



**Reservoir Administration
Issues
December 10, 2009**

Cheesman
Reservoir

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**General Order of Priorities of
Water Rights in the South Platte
Basin**

1. Direct flow
2. Storage
3. Refill Rights
4. Wells
5. Recharge

Key Supreme Court Case Decisions

- *Windsor Reservoir & Canal Co. v. Lake Supply Ditch Co.*, 44 Colo. 214, 98 P. 729 (1908), the Court articulated the one-fill rule, that each reservoir priority is only entitled to be filled once
- *Comstock v. Larimer & Weld Reservoir Co.*, 58 Colo. 186, 145 P. 700 (1914), the Court held that the year may not be divided into a “storage season,” when only storage rights may divert, and an “irrigation season” when only direct flow irrigation rights may divert.
- Finally, in *People ex rel. Park Reservoir Co. v. Hinderlider*, 98 Colo. 505, 57 P.2d 894 (1936), the Court held that decrees for direct uses of water are not superior to decrees for storage and state water officials must administer water rights solely on relative priority.

Considerations While Filling

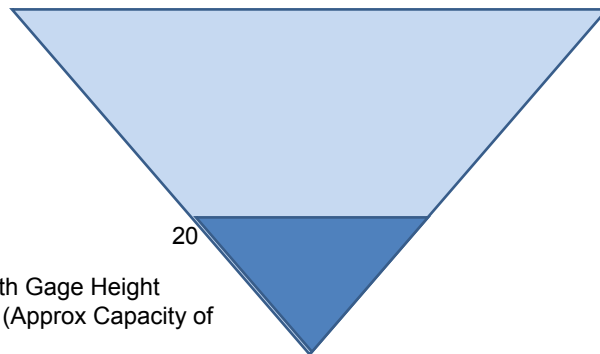
- Decree Conditions
- One Fill
- Volume vs. Gage Height Decree
- Measurement and Accounting
- Storage Limitations and Restrictions
- Evaporation and Seepage
- Paper Fill

One Fill

- One Fill Year Determined By Decree or
 - Irrigation – Nov. 1 through Oct. 31 (North Sterling Irr. District vs. Simpson)
 - Municipal – Often Apr. 1 through Mar. 31
- Cannot Change One Fill Year
- Gage Height vs. Volume Decreases
- Once Reservoir Physically Full Then Right is Fulfilled

Simple Storage Right Example With Carryover

GH 10
(≈50)

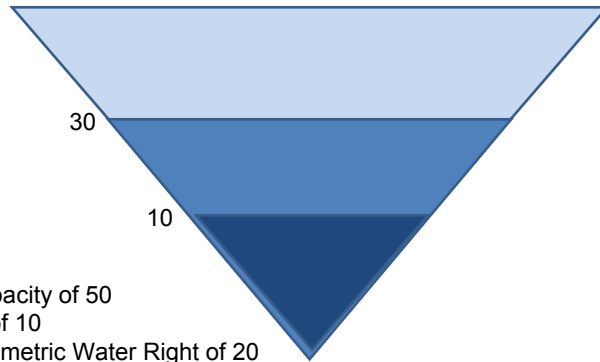


Assume:

- Reservoir with Gage Height Decree of 10 (Approx Capacity of 50)
- Carryover of 20
- May Fill to Gage Height 10

Simple Storage Right Example When Two Rights for Reservoir

GH 10
(≈50)

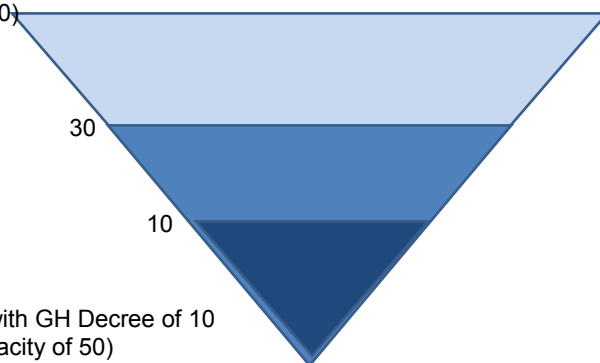


Assume:

- Approx Capacity of 50
- Carryover of 10
- Senior Volumetric Water Right of 20
- Junior Gage Height Water Right for GH 10

Simple Storage Right Example When Foreign Water In Bucket

GH 10 (≈50)



Assume:

- Reservoir with GH Decree of 10
(Approx Capacity of 50)
- Carryover of 10
- Foreign Water in Bucket of 20

Measuring Devices That May Be Required

- Staff Gage
- Stage Capacity Curve
- Flumes to Measure Inflow and Outflow
- Rain Gage and Evaporation Pan

