

Appendix A. Prioritization Table



Town of Silverthorne Drainage Master Plan
Project Prioritization

Project ID	Project Description	Impacts to Public Health and Safety	Impacts to Critical Infrastructure	Frequency of Problem	Potential Damage	Water Quality / Environmental Impacts	Multi-Objective	Feasibility	Priority	Cost Estimate
PR010	Increase the capacity of the storm drain south of Highway 6.	Moderate	Moderate	High	High	Low	Low	Moderate	High	\$390,000 - \$580,000
PR020	Increase culvert capacity beneath South Adams Avenue.	Moderate	Low	High	Moderate	Low	Low	High	Moderate	-
PR030	Water Quality Facility along the Blue River beneath I70.	Moderate	Low	High	Low	High	Low	Moderate	Moderate	-
PR040	Increase the capacity of the culverts along Salt Lick Gulch beneath South Adams Avenue.	Low	Low	High	Moderate	Low	Low	Low	Low	-
PR050	Formalize an alternate flow path to route drainage to the northeast along 3rd Street.	Low	Moderate	Moderate	Moderate	Low	Low	Low	Low	-
PR060	Create an alternate flow path to route drainage to the northeast along 5th Street.	Moderate	Moderate	High	Moderate	Low	Moderate	Moderate	High	\$170,000 - \$260,000
PR061	Full Spectrum Detention within Highway 9 Right of Way north of 5th Street to accompany rerouted flow path of	Low	Low	High	Low	High	Moderate	High	High	\$200,000 - \$300,000
PR070	Create a split flow path to route flood flows into existing storm system along Annie Road.	Moderate	Moderate	High	High	Low	Low	Moderate	High	\$300,000 - \$450,000
PR071	Full Spectrum Detention east of Annie Road and Highway 9 intersection to accompany rerouted flow path of Project	Low	Low	High	Low	High	Moderate	Moderate	Moderate	-
PR080	Create an alternate flow path to route Smith Ranch drainage to culvert beneath Highway 9 at 13th Street.	Moderate	Moderate	High	Moderate	Low	Moderate	Moderate	High	\$440,000 - \$660,000
PR090	Full Spectrum Detention downstream of Smith Ranch and upstream of Highway 9 crossing.	Moderate	Moderate	High	Moderate	High	High	Moderate	High	\$400,000 - \$610,000
PR100	Increase culvert capacity beneath Highway 9 south of Golden Eagle Road.	Moderate	Moderate	Low	Moderate	Low	Low	Low	Low	-
PR101	Full Spectrum Detention at southeast corner of Highway 9 and Bald Eagle Road.	Low	Low	High	Moderate	Moderate	Moderate	Moderate	Moderate	-
PR110	Increase culvert capacity beneath Golden Eagle Road.	Low	Low	Moderate	Low	Low	Low	Low	Low	-
PR120	Increase culvert capacity beneath Arnica Lane.	Low	Low	Moderate	Low	Low	Low	Moderate	Low	-
PR130	Increase culvert capacity beneath Highway 9 south of Rancher's Road.	Moderate	Low	Moderate	Moderate	Low	Low	Low	Low	-
PR131	Full Spectrum Detention at southwest corner of Highway 9 and Rancher's Road to be coordinated with Project PR130.	Moderate	Low	Moderate	Low	High	Moderate	Moderate	Moderate	-

Notes:

1. Cost estimates were developed for high priority projects only. Per AACE Class 4 estimate level for planning purposes, the cost includes a high range estimate of +50%. See Section 8 of the Plan for further discussion.

Appendix B. Model Output Summary Tables



Town of Silverthorne Drainage Master Plan: Modeling Results

Subbasins

Subbasin Name	Area (ac)	Slope (%)	Imperviousness (%)	Snowmelt ¹ (Yes/No)	Combined Peak Runoff (cfs) ²					
					2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
S0000	79.8	29	9	No	2.6	3.1	3.6	4.5	5.1	5.9
S0005	25.2	18	25	No	2.3	2.8	3.2	3.9	4.5	5.2
S0010	704	44	3	Yes	11	15	18	21	25	28
S0015	97.1	57	7	Yes	2.9	3.8	4.5	5.4	6.4	7.1
S0020	175	55	4	Yes	3.5	4.7	5.6	6.6	7.9	8.7
S0025	247	52	3	Yes	4.1	5.7	6.8	8.0	9.6	10
S0030	111	61	6	Yes	2.8	3.7	4.3	5.2	6.1	6.8
S0035	243	53	5	Yes	5.8	7.8	9.2	11	13	14
S0040	224	43	3	Yes	3.4	4.8	5.7	6.7	8.1	8.8
S0045	109	51	3	Yes	1.6	2.3	2.8	3.3	3.9	4.3
S0050	188	43	5	Yes	4.0	5.3	6.3	7.5	8.9	9.9
S0055	371	43	9	Yes	14	17	20	25	29	32
S0060	128	44	3	Yes	2.0	2.8	3.4	4.0	4.8	5.2
S0065	175	44	4	Yes	3.0	4.1	4.9	5.8	7.0	7.6
S0070	231	43	3	Yes	3.5	4.9	5.9	6.9	8.3	9.0
S0075	370	35	3	Yes	5.6	7.9	9.4	11	13	14
S0080	129	42	3	Yes	2.0	2.8	3.3	3.9	4.6	5.1
S0085	112	43	3	Yes	1.7	2.4	2.9	3.4	4.0	4.4
S0090	128	52	7	Yes	3.6	4.7	5.5	6.6	7.8	8.7
S0095	361	47	6	Yes	9.3	12	14	17	20	23
S0100	533	41	4	Yes	10	14	17	20	24	26
S0105	299	31	3	Yes	4.5	6.4	7.6	9.0	11	12
S0110	129	24	3	Yes	2.0	2.8	3.3	3.9	4.6	5.1
S0115	216	33	3	Yes	3.3	4.6	5.5	6.5	7.8	8.5
S0120	126	30	3	Yes	1.9	2.7	3.2	3.8	4.5	4.9
S0125	215	36	3	Yes	3.3	4.6	5.5	6.4	7.7	8.4
S0130	119	31	3	Yes	1.8	2.5	3.0	3.6	4.3	4.7
S0135	123	37	3	Yes	1.9	2.6	3.1	3.7	4.4	4.8
S0140	157	40	3	Yes	2.4	3.3	4.0	4.7	5.6	6.1
S0145	201	35	3	Yes	3.0	4.3	5.1	6.0	7.2	7.9
S0150	109	32	5	Yes	2.4	3.2	3.8	4.5	5.3	5.9
S0155	171	39	3	Yes	2.6	3.7	4.4	5.1	6.2	6.7
S0160	201	41	7	Yes	5.8	7.6	8.9	11	13	14
S0165	215	42	3	Yes	3.3	4.6	5.5	6.4	7.7	8.4
S0170	244	45	7	Yes	7.0	9.2	11	13	15	17
S0175	354	34	3	Yes	5.4	7.6	9.0	11	13	14
S0180	218	40	6	Yes	5.7	7.5	8.9	11	13	14

Notes:

1. Snowmelt runoff was applied only to subbasins above 9,000 feet as discussed in Section 3.6 of the Plan. No snowmelt runoff was applied to subbasins below 9,000 feet.
2. Combined peak runoff includes snowmelt and peak rainfall runoff.

Town of Silverthorne Drainage Master Plan: Modeling Results

Subbasins

Subbasin Name	Area (ac)	Slope (%)	Imperviousness (%)	Snowmelt ¹ (Yes/No)	Combined Peak Runoff (cfs) ²					
					2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
S0185	205	31	4	Yes	4.2	5.7	6.7	8.0	9.5	10
S0190	186	36	4	Yes	3.5	4.8	5.7	6.7	8.0	8.9
S0195	331	47	7	Yes	9.6	13	15	18	21	23
S0200	128	36	3	Yes	1.9	2.7	3.3	3.8	4.6	5.0
S0205	105	31	3	Yes	1.6	2.2	2.7	3.1	3.8	4.1
S0210	146	37	3	Yes	2.2	3.1	3.7	4.4	5.2	5.7
S0215	349	37	3	Yes	5.3	7.4	8.9	10	13	14
S0220	217	37	3	Yes	3.3	4.6	5.5	6.5	7.8	8.5
S0225	186	42	3	Yes	2.8	4.0	4.7	5.6	6.7	7.3
S0230	334	35	3	Yes	5.0	7.1	8.5	10	12	13
S0235	161	32	3	Yes	2.5	3.4	4.1	4.8	5.8	6.3
S0240	175	40	3	Yes	2.7	3.7	4.5	5.2	6.3	6.9
S0245	151	34	3	Yes	2.3	3.2	3.9	4.5	5.4	5.9
S0250	371	43	3	Yes	5.6	7.9	9.4	11	13	15
S0255	148	38	3	Yes	2.3	3.2	3.8	4.5	5.4	5.9
S0260	235	40	4	Yes	4.7	6.4	7.6	9.0	11	12
S0265	240	36	9	Yes	9.1	12	14	17	19	22
S0270	42.0	9.2	55	Yes	8.7	11	12	15	17	20
S0275	321	42	5	Yes	6.8	9.2	11	13	15	17
S0280	191	30	31	Yes	23	28	32	39	46	52
S0285	345	35	3	Yes	5.2	7.4	8.8	10	12	14
S0290	161	32	4	Yes	3.2	4.4	5.2	6.1	7.3	8.0
S0295	190	21	26	Yes	19	23	27	33	39	44
S0300	9.86	17	64	No	2.3	2.8	3.3	4.0	4.6	5.3
S0305	54.8	16	37	No	7.6	9.1	11	13	15	17
S0306	149	14	61	Yes	39	47	55	67	76	87
S0310	23.4	12	65	No	5.6	6.7	7.8	9.5	11	13
S0313	13.3	13	20	No	1.0	1.2	1.4	1.7	1.9	2.2
S0314	5.42	7.6	2	No	0.1	0.1	0.1	0.1	0.1	0.1
S0315	33.9	34	4	No	0.5	0.6	0.7	0.8	1.0	1.1
S0320	3.73	11	16	No	0.2	0.3	0.3	0.4	0.4	0.5
S0321	7.99	12	54	No	1.6	1.9	2.2	2.7	3.1	3.6
S0325	301	55	3	Yes	15	18	23	26	28	32
S0330	165	27	3	Yes	8.5	10	12	14	16	17
S0335	425	16	3	Yes	22	26	32	37	40	45
S0340	102	16	3	Yes	5.2	6.3	7.7	8.8	9.6	11
S0345	336	29	8	Yes	23	27	33	39	43	48

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Town of Silverthorne Drainage Master Plan: Modeling Results

Subbasins

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					2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
S0350	206	23	3	Yes	11	13	16	18	19	22
S0355	178	16	4	Yes	10	12	15	17	18	21
S0356	307	20	12	Yes	25	30	37	43	48	54
S0358	13.2	21	17	No	0.8	1.0	1.2	1.4	1.7	1.9
S0360	153	24	10	Yes	12	14	17	20	22	25
S0365	100	19	12	Yes	8.4	10	12	14	16	18
S0370	244	16	11	Yes	20	24	29	34	38	43
S0375	193	14	38	Yes	35	42	49	59	68	77
S0380	160	18	27	Yes	23	27	32	38	44	50
S0385	36.1	32	11	Yes	3.0	3.6	4.3	5.0	5.6	6.4
S0390	14.9	15	45	No	2.5	3.0	3.5	4.3	4.9	5.7
S0395	2.55	13	64	No	0.6	0.7	0.8	1.0	1.2	1.4
S0399	2.89	6.7	61	No	0.7	0.8	0.9	1.1	1.3	1.5
S0400	6.78	7.3	43	No	1.1	1.3	1.5	1.9	2.1	2.5
S0405	3.65	12	47	No	0.6	0.8	0.9	1.1	1.3	1.4
S0410	16.9	11	67	No	4.2	5.0	5.9	7.2	8.3	9.5
S0415	158	21	28	Yes	23	27	32	39	44	50
S0420	22.5	9.3	57	No	4.8	5.7	6.6	8.1	9.4	11
S0425	6.07	4.8	67	No	1.5	1.8	2.1	2.6	3.0	3.4
S0430	8.35	6.3	63	No	2.0	2.4	2.7	3.3	3.9	4.4
S0435	2.01	10	33	No	0.2	0.3	0.3	0.4	0.5	0.6
S0440	16.7	10	23	No	1.4	1.7	2.0	2.5	2.8	3.3
S0445	11.0	8.6	41	No	1.7	2.0	2.3	2.8	3.3	3.8
S0450	12.1	8.8	44	No	2.0	2.4	2.7	3.4	3.9	4.5
S0455	13.4	7.5	34	No	1.7	2.0	2.3	2.9	3.3	3.8
S0460	11.5	5.6	74	No	3.1	3.8	4.4	5.4	6.2	7.1
S0465	8.79	5.5	69	No	2.3	2.7	3.1	3.8	4.4	5.1
S0470	5.35	5.4	45	No	0.9	1.1	1.2	1.5	1.8	2.0
S0475	8.20	9.3	34	No	1.0	1.3	1.5	1.8	2.1	2.4
S0480	6.14	5.1	58	No	1.3	1.6	1.8	2.3	2.6	3.0
S0485	28.3	4.8	69	No	7.2	8.6	10	12	14	16
S0490	10.7	7.3	24	No	1.0	1.2	1.3	1.7	1.9	2.2
S0495	12.3	4.9	73	No	3.4	4.0	4.7	5.7	6.6	7.6
S0500	5.03	5.7	58	No	1.1	1.3	1.5	1.8	2.1	2.4
S0505	20.4	6.9	23	No	1.7	2.1	2.4	2.9	3.4	3.9
S0510	34.2	8.6	29	No	3.6	4.3	5.0	6.2	7.1	8.2
S0515	22.5	25	9	No	0.8	0.9	1.1	1.3	1.5	1.8

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Town of Silverthorne Drainage Master Plan: Modeling Results

Subbasins

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					2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
S0520	4.07	5.6	70	No	1.1	1.3	1.5	1.8	2.1	2.4
S0525	7.40	6.4	56	No	1.5	1.8	2.1	2.6	3.0	3.5
S0530	20.3	33	11	No	0.8	1.0	1.2	1.4	1.6	1.9
S0535	67.8	20	8	Yes	4.7	5.6	6.8	7.9	8.8	9.9
S0540	51.2	24	12	No	2.3	2.7	3.2	3.9	4.5	5.2
S0545	7.66	9.2	49	No	1.4	1.7	1.9	2.4	2.8	3.2
S0550	3.76	6.1	72	No	1.0	1.2	1.4	1.7	2.0	2.3
S0555	3.89	8.4	37	No	0.5	0.7	0.8	0.9	1.1	1.2
S0560	163	18	3	Yes	8.4	10	12	14	15	17
S0565	114	22	3	Yes	5.8	7.0	8.6	9.8	11	12
S0570	533	22	5	Yes	30	36	45	51	56	63
S0575	53.2	19	8	No	1.6	1.9	2.2	2.7	3.2	3.6
S0580	98.0	17	16	No	5.7	6.8	7.9	9.7	11	13
S0584	33.8	15	27	No	3.3	4.0	4.6	5.7	6.6	7.6
S0585	51.0	17	16	No	3.0	3.6	4.2	5.1	5.9	6.8
S0590	51.6	8.9	32	No	6.1	7.3	8.4	10	12	14
S0595	174	21	18	Yes	19	23	27	32	36	41
S0600	22.2	8.2	27	No	2.2	2.6	3.0	3.7	4.3	5.0
S0605	131	23	6	Yes	8.0	9.6	12	13	15	17
S0610	28.9	6	22	No	2.4	2.9	3.3	4.1	4.7	5.4
S0615	348	21	5	Yes	20	24	30	34	38	42
S0620	29.7	8.1	21	No	2.3	2.7	3.2	3.9	4.5	5.2
S0625	193	46	3	Yes	3.9	5.5	6.5	7.7	9.0	9.9
S0630	139	38	3	Yes	2.8	3.9	4.6	5.5	6.5	7.1
S0635	92.5	31	3	Yes	1.9	2.6	3.1	3.7	4.3	4.7
S0640	147	41	3	Yes	3.0	4.2	4.9	5.9	6.9	7.5
S0645	276	34	3	Yes	5.6	7.8	9.2	11	13	14
S0650	187	60	3	Yes	3.8	5.3	6.2	7.5	8.8	9.6
S0655	114	56	3	Yes	2.3	3.2	3.8	4.6	5.4	5.9
S0660	106	36	3	Yes	2.1	3.0	3.5	4.2	5.0	5.4
S0665	236	74	3	Yes	4.8	6.7	7.9	9.4	11	12
S0670	337	73	3	Yes	6.8	9.5	11	13	16	17
S0675	691	75	3	Yes	14	20	23	28	32	35
S0680	253	68	3	Yes	5.1	7.2	8.5	10	12	13
S0685	132	54	3	Yes	2.7	3.8	4.4	5.3	6.2	6.8
S0690	138	40	3	Yes	2.8	3.9	4.6	5.5	6.5	7.1
S0695	225	30	3	Yes	4.5	6.4	7.5	9.0	11	12

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Subbasins

Subbasin Name	Area (ac)	Slope (%)	Imperviousness (%)	Snowmelt ¹ (Yes/No)	Combined Peak Runoff (cfs) ²					
					2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
S0700	139	30	3	Yes	2.8	3.9	4.7	5.6	6.5	7.1
S0705	357	24	3	Yes	7.2	10	12	14	17	18
S0710	152	49	3	Yes	3.1	4.3	5.1	6.1	7.1	7.8
S0715	306	36	3	Yes	6.2	8.7	10	12	14	16
S0720	303	26	3	Yes	6.1	8.6	10	12	14	16
S0725	487	32	3	Yes	9.8	14	16	19	23	25
S0730	163	26	3	Yes	3.3	4.6	5.5	6.5	7.7	8.4
S0735	192	90	3	Yes	3.9	5.5	6.4	7.7	9.0	9.8
S0740	103	98	3	Yes	2.1	2.9	3.5	4.1	4.8	5.3
S0745	196	61	3	Yes	3.9	5.6	6.6	7.8	9.2	10
S0750	384	78	3	Yes	7.7	11	13	15	18	20
S0755	324	81	3	Yes	6.5	9.2	11	13	15	17
S0760	102	42	3	Yes	2.1	2.9	3.4	4.1	4.8	5.2
S0765	161	73	3	Yes	3.2	4.6	5.4	6.4	7.5	8.2
S0770	209	47	3	Yes	4.2	5.9	7.0	8.4	9.8	11
S0775	401	47	3	Yes	8.1	11	13	16	19	21
S0780	320	32	3	Yes	6.4	9.1	11	13	15	16
S0785	104	27	3	Yes	2.1	3.0	3.5	4.2	4.9	5.4
S0790	217	25	3	Yes	4.4	6.1	7.3	8.7	10	11
S0795	259	33	3	Yes	5.2	7.3	8.6	10	12	13
S0800	147	27	3	Yes	3.0	4.2	5.0	5.9	7.0	7.6
S0805	13.4	8.3	44	No	2.2	2.6	3.1	3.7	4.3	5.0
S0810	231	17	8	No	6.7	8.0	9.3	11	13	15
S0815	9.09	12	11	No	0.4	0.4	0.5	0.6	0.7	0.8
S0820	85.0	21	3	Yes	4.4	5.3	6.5	7.4	8.1	9.1
S0825	58.8	8.3	3	No	0.6	0.8	0.9	1.1	1.2	1.4
S0830	16.8	9.8	17	No	1.1	1.3	1.5	1.9	2.1	2.5
S0835	22.0	18	14	No	1.1	1.3	1.5	1.9	2.2	2.5
S0840	33.7	23	8	Yes	2.3	2.8	3.4	3.9	4.4	4.9
S0845	15.6	14	22	No	1.3	1.5	1.7	2.1	2.5	2.8
S0850	26.7	13	16	No	1.6	1.9	2.2	2.7	3.1	3.6
S0855	140	16	7	No	3.8	4.5	5.2	6.4	7.4	8.5
S0860	16.0	11	34	No	2.0	2.4	2.8	3.4	4.0	4.6
S0865	37.5	8.8	33	No	4.6	5.5	6.4	7.9	9.1	10
S0870	17.7	8.5	17	No	1.1	1.3	1.6	1.9	2.2	2.5
S0875	8.60	11	24	No	0.8	0.9	1.1	1.3	1.5	1.7
S0880	153	27	3	Yes	7.8	9.4	12	13	14	16

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2. Combined peak runoff includes snowmelt and peak rainfall runoff.

