


## FORD RESEARCH GROUP

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### MEMORANDUM

**To:** Richard Sprague, Mayor  
Town of Empire

**Date:** 23-Jun-19

**From:** James R. Ford, P.E. 

**Re:** Reservoir Valuation - Guanella Reservoir

**CC:** Matt Montgomery, Hill & Robbins  
Tim Davis, Town of Empire  
Wendy Koch, Town of Empire

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The Colorado Conservation Board approved the Town of Empire's application for a loan to purchase 10-acre feet (AF) of perpetual storage in Guanella Reservoir for the amount of \$124,230. Staff from the CWCB requested comparable reservoir storage costs to justify the value of the cost per acre foot of Empire's Guanella storage purchase.

The cost of purchasing the Guanella storage was established by the Water Delivery and Storage Agreement between the City of Golden, owner of Guanella Reservoir and the Town of Empire in 2003. The Golden Agreement (Paragraph 2. Storage Option, (b) Exercise Price) spells out the price to purchase storage in Guanella Reservoir as \$9,000 per AF in 2003 with an inflation adjustment of approximately two percent per year (2%/yr.) at the time of purchase.

The value of storage in Guanella Reservoir for Empire is that it is located on West Fork Clear Creek upstream of the Town and adjacent to the its water system. The Reservoir is fed by existing water rights owned by the Town.

Storage in the upper Clear Creek basin, above several northwest Denver municipalities (Golden, Wheatridge, Arvada, Westminster, Northglenn, and Thornton) in an over appropriated stream basin has added value because it is located above a population of approximately 350,000 residences as well as agricultural and industrial users.

Listed below are a few recent examples of reservoir storage purchases in the Clear Creek Basin. The Denver/Boulder/ Greeley CPI-U was used to calculate the present-day value for each example as a comparison of each example's current value to Empire's Guanella purchase. The cost per acre foot calculation in 2019 dollars for each example is attached as an appendix.

1. City of Golden's purchase in Georgetown Lake:  
In 2000, Golden purchased 100-acre feet of storage volume in Georgetown Lake from the Vidler Water Company for \$1,000,000 (\$10,000/AF). The present-day value is \$1,547,253 (\$15,473/AF).
2. City of Black Hawk's purchase of Georgetown Lake Storage  
In 2007, Black Hawk purchased 100-acre feet of storage in Georgetown Lake from Golden for \$1,875,000 (\$18,750/AF). The present-day value is \$2,485,536 (\$24,855/AF).
3. City of Black Hawk's and Clear Creek County's purchase of Green Lake:  
In 2010, Black Hawk and Clear Creek County jointly purchased Green Lake with a storage capacity of 270-acre feet from Xcel Energy for \$2,100,000. A number of upgrades were required make the Lake function. (new pump station, new pump discharge pipeline, remove

and replace the raw water pipeline, water seepage measurement flume, electrical and communication upgrades) for an additional \$1,930,000. The present-day value for both the purchase and repair costs is \$5,024,196 (\$18,608/AF).

4. Clear Creek County's purchase in Guanella Reservoir:

In 2011, the County purchased 50-acre feet of storage in Guanella Reservoir from Golden for \$686,500. The present-day value is \$16,678/AF.

The four examples of reservoir storage show that Empire's 10-acre feet of Guanella Reservoir storage is comparable to previous Clear Creek storage purchases and is a wise and prudent investment for the Town.

**APPENDIX**  
**Present-Day Value Calculation**

**FORD RESEARCH GROUP**  
**Guanella Reservoir Storage Valuation**

**City of Golden's Georgetown Lake Storage Purchase**

Year Purchased: 2000  
Purchase Price: \$1,000,000  
Volume (Acre Feet): 100

**Present Day Value**

**19-Jun-19**

Year	Denver-Boulder-Greeley CPI-U		
	Inflation Rate	Reservoir Value	Cost/AF
2000	4.0%	\$1,000,000	\$10,000
2001	4.7%	\$1,047,000	\$10,470
2002	1.9%	\$1,066,893	\$10,669
2003	1.1%	\$1,078,629	\$10,786
2004	0.1%	\$1,079,707	\$10,797
2005	2.1%	\$1,102,381	\$11,024
2006	3.6%	\$1,142,067	\$11,421
2007	2.2%	\$1,167,193	\$11,672
2008	3.9%	\$1,212,713	\$12,127
2009	-0.6%	\$1,205,437	\$12,054
2010	1.9%	\$1,228,340	\$12,283
2011	3.7%	\$1,273,789	\$12,738
2012	1.9%	\$1,297,991	\$12,980
2013	2.8%	\$1,334,334	\$13,343
2014	2.8%	\$1,371,696	\$13,717
2015	1.2%	\$1,388,156	\$13,882
2016	2.8%	\$1,427,024	\$14,270
2017	3.1%	\$1,471,262	\$14,713
2018	2.6%	\$1,509,515	\$15,095
2019	2.5%	\$1,547,253	\$15,473