Accounting

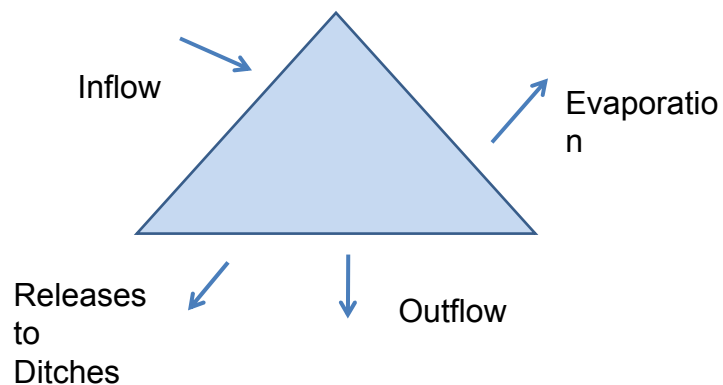
- Must keep track of different sources in reservoir or all carryover will count against the senior water right.

Refill Rights

May be used to replace water that is released for beneficial use, evaporates or seeps from the reservoir. The limit is the volume of the refill right.

Simplified Water Balance Accounting For On-Stream Reservoirs

$$I = \Delta S - O - R - E$$



Evaporation Release Table For 10 Acre Lake in Mountains

	Gross Evap.		Precip.	Eff. Precip.	Total Net Evap.
	Distribution	Inches	Inches	Inches	Ac-Ft
January	0.010	0.360	0.44	0.303	0.047
February	0.030	1.080	0.59	0.407	0.561
March	0.060	2.160	1.29	0.889	1.059
April	0.090	3.240	1.67	1.151	1.741
May	0.125	4.500	1.98	1.365	2.613
June	0.155	5.580	1.72	1.185	3.662
July	0.160	5.760	2.51	1.730	3.358
August	0.130	4.680	2.53	1.744	2.447
September	0.110	3.960	1.19	0.820	2.617
October	0.075	2.700	1.01	0.696	1.670
November	0.040	1.440	0.78	0.538	0.752
December	0.015	0.540	0.54	0.372	0.140
Total	1.000	36.000	16.25	11.200	20.667

Annual Free Water Surface Evaporation for Shallow Lakes (1956-1970) map from NOAA (evp2co shapefile)

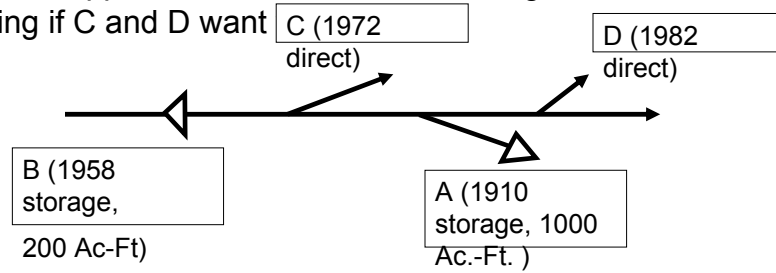
Average Annual Precipitation (1951-1980) from Colorado Climate Center at CSU (pcp3co_51-80 shapefile)

Some Reasons to Paper Fill

- Not Taking Water Available (except safety concerns or no injury)
- Choosing to Take Junior vs. Senior Right
- Sedimentation limits or storage restrictions limit capacity
- Foreign water limits the fill of the reservoir (Release or Book Over Concept)

Out-of-Priority Storage Allowed Under 37-80-120 (1) C.R.S.

- B stores 200 out-of-priority against A, loss from B to A is 20
- What happens if A has the call when A gets within 180 of filling if C and D want



http://www.water.state.co.us/pubs/presentations/jhall_irrigation_handout_090606.pdf

Other Issues

- Storage Release Orders
- Temporary Detention
- Dead vs. Active Storage
- Surcharge Above Spillway Level
- Gravel Pits (Lining Criteria)
http://water.state.co.us/wateradmin/GravPitLiner_Guidelines.pdf
- Underground Storage 37-87-101 (2) C.R.S.

Other Types of Dams

- Jurisdictional Versus Non-jurisdictional Dam Criteria
http://water.state.co.us/pubs/rule_reg/ds_rule_s07.pdf see Section 4.2.5.1
- Livestock Water Tanks 35-49-101 to 35-49-116 C.R.S. say exempt from Dam Safety Rules
- Erosion Control Dams 37-87-122 C.R.S. say exempt from Dam Safety Rules
- All structures are subject to administration if will create injury

