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## TABLES

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**Table 4.** Flow budgets for individual zones of contribution to individual wells or groups of wells within the Independence, Missouri, well field

[Rounding of numbers in table may cause small discrepancies between the sum of the values in each column and column totals; ZOC, zone of contribution; m<sup>3</sup>/day, cubic meters per day; na, not applicable]

Budget category (source, sink, or ZOC)	Inflow to ZOC (m <sup>3</sup> /day)	Outflow from ZOC (m <sup>3</sup> /day)	Sources and sinks within ZOC		Sources and sinks within ZOC and flow between ZOCs	
			Percent inflow from sources	Percent outflow to sinks	Percent inflow from sources	Percent outflow to sinks
<b>ZOC 1 - Entire model except for ZOCs of the Independence well field</b>						
Constant head	0	0	0	0	0	0
Wells	0	239,820	0	38.9	0	38.4
Drains	0	82,860	0	13.5	0	13.3
River inflow/outflow	385,370	285,870	62.6	46.4	61.7	45.8
Head-dependent boundaries	7,547	7,275	1.2	1.2	1.2	1.2
Recharge from precipitation	223,100	0	36.2	0	35.7	0
Flow between ZOC 2 and ZOC 1	27	56	na	na	0	0
Flow between ZOC 5 and ZOC 1	95	26	na	na	0	0
Flow between ZOC 8 and ZOC 1	167	164	na	na	0	0
Flow between ZOC 10 and ZOC 1	2,000	2,046	na	na	0	0
Flow between ZOC 14 and ZOC 1	65	25	na	na	0	0
Flow between ZOC 15 and ZOC 1	3	0	na	na	0	0
Flow between ZOC 22 and ZOC 1	1	0	na	na	0	0
Flow between ZOC 34 and ZOC 1	114	119	na	na	0	0
Flow between ZOC 35 and ZOC 1	0	2	na	na	0	0
Flow between ZOC 36 and ZOC 1	0	1	na	na	0	0
Flow between ZOC 38 and ZOC 1	0	2	na	na	0	0
Flow between ZOC 39 and ZOC 1	0	2	na	na	0	0
Flow between ZOC 40 and ZOC 1	0	1	na	na	0	0
Flow between ZOC 41 and ZOC 1	1,147	816	na	na	.2	.1
Flow between ZOC 43 and ZOC 1	1,335	1,139	na	na	.2	.2
Flow between ZOC 47 and ZOC 1	1,568	1,725	na	na	.3	.3
Flow between ZOC 49 and ZOC 1	2,377	2,585	na	na	.4	.4
Total	624,916	624,534	na	na	100.0	100.0
<b>ZOC 2 - Includes wells 2 and 4</b>						
Constant head	0	0	0	0	0	0
Wells	0	3,921	0	100.0	0	31.2
Drains	0	0	0	0	0	0
River inflow/outflow	472	0	97.7	0	3.7	0
Head-dependent boundaries	0	0	0	0	0	0
Recharge from precipitation	11	0	2.3	0	.1	0
Flow between ZOC 1 and ZOC 2	56	27	na	na	.4	.2
Flow between ZOC 5 and ZOC 2	1,866	173	na	na	14.8	1.4
Flow between ZOC 11 and ZOC 2	2,392	3,508	na	na	19.0	27.9
Flow between ZOC 14 and ZOC 2	137	0	na	na	1.1	0
Flow between ZOC 17 and ZOC 2	0	2,087	na	na	0	16.6

**Table 4.** Flow budgets for individual zones of contribution to individual wells or groups of wells within the Independence, Missouri, well field—Continued

[Rounding of numbers in table may cause small discrepancies between the sum of the values in each column and column totals; ZOC, zone of contribution; m<sup>3</sup>/day, cubic meters per day; na, not applicable]

Budget category (source, sink, or ZOC)	Inflow to ZOC (m <sup>3</sup> /day)	Outflow from ZOC (m <sup>3</sup> /day)	Sources and sinks within ZOC		Sources and sinks within ZOC and flow between ZOCs	
			Percent inflow from sources	Percent outflow to sinks	Percent inflow from sources	Percent outflow to sinks
<b>ZOC 2 - Includes wells 2 and 4—Continued</b>						
Flow between ZOC 25 and ZOC 2	7,594	1,110	na	na	60.3	8.8
Flow between ZOC 30 and ZOC 2	0	1,682	na	na	0	13.4
Flow between ZOC 47 and ZOC 2	59	65	na	na	.5	.5
Total	12,587	12,573	na	na	100.0	100.0
<b>ZOC 5 - Includes well 5</b>						
Constant head	0	0	0	0	0	0
Wells	0	3,225	0	100.0	0	19.1
Drains	0	0	0	0	0	0
River inflow/outflow	16,669	0	99.9	0	98.7	0
Head-dependent boundaries	0	0	0	0	0	0
Recharge from precipitation	23	0	.1	0	.1	0
Flow between ZOC 1 and ZOC 5	26	95	na	na	.2	.6
Flow between ZOC 2 and ZOC 5	173	1,866	na	na	1.0	11.1
Flow between ZOC 8 and ZOC 5	0	2,112	na	na	0	12.5
Flow between ZOC 11 and ZOC 5	0	4,709	na	na	0	27.9
Flow between ZOC 12 and ZOC 5	7	46	na	na	0	.3
Flow between ZOC 30 and ZOC 5	0	4,705	na	na	0	27.9
Flow between ZOC 47 and ZOC 5	0	94	na	na	0	.6
Total	16,898	16,852	na	na	100.0	100.0
<b>ZOC 8 - Includes wells 8 and 9</b>						
Constant head	0	0	0	0	0	0
Wells	0	7,057	0	100.0	0	33.5
Drains	0	0	0	0	0	0
River inflow/outflow	386	0	87.8	0	1.8	0
Head-dependent boundaries	0	0	0	0	0	0
Recharge from precipitation	54	0	12.2	0	.3	0
Flow between ZOC 1 and ZOC 8	164	167	na	na	.8	.8
Flow between ZOC 5 and ZOC 8	2,112	0	na	na	10.0	0
Flow between ZOC 10 and ZOC 8	2,895	5,728	na	na	13.8	27.2
Flow between ZOC 12 and ZOC 8	3,323	2,416	na	na	15.8	11.5
Flow between ZOC 27 and ZOC 8	7,390	4,400	na	na	35.1	20.9
Flow between ZOC 30 and ZOC 8	4,703	1,212	na	na	22.4	5.8
Flow between ZOC 41 and ZOC 8	10	57	na	na	0	.3
Total	21,037	21,037	na	na	100.0	100.0

**Table 4.** Flow budgets for individual zones of contribution to individual wells or groups of wells within the Independence, Missouri, well field—Continued

[Rounding of numbers in table may cause small discrepancies between the sum of the values in each column and column totals; ZOC, zone of contribution; m<sup>3</sup>/day, cubic meters per day; na, not applicable]

