



Figure 5. Generalized land use, location of wells, and specific conductance and nitrate concentrations in ground water

Table 4. Physical properties and constituent concentrations in water from selected wells in the Gallatin Valley

[Analyses by Mostana Bureau of Mines and Geology. Minimum detection levels as reported by analyzing laboratory. Geologic unit: Qal, Quaternary alluvium; Q/Ta, Quaternary and Tertiary alluvial-fan deposits; Ts, Tertiary sediments. Abbreviations: $\mu\text{S/cm}$, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; i, incremental titration; $\mu\text{g/L}$, micrograms per liter; pCi/L, picocuries per liter. Symbols: <, less than detection limit for analytical method used; --, no data. Remark: Q, water sample collected for analysis of organic constituents listed in table 7.]

[illegible]

Table 5. Drinking-water regulations for public water supply

[Abbreviations: MCL, Maximum Contaminant Level; SMCL, Secondary Maximum Contaminant Level; mg/L, milligrams per liter; µg/L, micrograms per liter; --, no regulation available or not applicable]

Water-quality characteristic	Maximum concentration or value for indicated regulation			
	National	National	Equivalent	
	Primary	Secondary	trace-element	
	Drinking-Water	Drinking-	concentration	
	Regulation ^a	Water		for MCL,
	(MCL or action level)	Regulation ^a (SMCL)		SMCL, or action level
pH	Physical property (standard units)			(μ g/L)
	--	6.5-8.5	--	--
	Common constituents (mg/L)			
	--	500	--	--
Dissolved solids	--	250	--	--
Chloride	--	250	--	--
Fluoride	4.0	2.0	--	--
Nitrate (as N)	10	--	--	--
Sulfate	--	250	--	--
	Trace elements (mg/L)			
Barium ^b	2.0	--	2,000	--
Cadmium	.005	--	5	--
Chromium	--	1	100	--
Copper ^c	1.0	--	1,000	--
Iron	--	.3	300	--
Lead ^d	.015	--	15	--
Manganese	--	.05	50	--
Silver	--	--	1	100
Zinc	--	5.0	5,000	--

¹Listed only for properties, common constituents, and trace elements analyzed in this report.

²U.S. Environmental Protection Agency (1991a), except as indicated.

³U.S. Environmental Protection Agency (1991b), except as indicated.

⁴The U.S. Geological Survey reports trace-element concentrations in micrograms per liter.

⁵U.S. Environmental Protection Agency (1992a).

⁶Montana Department of Health and Environmental Sciences (1994).

Table 3. Specific capacity of selected wells in the Gallatin Valley

[Tests by U.S. Geological Survey. Geologic unit: Qal, Quaternary alluvium; QTs, Quaternary and Tertiary alluvial-fan deposits; Ts, Tertiary sediments. Abbreviations: gal/min, gallons per minute; (gal/min)/ft, gallons per minute per foot of drawdown. Symbol: —, no data]

