TABLES

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	72	2	3372-2-1	2-1	Nuclear Assurance Company	378400	827759	500
33	72	2	3372-2-2	2-2	Nuclear Assurance Company	422338	797316	804
33	72	2	3372-2-3	2-3	Nuclear Assurance Company	419824	797476	502
33	72	2	3372-2-4	2-4	Nuclear Assurance Company	422257	802294	802
33	72	2	3372-2-5	2-5	Nuclear Assurance Company	421552	801492	200
33	72	2	3372-2-6	2-6	Nuclear Assurance Company	422342	801274	200
33	72	3	3372-3-1	3-1	Nuclear Assurance Company	411909	798281	700
33	72	3	3372-3-2	3-2	Nuclear Assurance Company	414501	797516	804
33	72	3	3372-3-OX-226-16	OX-226-16	Nuclear Assurance Company	414370	801391	499
33	72	4	3372-4-1	4-1	Nuclear Assurance Company	410705	800430	499
33	72	35	3372-6-35-45	35-45		398036.4	799718.1	
33	73	1	3373-1-1	1-1	Nuclear Assurance Company	395316	799874	434
33	73	1	3373-1-10	1-10	Nuclear Assurance Company	392548	800841	196
33	73	1	3373-1-11	1-11	Nuclear Assurance Company	392464	800896	216
33	73	1	3373-1-12	1-12	Nuclear Assurance Company	392472	801086	216
33	73	1	3373-1-13	1-13	Nuclear Assurance Company	392622	800780	193
33	73	1	3373-1-14	1-14	Nuclear Assurance Company	392703	801085	237
33	73	1	3373-1-15	1-15	Nuclear Assurance Company	392821	801089	237
33	73	1	3373-1-2	1-2	Nuclear Assurance Company	395576	798958	417
33	73	1	3373-1-3	1-3	Nuclear Assurance Company	395932	799872	396
33	73	1	3373-1-4	1-4	Nuclear Assurance Company	391642	800561	477
33	73	1	3373-1-5	1-5	Nuclear Assurance Company	392708	800721	477
33	73	1	3373-1-6	1-6	Nuclear Assurance Company	393230	801489	477
33	73	1	3373-1-7	1-7	Nuclear Assurance Company	393186	799775	395
33	73	1	3373-1-8	1-8	Nuclear Assurance Company	392036	799721	376
33	73	1	3373-1-9	1-9	Nuclear Assurance Company	390904	799716	453
33	73	2	3373-2-1	2-1	R.L. Peterson	389933	801910	117
33	73	2	3373-2-10	2-10	Nuclear Assurance Company	387612	801664	376
33	73	2	3373-2-11	2-11	Nuclear Assurance Company	389209	801416	196
33	73	2	3373-2-12	2-12	Nuclear Assurance Company	388861	801972	216
33	73	2	3373-2-13	2-13	Nuclear Assurance Company	389111	801243	196
33	73	2	3373-2-14	2-14	Nuclear Assurance Company	389556	801093	216
33	73	2	3373-2-15	2-15	Nuclear Assurance Company	388612	801882	156
33	73	2	3373-2-16	2-16	Nuclear Assurance Company	388986	801900	157
33	73	2	3373-2-17	2-17	Nuclear Assurance Company	389089	801874	116
33	73	2	3373-2-18	2-18	Nuclear Assurance Company	388938	801910	216
33	73	2	3373-2-19	2-19	Nuclear Assurance Company	389570	801233	196
33	73	2	3373-2-1X	2-1X	Nuclear Assurance Company	390671	800563	457
33	73	2	3373-2-2	2-2	R.L. Peterson	389030	801208	379
33	73	2	3373-2-20	2-20	Nuclear Assurance Company	389843	800702	174
33	73	2	3373-2-21	2-21	Arizona Public Service Company	389050.7	801360	139
33	73	2	3373-2-2X	2-2X	Nuclear Assurance Company	389661	800697	387
33	73	2	3373-2-3	2-3	R.L. Peterson	389935	801060	501
33	73	2	3373-2-3X	2-3X	Nuclear Assurance Company	389912	799726	456
33	73	2	3373-2-4	2-4	R.L. Peterson	389935	801360	179
33	73	2	3373-2-4X	2-4X	Nuclear Assurance Company	390596	798655	353
33	73	2	3373-2-5	2-5	R.L. Peterson	389935	801210	118
33	73	2	3373-2-5X	2-5X	Nuclear Assurance Company	389590	798704	496
33	73	2	3373-2-6	2-6	Nuclear Assurance Company	388560	798684	357
33	73	2	3373-2-7	2-7	Nuclear Assurance Company	385578	799005	377
33	73	2	3373-2-8	2-8	Nuclear Assurance Company	386475	799019	312
33	73	2	3373-2-9	2-9	Nuclear Assurance Company	387177	801687	396
33	73	3	3373-3-1	3-1	Nuclear Assurance Company	385104	801240	378
33	73	3	3373-3-2	3-2	Nuclear Assurance Company	384013	801200	377
33	73	3	3373-3-3	3-3	Nuclear Assurance Company	383127	801124	375
33	73	3	3373-3-4	3-4	Nuclear Assurance Company	381603	801431	356

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
33	73	3	3373-3-5	3-5	Nuclear Assurance Company	380392	801815	797
33	73	3	3373-3-6	3-6	Nuclear Assurance Company	384524	800403	376
33	73	3	3373-3-7	3-7	Nuclear Assurance Company	383501	800116	376
33	73	3	3373-3-8	3-8	Nuclear Assurance Company	382318	800379	376
33	73	3	3373-3-9	3-9	Nuclear Assurance Company	380665	800785	375
34	72	19	3472-19-1	19-1	R.L. Peterson	396191	815238	338
34	72	19	3472-19-10	19-10	R.L. Peterson	396670	813867	216
34	72	19	3472-19-100	19-100	Nuclear Assurance Company	397874	815203	318
34	72	19	3472-19-101	19-101	Nuclear Assurance Company	397589	815208	318
34	72	19	3472-19-102	19-102	Nuclear Assurance Company	398272	813912	297
34	72	19	3472-19-103	19-103	Nuclear Assurance Company	397860	814881	319
34	72	19	3472-19-104	19-104	Nuclear Assurance Company	397793	814826	318
34	72	19	3472-19-105	19-105	Nuclear Assurance Company	398570	814510	318
34	72	19	3472-19-106	19-106	Nuclear Assurance Company	398512	814556	318
