

APPENDIX B.

Summary of streamflow data collected during five seepage studies and streamflow gain and loss estimates for the middle reach of the Snake River, between the near Shelley and near Minidoka gaging stations, Idaho, April 2001 through November 2002

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Table B1. Estimates of streamflow gains and losses in specified subreaches of the Snake River between the near Shelley and near Minidoka gaging stations, Idaho, April 3-6, 2001

[ft³/s, cubic feet per second; mi, mile; ---, no data; estimated gain/loss presented across from the downstream site; values in **boldface** are statistically significant]

Site number (see figure 4)	Gaging-station name (number) or intermediate measurement site	River mile		Discharge (ft ³ /s)	Date	Time	Total gain or (loss) (ft ³ /s)	Gain or (loss) per mile (ft ³ /s/mi)
M1	Snake River near Shelley (13060000)	787.8		2940	4/3/2001	1030		
			total estimated inflow	0				
			total estimated outflow	0				
M2	Snake River at Shelley Bridge, near Shelley	782.3		2790	4/3/2001	1320	(150)	(27)
			total estimated inflow	0				
			total estimated outflow	0				
M3	Snake River at Firth	777.3		2690	4/3/2001	1415	(100)	(20)
			total estimated inflow	0				
			total estimated outflow	0				
M4	Snake River at Kennedy Road, near Firth	773.1		2620	4/3/2001	1520	(70)	(17)
			total estimated inflow	0				
			total estimated outflow	0				
M5	Snake River at Porterville Bridge, near Blackfoot	767.5		2460	4/3/2001	1615	(160)	(29)
			total estimated inflow	0				
			total estimated outflow	0				
M6	Snake River at Blackfoot (13062500)	764.3		2470	4/3/2001	1745	10	3
				2490	4/4/2001	1245		
			total estimated inflow	0				
			total estimated outflow	0				
M7	Snake River near Riverside	760.2		2210	4/4/2001	1445	(280)	(68)
			total estimated inflow	0				
			total estimated outflow	0				
M8	Snake River near Thomas	753.5		2050	4/4/2001	1555	(160)	(24)
			total estimated inflow	109				
			total estimated outflow	0				
M9	Snake River near Blackfoot (13069500)	750.1		2290	4/4/2001	1745	131	39
				2190	4/4/2001	0845		
			total estimated inflow	0				
			total estimated outflow	0				

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Table B1. Estimates of streamflow gains and losses in specified subreaches of the Snake River between the near Shelley and near Minidoka gaging stations, Idaho, April 3-6, 2001--Continued

Site number (see figure 4)	Gaging-station name (number) or intermediate measurement site	River mile		Discharge (ft ³ /s)	Date	Time	Total gain or (loss) (ft ³ /s)	Gain or (loss) per mile (ft ³ /s/mi)
M10	Snake River near Pingree	743.3		2520	4/4/2001	1210	330	49
			total estimated inflow	0				
			total estimated outflow	0				
M11	Snake River above McTucker Creek, near Pingree	738.0		2820	4/4/2001	1005	300	57
			total estimated inflow	588				
			total estimated outflow	0				
			estimated outflow to storage above American Falls Dam ¹	800				
M12	Snake River at Neeley (13077000)	714.1		3920	4/5/2001	0600	1,312	55
				3920	4/5/2001	0600		
			total estimated inflow	9				
			total estimated outflow	0				
M13	Snake River above Massacre Rocks, near Neeley	707.7		² ---	---	---	---	---
			total estimated inflow	37				
			total estimated outflow	0				
M14	Snake River at Register Rock, near Cold Water	702.5		² ---	---	---	---	---
			total estimated inflow	34				
			total estimated outflow	0				
M15	Snake River above Raft River, near Yale	694		² ---	---	---	---	---
			total estimated inflow	0				
			total estimated outflow	0				
			estimated outflow to storage above Minidoka Dam ¹	1150				
M16	Snake River near Minidoka (13081500)	673.5		2730	4/6/2001	0145	(121)	(3)

¹ Estimate based on reservoir-stage data (Bureau of Reclamation).

² Discharge was measured but not used in the calculations because of unsteady flow conditions (see table B3).

Table B2. Discharge data from gaging stations along the Snake River between near Shelley and near Minidoka, Idaho, April 3-6, 2001

[ft³/s, cubic feet per second]

Site number (see figure B5)	Gaging-station name (number)	Date	Time	Discharge (ft ³ /s)
M1	Snake River near Shelley (13060000)	4/3/2001	1030	2940
M6	Snake River at Blackfoot (13062500)	4/3/2001	1745	2470
		4/4/2001	1245	2490
M9	Snake River near Blackfoot (13069500)	4/4/2001	1745	2290
		4/4/2001	0845	2190
M12	Snake River at Neeley (13077000)	4/5/2001	0600	3920
		4/5/2001	0600	3920
M16	Snake River near Minidoka (13081500)	4/6/2001	0145	2730

Table B3. Discharge data from acoustic Doppler measurements along the Snake River between the near Shelley and near Minidoka gaging stations, Idaho, April 3-6, 2001

[ft³/s, cubic feet per second; COV, coefficient of variation; σ , standard deviation; μ , mean]

Site number (see figure B5)	Intermediate measurement site	Date	Time	Discharge (ft ³ /s)	COV (σ/μ)
M2	Snake River at Shelley Bridge, near Shelley	4/3/2001	1320	2790	0.03
M3	Snake River at Firth	4/3/2001	1415	2690	.01
M4	Snake River at Kennedy Road, near Firth	4/3/2001	1520	2620	.01
M5	Snake River at Porterville Bridge, near Blackfoot	4/3/2001	1615	2460	.01
M7	Snake River near Riverside	4/4/2001	1445	2210	.04
M8	Snake River near Thomas	4/4/2001	1555	2050	.02
M10	Snake River near Pingree	4/4/2001	1210	2520	.04
M11	Snake River above McTucker Creek, near Pingree	4/4/2001	1005	2820	.02
M13	Snake River above Massacre Rocks, near Neeley	4/3/2001	1235	¹ 4000	.02
M14	Snake River at Register Rock, near Cold Water	4/3/2001	1155	¹ 3020	.02
M15	Snake River above Raft River, near Yale	4/3/2001	1005	¹ 4860	.01

¹ Discharge was measured during unsteady flow conditions because of increasing releases from American Falls Dam.

Table B4. Discharge data for all inspected inflow and outflow sites along the Snake River between the near Shelley and near Minidoka gaging stations, Idaho, April 3-4, 2001

[Latitude and longitude in degrees, minutes, seconds referenced in North American Datum of 1983; ft³/s, cubic feet per second; site numbers shown in figure B5; ---, no data; DM, daily mean discharge; values in shaded areas indicate canal withdrawals]

Inspection site name	Gaging-station number	Location		Date	Time	Discharge (ft ³ /s)
		Latitude	Longitude			
Subreach between site numbers M1 and M2						
Miscellaneous agriculture return near Woodville	---	43 24 38	112 09 19	4/3/2001	---	0
Miscellaneous agriculture return near Woodville	---	43 24 57	112 08 48	4/3/2001	---	0
Shull Lateral near Shelley	---	43 24 26	112 08 00	4/3/2001	---	0
Reservation Canal near Shelley	13060500	43 22 24	112 09 13	4/3/2001	DM	0
Miscellaneous agriculture return near Shelley	---	43 22 42	112 10 11	4/3/2001	---	0
Subreach between site numbers M2 and M3						
Miscellaneous agriculture return near Shelley	---	43 22 26	112 10 11	4/3/2001	---	---
Blackfoot Canal near Shelley	13061430	43 21 18	112 09 53	4/3/2001	DM	0
Subreach between site numbers M3 and M4						
New Lavaside Canal near Firth	13061520	43 18 30	112 12 09	4/3/2001	DM	0
Peoples Canal near Firth	13061525	44 18 31	113 12 10	4/3/2001	DM	0
Aberdeen Springfield Canal near Firth	13061610	43 17 37	112 13 13	4/3/2001	DM	0
Subreach between site numbers M4 and M5						
Aberdeen Springfield Waste near Kimball	---	43 16 49	112 15 16	4/3/2001	---	0
Corbett Slough Canal near Kimball	13061650	43 15 40	112 15 30	4/3/2001	DM	0
Neilson-Hanson Canal near Kimball	13061670	43 15 29	112 17 07	4/3/2001	DM	0
Miscellaneous agriculture return near Wapello	---	43 14 47	112 17 58	4/3/2001	---	0
Riverside Canal near Rose	13061705	43 15 47	112 18 07	4/3/2001	DM	0
Lavaside and Riverside return near Rose	---	43 14 05	112 19 31	4/3/2001	---	0
Subreach between site numbers M5 and M6						
Miscellaneous agriculture return near Blackfoot	---	43 13 36	112 19 50	4/3/2001	---	0
Danskin Canal near Blackfoot	13061995	43 13 28	112 20 12	4/3/2001	DM	0
Miscellaneous agriculture return near Blackfoot	---	43 13 12	112 20 31	4/3/2001	---	0
Miscellaneous agriculture return at Blackfoot	---	43 12 12	112 22 12	4/3/2001	---	0
Subreach between site numbers M6 and M7						
Trego Canal near Blackfoot	13062050	43 12 05	112 22 00	4/3/2001	DM	0
Wearyrick Canal near Blackfoot	13062503	43 11 51	112 22 36	4/3/2001	DM	0
Watson Slough near Blackfoot	13062506	43 11 46	112 23 44	4/3/2001	DM	0
Parsons Ditch near Blackfoot	13062507	43 11 36	112 23 45	4/3/2001	DM	0
Subreach between site numbers M7 and M8						
Riverton Ditch near Thomas	---	43 09 00	112 27 04	4/3/2001	---	0
Crawford Ditch near Thomas	---	43 10 04	112 27 44	4/3/2001	---	0
Watson Slough return near Thomas	---	43 09 39	112 29 13	4/3/2001	---	0
Subreach between site numbers M8 and M9						
Blackfoot River near Blackfoot	¹ 13068500	43 07 50	112 28 35	4/4/2001	DM	109
Miscellaneous agriculture return near Thomas	---	43 08 04	112 30 54	4/3/2001	---	0
Subreach between site numbers M9 and M10						
Mud Slough near Fort Hall	---	43 05 40	112 31 04	4/3/2001	---	² ---
Diggie Creek near Fort Hall	---	43 05 43	112 31 07	4/3/2001	---	² 149
Jeff Cabin Creek near Fort Hall	---	43 04 05	112 33 00	4/3/2001	---	² 0
Subreach between site numbers M10 and M11						
---	---	---	---	---	---	---
Subreach between site numbers M11 and M12						
Ross Fork near Fort Hall	---	42 00 21	111 29 47	4/4/2001	---	² 10
Clear Creek near Fort Hall	---	43 02 23	112 32 33	---	---	² ---
Spring Creek near Fort Hall	¹ 13075983	43 02 36	112 33 15	4/4/2001	DM	² 332
McTucker Creek near Springfield	---	43 02 05	112 38 36	4/3/2001	---	² 20

Table B4. Discharge data for all inspected inflow and outflow sites along the Snake River between the near Shelley and near Minidoka gaging stations, Idaho, April 3-4, 2001--Continued