Budget category (source, sink, or ZOC)	Inflow to ZOC (m <sup>3</sup> /day)	Outflow from ZOC (m <sup>3</sup> /day)	Sources and sinks within ZOC		Sources and sinks within ZOC and flow between ZOCs	
			Percent inflow from sources	Percent outflow to sinks	Percent inflow from sources	Percent outflow to sinks
<b>ZOC 10 - Includes well 10</b>						
Constant head	0	0	0	0	0	0
Wells	0	6,303	0	100.0	0	37.4
Drains	0	0	0	0	0	0
River inflow/outflow	741	0	34.0	0	4.4	0
Head-dependent boundaries	0	0	0	0	0	0
Recharge from precipitation	1,438	0	66.0	0	8.5	0
Flow between ZOC 1 and ZOC 10	2,046	2,000	na	na	12.1	11.9
Flow between ZOC 8 and ZOC 10	5,728	2,895	na	na	34.0	17.2
Flow between ZOC 11 and ZOC 10	2,539	537	na	na	15.1	3.2
Flow between ZOC 17 and ZOC 10	60	20	na	na	.4	.1
Flow between ZOC 22 and ZOC 10	337	322	na	na	2.0	1.9
Flow between ZOC 27 and ZOC 10	656	453	na	na	3.9	2.7
Flow between ZOC 30 and ZOC 10	0	1,512	na	na	0	9.0
Flow between ZOC 33 and ZOC 10	2,683	2,046	na	na	15.9	12.1
Flow between ZOC 34 and ZOC 10	389	685	na	na	2.3	4.1
Flow between ZOC 35 and ZOC 10	220	24	na	na	1.3	.1
Flow between ZOC 41 and ZOC 10	6	46	na	na	0	.3
Flow between ZOC 47 and ZOC 10	0	1	na	na	0	0
Total	16,843	16,844	na	na	100.0	100.0
<b>ZOC 11 - Includes well 11</b>						
Constant head	0	0	0	0	0	0
Wells	0	5,361	0	100.0	0	28.4
Drains	0	0	0	0	0	0
River inflow/outflow	0	0	0	0	0	0
Head-dependent boundaries	0	0	0	0	0	0
Recharge from precipitation	0	0	0	0	0	0
Flow between ZOC 2 and ZOC 11	3,508	2,392	na	na	18.6	12.7
Flow between ZOC 5 and ZOC 11	4,709	0	na	na	25.0	0
Flow between ZOC 10 and ZOC 11	537	2,539	na	na	2.9	13.5
Flow between ZOC 17 and ZOC 11	4,539	1,968	na	na	24.1	10.4
Flow between ZOC 22 and ZOC 11	680	396	na	na	3.6	2.1
Flow between ZOC 25 and ZOC 11	1,949	2,884	na	na	10.3	15.3
Flow between ZOC 30 and ZOC 11	2,560	3,306	na	na	13.6	17.5
Flow between ZOC 33 and ZOC 11	364	0	na	na	1.9	0
Total	18,846	18,846	na	na	100.0	100.0

**Table 4.** Flow budgets for individual zones of contribution to individual wells or groups of wells within the Independence, Missouri, well field—Continued

[Rounding of numbers in table may cause small discrepancies between the sum of the values in each column and column totals; ZOC, zone of contribution; m<sup>3</sup>/day, cubic meters per day; na, not applicable]

Budget category (source, sink, or ZOC)	Inflow to ZOC (m <sup>3</sup> /day)	Outflow from ZOC (m <sup>3</sup> /day)	Sources and sinks within ZOC		Sources and sinks within ZOC and flow between ZOCs	
			Percent inflow from sources	Percent outflow to sinks	Percent inflow from sources	Percent outflow to sinks
<b>ZOC 12 - Includes well 12</b>						
Constant head	0	0	0	0	0	0
Wells	0	2,611	0	100.0	0	14.8
Drains	0	0	0	0	0	0
River inflow/outflow	12,424	0	99.9	0	70.5	0
Head-dependent boundaries	0	0	0	0	0	0
Recharge from precipitation	11	0	.1	0	.1	0
Flow between ZOC 5 and ZOC 12	46	7	na	na	.3	0
Flow between ZOC 8 and ZOC 12	2,416	3,323	na	na	13.7	18.9
Flow between ZOC 27 and ZOC 12	0	4,680	na	na	0	26.5
Flow between ZOC 30 and ZOC 12	1,745	7,007	na	na	9.9	39.7
Flow between ZOC 41 and ZOC 12	983	0	na	na	5.6	0
Total	17,625	17,629	na	na	100.0	100.0
<b>ZOC 14 - Includes wells 13 and 14</b>						
Constant head	0	0	0	0	0	0
Wells	0	4,583	0	100.0	0	30.9
Drains	0	0	0	0	0	0
River inflow/outflow	4,373	0	99.5	0	29.4	0
Head-dependent boundaries	0	0	0	0	0	0
Recharge from precipitation	23	0	.5	0	.2	0
Flow between ZOC 1 and ZOC 14	25	65	na	na	.2	.4
Flow between ZOC 2 and ZOC 14	0	137	na	na	0	.9
Flow between ZOC 15 and ZOC 14	4,861	1,666	na	na	32.7	11.2
Flow between ZOC 17 and ZOC 14	5,195	7,499	na	na	34.9	50.5
Flow between ZOC 25 and ZOC 14	296	303	na	na	2.0	2.0
Flow between ZOC 32 and ZOC 14	7	338	na	na	0	2.3
Flow between ZOC 47 and ZOC 14	87	257	na	na	.6	1.7
Total	14,867	14,849	na	na	100.0	100.0
<b>ZOC 15 - Includes wells 15 and 23</b>						
Constant head	0	0	0	0	0	0
Wells	0	5,015	0	100.0	0	17.3
Drains	0	0	0	0	0	0
River inflow/outflow	14,103	0	99.9	0	48.6	0
Head-dependent boundaries	0	0	0	0	0	0
Recharge from precipitation	11	0	.1	0	0	0
Flow between ZOC 1 and ZOC 15	0	3	na	na	0	0

**Table 4.** Flow budgets for individual zones of contribution to individual wells or groups of wells within the Independence, Missouri, well field—Continued

[Rounding of numbers in table may cause small discrepancies between the sum of the values in each column and column totals; ZOC, zone of contribution; m<sup>3</sup>/day, cubic meters per day; na, not applicable]