34	72	19	3472-19-107	19-107	Nuclear Assurance Company	398468	814503	318
34	72	19	3472-19-108	19-108	Nuclear Assurance Company	398517	814451	318
34	72	19	3472-19-109	19-109	Nuclear Assurance Company	398533	814287	319
34	72	19	3472-19-11	19-11	R.L. Peterson	397578	813939	279
34	72	19	3472-19-110	19-110	Nuclear Assurance Company	397908	814875	315
34	72	19	3472-19-111	19-111	Nuclear Assurance Company	397922	815092	318
34	72	19	3472-19-112	19-112	Nuclear Assurance Company	397938	814999	318
34	72	19	3472-19-113	19-113	Nuclear Assurance Company	397728	815200	317
34	72	19	3472-19-114	19-114	Nuclear Assurance Company	397874	815151	317
34	72	19	3472-19-115	19-115	Nuclear Assurance Company	398054	814401	298
34	72	19	3472-19-116	19-116	Nuclear Assurance Company	379975	815094	317
34	72	19	3472-19-117	19-117	Nuclear Assurance Company	398612	814630	318
34	72	19	3472-19-118	19-118	Nuclear Assurance Company	398777	814534	317
34	72	19	3472-19-119	19-119	Nuclear Assurance Company	398647	814309	297
34	72	19	3472-19-12	19-12	R.L. Peterson	396981	813945	298
34	72	19	3472-19-120	19-120	Nuclear Assurance Company	398084	815098	317
34	72	19	3472-19-121	19-121	Nuclear Assurance Company	397476	815711	316
34	72	19	3472-19-122	19-122	Nuclear Assurance Company	398018	814835	318
34	72	19	3472-19-122C	19-122C	Malapai	398029.7	814825.5	317
34	72	19	3472-19-123	19-123	Nuclear Assurance Company	398818	814663	316
34	72	19	3472-19-124	19-124	Nuclear Assurance Company	398833	814382	317
34	72	19	3472-19-125	19-125	Nuclear Assurance Company	398066	814941	319
34	72	19	3472-19-126	19-126	Nuclear Assurance Company	397913	814785	319
34	72	19	3472-19-127	19-127	Nuclear Assurance Company	398832	814234	318
34	72	19	3472-19-128	19-128	Nuclear Assurance Company	398026	814945	319
34	72	19	3472-19-129	19-129	Nuclear Assurance Company	397928	814685	319
34	72	19	3472-19-13	19-13	R.L. Peterson	396984	814039	298
34	72	19	3472-19-130	19-130	Nuclear Assurance Company	396957	813140	279
34	72	19	3472-19-131	19-131	Nuclear Assurance Company	396959	813094	278
34	72	19	3472-19-132	19-132	Nuclear Assurance Company	396794	813137	277
34	72	19	3472-19-133	19-133	Nuclear Assurance Company	396795	813092	277
34	72	19	3472-19-134	19-134	Nuclear Assurance Company	396648	813098	279
34	72	19	3472-19-134C	19-134C	Nuclear Assurance Company	396644	813097	277
34	72	19	3472-19-135	19-135	Nuclear Assurance Company	396797	813191	279
34	72	19	3472-19-136	19-136	Nuclear Assurance Company	397314	813304	278
34	72	19	3472-19-137	19-137	Nuclear Assurance Company	396649	813145	278
34	72	19	3472-19-137C	19-137C	Nuclear Assurance Company	396645	813144	280
34	72	19	3472-19-138	19-138	Nuclear Assurance Company	396480	813155	278
34	72	19	3472-19-139	19-139	Nuclear Assurance Company	396217	813774	199
34	72	19	3472-19-14	19-14	R.L. Peterson	397582	813796	296
34	72	19	3472-19-140	19-140	Nuclear Assurance Company	396226	813860	198
34	72	19	3472-19-141	19-141	Nuclear Assurance Company	398832	814332	320

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	72	19	3472-19-142	19-142	Nuclear Assurance Company	398023	814734	320
34	72	19	3472-19-143	19-143	Nuclear Assurance Company	396484	813075	278
34	72	19	3472-19-144	19-144	Nuclear Assurance Company	396486	813029	278
34	72	19	3472-19-145	19-145	Nuclear Assurance Company	396310	814318	216
34	72	19	3472-19-146	19-146	Nuclear Assurance Company	396316	814214	217
34	72	19	3472-19-147	19-147	Nuclear Assurance Company	396219	813576	220
34	72	19	3472-19-148	19-148	Nuclear Assurance Company	396439	813724	237
34	72	19	3472-19-149	19-149	Nuclear Assurance Company	396317	814164	215
34	72	19	3472-19-15	19-15	R.L. Peterson	397576	814080	298
34	72	19	3472-19-150	19-150	Nuclear Assurance Company	396429	813813	417
34	72	19	3472-19-151	19-151	Nuclear Assurance Company	396488	812976	317
34	72	19	3472-19-152	19-152	Nuclear Assurance Company	396289	812967	297
34	72	19	3472-19-152C	19-152C	Nuclear Assurance Company	396288.5	812970.9	278
34	72	19	3472-19-153	19-153	Nuclear Assurance Company	396289	812915	297
34	72	19	3472-19-154	19-154	Nuclear Assurance Company	396293	813018	297
34	72	19	3472-19-155	19-155	Nuclear Assurance Company	396286	812865	297
34	72	19	3472-19-156	19-156	Nuclear Assurance Company	396650	813047	277
34	72	19	3472-19-156C	19-156C	Nuclear Assurance Company	396646	813048	277
34	72	19	3472-19-157	19-157	Nuclear Assurance Company	396649	813194	277
34	72	19	3472-19-158	19-158	Nuclear Assurance Company	396796	813239	437
34	72	19	3472-19-159	19-159	Nuclear Assurance Company	397036	814133	197
34	72	19	3472-19-159C	19-159C	Nuclear Assurance Company	397031	814133	217
34	72	19	3472-19-16	19-16	R.L. Peterson	396985	814133	297
34	72	19	3472-19-160	19-160	Nuclear Assurance Company	396937	814130	216