Town of Silverthorne Drainage Master Plan: Modeling Results

Subbasins

Subbasin Name	Area (ac)	Slope (%)	Imperviousness (%)	Snowmelt ¹ (Yes/No)	Combined Peak Runoff (cfs) ²					
					2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
S0885	301	35	3	Yes	15	18	23	26	28	32
S0890	28.1	23	3	Yes	1.4	1.7	2.1	2.4	2.6	3.0
S0895	141	24	6	No	3.0	3.6	4.2	5.2	6.0	6.9
S0900	5.76	5.9	45	No	1.0	1.1	1.3	1.6	1.9	2.2
S0905	277	42	3	Yes	14	17	21	24	26	29
S0910	89.0	36	10	Yes	6.7	8.0	9.7	11	13	14
S0915	188	30	6	Yes	12	14	17	20	22	25
S0920	92.5	22	11	No	3.9	4.6	5.3	6.6	7.6	8.7
S0925	72.9	22	12	No	3.2	3.9	4.5	5.5	6.4	7.3
S0930	7.36	12	22	No	0.6	0.7	0.8	1.0	1.2	1.4
S0935	24.2	8	19	No	1.7	2.1	2.4	2.9	3.4	3.9
S0940	22.3	10	6	No	0.5	0.6	0.7	0.9	1.0	1.1
S0945	15.5	17	11	No	0.7	0.8	0.9	1.1	1.3	1.5
S0950	17.4	12	20	No	1.3	1.6	1.8	2.2	2.6	2.9
S0955	33.9	18	19	No	2.5	2.9	3.4	4.2	4.8	5.6
S0960	19.1	18	9	Yes	1.4	1.7	2.0	2.3	2.6	2.9
S0965	144	21	13	No	6.7	8.0	9.3	11	13	15
S0970	53.8	21	14	No	2.7	3.2	3.7	4.6	5.3	6.1
S0975	4.73	15	4	No	0.1	0.1	0.1	0.1	0.1	0.2
S0980	28.6	19	5	No	0.6	0.7	0.8	0.9	1.1	1.3
S0985	103	10	12	No	4.6	5.5	6.4	7.8	9.1	10
S0990	107	24	4	Yes	5.7	6.9	8.4	9.6	11	12
S0995	142	23	4	Yes	7.6	9.0	11	13	14	16
S1000	280	26	3	Yes	15	18	22	25	27	30
S1005	10.8	18	7	No	0.3	0.3	0.4	0.5	0.5	0.6
S1010	65.3	17	10	No	2.4	2.8	3.3	4.0	4.7	5.4
S1015	151	23	3	Yes	7.9	9.5	12	13	14	16
S1020	21.1	17	6	No	0.5	0.6	0.7	0.8	0.9	1.1
S1025	44.0	19	8	No	1.3	1.5	1.8	2.2	2.5	2.9
S1030	183	30	3	Yes	9.4	11	14	16	17	19
S1035	76.1	25	2	No	0.6	0.7	0.8	1.0	1.1	1.3
S1040	68.0	21	2	No	0.5	0.7	0.8	0.9	1.1	1.2
S1045	73.8	17	2	No	0.6	0.7	0.8	1.0	1.2	1.4
S1050	57.1	13	3	No	0.6	0.7	0.8	1.0	1.1	1.3
S1055	111	9.6	3	No	1.4	1.7	1.9	2.4	2.7	3.1
S1060	152	24	3	Yes	7.8	9.3	11	13	14	16
S1065	238	24	3	Yes	12	15	18	20	22	25

Notes:

1. Snowmelt runoff was applied only to subbasins above 9,000 feet as discussed in Section 3.6 of the Plan. No snowmelt runoff was applied to subbasins below 9,000 feet.
2. Combined peak runoff includes snowmelt and peak rainfall runoff.

Town of Silverthorne Drainage Master Plan: Modeling Results

Subbasins

Subbasin Name	Area (ac)	Slope (%)	Imperviousness (%)	Snowmelt ¹ (Yes/No)	Combined Peak Runoff (cfs) ²					
					2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
S1070	115	24	3	Yes	5.9	7.1	8.7	9.9	11	12
S1075	138	24	2	No	1.0	1.2	1.4	1.7	2.0	2.3
S1080	107	18	2	No	0.8	1.0	1.1	1.4	1.6	1.8
S1085	52.3	13	3	No	0.6	0.7	0.8	0.9	1.1	1.2
S1090	127	19	2	No	1.1	1.3	1.5	1.8	2.1	2.4

Notes:

1. Snowmelt runoff was applied only to subbasins above 9,000 feet as discussed in Section 3.6 of the Plan. No snowmelt runoff was applied to subbasins below 9,000 feet.
2. Combined peak runoff includes snowmelt and peak rainfall runoff.

Town of Silverthorne Drainage Master Plan: Modeling Results

Storm Drains

Storm Drain Name	Length (ft)	Drainage Area (ac)	Capacity (cfs)	Capacity (Year) ¹	Meets Existing Drainage Criteria ²	Peak Flow (cfs)					
						2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
C0005	143	25	58	Exceeds 100YR	Yes	2.3	2.8	3.2	3.9	4.5	5.2
C0292	114	12500	350	10YR	No	200	290	340	410	480	530
C0295	80	12700	420	10YR	No	210	300	360	460	510	570
C0300	387	10	14	Exceeds 100YR	Yes	2.3	2.8	3.3	4.0	4.6	5.3
C0305	122	12700	1500	Exceeds 100YR	Yes	220	310	370	470	520	580
C0306	971	149	81	50YR	Yes	39	47	55	67	76	87
C0310	50	12900	930	Exceeds 100YR	Yes	250	350	420	530	590	650
C0356	623	2020	190	50YR	No	99	120	150	170	190	210
C0358	59	2190	11	Less Than 2YR	No	14	21	27	39	59	96
C0362	477	2170	150	10YR	No	97	110	140	150	170	190
C0376	147	537	80	5YR	No	64	77	92	110	120	140
C0380	98	2870	82	Less Than 2YR	No	180	220	260	300	320	340
C0385	577	36	18	Exceeds 100YR	Yes	0.0	0.0	0.0	0.0	0.0	0.0
C0386	204	36	18	Exceeds 100YR	Yes	0.0	0.0	0.0	0.0	0.0	0.0
C0390	329	51	32	Exceeds 100YR	Yes	2.5	3.0	3.5	4.3	4.9	5.7
C0398	46	36	17	Exceeds 100YR	Yes	3.0	3.6	4.3	5.0	5.6	6.4
C0399	72	39	31	Exceeds 100YR	Yes	3.7	4.4	5.3	6.3	7.0	8.0
C0400	51	46	7	Exceeds 100YR	Yes	1.1	1.3	1.5	1.9	2.1	2.5
C0415	679	158	62	Exceeds 100YR	Yes	23	27	32	39	44	50
C0420	94	180	64	Exceeds 100YR	Yes	28	33	39	47	53	61
C0425	87	52	2	5YR	Yes	1.5	1.8	2.1	2.6	3	3.4
C0430	155	60	26	Exceeds 100YR	Yes	3.5	4.2	5.0	5.9	6.9	7.9
C0440	97	17	25	Exceeds 100YR	Yes	1.4	1.7	2.0	2.5	2.8	3.3
C0445	132	11	11	Exceeds 100YR	Yes	1.7	2.0	2.3	2.8	3.3	3.8
C0446	164	28	20	Exceeds 100YR	Yes	3.1	3.7	4.3	5.3	6.2	7.1
C0460	678	12	31	Exceeds 100YR	Yes	3.1	3.8	4.4	5.4	6.2	7.1
C0465	496	20	32	Exceeds 100YR	Yes	5.4	6.5	7.5	9.2	11	12
C0470	101	26	130	Exceeds 100YR	Yes	6.3	7.5	8.7	11	12	14
C0480	305	6.1	7	Exceeds 100YR	Yes	1.3	1.6	1.8	2.3	2.6	3.0
C0481	712	6.1	6	Exceeds 100YR	Yes	1.4	1.6	1.9	2.3	2.7	3.1
C0485	127	34	65	Exceeds 100YR	Yes	8.5	10	12	15	17	19
C0495	95	12	8	50YR	Yes	3.4	4.0	4.7	5.7	6.6	8.0
C0500	117	17	13	Exceeds 100YR	Yes	4.4	5.3	6.1	7.5	8.7	10
C0515	45	23	12	Exceeds 100YR	Yes	0.8	0.9	1.1	1.3	1.5	1.8

Notes:

1. Designation signifies the return period for which the storm drain has capacity to convey peak streamflows.
2. Based upon existing drainage criteria for the Town of Silverthorne. See Section 6 of the report.

Town of Silverthorne Drainage Master Plan: Modeling Results

Storm Drains

Storm Drain Name	Length (ft)	Drainage Area (ac)	Capacity (cfs)	Capacity (Year) ¹	Meets Existing Drainage Criteria ²	Peak Flow (cfs)					
						2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
C0520	49	27	5	Exceeds 100YR	Yes	1.8	2.2	2.6	3.1	3.6	4.1
C0525	54	34	6	25YR	Yes	3.4	4.0	4.7	5.7	6.6	7.6
C0529	39	23	4	Exceeds 100YR	Yes	0.0	0.0	0.0	0.0	0.0	0.0
C0530	90	43	6	Exceeds 100YR	Yes	0.8	1.0	1.2	1.4	1.6	1.9
C0545	62	7.7	8	Exceeds 100YR	Yes	1.4	1.7	1.9	2.4	2.8	3.2
C0550	63	11	5	50YR	Yes	2.4	2.9	3.3	4.1	4.7	5.4
C0552	45	185	18	5YR	No	14	16	19	23	27	31
C0555	61	189	11	Less Than 2YR	No	14	17	21	24	28	31
C0575	160	1050	69	5YR	No	54	64	78	91	100	120
C0580	137	1150	110	50YR	No	58	69	89	100	110	120
C0590	49	136	10	Less Than 2YR	No	12	15	17	21	24	27
C0595	79	174	13	Less Than 2YR	No	19	23	27	32	36	41
C0600	51	333	10	Less Than 2YR	No	15	16	16	17	17	18
C0605	54	464	14	Less Than 2YR	No	23	25	27	29	31	32
C0610	56	493	9	Less Than 2YR	No	43	51	61	73	83	94
C0615	634	348	11	Less Than 2YR	No	20	24	30	34	38	42
C0805	137	13	18	Exceeds 100YR	Yes	2.2	2.6	3.1	3.7	4.3	5.0
C0810	115	8540	1100	Exceeds 100YR	Yes	140	200	230	280	330	360
C0811	44	8540	1200	Exceeds 100YR	Yes	140	200	230	280	330	360
C0835	84	22	33	Exceeds 100YR	Yes	1.1	1.3	1.5	1.9	2.2	2.5
C0840	85	34	120	Exceeds 100YR	Yes	2.3	2.8	3.4	3.9	4.4	4.9
C0845	91	16	28	Exceeds 100YR	Yes	1.3	1.5	1.7	2.1	2.5	2.8
C0850	55	27	20	Exceeds 100YR	Yes	1.6	1.9	2.2	2.7	3.1	3.6
C0856	51	238	22	50YR	Yes	10	12	14	17	20	23
C0860	135	254	23	25YR	No	12	14	17	20	23	27
C0861	504	254	2	Less Than 2YR	No	12	14	17	20	24	28
C0865	132	38	26	Exceeds 100YR	Yes	4.6	5.5	6.4	7.9	9.1	10
C0870	346	309	8	Less Than 2YR	No	17	21	24	30	35	40
C0900	163	5.8	6	Exceeds 100YR	Yes	1.0	1.1	1.3	1.6	1.9	2.2
C0910	57	89	42	Exceeds 100YR	Yes	6.7	8.0	9.7	11	13	14
C0915	120	554	120	Exceeds 100YR	Yes	33	39	48	55	61	68
C0920	64	646	16	Less Than 2YR	No	37	44	53	62	69	77
C0930	114	7.4	17	Exceeds 100YR	Yes	0.6	0.7	0.8	1.0	1.2	1.4
C0935	60	32	19	Exceeds 100YR	Yes	2.0	2.5	2.9	3.7	4.3	5.0

Notes:

1. Designation signifies the return period for which the storm drain has capacity to convey peak streamflows.
2. Based upon existing drainage criteria for the Town of Silverthorne. See Section 6 of the report.

Town of Silverthorne Drainage Master Plan: Modeling Results

Storm Drains

Storm Drain Name	Length (ft)	Drainage Area (ac)	Capacity (cfs)	Capacity (Year) ¹	Meets Existing Drainage Criteria ²	Peak Flow (cfs)					
						2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
C0945	517	16	17	Exceeds 100YR	Yes	0.7	0.8	0.9	1.1	1.3	1.5
C0955	68	34	41	Exceeds 100YR	Yes	2.5	2.9	3.4	4.2	4.8	5.6
C0960	87	19	50	Exceeds 100YR	Yes	1.4	1.7	2.0	2.3	2.6	2.9
C0965	123	230	11	Less Than 2YR	No	12	15	17	21	24	28
C0970	131	283	48	Exceeds 100YR	Yes	15	18	21	25	29	34
C0975	71	4.7	160	Exceeds 100YR	Yes	0.1	0.1	0.1	0.1	0.1	0.2
C0980	116	33	30	Exceeds 100YR	Yes	0.6	0.7	0.8	1.0	1.2	1.4
C0990	70	107	110	Exceeds 100YR	Yes	5.7	6.9	8.4	9.6	11	12
C0995	49	249	15	2YR	Yes	13	16	20	22	24	27
C1000	73	529	210	Exceeds 100YR	Yes	28	34	41	47	51	58
C1001	92	529	160	Exceeds 100YR	Yes	28	34	41	47	52	58
C1005	103	540	220	Exceeds 100YR	Yes	28	35	42	47	52	58
C1010	146	605	98	Exceeds 100YR	Yes	30	37	45	51	56	63
C1015	94	151	190	Exceeds 100YR	Yes	7.9	9.5	12	13	14	16
C1020	79	172	160	Exceeds 100YR	Yes	8.4	10	12	14	16	17
C1025	163	216	14	5YR	No	9.6	12	14	16	18	20
C1050	86	458	46	Exceeds 100YR	Yes	11	14	17	20	22	24

Notes:

1. Designation signifies the return period for which the storm drain has capacity to convey peak streamflows.
2. Based upon existing drainage criteria for the Town of Silverthorne. See Section 6 of the report.

Town of Silverthorne Drainage Master Plan: Modeling Results

Open Channels

Name of Model Element	Length (ft)	Drainage Area (ac)	100-Year Depth ¹	Peak Flow (cfs)					
				2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
O0362	645	2170	Between 12in and 24in	0.0	0.0	0.0	3.0	17	37
O0584	2290	34	Less than 6in	0.0	0.0	0.0	0.0	0.8	2.1
O0586	476	85	Less than 6in	0.0	0.0	0.0	0.0	0.0	0.0
O0591	355	136	Less than 6in	0.0	0.0	0.0	0.0	0.0	0.0
O0597	642	310	Between 6in and 12in	18	25	32	41	48	56
O0602	1180	333	Between 12in and 24in	18	25	32	41	49	58
R0005	73	25	Less than 6in	2.3	2.8	3.2	3.9	4.5	5.2
R0015	2100	801	Between 6in and 12in	14	19	23	27	33	36
R0020	2200	976	Between 6in and 12in	17	24	28	33	40	44
R0030	1070	111	Between 6in and 12in	2.9	3.8	4.5	5.4	6.4	7.1
R0031	4200	1330	Between 6in and 12in	24	33	39	47	56	61
R0035	1430	243	Between 6in and 12in	6.2	8.1	9.6	11	14	15
R0045	3070	333	Less than 6in	4.9	6.6	7.9	9.4	11	12
R0050	976	764	Between 6in and 12in	15	20	23	28	33	36
R0051	764	2100	Between 12in and 24in	38	53	62	74	88	97
R0055	905	2470	Between 12in and 24in	52	69	82	98	120	130
R0060	869	2600	Between 6in and 12in	53	72	85	100	120	130
R0065	1390	2770	Between 12in and 24in	56	76	90	110	130	140
R0070	2240	231	Less than 6in	3.6	5.1	6.1	7.2	8.6	9.4
R0080	1700	730	Between 6in and 12in	11	15	18	21	25	27
R0090	192	970	Between 6in and 12in	15	21	24	29	34	38
R0091	1010	970	Between 12in and 24in	15	21	25	29	35	38
R0092	4970	3740	Between 12in and 24in	69	94	110	130	160	180
R0095	7850	4100	Between 12in and 24in	76	100	120	150	180	190
R0110	2810	428	Less than 6in	6.3	8.5	10	13	14	16
R0120	4440	771	Between 6in and 12in	11	15	17	21	25	27
R0130	2800	1100	Between 6in and 12in	15	20	24	29	35	38
R0140	1490	1380	Between 6in and 12in	18	25	30	35	42	47
R0145	1950	1580	Between 6in and 12in	21	29	34	41	49	54
R0146	2730	6220	Between 12in and 24in	100	140	170	200	240	260
R0155	5860	6500	Greater than 24in	100	140	170	200	240	270
R0170	4760	244	Less than 6in	7.4	9.7	11	14	16	18
R0175	1730	354	Between 6in and 12in	5.6	7.8	9.4	11	13	15
R0180	844	816	Between 12in and 24in	18	24	29	34	41	45
R0185	1490	1020	Between 6in and 12in	22	30	35	42	50	55
R0190	7400	1210	Between 12in and 24in	25	34	40	48	58	64
R0205	2420	233	Less than 6in	3.2	4.3	5.1	6.1	7.2	8.1
R0215	1090	728	Between 6in and 12in	9.8	12	14	17	20	23

Notes:

1. Approximate depth calculated from typical section sampled from LiDAR based DEM.

Town of Silverthorne Drainage Master Plan: Modeling Results

Open Channels

Name of Model Element	Length (ft)	Drainage Area (ac)	100-Year Depth ¹	Peak Flow (cfs)					
				2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
R0220	1450	944	Between 6in and 12in	13	17	20	24	28	31
R0225	5600	1130	Between 12in and 24in	15	21	24	29	35	39
R0235	1580	495	Between 6in and 12in	7.1	9.6	11	14	16	18
R0240	2020	670	Between 6in and 12in	9.7	13	16	19	22	24
R0245	1110	821	Between 6in and 12in	12	16	19	23	27	30
R0250	2380	2320	Between 6in and 12in	32	44	53	63	75	83
R0255	1150	4010	Between 12in and 24in	66	91	110	130	160	170
R0256	1240	10900	Greater than 24in	170	230	280	330	390	430
R0260	5500	11200	Greater than 24in	170	240	280	330	400	440
R0265	3290	11400	Greater than 24in	170	240	290	340	410	450
R0270	318	11400	Greater than 24in	180	250	300	350	420	460
R0275	6500	321	Between 6in and 12in	7.2	9.7	12	14	16	18
R0276	282	11800	Greater than 24in	180	260	310	370	440	480
R0285	3420	345	Between 6in and 12in	5.6	7.8	9.3	11	13	14
R0290	265	506	Between 6in and 12in	8.4	12	14	16	20	22
R0291	879	12300	Greater than 24in	190	270	320	380	450	500
R0292	1450	12500	Greater than 24in	200	290	340	430	480	540
R0295	2770	12700	Greater than 24in	210	300	360	460	510	570
R0300	390	10	Less than 6in	2.4	2.8	3.3	4.1	4.7	5.4
R0305	99	12700	Greater than 24in	220	310	370	470	520	580
R0306	137	149	Between 12in and 24in	40	47	55	67	77	92
R0307	869	12900	Greater than 24in	250	340	410	520	580	650
R0310	147	12900	Greater than 24in	250	350	420	530	590	650
R0315	772	34	Less than 6in	0.5	0.6	0.8	0.9	1.1	1.2
R0325	1970	301	Between 6in and 12in	16	19	23	26	29	32
R0330	7490	466	Between 6in and 12in	23	28	35	40	43	49
R0335	1530	892	Between 12in and 24in	44	53	65	75	82	92
R0350	4590	543	Between 6in and 12in	26	31	38	44	49	56
R0355	6860	1710	Between 12in and 24in	76	91	110	130	140	160
R0356	1580	2020	Greater than 24in	99	120	150	170	190	220
R0357	1000	2020	Between 12in and 24in	13	20	26	35	41	57
R0358	227	2190	Greater than 24in	14	21	27	39	59	96
R0361	396	2020	Between 12in and 24in	91	110	120	140	160	170
R0362	136	2170	Greater than 24in	97	110	140	160	160	160
R0365	3090	100	Between 6in and 12in	8.7	10	12	15	16	19
R0370	604	344	Between 6in and 12in	29	34	41	48	54	61
R0375	3890	537	Between 12in and 24in	64	77	92	110	120	140
R0380	209	2710	Greater than 24in	160	190	230	260	280	290

Notes:

1. Approximate depth calculated from typical section sampled from LiDAR based DEM.

Town of Silverthorne Drainage Master Plan: Modeling Results

Open Channels

Name of Model Element	Length (ft)	Drainage Area (ac)	100-Year Depth ¹	Peak Flow (cfs)					
				2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
R0390	210	2920	Greater than 24in	190	220	270	300	330	340
R0398	1160	36	Between 6in and 12in	3.1	3.7	4.5	5.2	5.8	6.6
R0399	167	39	Less than 6in	0.0	0.0	0.0	0.0	0.0	0.0
R0400	129	46	Less than 6in	1.1	1.3	1.5	1.9	2.2	2.5
R0401	153	46	Less than 6in	4.8	5.7	6.8	8.1	9.2	10
R0420	44	180	Between 6in and 12in	28	33	39	47	53	61
R0424	791	46	Less than 6in	0.0	0.0	0.0	0.0	0.0	0.0
R0425	318	52	Between 6in and 12in	1.5	1.8	2.3	2.6	3.0	3.5
R0430	130	60	Between 6in and 12in	3.5	4.2	5.0	5.9	6.9	7.9
R0440	102	17	Between 6in and 12in	1.5	1.7	2.0	2.5	2.9	3.3
R0445	71	11	Between 6in and 12in	1.7	2.0	2.3	2.8	3.3	3.8
R0446	47	28	Less than 6in	3.1	3.7	4.3	5.3	6.2	7.1
R0470	44	26	Less than 6in	6.3	7.5	8.7	11	12	14
R0480	339	6.1	Less than 6in	1.4	1.6	1.9	2.3	2.7	3.1
R0485	410	34	Between 12in and 24in	8.6	10	12	15	17	19
R0495	454	12	Between 6in and 12in	3.4	4.1	4.7	5.8	6.7	7.8
R0500	300	17	Between 6in and 12in	4.4	5.3	6.2	7.6	8.7	10
R0515	483	23	Between 6in and 12in	0.8	1.0	1.2	1.4	1.6	1.9
R0520	848	27	Between 6in and 12in	1.9	2.2	2.6	3.2	3.7	4.3
R0529	517	23	Less than 6in	0.0	0.0	0.0	0.0	0.0	0.0
R0530	406	43	Less than 6in	0.9	1.0	1.2	1.5	1.7	2.0
R0535	470	111	Between 6in and 12in	5.6	6.7	8.0	9.4	11	12
R0540	634	173	Between 12in and 24in	11	14	16	19	22	25
R0545	607	7.7	Between 6in and 12in	1.4	1.7	2.0	2.4	2.8	3.3
R0550	115	11	Between 6in and 12in	2.4	2.9	3.3	4.1	4.7	5.6
R0551	514	185	Between 12in and 24in	14	16	19	23	27	31
R0552	583	185	Between 12in and 24in	14	16	20	23	27	30
R0555	957	189	Between 12in and 24in	14	17	21	24	28	31
R0565	3590	277	Between 6in and 12in	9.9	12	14	17	18	21
R0570	2410	999	Between 12in and 24in	53	63	77	89	99	110
R0575	1470	1050	Greater than 24in	53	64	83	92	100	110
R0580	255	1150	Between 12in and 24in	58	69	89	99	110	130
R0584	1610	34	Less than 6in	3.5	4.2	4.8	6.0	6.0	6.0
R0585	821	85	Between 6in and 12in	6.4	7.6	8.9	11	12	13
R0586	445	85	Between 6in and 12in	6.3	7.6	8.8	11	13	14
R0591	315	136	Between 12in and 24in	13	15	17	21	24	28
R0595	730	174	Between 12in and 24in	19	23	28	33	37	42
R0596	580	310	Between 6in and 12in	13	13	13	13	13	13

Notes:

1. Approximate depth calculated from typical section sampled from LiDAR based DEM.

Town of Silverthorne Drainage Master Plan: Modeling Results

Open Channels

Name of Model Element	Length (ft)	Drainage Area (ac)	100-Year Depth ¹	Peak Flow (cfs)					
				2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
R0601	1170	333	Between 12in and 24in	15	16	16	16	16	16
R0605	1110	464	Between 12in and 24in	42	49	58	69	78	89
R0610	161	493	Greater than 24in	42	51	61	73	83	94
R0615	592	348	Between 12in and 24in	21	25	30	35	38	43
R0630	588	331	Less than 6in	5.6	7.5	8.8	11	12	14
R0635	418	424	Between 6in and 12in	7.3	10	12	14	17	18
R0640	2030	571	Between 6in and 12in	10	14	17	20	24	26
R0645	329	847	Between 6in and 12in	16	22	26	31	36	40
R0655	304	301	Less than 6in	5.2	7.0	8.2	9.9	12	13
R0660	2520	407	Between 6in and 12in	7.4	10	12	14	17	18
R0665	915	1490	Between 12in and 24in	28	39	45	54	64	70
R0670	8460	1830	Between 6in and 12in	34	48	57	68	80	87
R0675	2300	2520	Between 12in and 24in	47	67	79	95	110	120
R0685	564	2900	Between 12in and 24in	53	75	89	110	130	140
R0690	3870	3040	Between 12in and 24in	55	77	91	110	130	140
R0700	8880	3410	Between 12in and 24in	58	82	98	120	140	150
R0710	11000	152	Between 6in and 12in	3.1	4.4	5.2	6.3	7.4	8.2
R0720	2600	761	Between 6in and 12in	13	17	21	25	29	32
R0725	3980	1250	Between 6in and 12in	22	31	36	44	51	56
R0730	718	5170	Greater than 24in	83	120	140	170	200	220
R0740	5650	296	Less than 6in	5.3	7.2	8.5	10	12	13
R0750	2680	875	Between 6in and 12in	13	18	21	25	29	33
R0760	2440	426	Between 6in and 12in	8.1	11	13	16	18	20
R0765	2080	1460	Between 12in and 24in	24	33	39	46	54	60
R0770	7970	1670	Between 6in and 12in	28	38	45	54	63	70
R0775	1870	401	Between 6in and 12in	8.4	12	14	17	20	22
R0780	1250	2390	Between 12in and 24in	40	56	67	80	94	100
R0785	3210	2500	Between 12in and 24in	42	59	70	84	98	110
R0790	1530	2710	Between 12in and 24in	46	65	76	91	110	120
R0795	6760	2970	Between 12in and 24in	50	71	84	100	120	130
R0800	4290	8290	Greater than 24in	130	190	230	270	320	350
R0805	479	13	Less than 6in	2.3	2.7	3.1	3.8	4.4	5.1
R0806	1310	8310	Greater than 24in	130	190	230	270	320	350
R0810	104	8540	Greater than 24in	140	200	230	280	330	360
R0811	1100	8540	Greater than 24in	140	200	230	280	330	360
R0820	3250	85	Less than 6in	4.4	5.3	6.5	7.5	8.2	9.2
R0835	1020	22	Less than 6in	1.2	1.4	1.6	2.0	2.3	2.7
R0840	2800	34	Less than 6in	2.4	2.9	3.5	4.1	4.5	5.1

Notes:

1. Approximate depth calculated from typical section sampled from LiDAR based DEM.

Town of Silverthorne Drainage Master Plan: Modeling Results

Open Channels

Name of Model Element	Length (ft)	Drainage Area (ac)	100-Year Depth ¹	Peak Flow (cfs)					
				2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
R0841	1410	56	Less than 6in	3.5	4.2	5.0	6.0	6.7	7.6
R0845	1260	16	Less than 6in	1.3	1.6	1.8	2.2	2.6	3.0
R0850	559	27	Less than 6in	1.6	1.9	2.2	2.7	3.2	3.7
R0855	538	238	Between 6in and 12in	10	12	14	17	20	23
R0856	845	238	Between 6in and 12in	10	12	14	17	20	23
R0860	243	254	Between 12in and 24in	12	14	17	20	24	28
R0865	448	38	Less than 6in	4.8	5.7	6.7	8.2	9.4	11
R0866	533	291	Less than 6in	17	20	23	28	33	37
R0870	93	309	Between 6in and 12in	17	21	24	30	35	40
R0880	839	153	Between 6in and 12in	7.9	9.5	12	13	15	16
R0885	123	454	Between 12in and 24in	23	28	34	39	43	48
R0890	457	28	Less than 6in	1.5	1.7	2.1	2.4	2.7	3.0
R0891	7480	482	Between 12in and 24in	25	30	37	42	46	51
R0900	219	5.8	Less than 6in	1.0	1.2	1.3	1.7	1.9	2.2
R0905	2960	277	Between 6in and 12in	14	17	21	24	27	30
R0910	1920	89	Less than 6in	6.9	8.3	10	12	13	15
R0911	659	366	Between 6in and 12in	21	25	31	36	39	44
R0915	1540	554	Between 6in and 12in	33	40	48	56	62	69
R0920	1110	646	Between 12in and 24in	37	44	53	62	69	77
R0930	1020	7.4	Less than 6in	0.6	0.7	0.8	1.0	1.2	1.4
R0935	1630	32	Less than 6in	2.0	2.4	2.9	3.6	4.2	4.9
R0950	2710	33	Less than 6in	2.0	2.4	2.8	3.5	4.0	4.6
R0955	1540	34	Less than 6in	2.6	3.1	3.6	4.5	5.2	5.9
R0960	3330	19	Less than 6in	1.4	1.7	2.1	2.4	2.7	3.0
R0965	1030	230	Between 12in and 24in	13	15	17	21	25	28
R0970	1270	283	Between 12in and 24in	15	17	20	25	29	33
R0975	2920	4.7	Less than 6in	0.0	0.1	0.1	0.1	0.1	0.1
R0980	71	33	Less than 6in	0.6	0.7	0.8	1.0	1.2	1.4
R0981	179	317	Between 12in and 24in	16	18	21	26	30	35
R0990	1610	107	Between 6in and 12in	5.8	7.0	8.6	9.8	11	12
R0995	1000	249	Between 6in and 12in	13	17	20	22	25	28
R1000	200	529	Between 6in and 12in	28	34	41	47	52	58
R1001	478	529	Between 6in and 12in	28	34	41	47	52	58
R1005	3510	540	Between 6in and 12in	28	35	42	48	52	59
R1010	321	605	Between 12in and 24in	31	37	45	51	57	64
R1015	660	151	Less than 6in	8.0	9.6	12	13	15	16
R1020	1280	172	Between 6in and 12in	8.4	10	12	14	16	18
R1025	479	216	Between 6in and 12in	9.7	12	14	17	18	20

Notes:

1. Approximate depth calculated from typical section sampled from LiDAR based DEM.

Town of Silverthorne Drainage Master Plan: Modeling Results

Open Channels

Name of Model Element	Length (ft)	Drainage Area (ac)	100-Year Depth ¹	Peak Flow (cfs)					
				2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
R1030	3020	183	Between 6in and 12in	9.5	11	14	16	18	20
R1035	781	259	Between 6in and 12in	10	12	15	17	18	21
R1040	1650	327	Between 6in and 12in	10	13	15	18	19	22
R1045	1120	74	Less than 6in	0.7	0.8	0.9	1.1	1.3	1.5
R1050	3050	458	Between 12in and 24in	11	14	17	19	21	24
R1065	696	390	Between 6in and 12in	11	13	15	18	20	22
R1070	2110	505	Between 6in and 12in	17	20	24	28	31	35
R1075	1810	643	Between 6in and 12in	18	21	25	30	33	37
R1080	929	750	Less than 6in	18	21	26	30	34	38
R1085	1740	1260	Greater than 24in	29	35	43	50	55	63

Notes:

1. Approximate depth calculated from typical section sampled from LiDAR based DEM.

Appendix C. Cost Estimates



Town of Silverthorne Drainage Master Plan: Modeling Results

AACE Class 4 Cost Estimate Summary

Project	Capital Cost	High Range [+50%]
PR010	\$ 390,000	\$ 580,000
PR060	\$ 170,000	\$ 260,000
PR061	\$ 200,000	\$ 300,000
PR070	\$ 300,000	\$ 450,000
PR080	\$ 440,000	\$ 660,000
PR090	\$ 400,000	\$ 610,000

AACE International CLASS 4 Cost Estimate – Class 4 estimates are generally prepared based on limited information and subsequently have fairly wide accuracy ranges. Typically, engineering is 10% to 40% complete. They are typically used for project screening, determination of feasibility, concept evaluation, and preliminary budget approval. Virtually all Class 4 estimates use stochastic estimating methods such as cost curves, capacity factors, and other parametric and modeling techniques. Expected accuracy ranges are from –15% to –30% on the low side and +20% to 50% on the high side, depending on the technological complexity of the project, appropriate reference information, and the inclusion of an appropriate contingency determination. Ranges could exceed those shown in unusual circumstances.

Project Info

Project Name : **Silverthorne Drainage Master Plan**
 Estimator : **Drake Ludwig**
 Date : **7/8/2020**

Project Drainageways :

Drainageway Name	Drainageway Abbreviation (Prefix for Reach ID)	Length (mi)	Number of Reaches
PR010	PR010	0.19 mi	1
PR060	PR060	0.21 mi	1
PR061	PR061	0.03 mi	1
PR070	PR070	0.17 mi	1
PR080	PR080	0.25 mi	1
PR090	PR090	0.11 mi	1
		0.00 mi	0
		0.00 mi	0
		0.00 mi	0
		0.00 mi	0
Totals :		0.96 mi	6

Jurisdictions/Sponsors :

Jurisdiction
Silverthorne

Construction Cost Index (CCI)	
CCI Base Year :	2012
CCI Base Quarter :	1
Base CCI :	1.0000
Most Recent CCI Year :	2020
Most Recent CCI Quarter :	1
Most Recently Published CCI :	1.2500
Elapsed Time (years) :	8
Percentage Change in CCI :	25.0%

Benefit Cost Analysis	
Effective Interest Rate (%) :	

SUMMARY BY REACH

Project Name : **Silverthorne Drainage Master Plan**

Estimator : **Drake Ludwig**

Data : **7/8/2020**

REACH	CAPITAL	EASEMENT / ROW	ENGINEERING	LEGAL / ADMINISTRATIVE	CONTRACT ADMIN/CM	CONTINGENCY	TOTAL CAPITAL COST	ANNUAL O&M COST	50-YEAR O&M COST
PR010-ReachPR010	\$299,713.00	\$0.00	\$44,957.00	\$14,986.00	\$29,971.00	\$74,928.00	\$464,555.00	\$515.00	\$25,750.00
PR060-ReachPR060	\$134,050.00	\$0.00	\$20,108.00	\$6,703.00	\$13,405.00	\$33,513.00	\$207,779.00	\$646.00	\$32,300.00
PR061-ReachPR061	\$152,254.00	\$0.00	\$22,838.00	\$7,613.00	\$15,225.00	\$38,064.00	\$235,994.00	\$970.00	\$48,500.00
PR070-ReachPR070	\$228,764.00	\$0.00	\$34,315.00	\$11,438.00	\$22,876.00	\$57,191.00	\$354,584.00	\$432.00	\$21,600.00
PR080-ReachPR080	\$339,891.00	\$0.00	\$50,984.00	\$16,995.00	\$33,989.00	\$84,973.00	\$526,832.00	\$512.00	\$25,600.00
PR090-ReachPR090	\$311,265.00	\$0.00	\$46,690.00	\$15,563.00	\$31,127.00	\$77,816.00	\$482,461.00	\$1,938.00	\$96,900.00
Totals	\$1,465,937	\$0	\$219,892	\$73,298	\$146,593	\$366,485	\$2,272,205	\$5,013	\$250,650

MASTER PLAN COST ESTIMATE FOR INDIVIDUAL REACH

PROJECT: Silverthorne Drainage Master Plan
DRAINAGEWAY: PR000
REACH: PR000
JURISDICTION: Silverthorne
REACH ID: PR000/ReachPR000

ESTIMATED BY: Drake Ludwig
DATE: 7/9/2020

Main project cost estimate table with columns: DESCRIPTION, SUPPORTING DATA (USER DEFINED AND CALCULATED), QUANTITY, UNIT, UNIT COST, TOTAL COST, USER COMMENTS. Includes sub-sections like Pipe Culverts and Storm Drains, Flank End Sections, Headwalls, Manholes and Inlets, Concrete Box Culverts, and Hydraulic Structures.

MASTER PLAN COST ESTIMATE FOR INDIVIDUAL REACH

PROJECT: Silverthorne Drainage Master Plan
DRAINAGEWAY: PR001
REACH: PR001
JURISDICTION: Silverthorne
REACH ID: PR001-ReachPR001
ESTIMATED BY: Drake Ludwig
DATE: 7/9/2020

Main table with columns: DESCRIPTION, SUPPORTING DATA (USER DEFINED AND CALCULATED), QUANTITY, UNIT, UNIT COST, TOTAL COST, USER COMMENTS. Includes sections for Pipe Culverts and Storm Drains, Flank End Sections, Headwalls, Wingwalls, Manholes and Inlets, Concrete Box Culverts, and Hydraulic Structures.

MASTER PLAN COST ESTIMATE FOR INDIVIDUAL REACH

PROJECT: Silverthorne Drainage Master Plan
DRAINAGEWAY: P9270
REACH: P9270
JURISDICTION: Silverthorne
REACH ID: P9270-ReachP9270
ESTIMATED BY: Drake Ludwig
DATE: 7/9/2020

Table with columns: DESCRIPTION, SUPPORTING DATA (USER DEFINED AND CALCULATED), QUANTITY, UNIT, UNIT COST, TOTAL COST, USER COMMENTS. Sub-sections include Pipe Culverts and Storm Drains, Flare End Sections, Headwalls, Manholes and Inlets, Concrete Box Culverts, and Hydraulic Structures.

MASTER PLAN COST ESTIMATE FOR INDIVIDUAL REACH

PROJECT: Silverthorne Drainage Master Plan
DRAINAGEWAY: PR930
REACH: PR930
JURISDICTION: Silverthorne
REACH ID: PR930/ReachPR930
ESTIMATED BY: Drake Ludwig
DATE: 7/9/2020

Table with columns: DESCRIPTION, SUPPORTING DATA (USER DEFINED AND CALCULATED), QUANTITY, UNIT, UNIT COST, TOTAL COST, USER COMMENTS. Includes sections for Pipe Culverts and Storm Drains, Flank End Sections, Headwalls, Wingwalls, Manholes and Inlets, Concrete Box Culverts, Headwall and Topwalls, and Hydraulic Structures.

Note: Prices reflect circular reinforced concrete pipe. For arch or elliptical pipes, user shall use equivalent circular pipe diameter.

Appendix D. Model Calibration Memorandum



WWE
MEMORANDUM

To: Tom Daugherty
Town of Silverthorne
Via Email: TDaugherty@silverthorne.org

From: Scott Schreiber, P.E., C.F.M and Drake Ludwig, P.E.
Wright Water Engineers, Inc.

Date: March 2020

Re: Town of Silverthorne Drainage Master Plan Model Verification and Calibration

OVERVIEW

Wright Water Engineers, Inc. (WWE) has prepared this memorandum to summarize the verification and calibration analyses performed for the hydrologic modeling approach implemented in the Town of Silverthorne Drainage Master Plan (Plan). The Plan was prepared by WWE for the Town of Silverthorne (Town) to assess the function of the stormwater infrastructure throughout the Town and identify potential multi-objective improvement projects and recommendations. The Plan studied, evaluated, and documented the Town's current stormwater infrastructure through hydrologic and hydraulic modeling of storm events ranging from the 2-year to 100-year event. The hydrologic modeling approach utilized in this analysis was verified and calibrated against existing gage data in the region, this memorandum provides an overview of this analysis.

MODEL VERIFICATION AND CALIBRATION

A comprehensive comparison of the hydrologic modeling approach utilized in the Plan was completed for a nearby watershed tributary to Gore Creek through the Town of Vail. As the Study Area for this Plan and the Vail watershed both include headwaters originating in the Gore Range, and are within the same hydrologic region, it was determined that this comparison was also applicable to the Town.

Using the same modeling approach and input parameters outlined in Sections 3 and 4 of the Plan, a watershed model previously completed for the Town of Vail was run to compare the computed runoff against the observed, gaged runoff, for a gaged precipitation event. This analysis was used to verify that the hydrologic approach outlined in this Plan produced reasonable results for application in the identification of infrastructure deficiencies. This comparison indicated that the hydrologic modeling approach reasonably represents the runoff response from a recorded rainfall event within the same hydrologic region.

Results Compared to Observed Rainfall Runoff Response

To compare the hydrologic model's ability to estimate the runoff response following a rainfall event, recorded precipitation data from an actual event were run through the Vail model, and the

calculated runoff response was compared to the streamflow that was observed nearby during the event.

The U.S. Geologic Survey (USGS) operates a streamflow gage (Gore Creek above Red Sandstone Creek, at Vail, CO – USGS09066325) along Gore Creek, near the Eagle River Water and Sanitation District’s building near the intersection of South Frontage Road West and Forest Road. Since early June of 2019, this gage has also collected precipitation information at fifteen-minute intervals. With this resolution of rainfall data, it was possible to evaluate the Vail model’s ability to accurately simulate the rainfall-runoff response of a recorded event within the Vail watershed.

To perform this evaluation, the complete record of precipitation was downloaded from this gage and plotted against the streamflow record from USGS’s Booth Creek gage (USGS09066200), a location included in the Vail hydrologic model. Because the intent of this analysis was to evaluate the reasonableness of the model in predicting the runoff response from a rainfall event alone, not including snowmelt runoff, an early September precipitation event was chosen. The Booth Creek hydrograph in Figure 4 shows that the runoff response to the precipitation recorded on September 9, 2019 was outside of the snowmelt-driven peak runoff season.