Budget category (source, sink, or ZOC)	Inflow to ZOC (m <sup>3</sup> /day)	Outflow from ZOC (m <sup>3</sup> /day)	Sources and sinks within ZOC		Sources and sinks within ZOC and flow between ZOCs	
			Percent inflow from sources	Percent outflow to sinks	Percent inflow from sources	Percent outflow to sinks
<b>ZOC 15 - Includes wells 15 and 23—Continued</b>						
Flow between ZOC 14 and ZOC 15	1,666	4,861	na	na	5.7	16.8
Flow between ZOC 17 and ZOC 15	0	2,686	na	na	0	9.3
Flow between ZOC 22 and ZOC 15	5,783	7,280	na	na	19.9	25.1
Flow between ZOC 32 and ZOC 15	7,443	9,125	na	na	25.7	31.5
Flow between ZOC 33 and ZOC 15	0	14	na	na	0	0
Total	29,006	28,983	na	na	100.0	100.0
<b>ZOC 17 - Includes wells 17 and 18</b>						
Constant head	0	0	0	0	0	0
Wells	0	5,984	0	100.0	0	35.5
Drains	0	0	0	0	0	0
River inflow/outflow	0	0	0	0	0	0
Head-dependent boundaries	0	0	0	0	0	0
Recharge from precipitation	0	0	0	0	0	0
Flow between ZOC 2 and ZOC 17	2,087	0	na	na	12.4	0
Flow between ZOC 10 and ZOC 17	20	60	na	na	.1	.4
Flow between ZOC 11 and ZOC 17	1,968	4,539	na	na	11.7	26.9
Flow between ZOC 14 and ZOC 17	7,499	5,195	na	na	44.5	30.8
Flow between ZOC 15 and ZOC 17	2,686	0	na	na	15.9	0
Flow between ZOC 22 and ZOC 17	8	976	na	na	0	5.8
Flow between ZOC 25 and ZOC 17	2,585	99	na	na	15.3	.6
Total	16,852	16,852	na	na	100.0	100.0
<b>ZOC 22 - Includes wells 19, 20, 21, and 22</b>						
Constant head	0	0	0	0	0	0
Wells	0	8,522	0	100.0	0	43.5
Drains	0	0	0	0	0	0
River inflow/outflow	6,442	0	98.2	0	32.9	0
Head-dependent boundaries	0	0	0	0	0	0
Recharge from precipitation	116	0	1.8	0	.6	0
Flow between ZOC 1 and ZOC 22	0	1	na	na	0	0
Flow between ZOC 10 and ZOC 22	322	337	na	na	1.6	1.7
Flow between ZOC 11 and ZOC 22	396	680	na	na	2.0	3.5
Flow between ZOC 15 and ZOC 22	7,280	5,783	na	na	37.2	29.5
Flow between ZOC 17 and ZOC 22	976	8	na	na	5.0	0
Flow between ZOC 32 and ZOC 22	54	1,076	na	na	.3	5.5
Flow between ZOC 33 and ZOC 22	3,981	3,168	na	na	20.3	16.2
Total	19,565	19,573	na	na	100.0	100.0

**Table 4.** Flow budgets for individual zones of contribution to individual wells or groups of wells within the Independence, Missouri, well field—Continued

[Rounding of numbers in table may cause small discrepancies between the sum of the values in each column and column totals; ZOC, zone of contribution; m<sup>3</sup>/day, cubic meters per day; na, not applicable]

Budget category (source, sink, or ZOC)	Inflow to ZOC (m <sup>3</sup> /day)	Outflow from ZOC (m <sup>3</sup> /day)	Sources and sinks within ZOC		Sources and sinks within ZOC and flow between ZOCs	
			Percent inflow from sources	Percent outflow to sinks	Percent inflow from sources	Percent outflow to sinks
<b>ZOC 25 - Includes well 1</b>						
Constant head	0	0	0	0	0	0
Wells	0	2,855	0	100.0	0	18.7
Drains	0	0	0	0	0	0
River inflow/outflow	10,905	0	99.9	0	71.2	0
Head-dependent boundaries	0	0	0	0	0	0
Recharge from precipitation	11	0	.1	0	.1	0
Flow between ZOC 2 and ZOC 25	1,110	7,594	na	na	7.2	49.7
Flow between ZOC 11 and ZOC 25	2,884	1,949	na	na	18.8	12.8
Flow between ZOC 14 and ZOC 25	303	296	na	na	2.0	1.9
Flow between ZOC 17 and ZOC 25	99	2,585	na	na	.6	16.9
Total	15,312	15,279	na	na	100.0	100.0
<b>ZOC 27 - Includes wells 3, 24, and 27</b>						
Constant head	0	0	0	0	0	0
Wells	0	7,076	0	100.0	0	46.8
Drains	0	0	0	0	0	0
River inflow/outflow	1,937	0	99.0	0	12.8	0
Head-dependent boundaries	0	0	0	0	0	0
Recharge from precipitation	19	0	1.0	0	.1	0
Flow between ZOC 8 and ZOC 27	4,400	7,390	na	na	29.1	48.9
Flow between ZOC 10 and ZOC 27	453	656	na	na	3.0	4.3
Flow between ZOC 12 and ZOC 27	4,680	0	na	na	30.9	0
Flow between ZOC 41 and ZOC 27	3,633	0	na	na	24.0	0
Total	15,122	15,122	na	na	100.0	100.0
<b>ZOC 30 - Includes wells 6 and 30</b>						
Constant head	0	0	0	0	0	0
Wells	0	10,580	0	100.0	0	54.0
Drains	0	0	0	0	0	0
River inflow/outflow	0	0	0	0	0	0
Head-dependent boundaries	0	0	0	0	0	0
Recharge from precipitation	0	0	0	0	0	0
Flow between ZOC 2 and ZOC 30	1,682	0	na	na	8.6	0
Flow between ZOC 5 and ZOC 30	4,705	0	na	na	24.0	0
Flow between ZOC 8 and ZOC 30	1,212	4,703	na	na	6.2	24.0
Flow between ZOC 10 and ZOC 30	1,512	0	na	na	7.7	0
Flow between ZOC 11 and ZOC 30	3,306	2,560	na	na	16.9	13.1

**Table 4.** Flow budgets for individual zones of contribution to individual wells or groups of wells within the Independence, Missouri, well field—Continued

[Rounding of numbers in table may cause small discrepancies between the sum of the values in each column and column totals; ZOC, zone of contribution; m<sup>3</sup>/day, cubic meters per day; na, not applicable]

Budget category (source, sink, or ZOC)	Inflow to ZOC (m <sup>3</sup> /day)	Outflow from ZOC (m <sup>3</sup> /day)	Sources and sinks within ZOC		Sources and sinks within ZOC and flow between ZOCs	
			Percent inflow from sources	Percent outflow to sinks	Percent inflow from sources	Percent outflow to sinks
<b>ZOC 30 - Includes wells 6 and 30—Continued</b>						
Flow between ZOC 12 and ZOC 30	7,007	1,745	na	na	35.8	8.9
Flow between ZOC 41 and ZOC 30	164	0	na	na	.8	0
Total	19,588	19,588	na	na	100.0	100.0
<b>ZOC 32 - Includes wells 16 and 32</b>						
Constant head	0	0	0	0	0	0
Wells	0	8,622	0	100.0	0	53.2
Drains	0	0	0	0	0	0
River inflow/outflow	5,506	0	99.6	0	34.0	0
Head-dependent boundaries	0	0	0	0	0	0
Recharge from precipitation	23	0	.4	0	.1	0
Flow between ZOC 14 and ZOC 32	338	7	na	na	2.1	0
Flow between ZOC 15 and ZOC 32	9,125	7,443	na	na	56.3	46.0
Flow between ZOC 22 and ZOC 32	1,076	54	na	na	6.6	.3
Flow between ZOC 43 and ZOC 32	0	0	na	na	0	0
Flow between ZOC 47 and ZOC 32	136	68	na	na	.8	.4
Total	16,204	16,194	na	na	100.0	100.0
<b>ZOC 33 - Includes well 33</b>						
Constant head	0	0	0	0	0	0
Wells	0	1,750	0	100.0	0	14.8
Drains	0	0	0	0	0	0
River inflow/outflow	4,467	0	99.7	0	37.7	0
Head-dependent boundaries	0	0	0	0	0	0
Recharge from precipitation	11	0	.3	0	.1	0
Flow between ZOC 10 and ZOC 33	2,046	2,683	na	na	17.3	22.7
Flow between ZOC 11 and ZOC 33	0	364	na	na	0	3.1
Flow between ZOC 15 and ZOC 33	14	0	na	na	.1	0
Flow between ZOC 22 and ZOC 33	3,168	3,981	na	na	26.8	33.6
Flow between ZOC 34 and ZOC 33	2,117	1,206	na	na	17.9	10.2
Flow between ZOC 35 and ZOC 33	14	1,853	na	na	.1	15.7
Flow between ZOC 36 and ZOC 33	3	0	na	na	0	0
Flow between ZOC 43 and ZOC 33	0	0	na	na	0	0
Total	11,840	11,837	na	na	100.0	100.0