Inspection site name	Gaging-station number	Location		Date	Time	Discharge (ft ³ /s)
		Latitude	Longitude			
Portneuf River near Tyhee	¹ 13075910	42 56 42	112 32 38	4/4/2001	DM	536
Danielson Creek near Springfield	---	43 03 32	112 41 27	4/4/2001	---	² 45
Sterling Waste near Sterling	13069548	43 01 49	112 43 40	---	---	---
Unnamed Spring #1 near Sterling	---	43 03 37	112 43 19	---	---	---
Crystal Springs near Sterling	---	43 02 52	112 40 53	---	---	---
Unnamed Spring #2 near Sterling	---	42 59 39	112 45 37	---	---	---
Unnamed Spring #3 near Sterling	---	43 02 39	112 39 09	---	---	---
Bannock Creek near Michaud	---	42 53 12	112 38 35	4/4/2001	---	49
Aberdeen Waste Drain near Aberdeen	13069565	42 55 27	112 43 39	4/4/2001	---	1
Tarter Waste near American Falls	13076210	42 52 40	112 51 23	4/4/2001	---	0
Seagull Bay near American Falls	---	42 49 24	112 47 45	4/4/2001	---	0
Sunbeam near American Falls	---	42 47 55	112 50 53	4/4/2001	---	2
Spring Hallow near American Falls	---	42 48 39	112 53 30	4/4/2001	---	² 0
Falls Irrigation Pump near American Falls	13076400	42 46 46	112 52 22	4/4/2001	DM	0
Subreach between site numbers M12 and M13						
Ferry Hallow near Neeley	---	42 45 43	112 52 57	4/4/2001	---	0
Warm Creek near Neeley	---	42 44 01	112 54 25	4/4/2001	1105	7.0
Little Creek near Neeley	---	42 42 47	112 55 53	4/4/2001	1140	1.9
Subreach between site numbers M13 and M14						
Rock Creek near Rockland	13077650	42 39 10	113 01 00	4/4/2001	1315	37.4
Dry Hallow Creek near Rockland	---	42 38 40	113 01 57	4/4/2001	---	0
Subreach between site numbers M14 and M15						
Little Warm Creek near Cold Water	---	43 38 07	113 03 43	4/4/2001	1420	5.3
Fall Creek near Cold Water	---	43 37 36	113 05 05	4/4/2001	1515	28.9
Lanes Gulch near Cold Water	---	42 37 10	113 07 11	4/4/2001	---	0
Subreach between site numbers M15 and M16						
Raft River near Yale	---	42 35 50	113 14 19	4/4/2001	---	0
Minidoka Northside Canal near Minidoka	13080000	42 40 15	113 29 00	4/4/2001	DM	105
Minidoka Southside Canal near Minidoka	13080500	42 39 45	113 29 20	4/4/2001	DM	0

¹ Long-term United States Geological Survey gaging station.

² Streamflow resulting from spring discharge; not used in calculation of gain/loss estimates.

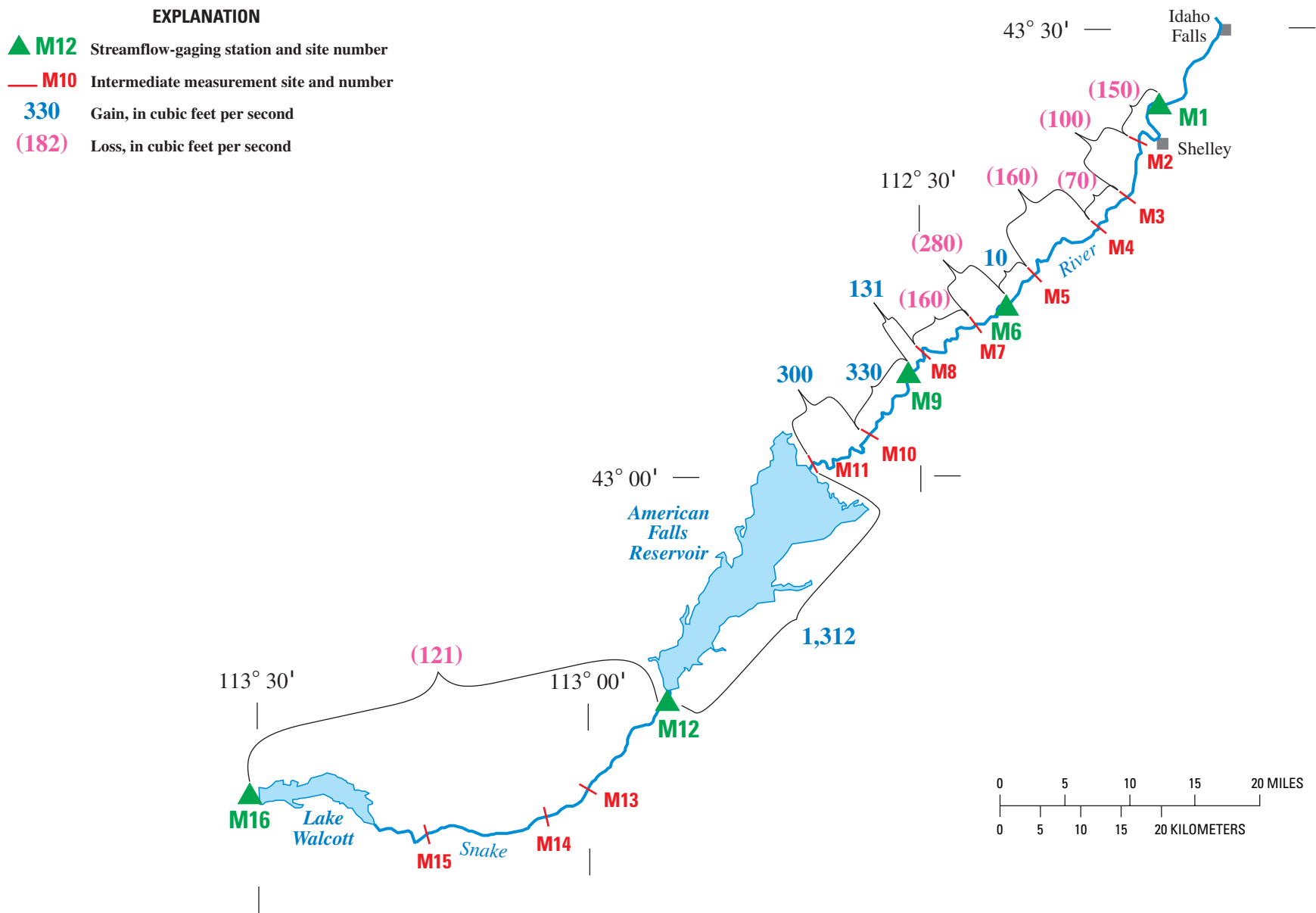


Figure B5. Streamflow gains and losses along the middle reach of the Snake River, between the near Shelley and near Minidoka gaging stations, Idaho, April 3–6, 2001.

Table B6. Estimates of streamflow gains and losses in specified subreaches of the Snake River between the near Shelley and near Minidoka gaging stations, Idaho, October 31, November 1-2, and November 20, 2001

[ft³/s, cubic feet per second; mi, mile; ---, no data; estimated gain/loss presented across from the downstream site; values in **boldface** are statistically significant]

Site number (see figure 4)	Gaging-station name (number) or intermediate measurement site	River mile		Discharge (ft ³ /s)	Date	Time	Total gain or (loss) (ft ³ /s)	Gain or (loss) per mile (ft ³ /s/mi)
M1	Snake River near Shelley (13060000)	787.8		2130	10/31/2001	0745		
			total estimated inflow	0				
			total estimated outflow	0				
M2	Snake River at Shelley Bridge, near Shelley	782.3		2090	10/31/2001	0930	(40)	(7)
			total estimated inflow	0				
			total estimated outflow	0				
M3	Snake River at Firth	777.3		1760	10/31/2001	1030	¹ (330)	(66)
			total estimated inflow	0				
			total estimated outflow	0				
M4	Snake River at Kennedy Road, near Firth	773.1		1840	10/31/2001	1115	80	19
			total estimated inflow	0				
			total estimated outflow	5				
M5	Snake River at Porterville Bridge, near Blackfoot	767.5		1710	10/31/2001	1230	(125)	(22)
			total estimated inflow	0				
			total estimated outflow	0				
M6	Snake River at Blackfoot (13062500)	764.3		1690	10/31/2001	1330	(20)	(6)
				1700	10/31/2001	1215		
			total estimated inflow	0				
			total estimated outflow	7				
M7	Snake River near Riverside	760.2		1520	10/31/2001	1415	(173)	(42)
			total estimated inflow	6				
			total estimated outflow	0				
M8	Snake River near Thomas	753.5		1510	10/31/2001	1600	¹ (16)	(2)
			total estimated inflow	90				
			total estimated outflow	0				
M9	Snake River near Blackfoot (13069500)	750.1		1570	10/31/2001	1745	(30)	(9)
				1810	11/1/2001	0530		
			total estimated inflow	0				
			total estimated outflow	0				

Table B6. Estimates of streamflow gains and losses in specified subreaches of the Snake River between the near Shelley and near Minidoka gaging stations, Idaho, October 31, November 1-2, and November 20, 2001--Continued

Site number (see figure 4)	Gaging-station name (number) or intermediate measurement site	River mile		Discharge (ft ³ /s)	Date	Time	Total gain or (loss) (ft ³ /s)	Gain or (loss) per mile (ft ³ /s/mi)
M10	Snake River near Pingree	743.3		2410	11/1/2001	0845	600	88
			total estimated inflow	0				
			total estimated outflow	0				
M11	Snake River above McTucker Creek, near Pingree	738.0		² ---	---	---	---	---
			total estimated inflow	481				
			total estimated outflow	0				
			estimated outflow to storage above American Falls Dam ³	4000				
M12	Snake River at Neeley (13077000)	714.1		354	11/2/2001	0715	1464	50
				377	11/20/2001	1130		
			total estimated inflow	4				
			total estimated outflow	0				
M13	Snake River above Massacre Rocks, near Neeley	707.7		573	11/20/2001	1440	192	30
			total estimated inflow	19				
			total estimated outflow	0				
M14	Snake River at Register Rock, near Cold Water	702.5		⁴ ---	---	---	---	---
			total estimated inflow	32				
			total estimated outflow	0				
M15	Snake River above Raft River, near Yale	694.0		492	11/20/2001	1145	(131)	(10)
			total estimated inflow	0				
			total estimated outflow	0				
			estimated outflow to storage above Minidoka Dam ²	0				
M16	Snake River near Minidoka (13081500)	673.5		545	11/20/2001	2145	53	3

¹ Estimate likely affected by unsteady releases from the two small hydrogenation facilities located on the Snake River near Idaho Falls.

² Unable to find a measurement location because of sediment buildup and braided channels.

³ Estimate based on reservoir-stage data (Bureau of Reclamation).

⁴ Discharge was not measured; unable to access measurement location.