34	72	19	3472-19-161	19-161	Nuclear Assurance Company	396957	813185	277
34	72	19	3472-19-162	19-162	Nuclear Assurance Company	396958	813236	276
34	72	19	3472-19-163	19-163	Nuclear Assurance Company	397285	813105	296
34	72	19	3472-19-164	19-164	Nuclear Assurance Company	396652	812998	276
34	72	19	3472-19-165	19-165	Nuclear Assurance Company	397850	813569	273
34	72	19	3472-19-166	19-166	Nuclear Assurance Company	397851	813368	275
34	72	19	3472-19-167	19-167	Nuclear Assurance Company	398045	813487	276
34	72	19	3472-19-168	19-168	Nuclear Assurance Company	397321	813349	276
34	72	19	3472-19-169	19-169	Nuclear Assurance Company	396959	813285	276
34	72	19	3472-19-16C	19-16C	Nuclear Assurance Company	396985	814129	217
34	72	19	3472-19-17	19-17	R.L. Peterson	397582	813649	298
34	72	19	3472-19-170	19-170	Nuclear Assurance Company	396653	812948	275
34	72	19	3472-19-171	19-171	Nuclear Assurance Company	396796	813288	276
34	72	19	3472-19-172	19-172	Nuclear Assurance Company	396963	813330	275
34	72	19	3472-19-173	19-173	Nuclear Assurance Company	397317	813404	276
34	72	19	3472-19-174	19-174	Nuclear Assurance Company	397849	813316	275
34	72	19	3472-19-175	19-175	Nuclear Assurance Company	397115	813241	275
34	72	19	3472-19-176	19-176	Nuclear Assurance Company	398047	813436	295
34	72	19	3472-19-177	19-177	Nuclear Assurance Company	396797	813339	275
34	72	19	3472-19-178	19-178	Nuclear Assurance Company	396648	813244	275
34	72	19	3472-19-179	19-179	Nuclear Assurance Company	396656	812896	296
34	72	19	3472-19-18	19-18	R.L. Peterson	397273	813946	297
34	72	19	3472-19-180	19-180	Nuclear Assurance Company	397109	813289	275
34	72	19	3472-19-181	19-181	Nuclear Assurance Company	396797	813390	276
34	72	19	3472-19-182	19-182	Nuclear Assurance Company	397088	814133	216
34	72	19	3472-19-183	19-183	Nuclear Assurance Company	397409	814202	296
34	72	19	3472-19-184	19-184	Nuclear Assurance Company	396886	814318	236
34	72	19	3472-19-185	19-185	Nuclear Assurance Company	396879	814514	216
34	72	19	3472-19-186	19-186	Nuclear Assurance Company	396928	814517	216
34	72	19	3472-19-187	19-187	Nuclear Assurance Company	397028	814515	216
34	72	19	3472-19-188	19-188	Nuclear Assurance Company	396669	814544	213
34	72	19	3472-19-189	19-189	Nuclear Assurance Company	396569	814544	234

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	72	19	3472-19-19	19-19	R.L. Peterson	397609	813504	296
34	72	19	3472-19-190	19-190	Nuclear Assurance Company	397136	814134	215
34	72	19	3472-19-191	19-191	Nuclear Assurance Company	397412	814302	296
34	72	19	3472-19-192	19-192	Nuclear Assurance Company	396932	814321	236
34	72	19	3472-19-193	19-193	Nuclear Assurance Company	396828	814506	235
34	72	19	3472-19-194	19-194	Nuclear Assurance Company	396520	814540	234
34	72	19	3472-19-195	19-195	Nuclear Assurance Company	396826	814769	232
34	72	19	3472-19-195C	19-195C	Malapai	396823.2	814775	239
34	72	19	3472-19-196	19-196	Nuclear Assurance Company	396558	814987	295
34	72	19	3472-19-197	19-197	Nuclear Assurance Company	396313	815016	296
34	72	19	3472-19-197C	19-197C	Malapai	396318.3	815017.9	299
34	72	19	3472-19-198	19-198	Nuclear Assurance Company	396883	814035	235
34	72	19	3472-19-199	19-199	Nuclear Assurance Company	397317	814415	293
34	72	19	3472-19-1X	19-1X	Nuclear Assurance Company	396294	816081	497
34	72	19	3472-19-2	19-2	R.L. Peterson	396678	813932	296
34	72	19	3472-19-20	19-20	R.L. Peterson	396985	814322	303
34	72	19	3472-19-200	19-200	Nuclear Assurance Company	397188	814134	216
34	72	19	3472-19-201	19-201	Nuclear Assurance Company	396755	814501	227
34	72	19	3472-19-202	19-202	Nuclear Assurance Company	396258	814961	296
34	72	19	3472-19-203	19-203	Nuclear Assurance Company	396558	814935	297
34	72	19	3472-19-204	19-204	Nuclear Assurance Company	396880	813933	255
34	72	19	3472-19-205	19-205	Nuclear Assurance Company	396924	814777	234
34	72	19	3472-19-206	19-206	Morrison Nuclear	396876	814771	237
34	72	19	3472-19-207	19-207	Nuclear Assurance Company	397366	814356	297
34	72	19	3472-19-208	19-208	Nuclear Assurance Company	396323	815071	295
34	72	19	3472-19-209	19-209	Nuclear Assurance Company	397410	814252	296
34	72	19	3472-19-209C	19-209C	Malapai	397413.4	814246.9	279
34	72	19	3472-19-21	19-21	R.L. Peterson	396977	814519	295
34	72	19	3472-19-210	19-210	Nuclear Assurance Company	397407	814149	295
34	72	19	3472-19-211	19-211	Nuclear Assurance Company	397314	814299	297
34	72	19	3472-19-212	19-212	Nuclear Assurance Company	397311	814348	295
34	72	19	3472-19-213	19-213	Nuclear Assurance Company	397315	814248	297
34	72	19	3472-19-214	19-214	Nuclear Assurance Company	396880	813980	216
34	72	19	3472-19-215	19-215	Nuclear Assurance Company	397215	814295	297