**Table 4.** Flow budgets for individual zones of contribution to individual wells or groups of wells within the Independence, Missouri, well field—Continued

[Rounding of numbers in table may cause small discrepancies between the sum of the values in each column and column totals; ZOC, zone of contribution; m<sup>3</sup>/day, cubic meters per day; na, not applicable]

Budget category (source, sink, or ZOC)	Inflow to ZOC (m <sup>3</sup> /day)	Outflow from ZOC (m <sup>3</sup> /day)	Sources and sinks within ZOC		Sources and sinks within ZOC and flow between ZOCs	
			Percent inflow from sources	Percent outflow to sinks	Percent inflow from sources	Percent outflow to sinks
<b>ZOC 34 - Includes well 34</b>						
Constant head	0	0	0	0	0	0
Wells	0	1,787	0	100.0	0	29.3
Drains	0	0	0	0	0	0
River inflow/outflow	1,102	0	70.7	0	18.0	0
Head-dependent boundaries	0	0	0	0	0	0
Recharge from precipitation	456	0	29.3	0	7.4	0
Flow between ZOC 1 and ZOC 34	119	114	na	na	2.0	1.9
Flow between ZOC 10 and ZOC 34	685	389	na	na	11.2	6.4
Flow between ZOC 33 and ZOC 34	1,206	2,117	na	na	19.7	34.7
Flow between ZOC 35 and ZOC 34	2,414	1,512	na	na	39.5	24.8
Flow between ZOC 40 and ZOC 34	134	179	na	na	2.2	2.9
Total	6,116	6,098	na	na	100.0	100.0
<b>ZOC 35 - Includes well 35</b>						
Constant head	0	0	0	0	0	0
Wells	0	2,003	0	100.0	0	28.8
Drains	0	0	0	0	0	0
River inflow/outflow	1,613	0	88.8	0	23.2	0
Head-dependent boundaries	0	0	0	0	0	0
Recharge from precipitation	203	0	11.2	0	2.9	0
Flow between ZOC 1 and ZOC 35	2	0	na	na	0	0
Flow between ZOC 10 and ZOC 35	24	220	na	na	.3	3.2
Flow between ZOC 33 and ZOC 35	1,853	14	na	na	26.6	.2
Flow between ZOC 34 and ZOC 35	1,512	2,414	na	na	21.7	34.7
Flow between ZOC 36 and ZOC 35	1,368	1,202	na	na	19.6	17.3
Flow between ZOC 38 and ZOC 35	99	658	na	na	1.4	9.5
Flow between ZOC 39 and ZOC 35	164	30	na	na	2.4	.4
Flow between ZOC 40 and ZOC 35	126	418	na	na	1.8	6.0
Flow between ZOC 43 and ZOC 35	0	6	na	na	0	.1
Total	6,964	6,965	na	na	100.0	100.0
<b>ZOC 36 - Includes well 36</b>						
Constant head	0	0	0	0	0	0
Wells	0	2,309	0	100.0	0	62.0
Drains	0	0	0	0	0	0
River inflow/outflow	2,485	0	99.1	0	66.4	0
Head-dependent boundaries	0	0	0	0	0	0

**Table 4.** Flow budgets for individual zones of contribution to individual wells or groups of wells within the Independence, Missouri, well field—Continued

[Rounding of numbers in table may cause small discrepancies between the sum of the values in each column and column totals; ZOC, zone of contribution; m<sup>3</sup>/day, cubic meters per day; na, not applicable]

Budget category (source, sink, or ZOC)	Inflow to ZOC (m <sup>3</sup> /day)	Outflow from ZOC (m <sup>3</sup> /day)	Sources and sinks within ZOC		Sources and sinks within ZOC and flow between ZOCs	
			Percent inflow from sources	Percent outflow to sinks	Percent inflow from sources	Percent outflow to sinks
<b>ZOC 36 - Includes well 36—Continued</b>						
Recharge from precipitation	23	0	0.9	0	0.6	0
Flow between ZOC 1 and ZOC 36	1	0	na	na	0	0
Flow between ZOC 33 and ZOC 36	0	3	na	na	0	.1
Flow between ZOC 35 and ZOC 36	1,202	1,368	na	na	32.1	36.7
Flow between ZOC 39 and ZOC 36	31	46	na	na	.8	1.2
Flow between ZOC 43 and ZOC 36	1	2	na	na	0	0
Total	3,742	3,727	na	na	100.0	100.0
<b>ZOC 38 - Includes well 38</b>						
Constant head	0	0	0	0	0	0
Wells	0	2,137	0	100.0	0	86.9
Drains	0	0	0	0	0	0
River inflow/outflow	1,765	0	99.4	0	71.6	0
Head-dependent boundaries	0	0	0	0	0	0
Recharge from precipitation	11	0	.6	0	.5	0
Flow between ZOC 1 and ZOC 38	2	0	na	na	.1	0
Flow between ZOC 35 and ZOC 38	658	99	na	na	26.7	4.0
Flow between ZOC 39 and ZOC 38	28	213	na	na	1.1	8.6
Flow between ZOC 40 and ZOC 38	0	11	na	na	0	.5
Total	2,464	2,460	na	na	100.0	100.0
<b>ZOC 39 - Includes well 39</b>						
Constant head	0	0	0	0	0	0
Wells	0	2,003	0	100.0	0	90.0
Drains	0	0	0	0	0	0
River inflow/outflow	1,924	0	99.4	0	86.5	0
Head-dependent boundaries	0	0	0	0	0	0
Recharge from precipitation	11	0	.6	0	.5	0
Flow between ZOC 1 and ZOC 39	2	0	na	na	.1	0
Flow between ZOC 35 and ZOC 39	30	164	na	na	1.3	7.4
Flow between ZOC 36 and ZOC 39	46	31	na	na	2.0	1.4
Flow between ZOC 38 and ZOC 39	213	28	na	na	9.6	1.2
Total	2,226	2,226	na	na	100.0	100.0

**Table 4.** Flow budgets for individual zones of contribution to individual wells or groups of wells within the Independence, Missouri, well field—Continued

