

MEMO

State of Idaho

Department of Water Resources

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Date: June 13, 2011
To: ESHMC
From: Allan Wylie *AW*
cc: Sean Vincent, Rick Raymondi
Subject: MKMOD6 input file *.eff

This memo discusses the format for the *.eff file, an input file for MKMOD6. MKMOD6 generates a MODFLOW 'well' file based on information in the *.eff file and several other input files discussed elsewhere. The *.eff file tells MKMOD6 the maximum achievable irrigation efficiency for sprinkler and gravity irrigated lands, the field capacity and depth of the soil, the wilting point for the crop mix, and the fate of the water lost to inefficiency. Water lost to inefficiency is routed to either ground water recharge or surface return flow to the Snake River.

The Appendix contains an example of a *.eff file. Line numbers have been added for convenience, and should not be included in any functional *.eff file. MKMOD6 ignores any line beginning with a pound sign (#). This feature allows line one of the example *.eff file in the Appendix to be used to label the columns.

The remainder of the file (beginning on line two in the Appendix) consists of one line per irrigation entity, each line contains eight columns. Column one identifies the irrigation entity described by the remaining seven numbers on the line. Column two contains the maximum estimated efficiency for gravity irrigation in the irrigation entity (EffGR in the Appendix). Column three contains the maximum estimated efficiency for sprinkler irrigation (EffSP in the Appendix). These maximum efficiencies describe the level or point at which most farmers in the entity will abandon irrigating some of their acreage and use the saved water to irrigate the remaining crops. The average efficiency achieved by most farmers in most years is lower than the maximum efficiency.

The next column contains the parameter that controls the fate of the water lost to the maximum efficiency value listed in columns one and two (DPin in the Appendix). DPin is the fraction of surface water irrigation reaching the aquifer from the initial loss implied by the maximum efficiency value, and 1-DPin is the fraction that returns to the Snake River.

The next column contains the parameter that controls the fate of any water remaining after adding precipitation and subtracting ET (DPex in the Appendix). This leftover water

is called excess water. DPex is the fraction of excess water that infiltrates to the aquifer, and 1-DPex is the fraction that returns to the Snake River.

The next column contains the wilting point (volume of water/volume of soil). Wilting point (Wilt in the Appendix) is the point at which a plant begins to use water from its own tissues for transpiration because soil moisture is not sufficient. When the soil moisture gets below Wilt, MKMOD6 reverts to deficit irrigation and will not extract water from the soil reservoir to meet crop irrigation demand for the remainder of the stress period.

The next column contains the field capacity (volume of water/volume of soil). Field capacity (FICap in the Appendix) is the water content remaining in the soil after any excess has drained away. This defines the maximum concentration of water MKMOD6 can store in the soil. Any water above this amount percolates to the aquifer or becomes runoff.

The last column contains the rooting depth of the crops grown in the irrigation entity in units of feet. The rooting depth is combined with the irrigated area for the entity and the FICap to compute the size of the soil moisture reservoir for each entity.

Attachment A

1) # Name	EffGR	EffSP	DPin	DPex	Wilt	FlCap	Depth
2) IESW000	0.80	0.85	1.0	1.0	0.002	0.20	3.00
3) IESW001	0.80	0.85	1.0	1.0	0.002	0.20	3.00
4) IESW002	0.80	0.85	0.931	0.931	0.002	0.20	3.00
5) IESW005	0.80	0.85	1.0	1.0	0.002	0.20	3.00
6) IESW008	0.80	0.85	1.0	1.0	0.002	0.20	3.00
7) IESW009	0.80	0.85	0.735	0.735	0.002	0.20	3.00
8) IESW010	0.80	0.85	0.898	0.898	0.002	0.20	3.00
9) IESW011	0.80	0.85	0.979	0.979	0.002	0.20	3.00
10) IESW012	0.80	0.85	1.0	1.0	0.002	0.20	3.00
11) IESW014	0.80	0.85	0.735	0.735	0.002	0.20	3.00
12) IESW015	0.80	0.85	1.0	1.0	0.002	0.20	3.00
13) IESW016	0.80	0.85	0.984	0.984	0.002	0.20	3.00
14) IESW018	0.80	0.85	1.0	1.0	0.002	0.20	3.00
15) IESW019	0.80	0.85	0.965	0.965	0.002	0.20	3.00
16) IESW020	0.80	0.85	0.735	0.735	0.002	0.20	3.00