34	72	19	3472-19-216	19-216	Nuclear Assurance Company	397318	814193	297
34	72	19	3472-19-217	19-217	Nuclear Assurance Company	398077	814735	336
34	72	19	3472-19-218	19-218	Nuclear Assurance Company	398067	814841	315
34	72	19	3472-19-219	19-219	Nuclear Assurance Company	397986	815003	315
34	72	19	3472-19-22	19-22	R.L. Peterson	396685	814778	297
34	72	19	3472-19-220	19-220	Nuclear Assurance Company	398036	815005	316
34	72	19	3472-19-221	19-221	Nuclear Assurance Company	397886	814999	313
34	72	19	3472-19-222	19-222	Nuclear Assurance Company	397871	815096	316
34	72	19	3472-19-223	19-223	Nuclear Assurance Company	397820	815097	316
34	72	19	3472-19-224	19-224	Nuclear Assurance Company	397924	815203	316
34	72	19	3472-19-225	19-225	Nuclear Assurance Company	398127	814732	316
34	72	19	3472-19-226	19-226	Nuclear Assurance Company	398116	814844	314
34	72	19	3472-19-227	19-227	Nuclear Assurance Company	397834	814996	316
34	72	19	3472-19-228	19-228	Nuclear Assurance Company	397762	815096	316
34	72	19	3472-19-229	19-229	Nuclear Assurance Company	398023	815097	313
34	72	19	3472-19-23	19-23	R.L. Peterson	396387	814887	298
34	72	19	3472-19-230	19-230	Nuclear Assurance Company	398512	814608	316
34	72	19	3472-19-231	19-231	Nuclear Assurance Company	398402	814556	315
34	72	19	3472-19-232	19-232	Nuclear Assurance Company	397662	815094	314
34	72	19	3472-19-233	19-233	Nuclear Assurance Company	397778	814991	315
34	72	19	3472-19-234	19-234	Nuclear Assurance Company	398403	814605	315
34	72	19	3472-19-234C	19-234C	Malapai	398409.1	814605.2	299

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	72	19	3472-19-235	19-235	Nuclear Assurance Company	398510	814705	313
34	72	19	3472-19-236	19-236	Nuclear Assurance Company	398274	813716	317
34	72	19	3472-19-237	19-237	Nuclear Assurance Company	398208	813788	295
34	72	19	3472-19-238	19-238	Nuclear Assurance Company	398202	814548	317
34	72	19	3472-19-239	19-239	Nuclear Assurance Company	398404	814658	314
34	72	19	3472-19-24	19-24	R.L. Peterson	396776	814771	296
34	72	19	3472-19-240	19-240	Nuclear Assurance Company	398510	814656	317
34	72	19	3472-19-241	19-241	Nuclear Assurance Company	397546	814579	293
34	72	19	3472-19-242	19-242	Nuclear Assurance Company	397785	814270	310
34	72	19	3472-19-243	19-243	Nuclear Assurance Company	397964	814790	317
34	72	19	3472-19-244	19-244	Nuclear Assurance Company	397564	815088	314
34	72	19	3472-19-245	19-245	Nuclear Assurance Company	398143	813863	294
34	72	19	3472-19-246	19-246	Nuclear Assurance Company	397580	814974	315
34	72	19	3472-19-247	19-247	Nuclear Assurance Company	398107	813901	293
34	72	19	3472-19-248	19-248	Nuclear Assurance Company	398172	813832	295
34	72	19	3472-19-248C	19-248C	Malapai	398177.3	813835.7	299
34	72	19	3472-19-249	19-249	Nuclear Assurance Company	397682	814982	316
34	72	19	3472-19-25	19-25	R.L. Peterson	396980	814564	296
34	72	19	3472-19-250	19-250	Nuclear Assurance Company	397530	814969	316
34	72	19	3472-19-251	19-251	Nuclear Assurance Company	397596	814861	317
34	72	19	3472-19-252	19-252	Arizona Public Service Company	398726	814532.9	299
34	72	19	3472-19-253	19-253	Arizona Public Service Company	398780.7	814383.1	299
34	72	19	3472-19-254	19-254	Arizona Public Service Company	398606.2	814582.7	299
34	72	19	3472-19-255	19-255	Arizona Public Service Company	398539.6	814242	299
34	72	19	3472-19-256	19-256	Arizona Public Service Company	398316.1	814435.3	299
34	72	19	3472-19-257	19-257	Arizona Public Service Company	398056.5	814345.6	299
34	72	19	3472-19-258	19-258	Arizona Public Service Company	397899.8	814194.5	299
34	72	19	3472-19-259	19-259	Arizona Public Service Company	397594.7	814579.9	299
34	72	19	3472-19-26	19-26	R.L. Peterson	396797	814859	294
34	72	19	3472-19-260	19-260	Arizona Public Service Company	397925.5	814634.5	299
34	72	19	3472-19-261	19-261	Arizona Public Service Company	398665	814259.6	297
34	72	19	3472-19-262	19-262	Arizona Public Service Company	397137.6	815114.6	297
34	72	19	3472-19-263	19-263	Arizona Public Service Company	397490.9	815251.1	319
34	72	19	3472-19-264	19-264	Arizona Public Service Company	397127.3	813099.7	302
34	72	19	3472-19-265	19-265	Arizona Public Service Company	396559.3	814878.9	299
34	72	19	3472-19-266	19-266	Arizona Public Service Company	397897	814244.2	299
34	72	19	3472-19-267	19-267	Arizona Public Service Company	398778	814430.4	299
34	72	19	3472-19-268	19-268	Arizona Public Service Company	398539.7	814190.4	299
34	72	19	3472-19-269	19-269	Arizona Public Service Company	398541.9	814138.9	299
34	72	19	3472-19-269-C	19-269-C	Malapai	398541.4	814142.4	299
34	72	19	3472-19-27	19-27	R.L. Peterson	396994	814653	292
34	72	19	3472-19-270	19-270	Arizona Public Service Company	397928.3	814584.8	297