[Rounding of numbers in table may cause small discrepancies between the sum of the values in each column and column totals; ZOC, zone of contribution; m<sup>3</sup>/day, cubic meters per day; na, not applicable]

Budget category (source, sink, or ZOC)	Inflow to ZOC (m <sup>3</sup> /day)	Outflow from ZOC (m <sup>3</sup> /day)	Sources and sinks within ZOC		Sources and sinks within ZOC and flow between ZOCs	
			Percent inflow from sources	Percent outflow to sinks	Percent inflow from sources	Percent outflow to sinks
<b>ZOC 40 - Includes well 40</b>						
Constant head	0	0	0	0	0	0
Wells	0	1,989	0	100.0	0	88.4
Drains	0	0	0	0	0	0
River inflow/outflow	1,609	0	97.3	0	71.1	0
Head-dependent boundaries	0	0	0	0	0	0
Recharge from precipitation	45	0	2.7	0	2.0	0
Flow between ZOC 1 and ZOC 40	1	0	na	na	.1	0
Flow between ZOC 34 and ZOC 40	179	134	na	na	7.9	6.0
Flow between ZOC 35 and ZOC 40	418	126	na	na	18.5	5.6
Flow between ZOC 38 and ZOC 40	11	0	na	na	.5	0
Total	2,263	2,249	na	na	100.0	100.0
<b>ZOC 41 - Includes well 41</b>						
Constant head	0	0	0	0	0	0
Wells	0	18,083	0	100.0	0	75.3
Drains	0	0	0	0	0	0
River inflow/outflow	23,030	0	99.6	0	95.8	0
Head-dependent boundaries	0	0	0	0	0	0
Recharge from precipitation	85	0	.4	0	.4	0
Flow between ZOC 1 and ZOC 41	816	1,147	na	na	3.4	4.8
Flow between ZOC 8 and ZOC 41	57	10	na	na	.2	0
Flow between ZOC 10 and ZOC 41	46	6	na	na	.2	0
Flow between ZOC 12 and ZOC 41	0	983	na	na	0	4.1
Flow between ZOC 27 and ZOC 41	0	3,633	na	na	0	15.1
Flow between ZOC 30 and ZOC 41	0	164	na	na	0	.7
Total	24,034	24,026	na	na	100.0	100.0
<b>ZOC 43 - Includes well 43</b>						
Constant head	0	0	0	0	0	0
Wells	0	2,900	0	100.0	0	28.7
Drains	0	0	0	0	0	0
River inflow/outflow	1,210	0	49.6	0	11.9	0
Head-dependent boundaries	0	0	0	0	0	0
Recharge from precipitation	1,228	0	50.4	0	12.1	0
Flow between ZOC 1 and ZOC 43	1,139	1,335	na	na	11.2	13.2
Flow between ZOC 32 and ZOC 43	0	0	na	na	0	0
Flow between ZOC 33 and ZOC 43	0	0	na	na	0	0

**Table 4.** Flow budgets for individual zones of contribution to individual wells or groups of wells within the Independence, Missouri, well field—Continued

[Rounding of numbers in table may cause small discrepancies between the sum of the values in each column and column totals; ZOC, zone of contribution; m<sup>3</sup>/day, cubic meters per day; na, not applicable]

Budget category (source, sink, or ZOC)	Inflow to ZOC (m <sup>3</sup> /day)	Outflow from ZOC (m <sup>3</sup> /day)	Sources and sinks within ZOC		Sources and sinks within ZOC and flow between ZOCs	
			Percent inflow from sources	Percent outflow to sinks	Percent inflow from sources	Percent outflow to sinks
<b>ZOC 43 - Includes well 43—Continued</b>						
Flow between ZOC 35 and ZOC 43	6	0	na	na	0.1	0
Flow between ZOC 36 and ZOC 43	2	1	na	na	0	0
Flow between ZOC 47 and ZOC 43	4,478	4,154	na	na	44.2	41.0
Flow between ZOC 49 and ZOC 43	2,066	1,729	na	na	20.4	17.1
Total	10,129	10,119	na	na	100.0	100.0
<b>ZOC 47 - Includes well 47</b>						
Constant head	0	0	0	0	0	0
Wells	0	2,900	0	100.0	0	30.9
Drains	0	0	0	0	0	0
River inflow/outflow	909	0	30.1	0	9.7	0
Head-dependent boundaries	0	0	0	0	0	0
Recharge from precipitation	2,111	0	69.9	0	22.5	0
Flow between ZOC 1 and ZOC 47	1,725	1,568	na	na	18.4	16.7
Flow between ZOC 2 and ZOC 47	65	59	na	na	.7	.6
Flow between ZOC 5 and ZOC 47	94	0	na	na	1.0	0
Flow between ZOC 10 and ZOC 47	1	0	na	na	0	0
Flow between ZOC 14 and ZOC 47	257	87	na	na	2.7	.9
Flow between ZOC 32 and ZOC 47	68	136	na	na	.7	1.5
Flow between ZOC 43 and ZOC 47	4,154	4,478	na	na	44.3	47.7
Flow between ZOC 49 and ZOC 47	0	157	na	na	0	1.7
Total	9,384	9,385	na	na	100.0	100.0
<b>ZOC 49 - Includes well 49</b>						
Constant head	0	0	0	0	0	0
Wells	0	2,900	0	100.0	0	39.5
Drains	0	0	0	0	0	0
River inflow/outflow	0	0	0	0	0	0
Head-dependent boundaries	0	0	0	0	0	0
Recharge from precipitation	2,873	0	100.0	0	39.1	0
Flow between ZOC 1 and ZOC 49	2,585	2,377	na	na	35.2	32.4
Flow between ZOC 43 and ZOC 49	1,729	2,066	na	na	23.5	28.1
Flow between ZOC 47 and ZOC 49	157	0	na	na	2.1	0
Total	7,344	7,343	na	na	100.0	100.0

**Table 6.** Percentage of source water reaching Independence, Missouri, well field zones of contribution within 1, 2, 5, 10, and 25 years, and total simulation time

[ZOC, zone of contribution]

ZOC	1 Year			2 Years			5 Years			10 Years			25 Years			Total simulation time		
	River	Recharge from precipitation	ZOC to ZOC	River	Recharge from precipitation	ZOC to ZOC	River	Recharge from precipitation	ZOC to ZOC	River	Recharge from precipitation	ZOC to ZOC	River	Recharge from precipitation	ZOC to ZOC	River	Recharge from precipitation	ZOC to ZOC
2	0	0	0	2	0	0	63	0	0	63	0	0	100	0	0	100	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	100	0	0
7	0	0	0	0	0	0	100	0	0	100	0	0	100	0	0	100	0	0
8	0	0	22	0	0	22	67	0	22	67	0	22	77	0	22	78	0	22
10	0	0	20	0	0	22	11	2	22	25	3	22	47	11	22	59	19	22
11	0	0	27	0	0	27	58	0	27	58	0	27	73	0	27	73	0	27
12	0	0	0	0	0	0	100	0	0	100	0	0	100	0	0	100	0	0
14	0	0	0	0	0	0	0	0	0	13	0	0	100	0	0	100	0	0
15	0	0	42	0	0	42	0	0	42	0	0	42	58	0	42	58	0	42
17	0	0	28	0	0	28	33	0	28	53	0	28	72	0	28	72	0	28
22	0	0	12	0	0	12	0	0	12	0	0	12	67	0	12	88	0	12
25	0	0	17	0	0	17	80	0	17	83	0	17	83	0	17	83	0	17
27	6	0	19	13	0	19	31	0	19	56	0	19	56	0	19	81	0	19
30	0	0	11	0	0	11	17	0	11	19	0	11	89	0	11	89	0	11
32	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	100	0	0
34	0	0	0	0	0	0	0	6	0	17	14	0	23	19	0	81	19	0
35	0	0	3	0	0	5	0	3	5	22	3	5	42	6	5	89	6	5
36	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	100	0	0
38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0

