

APPENDIX J

STEADY STATE GROUNDWATER MODEL

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TABLE J-1

Steady State Model Parameter Sensitivity Analysis Results

Unit Designation in Report	Group	Current value	Relative Sensitivity
L1(2)	Horizontal Conductivity	800	30.9265
L1(7)	Horizontal Conductivity	75.8	25.1715
L2(1)	Horizontal Conductivity	454.97	20.5582
L1(5)	Horizontal Conductivity	87.8	17.8038
L1(3)	Horizontal Conductivity	200	11.988
Boxley	General Head Boundary	10.5	10.2013
L1(1)	Horizontal Conductivity	260	9.79502
L3(5)	Horizontal Conductivity	500	8.72558
South	General Head Boundary	0.5	7.8233
L3(7)	Horizontal Conductivity	70	4.82697
L2(3)	Horizontal Conductivity	177	4.34614
L2(6)	Horizontal Conductivity	85	3.7484
Middle	River	5.9109	2.69289
L1(6)	Horizontal Conductivity	450	2.30299
L3(3)	Horizontal Conductivity	70	1.45805
L2(5)	Horizontal Conductivity	12	1.39617
South	River	16.887	1.27003
SE_1	General Head Boundary	3.4	1.00832
L4(4)	Horizontal Conductivity	100	0.963943
Middle	River	9.375	0.839957
L1(8)	Horizontal Conductivity	100	0.792841
North	River	5.6559	0.739852
Middle	River	9.1816	0.696837
L1(1)	Vertical Conductivity	26	0.695893
L4(6)	Horizontal Conductivity	70	0.626333
Middle	River	19.647	0.602497
L3(1)	Vertical Conductivity	45.497	0.504261
L2(5)	Vertical Conductivity	0.12	0.462834
L3(2)	Horizontal Conductivity	50	0.414087
L2(2)	Horizontal Conductivity	70	0.408439
South	River	3	0.332762
L2(7)	Horizontal Conductivity	85	0.325383
L4(2)	Horizontal Conductivity	50	0.313595
South	River	5.0062	0.25865
Boxley	River	40.043	0.244445
Middle	River	1.8909	0.240115
South	River	18.947	0.234349
L4(1)	Horizontal Conductivity	30	0.231222
L3(6)	Vertical Conductivity	0.1	0.207779
Snoqualmie	River	1.5526	0.204478
NE-1	General Head Boundary	25	0.17195
NW1	Drain	1.4315	0.153196
South	River	12.784	0.137298
L4(7)	Vertical Conductivity	8.00E-03	0.125758
L2(6)	Vertical Conductivity	8.5	0.11777
L1(3)	Vertical Conductivity	20	0.111409

TABLE J-1

Steady State Model Parameter Sensitivity Analysis Results

Unit Designation in Report	Group	Current value	Relative Sensitivity
NF-2	General Head Boundary	2000	0.105566
NW	General Head Boundary	302.4	0.101117
L2(3)	Vertical Conductivity	17.7	0.101113
L3(7)	Vertical Conductivity	7	8.47E-02
Boxley	River	37.433	6.77E-02
Middle	River	37.769	5.46E-02
L1(5)	Vertical Conductivity	8.78	5.28E-02
L3(5)	Vertical Conductivity	50	2.95E-02
L2(2)	Vertical Conductivity	7	2.88E-02
L1(7)	Vertical Conductivity	7.58	2.78E-02
L3(3)	Vertical Conductivity	7	2.68E-02
L4(4)	Vertical Conductivity	10	2.55E-02
L5(1)	Vertical Conductivity	3.00E-03	2.02E-02
L1(6)	Vertical Conductivity	45	2.01E-02
L3(8)	Horizontal Conductivity	10	1.90E-02
L1(8)	Vertical Conductivity	10	1.27E-02
L1(4)	Vertical Conductivity	1.81E-03	1.20E-02
L1(2)	Vertical Conductivity	80	1.04E-02
L4(2)	Vertical Conductivity	5	1.03E-02
L3(2)	Vertical Conductivity	5	9.53E-03
L5(2)	Horizontal Conductivity	5.00E-03	9.22E-03
L5(2)	Horizontal Conductivity	0.3	8.35E-03
L2(7)	Vertical Conductivity	8.5	8.00E-03
L4(7)	Horizontal Conductivity	0.8	7.59E-03
L4(1)	Vertical Conductivity	3	6.12E-03
L4(3)	Horizontal Conductivity	3	5.67E-03
L2(4)	Horizontal Conductivity	4.52E-02	4.29E-03
L4(8)	Horizontal Conductivity	6	3.89E-03
L4(8)	Vertical Conductivity	6.00E-03	3.65E-03
L4(6)	Vertical Conductivity	7	2.58E-03
L5(2)	Vertical Conductivity	5.00E-05	1.98E-03
L4(3)	Vertical Conductivity	0.3	6.97E-04
L3(8)	Vertical Conductivity	1	0
L3(6)	Horizontal Conductivity	1	0