34	72	19	3472-19-271	19-271	Arizona Public Service Company	398828.1	814482.1	299
34	72	19	3472-19-272	19-272	Arizona Public Service Company	397594.2	814529.5	299
34	72	19	3472-19-273	19-273	Arizona Public Service Company	397894.8	814292.1	299
34	72	19	3472-19-274	19-274	Arizona Public Service Company	397334.9	815109.6	319
34	72	19	3472-19-275	19-275	Arizona Public Service Company	397927.8	814533	299
34	72	19	3472-19-276	19-276	Arizona Public Service Company	398818.8	814612.2	298
34	72	19	3472-19-277	19-277	Arizona Public Service Company	397330.5	815158.8	319
34	72	19	3472-19-278	19-278	Arizona Public Service Company	396493.7	812927.3	279
34	72	19	3472-19-279	19-279	Arizona Public Service Company	396308.8	814752.8	299
34	72	19	3472-19-28	19-28	R.L. Peterson	397574	814129	296
34	72	19	3472-19-280	19-280	Malapai	398404.3	814056.7	297
34	72	19	3472-19-281	19-281	Malapai	398780.5	814334.4	297
34	72	19	3472-19-282	19-282	Malapai	397777.7	814524.7	298
34	72	19	3472-19-283	19-283	Malapai	397484.1	814914.9	317

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	72	19	3472-19-284	19-284	Malapai	397475.3	815063.7	317
34	72	19	3472-19-284-C	19-284-C	Malapai	397477	815056.2	318
34	72	19	3472-19-285	19-285	Malapai	396287.9	812766.4	297
34	72	19	3472-19-286	19-286	Malapai	396489.4	812879.4	296
34	72	19	3472-19-287	19-287	Malapai	396318.9	814263.8	217
34	72	19	3472-19-288	19-288	Malapai	396573.5	814443.1	217
34	72	19	3472-19-289	19-289	Malapai	397989.3	813629	298
34	72	19	3472-19-29	19-29	R.L. Peterson	397610	813454	292
34	72	19	3472-19-290	19-290	Malapai	397126.7	813047.1	296
34	72	19	3472-19-291	19-291	Malapai	396663.1	812848	297
34	72	19	3472-19-292	19-292	Malapai	396887.5	814082.2	317
34	72	19	3472-19-293	19-293	Malapai	396673.4	814652.5	237
34	72	19	3472-19-294	19-294	Malapai	396828.7	814645.4	237
34	72	19	3472-19-295	19-295	Malapai	396826.5	814810.9	237
34	72	19	3472-19-296	19-296	Malapai	397435	814911.4	317
34	72	19	3472-19-297	19-297	Malapai	397488.6	814860.8	317
34	72	19	3472-19-298	19-298	Malapai	397774.4	814577	297
34	72	19	3472-19-299	19-299	Malapai	398450.8	814058	297
34	72	19	3472-19-3	19-3	R.L. Peterson	396099	814590	290
34	72	19	3472-19-30	19-30	R.L. Peterson	397767	813911	295
34	72	19	3472-19-300	19-300	Malapai	397495.8	814758	317
34	72	19	3472-19-301	19-301	Malapai	396490.5	814388.9	237
34	72	19	3472-19-301-C	19-301-C	Malapai	396488	814390.9	219
34	72	19	3472-19-302	19-302	Malapai	396426.1	813858.7	216
34	72	19	3472-19-303	19-303	Malapai	396829	814405.6	217
34	72	19	3472-19-304	19-304	Malapai	396790.2	814502.6	217
34	72	19	3472-19-305	19-305	Malapai	398457.1	814005.3	317
34	72	19	3472-19-306	19-306	Malapai	397930.9	814480	316
34	72	19	3472-19-307	19-307	Malapai	397394.1	814804.5	316
34	72	19	3472-19-308	19-308	Malapai	396293.3	812719.3	297
34	72	19	3472-19-309	19-309	Malapai	396675.3	812798.7	296
34	72	19	3472-19-31	19-31	R.L. Peterson	397175	814576	290
34	72	19	3472-19-310	19-310	Malapai	396219.9	813673.3	216
34	72	19	3472-19-311	19-311	Malapai	396772.1	814397.9	217
34	72	19	3472-19-312	19-312	Malapai	396481.5	812838.1	297
34	72	19	3472-19-313	19-313	Malapai	396295.7	812671.4	296
34	72	19	3472-19-32	19-32	R.L. Peterson	396817	814950	297
34	72	19	3472-19-33	19-33	R.L. Peterson	396842	815039	296
34	72	19	3472-19-34	19-34	R.L. Peterson	396396	814934	298
34	72	19	3472-19-35	19-35	R.L. Peterson	396826	814997	297
34	72	19	3472-19-36	19-36	R.L. Peterson	397014	814741	293
34	72	19	3472-19-37	19-37	R.L. Peterson	397616	813362	296
34	72	19	3472-19-38	19-38	R.L. Peterson	397803	813504	297
34	72	19	3472-19-39	19-39	R.L. Peterson	397895	813542	298
34	72	19	3472-19-4	19-4	R.L. Peterson	396231	813948	294
34	72	19	3472-19-40	19-40	R.L. Peterson	397847	813521	297
34	72	19	3472-19-41	19-41	Nuclear Assurance Company	397992	813533	297
34	72	19	3472-19-42	19-42	Nuclear Assurance Company	397848	813419	297
34	72	19	3472-19-43	19-43	Nuclear Assurance Company	397618	813173	276
34	72	19	3472-19-44	19-44	Nuclear Assurance Company	397430	813344	299
34	72	19	3472-19-45	19-45	Nuclear Assurance Company	396403	815025	298
34	72	19	3472-19-46	19-46	Nuclear Assurance Company	397253	814905	300
34	72	19	3472-19-47	19-47	Nuclear Assurance Company	397491	814649	300
34	72	19	3472-19-48	19-48	Nuclear Assurance Company	397718	814356	320
34	72	19	3472-19-49	19-49	Nuclear Assurance Company	397974	814029	320
34	72	19	3472-19-5	19-5	R.L. Peterson	397284	815206	313

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	72	19	3472-19-50	19-50	Nuclear Assurance Company	397617	813278	278
34	72	19	3472-19-51	19-51	Nuclear Assurance Company	397847	813473	278
34	72	19	3472-19-52	19-52	Nuclear Assurance Company	397614	813321	280