**Table 6.** Percentage of source water reaching Independence, Missouri, well field zones of contribution within 1, 2, 5, 10, and 25 years, and total simulation time—Continued

[ZOC, zone of contribution]

ZOC	1 Year			2 Years			5 Years			10 Years			25 Years			Total simulation time		
	River	Recharge from precipitation	ZOC to ZOC	River	Recharge from precipitation	ZOC to ZOC	River	Recharge from precipitation	ZOC to ZOC	River	Recharge from precipitation	ZOC to ZOC	River	Recharge from precipitation	ZOC to ZOC	River	Recharge from precipitation	ZOC to ZOC
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
41	9	0	0	22	0	0	88	0	0	100	0	0	100	0	0	100	0	0
43	0	0	3	9	5	3	28	9	3	30	9	3	42	17	3	52	45	3
47	0	0	0	0	0	0	2	0	0	11	2	0	37	27	0	37	63	0
49	0	0	0	0	0	0	0	8	0	0	13	0	0	38	0	0	100	0
Total	1	0	8	2	0	8	27	1	8	33	2	8	59	5	8	82	10	8

**Table 7.** Results of analyses for common constituents in water samples from Independence monitoring wells, combined Independence, Missouri, well-field pumpage, and the Missouri River at St. Joseph, Missouri

[mg/L, milligrams per liter; --, data not available; <, less than]

Sample location (fig. 1)	Date	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Iron, dissolved (mg/L)	Sulfate, dissolved (mg/L)	Chloride, dissolved (mg/L)	Fluoride, dissolved (mg/L)
1-5yr	12/15/97	240	75	9.1	46	28.00	260	23	0.24
	05/27/99	200	63	8.7	37	24.80	210	18	.21
2-2yr	07/15/98	140	39	7.2	52	17.30	77	23	.30
3-3yr	01/13/98	140	24	3.2	38	.34	97	13	.23
	05/18/99	140	24	3.4	26	.71	89	12	.21
3-10yr	01/15/98	170	24	3.8	13	.01	63	17	.23
	05/18/99	160	21	3.3	13	.01	100	6.3	.18
4-1yr	07/22/98	180	52	7.4	62	14.80	250	25	.28
5-4yr	05/05/98	60	18	--	59	.54	130	22	.32
	05/26/99	170	30	4.1	26	12.40	4.1	13	.20
5-10yr	05/05/98	170	30	5.2	33	8.40	19	15	.27
6-5yr	07/22/98	150	27	4.2	38	9.70	100	44	.17
	05/26/99	150	26	3.7	26	11.00	81	48	.15
7-1yr	04/21/98	110	26	4.6	38	8.30	91	19	.23
8-2yr	04/21/98	110	18	5.7	44	.81	150	23	.32
	05/13/99	130	20	6.0	33	2.60	110	14	.34
	05/23/00	170	28	6.4	27	3.80	64	6.8	.26
9-5yr	05/13/99	160	33	7.6	27	16.20	91	11	.26
10-5yr	05/18/99	180	50	7.6	21	14.60	19	40	.22
11-0.5yr	01/22/98	66	18	5.7	59	4.20	160	25	.46
11-1yr	07/22/98	77	18	5.5	59	5.00	150	21	.42
12-0.5yr	01/27/98	97	22	5.2	38	10.90	130	22	.32
13-0.5yr	02/04/98	160	48	7.6	24	15.20	55	7.7	.23
14-0.5yr	02/03/98	72	20	6.5	60	2.20	180	19	.45
15-1yr	02/02/98	74	22	6.8	57	4.20	170	19	.46
16-5yr	06/05/98	140	39	5.4	24	13.30	5.1	6.1	.26
16-10yr	06/05/98	142	34	6.4	12	14.70	3.5	6.2	.21
	05/05/99	180	43	6.5	18	21.80	6.3	4.9	.19
17-0.5yr	05/05/98	120	29	7.0	42	7.00	92	12	.33
18-0.5yr	07/09/98	160	43	6.3	21	10.70	19	6.7	.26
19-0.5yr	07/15/98	130	33	6.2	10	6.10	2.6	3.7	.26
20-0.5yr	07/14/98	100	18	5.4	11	2.20	26	9.6	.23
21-0.5yr	02/12/98	140	39	5.9	22	8.70	14	7.9	.21
22-3yr	04/17/98	160	34	8.9	9.3	12.00	42	2.0	.25
	05/19/99	160	35	9.0	9.5	13.90	32	4.1	.23
23-3yr	05/06/99	81	20	4.4	12	5.60	22	9.8	.30
23-5yr	04/20/98	120	25	6.7	20	12.10	29	3.6	.30
	05/19/99	130	27	7.1	13	16.30	19	5.5	.27

**Table 7.** Results of analyses for common constituents in water samples from Independence monitoring wells, combined Independence, Missouri, well-field pumpage, and the Missouri River at St. Joseph, Missouri—Continued

[mg/L, milligrams per liter; --, data not available; <, less than]