TABLE J-2
River Calibration Targets

Model River Reach	General Location	Observed flow rate (ft ³ /d) ¹	Observed flow standard deviation (ft ³ /d) ²	Modeled flow rate (ft ³ /d)
1	Along the South Fork between the South Fork gauge at North Bend and the confluence with the Snoqualmie R.	-94,937	14,531	-785,000
2		-65,848	10,079	-548,000
3		-43,266	6,622	-62,400
4	Along the South Fork between the confluence with Boxley Cr. and the South Fork gauge at North Bend	-117,507	5,995	-65,500
5		-395,053	20,156	-174,000
6		-235,761	12,029	-223,000
7		-223,295	11,393	60,800
8		-104,976	5,356	2,930
9		-164,730	8,405	-93,100
10		-164,909	8,414	-102,000
11		-361,252	18,432	-183,000
12	Along Boxley Cr. from the model boundary to the confluence with the South Fork	-927,359	47,315	-278,000
14	Along the South Fork from the model boundary to the confluence with Boxley Cr.	-167,435	17,086	-187,000
15	Along the Middle Fork between the Middle Fork gauge at Tanner and the east model boundary	-349,719	71,372	-409,000
16		-243,114	49,616	-52,000
17		-144,099	29,408	-36,300
18		-437,624	89,313	-103,000
19		-258,084	52,671	-212,000
20		-264,167	53,913	-158,000
21		-211,585	43,181	-237,000
22		-248,581	50,732	-129,000
23		-141,701	28,919	-260,000
24	Along Middle Fork between the Middle Fork gauge at North Bend and the Middle Fork gauge at Tanner	-15,723	2,407	-25,200
25		-33,698	5,158	-103,000
26		-40,131	6,143	-226,000
27		-58,179	8,905	-583,000
28		-51,703	7,914	-1,430,000
29		-54,579	8,354	-1,020,000