Table B7. Discharge data from gaging stations along the Snake River between near Shelley and near Minidoka, Idaho, October 31, November 1–2, and November 20, 2001

[ft³/s, cubic feet per second]

Site number (see figure B10)	Gaging-station name (number)	Date	Time	Discharge (ft³/s)
M1	Snake River near Shelley (13060000)	10/31/2001	0745	2130
M6	Snake River at Blackfoot (13062500)	10/31/2001	1330	1690
		10/31/2001	1215	1700
M9	Snake River near Blackfoot (13069500)	10/31/2001	1745	1570
		11/1/2001	0530	1810
M12	Snake River at Neeley (13077000)	11/2/2001	0715	354
		11/20/2001	1130	377
M16	Snake River near Minidoka (13081500)	11/20/2001	2145	545

Table B8. Discharge data from acoustic Doppler measurements along the Snake River between the near Shelley and near Minidoka gaging stations, Idaho, October 31, November 1-2, and November 20, 2001

[ft³/s, cubic feet per second; COV, coefficient of variation; σ , standard deviation; μ , mean; ---, no data]

Site number (see figure B10)		Intermediate measurement site	Date	Time	Discharge (ft ³ /s)	COV (σ/μ)
M2		Snake River at Shelley Bridge, near Shelley	10/31/2001	0930	2090	0.04
M3		Snake River at Firth	10/31/2001	1030	1760	.04
M4		Snake River at Kennedy Road, near Firth	10/31/2001	1115	1840	.02
M5		Snake River at Porterville Bridge, near Blackfoot	10/31/2001	1230	1710	.04
M7		Snake River near Riverside	10/31/2001	1415	1520	.07
M8		Snake River near Thomas	10/31/2001	1600	1510	.05
M10		Snake River near Pingree	11/1/2001	0845	2410	.03
M11		Snake River above McTucker Creek, near Pingree	---	---	¹ ---	---
---		12 miles above American Falls Dam, near Aberdeen	11/1/2001	1130	² 2580	.02
M13		Snake River above Massacre Rocks, near Neeley	11/20/2001	1440	573	.11
M14		Snake River at Register Rock, near Cold Water	---	---	³ ---	---
M15		Snake River above Raft River, near Yale	11/20/2001	1145	492	.04

¹ Unable to find a measurement location because of sediment buildup and braided channels.

² Main-channel measurement within American Falls Reservoir during low-water conditions (not used in the final estimates).

³ Discharge was not measured; unable to access measurement location because of shallow depths.

Table B9. Discharge data for all inspected inflow and outflow sites along the Snake River between the near Shelley and near Minidoka gaging stations, Idaho, October 31 and November 1, 2001

[Latitude and longitude in degrees, minutes, seconds referenced in North American Datum of 1983; ft³/s, cubic feet per second; site numbers shown in figure B10; ---, no data; DM, daily mean discharge; values in shaded areas indicate canal withdrawals]

Inspection site name	Gaging-station number	Location		Date	Time	Discharge (ft ³ /s)
		Latitude	Longitude			
Subreach between site numbers M1 and M2						
Miscellaneous agriculture return near Woodville	---	43 24 38	112 09 19	10/31/2001	---	0
Miscellaneous agriculture return near Woodville	---	43 24 57	112 08 48	10/31/2001	---	0
Shull Lateral near Shelley	---	43 24 26	112 08 00	10/31/2001	---	0
Reservation Canal near Shelley	13060500	43 22 24	112 09 13	10/31/2001	DM	0
Miscellaneous agriculture return near Shelley	---	43 22 42	112 10 11	10/31/2001	---	0
Subreach between site numbers M2 and M3						
Miscellaneous agriculture return near Shelley	---	43 22 26	112 10 11	10/31/2001	---	---
Blackfoot Canal near Shelley	13061430	43 21 18	112 09 53	10/31/2001	DM	0
Subreach between site numbers M3 and M4						
New Lavaside Canal near Firth	13061520	43 18 30	112 12 09	10/31/2001	DM	0
Peoples Canal near Firth	13061525	44 18 31	113 12 10	10/31/2001	DM	0
Aberdeen Springfield Canal near Firth	13061610	43 17 37	112 13 13	10/31/2001	DM	0
Subreach between site numbers M4 and M5						
Aberdeen Springfield Waste near Kimball	---	43 16 49	112 15 16	10/31/2001	---	0
Corbett Slough Canal near Kimball	13061650	43 15 40	112 15 30	10/31/2001	DM	0
Neilson-Hanson Canal near Kimball	13061670	43 15 29	112 17 07	10/31/2001	DM	5
Miscellaneous agriculture return near Wapello	---	43 14 47	112 17 58	10/31/2001	---	0
Riverside Canal near Rose	13061705	43 15 47	112 18 07	10/31/2001	DM	0
Lavaside and Riverside return near Rose	---	43 14 05	112 19 31	10/31/2001	---	0
Subreach between site numbers M5 and M6						
Miscellaneous agriculture return near Blackfoot	---	43 13 36	112 19 50	10/31/2001	---	0
Danskin Canal near Blackfoot	13061995	43 13 28	112 20 12	10/31/2001	DM	0
Miscellaneous agriculture return near Blackfoot	---	43 13 12	112 20 31	10/31/2001	---	0
Miscellaneous agriculture return at Blackfoot	---	43 12 12	112 22 12	10/31/2001	---	0
Subreach between site numbers M6 and M7						
Trego Canal near Blackfoot	13062050	43 12 05	112 22 00	10/31/2001	DM	0
Wearyrick Canal near Blackfoot	13062503	43 11 51	112 22 36	10/31/2001	DM	0
Watson Slough near Blackfoot	13062506	43 11 46	112 23 44	10/31/2001	DM	7
Parsons Ditch near Blackfoot	13062507	43 11 36	112 23 45	10/31/2001	DM	0
Subreach between site numbers M7 and M8						
Riverton Ditch near Thomas	---	43 09 00	112 27 04	10/31/2001	---	0
Crawford Ditch near Thomas	---	43 10 04	112 27 44	10/31/2001	---	2.5
Watson Slough return near Thomas	---	43 09 39	112 29 13	10/31/2001	---	3.2
Subreach between site numbers M8 and M9						
Blackfoot River near Blackfoot	¹ 13068500	43 07 50	112 28 35	10/31/2001	DM	90
Miscellaneous agriculture return near Thomas	---	43 08 04	112 30 54	10/31/2001	---	0
Subreach between site numbers M9 and M10						
Mud Slough near Fort Hall	---	43 05 40	112 31 04	11/1/2001	---	² ---
Diggie Creek near Fort Hall	---	43 05 43	112 31 07	11/1/2001	---	² ---
Jeff Cabin Creek near Fort Hall	---	43 04 05	112 33 00	11/1/2001	---	² 0
Subreach between site numbers M10 and M11						
---	---	---	---	---	---	---
Subreach between site numbers M11 and M12						
Ross Fork near Fort Hall	---	43 00 21	111 29 47	11/1/2001	---	² 44.6
Clear Creek near Fort Hall	---	43 02 23	112 32 33	11/1/2001	---	² 21.1
Spring Creek near Fort Hall	¹ 13075983	43 02 36	112 33 15	11/1/2001	DM	² 336
McTucker Creek near Springfield	---	43 02 05	112 38 36	11/1/2001	---	² 14.4

Table B9. Discharge data for all inspected inflow and outflow sites along the Snake River between the near Shelley and near Minidoka gaging stations, Idaho, October 31 and November 1, 2001--Continued

Inspection site name	Gaging-station number	Location		Date	Time	Discharge (ft ³ /s)
		Latitude	Longitude			
Portneuf River near Tyhee	¹ 13075910	42 56 42	112 32 38	11/1/2001	DM	448
Danielson Creek near Springfield	---	43 03 32	112 41 27	11/1/2001	---	² 49.7
Sterling Waste near Sterling	13069548	43 01 49	112 43 40	11/1/2001	---	² 7.5
Unnamed Spring #1 near Sterling	---	43 03 37	112 43 19	11/1/2002	---	² 0.7
Crystal Springs near Sterling	---	43 02 52	112 40 53	11/1/2001	---	² 45.9
Unnamed Spring #2 near Sterling	---	42 59 39	112 45 37	11/1/2001	---	² 3
Unnamed Spring #3 near Sterling	---	43 02 39	112 39 09	11/1/2001	---	² 16.6
Bannock Creek near Michaud	---	42 53 12	112 38 35	11/1/2001	---	30
Aberdeen Waste Drain near Aberdeen	13069565	42 55 27	112 43 39	11/1/2001	---	1.3
Tarter Waste near American Falls	13076210	42 52 40	112 51 23	11/1/2001	---	---
Seagull Bay near American Falls	---	42 49 24	112 47 45	11/1/2001	---	0
Sunbeam near American Falls	---	42 47 55	112 50 53	11/1/2001	---	1
Spring Hallow near American Falls	---	42 48 39	112 53 30	11/1/2001	---	² 2
Falls Irrigation Pump near American Falls	13076400	42 46 46	112 52 22	11/1/2001	DM	0
Subreach between site numbers M12 and M13						
Ferry Hallow near Neeley	---	42 45 43	112 52 57	11/1/2001	---	0
Warm Creek near Neeley	---	42 44 01	112 54 25	11/1/2001	---	2.2
Little Creek near Neeley	---	42 42 47	112 55 53	11/1/2001	---	1.5
Subreach between site numbers M13 and M14						
Rock Creek near Rockland	13077650	42 39 10	113 01 00	11/1/2001	---	18.6
Dry Hallow Creek near Rockland	---	42 38 40	113 01 57	11/1/2001	---	0
Subreach between site numbers M14 and M15						
Little Warm Creek near Cold Water	---	43 38 07	113 03 43	11/1/2001	---	2.2
Fall Creek near Cold Water	---	43 37 36	113 05 05	11/1/2001	---	29.3
Lanes Gulch near Cold Water	---	42 37 10	113 07 11	11/1/2001	---	0
Subreach between site numbers M15 and M16						
Raft River near Yale	---	42 35 50	113 14 19	11/1/2001	---	0
Minidoka Northside Canal near Minidoka	13080000	42 40 15	113 29 00	11/1/2001	DM	0
Minidoka Southside Canal near Minidoka	13080500	42 39 45	113 29 20	11/1/2001	DM	0

¹ Long-term United States Geological Survey gaging station.

² Streamflow resulting from spring discharge; not used in calculation of gain/loss estimates.

