STATE OF UTAH
NATURAL RESOURCES
Water Rights

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20 June 1991

Mr. Gerry Hoyt
Distribution System Commissioner
Orderville, UT 84758

RE: IRRIGATION DIVERSIONS ON EAST FORK, VIRGIN RIVER

Gerry:

This letter is to provide a written summary of the evaluations of the three diversions we examined yesterday and the recommendations made at that time to increase the accuracy of the measuring devices.

GLENDALE DIVERSION

Weir type: 3' Cipolletti (trapezoidal)

Problems:

1. Flow entering the weir is turbulent and exhibits higher velocities than suggested for accurate measurement;

2. The weir has a square-edged crest rather than the recommended sharp crest.

Recommendations:

1. Limit flow entering the stilling basin to an amount equal to that being diverted, plus a small amount (1-2 CFS) to cover possible fluctuations in creek flow and to keep the sluice line flushed;

2. Sluice the stilling basin every month or so to keep the basin volume at its greatest potential level;

3. Fit the inlet pipe to the basin with an upturned elbow to act as an energy dissipator and prevent the flow from "shooting" toward the weir (given the narrow dimension at the inlet end of the basin, this may create problems with water splashing from the basin, thus requiring the additional construction of a catch apron or other structure to keep the flow in the basin);

4. Grind the weir crest to the recommended sharp edge and keep the weir crest free of accumulations of debris, etc..

ORDERVILLE DIVERSION & DIVIDER

Weir type: 23.5" (1.958') and 35.5" (2.958') contracted rectangular

Problems:

1. Flow entering the weirs is turbulent and exhibits higher velocities than suggested for accurate measurement;

2. The weirs have square-edged crests rather than the recommended sharp crests.

Recommendations:

1. Excavate a stilling basin just above the weirs to slow the velocity of the flow (keep the basin cleaned out); or

1. Raise the elevation of the weir crests, thus flattening the grade of the incoming ditch and lowering the velocity (this will result in increased sedimentation in the ditch and may create additional operational and maintenance problems);

2. Grind the weir crests to the recommended sharp edge and keep the weir crests free of accumulations of debris, etc..

MT. CARMEL DIVERSION & DIVIDER

Weir type: 4' contracted rectangular with 35:65 splitter plate behind weir (17":31")

Problems:

1. Flow entering the weir is turbulent and exhibits higher velocities than suggested for accurate measurement;

2. The weir has a square-edged crest rather than the recommended sharp crest (The second item is minor compared to the first);

3. Flow passing over the smaller side of the weir is not producing a ventilated nappe (the water clings to the back side of the weir rather than breaking away).

Recommendations:

1. Excavate a stilling basin just above the weirs to slow the velocity of the flow (keep the basin cleaned out);

2. Grind the weir crests to the recommended sharp edge and keep the weir crests free of accumulations of debris, etc.;

3. Given the structures below the small side of the weir, there is probably nothing that can be done economically to solve the third problem mentioned.

As I told you yesterday, it will be up to the irrigation companies to determine among themselves which of these recommendations should be pursued. In each case, the recommendations have been listed in priority order of probable effectiveness in increasing accuracy. If one or more of the companies believes an injustice is being done in correcting any of the observed problems, they should provide our office with a written statement of their concerns and we will respond.

Enclosed herewith is a "Flow Conversion Table" I have prepared for the non-standard weirs at the Orderville/Mt. Carmel divider. It's accuracy will be dependent upon taking some action to create a smooth, low-velocity flow into the weirs, but it should give you a fairly representative figure under present conditions.

We appreciate your diligent efforts in accomplishing your duties, Gerry, and hope this information will assist you in those efforts. I have enclosed additional copies of this letter for each irrigation company. Would you please distribute them?

Cordially,

Kerry Carpenter, P.E.
Assistant Area Engineer

KEC:k

pc: Robert L. Morgan, P.E., State Engineer
Lee Sim, P.E., Directing Engineer, Distribution