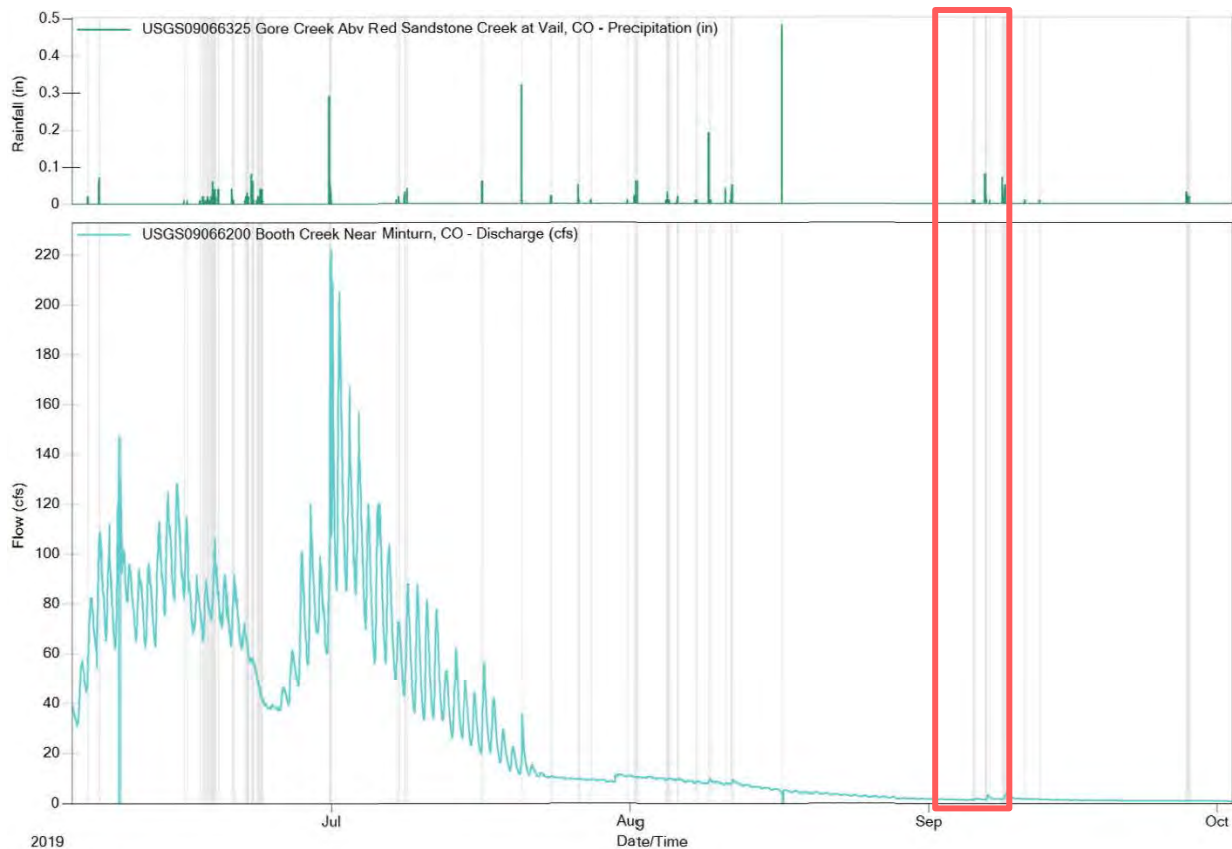


Figure 1. Observed Precipitation Data at Red Sandstone vs. Streamflow at Booth Creek

The precipitation data recorded for this event, shown on Figure 5, were included as rainfall input into the Vail model. The model was then run, and the output hydrograph (labeled as R1001) was

plotted against the recorded hydrograph for that day, adjusted for baseflow prior to the runoff response. As illustrated in Figure 5, the magnitude of the runoff response from the modeled rainfall event, approximately 2.3 cfs, generally agrees with the observed response, 2.7 cfs, recorded at the Booth Creek gage. This indicates that the hydrologic modeling approach reasonably represents the runoff response from rainfall, thus no adjustments to the input hydrologic parameters were deemed necessary to simulate rainfall-runoff processes.

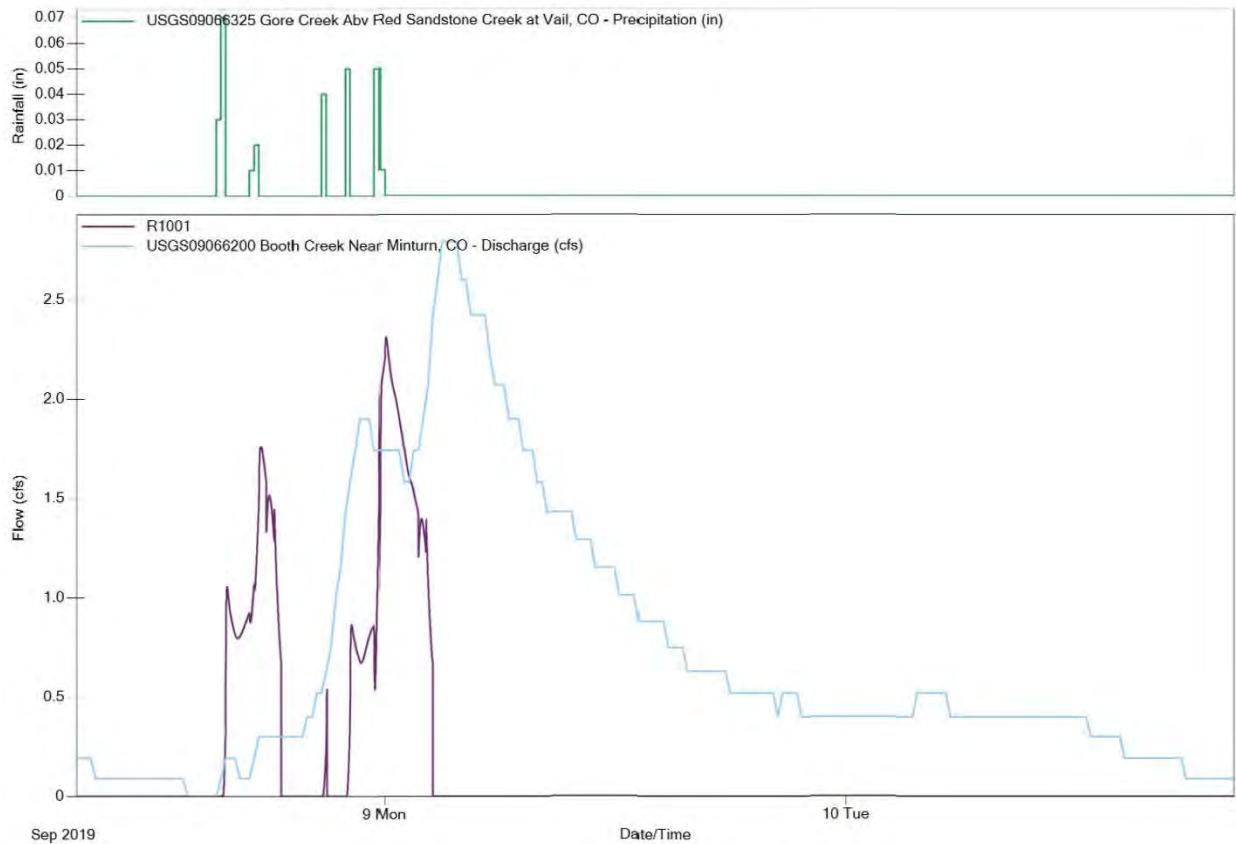


Figure 2. September 9, 2019 Modeled vs. Observed Rainfall-Runoff at Booth Creek

This analysis assumed that the same rainfall depth and intensity recorded at the Red Sandstone gage fell uniformly across the watershed contributing to the Booth Creek gage, approximately four miles away. Although the orographic influence of the Gore Range may introduce some variation to the spatial and temporal distribution of rainfall, the analysis was based upon the best available data. While the timing of peak flows varied between the model and gage, this exercise demonstrated that the modeling approach produces peaks of a similar magnitude to what was observed at the gage for this rainfall event.

Results Compared to Observed Rainfall Runoff Response

WWE performed a flood frequency analysis using the streamflow data obtained from the Booth Creek gage to compare the estimated peak flow rate from the hydrologic model to that of observed events. The Booth Creek near Minturn, CO gage (USGS09066200) is located near the pedestrian trail

crossing, just north of the I-70 Frontage Road in East Vail. The gage has a drainage area of 6.18 square miles and is at an elevation of 8,325 feet. The gage has a 54-year period of record (1965-2018) from which a flood frequency analysis was performed using the methodology outlined in the USGS Bulletin 17B (Bulletin 17B). Bulletin 17B is a guidance document that outlines a statistical method for determining flood flow frequencies from historical peak flow records. A period of record of over 50-years is sufficient to make reasonable estimates of the 100-year event using this methodology. The flood frequency analysis was performed using the U.S. Army Corps of Engineers (USACE) Hydrologic Engineering Center’s Statistical Software Package (HEC-SSP) version 2.2. This software includes the statistical method outlined in Bulletin 17B for determining flood flow frequency.

Consistent with Bulletin 17B methodology, the Single Grubbs-Beck Low Outlier Test and Weibull plotting positions were utilized to develop flood estimates for a range of events. To account for irregularities in the peak flow frequency distribution, a skew coefficient is required to develop a frequency curve that best represents the sample data. To determine which skew value provided the best representation, the test was run three different times: once using the station skew coefficient as provided by USGS, once using the regional skew coefficient as provided by the Generalized Skew Coefficients of Logarithms of Annual Maximum Streamflow chart (Regional Skew Chart) shown on Plate 1 of Bulletin 17B, and once using the weighted skew coefficient as calculated by HEC-SSP from the provided station and regional skew coefficients. The regional skew coefficient was determined to be -0.55, and a mean square error of 0.302 is provided for all regional skew coefficients on the Regional Skew Chart. The station skew coefficient provided by USGS for the Gage is 0.133, and the mean square error is 0.104. The three computed curves were compared, and it was determined that station skew provided the optimal computed curve out of the three.

The resulting computed flows are provided in the table, below. As a final check for reasonableness of the computed flow frequency estimates, the flow rates published in the latest Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) report for Booth Creek are also included in Table 5.

Table 1. Results of Flood Frequency Analysis at Booth Creek

Return Period	Percent Chance Exceedance	2007 FEMA FIS (cfs)	Bulletin 17B Computed Flow Estimate (cfs)	Confidence Limits, Flow (cfs)	
				0.05	0.95
2-Year	50%	-	190	160	130
5-Year	20%	-	230	240	190
10-Year	10%	245	280	300	230
25-Year	4%	-	320	390	280
50-Year	2%	330	350	460	320
100-Year	1%	370	400	530	360

As shown in Table 5, the flood frequency analysis for Booth Creek generally found flow estimates to be somewhat higher than those included in the FIS report; however, the published flow rates remain within the 95% confidence limits of the analysis. Due to the general agreement with the FIS flows, it

was determined that the computed flow estimates were suitable for comparison with modeled peak flow rates for each return period.

The Vail hydrologic model accounted for snowmelt runoff through the application of the same unit runoff rates outlined in Section 3.6 of the Plan. Using the same hydrologic methodology outlined in the Plan for both rainfall and snowmelt runoff, the Vail model produced the following peak flow estimates at the Booth Creek gage location, outline in Table 2.

Table 2. Modeled vs. Flood Frequency Flow Estimates at USGS Booth Creek Gage

Return Period	Percent Chance Exceedance	B17B Flood Frequency Flow Estimate (cfs)	NOAA14 2 nd Quartile 10% + Snowmelt (cfs)
5-Year	20%	210	230
25-Year	4%	320	320
50-Year	2%	370	350
100-Year	1%	440	410

CONCLUSION

As shown in Table 2, the National Oceanic and Atmospheric Administration (NOAA) Atlas 14, 2nd Quartile 10% temporal rainfall distribution, discussed in Section 3.5 of the Plan, produces peak flow rates within the computed confidence limits for all events. Because the hydrologic model was shown to reproduce an observed rainfall-runoff response with relative accuracy, and produced modeled peak flow rates which aligned with those estimated from the flood frequency analysis, the hydrologic modeling methodology was deemed to be an appropriate tool for hydrologic and hydraulic routing of storm events through the Town of Vail and other communities within the same hydrologic region, including the Town of Silverthorne.

Appendix E. Bulletin 17B Flood Frequency Analyses



Bulletin 17B Frequency Analysis
12 Sep 2019 11:45 AM

--- Input Data ---

Analysis Name: Straight_Creek_17B
Description: Bulletin 17B flow frequency analysis for Straight Creek below Lasky

Data Set Name: Straight_Creek-DILLON, CO-FLOW-ANNUAL PEAK
DSS File Name: G:\WWE\181-061\030\000\Engr\17B
Analyses\Straight_Creek_17B_Station_Skew\Straight_Creek_17B_Station_Skew.dss
DSS Pathname: /STRAIGHT CR BLW LASKEY GULCH/DILLON, CO/FLOW-ANNUAL
PEAK/01jan1900/IR-CENTURY/USGS/

Report File Name: G:\WWE\181-061\030\000\Engr\17B
Analyses\Straight_Creek_17B_Station_Skew\Bulletin17Results\Straight_Creek_17B\Strai
ght_Creek_17B.rpt
XML File Name: G:\WWE\181-061\030\000\Engr\17B
Analyses\Straight_Creek_17B_Station_Skew\Bulletin17Results\Straight_Creek_17B\Strai
ght_Creek_17B.xml

Start Date:
End Date:

Skew Option: Use Station Skew
Regional Skew: -Infinity
Regional Skew MSE: -Infinity

Plotting Position Type: Median

Upper Confidence Level: 0.05
Lower Confidence Level: 0.95

Use non-standard frequencies

Frequency: 0.2
Frequency: 0.5
Frequency: 1.0
Frequency: 2.0
Frequency: 4.0
Frequency: 10.0
Frequency: 20.0
Frequency: 50.0
Frequency: 80.0
Frequency: 90.0
Frequency: 95.0
Frequency: 99.0

Display ordinate values using 1 digit in fraction part of value

--- End of Input Data ---

--- Preliminary Results ---

<< Skew Weighting >>

Based on 32 events, mean-square error of station skew = 0.216
Mean-square error of regional skew = -?

<< Frequency Curve >>

Straight_Creek-DILLON, CO-FLOW-ANNUAL PEAK

Computed Curve FLOW, CFS	Expected Probability ---	Percent Chance Exceedance	Confidence Limits	
			0.05 FLOW, CFS	0.95 FLOW, CFS
466.6	---	0.2	703.6	349.8
426.7	---	0.5	630.5	323.8
393.6	---	1.0	571.2	301.9
357.6	---	2.0	508.2	277.7
318.4	---	4.0	441.5	250.7
260.5	---	10.0	347.0	209.6
210.5	---	20.0	270.1	172.5
130.6	---	50.0	158.5	108.3
73.4	---	80.0	89.3	57.6
52.1	---	90.0	65.3	38.4
38.4	---	95.0	49.9	26.6
20.5	---	99.0	29.1	12.2

<< Systematic Statistics >>

Straight_Creek-DILLON, CO-FLOW-ANNUAL PEAK

Log Transform: FLOW, CFS		Number of Events	
Mean	2.086	Historic Events	0
Standard Dev	0.277	High Outliers	0
Station Skew	-0.658	Low Outliers	0
Regional Skew	---	Zero Events	0
Weighted Skew	---	Missing Events	0
Adopted Skew	-0.658	Systematic Events	32

--- End of Preliminary Results ---

<< Low Outlier Test >>

Based on 32 events, 10 percent outlier test deviate $K(N) = 2.591$
Computed low outlier test value = 23.31

1 low outlier(s) identified below test value of 23.31

Statistics and frequency curve adjusted for 1 low outlier(s)

<< Systematic Statistics >>

Straight_Creek-DILLON, CO-FLOW-ANNUAL PEAK

Log Transform: FLOW, CFS		Number of Events	
Mean	2.110	Historic Events	0
Standard Dev	0.246	High Outliers	0
Station Skew	-0.306	Low Outliers	1
Regional Skew	---	Zero Events	0
Weighted Skew	---	Missing Events	0
Adopted Skew	-0.658	Systematic Events	32

<< High Outlier Test >>

Based on 31 events, 10 percent outlier test deviate $K(N) = 2.577$
Computed high outlier test value = 553.39

0 high outlier(s) identified above test value of 553.39

Note: Statistics and frequency curve were modified
using conditional probability adjustment.

--- Final Results ---

<< Plotting Positions >>

Straight_Creek-DILLON, CO-FLOW-ANNUAL PEAK

Events Analyzed				Ordered Events			
Day	Mon	Year	FLOW CFS	Rank	Water Year	FLOW CFS	Median Plot Pos
07	Jun	1987	55.0	1	1995	416.0	2.16
10	Jun	1988	104.0	2	2010	339.0	5.25
29	May	1989	76.0	3	2003	289.0	8.33
05	Jul	1990	146.0	4	2011	261.0	11.42
11	Jun	1991	136.0	5	1997	205.0	14.51
13	Jun	1992	63.0	6	1996	205.0	17.59
16	Jun	1993	168.0	7	2014	185.0	20.68
31	May	1994	81.0	8	2000	177.0	23.77
17	Jun	1995	416.0	9	1993	168.0	26.85
22	Jun	1996	205.0	10	2013	160.0	29.94
19	Jun	1997	205.0	11	2016	156.0	33.02
10	Jul	1998	87.0	12	2015	151.0	36.11
23	Jun	1999	138.0	13	1990	146.0	39.20
30	May	2000	177.0	14	1999	138.0	42.28
02	Jun	2001	95.0	15	2017	136.0	45.37
20	May	2002	22.0	16	1991	136.0	48.46
19	Jun	2003	289.0	17	2009	135.0	51.54
07	Jun	2004	48.0	18	2008	133.0	54.63
22	Jun	2005	113.0	19	2006	130.0	57.72
06	Jun	2006	130.0	20	2007	127.0	60.80
17	Jun	2007	127.0	21	2005	113.0	63.89
20	Jun	2008	133.0	22	1988	104.0	66.98
26	Jun	2009	135.0	23	2001	95.0	70.06
28	May	2010	339.0	24	1998	87.0	73.15
18	Jul	2011	261.0	25	1994	81.0	76.23
22	May	2012	31.0	26	2018	79.9	79.32
09	Jun	2013	160.0	27	1989	76.0	82.41
02	Jun	2014	185.0	28	1992	63.0	85.49
11	Jun	2015	151.0	29	1987	55.0	88.58
11	Jun	2016	156.0	30	2004	48.0	91.67
12	Jun	2017	136.0	31	2012	31.0	94.75
25	May	2018	79.9	32	2002	22.0*	97.84

* Outlier

<< Skew Weighting >>

Based on 32 events, mean-square error of station skew = 0.181
 Mean-square error of regional skew = -?

<< Frequency Curve >>
 Straight_Creek-DILLON, CO-FLOW-ANNUAL PEAK

Computed Curve FLOW, CFS	Expected Probability	Percent Chance Exceedance	Confidence Limits	
			0.05 FLOW, CFS	0.95
533.1	597.9	0.2	814.5	398.1
468.8	512.8	0.5	694.8	356.6
420.1	451.6	1.0	607.1	324.5
371.4	392.7	2.0	521.9	291.7
322.4	335.9	4.0	439.3	257.8
256.6	262.7	10.0	333.6	210.6
204.9	207.6	20.0	256.0	171.5
129.5	129.5	50.0	153.7	109.4
78.7	77.5	80.0	93.9	63.1
59.7	57.8	90.0	73.0	45.6
47.1	44.7	95.0	59.2	34.2
29.6	26.3	99.0	39.6	19.3

<< Synthetic Statistics >>
 Straight_Creek-DILLON, CO-FLOW-ANNUAL PEAK

Log Transform: FLOW, CFS		Number of Events	
Mean	2.100	Historic Events	0
Standard Dev	0.248	High Outliers	0
Station Skew	-0.292	Low Outliers	1
Regional Skew	---	Zero Events	0
Weighted Skew	---	Missing Events	0
Adopted Skew	-0.292	Systematic Events	32

--- End of Analytical Frequency Curve ---

Bulletin 17B Frequency Analysis
06 Jan 2020 10:10 AM

--- Input Data ---

Analysis Name: Willow_Creek_17B
Description:

Data Set Name: WILLOW CREEK-DILLON, CO.-FLOW-ANNUAL PEAK
DSS File Name: G:\WWE\181-061\030\000\Engr\17B
Analyses\Willow_Creek\Willow_Creek_17B\Willow_Creek_17B.dss
DSS Pathname: /WILLOW CREEK/DILLON, CO./FLOW-ANNUAL PEAK/01jan1900/IR-CENTURY/USGS/

Report File Name: G:\WWE\181-061\030\000\Engr\17B
Analyses\Willow_Creek\Willow_Creek_17B\Bulletin17Results\Willow_Creek_17B\Willow_Cr
eek_17B.rpt
XML File Name: G:\WWE\181-061\030\000\Engr\17B
Analyses\Willow_Creek\Willow_Creek_17B\Bulletin17Results\Willow_Creek_17B\Willow_Cr
eek_17B.xml

Start Date:
End Date:

Skew Option: Use Station Skew
Regional Skew: -Infinity
Regional Skew MSE: -Infinity

Plotting Position Type: Median

Upper Confidence Level: 0.05
Lower Confidence Level: 0.95

Display ordinate values using 1 digits in fraction part of value

--- End of Input Data ---

Warning: Less than 10 events for analysis,
Bulletin 17B procedures are not applicable.