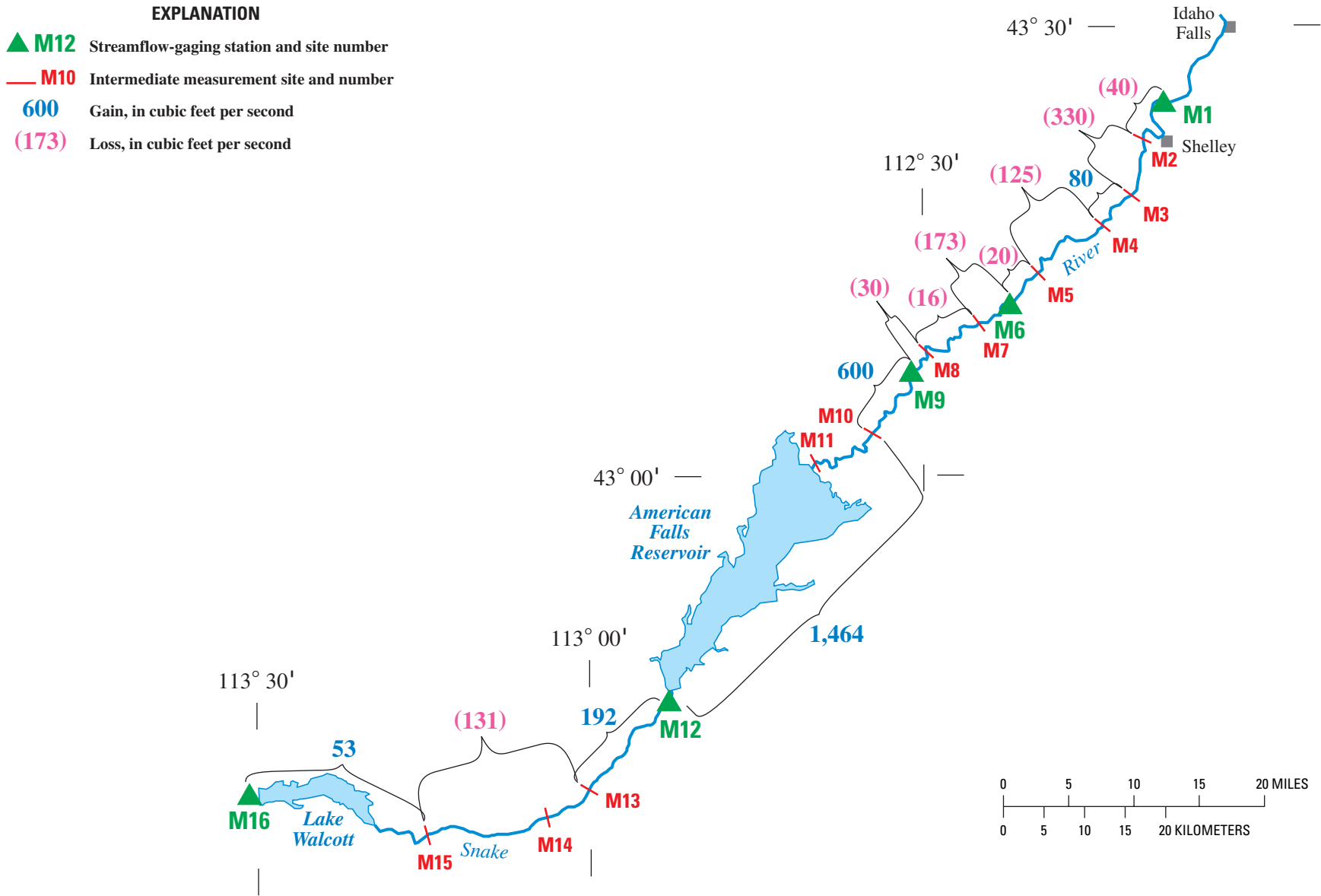


Figure B10. Streamflow gains and losses along the middle reach of the Snake River, between the near Shelley and near Minidoka gaging stations, Idaho, October 31, November 1–2, and November 20, 2001.

Table B11. Estimates of streamflow gains and losses in specified subreaches of the Snake River between the near Shelley and near Minidoka gaging stations, Idaho, April 9-11 and May 7, 2002

[ft³/s, cubic feet per second; mi, mile; ---, no data; estimated gain/loss presented across from the downstream site; values in **boldface** are statistically significant]

Site number (see figure 4)	Gaging-station name (number) or intermediate measurement site	River mile	Discharge			Total gain or (loss) (ft ³ /s)	Gain or (loss) per mile (ft ³ /s/mi)
			(ft ³ /s)	Date	Time		
M1	Snake River near Shelley (13060000)	787.8	2290	4/9/2002	0915		
			total estimated inflow	0			
			total estimated outflow	0			
M2	Snake River at Shelley Bridge, near Shelley	782.3	2190	4/9/2002	1059	(100)	(18)
			total estimated inflow	0			
			total estimated outflow	0			
M3	Snake River at Firth	777.3	2290	4/9/2002	1155	100	20
			total estimated inflow	0			
			total estimated outflow	0			
M4	Snake River at Kennedy Road, near Firth	773.1	2120	4/9/2002	1030	(170)	(40)
			total estimated inflow	0			
			total estimated outflow	0			
M5	Snake River at Porterville Bridge, near Blackfoot	767.5	2050	4/9/2002	1130	(70)	(12)
			total estimated inflow	0			
			total estimated outflow	0			
M6	Snake River at Blackfoot (13062500)	764.3	1980	4/9/2002	1230	(70)	(22)
			1970	4/9/2002	1200		
			total estimated inflow	0			
			total estimated outflow	0			
M7	Snake River near Riverside	760.2	1790	4/9/2002	1330	(180)	(44)
			total estimated inflow	0			
			total estimated outflow	0			
M8	Snake River near Thomas	753.5	1660	4/9/2002	1430	(130)	(19)
			total estimated inflow	110			
			total estimated outflow	0			
M9	Snake River near Blackfoot (13069500)	750.1	1750	4/9/2002	1545	(20)	(6)
			1730	4/10/2002	0630		
			total estimated inflow	0			
			total estimated outflow	0			

Table B11. Estimates of streamflow gains and losses in specified subreaches of the Snake River between the near Shelley and near Minidoka gaging stations, Idaho, April 9-11 and May 7, 2002--Continued

Site number (see figure 4)	Gaging-station name (number) or intermediate measurement site	River mile		Discharge (ft ³ /s)	Date	Time	Total gain or (loss) (ft ³ /s)	Gain or (loss) per mile (ft ³ /s/mi)
M10	Snake River near Pingree	743.3		¹ ---	---	---	---	---
			total estimated inflow	0				
			total estimated outflow	0				
M11	Snake River above McTucker Creek, near Pingree	738		2190	4/10/2002	1223	460	38
			total estimated inflow	538				
			total estimated outflow	0				
			estimated outflow to storage above American Falls Dam ²	2300				
M12	Snake River at Neeley (13077000)	714.1		1660	4/11/2002	0600	1,232	52
				8450	5/7/2002	0400		
			total estimated inflow	5				
			total estimated outflow	0				
M13	Snake River above Massacre Rocks, near Neeley	707.7		8680	5/7/2002	0715	225	35
			total estimated inflow	5				
			total estimated outflow	0				
M14	Snake River at Register Rock, near Cold Water	702.5		8310	5/7/2002	0815	(375)	(72)
			total estimated inflow	15				
			total estimated outflow	0				
M15	Snake River above Raft River, near Yale	694		³ ---	---	---	---	---
			total estimated inflow	0				
			total estimated outflow (canals)	660				
			estimated outflow to storage above Minidoka Dam ²	250				
M16	Snake River near Minidoka (13081500)	673.5		6480	5/7/2002	2230	(935)	(32)

¹ Discharge was not measured; unable to access measurement location.

² Estimate based on reservoir-stage data (Bureau of Reclamation).

³ Discharge was not measured because of river or weather conditions.

Table B12. Discharge data from gaging stations along the Snake River between near Shelley and near Minidoka, Idaho, April 9-11 and May 7, 2002

[ft³/s, cubic feet per second]

Site number (see figure B15)	Gaging-station name (number)	Date	Time	Discharge (ft ³ /s)
M1	Snake River near Shelley (13060000)	4/9/2002	0915	2290
M6	Snake River at Blackfoot (13062500)	4/9/2002	1230	1980
		4/9/2002	1200	1970
M9	Snake River near Blackfoot (13069500)	4/9/2002	1545	1750
		4/10/2002	0630	1730
M12	Snake River at Neeley (13077000)	4/11/2002	0600	1660
		5/7/2002	0400	8450
M16	Snake River near Minidoka (13081500)	5/7/2002	2230	6480

Table B13. Discharge data from acoustic Doppler measurements along the Snake River between the near Shelley and near Minidoka gaging stations, Idaho, April 9-10 and May 7, 2002
 [ft³/s, cubic feet per second; COV, coefficient of variation; σ , standard deviation; μ , mean; ---, no data]

Site number (see figure B15)	Intermediate measurement site	Date	Time	Discharge (ft ³ /s)	COV (σ/μ)
M2	Snake River at Shelley Bridge, near Shelley	4/9/2002	1059	2190	0.04
M3	Snake River at Firth	4/9/2002	1155	2290	.01
M4	Snake River at Kennedy Road, near Firth	4/9/2002	1030	2120	.03
M5	Snake River at Porterville Bridge, near Blackfoot	4/9/2002	1130	2050	.02
M7	Snake River near Riverside	4/9/2002	1330	1790	.04
M8	Snake River near Thomas	4/9/2002	1430	1660	.05
M10	Snake River near Pingree	---	---	¹ ---	---
M11	Snake River above McTucker Creek, near Pingree	4/10/2002	1223	2190	.02
M13	Snake River above Massacre Rocks, near Neeley	5/7/2002	0715	8680	.02
M14	Snake River at Register Rock, near Cold Water	5/7/2002	0815	8310	.06
M15	Snake River above Raft River, near Yale	---	---	¹ ---	---

¹ Discharge was not measured; unable to access measurement location because of braided channels and shallow depths.

² Discharge was not measured because of unsafe river conditions due to high winds.

Table B14. Discharge data for all inspected inflow and outflow sites along the Snake River between the near Shelley and near Minidoka gaging stations, Idaho, April 9-10 and May 7, 2002

[Latitude and longitude in degrees, minutes, seconds referenced in North American Datum of 1983; ft³/s, cubic feet per second; site numbers shown in figure B15; ---, no data; DM, daily mean discharge; values in shaded areas indicate canal withdrawals]

