0				0	0	0	18
Total Adjacent Areas	Demand (Diversion)	0	0	0	0	0	0	0	0	0	0	0	0	2,228	2,134	2,276	2,228	2,134	2,276	
Total Demand in the Study Area		559	551	590	35	40	46	189	196	193	79	96	121	2,228	2,134	2,276	3,089	3,017	3,226	
Demand that may be met by Other Supplies		0	0	0	0	0	0	0	0	0	79	39	47	2,013	1,919	2,070	2,092	1,958	2	19
Potential Colorado River Demand		559	551	590	35	40	46	189	196	193	0	57	74	215	215	206	997	1,059	1,109	
Agricultural	Colorado River Demand	287	278	307	27	33	38	137	142	142	0	0	0	6	6	5	457	459	492	20
Municipal and Industrial	Colorado River Demand	13	14	16	5	5	6	7	7	7	0	57	74	209	209	201	234	292	304	
Energy	Colorado River Demand	0	0.2	8	2	2	2	45	47	44	0	0	0	0	0	0	47	50	54	
Minerals	Colorado River Demand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Fish, Wildlife, and Recreation	Colorado River Demand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Tribal	Colorado River Demand	259	259	259	0	0	0	0	0	0	0	0	0	0	0	0	259	259	259	

Notes

- 1) No changes from Current Projected.
- 2) No changes from Current Projected.
- 3) No changes from Current Projected.
- 4) Assume 16 percent reduction in 2020 and 25 percent reduction by 2035 (relative to actual 2011 use) and two percent reduction per decade after 2035.
- 5) No changes from Current Projected.
- 6a) Uintah Basin: Assume 10 percent decreased demand from Current Projected by 2060 due to new technology.
- 6b) Assume increased demand from Current Projected is offset by new technology in the Southeast Colorado River and West Colorado River planning areas.
- 7) No changes from Current Projected.
- 8) No changes from Current Projected.
- 9) No changes from Current Projected.
- 10) No changes from Current Projected.
- 11) Twenty percent decrease from Current Projected by 2060 based on regional trends matrix.
- 12) No changes from Current Projected.
- 13) Assume 16 percent reduction in 2020 and 25 percent reduction by 2035 (relative to actual 2011 use) and 2 percent reduction per decade after 2035.
- 14) No changes from Current Projected.
- 15) No changes from Current Projected.
- 16) No changes from Current Projected.
- 17) No changes from Current Projected.
- 18) No changes from Current Projected.
- 19) Assume other sources are unchanged from Current Projected.
- 20) For Kanab/Virgin, all potential Colorado River demand is M&I (Lake Powell pipeline). For Wasatch Front, all potential Colorado River demand is M&I, except for one agricultural export. M&I is computed as total export minus agricultural user schedule.

Colorado River Basin
Water Supply and Demand Study

TABLE C4-7
Total Demand within Study Area under Enhanced Environment (D2) Scenario

