

Estimation of Timing of Aquifer-Stream Interaction

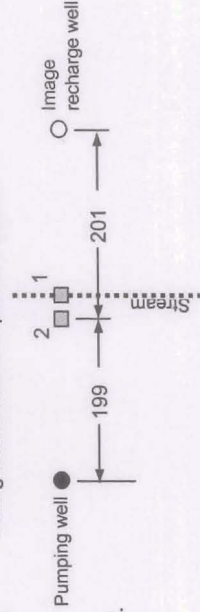
Dawson well - Big Wood River near Chocolate Gulch
Brockway Engineering, PLLC 2/24/09

Hydraulic conductivity
104 ft/day
Aquifer saturated thickness
50 feet
Transmissivity
5200 ft²/d
Storage coefficient
0.15

Pumping rate
62.8 gpm =
Pumping time
48 hrs
12090 ft³/d

Their assumptions apply.
Method of images used to estimate
gradient at constant-head stream boundary.

Point 1: Constant-head, drawdown = 0, 200 feet from well.
Point 2: 1 foot from constant-head boundary.
Find gradient between points 1 and 2.



SEE ANALYSIS
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4/30/09

PUMPING WELL										IMAGE WELL										RESULTANT using R = 199' (pumping) and R = 201' (image)										Portion of total discharge supplied by the stream (after Glover and Balmer, 1954)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Pumping time		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 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feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 199 feet		R = 201 feet		R = 1	