Inspection site name	Gaging-station number	Location		Date	Time	Discharge (ft ³ /s)
		Latitude	Longitude			
Subreach between site numbers M1 and M2						
Miscellaneous agriculture return near Woodville	---	43 24 38	112 09 19	4/9/2002	---	0
Miscellaneous agriculture return near Woodville	---	43 24 57	112 08 48	4/9/2002	---	0
Shull Lateral near Shelley	---	43 24 26	112 08 00	4/9/2002	---	0
Reservation Canal near Shelley	13060500	43 22 24	112 09 13	4/9/2002	DM	0
Miscellaneous agriculture return near Shelley	---	43 22 42	112 10 11	4/9/2002	---	0
Subreach between site numbers M2 and M3						
Miscellaneous agriculture return near Shelley	---	43 22 26	112 10 11	4/9/2002	---	---
Blackfoot Canal near Shelley	13061430	43 21 18	112 09 53	4/9/2002	DM	0
Subreach between site numbers M3 and M4						
New Lavaside Canal near Firth	13061520	43 18 30	112 12 09	4/9/2002	DM	0
Peoples Canal near Firth	13061525	44 18 31	113 12 10	4/9/2002	DM	0
Aberdeen Springfield Canal near Firth	13061610	43 17 37	112 13 13	4/9/2002	DM	0
Subreach between site numbers M4 and M5						
Aberdeen Springfield Waste near Kimball	---	43 16 49	112 15 16	4/9/2002	---	0
Corbett Slough Canal near Kimball	13061650	43 15 40	112 15 30	4/9/2002	DM	0
Neilson-Hanson Canal near Kimball	13061670	43 15 29	112 17 07	4/9/2002	DM	0
Miscellaneous agriculture return near Wapello	---	43 14 47	112 17 58	4/9/2002	---	0
Riverside Canal near Rose	13061705	43 15 47	112 18 07	4/9/2002	DM	0
Lavaside and Riverside return near Rose	---	43 14 05	112 19 31	4/9/2002	---	0
Subreach between site numbers M5 and M6						
Miscellaneous agriculture return near Blackfoot	---	43 13 36	112 19 50	4/9/2002	---	0
Danskin Canal near Blackfoot	13061995	43 13 28	112 20 12	4/9/2002	DM	0
Miscellaneous agriculture return near Blackfoot	---	43 13 12	112 20 31	4/9/2002	---	0
Miscellaneous agriculture return at Blackfoot	---	43 12 12	112 22 12	4/9/2002	---	0
Subreach between site numbers M6 and M7						
Trego Canal near Blackfoot	13062050	43 12 05	112 22 00	4/9/2002	DM	0
Wearyrick Canal near Blackfoot	13062503	43 11 51	112 22 36	4/9/2002	DM	0
Watson Slough near Blackfoot	13062506	43 11 46	112 23 44	4/9/2002	DM	0
Parsons Ditch near Blackfoot	13062507	43 11 36	112 23 45	4/9/2002	DM	0
Subreach between site numbers M7 and M8						
Riverton Ditch near Thomas	---	43 09 00	112 27 04	4/9/2002	---	0
Crawford Ditch near Thomas	---	43 10 04	112 27 44	4/9/2002	---	0
Watson Slough return near Thomas	---	43 09 39	112 29 13	4/9/2002	---	0
Subreach between site numbers M8 and M9						
Blackfoot River near Blackfoot	¹ 13068500	43 07 50	112 28 35	4/9/2002	DM	110
Miscellaneous agriculture return near Thomas	---	43 08 04	112 30 54	4/9/2002	---	0
Subreach between site numbers M9 and M10						
Mud Slough near Fort Hall	---	43 05 40	112 31 04	4/10/2002	---	² ---
Diggie Creek near Fort Hall	---	43 05 43	112 31 07	4/10/2002	---	² ---
Jeff Cabin Creek near Fort Hall	---	43 04 05	112 33 00	4/10/2002	---	² 0
Subreach between site numbers M10 and M11						
---	---	---	---	---	---	---
Subreach between site numbers M11 and M12						
Ross Fork near Fort Hall	---	43 00 21	111 29 47	4/10/2002	---	² ---
Clear Creek near Fort Hall	---	43 02 23	112 32 33	4/10/2002	---	² ---
Spring Creek near Fort Hall	¹ 13075983	43 02 36	112 33 15	4/10/2002	DM	² 311
McTucker Creek near Springfield	---	43 02 05	112 38 36	4/10/2002	---	² ---

Table B14. Discharge data for all inspected inflow and outflow sites along the Snake River between the near Shelley and near Minidoka gaging stations, Idaho, April 9-10 and May 7, 2002--Continued

Inspection site name	Gaging-station number	Location		Date	Time	Dis-charge (ft ³ /s)
		Latitude	Longitude			
Portneuf River near Tyhee	¹ 13075910	42 56 42	112 32 38	4/10/2002	DM	518
Danielson Creek near Springfield	---	43 03 32	112 41 27	4/10/2002	---	² ---
Sterling Waste near Sterling	13069548	43 01 49	112 43 40	4/10/2002	---	² ---
Unnamed Spring #1 near Sterling	---	43 03 37	112 43 19	4/10/2002	---	² ---
Crystal Springs near Sterling	---	43 02 52	112 40 53	4/10/2002	---	² ---
Unnamed Spring #2 near Sterling	---	42 59 39	112 45 37	4/10/2002	---	² ---
Unnamed Spring #3 near Sterling	---	43 02 39	112 39 09	4/10/2002	---	² ---
Bannock Creek near Michaud	---	42 53 12	112 38 35	4/10/2002	---	20
Aberdeen Waste Drain near Aberdeen	13069565	42 55 27	112 43 39	4/10/2002	---	0
Tarter Waster near American Falls	13076210	42 52 40	112 51 23	4/10/2002	---	---
Seagull Bay near American Falls	---	42 49 24	112 47 45	4/10/2002	---	0
Sunbeam near American Falls	---	42 47 55	112 50 53	4/10/2002	---	0
Spring Hallow near American Falls	---	42 48 39	112 53 30	4/10/2002	---	² ---
Falls Irrigation Pump near American Falls	13076400	42 46 46	112 52 22	4/10/2002	DM	0
Subreach between site numbers M12 and M13						
Ferry Hallow near Neeley	---	42 45 43	112 52 57	5/7/2002	---	0
Warm Creek near Neeley	---	42 44 01	112 54 25	5/7/2002	---	5.0
Little Creek near Neeley	---	42 42 47	112 55 53	5/7/2002	---	---
Subreach between site numbers M13 and M14						
Rock Creek near Rockland	13077650	42 39 10	113 01 00	5/7/2002	---	4.5
Dry Hallow Creek near Rockland	---	42 38 40	113 01 57	5/7/2002	---	0
Subreach between site numbers M14 and M15						
Little Warm Creek near Cold Water	---	43 38 07	113 03 43	5/7/2002	---	---
Fall Creek near Cold Water	---	43 37 36	113 05 05	5/7/2002	---	15
Lanes Gulch near Cold Water	---	42 37 10	113 07 11	5/7/2002	---	---
Subreach between site numbers M15 and M16						
Raft River near Yale	---	42 35 50	113 14 19	5/7/2002	---	0
Minidoka Northside Canal near Minidoka	13080000	42 40 15	113 29 00	5/7/2002	DM	946
Minidoka Southside Canal near Minidoka	13080500	42 39 45	113 29 20	5/7/2002	DM	660

¹ Long-term United States Geological Survey gaging station.

² Streamflow resulting from spring discharge; not used in calculation of gain/loss estimates.

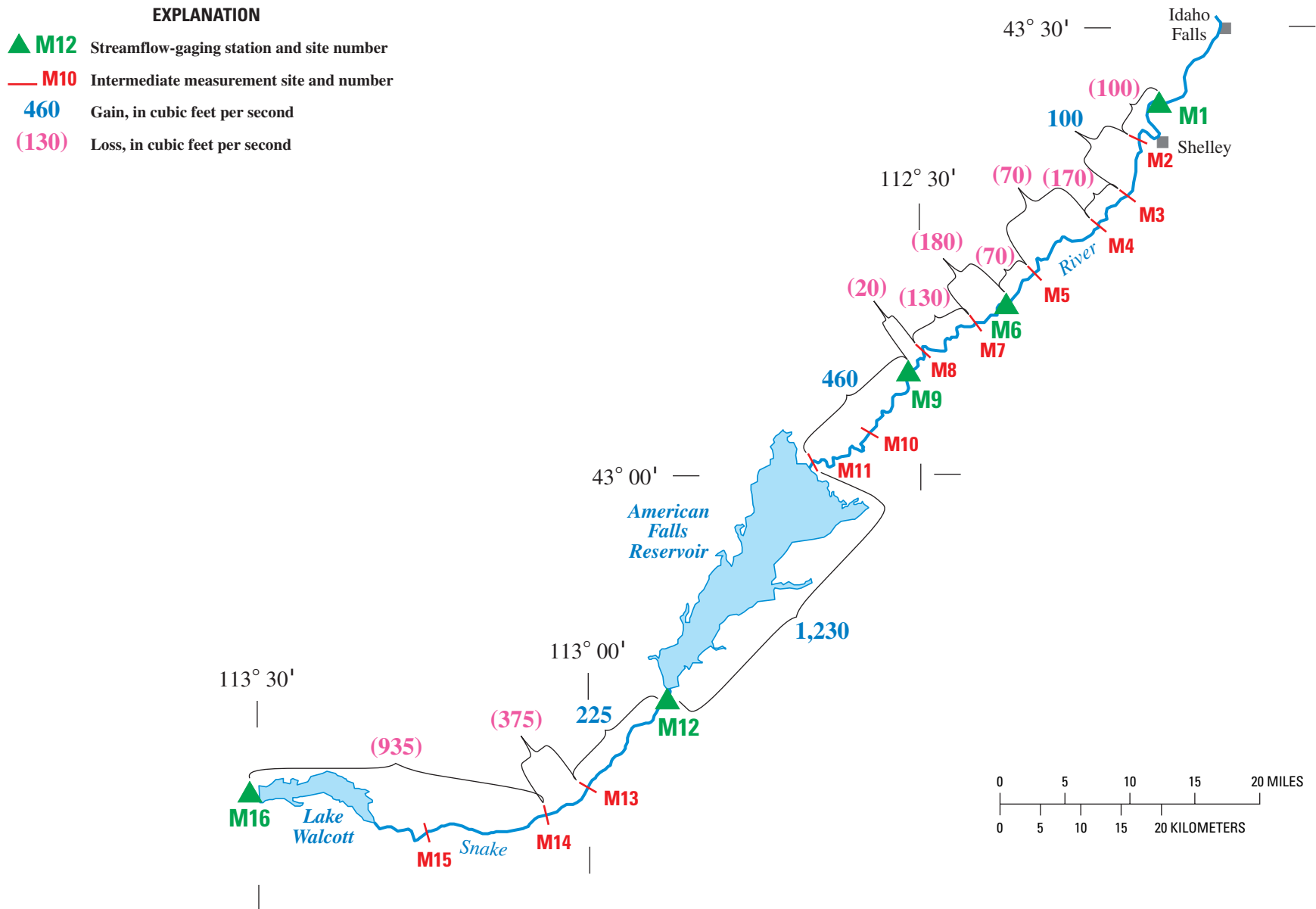


Figure B15. Streamflow gains and losses along the middle reach of the Snake River, between the near Shelley and near Minidoka gaging stations, Idaho, April 9–11 and May 7, 2002.

Table B16. Estimates of streamflow gains and losses in specified subreaches of the Snake River between the near Shelley and near Minidoka gaging stations, Idaho, July 23-24, 2002

[ft³/s, cubic feet per second; mi, mile; ---, no data; estimated gain/loss presented across from the downstream site; values in **boldface** are statistically significant]

Site number (see figure 4)	Gaging-station name (number) or intermediate measurement site	River mile	Discharge			Total gain or (loss) (ft ³ /s)	Gain or (loss) per mile (ft ³ /s/mi)
			(ft ³ /s)	Date	Time		
M1	Snake River near Shelley (13060000)	787.8		7330	7/23/2002	1215	
			total estimated inflow	8			
			total estimated outflow	360			
M2	Snake River at Shelley Bridge, near Shelley	782.3		6730	7/23/2002	1407	(248) (45)
			total estimated inflow	2			
			total estimated outflow	348			
M3	Snake River at Firth	777.3		6640	7/23/2002	1527	257 51
			total estimated inflow	0			
			total estimated outflow	1337			
M4	Snake River at Kennedy Road, near Firth	773.1		4690	7/23/2002	1030	(613) (146)
			total estimated inflow	92			
			total estimated outflow	249			
M5	Snake River at Porterville Bridge, near Blackfoot	767.5		4660	7/23/2002	1145	127 23
			total estimated inflow	62			
			total estimated outflow	185			
M6	Snake River at Blackfoot (13062500)	764.3		4460	7/23/2002	1245	(77) (24)
			total estimated inflow	0			
			total estimated outflow	189			
M7	Snake River near Riverside	760.2		4460	7/23/2002	1400	169 41
			total estimated inflow	46			
			total estimated outflow	0			
M8	Snake River near Thomas	753.5		4060	7/23/2002	1515	(446) (67)
			total estimated inflow	41			
			total estimated outflow	0			
M9	Snake River near Blackfoot (13069500)	750.1		3980	7/23/2002	1630	(121) (36)
			total estimated inflow	0			
			total estimated outflow	0			