34	72	19	3472-19-53	19-53	Nuclear Assurance Company	397455	813085	278
34	72	19	3472-19-54	19-54	Nuclear Assurance Company	397611	813231	277
34	72	19	3472-19-54C	19-54C	Malapai	397608	813232.2	259
34	72	19	3472-19-55	19-55	Nuclear Assurance Company	398043	813534	298
34	72	19	3472-19-56	19-56	Nuclear Assurance Company	397985	813578	297
34	72	19	3472-19-56C	19-56C	Malapai	397989	813580.2	279
34	72	19	3472-19-57	19-57	Nuclear Assurance Company	397437	813162	278
34	72	19	3472-19-58	19-58	Nuclear Assurance Company	397434	813210	279
34	72	19	3472-19-59	19-59	Nuclear Assurance Company	397429	813256	277
34	72	19	3472-19-6	19-6	R.L. Peterson	396383	814115	275
34	72	19	3472-19-60	19-60	Nuclear Assurance Company	398060	814091	300
34	72	19	3472-19-61	19-61	Nuclear Assurance Company	397846	814189	300
34	72	19	3472-19-62	19-62	Nuclear Assurance Company	397608	814503	300
34	72	19	3472-19-63	19-63	Nuclear Assurance Company	397143	815066	300
34	72	19	3472-19-64	19-64	Nuclear Assurance Company	398274	814083	298
34	72	19	3472-19-65	19-65	Nuclear Assurance Company	397648	814756	298
34	72	19	3472-19-66	19-66	Nuclear Assurance Company	397406	815009	305
34	72	19	3472-19-67	19-67	Nuclear Assurance Company	398054	814291	298
34	72	19	3472-19-68	19-68	Nuclear Assurance Company	398327	813910	298
34	72	19	3472-19-69	19-69	Nuclear Assurance Company	398326	814094	299
34	72	19	3472-19-7	19-7	R.L. Peterson	396641	813731	276
34	72	19	3472-19-70	19-70	Nuclear Assurance Company	397282	813154	268
34	72	19	3472-19-71	19-71	Nuclear Assurance Company	397558	814211	297
34	72	19	3472-19-72	19-72	Nuclear Assurance Company	397506	814275	300
34	72	19	3472-19-73	19-73	Nuclear Assurance Company	397154	814351	240
34	72	19	3472-19-74	19-74	Nuclear Assurance Company	397023	814330	240
34	72	19	3472-19-75	19-75	Nuclear Assurance Company	396615	814616	239
34	72	19	3472-19-76	19-76	Nuclear Assurance Company	397506	814214	278
34	72	19	3472-19-77	19-77	Nuclear Assurance Company	396619	814544	237
34	72	19	3472-19-78	19-78	Nuclear Assurance Company	396402	814987	297
34	72	19	3472-19-79	19-79	Nuclear Assurance Company	396403	815074	297
34	72	19	3472-19-8	19-8	R.L. Peterson	396659	813817	218
34	72	19	3472-19-80	19-80	Nuclear Assurance Company	401202	815072	800
34	72	19	3472-19-81	19-81	Nuclear Assurance Company	399374	813852	500
34	72	19	3472-19-82	19-82	Nuclear Assurance Company	397000	816510	500
34	72	19	3472-19-83	19-83	Nuclear Assurance Company	398321	814291	298
34	72	19	3472-19-84	19-84	Nuclear Assurance Company	398375	814100	298
34	72	19	3472-19-85	19-85	Nuclear Assurance Company	397799	814885	317
34	72	19	3472-19-86	19-86	Nuclear Assurance Company	398221	813915	297
34	72	19	3472-19-87	19-87	Nuclear Assurance Company	398436	814284	298
34	72	19	3472-19-88	19-88	Nuclear Assurance Company	398315	814484	297
34	72	19	3472-19-89	19-89	Nuclear Assurance Company	398516	814505	317
34	72	19	3472-19-89C	19-89C	Malapai	398506.7	814512.3	300
34	72	19	3472-19-9	19-9	R.L. Peterson	396653	813776	216
34	72	19	3472-19-90	19-90	Nuclear Assurance Company	396625	814498	236
34	72	19	3472-19-91	19-91	Nuclear Assurance Company	396557	815040	300
34	72	19	3472-19-92	19-92	Nuclear Assurance Company	396355	814977	300
34	72	19	3472-19-93	19-93	Nuclear Assurance Company	396908	814656	239
34	72	19	3472-19-94	19-94	Nuclear Assurance Company	396752	814652	240
34	72	19	3472-19-95	19-95	Nuclear Assurance Company	396308	814969	298
34	72	19	3472-19-96	19-96	Nuclear Assurance Company	397291	813204	280
34	72	19	3472-19-97	19-97	Nuclear Assurance Company	397123	813147	278
34	72	19	3472-19-98	19-98	Nuclear Assurance Company	397119	813192	280

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	72	19	3472-19-99	19-99	Nuclear Assurance Company	397303	813243	279
34	34	72	3472-19-M23	M-23	Uranium One	398153	814735	400
34	72	19	3472-19-RM-01C	RM-01C		397316.7	814296.8	
34	72	20	3472-20-1	20-1	Nuclear Assurance Company	402748	813833	500
34	72	21	3472-21-1	21-1	R.L. Peterson	407320	812700	600
34	72	21	3472-21-2	21-2	R.L. Peterson	412000	812700	600
34	72	23	3472-23-1	23-1	Nuclear Assurance Company	422216	814490	803
34	72	23	3472-23-2	23-2	Nuclear Assurance Company	420193	816862	797
34	72	23	3472-23-3	23-3	Nuclear Assurance Company	421885	817772	497
34	72	23	3472-23-4	23-4	Nuclear Assurance Company	418331	813467	497
34	72	26	3472-26-1	26-1	Nuclear Assurance Company	421818	810439	803
34	72	27	3472-27-1	27-1	Nuclear Assurance Company	413637	812372	797
34	72	28	3472-28-1	28-1	R.L. Peterson	406970	807720	600
34	72	28	3472-28-2	28-2	R.L. Peterson	411790	807840	600
34	72	28	3472-28-3	28-3	Nuclear Assurance Company	410074	812128	497
34	72	29	3472-29-1	29-1	R.L. Peterson	402200	807795	599
34	72	29	3472-29-4	29-4	Nuclear Assurance Company	404610	812502	500