Location number	Drycharge (g/dm ³)	Specific capacity (g/whin·h)	Pumping period (hours)	Geologic unit
01N04E17AAA01	12	3.0	0.5	Qal
01N04E18BFC01	54	13.3	—	Qal
01N04E25CDD01	140	19.7	—	Qal
01N04E26AAB01	5	5.2	—	Qal
01N04E28ABD01	5.2	8.9	—	Qal
01N05B64DDAD02	11	4.6	.3	Qal
01N05B68DAD01	14	6.86	.2	Qal
01N05E10D01	15	4.4	.2	Qal
01N05E17CDD01	7.5	1.8	.2	Qal
01N05E22CDD01	8.0	6.05	—	Qal
01N05E00EBC01	12	6.7	.2	Qal
01N05E15SCA01	9.2	3.97	.2	Qal
01N05E16D0C01	19	21.8	1.5	Qal
01N05E17CC01	12	2.4	.2	Qal
01N05E22ADD01	12	.46	.2	Qal
01N05E24CAC01	5.4	2.2	—	Qal
02N04E15BDC01	12	1.7	.2	Qal
02N05E05AAB01	6.3	63.2	—	Qal
02N05E05AB01	7.1	1.6	.4	Qal
02N05E05ZCA01	10	5.19	—	Qal
03N04D013ARA01	12	3.97	.2	Qal
03N04E11CB101	12	20.3	.3	Qal
03N04E25BDD01	8.6	1.3	1.0	Qal
03N05E05AAB01	6.0	16.62	.3	Qal
03N05E07BCC01	12	23.1	.3	Qal
03N05E21BBB01	8.0	1.78	.3	Qal
01N05E02AA01	8.0	2.7	.5	QTa
01N05E04ACD01	8.0	5.13	—	QTa
01N05E20DBA01	8.6	5.73	.2	QTa
01N05E34DDD01	6.6	.7	3.0	QTa
01N05E35ADB01	14	82	1	QTa
01N06E02BDA01	6.7	1.5	.3	QTa
01N05E27CDD01	12	3.8	.2	QTa
01N05E19CAA01	15	2.96	.3	QTa
01N05E18BB01	9.1	1.7	.5	QTa
01N05E20BDA02	11	19	.5	QTa
01N06E02BDA01	9.1	—	—	QTa
02N05E22ZDD01	6.0	300	.28	QTa
02N05E11BDA01	114	0.55	1.1	QTa
02N05E17BBA01	3.7	9.38	.3	QTa
02N05E20DBD01	7.4	1.2	.3	QTa
02N05E22CCD01	12	8.5	.2	QTa
02N05E31ADD01	7.1	.2	.3	QTa
02N05E20BDA01	7.1	3.2	—	QTa
03N04E24AAC01	8.6	23.8	.3	QTa
03N05E06A0001	20	3.12	.3	QTa
03N05E10CCB01	10	1.4	.4	QTa
02N04E10DBA01	7	.42	.4	QTa
01N04E00D01	10	4.9	.5	QTa
01N05E16DAA01	13	1.26	.5	QTa
02N02E36CAA01	2.4	1.2	.5	Ts
02N04E23BDD01	10	5.5	1.5	Ts
02N04E23BDD01	6.7	2.9	.29	Ts
02N05E10RBD01	6.7	.53	.5	Ts
02N05E18AB01	10	.74	.2	Ts
02N05E34DDB01	10	.78	.5	Ts
02N04E03CB01	6.7	8.9	.22	Ts
02N04E16BCC01	6.9	5.97	.2	Ts
02N05E20CC01	5.7	1.9	.2	Ts
02N05E05AB01	11	.42	.6	Ts
02N05E20CAB01	6.7	.20	.4	Ts
03N04E09ABC01	6.7	47.6	.3	Ts
03N04E20BDA01	6.7	1.5	.3	Ts

Table 6. Results of analyses of quality-control samples

[Laboratory: MBMG, Montana Bureau of Mines and Geology; USGS, U.S. Geological Survey. Minimum detection levels as reported by analyzing laboratory. Geologic unit: Qal, Quaternary alluvium; QTa, Quaternary and Tertiary alluvial-fan deposits. Abbreviations: $\mu\text{S}/\text{cm}$, microsiemens per centimeter at 25 °C; °C, degrees Celsius; mg/L, milligrams per liter; fei, fixed-endpoint titration; lab, laboratory; $\mu\text{g}/\text{L}$, micrograms per liter; CFU/g, colony-forming units per gram.]

Location name	Laboratory	Geologic unit	Date	Specific conductance, lab (μS/cm)	Temperature, lab (°C)	pH, lab (tetra-dent units)	Hardness, total (mg/L as CaCO ₃)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)
01N05E28DCAD01	MBMG	Qal	06-24-92	449	8.5	8.0	220	59	17
01N05E19BCBA01	USGS	Qal	02-04-92	635	8.5	7.8	210	58	16
01N05E19CBAB01	MBMG	Qal	07-13-99						
01N05E19CBAB01	MBMG	Qal	06-24-92	304	8.0	8.2	150	36	15
01N05E19CBAB01	MBMG	Qal	06-24-92	293	8.0	8.0	150	35	14
02N04E35SDCC01	USGS	Qal	01-01-92						
02N04E35SDCC01	MBMG	Qal	07-20-93	281	8.0	7.4	130	24	16

Location number	Sodium, dissolved (mg/L as Na)	Sodium adsorption ratio	Potassium, dissolved (mg/L as K)	Alkalinity, lab (mg/L as CaCO ₃)	Sulfate, dissolved (mg/L as SO ₄)	Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Silica, dissolved (mg/L as SiO ₂)
Q1N05E2DCAD01	10	0.3	2.0	210	18	1.5	<1	12
Q1S05E1SCBA01	11	.3	1.7	210	16	1.5	<1	12
Q1S05E0ACBA01	2.5	1	2.3	150	11	1.2	<4	12
	2.6	0	1.7	150	9.6	2	<1	13
Q2N05E3SCC01								
Q2N05E3CBA01	4.7	.2	2.1	120	11	4.5	.2	15