Table B16. Estimates of streamflow gains and losses in specified subreaches of the Snake River between the near Shelley and near Minidoka gaging stations, Idaho, July 23-24, 2002--Continued

Site number (see figure 4)	Gaging-station name (number) or intermediate measurement site	River mile		Discharge (ft ³ /s)	Date	Time	Total gain or (loss) (ft ³ /s)	Gain or (loss) per mile (ft ³ /s/mi)
M10	Snake River near Pingree	743.3		¹ ---	---	---	---	---
			total estimated inflow	0				
			total estimated outflow	0				
M11	Snake River above McTucker Creek, near Pingree	738		² ---	---	---	---	---
			total estimated inflow	506				
			total estimated outflow	96				
			estimated outflow to storage above American Falls Dam ³	-4900				
M12	Snake River at Neeley (13077000)	714.1		10,400	7/24/2002	0600	1131	31
				10,400	7/24/2002	0600		
			total estimated inflow	3				
			total estimated outflow	0				
M13	Snake River above Massacre Rocks, near Neeley	707.7		10,300	7/24/2002	0845	(103)	(16)
			total estimated inflow	20				
			total estimated outflow	0				
M14	Snake River at Register Rock, near Cold Water	702.5		10,300	7/24/2002	0745	(20)	(4)
			total estimated inflow	27				
			total estimated outflow	0				
M15	Snake River above Raft River, near Yale	694		10,400	7/24/2002	1030	74	9
			total estimated inflow	0				
			total estimated outflow	1811				
			estimated outflow to storage above Minidoka Dam ³	165				
M16	Snake River near Minidoka (13081500)	673.5		8560	7/24/2002	2030	136	7

¹ Discharge was not measured; unable to access measurement location.

² Discharge was not measured; unable to find a measurement location.

³ Estimate based on reservoir-stage data (Bureau of Reclamation).

Table B17. Discharge data from gaging stations along the Snake River between near Shelley and near Minidoka, Idaho, July 23-24, 2002

[ft³/s, cubic feet per second]

Site number (see figure B20)	Gaging-station name (number)	Date	Time	Discharge (ft ³ /s)
M1	Snake River near Shelley (13060000)	7/23/2002	1215	7330
M6	Snake River at Blackfoot (13062500)	7/23/2002	1245	4460
		7/23/2002	1230	4480
M9	Snake River near Blackfoot (13069500)	7/23/2002	1630	3980
		7/23/2002	0400	3960
M12	Snake River at Neeley (13077000)	7/24/2002	0600	10,400
		7/24/2002	0600	10,400
M16	Snake River near Minidoka (13081500)	7/24/2002	2030	8560

Table B18. Discharge data from acoustic Doppler measurements along the Snake River between the near Shelley and near Minidoka gaging stations, Idaho, July 23-24, 2002

[ft³/s, cubic feet per second; COV, coefficient of variation; σ , standard deviation; μ , mean; ---, no data]

Site number (see figure		Date	Time	Discharge (ft ³ /s)	COV (σ/μ)
B20)	Intermediate measurement site				
M2	Snake River at Shelley Bridge, near Shelley	7/23/2002	1407	6730	0.08
M3	Snake River at Firth	7/23/2002	1527	6640	.01
M4	Snake River at Kennedy Road, near Firth	7/23/2002	1030	4690	.05
M5	Snake River at Porterville Bridge, near Blackfoot	7/23/2002	1145	4660	.05
M7	Snake River near Riverside	7/23/2002	1400	4460	.04
M8	Snake River near Thomas	7/23/2002	1515	4060	.03
M10	Snake River near Pingree	---	---	¹ ---	---
M11	Snake River above McTucker Creek, near Pingree	---	---	² ---	---
M13	Snake River above Massacre Rocks, near Neeley	7/24/2002	0845	10,300	.01
M14	Snake River at Register Rock, near Cold Water	7/24/2002	0745	10,300	.01
M15	Snake River above Raft River, near Yale	7/24/2002	1030	10,400	.03

¹ Discharge was not measured; unable to access measurement location because of sediment buildup and braided channels.

² Discharge was not measured; unable to find a measurement location because of sediment buildup and braided channels.

Table B19. Discharge data for all inspected inflow and outflow sites along the Snake River between the near Shelley and near Minidoka gaging stations, Idaho, July 23-25, 2002

[Latitude and longitude in degrees, minutes, seconds referenced in North American Datum of 1983; ft³/s, cubic feet per second; site numbers shown in figure B20; ---, no data; DM, daily mean discharge; values in shaded areas indicate canal withdrawals]

Inspection site name	Gaging-station number	Location		Date	Time	Discharge (ft ³ /s)
		Latitude	Longitude			
Subreach between site numbers M1 and M2						
Miscellaneous agriculture return near Woodville	---	43 24 38	112 09 19	7/24/2002	1645	3
Miscellaneous agriculture return near Woodville	---	43 24 57	112 08 48	7/24/2002	1655	1
Shull Lateral near Shelley	---	43 24 26	112 08 00	7/24/2002	1620	1
Reservation Canal near Shelley	13060500	43 22 24	112 09 13	7/23/2002	DM	360
Miscellaneous agriculture return near Shelley	---	43 22 42	112 10 11	7/24/2002	1630	3
Subreach between site numbers M2 and M3						
Miscellaneous agriculture return near Shelley	---	43 22 26	112 10 11	7/24/2002	1630	1.5
Blackfoot Canal near Shelley	13061430	43 21 18	112 09 53	7/23/2002	DM	348
Subreach between site numbers M3 and M4						
New Lavaside Canal near Firth	13061520	43 18 30	112 12 09	7/23/2002	DM	94
Peoples Canal near Firth	13061525	44 18 31	113 12 10	7/23/2002	DM	261
Aberdeen Springfield Canal near Firth	13061610	43 17 37	112 13 13	7/23/2002	DM	982
Subreach between site numbers M4 and M5						
Aberdeen Springfield Waste near Kimball	---	43 16 49	112 15 16	7/23/2002	---	90
Corbett Slough Canal near Kimball	13061650	43 15 40	112 15 30	7/23/2002	DM	130
Neilson-Hanson Canal near Kimball	13061670	43 15 29	112 17 07	7/23/2002	---	17
Miscellaneous agriculture return near Wapello	---	43 14 47	112 17 58	7/23/2002	---	2.4
Riverside Canal near Rose	13061705	43 15 47	112 18 07	7/23/2002	DM	102
Lavaside and Riverside return near Rose	---	43 14 05	112 19 31	7/23/2002	---	0
Subreach between site numbers M5 and M6						
Miscellaneous agriculture return near Blackfoot	---	43 13 36	112 19 50	7/23/2002	---	3.3
Danskin Canal near Blackfoot	13061995	43 13 28	112 20 12	7/23/2002	DM	185
Miscellaneous agriculture return near Blackfoot	---	43 13 12	112 20 31	7/23/2002	---	1
Miscellaneous agriculture return at Blackfoot	---	43 12 12	112 22 12	7/23/2002	---	58
Subreach between site numbers M6 and M7						
Trego Canal near Blackfoot	13062050	43 12 05	112 22 00	7/23/2002	DM	61
Wearyrick Canal near Blackfoot	13062503	43 11 51	112 22 36	7/23/2002	DM	37
Watson Slough near Blackfoot	13062506	43 11 46	112 23 44	7/23/2002	DM	60
Parsons Ditch near Blackfoot	13062507	43 11 36	112 23 45	7/23/2002	DM	31
Subreach between site numbers M7 and M8						
Riverton Ditch near Thomas	---	43 09 00	112 27 04	7/24/2002	---	2.4
Crawford Ditch near Thomas	---	43 10 04	112 27 44	7/23/2002	---	21
Watson Slough return near Thomas	---	43 09 39	112 29 13	7/24/2002	---	23
Subreach between site numbers M8 and M9						
Blackfoot River near Blackfoot	¹ 13068500	43 07 50	112 28 35	7/23/2002	DM	40
Miscellaneous agriculture return near Thomas	---	43 08 04	112 30 54	7/24/2002	---	1
Subreach between site numbers M9 and M10						
Mud Slough near Fort Hall	---	43 05 40	112 31 04	7/25/2002	---	² 75
Diggie Creek near Fort Hall	---	43 05 43	112 31 07	7/25/2002	---	² 500
Jeff Cabin Creek near Fort Hall	---	43 04 05	112 33 00	7/25/2002	---	² 13
Subreach between site numbers M10 and M11						
---	---	---	---	---	---	---
Subreach between site numbers M11 and M12						
Ross Fork near Fort Hall	---	42 00 21	111 29 47	7/25/2002	---	² 20
Clear Creek near Fort Hall	---	43 02 23	112 32 33	7/25/2002	---	² 28
Spring Creek near Fort Hall	¹ 13075983	43 02 36	112 33 15	7/24/2002	DM	² 272
McTucker Creek near Springfield	---	43 02 05	112 38 36	7/24/2002	---	250

Table B19. Discharge data for all inspected inflow and outflow sites along the Snake River between the near Shelley and near Minidoka gaging stations, Idaho, July 23-25, 2002--Continued

Inspection site name	Gaging-station number	Location		Date	Time	Discharge (ft ³ /s)
		Latitude	Longitude			
Portneuf River near Tyhee	¹ 13075910	42 56 42	112 32 38	7/24/2002	DM	166
Danielson Creek near Springfield	---	43 03 32	112 41 27	7/24/2002	---	10
Sterling Waste near Sterling	13069548	43 01 49	112 43 40	7/24/2002	---	² 1
Unnamed Spring near Sterling	---	43 03 37	112 43 19	7/24/2002	---	² 2
Crystal Springs near Sterling	---	43 02 52	112 40 53	7/24/2002	---	² 37
Unnamed Spring near Sterling	---	42 59 39	112 45 37	7/24/2002	---	² 1
Unnamed Spring near Sterling	---	43 02 39	112 39 09	7/24/2002	---	² 12
Bannock Creek near Michaud	---	42 53 12	112 38 35	7/25/2002	---	30
Aberdeen Waste Drain near Aberdeen	13069565	42 55 27	112 43 39	7/24/2002	---	41
Tarter Waster near American Falls	13076210	42 52 40	112 51 23	7/24/2002	---	3
Seagull Bay near American Falls	---	42 49 24	112 47 45	7/25/2002	---	3
Sunbeam near American Falls	---	42 47 55	112 50 53	7/25/2002	---	3
Spring Hallow near American Falls	---	42 48 39	112 53 30	7/25/2002	---	² 1
Falls Irrigation Pump near American Falls	13076400	42 46 46	112 52 22	7/24/2002	DM	96
Subreach between site numbers M12 and M13						
Ferry Hallow near Neeley	---	42 45 43	112 52 57	7/24/2002	---	0
Warm Creek near Neeley	---	42 44 01	112 54 25	7/24/2002	---	1.5
Little Creek near Neeley	---	42 42 47	112 55 53	7/24/2002	---	1.0
Subreach between site numbers M13 and M14						
Rock Creek near Rockland	13077650	42 39 10	113 01 00	7/24/2002	---	20
Dry Hallow Creek near Rockland	---	42 38 40	113 01 57	7/24/2002	---	0
Subreach between site numbers M14 and M15						
Little Warm Creek near Cold Water	---	43 38 07	113 03 43	7/24/2002	---	2.5
Fall Creek near Cold Water	---	43 37 36	113 05 05	7/24/2002	---	24
Lanes Gulch near Cold Water	---	42 37 10	113 07 11	7/24/2002	---	0
Subreach between site numbers M15 and M16						
Raft River near Yale	---	42 35 50	113 14 19	7/24/2002	---	0
Minidoka Northside Canal near Minidoka	13080000	42 40 15	113 29 00	7/24/2002	DM	942
Minidoka Southside Canal near Minidoka	13080500	42 39 45	113 29 20	7/24/2002	DM	869

¹ Long-term United States Geological Survey gaging station.