<< Low Outlier Test >>

Based on 9 events, 10 percent outlier test deviate $K(N) = 1.977$
Computed low outlier test value = 90.3

0 low outlier(s) identified below test value of 90.3

<< High Outlier Test >>

Based on 9 events, 10 percent outlier test deviate $K(N) = 1.977$
Computed high outlier test value = 219.76

0 high outlier(s) identified above test value of 219.76

--- Final Results ---

<< Plotting Positions >>

WILLOW CREEK-DILLON, CO.-FLOW-ANNUAL PEAK

Events Analyzed				Ordered Events			
Day	Mon	Year	FLOW CFS	Rank	Water Year	FLOW CFS	Median Plot Pos
02	Jun	1943	150.0	1	1951	210.0	7.45
30	May	1944	116.0	2	1950	166.0	18.09
24	Jun	1945	102.0	3	1947	162.0	28.72
18	Jun	1946	112.0	4	1943	150.0	39.36
20	Jun	1947	162.0	5	1948	141.0	50.00
03	Jun	1948	141.0	6	1949	138.0	60.64
17	Jun	1949	138.0	7	1944	116.0	71.28
16	Jun	1950	166.0	8	1946	112.0	81.91
21	Jun	1951	210.0	9	1945	102.0	92.55

<< Skew Weighting >>

Based on 9 events, mean-square error of station skew = 0.537
Mean-square error of regional skew = -?

<< Frequency Curve >>

WILLOW CREEK-DILLON, CO.-FLOW-ANNUAL PEAK

Computed Curve	Expected Probability	Percent Chance Exceedance	Confidence Limits 0.05 0.95
FLOW, CFS			FLOW, CFS

288.6	425.3	0.2	488.2	228.4
265.3	349.1	0.5	424.5	214.5
247.8	303.3	1.0	379.3	203.8
230.4	265.7	2.0	336.5	192.8
207.1	224.8	5.0	283.1	177.3
189.0	198.3	10.0	244.7	164.5
169.7	173.7	20.0	207.5	149.6
139.5	139.5	50.0	159.5	121.6
116.3	114.1	80.0	132.0	94.8
106.3	102.4	90.0	121.9	82.7
99.0	93.2	95.0	114.9	73.8
87.1	76.7	99.0	103.8	60.1

<< Systematic Statistics >>

WILLOW CREEK-DILLON, CO.-FLOW-ANNUAL PEAK

Log Transform: FLOW, CFS		Number of Events	
Mean	2.149	Historic Events	0
Standard Dev	0.098	High Outliers	0
Station Skew	0.254	Low Outliers	0
Regional Skew	---	Zero Events	0
Weighted Skew	---	Missing Events	0
Adopted Skew	0.254	Systematic Events	9

--- End of Analytical Frequency Curve ---

Appendix F. NOAA Atlas 14 Rainfall Data





NOAA Atlas 14, Volume 8, Version 2
Location name: Silverthorne, Colorado, USA*
Latitude: 39.6486°, Longitude: -106.0795°
Elevation: 8705.74 ft**



* source: ESRI Maps
 ** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffrey Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps & aeriels](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.119 (0.094-0.155)	0.169 (0.133-0.220)	0.249 (0.195-0.325)	0.315 (0.245-0.413)	0.404 (0.302-0.551)	0.473 (0.345-0.655)	0.540 (0.381-0.772)	0.608 (0.410-0.897)	0.696 (0.452-1.06)	0.763 (0.483-1.19)
10-min	0.175 (0.138-0.227)	0.247 (0.195-0.322)	0.364 (0.286-0.476)	0.461 (0.359-0.605)	0.592 (0.443-0.807)	0.692 (0.506-0.960)	0.791 (0.558-1.13)	0.890 (0.601-1.31)	1.02 (0.661-1.56)	1.12 (0.707-1.74)
15-min	0.213 (0.168-0.277)	0.301 (0.237-0.392)	0.444 (0.349-0.581)	0.562 (0.438-0.738)	0.722 (0.540-0.984)	0.844 (0.617-1.17)	0.964 (0.680-1.38)	1.09 (0.733-1.60)	1.24 (0.807-1.90)	1.36 (0.862-2.12)
30-min	0.306 (0.241-0.398)	0.393 (0.310-0.512)	0.544 (0.427-0.711)	0.678 (0.528-0.890)	0.873 (0.661-1.21)	1.03 (0.761-1.45)	1.20 (0.853-1.74)	1.38 (0.939-2.06)	1.63 (1.06-2.51)	1.83 (1.16-2.85)
60-min	0.400 (0.315-0.520)	0.480 (0.378-0.625)	0.627 (0.492-0.819)	0.763 (0.595-1.00)	0.972 (0.741-1.36)	1.15 (0.851-1.62)	1.34 (0.957-1.95)	1.55 (1.06-2.33)	1.85 (1.21-2.86)	2.10 (1.33-3.27)
2-hr	0.493 (0.393-0.634)	0.567 (0.451-0.730)	0.710 (0.563-0.916)	0.849 (0.669-1.10)	1.07 (0.829-1.49)	1.27 (0.951-1.78)	1.48 (1.07-2.14)	1.73 (1.19-2.57)	2.08 (1.38-3.19)	2.37 (1.52-3.66)
3-hr	0.560 (0.449-0.715)	0.625 (0.501-0.799)	0.756 (0.603-0.970)	0.888 (0.704-1.15)	1.10 (0.862-1.52)	1.30 (0.981-1.81)	1.51 (1.10-2.17)	1.76 (1.22-2.60)	2.12 (1.41-3.23)	2.42 (1.56-3.71)
6-hr	0.680 (0.551-0.858)	0.758 (0.614-0.958)	0.908 (0.733-1.15)	1.05 (0.845-1.34)	1.29 (1.01-1.74)	1.49 (1.14-2.04)	1.71 (1.26-2.42)	1.96 (1.38-2.86)	2.33 (1.57-3.50)	2.63 (1.71-3.99)
12-hr	0.827 (0.679-1.03)	0.946 (0.775-1.18)	1.16 (0.949-1.46)	1.36 (1.11-1.72)	1.67 (1.32-2.22)	1.93 (1.48-2.60)	2.20 (1.63-3.07)	2.51 (1.78-3.61)	2.94 (2.00-4.38)	3.30 (2.17-4.96)
24-hr	1.02 (0.845-1.25)	1.17 (0.972-1.45)	1.45 (1.20-1.80)	1.71 (1.40-2.12)	2.09 (1.67-2.75)	2.42 (1.88-3.22)	2.76 (2.07-3.80)	3.14 (2.25-4.47)	3.68 (2.52-5.41)	4.11 (2.73-6.12)
2-day	1.25 (1.05-1.52)	1.42 (1.19-1.73)	1.73 (1.45-2.12)	2.02 (1.68-2.48)	2.46 (1.99-3.19)	2.83 (2.22-3.73)	3.23 (2.44-4.39)	3.67 (2.65-5.16)	4.29 (2.98-6.25)	4.80 (3.22-7.07)
3-day	1.39 (1.17-1.68)	1.59 (1.34-1.92)	1.94 (1.63-2.35)	2.26 (1.89-2.76)	2.74 (2.23-3.53)	3.15 (2.49-4.12)	3.58 (2.73-4.84)	4.06 (2.95-5.66)	4.72 (3.30-6.83)	5.27 (3.56-7.70)
4-day	1.50 (1.27-1.81)	1.72 (1.46-2.07)	2.09 (1.77-2.53)	2.44 (2.05-2.96)	2.95 (2.40-3.77)	3.37 (2.68-4.39)	3.82 (2.92-5.13)	4.31 (3.15-5.99)	5.00 (3.50-7.19)	5.56 (3.77-8.10)
7-day	1.80 (1.54-2.14)	2.02 (1.73-2.41)	2.42 (2.06-2.89)	2.77 (2.35-3.33)	3.30 (2.72-4.17)	3.74 (2.99-4.80)	4.20 (3.24-5.57)	4.69 (3.46-6.45)	5.39 (3.81-7.67)	5.95 (4.07-8.60)
10-day	2.06 (1.78-2.44)	2.30 (1.98-2.72)	2.71 (2.32-3.22)	3.07 (2.62-3.67)	3.62 (2.99-4.53)	4.06 (3.27-5.19)	4.54 (3.52-5.98)	5.04 (3.74-6.88)	5.75 (4.09-8.13)	6.32 (4.35-9.08)
20-day	2.78 (2.42-3.24)	3.09 (2.69-3.61)	3.62 (3.14-4.24)	4.07 (3.52-4.81)	4.73 (3.95-5.83)	5.26 (4.28-6.61)	5.81 (4.55-7.54)	6.39 (4.78-8.60)	7.19 (5.16-10.0)	7.81 (5.44-11.1)
30-day	3.36 (2.96-3.90)	3.75 (3.29-4.35)	4.39 (3.84-5.11)	4.93 (4.29-5.77)	5.69 (4.78-6.95)	6.30 (5.15-7.83)	6.91 (5.44-8.88)	7.54 (5.68-10.1)	8.40 (6.06-11.6)	9.06 (6.35-12.8)
45-day	4.09 (3.62-4.71)	4.57 (4.04-5.26)	5.35 (4.71-6.18)	5.99 (5.24-6.96)	6.87 (5.79-8.29)	7.55 (6.21-9.29)	8.22 (6.51-10.5)	8.90 (6.73-11.8)	9.80 (7.11-13.4)	10.5 (7.39-14.7)
60-day	4.71 (4.20-5.39)	5.26 (4.68-6.03)	6.15 (5.44-7.07)	6.86 (6.04-7.94)	7.83 (6.62-9.37)	8.55 (7.06-10.5)	9.26 (7.36-11.7)	9.96 (7.56-13.1)	10.9 (7.91-14.8)	11.5 (8.17-16.1)

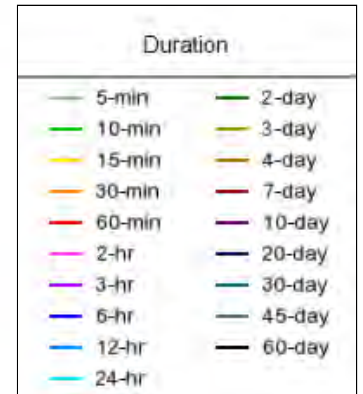
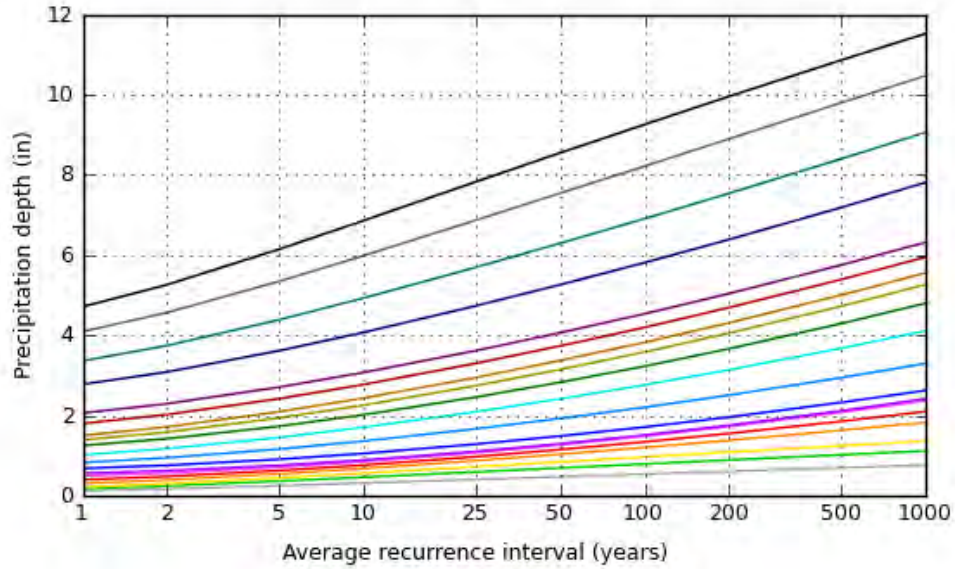
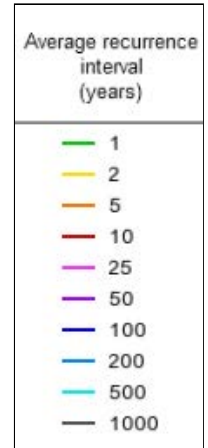
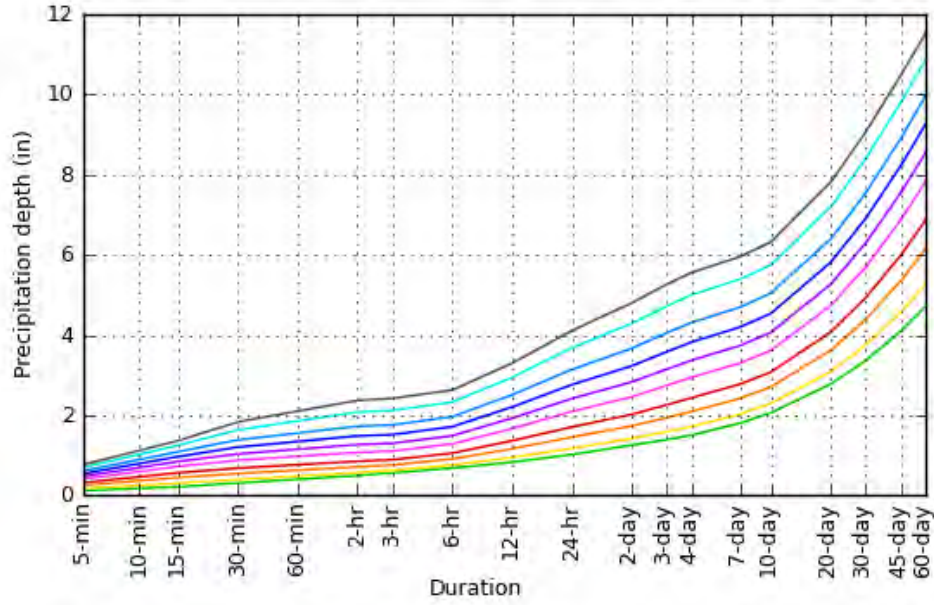
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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PF graphical

PDS-based depth-duration-frequency (DDF) curves

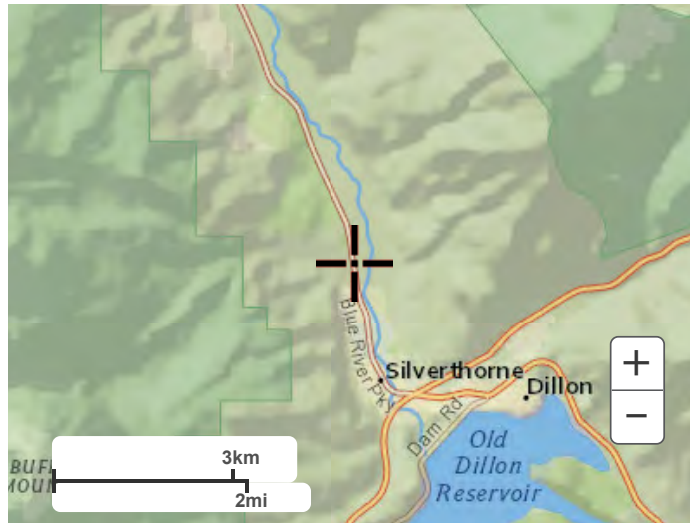
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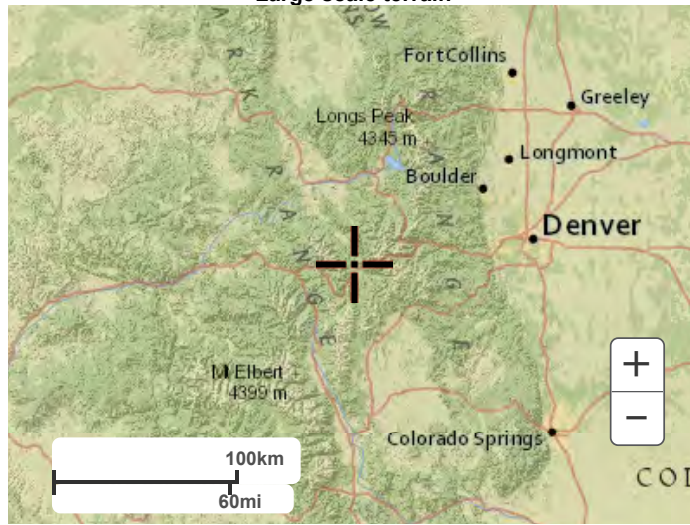
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Maps & aerials

Small scale terrain



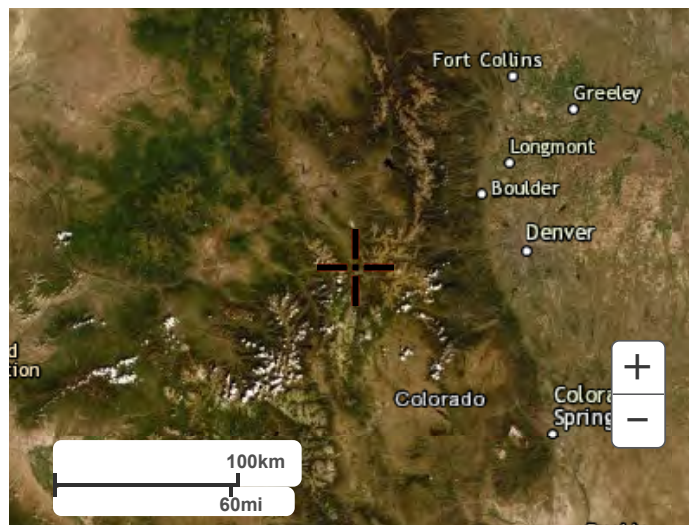
Large scale terrain



Large scale map



Large scale aerial



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[National Weather Service](#)
[National Water Center](#)
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

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Tabulated temporal distribution data for NOAA Atlas 14 Volume 8: Midwestern Region 2

This is a comma delimited file containing temporal distribution data for all four quartile cases and for all cases combined for the 6-hour duration.

First column of each table shows time from 0 to 6 hours in 0.5-hourly increments

Second column shows cumulative percentages of total precipitation that occurred by given time in 90% of cases etc.

CUMULATIVE PERCENTAGES OF TOTAL PRECIPITATION FOR FIRST-QUARTILE CASES

Time	Percent of occurrence								
hours	90%	80%	70%	60%	50%	40%	30%	20%	10%
0	0	0	0	0	0	0	0	0	0
0.5	8.33	9.95	12.82	16.96	21.58	28.76	36.5	42.21	48.13
1	17.85	21.81	26.9	33.33	42.3	55.18	65.7	74.73	84.89
1.5	30.71	37.4	47.71	54.43	64.03	73.91	82.42	90.78	97.69
2	41.4	50	62.46	72.91	81.74	86.83	92.18	97.27	99.86
2.5	49.34	58.07	70.45	82.61	90.09	94.63	97.53	99.46	99.96
3	55.91	64.78	77.33	87.12	92.74	97.93	99.58	99.95	99.98
3.5	61.36	72.04	83.31	90.91	95.56	99.03	99.97	99.98	99.99
4	67.19	79.19	87.71	94.11	98.62	99.67	99.98	99.99	99.99
4.5	74.92	85.09	92.24	96.44	99.67	99.96	99.99	99.99	100
5	83.35	89.95	96.28	98.85	99.75	99.98	100	100	100
5.5	91.67	95.05	98.3	99.88	99.95	100	100	100	100
6	100	100	100	100	100	100	100	100	100

CUMULATIVE PERCENTAGES OF TOTAL PRECIPITATION FOR SECOND-QUARTILE CASES

Time	Percent of occurrence								
hours	90%	80%	70%	60%	50%	40%	30%	20%	10%
0	0	0	0	0	0	0	0	0	0
0.5	1.14	2.15	3.38	4.62	5.56	6.25	7.14	7.83	9.51
1	3.67	6.2	8.67	10.81	12.14	13.51	15.25	17.73	21.17
1.5	7.96	14.08	17.97	20.93	24.29	27.16	30.36	35.5	42.06
2	18.17	25.54	29.89	33.02	36.65	41.22	47.14	54.85	66.35
2.5	35.81	41.58	45.14	48.17	52.29	56.84	64.43	72.78	85.25
3	51.8	56.26	59.65	63.62	69.11	73.82	81.17	87.73	95.55
3.5	60.32	64.79	69.44	74.34	80.26	86.35	92.66	96.77	99.27
4	66.67	71.25	76.77	81	86.84	92.77	97.36	99.67	99.95
4.5	75.09	79.56	84.17	87.61	93.24	96.86	98.92	99.89	99.97
5	83	87.02	90.07	93.63	97.28	99.55	99.82	99.95	99.98
5.5	91.82	93.83	95.33	97.08	98.72	99.93	99.96	99.96	99.99
6	100	100	100	100	100	100	100	100	100

CUMULATIVE PERCENTAGES OF TOTAL PRECIPITATION FOR THIRD-QUARTILE CASES

Time	Percent of occurrence								
hours	90%	80%	70%	60%	50%	40%	30%	20%	10%
0	0	0	0	0	0	0	0	0	0
0.5	1.19	2.78	4.12	4.92	5.66	6.06	7.07	8.3	10.2
1	2.58	5.75	8.49	10.22	11.39	12.72	14.75	17.02	21.2
1.5	5.68	8.85	12.5	15.69	17.66	19.14	21.43	24.75	27.27
2	8.39	11.96	17.24	21.23	24.15	26.18	28.87	32.16	34.47
2.5	10.37	15.74	22.81	26.9	30.37	32.58	35.25	38.16	41.11
3	17.89	26.03	32.57	36.09	39.92	41.91	44.05	46.87	50.29
3.5	33.75	43.37	47.43	50.27	54	56.5	58.87	62.49	67.89
4	52.24	59.67	62.45	65.28	68.13	71.33	74.89	80.41	87.27
4.5	68.24	71.78	75	77.35	79.61	82.54	86.84	92.76	97.1
5	81.58	83.54	86.35	87.14	89.26	91.6	95.64	98.5	99.23
5.5	90.91	92.11	93.45	94.21	94.93	96.43	99.15	100	100
6	100	100	100	100	100	100	100	100	100