TABLE J-2
River Calibration Targets

Model River Reach	General Location	Observed flow rate (ft ³ /d) ¹	Observed flow standard deviation (ft ³ /d) ²	Modeled flow rate (ft ³ /d)
30	Along Middle Fork between the Middle Fork gauge at North Bend and the Middle Fork gauge at Tanner, Continued	-31,099	4,760	-98,300
31		-43,848	6,711	-252,000
32		-40,283	6,166	-50,700
33	Along the South Fork between the South Fork gauge at Edgewick and the confluence with Boxley Cr.	-89,410	9,124	-71,500
34	Along the Middle Fork between the Middle Fork gauge at North Bend and the Middle Fork gauge at Tanner	-40,074	6,134	87,400
35		-35,834	5,485	-56,400
36	Along the Middle Fork between the confluence with the North Fork and the Middle Fork gauge at North Bend	-40,359	6,177	-216,000
37		-31,254	4,784	-140,000
38		-40,208	6,154	-277,000
39	Along the South Fork between the South Fork gauge at North Bend and confluence with Snoqualmie R.	-92,342	14,134	-660,000
40	Along the Middle Fork between the confluence with the North Fork and the Middle Fork gauge at North Bend	-42,528	6,510	-188,000
41	Along the North Fork before the confluence with the Middle Fork	-13,327	2,040	-52,500
42	Along the Snoqualmie R. west of South Fork confluence	-37,215	5,696	-104,000
43		-22,814	3,492	-24,400
44		-22,763	3,484	-8,430
45		-20,700	3,168	-15,100
46	Along the North Fork before the confluence with the Middle Fork	-14,542	2,226	-112,000
47	East of the Middle Fork/South Fork confluence and west of the North Fork confluence with the Middle Fork	-35,334	5,408	-324,000
48	Along Boxley Cr. from the model boundary to the confluence with the South Fork	-400,651	20,442	-377,000
49	Along the Snoqualmie R. west of the South Fork confluence	-58,042	8,884	-68,000
13	Along the South Fork from the model boundary to the confluence with Boxley Cr.	-562,786	28,714	-696,000

Notes:

¹ Positive values indicate flow entering the model, and negative values indicate flow leaving the model

² A 95 percent confidence interval is used for each river conductance target

TABLE J-3

General Head Boundary Calibration Targets

General Head Boundary (GHB) target	Observed flow rate (ft ³ /d) ¹	Observed flow interval (ft ³ /d)	Observed flow standard deviation (ft ³ /d) ²
South	1,123,300	11,233	5,731
Boxley	2,160,000	21,600	11,021
NW	-1,728,000	172,800	88,165
NF-1	70,010	17,502	8,930
NF-2	1,728,000	172,800	88,165
NE-1	1,123,200	280,800	143,268
SE_1	518,400	51,840	26,449

NOTES

1. Positive values indicate flow entering the model, and negative values indicate flow leaving the model.
2. A 95 percent confidence interval is used for each GHB conductance target.