² Streamflow resulting from spring discharge; not used in calculation of gain/loss estimates.

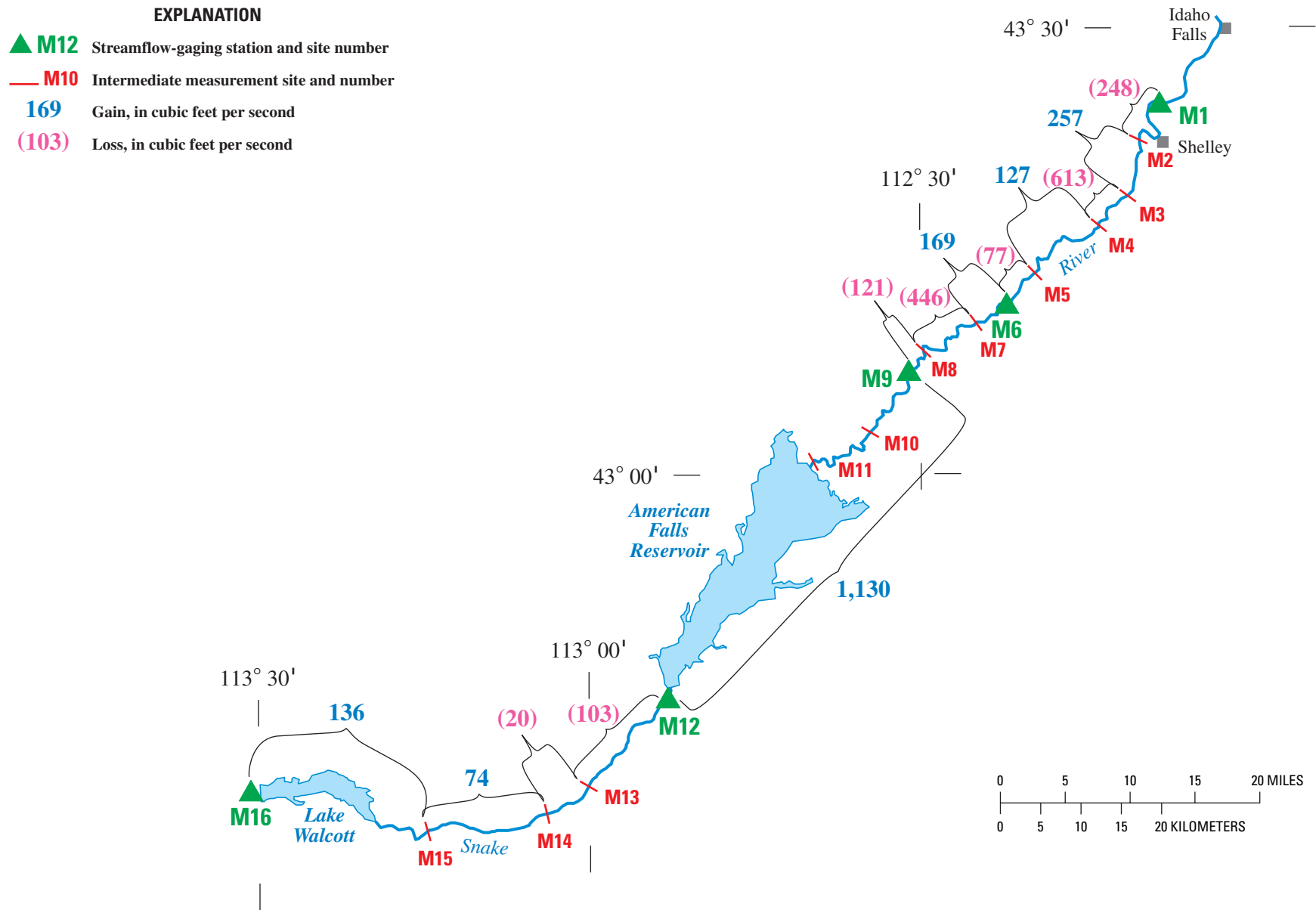


Figure B20. Streamflow gains and losses along the middle reach of the Snake River, between the near Shelley and near Minidoka gaging stations, Idaho, July 23–24, 2002.

Table B21. Estimates of streamflow gains and losses in specified subreaches of the Snake River between the near Shelley and near Minidoka gaging stations, Idaho, November 5-7, 2002

[ft³/s, cubic feet per second; mi, mile; ---, no data; estimated gain/loss presented across from the downstream site; values in **boldface** are statistically significant]

Site number (see figure 4)	Gaging-station name (number) or intermediate measurement site	River mile		Discharge			Total gain or (loss) (ft ³ /s)	Gain or (loss) per mile (ft ³ /s/mi)
				(ft ³ /s)	Date	Time		
M1	<i>Snake River near Shelley (13060000)</i>	787.8		2630	11/5/2002	0815		
			total estimated inflow	0				
			total estimated outflow	6				
M2	Snake River at Shelley Bridge, near Shelley	782.3		2200	11/5/2002	1001	(424)	(77)
			total estimated inflow	0				
			total estimated outflow	16				
M3	Snake River at Firth	777.3		2440	11/5/2002	1258	256	51
			total estimated inflow	0				
			total estimated outflow	8				
M4	Snake River at Kennedy Road, near Firth	773.1		2310	11/5/2002	1130	(122)	(29)
			total estimated inflow	38				
			total estimated outflow	18				
M5	Snake River at Porterville Bridge, near Blackfoot	767.5		2280	11/5/2002	1219	(50)	(9)
			total estimated inflow	0				
			total estimated outflow	0				
M6	<i>Snake River at Blackfoot (13062500)</i>	764.3		2140	11/5/2002	1330	(140)	(44)
				2100	11/5/2002	1230		
			total estimated inflow	0				
			total estimated outflow	5				
M7	Snake River near Riverside	760.2		2060	11/5/2002	1406	(35)	(9)
			total estimated inflow	1				
			total estimated outflow	0				
M8	Snake River near Thomas	753.5		2060	11/5/2002	1456	(1)	0
			total estimated inflow	73				
			total estimated outflow	0				
M9	<i>Snake River near Blackfoot (13069500)</i>	750.1		1900	11/5/2002	1615	(233)	(69)
				2060	11/6/2002	0630		
			total estimated inflow	0				
			total estimated outflow	0				

Table B21. Estimates of streamflow gains and losses in specified subreaches of the Snake River between the near Shelley and near Minidoka gaging stations, Idaho, November 5-7, 2002--Continued

Site number (see figure 4)	Gaging-station name (number) or intermediate measurement site	River mile		Discharge (ft ³ /s)	Date	Time	Total gain or (loss) (ft ³ /s)	Gain or (loss) per mile (ft ³ /s/mi)
M10	Snake River near Pingree	743.3		2430	11/6/2002	1355	370	54
			total estimated inflow	0				
			total estimated outflow	0				
M11	Snake River above McTucker Creek, near Pingree	738		2550	11/6/2002	1224	120	23
			total estimated inflow	421				
			total estimated outflow	0				
			estimated outflow to storage above American Falls Dam ¹	4300				
M12	Snake River at Neeley (13077000)	714.1		367	11/7/2002	0830	2186	61
				415	11/6/2002	0545		
			total estimated inflow	1				
			total estimated outflow	0				
M13	Snake River above Massacre Rocks, near Neeley	707.7		538	11/6/2002	0855	122	19
			total estimated inflow	20				
			total estimated outflow	0				
M14	Snake River at Register Rock, near Cold Water	702.5		509	11/6/2002	0720	(49)	(9)
			total estimated inflow	24				
			total estimated outflow	0				
M15	Snake River above Raft River, near Yale	694		1110	11/6/2002	1046	577	68
			total estimated inflow	0				
			total estimated outflow	0				
			estimated outflow to storage above Minidoka Dam ¹	0				
M16	Snake River near Minidoka (13081500)	673.5		585	11/6/2002	2045	(525)	(26)

¹ Estimate based on reservoir-stage data (Bureau of Reclamation).

Table B22. Discharge data from gaging stations along the Snake River between near Shelley and near Minidoka, Idaho, November 5-7, 2002

[ft³/s, cubic feet per second]

Site number (see figure B25)	Gaging-station name (number)	Date	Time	Discharge (ft³/s)
M1	Snake River near Shelley (13060000)	11/5/2002	0815	2630
M6	Snake River at Blackfoot (13062500)	11/5/2002	1330	2140
		11/5/2002	1230	2100
M9	Snake River near Blackfoot (13069500)	11/5/2002	1615	1900
		11/6/2002	0630	2060
M12	Snake River at Neeley (13077000)	11/7/2002	0830	367
		11/6/2002	0545	415
M16	Snake River near Minidoka (13081500)	11/6/2002	2045	585

Table B23. Discharge data from acoustic Doppler measurements along the Snake River between the near Shelley and near Minidoka gaging stations, Idaho, November 5-6, 2002

[ft³/s, cubic feet per second; COV, coefficient of variation; σ , standard deviation; μ , mean]

Site number (see figure B25)	Intermediate measurement site	Date	Time	Discharge (ft ³ /s)	COV (σ/μ)
M2	Snake River at Shelley Bridge, near Shelley	11/5/2002	1001	2200	0.09
M3	Snake River at Firth	11/5/2002	1258	2440	.10
M4	Snake River at Kennedy Road, near Firth	11/5/2002	1130	2310	.03
M5	Snake River at Porterville Bridge, near Blackfoot	11/5/2002	1219	2280	.01
M7	Snake River near Riverside	11/5/2002	1406	2060	.02
M8	Snake River near Thomas	11/5/2002	1456	2060	.03
M10	Snake River near Pingree	11/6/2002	1355	2430	.01
M11	Snake River above McTucker Creek, near Pingree	11/6/2002	1224	2550	.03
M13	Snake River above Massacre Rocks, near Neeley	11/6/2002	0855	538	.08
M14	Snake River at Register Rock, near Cold Water	11/6/2002	0720	509	.12
M15	Snake River above Raft River, near Yale	11/6/2002	1046	1110	.18

Table B24. Discharge data for all inspected inflow and outflow sites along the Snake River between the near Shelley and near Minidoka gaging stations, Idaho, November 4-7, 2002

[Latitude and longitude in degrees, minutes, seconds referenced in North American Datum of 1983; ft³/s, cubic feet per second; site numbers shown in figure B25; ---, no data; DM, daily mean discharge; values in shaded areas indicate canal withdrawals]