CUMULATIVE PERCENTAGES OF TOTAL PRECIPITATION FOR FOURTH-QUARTILE CASES

Time	Percent of occurrence								
hours	90%	80%	70%	60%	50%	40%	30%	20%	10%
0	0	0	0	0	0	0	0	0	0
0.5	1.24	2.08	3.24	4.55	5.72	6.22	7.52	9.09	11.11
1	2.21	4.17	6.53	9.19	11.28	12.8	15	17.74	22.12
1.5	3.95	8.71	12.28	13.94	16.79	19.87	22.17	25.42	31.47
2	5.22	10.13	16.55	18.68	22.17	25.99	28.39	32.84	37.8
2.5	6.24	12.79	22.22	24.7	28.21	31.65	34.34	38.99	43.33
3	6.46	17.11	27.12	30.33	34.4	37.7	40.35	44.44	49.72
3.5	7.36	20.8	29.31	34.65	39.92	43.66	46.13	50	55.15

Appendix G. Soils Report





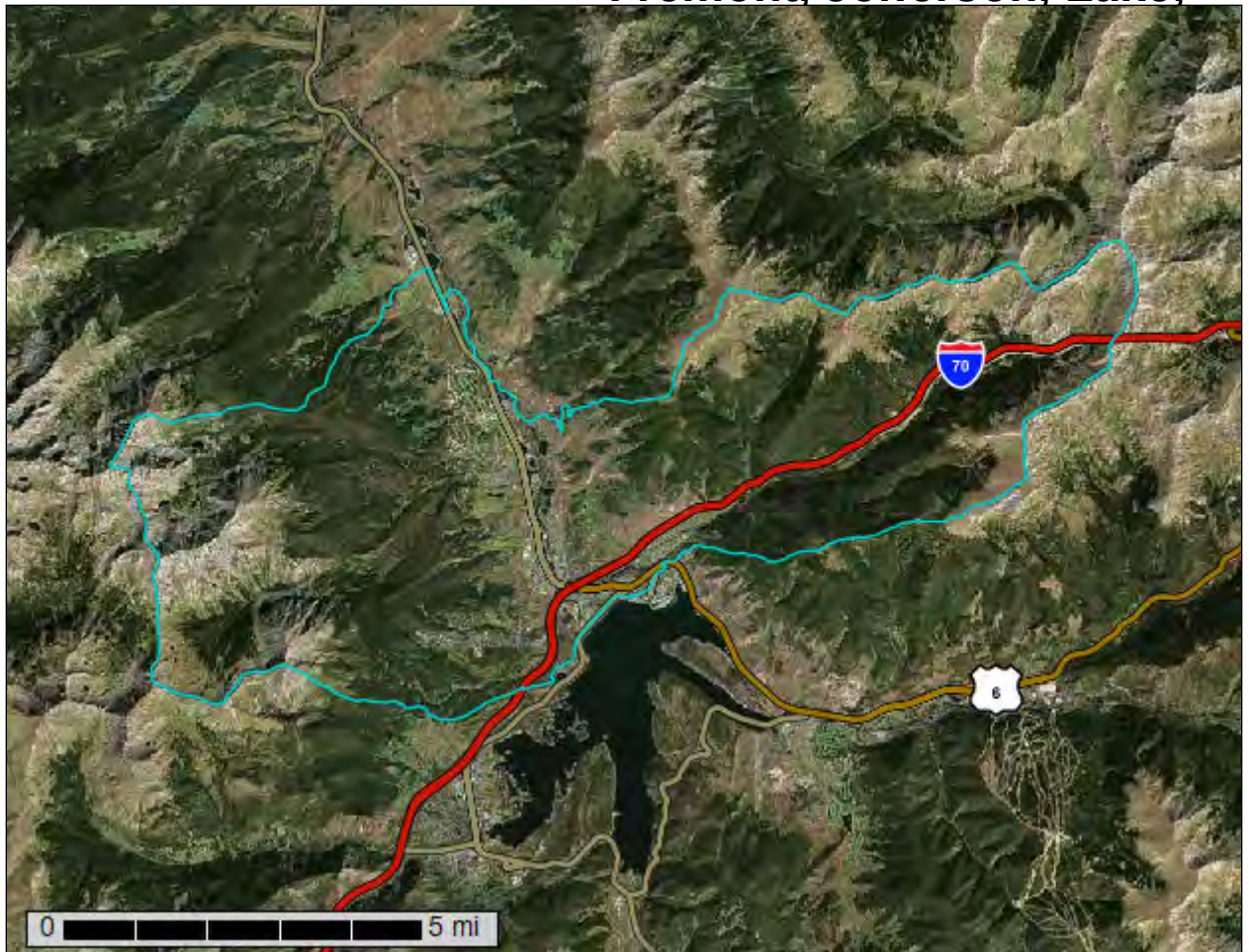
United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for Arapaho-Roosevelt National Forest Area, Colorado, Parts of Boulder, Clear Creek, Gilpin, Grand, Park and Larimer Counties; Grand County Area, Colorado; Holy Cross Area, Colorado, Parts of Eagle, Garfield, Mesa, Pitkin, and Summit Counties; Pike and San Isabel NF, Colorado, Northern Part, Parts of Chaffee, Clear Creek, Fremont, Jefferson, Lake,



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

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scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

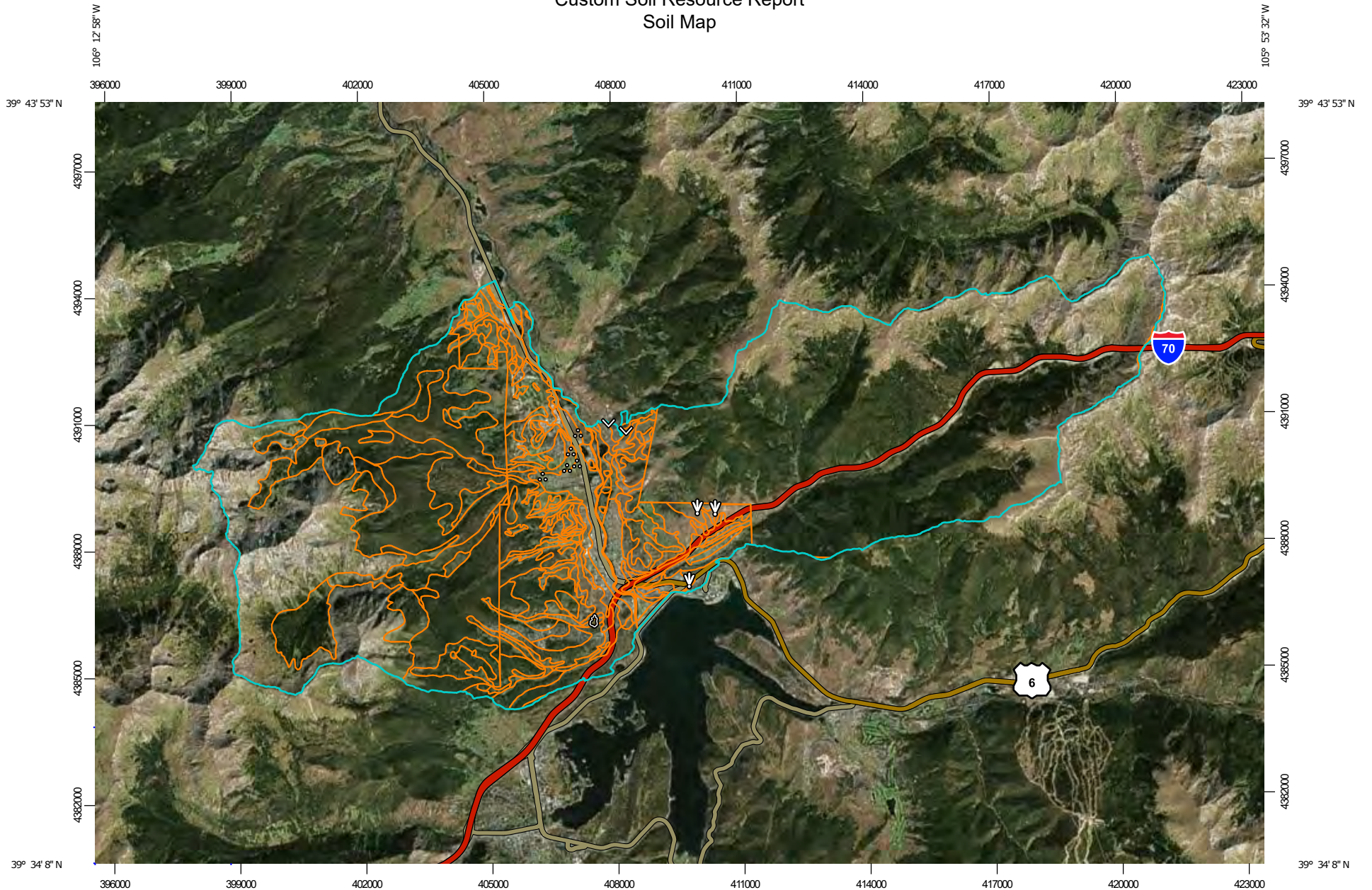
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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

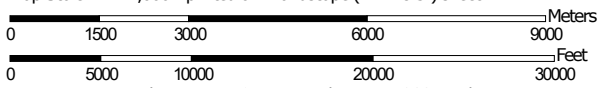
Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Map Scale: 1:127,000 if printed on A landscape (11" x 8.5") sheet.




Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84




MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)




















Soils







 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Arapaho-Roosevelt National Forest Area, Colorado, Parts of Boulder, Clear Creek, Gilpin, Grand, Park and Larimer Counties
 Survey Area Data: Version 7, Sep 13, 2019

Soil Survey Area: Grand County Area, Colorado
 Survey Area Data: Version 13, Sep 13, 2019

Soil Survey Area: Holy Cross Area, Colorado, Parts of Eagle, Garfield, Mesa, Pitkin, and Summit Counties
 Survey Area Data: Version 2, Sep 13, 2019

Soil Survey Area: Pike and San Isabel NF, Colorado, Northern Part, Parts of Chaffee, Clear Creek, Fremont, Jefferson, Lake, Park, and Saguache Counties
 Survey Area Data: Version 2, Sep 13, 2019

Soil Survey Area: Summit County Area, Colorado
 Survey Area Data: Version 11, Sep 13, 2019

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different

MAP LEGEND

MAP INFORMATION

scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 4, 2010—Aug 18, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
8700B	Bross-Matcher families-Lithic Cryorthents complex, 5 to 40 percent slopes	13.5	0.0%
8708D	Matcher family-Rock outcrop-Lithic Cryorthents complex, 40 to 150 percent slopes	0.2	0.0%
CQ	Cirque land, 40 to 150 percent slopes	1.5	0.0%
RR	Rubble land, 40 to 150 percent slopes	4.1	0.0%
Subtotals for Soil Survey Area		19.3	0.1%
Totals for Area of Interest		31,613.2	100.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
10	Bross-Mirror extremely stony sandy loams, 20 to 50 percent slopes	0.2	0.0%
41	Histic Cryaquolls, nearly level	1.2	0.0%
54	Meredith extremely stony sandy loam, 50 to 70 percent slopes	2.9	0.0%
64	Pergelic Cryorthents-Rock outcrop complex, extremely steep	0.6	0.0%
73	Rubble land	0.1	0.0%
Subtotals for Soil Survey Area		5.0	0.0%
Totals for Area of Interest		31,613.2	100.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
104A	Haplocryolls-Cryaquolls complex, 0 to 15 percent slopes	9.6	0.0%
223B	Leighcan family-Rock outcrop-Cryaquolls complex, 0 to 40 percent slopes	431.8	1.4%
225B	Leighcan family-Cryaquolls complex, 0 to 25 percent slopes	1,876.5	5.9%
290B	Leighcan family, 5 to 40 percent slopes	3,164.5	10.0%
290C	Leighcan family, till substratum, 40 to 60 percent slopes	354.3	1.1%

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Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
604D	Leighcan family-Rock outcrop complex, 40 to 75 percent slopes	341.8	1.1%
NOTCOM	No Digital Data Available	4,873.1	15.4%
Subtotals for Soil Survey Area		11,051.4	35.0%
Totals for Area of Interest		31,613.2	100.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available	12,922.0	40.9%
Subtotals for Soil Survey Area		12,922.0	40.9%
Totals for Area of Interest		31,613.2	100.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1D	Anvik loam, 6 to 15 percent slopes	24.1	0.1%
1F	Anvik loam, 15 to 35 percent slopes	387.0	1.2%
3D	Cimarron loam, 6 to 15 percent slopes	254.6	0.8%
3F	Cimarron loam, 15 to 35 percent slopes	214.0	0.7%
4	Cumulic Cryaquolls, nearly level	513.8	1.6%
5E	Frisco-Peeler complex, 6 to 25 percent slopes	621.1	2.0%
5F	Frisco-Peeler complex, 25 to 65 percent slopes	1,343.1	4.2%
6	Gravel pits	31.5	0.1%
7C	Grenadier gravelly loam, 0 to 6 percent slopes	11.1	0.0%
7D	Grenadier gravelly loam, 6 to 15 percent slopes	79.5	0.3%
8B	Handran gravelly loam, 0 to 3 percent slopes	819.6	2.6%
8D	Handran gravelly loam, 3 to 15 percent slopes	42.9	0.1%
10	Histic Cryaquolls, nearly level	281.1	0.9%
14C	Muggins sandy loam, 0 to 6 percent slopes	394.5	1.2%
14D	Muggins sandy loam, 6 to 15 percent slopes	990.2	3.1%
14F	Muggins sandy loam, 15 to 35 percent slopes	46.2	0.1%
16C	Quander cobbly loam, 0 to 6 percent slopes	8.5	0.0%
16D	Quander cobbly loam, 6 to 15 percent slopes	69.6	0.2%

Custom Soil Resource Report

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
16E	Quander cobbly loam, 15 to 55 percent slopes	181.4	0.6%
18	Rock outcrop-Cryoborolls complex	214.0	0.7%
19C	Youga loam, 1 to 6 percent slopes	121.0	0.4%
19D	Youga loam, 6 to 15 percent slopes	121.8	0.4%
19F	Youga loam, 15 to 45 percent slopes	116.7	0.4%
20D	Youga loam, thick surface, 6 to 15 percent slopes	212.5	0.7%
20F	Youga loam, thick surface, 15 to 50 percent slopes	24.8	0.1%
21F	Yovimpa clay loam, 15 to 45 percent slopes	353.2	1.1%
22	Borrow pits	28.9	0.1%
W	Water	108.5	0.3%
Subtotals for Soil Survey Area		7,615.4	24.1%
Totals for Area of Interest		31,613.2	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a

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given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Arapaho-Roosevelt National Forest Area, Colorado, Parts of Boulder, Clear Creek, Gilpin, Grand, Park and Larimer Counties

8700B—Bross-Matcher families-Lithic Cryorthents complex, 5 to 40 percent slopes

Map Unit Setting

National map unit symbol: tlz3
Elevation: 11,000 to 13,000 feet
Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 34 to 37 degrees F
Frost-free period: 10 to 30 days
Farmland classification: Not prime farmland

Map Unit Composition

Bross family and similar soils: 50 percent
Matcher family and similar soils: 20 percent
Lithic cryorthents and similar soils: 20 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bross Family

Setting

Landform: Saddles, mountain slopes
Parent material: Residuum weathered from igneous and metamorphic rock

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A1 - 2 to 15 inches: very gravelly sandy loam
A2 - 15 to 20 inches: very gravelly sandy loam
Bw1 - 20 to 28 inches: very cobbly sandy loam
Bw2 - 28 to 33 inches: very cobbly sandy loam
C - 33 to 64 inches: extremely cobbly sandy loam

Properties and qualities

Slope: 5 to 40 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Hydrologic Soil Group: A
Other vegetative classification: Ross' avens/rock sedge (GEROT/CASA10) (F0208x), Bellardi kobresia/Ross' avens-curly sedge (KOMY/GEROT-CARU3) (G2401x), Tufted hairgrass/Ross' avens (DECA18/GEROT) (G1503)
Hydric soil rating: No

Description of Matcher Family

Setting

Landform: Solifluction lobes

Parent material: Residuum weathered from igneous and metamorphic rock

Typical profile

O_i - 0 to 2 inches: slightly decomposed plant material

A - 2 to 11 inches: very stony fine sandy loam

AC - 11 to 19 inches: extremely stony sandy loam

C₁ - 19 to 44 inches: extremely stony loamy coarse sand

C₂ - 44 to 60 inches: extremely stony loamy sand

Properties and qualities

Slope: 5 to 40 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Excessively drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (K_{sat}): High (2.00 to 6.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Hydrologic Soil Group: A

Other vegetative classification: Parry's clover - Ross' avens (TRPA5-GEROT) (F0604), Ross' avens - alpine bistort (GEROT-POVI3) (F0205x), Tufted hairgrass/alpine clover (DECA18/TRDA2) (G1599)

Hydric soil rating: No

Description of Lithic Cryorthents

Setting

Landform: Mountain slopes

Parent material: Glaciofluvial and/or residuum derived from igneous and metamorphic rock

Typical profile

O_i - 0 to 1 inches: slightly decomposed plant material

A - 1 to 4 inches: very gravelly sandy loam

AC - 4 to 11 inches: very cobbly sandy loam

C - 11 to 17 inches: extremely cobbly sandy loam

R - 17 to 27 inches: bedrock

Properties and qualities

Slope: 5 to 40 percent

Depth to restrictive feature: 10 to 20 inches to lithic bedrock

Natural drainage class: Somewhat excessively drained

Runoff class: High

Capacity of the most limiting layer to transmit water (K_{sat}): Very low to moderately low (0.00 to 0.01 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

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Available water storage in profile: Very low (about 1.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Hydrologic Soil Group: D

Other vegetative classification: Pennsylvania sedge/moss campion (CAPE6/SIAC) (G1299), Timber oatgrass/varileaf cinquefoil (DAIN/PODI2) (G1301)

Hydric soil rating: No

Minor Components

Moran family

Percent of map unit: 6 percent

Hydric soil rating: No

Cryaquepts

Percent of map unit: 2 percent

Hydric soil rating: Yes

Rubble land

Percent of map unit: 2 percent

Hydric soil rating: Unranked

8708D—Matcher family-Rock outcrop-Lithic Cryorthents complex, 40 to 150 percent slopes

Map Unit Setting

National map unit symbol: tt44

Elevation: 11,000 to 13,000 feet

Mean annual precipitation: 30 to 50 inches

Mean annual air temperature: 34 to 37 degrees F

Frost-free period: 10 to 30 days

Farmland classification: Not prime farmland

Map Unit Composition

Matcher family and similar soils: 40 percent

Rock outcrop: 25 percent

Lithic cryorthents and similar soils: 20 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Matcher Family

Setting

Landform: Solifluction lobes

Parent material: Residuum weathered from igneous and metamorphic rock

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material

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A - 2 to 11 inches: very stony fine sandy loam
AC - 11 to 19 inches: extremely stony sandy loam
C1 - 19 to 44 inches: extremely stony loamy coarse sand
C2 - 44 to 60 inches: extremely stony loamy sand

Properties and qualities

Slope: 40 to 75 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Hydrologic Soil Group: A
Other vegetative classification: Ross' avens/rock sedge (GEROT/CASA10) (F0208x), Bellardi kobresia/Ross' avens-curly sedge (KOMY/GEROT-CARU3) (G2401x)
Hydric soil rating: No

Description of Rock Outcrop

Typical profile

R - 0 to 60 inches: bedrock

Properties and qualities

Slope: 60 to 150 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: No

Description of Lithic Cryorthents

Setting

Landform: Mountain slopes
Parent material: Glaciofluvial deposits and/or residuum derived from igneous and metamorphic rock

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 4 inches: very gravelly sandy loam
AC - 4 to 11 inches: very cobbly sandy loam
C - 11 to 17 inches: extremely cobbly sandy loam
R - 17 to 27 inches: bedrock

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Properties and qualities

Slope: 40 to 75 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.01 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Hydrologic Soil Group: D
Other vegetative classification: Pennsylvania sedge/moss campion (CAPE6/SIAC) (G1299), Ross' avens/rock sedge (GEROT/CASA10) (F0208x)
Hydric soil rating: No

Minor Components

Rubble land

Percent of map unit: 5 percent
Hydric soil rating: Unranked

Water

Percent of map unit: 5 percent
Hydric soil rating: Unranked

Moran family

Percent of map unit: 5 percent
Hydric soil rating: No

CQ—Cirque land, 40 to 150 percent slopes

Map Unit Setting

National map unit symbol: tlzd
Elevation: 10,700 to 14,000 feet
Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 34 to 37 degrees F
Frost-free period: 10 to 30 days
Farmland classification: Not prime farmland