UTAH		LEGEND: 999 Input Parameter 999 From Current Projected Data Sheet																		
Units are thousand acre-feet per year, unless otherwise noted																				
Hydrologic Basin	Planning Area Year	Uintah Basin			Southeast Colorado River			West Colorado River			Kanab Creek / Virgin River			Wasatch Front			STATE TOTAL			Notes
		2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	2015	2035	2060	
Agriculture	Irrigated Acreage [thousands]	198	197	197	19	18	18	83	83	83	19	18	15				319	317	312	1
	Per-Acre Water Delivery (Diversion) [af/ac/yr]	2.90	2.76	2.97	2.93	3.54	3.99	3.27	3.34	3.25	4.56	4.27	4.33				3.10	3.04	3.16	2
	Consumptive Factor [%]	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%				50%	50%	50%	
	Demand (Consumptive)	287	273	292	27	32	36	137	139	135	43	38	31				494	482	494	
Municipal and Industrial (M&I)	Population [thousands]	53	77	111	27	36	48	42	53	68	260	572	1,031				382	739	1,258	3
	M&I Per Capita Use (Diversion) [gpcd]	293	239	220	316	258	238	227	185	171	281	229	212				279	228	211	4
	Consumptive factor [%]	73%	73%	73%	56%	56%	56%	69%	69%	69%	44%	44%	44%				51%	49%	48%	
	M&I Demand (Consumptive)	13	15	20	5	6	7	7	8	9	36	65	108				61	93	144	
	Self Served Industrial Demand (Consumptive)	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	5
	Demand (Consumptive)	13	15	20	5	6	7	7	8	9	36	65	108				61	93	144	
Energy	Demand (Consumptive)	0	0.2	8	2	2	2	45	50	49	0	0	0				47	53	59	6a, 6b
Minerals	Demand (Consumptive)	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	7
Fish, Wildlife, and Recreation	Demand (Consumptive)	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	8
Tribal	Demand (Consumptive)	259	259	259	13	40	78	0	0	0	0	0	0				272	299	337	9
Total Hydrologic Basin	Demand (Consumptive)	559	547	578	48	80	124	189	197	193	79	102	139	0	0	0	875	926	1,034	
Adjacent Areas																				
Agriculture	Irrigated Acreage [thousands]													543	514	484	543	514	484	10
	Per-Acre Water Delivery (Diversion) [af/ac/yr]													2.85	2.41	2.05	2.85	2.41	2.05	11
	Consumptive factor [%]													50%	50%	50%	50%	50%	50%	
	Demand (Diversion)													1,547	1,241	992	1,547	1,241	992	
	Demand (Consumptive)													773	621	496	773	621	496	
Municipal and Industrial (M&I)	Population [thousands]													2,006	3,178	4,926	2,006	3,178	4,926	12
	M&I Per Capita Use (Diversion) [gpcd]													303	247	229	303	247	229	13
	Consumptive factor [%]													59%	59%	59%	59%	59%	59%	
	M&I Demand (Diversion)													681	879	1,261	681	879	1,261	
	Self Served Industrial Demand (Diversion)													0	0	0	0	0	0	14
	Demand (Diversion)													681	879	1,261	681	879	1,261	
Energy	Demand (Diversion)													402	519	744	402	519	744	15
Minerals	Demand (Diversion)													0	0	0	0	0	0	16
Fish, Wildlife, and Recreation	Demand (Diversion)													0	0	0	0	0	0	17
Tribal	Demand (Diversion)													0	0	0	0	0	0	18
Total Adjacent Areas	Demand (Diversion)	0	0	0	0	0	0	0	0	0	0	0	0	2,228	2,120	2,253	2,228	2,120	2,253	
Total Demand in the Study Area		559	547	578	48	80	124	189	197	193	79	102	139	2,228	2,120	2,253	3,102	3,047	3,287	
Demand that may be met by Other Supplies		0	0	0	0	0	0	0	0	0	79	45	65	2,013	1,890	2,010	2,092	1,936	2,075	19
Potential Colorado River Demand		559	547	578	48	80	124	189	197	193	0	57	74	215	230	243	1,010	1,111	1,212	
Agricultural	Colorado River Demand	287	273	292	27	32	36	137	139	135	0	0	0	6	6	6	457	450	469	20
Municipal and Industrial	Colorado River Demand	13	15	20	5	6	7	7	8	9	0	57	74	209	224	237	234	310	347	
Energy	Colorado River Demand	0	0.2	8	2	2	2	45	50	49	0	0	0	0	0	0	47	53	59	
Minerals	Colorado River Demand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Fish, Wildlife, and Recreation	Colorado River Demand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Tribal	Colorado River Demand	259	259	259	13	40	78	0	0	0	0	0	0	0	0	0	272	299	337	

Notes

- 1) No changes from Current Projected.
- 2) Five percent decrease from Current Projected by 2060 based on regional trends matrix.
- 3) A 25 percent population increase from Current Projected by 2060 was estimated based on regional trends (per census data).
- 4) Assume 16 percent reduction in 2020 and 25 percent reduction by 2035 (relative to actual 2011 use) and 3 percent reduction per decade after 2035.
- 5) No changes from Current Projected.
- 6a) Uintah Basin: Assume 10 percent decreased demand from Current Projected by 2060 due to new technology.
- 6b) Assume increased demand from Current Projected is offset by new technology in the Southeast Colorado River and West Colorado River planning areas.
- 7) No changes from Current Projected.
- 8) No changes from Current Projected.
- 9) Uintah: No changes from Current Projected; Southeast Colorado: personal communication, Navajo Nation, Apr. 16, 2012.
- 10) No changes from Current Projected.
- 11) No changes from Current Projected.
- 12) A 25 percent population increase from Current Projected by 2060 was estimated based on regional trends (per census data).
- 13) Assume 16 percent reduction in 2020 and 25 percent reduction by 2035 (relative to actual 2011 use) and 3 percent reduction per decade after 2035.
- 14) No changes from Current Projected.
- 15) No changes from Current Projected.
- 16) No changes from Current Projected.
- 17) No changes from Current Projected.
- 18) No changes from Current Projected.
- 19) Assume other sources are unchanged from Current Projected.
- 20) For Kanab/Virgin, all potential Colorado River demand is M&I (Lake Powell pipeline). For Wasatch Front, all potential Colorado River demand is M&I, except for one agricultural export. M&I is computed as total export minus agricultural user schedule.