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memorandum

To: Cole Bedford, CWCB
From: Ed Armbruster, P.E.
Cc: Randy Ray, Danyelle McCannon, CCWCD
Date: October 27, 2019
RE: Additional information on the Hokestra Reservoir Project

At your request we are providing additional information concerning the feasibility study associated with a loan request by the Water Activities Enterprise Fund of the Groundwater Management Subdistrict for funds to develop the Hokestra Reservoir Project. Specifically, you inquired about the Project schedule and you requested additional information concerning alternatives that we considered.

Project Schedule

The first phase of the Project was initiated in 2016 and was completed March 22, 2017 when GMS acquired the Hokestra Reservoir property from Weld County. GMS currently owns the site, although Weld County is still actively mining a portion of the property.

The second phase of the project includes installing three phase electrical power at the site, constructing inlet and outlet facilities, and installing rip-rap in some areas around the perimeter of the reservoir cells. Three-phase power installation has begun and is expected to be completed by April 2020. Engineering design efforts for the second phase will begin in mid to late 2020 and will likely be completed by early 2021. Competitive bid packages will be provided to potential contractors by mid-2021, and contractor selection will occur by the end of 2021. Project construction will likely be completed by the end of 2022 or early 2023. As noted previously, Weld County is actively mining the northern-most reservoir cell, and depending on mining progress, the completion schedule for some Project components could be delayed.

Project Alternatives

Three alternatives are summarized in the feasibility study.

No Action Alternative

A “No Action” alternative was discussed in the feasibility study where GMS would not implement the second development phase of the Hokestra Reservoir Project (infrastructure development). The second development phase includes constructing several infrastructure components to allow efficient diversions to storage and releases back to the river, along with measurement facilities and some shoreline protective

measures. Currently water can only be diverted into the reservoir via a relatively small headgate off of the Rural Ditch (capacity to divert to storage is approximately 10 cfs). Releases are currently accomplished via a portable diesel pump (capacity to release is approximately 5 cfs).

This alternative is unacceptable because the existing diversion and release facilities are not efficient, i.e., they are of insufficient capacity. Hokestra Reservoir will operate under a junior water right priority and opportunities to divert will typically be of short duration. As such, inlet facilities must be larger in order to capture as much water as possible during brief periods when the water right is in priority. Similarly, the outlet works must be capable of releasing at high flow rates; downstream augmentation demands of GMS can exceed 50 cfs when there is a downstream senior call for water. This alternative is unacceptable because it does not allow for efficient use of the storage space in Hokestra Reservoir.

Reduced Project Scope

We also identified an alternative where GMS would develop less than the full storage capacity at Hokestra Reservoir. This would be possible because there are three separate lined cells that comprise the Reservoir. One or even two, of the cells could be sold to a third party, with GMS retaining only a portion of the overall storage. For example, the capacity of Cell No. 2 is approximately 458 af, and could be separated from the other mining cells for sale to another party. Such a sale might be difficult because it would not include access to storage via the Rural Ditch. Regardless, we considered this alternative unacceptable because it does not develop the full additional storage capacity needed by GMS. In addition, the costs of the required infrastructure would be the same, thus substantially increasing the unit storage cost for the mined cells that were retained by GMS (unit costs would increase from approximately \$4,300 per acre-foot to over \$6,800 per acre-foot if Cell No. 2 were not included in the Project).

Preferred Alternative

The preferred alternative is to fully develop the Hokestra Reservoir Project, which provides GMS with an additional 1,250 acre-feet of storage capacity in their water supply system. The feasibility study provided detailed information concerning GMS' need for additional water supplies. Additional reservoir storage, in particular, is very beneficial for GMS because of the need to provide augmentation water on a year around basis.

Over the past 10 years we have assisted Central in evaluating numerous water storage projects along the South Platte River and its tributaries. Different infrastructure needs at these projects result in different unit storage costs, but costs for "finished" storage typically range from approximately \$4,500 to over \$6,500 per acre-foot. The total cost of the Hokestra Reservoir Project is anticipated to be \$5,390,500 which, for 1,250 acre-feet of storage, represents a unit cost of approximately \$4,300 per acre-foot.

In our opinion fully developing the Hokestra Reservoir Project is a very cost-effective means for GMS to secure additional, much needed, storage for use in their augmentation plan.