34	72	29	3472-29-5	29-5	Nuclear Assurance Company	405998	811663	797
34	72	29	3472-29-OX-102-12	OX-102-12		404466	807413	
34	72	29	3472-29-OX-56-13	OX-56-13		401498	810309	
34	72	30	3472-30-1	30-1	R.L. Peterson	396200	810120	600
34	72	30	3472-30-1X	30-1X	Nuclear Assurance Company	398427	812400	597
34	72	30	3472-30-2X	30-2X	Nuclear Assurance Company	397616	811686	437
34	72	30	3472-30-3X	30-3X		396753	811285	620
34	72	30	3472-30-46-10	46-10		398897	810292	
34	72	32	3472-32OX-243-14	OX-243-14		405151	802909	
34	72	32	3472-32-QX-190-11	QX-190-11		405826	805553	
34	72	33	3472-33-1	33-1	Nuclear Assurance Company	410996	802829	802
34	72	33	3472-33-OX-253-15	OX-253-15		407748	802307	
34	72	34	3472-34-1	34-1	R.L. Peterson	415500	806880	595
34	72	34	3472-34-2	34-2	Nuclear Assurance Company	415327	807108	797
34	72	35	3472-35-1	35-1	Nuclear Assurance Company	417075	802312	795
34	72	35	3472-35-2	35-2	Nuclear Assurance Company	422217	806713	802
34	72	35	3472-35-3	35-3	Nuclear Assurance Company	421128	802361	196
34	72	35	3472-35-4	35-4	Nuclear Assurance Company	421355	803192	196
34	72	35	3472-35-5	35-5	Nuclear Assurance Company	422100	803251	797
34	72	35	3472-35-6	35-6	Nuclear Assurance Company	419087	804972	496
34	73	10	3473-10-1	1	Uranium One	380448.3573	823396.6972	802
34	73	10	3473-10-100	100	Uranium One	380448.3573	824196.6972	801
34	73	10	3473-10-101	101	Uranium One	380848	824196	792
34	73	10	3473-10-102	102	Uranium One	381248.3573	824196.6972	803
34	73	10	3473-10-103	103	Uranium One	381648.3573	824196.6972	797
34	73	10	3473-10-104	104	Uranium One	382048.3573	824196.6972	800
34	73	10	3473-10-105	105	Uranium One	382448.3573	824196.6972	803
34	73	10	3473-10-106	106	Uranium One	382448.3573	823796.6972	795
34	73	10	3473-10-107	107	Uranium One	382448.3573	823396.6972	703
34	73	10	3473-10-108	108	Uranium One	380448.3573	825796.6972	907
34	73	10	3473-10-109	109	Uranium One	380448.3573	827396.6972	904
34	73	10	3473-10-110	110	Uranium One	382048.3573	827396.6972	819
34	73	10	3473-10-111	111	Uranium One	382048.3573	825796.6972	897
34	73	10	3473-10-112	112	Uranium One	383648.3573	825796.6972	900
34	73	10	3473-10-113	113	Uranium One	383648.3573	827396.6972	900
34	73	10	3473-10-114	114	Uranium One	385248.3573	827396.6972	900
34	73	10	3473-10-115	115	Uranium One	385248.3573	825796.6972	900
34	73	10	3473-10-116	116	Uranium One	383648.3573	824196.6972	900
34	73	10	3473-10-117	117	Uranium One	385248.3573	824196.6972	906

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	10	3473-10-118	118	Uranium One	385248.3573	828196.6972	902
34	73	10	3473-10-119	119	Uranium One	383648.3573	828196.6972	901
34	73	10	3473-10-120	120	Uranium One	382048.3573	828196.6972	900
34	73	10	3473-10-121	121	Uranium One	380448.3573	828196.6972	900
34	73	10	3473-10-188	188	UNC Teton	384773.3	826965	588
34	73	10	3473-10-2	2	Uranium One	380448.3573	823796.6972	802
34	73	10	3473-10-3	3	Uranium One	380848.3573	823796.6972	802
34	73	10	3473-10-334	334		382142.3	823299.9	
34	73	10	3473-10-341	341	Uranium Resources INC.	383035.4	823376.9	646
34	73	10	3473-10-4	4	Uranium One	380848.3573	823396.6972	807
34	73	10	3473-10-59	59	UNC Teton	382992.4	823495	798
34	73	10	3473-10-Ace-12	M-12	Morrison Nuclear	384946	823574	503
34	73	10	3473-10-Ace-150	M-150	Morrison Nuclear	385673	827346	496
34	73	10	3473-10-Ace-27	M-27	Morrison Nuclear	380574	823332	498
34	73	10	3473-10-Ace-5A	M-5A	Morrison Nuclear	381877	825804	497
34	73	10	3473-10-LI-69-2	LI-69-2		384817	824117	
34	73	10	3473-10-LI-70-1	LI-70-1		384974	827431	
34	73	13	3473-13-SX-03	SX-03	UNC Teton	395520.1	822531.3	300
34	73	13	3473-13-SX-2A	SX-2A	UNC Teton	393993.7	818195.8	277
34	73	14	3473-14-?2	?2		388712.1	818592.6	
34	73	14	3473-14-1	1		388140.6	817919.6	
34	73	14	3473-14-10	10		387912	819261.7	
34	73	14	3473-14-10 Dup ID	10		389387.5	818700.6	
34	73	14	3473-14-100	100		387176.9	818325.6	
34	73	14	3473-14-1001	1001	Uranium One	389720	818490	791
34	73	14	3473-14-1002	1002	Uranium One	389820	818490	799
34	73	14	3473-14-1003	1003	Uranium One	389920	818490	794
34	73	14	3473-14-1004	1004	Uranium One	390020	818490	499
34	73	14	3473-14-1005	1005	Uranium One	390120	818490	789
34	73	14	3473-14-1006	1006	Uranium One	390120	818590	797
34	73	14	3473-14-1007	1007	Uranium One	389920	818590	499
34	73	14	3473-14-1008	1008	Uranium One	390120	818890	498
34	73	14	3473-14-1009	1009	Uranium One	389731.9734	818890.2347	497
34	73	14	3473-14-101	101		388181	820576.6	
34	73	14	3473-14-101 Dup ID	101		388872	819344	
34	73	14	3473-14-1010	1010	Uranium One	389331.9976	818889.9989	500
34	73	14	3473-14-1011	1011	Uranium One	390320	818590	496
34	73	14	3473-14-102	102		387007.4	818325.7	
34	73	14	3473-14-102 Dup ID	102		388285.3	819357	