TABLE J-4
Head Calibration Targets

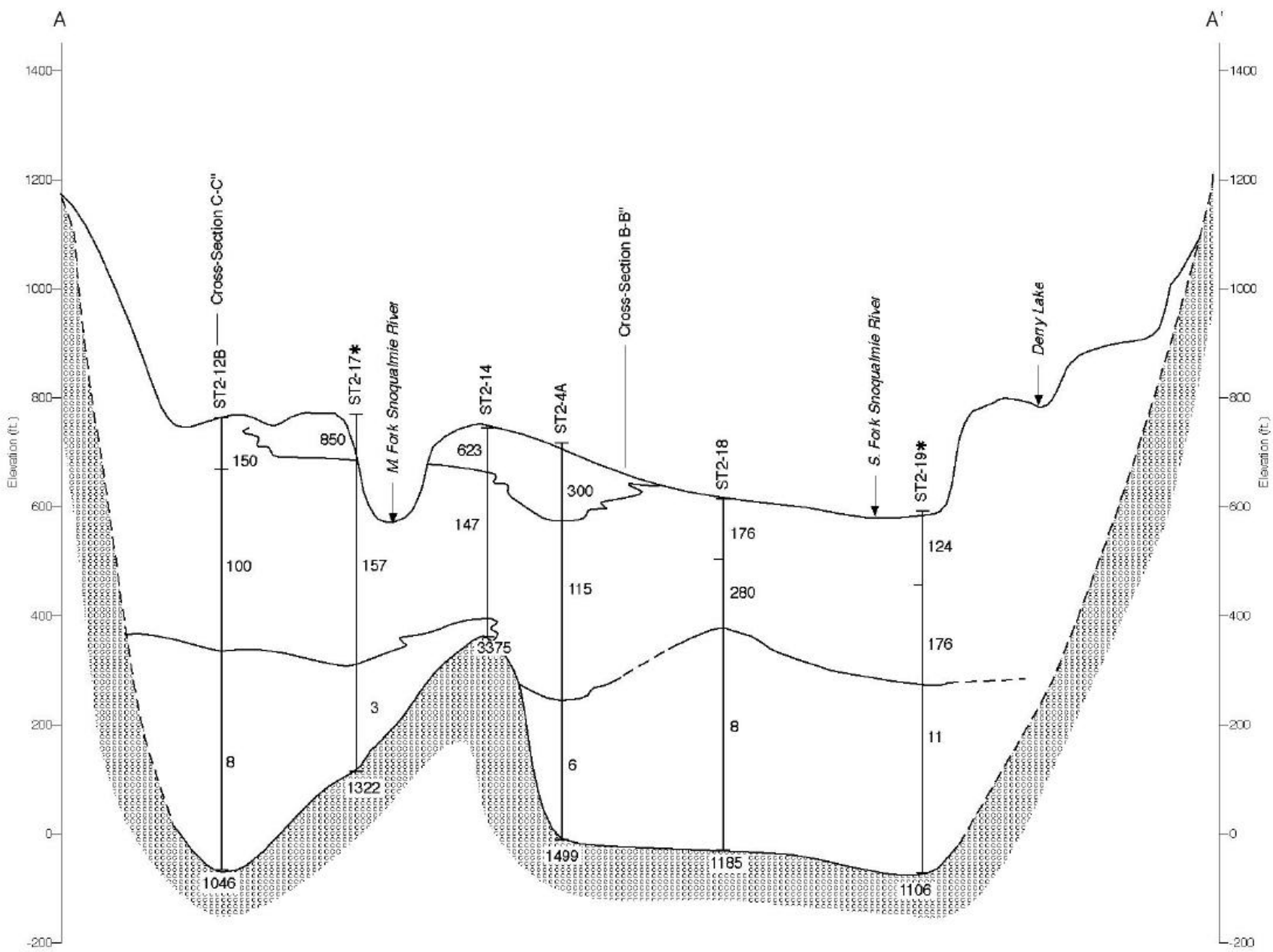
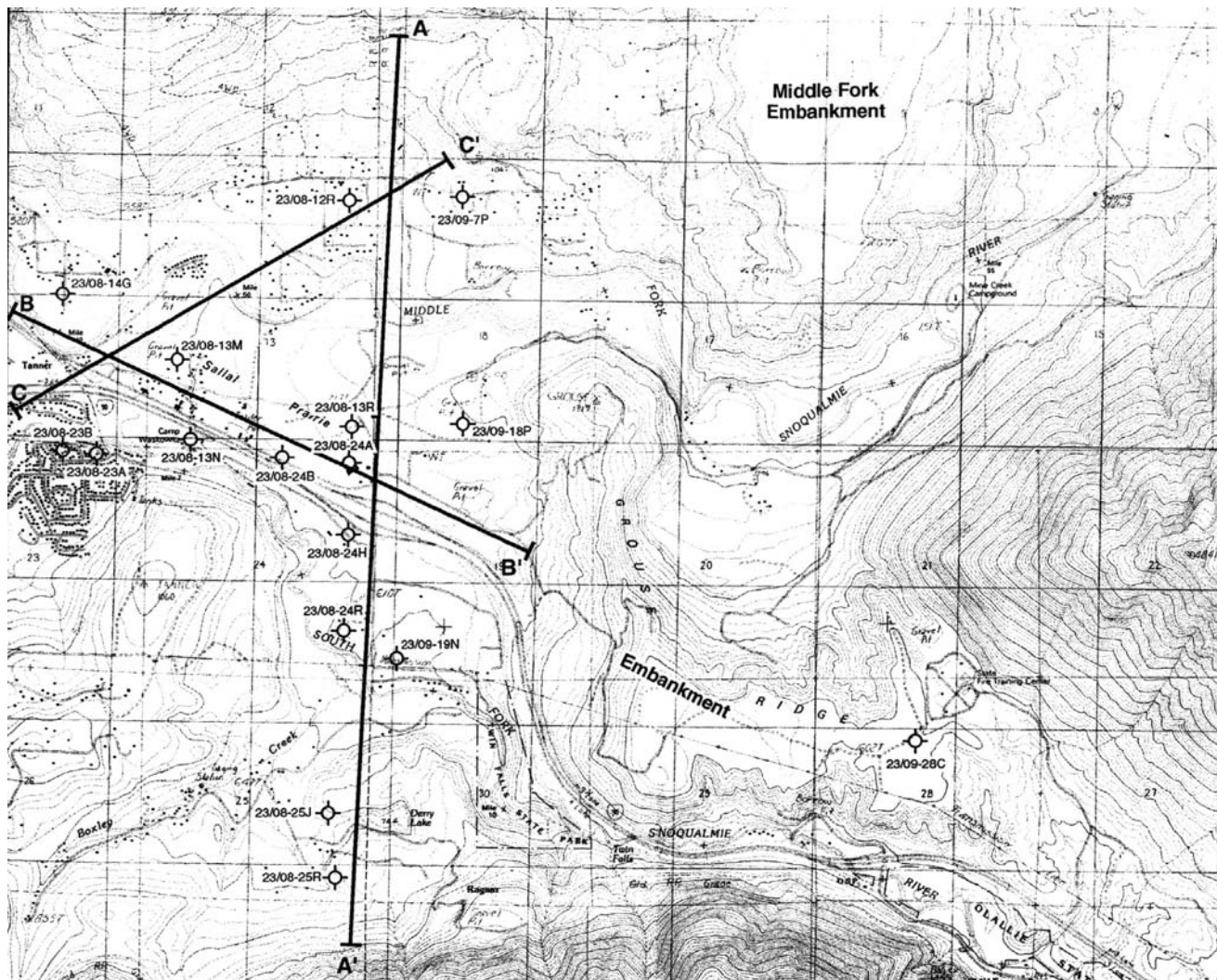
Head target	Observed head (ft msl)	Observed head interval (ft)	Observed head standard deviation (ft)
TW-6	454.52	9	4.59
NB-1	446.06	7	3.57
Francis	446.96	8	4.08
Tree Farm	457.28	7	3.57
Rogers	522.47	2	1.02
Golf Course	471.44	10	5.10
MW-5	495.03	2	1.02
OB-1	517.52	2	1.02
Anderson	745.63	36	18.37
Trailer Park	458.76	10	5.10
Stringfellow	445.78	8	4.08
Gardiner Weeks	435.33	4	2.04
Ecology	420.01	3	1.53
Lower Waskowitz	532.68	3	1.53
Funeral Home	424.98	4	2.04
TW-5	489.90	3	1.53
TW-2	765.22	2	1.02
MW-2	446.42	7	3.57
MW-1	452.93	3	1.53
TW-1	535.40	2	1.02
Davidson	481.56	1	0.51