Map Unit Composition

Cirque land: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cirque Land

Setting

Landform: Cirque headwalls

Parent material: Talus derived from igneous and metamorphic rock

Typical profile

R - 0 to 60 inches: bedrock

Properties and qualities

Slope: 40 to 150 percent

Depth to restrictive feature: 0 inches to lithic bedrock

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Very high (20.00 to 99.90 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

Hydric soil rating: Unranked

Minor Components

Cryorthents

Percent of map unit: 5 percent

Hydric soil rating: No

Dystrocryepts

Percent of map unit: 5 percent

Hydric soil rating: No

RR—Rubble land, 40 to 150 percent slopes

Map Unit Setting

National map unit symbol: tlzh

Elevation: 11,200 to 14,000 feet

Mean annual precipitation: 30 to 50 inches

Mean annual air temperature: 34 to 37 degrees F

Frost-free period: 10 to 30 days

Farmland classification: Not prime farmland

Map Unit Composition

Rubble land: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rubble Land

Setting

Landform: Fans, mountainsides

Landform position (two-dimensional): Backslope, footslope

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Landform position (three-dimensional): Side slope

Parent material: Colluvium and/or residuum derived from igneous, metamorphic and sedimentary rock

Typical profile

- 0 to 60 inches: boulders

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

Hydric soil rating: Unranked

Minor Components

Cryorthents

Percent of map unit: 10 percent

Hydric soil rating: No

Grand County Area, Colorado

10—Bross-Mirror extremely stony sandy loams, 20 to 50 percent slopes

Map Unit Setting

National map unit symbol: jq13
Elevation: 11,400 to 13,500 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 25 to 30 degrees F
Frost-free period: 10 to 20 days
Farmland classification: Not prime farmland

Map Unit Composition

Bross and similar soils: 60 percent
Mirror and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bross

Setting

Landform: Mountain slopes
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Deeply weathered residuum weathered from granite and gneiss and/or deeply weathered residuum weathered from schist and/or deeply weathered residuum weathered from metamorphic rock

Typical profile

H1 - 0 to 12 inches: extremely stony sandy loam
H2 - 12 to 22 inches: very cobbly sandy loam, very gravelly sandy loam
H2 - 12 to 22 inches: very gravelly loamy sand, very cobbly loamy sand
H3 - 22 to 60 inches:
H3 - 22 to 60 inches:

Properties and qualities

Slope: 20 to 50 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: Alpine Slopes (R048AY304CO)
Hydric soil rating: No

Description of Mirror

Setting

Landform: Mountain slopes

Landform position (three-dimensional): Mountainflank

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Deeply weathered residuum weathered from granite and gneiss and/or deeply weathered residuum weathered from schist and/or deeply weathered residuum weathered from metamorphic rock

Typical profile

H1 - 0 to 8 inches: extremely stony sandy loam

H2 - 8 to 31 inches: very stony sandy loam, very gravelly sandy loam, very gravelly loam

H2 - 8 to 31 inches: unweathered bedrock

H2 - 8 to 31 inches:

H3 - 31 to 35 inches:

Properties and qualities

Slope: 20 to 50 percent

Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Natural drainage class: Well drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: C

Ecological site: Alpine Slopes (R048AY304CO)

Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 10 percent

Hydric soil rating: No

41—Histic Cryaquolls, nearly level

Map Unit Setting

National map unit symbol: jq26

Elevation: 9,000 to 11,500 feet

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Mean annual precipitation: 20 to 30 inches
Mean annual air temperature: 36 to 42 degrees F
Frost-free period: 20 to 70 days
Farmland classification: Not prime farmland

Map Unit Composition

Histic cryaquolls and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Histic Cryaquolls

Setting

Landform: Flood plains
Landform position (three-dimensional): Talf, rise, dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

H1 - 0 to 10 inches: mucky peat
H2 - 10 to 20 inches: stratified sandy loam to clay
H3 - 20 to 60 inches: stratified sandy loam to clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 24 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water storage in profile: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): 7w
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Cumulic cryaquolls

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Cryaquolls

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Cryaquepts

Percent of map unit: 5 percent
Landform: Slumps
Hydric soil rating: Yes

54—Meredith extremely stony sandy loam, 50 to 70 percent slopes

Map Unit Setting

National map unit symbol: jq2n
Elevation: 11,400 to 13,500 feet
Frost-free period: 0 to 10 days
Farmland classification: Not prime farmland

Map Unit Composition

Meredith and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Meredith

Setting

Landform: Mountain slopes
Landform position (three-dimensional): Mountainflank
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granite and gneiss and/or residuum weathered from metamorphic rock and/or residuum weathered from schist

Typical profile

H1 - 0 to 9 inches: extremely stony sandy loam
H2 - 9 to 26 inches: extremely stony sandy loam
H3 - 26 to 60 inches: fragmental material

Properties and qualities

Slope: 50 to 70 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: Alpine Slopes (R048AY304CO)
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 10 percent
Hydric soil rating: No

64—Pergelic Cryorthents-Rock outcrop complex, extremely steep

Map Unit Setting

National map unit symbol: jq30
Elevation: 11,400 to 13,550 feet
Mean annual precipitation: 30 to 35 inches
Mean annual air temperature: 26 to 29 degrees F
Farmland classification: Not prime farmland

Map Unit Composition

Pergelic cryorthents and similar soils: 60 percent
Rock outcrop: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pergelic Cryorthents

Setting

Landform: Mountains
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Mountainbase, mountainflank, mountaintop
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Weathered schist and/or weathered granite and gneiss and/or weathered metamorphic rock

Typical profile

H1 - 0 to 8 inches: gravelly sandy loam
H2 - 8 to 30 inches: very stony sandy loam, very gravelly sandy loam, very gravelly loam
H2 - 8 to 30 inches: unweathered bedrock
H2 - 8 to 30 inches:
H3 - 30 to 34 inches:

Properties and qualities

Slope: 30 to 70 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

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Frequency of ponding: None

Available water storage in profile: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: B

Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Mountains

Landform position (two-dimensional): Backslope, summit, shoulder

Landform position (three-dimensional): Mountaintop, mountainflank, mountainbase

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 50 to 99 percent

Depth to restrictive feature: 0 to 4 inches to lithic bedrock

Runoff class: Very high

Available water storage in profile: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s

Hydrologic Soil Group: D

Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 10 percent

Hydric soil rating: No

73—Rubble land

Map Unit Setting

National map unit symbol: jq3b

Elevation: 10,000 to 13,550 feet

Mean annual precipitation: 36 to 50 inches

Mean annual air temperature: 45 to 54 degrees F

Frost-free period: 150 to 180 days

Farmland classification: Not prime farmland

Map Unit Composition

Rubble land: 95 percent

Minor components: 5 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rubble Land

Setting

Landform: Talus slopes, mountains

Landform position (three-dimensional): Mountaintop, mountainflank, mountainbase

Down-slope shape: Linear, concave

Across-slope shape: Linear

Parent material: Residuum

Typical profile

H1 - 0 to 60 inches: fragmental material

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s

Hydrologic Soil Group: A

Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 5 percent

Hydric soil rating: No

Holy Cross Area, Colorado, Parts of Eagle, Garfield, Mesa, Pitkin, and Summit Counties

104A—Haplocryolls-Cryaquolls complex, 0 to 15 percent slopes

Map Unit Setting

National map unit symbol: 1jh8f
Elevation: 6,990 to 11,640 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 36 to 40 degrees F
Frost-free period: 20 to 60 days
Farmland classification: Not prime farmland

Map Unit Composition

Haplocryolls and similar soils: 65 percent
Cryaquolls and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Haplocryolls

Setting

Landform: Stream terraces on mountain valleys
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

A1 - 0 to 2 inches: cobbly silt loam
A2 - 2 to 12 inches: silt loam
AC - 12 to 20 inches: silt loam
C1 - 20 to 47 inches: cobbly silt loam
C2 - 47 to 60 inches: cobbly silt loam

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.71 to 2.13 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6c
Hydrologic Soil Group: B
Other vegetative classification: Quaking aspen/mountain snowberry (POTR5/SYOR2) (D0511)
Hydric soil rating: No

Description of Cryaquolls

Setting

Landform: Flood plains on mountain valleys

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material

A - 2 to 13 inches: silt loam

Bg - 13 to 22 inches: gravelly sandy clay loam

Cg - 22 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 5 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Very poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.21 to 0.71 in/hr)

Depth to water table: About 0 to 6 inches

Frequency of flooding: Frequent

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline (0.0 to 1.0 mmhos/cm)

Available water storage in profile: High (about 11.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7w

Hydrologic Soil Group: C/D

Other vegetative classification: Planeleaf willow/water sedge (SAPLP2/CAAQ) (S1405)

Hydric soil rating: Yes

223B—Leighcan family-Rock outcrop-Cryaquolls complex, 0 to 40 percent slopes

Map Unit Setting

National map unit symbol: 1jh9f

Elevation: 7,540 to 10,990 feet

Mean annual precipitation: 20 to 40 inches

Mean annual air temperature: 36 to 40 degrees F

Frost-free period: 20 to 60 days

Farmland classification: Not prime farmland

Map Unit Composition

Leighcan family and similar soils: 40 percent

Rock outcrop: 30 percent

Cryaquolls and similar soils: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Leighcan Family

Setting

Landform: Glacial-valley floors

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Till derived from igneous and sedimentary rock

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material

A - 2 to 4 inches: very cobbly silt loam

BA - 4 to 9 inches: very cobbly loamy coarse sand

Bw1 - 9 to 16 inches: very cobbly sandy loam

Bw2 - 16 to 26 inches: extremely stony sandy loam

BC - 26 to 33 inches: extremely cobbly sandy loam

C - 33 to 72 inches: extremely cobbly sandy loam

Properties and qualities

Slope: 0 to 40 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Somewhat excessively drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.71 to 2.13 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: B

Other vegetative classification: Lodgepole pine/myrtle whortleberry (PICO/VAMY2) (C0909)

Hydric soil rating: No

Description of Rock Outcrop

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

Hydric soil rating: No

Description of Cryaquolls

Setting

Landform: Flood plains

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Till derived from igneous and sedimentary rock

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material

A - 2 to 17 inches: silt loam

BC - 17 to 24 inches: gravelly sandy clay loam

C - 24 to 59 inches: clay loam

Custom Soil Resource Report

Properties and qualities

Slope: 0 to 10 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Very poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.21 to 0.71 in/hr)

Depth to water table: About 0 to 6 inches

Frequency of flooding: Occasional

Frequency of ponding: None

Available water storage in profile: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6w

Hydrologic Soil Group: C/D

Other vegetative classification: Planeleaf willow/water sedge (SAPLP2/CAAQ) (S1405)

Hydric soil rating: Yes

225B—Leighcan family-Cryaquolls complex, 0 to 25 percent slopes

Map Unit Setting

National map unit symbol: 1jh9g

Elevation: 8,990 to 11,610 feet

Mean annual precipitation: 25 to 40 inches

Mean annual air temperature: 36 to 40 degrees F

Frost-free period: 20 to 60 days

Farmland classification: Not prime farmland

Map Unit Composition

Leighcan family and similar soils: 70 percent

Cryaquolls and similar soils: 25 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Leighcan Family

Setting

Landform: Glacial-valley floors

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Till derived from igneous and sedimentary rock

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material

A - 2 to 4 inches: very cobbly silt loam

BA - 4 to 9 inches: very cobbly loamy coarse sand

Bw1 - 9 to 16 inches: very cobbly sandy loam

Bw2 - 16 to 26 inches: extremely stony sandy loam

BC - 26 to 33 inches: extremely cobbly sandy loam

Custom Soil Resource Report

C - 33 to 72 inches: extremely cobbly sandy loam

Properties and qualities

Slope: 0 to 25 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Somewhat excessively drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.71 to 2.13 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: B

Other vegetative classification: Lodgepole pine/myrtle whortleberry (PICO/VAMY2) (C0909)

Hydric soil rating: No

Description of Cryaquolls

Setting

Landform: Flood plains

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Till derived from igneous and sedimentary rock

Typical profile

O_i - 0 to 2 inches: slightly decomposed plant material

A - 2 to 17 inches: silt loam

BC - 17 to 24 inches: gravelly sandy clay loam

C - 24 to 59 inches: clay loam

Properties and qualities

Slope: 0 to 10 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Very poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.21 to 0.71 in/hr)

Depth to water table: About 0 to 6 inches

Frequency of flooding: Occasional

Frequency of ponding: None

Available water storage in profile: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6w

Hydrologic Soil Group: C/D

Other vegetative classification: Planeleaf willow/water sedge (SAPLP2/CAAQ) (S1405)

Hydric soil rating: Yes

290B—Leighcan family, 5 to 40 percent slopes

Map Unit Setting

National map unit symbol: 1jh9s
Elevation: 8,990 to 11,610 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 36 to 40 degrees F
Frost-free period: 20 to 60 days
Farmland classification: Not prime farmland

Map Unit Composition

Leighcan family and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Leighcan Family

Setting

Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till derived from igneous and sedimentary rock

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 4 inches: very cobbly silt loam
BA - 4 to 9 inches: very cobbly loamy coarse sand
Bw1 - 9 to 16 inches: very cobbly sandy loam
Bw2 - 16 to 26 inches: extremely stony sandy loam
BC - 26 to 33 inches: extremely cobbly sandy loam
C - 33 to 72 inches: extremely cobbly sandy loam

Properties and qualities

Slope: 5 to 40 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.71 to 2.13 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Other vegetative classification: Lodgepole pine/myrtle whortleberry (PICO/VAMY2) (C0909)
Hydric soil rating: No

290C—Leighcan family, till substratum, 40 to 60 percent slopes

Map Unit Setting

National map unit symbol: 1jh9t
Elevation: 8,990 to 11,610 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 36 to 40 degrees F
Frost-free period: 20 to 60 days
Farmland classification: Not prime farmland

Map Unit Composition

Leighcan family, till substratum, and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Leighcan Family, Till Substratum

Setting

Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till derived from igneous and sedimentary rock

Typical profile

O_i - 0 to 2 inches: slightly decomposed plant material
A - 2 to 4 inches: very cobbly silt loam
BA - 4 to 9 inches: very cobbly loamy coarse sand
Bw₁ - 9 to 16 inches: very cobbly sandy loam
Bw₂ - 16 to 26 inches: extremely stony sandy loam
BC - 26 to 33 inches: extremely cobbly sandy loam
C - 33 to 72 inches: extremely cobbly sandy loam

Properties and qualities

Slope: 40 to 60 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (K_{sat}): Moderately high to high (0.71 to 2.13 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Other vegetative classification: Lodgepole pine/myrtle whortleberry (PICO/VAMY2) (C0909)
Hydric soil rating: No

604D—Leighcan family-Rock outcrop complex, 40 to 75 percent slopes

Map Unit Setting

National map unit symbol: 1jhgb
Elevation: 8,990 to 11,810 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 37 to 40 degrees F
Frost-free period: 20 to 60 days
Farmland classification: Not prime farmland

Map Unit Composition

Leighcan family and similar soils: 60 percent
Rock outcrop: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Leighcan Family

Setting

Landform: Mountain slopes
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Colluvium derived from igneous, metamorphic and sedimentary rock

Typical profile

O_i - 0 to 2 inches: slightly decomposed plant material
A - 2 to 4 inches: very cobbly silt loam
BA - 4 to 9 inches: very cobbly loamy coarse sand
Bw₁ - 9 to 16 inches: very cobbly sandy loam
Bw₂ - 16 to 26 inches: extremely stony sandy loam
BC - 26 to 33 inches: extremely cobbly sandy loam
C - 33 to 72 inches: extremely cobbly sandy loam

Properties and qualities

Slope: 40 to 75 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (K_{sat}): Moderately high to high (0.71 to 2.13 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: B
Other vegetative classification: Subalpine fir - Engelmann spruce/myrtle whortleberry (ABLA-PIEN/VAMY2) (C0320)
Hydric soil rating: No

Description of Rock Outcrop

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

Hydric soil rating: No

NOTCOM—No Digital Data Available

Map Unit Composition

Notcom: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Notcom

Properties and qualities

Pike and San Isabel NF, Colorado, Northern Part, Parts of Chaffee, Clear Creek, Fremont, Jefferson, Lake, Park, and Saguache Counties

NOTCOM—No Digital Data Available

Map Unit Composition

Notcom: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Notcom

Properties and qualities

Summit County Area, Colorado

1D—Anvik loam, 6 to 15 percent slopes

Map Unit Setting

National map unit symbol: jpgy

Frost-free period: 35 to 75 days

Farmland classification: Not prime farmland

Map Unit Composition

Anvik and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Anvik

Setting

Landform position (three-dimensional): Mountainflank

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Colluvium and/or glacial drift

Typical profile

H1 - 0 to 10 inches: loam

H2 - 10 to 15 inches: sandy loam, loam

H2 - 10 to 15 inches: clay loam, cobbly loam, sandy clay loam

H3 - 15 to 48 inches: loam, cobbly clay loam, sandy clay loam

H3 - 15 to 48 inches:

H3 - 15 to 48 inches:

H4 - 48 to 60 inches:

H4 - 48 to 60 inches:

H4 - 48 to 60 inches:

Properties and qualities

Slope: 6 to 15 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Very high (about 26.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: B

Ecological site: Subalpine Loam (R048AY250CO)

Hydric soil rating: No

Minor Components

Youga

Percent of map unit: 5 percent

Hydric soil rating: No

Muggins

Percent of map unit: 5 percent

Hydric soil rating: No

1F—Anvik loam, 15 to 35 percent slopes

Map Unit Setting

National map unit symbol: jpgz

Elevation: 8,000 to 10,000 feet

Frost-free period: 35 to 75 days

Farmland classification: Not prime farmland

Map Unit Composition

Anvik and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Anvik

Setting

Landform position (three-dimensional): Mountainflank

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Colluvium and/or glacial drift

Typical profile

H1 - 0 to 10 inches: loam

H2 - 10 to 15 inches: sandy loam, loam

H2 - 10 to 15 inches: clay loam, cobbly loam, sandy clay loam

H3 - 15 to 48 inches: loam, cobbly clay loam, sandy clay loam

H3 - 15 to 48 inches:

H3 - 15 to 48 inches:

H4 - 48 to 60 inches:

H4 - 48 to 60 inches:

H4 - 48 to 60 inches:

Properties and qualities

Slope: 15 to 35 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Very high (about 26.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: Subalpine Loam (R048AY250CO)
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 15 percent
Hydric soil rating: No

3D—Cimarron loam, 6 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2tz4s
Elevation: 7,460 to 9,000 feet
Mean annual precipitation: 14 to 20 inches
Mean annual air temperature: 37 to 42 degrees F
Frost-free period: 35 to 75 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Cimarron and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cimarron

Setting

Landform: Mountain slopes, colluvial aprons
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainbase, base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Slope alluvium over residuum weathered from shale

Typical profile

A - 0 to 7 inches: loam
AB - 7 to 12 inches: clay loam
Bt - 12 to 26 inches: clay
BC - 26 to 33 inches: clay loam
C - 33 to 59 inches: gravelly clay loam

Properties and qualities

Slope: 6 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained

Custom Soil Resource Report

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.07 to 0.21 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): 6c

Land capability classification (nonirrigated): 6c

Hydrologic Soil Group: C

Ecological site: Mountain Loam 13-18" PPT (R048BY226CO)

Hydric soil rating: No

Minor Components

Mayoworth

Percent of map unit: 8 percent

Yovimpa

Percent of map unit: 5 percent

Youga

Percent of map unit: 5 percent

Landform: Mountain slopes, colluvial aprons

Landform position (two-dimensional): Backslope, footslope

Landform position (three-dimensional): Mountainbase, base slope

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Mountain Loam 13-18" PPT (R048BY226CO)

Hydric soil rating: No

Woodhall

Percent of map unit: 2 percent

3F—Cimarron loam, 15 to 35 percent slopes

Map Unit Setting

National map unit symbol: 2tz4t

Elevation: 7,460 to 9,020 feet

Mean annual precipitation: 14 to 20 inches

Mean annual air temperature: 37 to 42 degrees F

Frost-free period: 30 to 75 days

Farmland classification: Not prime farmland

Map Unit Composition

Cimarron and similar soils: 80 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cimarron

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainbase, mountainflank
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Slope alluvium over residuum weathered from shale

Typical profile

A - 0 to 7 inches: loam
AB - 7 to 12 inches: clay loam
Bt - 12 to 26 inches: clay
BC - 26 to 33 inches: clay loam
C - 33 to 59 inches: gravelly clay loam

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.07 to 0.21 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: Mountain Loam 13-18" PPT (R048BY226CO)
Hydric soil rating: No

Minor Components

Mayoworth

Percent of map unit: 8 percent

Yovimpa

Percent of map unit: 5 percent

Youga

Percent of map unit: 5 percent
Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainbase
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Mountain Loam 13-18" PPT (R048BY226CO)
Hydric soil rating: No

Woodhall

Percent of map unit: 2 percent

4—Cumulic Cryaquolls, nearly level

Map Unit Setting

National map unit symbol: jph7

Elevation: 7,500 to 8,500 feet

Mean annual precipitation: 12 to 20 inches

Mean annual air temperature: 37 to 43 degrees F

Frost-free period: 30 to 80 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Cumulic cryaquolls and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cumulic Cryaquolls