Sample location (fig. 1)	Date	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Iron, dissolved (mg/L)	Sulfate, dissolved (mg/L)	Chloride, dissolved (mg/L)	Fluoride, dissolved (mg/L)
24-5yr	06/10/98	--	22	6.0	20	0.16	67	11	0.32
	05/11/99	130	20	6.0	15	.01	35	16	.33
25-10yr	05/11/98	160	40	5.9	42	9.50	27	6.3	.24
	05/26/99	160	40	5.6	27	9.40	13	5.6	.22
26-5yr	05/11/98	140	38	5.6	50	9.40	17	5.7	.26
	05/19/99	150	40	5.5	27	13.40	.7	5.1	.25
27-10yr	05/11/98	47	11	7.8	57	1.70	150	21	.29
	05/14/99	140	38	5.3	22	14.40	.1	3.9	.31
Raw water <sup>1</sup> , tank 1	01/01/99	76	21	--	--	3.12	115	21.4	.30
	02/01/99	77	22	--	--	2.72	126	23.3	.27
	03/01/99	82	22	--	--	3.21	134	24.4	.30
	04/01/99	83	24	--	--	3.14	134.7	23	.30
	06/01/99	78	22	--	--	3.09	118.5	21	.32
	07/01/99	86	23	--	--	4.61	113	20	.31
	08/01/99	83	22	--	--	2.93	146	18.5	.34
	09/01/99	81	22	--	--	3.15	138	19.8	.33
	10/01/99	80	22	--	--	3.25	147	20.6	.34
	11/01/99	86	23	--	--	2.75	166	24.7	.33
	12/01/99	84	23	--	--	2.76	183	28	.27
	01/01/00	87	24	--	--	2.96	146	31	.29
	02/01/00	88	24	--	--	2.95	131	22.9	.24
	03/01/00	87	25	--	--	3.50	160	25	.23
	04/01/00	85	24	--	--	3.42	158.3	24.2	.24
	05/01/00	91	23	--	--	3.59	156.7	26.6	.30
	06/01/00	91	23	--	--	4.35	167.2	30.1	.30
	07/01/00	85	22	--	--	3.60	172	28.5	.34
	08/01/00	83	22	--	--	3.15	166	26	.35
	09/01/00	84	23	--	--	2.54	174	25.7	.36
	10/01/00	76	22	--	--	2.61	169	23.9	.42
	11/01/00	75	22	--	--	2.92	190	25.4	.33
	12/01/00	76	23	--	--	2.84	190	25.4	.33
	01/01/01	80	23	--	--	2.84	177	27	.35
02/01/01	85	24	--	--	4.56	165	30.4	.38	
03/01/01	83	24	--	--	3.45	154.7	29.6	.38	
04/01/01	76	25	--	--	3.50	148.5	27.8	.40	
05/01/01	80	23	--	--	3.83	122.3	25.8	.36	
06/01/01	78	21	--	--	3.70	123	25.2	.44	
07/01/01	87	26	--	--	9.31	75.8	16.9	.67	
08/01/01	93	25	--	--	4.97	97.5	20.3	.60	

**Table 7.** Results of analyses for common constituents in water samples from Independence monitoring wells, combined Independence, Missouri, well-field pumpage, and the Missouri River at St. Joseph, Missouri—Continued

[mg/L, milligrams per liter; --, data not available; <, less than]

Sample location (fig. 1)	Date	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Iron, dissolved (mg/L)	Sulfate, dissolved (mg/L)	Chloride, dissolved (mg/L)	Fluoride, dissolved (mg/L)
Raw water <sup>1</sup> , tank 2	01/01/99	77	20	--	--	3.30	116	21.2	0.29
	02/01/99	77	22	--	--	2.63	128	23.8	.28
	03/01/99	81	23	--	--	3.32	134	24.6	.31
	04/01/99	83	23	--	--	3.21	137.7	23.5	.30
	06/01/99	81	21	--	--	3.13	117.7	20.0	.32
	07/01/99	81	22	--	--	2.73	121	18.9	.34
	08/01/99	82	22	--	--	2.94	146	18.6	.32
	09/01/99	81	21	--	--	3.13	140	20	.32
	10/01/99	81	22	--	--	3.28	147	20.6	.35
	11/01/99	85	23	--	--	3.18	166	24.6	.34
	12/01/99	85	23	--	--	2.60	182	25.3	.28
	01/01/00	86	24	--	--	2.95	146	31.3	.30
	02/01/00	87	24	--	--	3.07	131	22.9	.25
	03/01/00	86	24	--	--	3.22	162	26.7	.23
	04/01/00	85	24	--	--	3.40	161.8	28.8	.24
	05/01/00	82	21	--	--	2.78	179.7	29.1	.34
	06/01/00	82	20	--	--	2.80	183.5	31.2	.36
	07/01/00	74	20	--	--	2.15	176	27.8	.42
	08/01/00	79	20	--	--	2.74	172	26.7	.37
	09/01/00	76	21	--	--	1.98	187	27.1	.43
	10/01/00	76	22	--	--	2.67	169	23.8	.40
	11/01/00	74	22	--	--	2.95	188	25.3	.35
	12/01/00	77	23	--	--	3.11	184	26.3	.38
	01/01/01	81	23	--	--	3.00	176	27	.28
	02/01/01	86	24	--	--	4.69	164.7	30.6	.38
	03/01/01	82	24	--	--	3.50	154.2	30.1	.40
	04/01/01	76	24	--	--	2.40	133.3	25.7	.39
	05/01/01	80	23	--	--	3.84	123.9	25.9	.37
	06/01/01	76	22	--	--	3.09	144.3	28.9	.51
	07/01/01	74	25	--	--	4.04	76.2	16.2	.63
08/01/01	81	23	--	--	3.45	106.3	19.9	.57	
Raw water <sup>1</sup> , tank 3	01/01/99	77	21	--	--	3.28	115	21	.30
	02/01/99	77	22	--	--	2.77	127	23.7	.28
	03/01/99	81	23	--	--	3.34	134	24	.30
	04/01/99	83	24	--	--	3.24	137.7	23.4	.30
	06/01/99	81	21	--	--	3.05	119.1	20.2	.33
	07/01/99	81	22	--	--	2.74	120	18.9	.34
	08/01/99	82	22	--	--	2.91	142	18.9	.32

**Table 7.** Results of analyses for common constituents in water samples from Independence monitoring wells, combined Independence, Missouri, well-field pumpage, and the Missouri River at St. Joseph, Missouri—Continued

[mg/L, milligrams per liter; --, data not available; <, less than]

Sample location (fig. 1)	Date	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Iron, dissolved (mg/L)	Sulfate, dissolved (mg/L)	Chloride, dissolved (mg/L)	Fluoride, dissolved (mg/L)
Raw water <sup>1</sup> , tank 3 —Continued	09/01/99	80	22	--	--	3.08	138	19.7	0.33
	10/01/99	80	23	--	--	3.21	147	20.6	.36
	11/01/99	85	23	--	--	2.98	167	25	.33
	12/01/99	85	23	--	--	2.70	182	25.3	.28
	01/01/00	86	24	--	--	3.16	145	31.2	.30
	02/01/00	87	25	--	--	3.02	131	22.9	.25
	03/01/00	86	24	--	--	3.58	162	26.8	.23
	04/01/00	85	24	--	--	3.64	162.9	28.1	.26
	05/01/00	81	21	--	--	2.19	178	29.3	.34
	06/01/00	81	20	--	--	2.33	183.9	31.5	.36
	07/01/00	76	19	--	--	1.99	177	27.9	.46
	08/01/00	78	20	--	--	2.59	173	26.9	.39
	09/01/00	76	22	--	--	1.97	187	27.2	.44
	10/01/00	76	22	--	--	2.59	169	24	.38
	11/01/00	74	22	--	--	3.20	165	25	.43
	12/01/00	78	23	--	--	3.12	185	26.7	.33
	01/01/01	80	24	--	--	2.94	177	27.2	.31
	02/01/01	86	24	--	--	4.50	164.5	30.6	.37
	03/01/01	82	24	--	--	3.94	162.3	30.7	.41
	04/01/01	77	24	--	--	3.20	144.8	28.6	.35
05/01/01	80	23	--	--	3.90	127	26.3	.34	
06/01/01	79	21	--	--	3.75	143.8	29.6	.60	
07/01/01	72	24	--	--	3.35	80	16.7	.64	
08/01/01	76	23	--	--	3.13	128.1	23.8	.63	
Raw water <sup>1</sup> , tank 4	01/01/99	76	21	--	--	3.26	116	21.6	.30
	02/01/99	77	22	--	--	2.82	127	23.3	.27
	03/01/99	81	23	--	--	3.44	134	24.7	.30
	04/01/99	83	23	--	--	3.22	138.1	23.7	.30
	06/01/99	80	21	--	--	3.33	117	19.7	.33
	07/01/99	86	23	--	--	4.22	114	20	.32
	08/01/99	82	22	--	--	3.13	146	19.1	.34
	09/01/99	80	22	--	--	3.17	141	20.1	.32
	10/01/99	80	23	--	--	3.16	148	20.7	.36
	11/01/99	86	24	--	--	2.96	166	24.9	.33
	12/01/99	85	23	--	--	2.92	182	25	.28
	01/01/00	86	24	--	--	3.17	145	31.4	.30
	02/01/00	89	26	--	--	2.99	131	22.9	.25
	03/01/00	88	25	--	--	3.63	160	25.7	.22