NOTES

Assumes a 95% observed head confidence interval for each head target.

FIGURES

Vicinity Map



EXPLANATION

- ST3-6* — Site projected onto cross-section
- ST3-6* — Sounding location
- 133 — Resistivity in ohm-meters
- 32 — Approximate geoelectric context (dashed where inferred)
- 1385 — Bedrock

0 2000
 FEET
 HORIZONTAL SCALE 1" = 2000'
 VERTICAL EXAGGERATION 10:1

Source: Golder (1995)

FIGURE J-1
GEOELECTRIC CROSS-SECTION
 EAST KING CO. RWA/AQUIFER ENHANCE/WA

Golder Associates

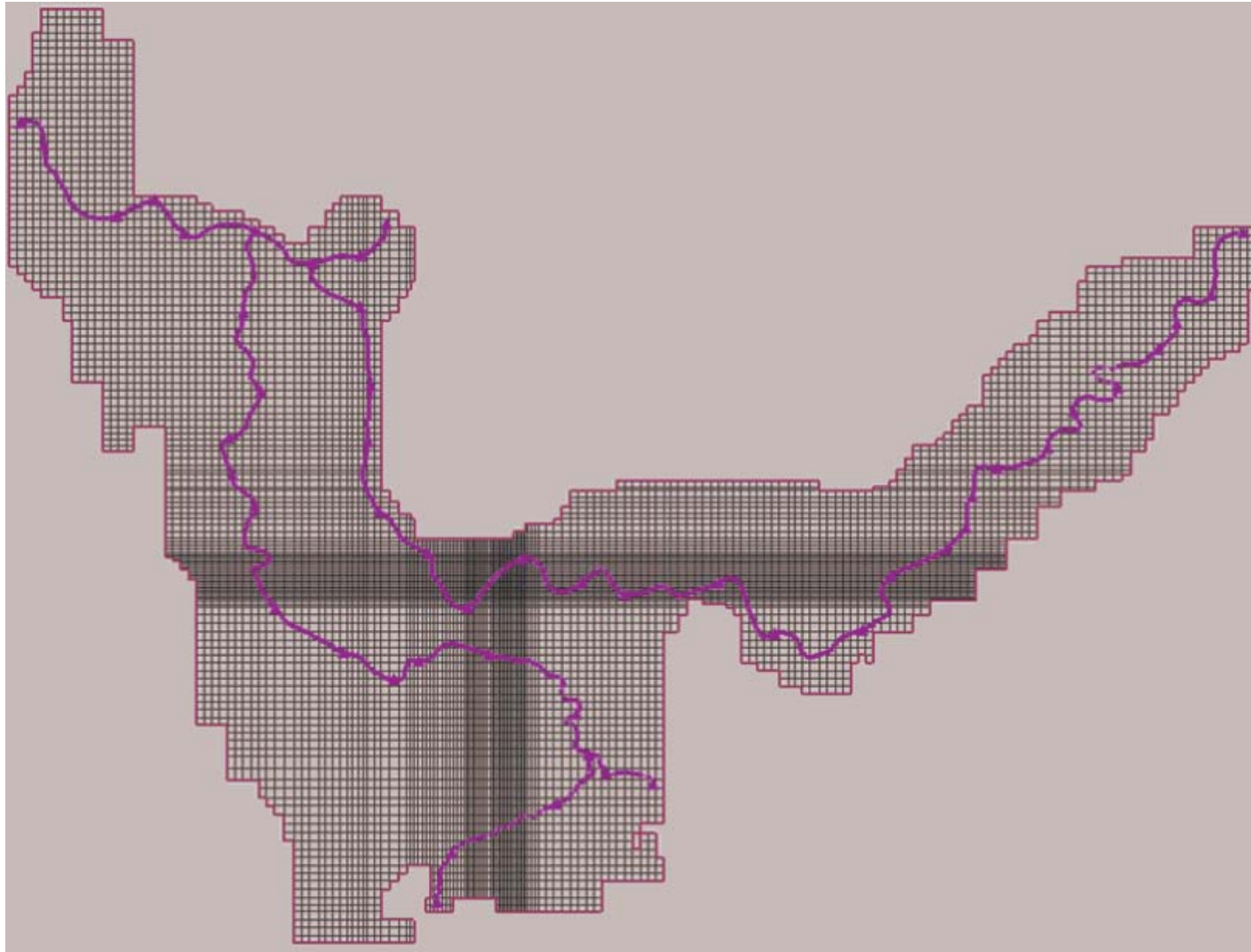


FIGURE **J-2**
PLAN VIEW MODEL DISCRETIZATION
EAST KING CO. RWA/AQUIFER ENHANCE/WA