**FORD RESEARCH GROUP**  
**Guanella Reservoir Storage Valuation**

**Black Hawk's Georgetown Lake Purchase**

Year Purchased: 2007  
Purchase Price: \$1,875,000  
Volume (Acre Feet): 100

Present Day Value

19-Jun-19

Year	Denver-Boulder-Greeley CPI-U		
	Inflation Rate	Reservoir Value	Cost/AF
2007	2.2%	\$1,875,000	\$18,750
2008	3.9%	\$1,948,125	\$19,481
2009	-0.6%	\$1,936,436	\$19,364
2010	1.9%	\$1,973,229	\$19,732
2011	3.7%	\$2,046,238	\$20,462
2012	1.9%	\$2,085,117	\$20,851
2013	2.8%	\$2,143,500	\$21,435
2014	2.8%	\$2,203,518	\$22,035
2015	1.2%	\$2,229,960	\$22,300
2016	2.8%	\$2,292,399	\$22,924
2017	3.1%	\$2,363,463	\$23,635
2018	2.6%	\$2,424,913	\$24,249
2019	2.5%	\$2,485,536	\$24,855

**FORD RESEARCH GROUP**  
**Guanella Reservoir Storage Valuation**

**Black Hawk - Clear Creek County's Green Lake Purchase**

Year Purchased: 2010  
Purchase Price: \$2,100,000  
Construction Cost: \$1,931,268  
TOTAL COST: \$4,031,268  
Volume (Acre Feet): 270

Year	Upgrade Cost
2007	\$178,855
2008	\$178,855
2009	\$178,855
2010	\$178,855
2011	\$50,855
2012	\$93,565
2013	\$75,021
2014	\$78,289
2015	\$181,790
2016	\$236,327
2017	\$166,667
2018	\$166,667
2019	\$166,667
<b>Total</b>	<b>\$1,931,268</b>

Present Day Value

19-Jun-19

Year	Denver-Boulder-Greeley CPI-U		
	Inflation Rate	Reservoir Value	Cost/AF
2007	2.2%	\$2,278,855	\$8,440
2008	3.9%	\$2,546,586	\$9,432
2009	-0.6%	\$2,710,162	\$10,038
2010	1.9%	\$2,940,510	\$10,891
2011	3.7%	\$3,100,164	\$11,482
2012	1.9%	\$3,252,632	\$12,047
2013	2.8%	\$3,418,727	\$12,662
2014	2.8%	\$3,592,740	\$13,306
2015	1.2%	\$3,817,643	\$14,139
2016	2.8%	\$4,160,864	\$15,411
2017	3.1%	\$4,456,517	\$16,506
2018	2.6%	\$4,739,053	\$17,552
<b>2019</b>	<b>2.5%</b>	<b>\$5,024,196</b>	<b>\$18,608</b>

**FORD RESEARCH GROUP**  
**Guanella Reservoir Storage Valuation**

**Clear Creek County's Guanella Reservoir Storage Purchase**

Year Purchased: 2011  
Purchase Price: \$686,500  
Volume (Acre Feet): 50

**Present Day Value**

**19-Jun-19**

Year	Denver-Boulder-Greeley CPI-U		
	Inflation Rate	Reservoir Value	Cost/AF
2011	3.7%	\$686,500	\$13,730
2012	1.9%	\$699,544	\$13,991
2013	2.8%	\$719,131	\$14,383
2014	2.8%	\$739,266	\$14,785
2015	1.2%	\$748,138	\$14,963
2016	2.8%	\$769,085	\$15,382
2017	3.1%	\$792,927	\$15,859
2018	2.6%	\$813,543	\$16,271
<b>2019</b>	<b>2.5%</b>	<b>\$833,882</b>	<b>\$16,678</b>