Setting

Landform: Flood plains

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Stratified, loamy to clayey alluvium over sand & gravel

Typical profile

H1 - 0 to 20 inches: variable

H2 - 20 to 60 inches: extremely gravelly loamy sand, very cobbly loamy sand, very cobbly sandy loam

H2 - 20 to 60 inches:

H2 - 20 to 60 inches:

Properties and qualities

Slope: 0 to 5 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Poorly drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 6.00 in/hr)

Depth to water table: About 12 to 24 inches

Frequency of flooding: Frequent

Frequency of ponding: None

Available water storage in profile: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): 6w

Land capability classification (nonirrigated): 6w

Hydrologic Soil Group: A/D

Ecological site: Mountain Meadow (R048AY241CO)

Hydric soil rating: Yes

Minor Components

Histic cryaquolls

Percent of map unit: 10 percent
Landform: Flood plains
Hydric soil rating: Yes

5E—Frisco-Peeler complex, 6 to 25 percent slopes

Map Unit Setting

National map unit symbol: jph8
Elevation: 8,500 to 11,000 feet
Frost-free period: 30 to 40 days
Farmland classification: Not prime farmland

Map Unit Composition

Frisco and similar soils: 55 percent
Peeler and similar soils: 35 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Frisco

Setting

Landform: Ridges, mountainsides, fans
Landform position (three-dimensional): Mountainflank, mountainbase
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glacial drift

Typical profile

H1 - 0 to 16 inches: sandy loam
H2 - 16 to 67 inches: very stony sandy clay loam
H3 - 67 to 80 inches: very stony sandy clay loam

Properties and qualities

Slope: 6 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e

Custom Soil Resource Report

Hydrologic Soil Group: B
Hydric soil rating: No

Description of Peeler

Setting

Landform: Ridges, mountain slopes, fans
Landform position (three-dimensional): Mountainflank, mountainbase
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glacial drift

Typical profile

H1 - 0 to 15 inches: sandy loam
H2 - 15 to 55 inches: cobbly sandy clay loam
H3 - 55 to 60 inches: cobbly sandy clay loam

Properties and qualities

Slope: 6 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 8 percent
Hydric soil rating: No

Cumulic cryaquolls

Percent of map unit: 2 percent
Landform: Swales
Hydric soil rating: Yes

5F—Frisco-Peeler complex, 25 to 65 percent slopes

Map Unit Setting

National map unit symbol: jph9
Elevation: 8,500 to 11,000 feet

Custom Soil Resource Report

Frost-free period: 30 to 60 days
Farmland classification: Not prime farmland

Map Unit Composition

Frisco and similar soils: 60 percent
Peeler and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Frisco

Setting

Landform: Ridges, mountainsides
Landform position (three-dimensional): Mountainflank
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glacial drift

Typical profile

H1 - 0 to 16 inches: sandy loam
H2 - 16 to 67 inches: very stony sandy clay loam
H3 - 67 to 80 inches: very stony sandy clay loam

Properties and qualities

Slope: 25 to 65 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Peeler

Setting

Landform: Mountainsides, ridges
Landform position (three-dimensional): Mountainflank
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glacial drift

Typical profile

H1 - 0 to 15 inches: sandy loam
H2 - 15 to 55 inches: cobbly sandy clay loam
H3 - 55 to 60 inches: cobbly sandy clay loam

Properties and qualities

Slope: 25 to 60 percent
Depth to restrictive feature: More than 80 inches

Custom Soil Resource Report

Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 8 percent
Hydric soil rating: No

Cumulative cryaquolls

Percent of map unit: 2 percent
Landform: Swales
Hydric soil rating: Yes

6—Gravel pits

Map Unit Composition

Gravel pits: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gravel Pits

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sand & gravel

Typical profile

H1 - 0 to 6 inches: extremely gravelly sand
H2 - 6 to 60 inches: extremely gravelly sand, extremely gravelly coarse sand, very gravelly coarse sand
H2 - 6 to 60 inches:
H2 - 6 to 60 inches:

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s

Custom Soil Resource Report

Hydrologic Soil Group: A
Hydric soil rating: No

7C—Grenadier gravelly loam, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: jphc
Elevation: 9,000 to 13,000 feet
Mean annual precipitation: 20 to 30 inches
Mean annual air temperature: 30 to 34 degrees F
Frost-free period: 30 to 50 days
Farmland classification: Not prime farmland

Map Unit Composition

Grenadier and similar soils: 80 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Grenadier

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Cumelic cryaquolls

Percent of map unit: 5 percent
Landform: Swales
Hydric soil rating: Yes

Histic cryaquolls

Percent of map unit: 5 percent
Landform: Swales
Hydric soil rating: Yes

7D—Grenadier gravelly loam, 6 to 15 percent slopes

Map Unit Setting

National map unit symbol: jphd
Elevation: 9,000 to 13,000 feet
Frost-free period: 30 to 50 days
Farmland classification: Not prime farmland

Map Unit Composition

Grenadier and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Grenadier

Setting

Landform: Fans
Landform position (three-dimensional): Mountainbase
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glacial drift

Typical profile

H1 - 0 to 6 inches: gravelly loam
H2 - 6 to 19 inches: gravelly sandy clay loam
H3 - 19 to 60 inches: very cobbly sandy loam

Properties and qualities

Slope: 6 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 10 percent
Hydric soil rating: No

Cumulic cryaquolls

Percent of map unit: 5 percent
Landform: Swales
Hydric soil rating: Yes

Histic cryaquolls

Percent of map unit: 5 percent
Landform: Swales
Hydric soil rating: Yes

8B—Handran gravelly loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: jphg
Elevation: 7,500 to 9,000 feet
Frost-free period: 30 to 75 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Handran and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Handran

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

H1 - 0 to 6 inches: gravelly loam
H2 - 6 to 15 inches: gravelly sandy loam
H3 - 15 to 60 inches: very cobbly sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Custom Soil Resource Report

Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: Stony Loam (R048AY237CO)
Hydric soil rating: No

Minor Components

Quander

Percent of map unit: 10 percent
Hydric soil rating: No

Cumulic cryaquolls

Percent of map unit: 5 percent
Landform: Swales
Hydric soil rating: Yes

8D—Handran gravelly loam, 3 to 15 percent slopes

Map Unit Setting

National map unit symbol: jphh
Elevation: 7,500 to 9,000 feet
Frost-free period: 30 to 75 days
Farmland classification: Not prime farmland

Map Unit Composition

Handran and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Handran

Setting

Landform: Alluvial fans
Landform position (three-dimensional): Mountainbase
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

H1 - 0 to 6 inches: gravelly loam
H2 - 6 to 15 inches: gravelly sandy loam
H3 - 15 to 60 inches: very cobbly sandy loam

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches

Custom Soil Resource Report

Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: Stony Loam (R048AY237CO)
Hydric soil rating: No

Minor Components

Quander

Percent of map unit: 10 percent
Hydric soil rating: No

10—Histic Cryaquolls, nearly level

Map Unit Setting

National map unit symbol: jpgc
Elevation: 9,000 to feet
Mean annual precipitation: 20 to 30 inches
Mean annual air temperature: 36 to 43 degrees F
Frost-free period: 20 to 70 days
Farmland classification: Not prime farmland

Map Unit Composition

Histic cryaquolls and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Histic Cryaquolls

Setting

Landform: Flood plains, alluvial fans
Landform position (three-dimensional): Mountainbase, tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Organic material over stratified, sandy loam to clayey alluvium over sand and gravel

Typical profile

H1 - 0 to 8 inches: mucky peat
H2 - 8 to 28 inches: stratified sandy loam to clay
H3 - 28 to 60 inches: sand and gravel

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained

Custom Soil Resource Report

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high
(0.06 to 6.00 in/hr)

Depth to water table: About 0 to 24 inches

Frequency of flooding: Frequent

Frequency of ponding: None

Available water storage in profile: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): 7w

Land capability classification (nonirrigated): 7w

Hydrologic Soil Group: A/D

Ecological site: Mountain Meadow (R048AY241CO)

Hydric soil rating: Yes

Minor Components

Cumulic cryaquolls

Percent of map unit: 10 percent

Landform: Flood plains

Hydric soil rating: Yes

14C—Muggins sandy loam, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: jpgk

Elevation: 7,600 to 10,000 feet

Frost-free period: 30 to 50 days

Farmland classification: Not prime farmland

Map Unit Composition

Muggins and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Muggins

Setting

Landform: Alluvial fans

Landform position (three-dimensional): Mountainbase

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium and/or glacial drift

Typical profile

H1 - 0 to 12 inches: sandy loam

H2 - 12 to 18 inches: sandy clay loam

H3 - 18 to 50 inches: sandy clay

H4 - 50 to 60 inches: sandy clay loam

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 15 percent
Hydric soil rating: No

14D—Muggins sandy loam, 6 to 15 percent slopes

Map Unit Setting

National map unit symbol: jpgl
Elevation: 7,600 to 10,000 feet
Frost-free period: 30 to 50 days
Farmland classification: Not prime farmland

Map Unit Composition

Muggins and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Muggins

Setting

Landform: Alluvial fans
Landform position (three-dimensional): Mountainbase
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium and/or glacial drift

Typical profile

H1 - 0 to 12 inches: sandy loam
H2 - 12 to 18 inches: sandy clay loam
H3 - 18 to 50 inches: sandy clay

Custom Soil Resource Report

H4 - 50 to 60 inches: sandy clay loam

Properties and qualities

Slope: 6 to 15 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: C

Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 15 percent

Hydric soil rating: No

14F—Muggins sandy loam, 15 to 35 percent slopes

Map Unit Setting

National map unit symbol: jpgm

Elevation: 7,600 to 10,000 feet

Frost-free period: 30 to 50 days

Farmland classification: Not prime farmland

Map Unit Composition

Muggins and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Muggins

Setting

Landform: Ridges, mountainsides

Landform position (three-dimensional): Mountainflank

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Glacial drift

Typical profile

H1 - 0 to 12 inches: sandy loam

H2 - 12 to 18 inches: sandy clay loam

Custom Soil Resource Report

H3 - 18 to 50 inches: sandy clay

H4 - 50 to 60 inches: sandy clay loam

Properties and qualities

Slope: 15 to 35 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: C

Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 15 percent

Hydric soil rating: No

16C—Quander cobbly loam, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: jpgp

Elevation: 7,500 to 9,500 feet

Frost-free period: 30 to 75 days

Farmland classification: Not prime farmland

Map Unit Composition

Quander and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Quander

Setting

Landform: Terraces

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Glacial drift

Typical profile

H1 - 0 to 10 inches: cobbly loam

Custom Soil Resource Report

H2 - 10 to 15 inches: very cobbly loam
H3 - 15 to 60 inches: very cobbly sandy clay loam

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: Stony Loam (R048AY237CO)
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 15 percent
Hydric soil rating: No

16D—Quander cobbly loam, 6 to 15 percent slopes

Map Unit Setting

National map unit symbol: jpgq
Elevation: 7,500 to 9,500 feet
Frost-free period: 30 to 75 days
Farmland classification: Not prime farmland

Map Unit Composition

Quander and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Quander

Setting

Landform: Mountainsides, fans
Landform position (three-dimensional): Lower third of mountainflank, mountainbase
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glacial drift

Custom Soil Resource Report

Typical profile

H1 - 0 to 10 inches: cobbly loam
H2 - 10 to 15 inches: very cobbly loam
H3 - 15 to 60 inches: very cobbly sandy clay loam

Properties and qualities

Slope: 6 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: Stony Loam (R048AY237CO)
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 15 percent
Hydric soil rating: No

16E—Quander cobbly loam, 15 to 55 percent slopes

Map Unit Setting

National map unit symbol: jpgr
Elevation: 7,500 to 9,500 feet
Frost-free period: 30 to 75 days
Farmland classification: Not prime farmland

Map Unit Composition

Quander and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Quander

Setting

Landform: Ridges, mountainsides, moraines
Landform position (three-dimensional): Lower third of mountainflank, mountainbase
Down-slope shape: Linear

Custom Soil Resource Report

Across-slope shape: Linear
Parent material: Glacial drift

Typical profile

H1 - 0 to 10 inches: cobbly loam
H2 - 10 to 15 inches: very cobbly loam
H3 - 15 to 60 inches: very cobbly sandy clay loam

Properties and qualities

Slope: 15 to 55 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: Stony Loam (R048AY237CO)
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 15 percent
Hydric soil rating: No

18—Rock outcrop-Cryoborolls complex

Map Unit Setting

National map unit symbol: jpgt
Elevation: 8,000 to 13,000 feet
Mean annual precipitation: 15 to 30 inches
Mean annual air temperature: 32 to 38 degrees F
Frost-free period: 20 to 75 days
Farmland classification: Not prime farmland

Map Unit Composition

Rock outcrop: 70 percent
Cryoborolls and similar soils: 20 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rock Outcrop

Setting

Landform: Escarpments, ridges, mountainsides

Landform position (three-dimensional): Free face, mountaintop, mountainflank

Down-slope shape: Convex, linear

Across-slope shape: Convex, linear

Parent material: Exposed hard bedrock granite and/or sandstone and shale

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 30 to 70 percent

Depth to restrictive feature: 0 inches to paralithic bedrock

Runoff class: Very high

Available water storage in profile: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s

Hydric soil rating: No

Description of Cryoborolls

Setting

Landform: Mountain slopes

Landform position (three-dimensional): Mountainflank

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Slope alluvium derived from sandstone and shale and/or granite

Typical profile

H1 - 0 to 10 inches: extremely stony silty clay loam

H2 - 10 to 19 inches: very cobbly silty clay loam, very cobbly clay, very cobbly clay loam

H2 - 10 to 19 inches: unweathered bedrock

H2 - 10 to 19 inches:

H3 - 19 to 23 inches:

Properties and qualities

Slope: 30 to 70 percent

Depth to restrictive feature: 10 to 40 inches to lithic bedrock

Natural drainage class: Well drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: D

Hydric soil rating: No

Minor Components

Cryoboralfs

Percent of map unit: 5 percent
Hydric soil rating: No

Cryochrepts

Percent of map unit: 5 percent
Hydric soil rating: No

19C—Youga loam, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2tz4z
Elevation: 7,480 to 9,020 feet
Mean annual precipitation: 18 to 20 inches
Mean annual air temperature: 37 to 42 degrees F
Frost-free period: 30 to 75 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Youga and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Youga

Setting

Landform: Colluvial aprons
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Slope alluvium derived from sedimentary rock

Typical profile

A - 0 to 6 inches: loam
BAt - 6 to 14 inches: loam
Bt - 14 to 55 inches: clay loam
C - 55 to 79 inches: clay loam

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.21 to 0.71 in/hr)
Depth to water table: More than 80 inches

Custom Soil Resource Report

Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): 6c
Land capability classification (nonirrigated): 6c
Hydrologic Soil Group: C
Ecological site: Mountain Loam 13-18" PPT (R048BY226CO)
Hydric soil rating: No

Minor Components

Lymanson

Percent of map unit: 5 percent
Landform: Mountain slopes
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainbase
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Mountain Loam 13-18" PPT (R048BY226CO)
Hydric soil rating: No

Quander

Percent of map unit: 5 percent

Cimarron

Percent of map unit: 5 percent
Landform: Mountain slopes, colluvial aprons
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainbase, base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Mountain Loam 13-18" PPT (R048BY226CO)
Hydric soil rating: No

19D—Youga loam, 6 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2tz4q
Elevation: 7,480 to 9,020 feet
Mean annual precipitation: 18 to 20 inches
Mean annual air temperature: 37 to 42 degrees F
Frost-free period: 30 to 75 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Youga and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Youga

Setting

Landform: Mountain slopes, colluvial aprons
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainbase, base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Slope alluvium derived from sedimentary rock

Typical profile

A - 0 to 6 inches: loam
BAt - 6 to 14 inches: loam
Bt - 14 to 55 inches: clay loam
C - 55 to 71 inches: clay loam

Properties and qualities

Slope: 6 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.21 to 0.71 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: Mountain Loam 13-18" PPT (R048BY226CO)
Hydric soil rating: No

Minor Components

Quander

Percent of map unit: 5 percent

Cimarron

Percent of map unit: 5 percent
Landform: Mountain slopes, colluvial aprons
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainbase, base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Mountain Loam 13-18" PPT (R048BY226CO)
Hydric soil rating: No

Lymanson

Percent of map unit: 5 percent
Landform: Mountain slopes
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainbase
Down-slope shape: Linear
Across-slope shape: Convex

Custom Soil Resource Report

Ecological site: Mountain Loam 13-18" PPT (R048BY226CO)
Hydric soil rating: No

19F—Youga loam, 15 to 45 percent slopes

Map Unit Setting

National map unit symbol: 2tz4x
Elevation: 8,000 to 9,020 feet
Mean annual precipitation: 18 to 20 inches
Mean annual air temperature: 37 to 42 degrees F
Frost-free period: 30 to 60 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Youga and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Youga

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainbase, mountainflank
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Slope alluvium derived from sedimentary rock

Typical profile

A - 0 to 6 inches: loam
BAt - 6 to 14 inches: loam
Bt - 14 to 55 inches: clay loam
C - 55 to 71 inches: clay loam

Properties and qualities

Slope: 15 to 45 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.21 to 0.71 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): 7e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: Mountain Loam 13-18" PPT (R048BY226CO)

Custom Soil Resource Report

Hydric soil rating: No

Minor Components

Quander

Percent of map unit: 5 percent

Lymanson

Percent of map unit: 5 percent

Landform: Mountain slopes

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Mountainflank

Down-slope shape: Linear

Across-slope shape: Convex

Ecological site: Mountain Loam 13-18" PPT (R048BY226CO)

Hydric soil rating: No

Cimarron

Percent of map unit: 5 percent

Landform: Mountain slopes

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Mountainbase, mountainflank

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Mountain Loam 13-18" PPT (R048BY226CO)

Hydric soil rating: No

20D—Youga loam, thick surface, 6 to 15 percent slopes

Map Unit Setting

National map unit symbol: jph0

Elevation: 8,500 to 10,000 feet

Frost-free period: 30 to 75 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Youga, thick surface, and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Youga, Thick Surface

Setting

Landform: Mountainsides, fans

Landform position (three-dimensional): Lower third of mountainflank,
mountainbase

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Glacial drift

Custom Soil Resource Report

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 30 inches: gravelly loam
H3 - 30 to 42 inches: gravelly sandy clay loam
H4 - 42 to 60 inches: gravelly sandy clay loam

Properties and qualities

Slope: 6 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: Subalpine Loam (R048AY250CO)
Hydric soil rating: No

Minor Components

Quander

Percent of map unit: 5 percent
Hydric soil rating: No

Anvik

Percent of map unit: 5 percent
Hydric soil rating: No

20F—Youga loam, thick surface, 15 to 50 percent slopes

Map Unit Setting

National map unit symbol: jph1
Elevation: 8,500 to 10,000 feet
Frost-free period: 30 to 75 days
Farmland classification: Not prime farmland

Map Unit Composition

Youga, thick surface, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Youga, Thick Surface

Setting

Landform: Ridges, mountainsides
Landform position (three-dimensional): Mountainflank
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glacial drift

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 22 inches: gravelly sandy clay loam
H3 - 22 to 60 inches: gravelly sandy clay loam

Properties and qualities

Slope: 15 to 50 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: Subalpine Loam (R048AY250CO)
Hydric soil rating: No

Minor Components

Quander

Percent of map unit: 5 percent
Hydric soil rating: No

Anvik

Percent of map unit: 5 percent
Hydric soil rating: No

21F—Yovimpa clay loam, 15 to 45 percent slopes

Map Unit Setting

National map unit symbol: jph3
Elevation: 7,500 to 9,000 feet
Frost-free period: 30 to 75 days
Farmland classification: Not prime farmland

Map Unit Composition

Yovimpa and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Yovimpa

Setting

Landform: Ridges, mountainsides

Landform position (three-dimensional): Mountainflank

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Material weathered from slate and/or shale

Typical profile

H1 - 0 to 2 inches: clay loam

H2 - 2 to 7 inches: clay loam

H3 - 7 to 18 inches: clay loam, clay, silty clay

H3 - 7 to 18 inches: unweathered bedrock

H3 - 7 to 18 inches:

H4 - 18 to 22 inches:

Properties and qualities

Slope: 15 to 45 percent

Depth to restrictive feature: 15 to 20 inches to paralithic bedrock

Natural drainage class: Well drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: D

Ecological site: Mountain Shale (R048AY244CO)

Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 15 percent

Hydric soil rating: No

22—Borrow pits

Map Unit Composition

Borrow pits: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Borrow Pits

Setting

Parent material: Very gravelly alluvium

Typical profile

H1 - 0 to 6 inches: extremely gravelly sand

H2 - 6 to 60 inches: extremely gravelly sand, extremely gravelly coarse sand, very gravelly coarse sand

H2 - 6 to 60 inches:

H2 - 6 to 60 inches:

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s

Hydrologic Soil Group: A

Hydric soil rating: No

W—Water

Map Unit Composition

Water: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Minor Components

Aquolls

Percent of map unit: 10 percent

Landform: Marshes

Hydric soil rating: Yes

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Appendix H. EPA SWMM Model Reports

(electronic appendix provided on flash drive)



Town of Silverthorne
Drainage Master Plan



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