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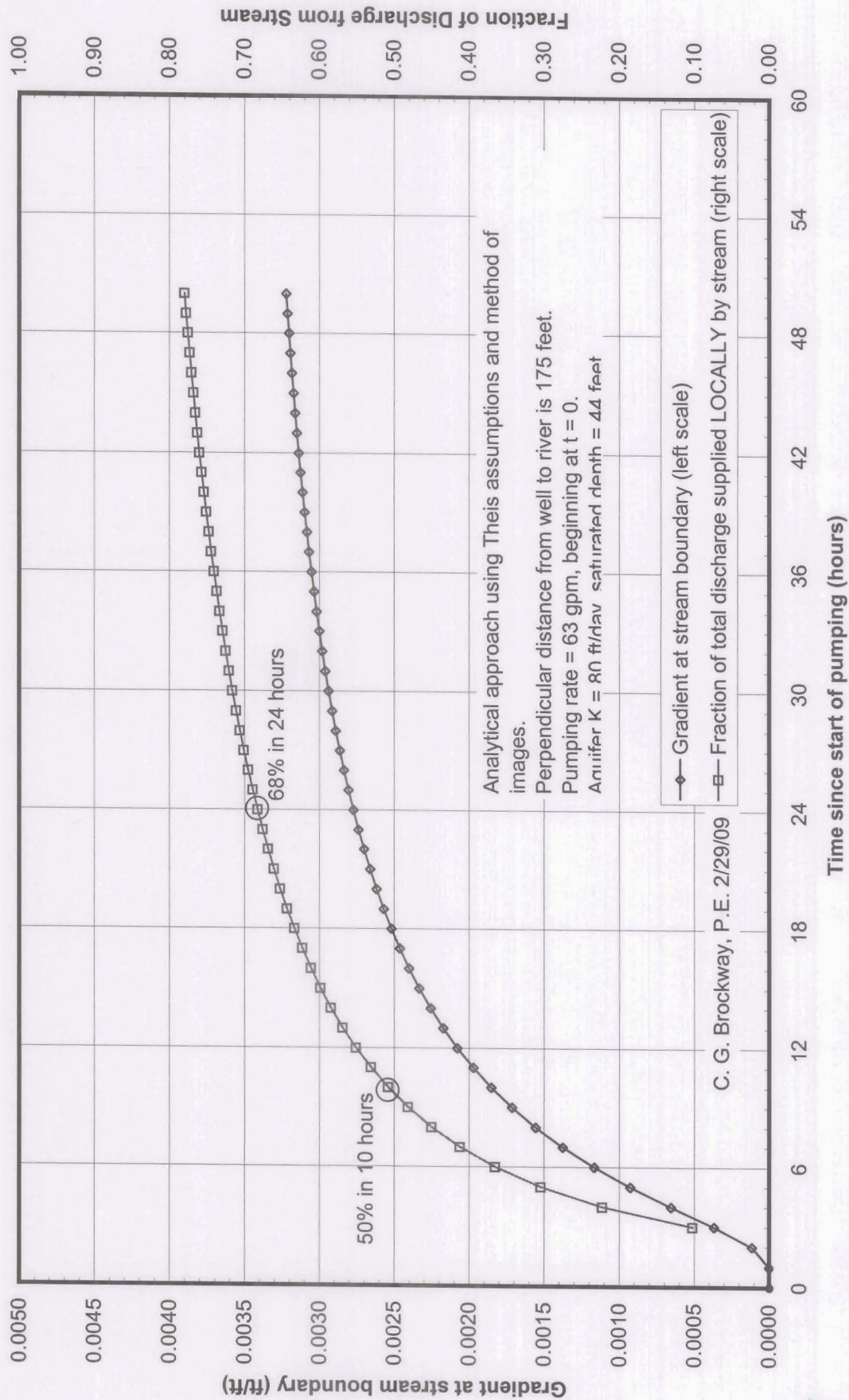
27	2.6E-01	1.017	0.188	2.5E-01	1.032	0.191	-0.188	0.0029	0.0029	0.754	0.509	0.70
28	2.5E-01	1.045	0.193	2.4E-01	1.061	0.196	-0.193	0.0029	0.0029	0.760	0.500	0.71
29	2.4E-01	1.073	0.198	2.4E-01	1.088	0.201	-0.198	0.0029	0.0029	0.767	0.491	0.71
30	2.3E-01	1.099	0.203	2.3E-01	1.115	0.206	-0.203	0.0029	0.0029	0.773	0.483	0.72
31	2.3E-01	1.125	0.208	2.2E-01	1.141	0.211	-0.208	0.0030	0.0030	0.779	0.475	0.72
32	2.2E-01	1.151	0.213	2.1E-01	1.167	0.216	-0.213	0.0030	0.0030	0.784	0.467	0.73
33	2.1E-01	1.176	0.218	2.1E-01	1.192	0.221	-0.218	0.0030	0.0030	0.789	0.460	0.73
34	2.1E-01	1.200	0.222	2.0E-01	1.216	0.225	-0.222	0.0030	0.0030	0.794	0.453	0.73
35	2.0E-01	1.224	0.226	2.0E-01	1.240	0.229	-0.226	0.0030	0.0030	0.799	0.447	0.74
36	1.9E-01	1.247	0.231	1.9E-01	1.263	0.234	-0.231	0.0031	0.0031	0.803	0.441	0.74
37	1.9E-01	1.269	0.235	1.9E-01	1.286	0.238	-0.235	0.0031	0.0031	0.808	0.435	0.74
38	1.8E-01	1.291	0.239	1.8E-01	1.308	0.242	-0.239	0.0031	0.0031	0.812	0.429	0.75
39	1.8E-01	1.313	0.243	1.8E-01	1.330	0.246	-0.243	0.0031	0.0031	0.815	0.423	0.75
40	1.7E-01	1.334	0.247	1.7E-01	1.351	0.250	-0.247	0.0031	0.0031	0.819	0.418	0.75
41	1.7E-01	1.355	0.251	1.7E-01	1.372	0.254	-0.251	0.0031	0.0031	0.822	0.413	0.76
42	1.7E-01	1.375	0.254	1.6E-01	1.392	0.258	-0.254	0.0031	0.0031	0.826	0.408	0.76
43	1.6E-01	1.395	0.258	1.6E-01	1.412	0.261	-0.258	0.0032	0.0032	0.829	0.403	0.76
44	1.6E-01	1.415	0.262	1.6E-01	1.432	0.265	-0.262	0.0032	0.0032	0.832	0.399	0.77
45	1.6E-01	1.434	0.265	1.5E-01	1.451	0.269	-0.265	0.0032	0.0032	0.835	0.394	0.77
46	1.5E-01	1.453	0.269	1.5E-01	1.470	0.272	-0.269	0.0032	0.0032	0.838	0.390	0.77
47	1.5E-01	1.472	0.272	1.5E-01	1.489	0.275	-0.272	0.0032	0.0032	0.840	0.386	0.77
48	1.5E-01	1.490	0.276	1.4E-01	1.507	0.279	-0.276	0.0032	0.0032	0.843	0.382	0.78
49	1.4E-01	1.508	0.279	1.4E-01	1.525	0.282	-0.279	0.0032	0.0032	0.845	0.378	0.78
50	1.4E-01	1.525	0.282	1.4E-01	1.543	0.285	-0.282	0.0032	0.0032	0.848	0.374	0.780

SEE ANALYSIS
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Timing of Influence on Big Wood River by Dawson Well Pumping



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