

Vina Subbasin Water Budget Overview

Draft water budgets for the Vina Subbasin will be presented for discussion purposes. The water budget components and assumptions related to different water budget scenarios being developed for the Vina Subbasin Groundwater Sustainability Plan (GSP) are summarized below.

Water Budget Components

Water budgets are under development for the Vina Subbasin as required by the GSP Regulations (§354.18). Water budgets are required for the land and surface water system (land surface and surface water bodies), for the groundwater system, and for the basin as a whole (Figure 1).

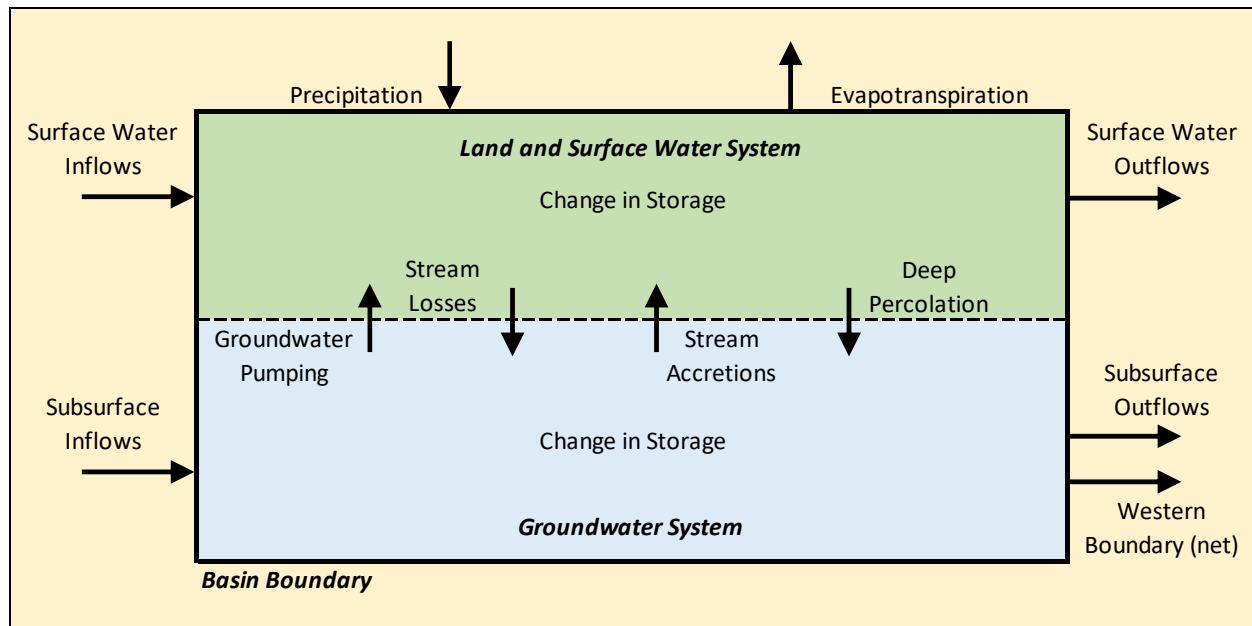


Figure 1. Primary Water Budget Components.

Primary water budget components include the following:

- Basin Inflows
 - Surface Water Inflows – Surface water flowing into the basin across the basin boundary, including streams, diversions, and drainage from upslope lands.
 - Precipitation Inflow – Precipitation falling within the basin as rainfall or snow.
 - Subsurface Inflow – Groundwater inflow from adjacent basins (Butte, Los Molinos, and Wyandotte Creek) and from the foothill area.
- Basin Outflows
 - Surface Water Outflows – Surface water flowing out of the basin, including stream outflows, diversions, and surface runoff to downstream basins.
 - Evapotranspiration – Consumptive use of water through the processes of evaporation and transpiration occurring within the basin.
 - Subsurface Outflow – Groundwater outflow to adjacent basins (Butte, Los Molinos, and Wyandotte Creek) and to the foothill area.

- Western Boundary Net Outflow – Net outflow along the basin’s western boundary, including accretions to the Sacramento River and subsurface outflows to the Corning Subbasin.
- Surface Water – Groundwater Exchanges
 - Groundwater Pumping – Extraction of water from the groundwater system through pumping for use in the land and surface water system.
 - Stream Accretions – Flow of groundwater to the land and surface water system (streams, lakes, etc.).
 - Deep Percolation – Flow of infiltrated water from the root zone to the underlying groundwater system.
 - Stream Losses – Flow of surface water to the groundwater system.
- Change in Storage – Change in the amount of water stored in the land and surface water system and in the groundwater system.

Water Budget Scenarios and Assumptions

The following assumptions have been developed to prepare draft water budget scenarios for the GSP:

Water Budget Scenario	Assumptions			
	Land Use	Urban Demands	Diversions	Hydrology
Historical	2000-2018	2000-2018	2000-2018	2000-2018
Current	2015-2016	2016-2018	2015-2016	1971-2018 ¹
Future, no Climate Change	2015-2016	2050 ²	2015-2016	1971-2018 ¹
Future, 2030 Climate Change	2015-2016	2050 ²	2015-2016	1971-2018 ³
Future, 2070 Climate Change	2015-2016	2050 ²	2015-2016	1971-2018 ⁴

1. WY2004 and WY2005 added at end of simulation to provide 50 years of hydrology.
2. Primarily based on CalWater 2050 preliminary draft projections for 2020 UWMP.
3. Historical hydrology modified based on DWR Central Tendency climate projections for 2030.
4. Historical hydrology modified based on DWR Central Tendency climate projections for 2070.

Draft Water Budget Results

Draft water budget results for the Vina Subbasin are provided on the following page. These results are subject to change.

Vina Subbasin

Note: TAF/yr = thousand acre-feet per year

Land and Surface Water System

Water Budget Scenario	Inflows (TAF/yr)				Outflows (TAF/yr)				Change in Storage (TAF/yr)
	Surface Water In	Groundwater Pumping	Stream Accretions	Precipitation	Evapotranspiration	Deep Percolation	Stream Losses	Surface Water Out	
Historical	719	243	218	411	363	193	189	848	0
Current	918	209	39	422	348	192	343	704	0
Future, No Climate Change	914	216	39	422	347	189	344	710	0
Future, 2030 Central Tendency	949	226	39	438	358	194	346	753	0
Future, 2070 Central Tendency	970	238	39	453	371	197	345	786	0

Groundwater System

Water Budget Scenario	Inflows (TAF/yr)			Outflows (TAF/yr)				Change in Storage (TAF/yr)
	Deep Percolation	Stream Losses	Subsurface In	Groundwater Pumping	Stream Accretions	Subsurface Out	Western Boundary (net)	
Historical	193	24	137	243	4	70	56	-20
Current	192	28	143	209	1	76	77	-1
Future, No Climate Change	189	28	143	216	1	72	73	-2
Future, 2030 Central Tendency	194	28	145	226	1	71	71	-2
Future, 2070 Central Tendency	197	27	145	238	1	68	66	-3

Entire Basin

Water Budget Scenario	Inflows (TAF/yr)			Outflows (TAF/yr)				Change in Storage (TAF/yr)
	Surface Water In	Precipitation	Subsurface In	Surface Water Out	Evapotranspiration	Subsurface Out	Western Boundary (net)	
Historical	555	411	137	633	363	70	56	-20
Current	602	422	143	666	348	76	77	-1
Future, No Climate Change	598	422	143	672	347	72	73	-2
Future, 2030 Central Tendency	631	438	145	715	358	71	71	-2
Future, 2070 Central Tendency	652	453	145	749	371	68	66	-3