Location number	Solids, sum of constituents, dissolved (mg/L)	Phosphorus, ortho, dissolved (mg/L as P)	Aluminum, dissolved (μg/L as Al)	Arsenic, dissolved (μg/L as As)	Barium, dissolved (μg/L as Ba)	Beryllium, dissolved (μg/L as Be)	Boron, dissolved (μg/L as B)	Cadmium, dissolved (μg/L as Cd)
01N06E28DCAD01	248	<0.5	<10	<50	<5	70	<2	26
01S06E15BCBA01	243	<0.5	<10	<50	<5	0.5	<2	<1
01S06E46BCB01	169	<5	<10	<50	<5	<2	<2	<2
02N06E58DCB01	166	<5	<10	<50	83	.5	10	1.0
02N06E58DCB01	160	<5	<10	<50	<5	<2	<2	<2

Location number	Chromium, dissolved ($\mu\text{g/L}$)	Cobalt, dissolved ($\mu\text{g/L}$ as Co)	Copper, dissolved ($\mu\text{g/L}$ as Cu)	Iron, dissolved ($\mu\text{g/L}$ as Fe)	Lead, dissolved ($\mu\text{g/L}$ as Pb)	Lithium, dissolved ($\mu\text{g/L}$ as Li)	Manganese, dissolved ($\mu\text{g/L}$ as Mn)	Molybdenum, dissolved ($\mu\text{g/L}$ as Mo)	Nickel, dissolved ($\mu\text{g/L}$ as Ni)
01N1SE2B0CA01	3.5	~	0	4	<	<	<	<	21
01S0SE15BCRA01	5.0	~	<	<	<	<	<	<	<
01S0SE06ABCR01	Δ	3	<	<	<	<	<	<	<
02N0SE35BCC01	Δ	3	<	<	<	<	<	<	<
02N0SE35BCC01	3	~	<	~	<	<	<	<	<

Location number	Silver, disclosed ($\mu\text{g/L}$ as Ag)	Strontium, disclosed ($\mu\text{g/L}$ as Sr)	Titanium, disclosed ($\mu\text{g/L}$ as Ti)	Vanadium, disclosed ($\mu\text{g/L}$ as V)	Zinc, disclosed ($\mu\text{g/L}$ as Zn)	Zirconium, disclosed ($\mu\text{g/L}$ as Zr)	Radon-222, total (pCi/L)
01N05E2XCAD01	<1	120	38	<5	1	<100	--
	<1	120	--	<6	1	--	--
01S05E15BCBA01	<1	80	23	<5	<60	<100	726
01S06E06ACB01	<1	81	--	<6	58	--	--
02N05E35BD001	1	--	--	<6	58	--	475
03S05E15CBA01	--	83	<10	--	<6	<20	1,359

Table 7. Selected pesticides and pesticide-degradation products analyzed in water from selected wells in the Gallatin Valley

[Abbreviation: $\mu\text{g/L}$, micrograms per liter]

Compound	Method detection limit ($\mu\text{g/L}$)
Alachlor	0.38
Aldicarb	1.0
Aldicarb sulfone	2.0
Aldicarb sulfoxide	2.0
Atrazine	.13
De-allyl atrazine	1.0
De-ethyl atrazine	1.0
De-isopropyl atrazine	1.0
Bromoxynil	2.5
Carbaryl	.50
Carbofuran	1.5
3-hydroxy carbofuran	2.0
Carbozin	.60
Chlorpyrifos	.50
Cyfluthrin	1.0
Cyfluthrin	.50
Cyfluthrin	.25
Dinoseb-S	.25
Diazinon	.25
Dicamba	.28
5-hydroxy dicamba	.25
Dichlorvos	2.5
Dinoseb	.28
Diazinofos	.38
Diazinofos sulfone	3.8
Diazinofos sulfoxide	.38
Hexazinone	.76
Malathion	.80
MCPA	2.6
MCPB	.50
Mets and para asert acid metabolites	.50
Mets and para asert methyl ester	.50
Methoxy	.50
Mesulachlor	.75
Merbuzin	.15
Deaminated diketo merbuzin	2.5
Deaminated merbuzin	1.0
Diketo merbuzin	.50
Ethyl parathion	.50
Methyl parathion	.50
PCP	.16
Picloram	.35
Prometon	.30
Prometryn	.19
Propazine	.13
Silvex	.16
Sinazine	.075
Tebuthiuron	1.3
Terbuthyl	4.5
Terbufos	.50
Trichlor	.25
2,4-D	.28
2,4-DB	.72
2,4-DP	.20
2,4,5-T	.20