Subject: Summary of the Mid-Valley Collector System

This memorandum describes the purpose, cost, and operation of the components comprising the Mid-Valley Collector system – a key feature of the System Conservation Plan (SCP).

System Description – Areas Impacted

The SCP is the largest and most important component of a district-wide set of system improvements designed to meet efficiency water conservation obligations set forth in the Quantification Settlement Agreement (QSA). Existing intertie connections and interceptors presently channel lateral canal spill water to a lower elevation area served by the Rose and Redwood Canals downstream of Sperber and Bevins Reservoirs. Because there is limited cropped acreage in this area, and due to the difference in cropping patterns in the area receiving this spill water, much of it already cannot be used effectively. Therefore, excess spill is presently directed into drains which subsequently flow to the Alamo Drain. As part of the SCP, some new intertie projects in the southern portion of IID will also consolidate and route canal spill to the same area.

The Mid-Valley Collector system is designed to utilize intercepted spill water as a supplemental source of water for downstream areas with new connections extending all the way to the Westside Main Canal, providing enhanced operational flexibility for various canal systems enroute. The Mid-Valley Collector will be able to supply more or less water to those points via new flow control outlets. These new “interceptor” supply points will enable zanjeros on those laterals to increase or decrease flows as needed to manage spill. This new management tool will in turn reduce the flows into the Wiley Reservoir, which currently sends its stored water to the Vail Canal. At present it is often difficult or impossible to effectively use water captured in Wiley Reservoir. By reducing pressure on the Vail Canal from other areas upstream, the Vail Canal system will be able to absorb more “backed out” spill from Vail laterals (referring to when the flow to a lateral heading is reduced in order to match more precisely match irrigation demand or respond to demand changes in the lateral).

Due to the unpredictable and irregular timing of intercepted spill and the need to be responsive to irrigation demands, the spill water must be “buffered” in new re-regulation reservoirs integral to the Mid-Valley Collector system. Several reservoirs are included at key operational points.

Figure 1 on the following page shows all the different areas impacted by the Mid-Valley Collector system. In summary, the operational advantages of the Mid-Valley Collector system include:

1. Expanding the area that can receive water currently collected by the Bevins Reservoir
2. Conservation of lateral spills that currently go into drains in the lower elevation area near the Rose and Redwood Canals.
3. Improved flexibility on the Rose and Redwood Canals to “back out” spill from their lateral canals.
4. Movement of spill from the lower elevation area to higher elevation areas, as regularly scheduled inflows to enhance operation in the higher elevation areas.
5. Improved flexibility to laterals along the hydraulic pathway of the flows as they are moved from the Rose and Redwood Canals to the West Side Main Reservoir #1 (a new reservoir).
6. Reduction of spill volume into the Wiley Reservoir, providing more flexibility for spill management along the Vail Canal system.

Figure 1. Regions in IID impacted by the Mid-Valley Collector System
System Description – Physical Features

The Mid-Valley Collector system is comprised of an integrated package of system improvements.

Figure 2 on the following page illustrates the key physical features of the Mid-Valley Collector system.

The key physical features of the Mid-Valley Collector system can be described as follows:

1. An increase in the discharge flow rate capacity from the Sperber Reservoir. Specifically, a new outlet will be provided to the head of the Redwood Canal with a new VFD-equipped pump at Sperber. This will enable IID staff to utilize Sperber much more effectively.

2. Automation of canal check gates along the Rose Canal to accept rapid changes of flow rate from spill from intercepted laterals, or from changes in flow from the Sperber Reservoir in response to downstream conditions.

3. A new reservoir on the Rose Canal (150 acre-feet), designed to temporarily hold collected spill before it is moved out of the low area.

4. Connections at the downstream ends of the Rose Canal and Redwood Canal to a new spill buffer reservoir of 50 acre-feet. The Water Control Center (WCC) will adjust the outflow from the 50 acre-foot reservoir based on conditions at the Rose Canal Reservoir and Bevins Reservoir.

5. Pumps capable of 100 cfs to pump water from Rose-Moorhead Reservoir to the Moorhead Canal.

6. A small buffer reservoir where the Moorhead Canal supplies the new pipeline to carry water to the West Side Main (WSM) Reservoir #1 and to intermediate laterals.

7. Pumps capable of 100 cfs to pump water through the pipeline from the Moorhead Canal to WSM Reservoir #1.

8. A pipeline sized for 100 cfs (decreasing to 75 cfs downstream of the Best Canal). The pipeline has special features:
   a. When the pipeline crosses five canals, a turnout from the pipeline will maintain the water level in the pool of new flow control gates. Zanjeros will be able to reset the flow in the downstream portion of the canal. The flow rate at the head of the intersected canals will be deliberately set lower than current water demands in order to utilize some of the water from the pipeline as supplemental supply. Using more water from the pipeline for these intersected canals will reduce pumping costs compared to pumping it all the way to the WSM #1 Reservoir. The key aspect is that zanjeros will then effectively have much shorter lateral canals to operate, making it easier to control and back out spill flows.
   b. It will be possible for water to flow into the pipeline from both directions to supply demand as needed along the pipeline.

9. WSM Reservoir #1. The WSM Reservoir #1 will not only buffer the flows from the Mid-Valley Collector system. It will also buffer flows from the WSM.
   a. 300 acre-feet (live) storage capacity
   b. Gravity inlet (50 cfs) and gravity outlet (100 cfs)

10. WSM Reservoir #2. The WSM Reservoir #2 is an off-line reservoir intended to provide operational flexibility in capturing spills. Captured and buffered spill from upstream delivery gates (via the laterals intercepted by the WSM) will be used as part of future or present water deliveries both downstream of the reservoir from the WSM and the canals it serves, and upstream of the reservoir via a new pumped pipeline that will discharge to the WSM upstream of Trifolium Lateral 6.
   a. 100 acre-feet (live) storage capacity
   b. Gravity inlet (100 cfs) and pumped outlet (40 cfs)
   c. 20 cfs pumped discharge and pipeline connection to WSM upstream of Trifolium Lat. 6
Figure 2. Components of the Mid-Valley Collector system and Westside Main Canal reservoirs
System Description – Estimated Costs

The estimated costs of the components in the Mid-Valley Collector system are summarized in Table 1.

Table 1. Estimated cost summary for the components in the Mid-Valley Collector

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Construction Costs†</th>
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<tbody>
<tr>
<td>a</td>
<td>Rose Canal Reservoir and Canal Upgrades</td>
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<tr>
<td>b</td>
<td>Rose-Moorhead Reservoir</td>
<td>$14,443,000</td>
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<tr>
<td>c</td>
<td>Rose Canal Extension to Reservoir</td>
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<tr>
<td>d</td>
<td>Redwood Canal and Lateral 8 Upgrades</td>
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<tr>
<td>e</td>
<td>Moorhead Canal Upgrades</td>
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<td>f</td>
<td>Westside Main Canal Reservoir #1 System</td>
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<td></td>
<td>WSM #1 Reservoir</td>
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<td>Electrical Sub-Station</td>
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<td>Westside Main Canal Reservoir #2</td>
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<td>Sperber Reservoir (New Pump Outlet)</td>
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<td></td>
<td><strong>Total</strong></td>
<td><strong>$99,494,000</strong></td>
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†Includes 15% engineering and project management cost, plus 15% contingency