Inspection site name	Gaging-station number	Location		Date	Time	Discharge (ft ³ /s)
		Latitude	Longitude			
Subreach between site numbers M1 and M2						
Miscellaneous agriculture return near Woodville	---	43 24 38	112 09 19	11/6/2002	1240	0
Miscellaneous agriculture return near Woodville	---	43 24 57	112 08 48	11/6/2002	1245	0
Shull Lateral near Shelley	---	43 24 26	112 08 00	11/6/2002	1205	0
Reservation Canal near Shelley	13060500	43 22 24	112 09 13	11/6/2002	1225	6
Miscellaneous agriculture return near Shelley	---	43 22 42	112 10 11	11/6/2002	1235	0
Subreach between site numbers M2 and M3						
Miscellaneous agriculture return near Shelley	---	43 22 26	112 10 11	11/6/2002	1230	0
Blackfoot Canal near Shelley	13061430	43 21 18	112 09 53	11/5/2002	DM	16
Subreach between site numbers M3 and M4						
New Lavaside Canal near Firth	13061520	43 18 30	112 12 09	11/5/2002	DM	8
Peoples Canal near Firth	13061525	44 18 31	113 12 10	11/5/2002	DM	0
Aberdeen Springfield Canal near Firth	13061610	43 17 37	112 13 13	11/6/2002	DM	0
Subreach between site numbers M4 and M5						
Aberdeen Springfield Waste near Kimball	---	43 16 49	112 15 16	11/5/2002	---	33
Corbett Slough Canal near Kimball	13061650	43 15 40	112 15 30	11/6/2002	DM	0
Neilson-Hanson Canal near Kimball	13061670	43 15 29	112 17 07	11/5/2002	---	17
Miscellaneous agriculture return near Wapello	---	43 14 47	112 17 58	11/6/2002	---	5
Riverside Canal near Rose	13061705	43 15 47	112 18 07	11/5/2002	DM	1
Lavaside and Riverside return near Rose	---	43 14 05	112 19 31	11/5/2002	---	0
Subreach between site numbers M5 and M6						
Miscellaneous agriculture return near Blackfoot	---	43 13 36	112 19 50	11/6/2002	---	0
Danskin Canal near Blackfoot	13061995	43 13 28	112 20 12	11/6/2002	DM	0
Miscellaneous agriculture return near Blackfoot	---	43 13 12	112 20 31	11/6/2002	---	0
Miscellaneous agriculture return at Blackfoot	---	43 12 12	112 22 12	11/5/2002	---	0
Subreach between site numbers M6 and M7						
Trego Canal near Blackfoot	13062050	43 12 05	112 22 00	11/6/2002	DM	0
Wearyrick Canal near Blackfoot	13062503	43 11 51	112 22 36	11/6/2002	DM	1
Watson Slough near Blackfoot	13062506	43 11 46	112 23 44	11/6/2002	DM	3
Parsons Ditch near Blackfoot	13062507	43 11 36	112 23 45	11/6/2002	DM	1
Subreach between site numbers M7 and M8						
Riverton Ditch near Thomas	---	43 09 00	112 27 04	11/6/2002	---	0
Crawford Ditch near Thomas	---	43 10 04	112 27 44	11/6/2002	---	0
Watson Slough return near Thomas	---	43 09 39	112 29 13	11/6/2002	---	1
Subreach between site numbers M8 and M9						
Blackfoot River near Blackfoot	¹ 13068500	43 07 50	112 28 35	11/5/2002	DM	73
Miscellaneous agriculture return near Thomas	---	43 08 04	112 30 54	11/6/2002	---	0
Subreach between site numbers M9 and M10						
Mud Slough near Fort Hall	---	43 05 40	112 31 04	11/5/2002	---	² 50
Diggie Creek near Fort Hall	---	43 05 43	112 31 07	11/5/2002	1605	² 175
Jeff Cabin Creek near Fort Hall	---	43 04 05	112 33 00	11/7/2002	---	² 18
Subreach between site numbers M10 and M11						
---	---	---	---	---	---	---
Subreach between site numbers M11 and M12						
Ross Fork near Fort Hall	---	42 00 21	111 29 47	11/7/2002	---	² 9
Clear Creek near Fort Hall	---	43 02 23	112 32 33	11/7/2002	---	² 24
Spring Creek near Fort Hall	¹ 13075983	43 02 36	112 33 15	11/6/2002	DM	² 308
McTucker Creek near Springfield	---	43 02 05	112 38 36	11/6/2002	---	² 134

Table B24. Discharge data for all inspected inflow and outflow sites along the Snake River between the near Shelley and near Minidoka gaging stations, Idaho, November 4-7, 2002--Continued

Inspection site name	Gaging-station number	Location		Date	Time	Discharge (ft ³ /s)
		Latitude	Longitude			
Portneuf River near Tyhee	¹ 13075910	42 56 42	112 32 38	11/6/2002	DM	397
Danielson Creek near Springfield	---	43 03 32	112 41 27	11/6/2002	---	² 48
Sterling Waste near Sterling	13069548	43 01 49	112 43 40	11/6/2002	---	² 5
Unnamed Spring near Sterling	---	43 03 37	112 43 19	11/6/2002	---	² 1
Crystal Springs near Sterling	---	43 02 52	112 40 53	11/6/2002	---	² 62
Unnamed Spring near Sterling	---	42 59 39	112 45 37	11/6/2002	---	² 0
Unnamed Spring near Sterling	---	43 02 39	112 39 09	11/6/2002	---	² 12
Bannock Creek near Michaud	---	42 53 12	112 38 35	11/7/2002	---	21
Aberdeen Waste Drain near Aberdeen	13069565	42 55 27	112 43 39	11/6/2002	---	2
Tarter Waster near American Falls	13076210	42 52 40	112 51 23	11/6/2002	---	0
Seagull Bay near American Falls	---	42 49 24	112 47 45	11/7/2002	---	1
Sunbeam near American Falls	---	42 47 55	112 50 53	11/7/2002	---	0
Spring Hallow near American Falls	---	42 48 39	112 53 30	11/7/2002	---	² 1
Falls Irrigation Pump near American Falls	13076400	42 46 46	112 52 22	11/7/2002	DM	0
Subreach between site numbers M12 and M13						
Ferry Hallow near Neeley	---	42 45 43	112 52 57	11/4/2002	---	0
Warm Creek near Neeley	---	42 44 01	112 54 25	11/4/2002	---	1.0
Little Creek near Neeley	---	42 42 47	112 55 53	11/4/2002	---	.5
Subreach between site numbers M13 and M14						
Rock Creek near Rockland	13077650	42 39 10	113 01 00	11/4/2002	---	20
Dry Hallow Creek near Rockland	---	42 38 40	113 01 57	11/4/2002	---	0
Subreach between site numbers M14 and M15						
Little Warm Creek near Cold Water	---	43 38 07	113 03 43	11/4/2002	---	.8
Fall Creek near Cold Water	---	43 37 36	113 05 05	11/4/2002	---	24
Lanes Gulch near Cold Water	---	42 37 10	113 07 11	11/4/2002	---	0
Subreach between site numbers M15 and M16						
Raft River near Yale	---	42 35 50	113 14 19	11/4/2002	---	0
Minidoka Northside Canal near Minidoka	13080000	42 40 15	113 29 00	11/6/2002	DM	0
Minidoka Southside Canal near Minidoka	13080500	42 39 45	113 29 20	11/6/2002	DM	0

¹ Long-term United States Geological Survey gaging station.

² Streamflow resulting from spring discharge; not used in calculation of gain/loss estimates.

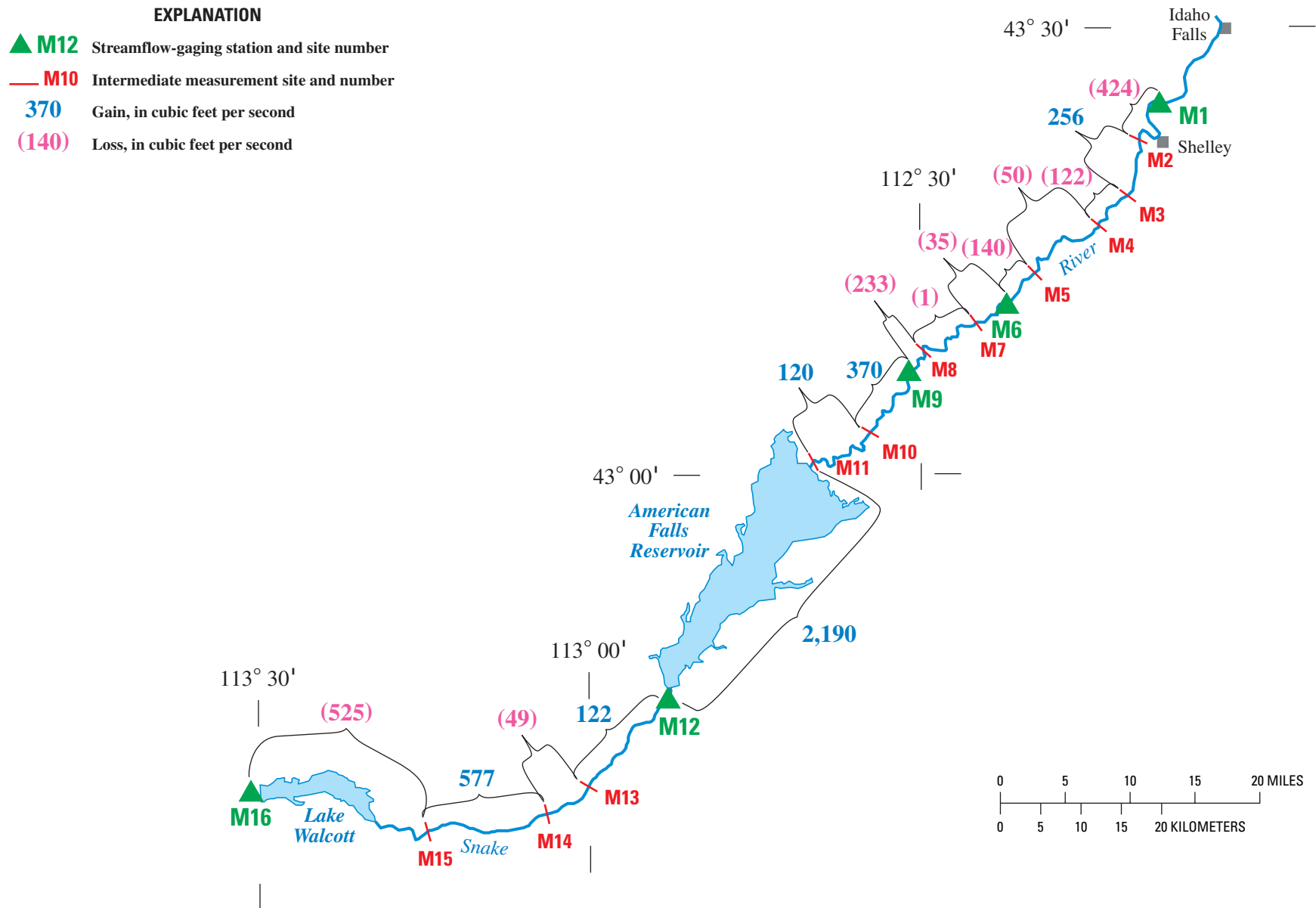


Figure B25. Streamflow gains and losses along the middle reach of the Snake River, between the near Shelley and near Minidoka gaging stations, Idaho, November 4–7, 2002.