**Table 7.** Results of analyses for common constituents in water samples from Independence monitoring wells, combined Independence, Missouri, well-field pumpage, and the Missouri River at St. Joseph, Missouri—Continued

[mg/L, milligrams per liter; --, data not available; <, less than]

Sample location (fig. 1)	Date	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Iron, dissolved (mg/L)	Sulfate, dissolved (mg/L)	Chloride, dissolved (mg/L)	Fluoride, dissolved (mg/L)
Raw water <sup>1</sup> , tank 4 —Continued	04/01/00	85	25	--	--	3.66	158.6	26.9	0.24
	05/01/00	91	23	--	--	3.99	156.4	27.1	.31
	06/01/00	91	23	--	--	4.30	167.3	30.6	.30
	07/01/00	87	22	--	--	4.43	170	28.4	.33
	08/01/00	81	21	--	--	2.94	169	25.8	.36
	09/01/00	80	22	--	--	2.35	180	26.3	.43
	10/01/00	76	22	--	--	2.70	170	24.1	.41
	11/01/00	76	22	--	--	2.88	188	25.3	.36
	12/01/00	77	23	--	--	3.14	187	26.8	.32
	01/01/01	80	25	--	--	2.77	180	27.4	.32
	02/01/01	85	25	--	--	4.78	164.9	30.4	.36
	03/01/01	84	24	--	--	3.50	150.5	30.1	.37
	04/01/01	78	23	--	--	3.50	142.3	27.8	.38
	05/01/01	82	23	--	--	3.80	106.5	21.8	.32
	06/01/01	79	21	--	--	3.66	142.6	29.5	.58
	07/01/01	80	26	--	--	5.31	71.5	15.5	.62
	08/01/01	90	24	--	--	4.73	97.7	19.3	.57
Combined Independence well-field pumpage <sup>2</sup>	06/03/98	76	22	7.1	51	1.70	150	24	.39
	05/27/99	66	21	5.7	39	.78	110	20	.33
	05/23/00	79	23	6.6	65	1.10	180	29	.41
Missouri River at St. Joseph, Mo.	01/21/97	72	24	5.8	62	--	190	20	.40
	06/18/97	70	26	6.0	65	--	210	15	.40
	08/20/97	57	21	6.0	68	--	220	15	.40
	11/18/97	60	22	6.0	67.7	<.01	208	13.5	.40
	01/13/98	70	25	6.2	64.4	.01	190	20.5	.40
	06/10/98	64	23	6.1	50.3	.01	155	16.7	.40
	08/19/98	61	22	6.5	54.5	.01	157	16.7	.40
	11/17/98	64	23	6.4	54.7	.01	165	16.9	.30
	01/27/99	70	25	7.0	63.3	.01	178	20.5	.40
	06/18/99	73	26	3.9	52.3	.01	49	7.0	.40
	08/13/99	65	23	7.9	62.8	.01	193	16.7	.40
11/03/99	62	24	5.5	66.6	.01	212	17.3	.50	
01/06/00	73	24	5.9	65.1	.01	193	20.7	.40	
05/24/00	62	24	6.3	68.2	.01	214	18.4	.40	
07/20/00	56	22	6.2	69.5	.01	201	17.6	.40	

<sup>1</sup>Raw water from tank 1, 2, 3, or 4.

<sup>2</sup>Sampled by the Independence Water Department from mixing tanks 1, 2, 3, and 4.

**Table 8.** Results of analyses for isotopes of oxygen and hydrogen in water samples from the Independence monitoring wells, combined pumpage of the Independence well field, the Missouri River at St. Joseph, Missouri, and the Missouri River near the Independence, Missouri, well field

[per mil, parts per thousand]

Sample location (fig. 1)	Date	$\delta^{18}\text{O}$ (per mil)	$\delta\text{D}$ (per mil)	Sample location (fig. 1)	Date	$\delta^{18}\text{O}$ (per mil)	$\delta\text{D}$ (per mil)
2-2yr	07/15/98	-8.65	-61.3	Combined Independence well-field pumpage	05/27/99	-8.56	-60.9
3-3yr	05/18/99	-6.74	-41.5		04/03/00	-9.72	-72.8
	07/17/01	-6.81	-40.8		05/23/00	-10.31	-82.8
4-1yr	07/22/98	-8.01	-56.4		07/19/01	-7.65	-54.9
5-4yr	08/25/99	-6.49	-38.8	Missouri River at St. Joseph	08/13/99	-9.62	-73.2
	11/20/99	-6.51	-39.4		03/16/00	-11.12	-87.2
	02/28/00	-6.75	-43.0		11/17/98	-12.86	-101.5
6-5yr	05/26/99	-6.69	-40.3		05/24/00	-11.21	-90.5
	07/17/01	-6.59	-40.3		11/23/99	-11.53	-94.7
	07/22/98	-6.66	-41.2	Missouri River near the Independence well field	05/21/99	-7.77	-54.4
8-2yr	05/23/00	-6.57	-43.1		03/01/00	-9.72	-71.6
11-1yr	07/22/98	-10.84	-81.7		04/03/00	-10.30	-78.6
12-2yr	05/22/00	-6.88	-44.7		11/22/99	-11.53	-91.8
	07/18/01	-8.63	-63.7		09/08/99	-10.11	-80.9
16-10yr	03/31/00	-6.22	-38.8		05/19/00	-11.10	-89.8
	07/19/01	-9.67	-71.0		07/18/01	-8.09	-61.0
16-5yr	02/23/00	-5.81	-35.7				
	05/05/99	-5.91	-36.8				
	08/27/99	-5.93	-37.0				
	11/24/99	-5.81	-36.4				
19-0.5yr	07/15/98	-6.45	-39.2				
24-5yr	03/31/00	-6.31	-39.7				
25-10yr	05/26/99	-5.89	-36.3				
25-3yr	09/08/99	-6.47	-42.9				
	02/22/00	-6.52	-43.3				
	11/18/99	-6.49	-43.6				
27-10yr	05/14/99	-5.80	-33.4				