34	73	14	3473-14-103	103		388165.9	820768.5	
34	73	14	3473-14-103 Dup ID	103		388470.1	819367.6	
34	73	14	3473-14-104	104		387009.8	818042.9	
34	73	14	3473-14-104 Dup ID	104		388662	819369.5	
34	73	14	3473-14-105	105		388142.4	818617.8	
34	73	14	3473-14-105 Dup ID	105		389300.1	818558.5	
34	73	14	3473-14-106	106		386811.6	818036.4	
34	73	14	3473-14-106 Dup ID	106		388292.8	819261	
34	73	14	3473-14-107	107		388365.5	820579.6	
34	73	14	3473-14-107 Dup ID	107		388975.3	819126.4	
34	73	14	3473-14-108	108		387986.7	820579.1	
34	73	14	3473-14-108 Dup ID	108		389298.4	818511.5	
34	73	14	3473-14-109	109		388134.2	818890.5	
34	73	14	3473-14-11	11		387919	819358.8	
34	73	14	3473-14-11 Dup ID-1	11		389194.7	818661.1	
34	73	14	3473-14-11 Dup ID-2	11		389547	818780.5	
34	73	14	3473-14-11?	11?		388295.9	819305.5	

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	14	3473-14-110	110		387948.2	818880.9	
34	73	14	3473-14-111	111		388543.2	820586.1	
34	73	14	3473-14-111 Dup ID	111		389014	818580.7	
34	73	14	3473-14-112	112		388074	820577.5	
34	73	14	3473-14-112 Dup ID	112		388975.5	819029.6	
34	73	14	3473-14-113	113		387953.7	818601.3	
34	73	14	3473-14-114	114		388137.2	820608.3	
34	73	14	3473-14-114 Dup ID	114		388888.3	819031.9	
34	73	14	3473-14-115	115		387786.8	818591.3	
34	73	14	3473-14-115 Dup ID	115		388298.7	819280.9	
34	73	14	3473-14-116	116		387886.7	818585.3	
34	73	14	3473-14-116 Dup ID	116		388993.1	818632.7	
34	73	14	3473-14-117	117		387212.4	818592.9	
34	73	14	3473-14-117 Dup ID	117		388937.4	819032.4	
34	73	14	3473-14-118	118		387286.3	818703.4	
34	73	14	3473-14-118 Dup ID	118		388721.8	818500.1	
34	73	14	3473-14-119	119		388207.2	819653.3	
34	73	14	3473-14-119 Dup ID	119		388606.74	818380.3	
34	73	14	3473-14-12	12		387713	819258.7	
34	73	14	3473-14-12 Dup ID-1	12		389137.6	818955.6	
34	73	14	3473-14-12 Dup ID-2	12		389471.8	818665.3	
34	73	14	3473-14-120	120		388383.4	820227.1	
34	73	14	3473-14-121	121		387985.4	819559.6	
34	73	14	3473-14-121 Dup ID	121		388428.9	818374.1	
34	73	14	3473-14-122	122		387305.2	819262.9	
34	73	14	3473-14-122 Dup ID	122		388404.2	818166.4	
34	73	14	3473-14-123	123		387937.8	820312.4	
34	73	14	3473-14-123 Dup ID	123		388608.7	818575.4	
34	73	14	3473-14-124	124		387594.2	819811.9	
34	73	14	3473-14-124 Dup ID	124		388517.5	818376.3	
34	73	14	3473-14-125	125		388494.7	818168.6	
34	73	14	3473-14-126	126		389734.9	818787.2	
34	73	14	3473-14-128	128		388604.7	818476.5	
34	73	14	3473-14-128 Dup ID	128		389737.4	818719	
34	73	14	3473-14-129	129		389289	818656.8	
34	73	14	3473-14-13	13		389265.8	819041.6	
34	73	14	3473-14-130	130		389631.3	818634.1	
34	73	14	3473-14-14	14		387714.3	819454.3	
34	73	14	3473-14-14 Dup ID	14		389259.7	818922.4	
34	73	14	3473-14-15	15		387927.5	819454.7	
34	73	14	3473-14-15 Dup ID	15		389655.4	818787.6	
34	73	14	3473-14-16	16		387713.2	819652	
34	73	14	3473-14-17	17		387925.5	819668.9	
34	73	14	3473-14-17 Dup ID	17		389393.2	818603.8	
34	73	14	3473-14-18	18		388018.6	819359.4	
34	73	14	3473-14-18 Dup ID	18		389564.5	818586.1	
34	73	14	3473-14-19	19		386603	819266.1	
34	73	14	3473-14-19 Dup ID	19		389739.4	818579	
34	73	14	3473-14-2	2		388651.8	819559.2	
34	73	14	3473-14-20	20		387710.4	820059.7	
34	73	14	3473-14-20 Dup ID	20		389638.4	818593.2	
34	73	14	3473-14-21	21		387708.9	820149.7	
34	73	14	3473-14-21 Dup ID	21		389773.3	818392.6	
34	73	14	3473-14-22	22		387712	819969.6	
34	73	14	3473-14-22 Dup ID	22		389749.7	818492.9	
34	73	14	3473-14-23	23		387623.5	820060.9	

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	14	3473-14-23 Dup ID	23		389860.9	818590.9	
34	73	14	3473-14-24	24		388029.3	819455.9	
34	73	14	3473-14-24 Dup ID	24		389837.1	818492.7	
34	73	14	3473-14-25	25		387050	819295.9	
34	73	14	3473-14-25 Dup ID	25		389840.6	818443	
34	73	14	3473-14-26	26		387971.1	819364.4	
34	73	14	3473-14-26 Dup ID	26		389854.6	818755.4	
34	73	14	3473-14-27	27		388073.4	819359.9	
34	73	14	3473-14-27 Dup ID	27		389921	818434.7	
34	73	14	3473-14-28	28		387624.7	820241.2	
34	73	14	3473-14-28 Dup ID	28		390100.5	818318.8	
34	73	14	3473-14-29	29		387270.8	819308.1	
34	73	14	3473-14-29 Dup ID	29		389837	818848.2	
34	73	14	3473-14-3	3		388652.2	819383.4	
34	73	14	3473-14-30	30		387806.3	820062.6	
34	73	14	3473-14-30 Dup ID	30		389858.3	818717.4	
34	73	14	3473-14-31	31		388127.1	819459.6	
34	73	14	3473-14-31 Dup ID	31		389947.2	818748.7	
34	73	14	3473-14-32	32		387627.2	820150.3	
34	73	14	3473-14-32 Dup ID	32		389918.2	818523.8	
34	73	14	3473-14-33	33		387539.9	820143.7	
34	73	14	3473-14-33 Dup ID	33		389811.5	818938.7	
34	73	14	3473-14-34	34		387501.6	819383.4	
34	73	14	3473-14-34 Dup ID	34		389945.4	818843.4	
34	73	14	3473-14-35	35		387385.6	819352.9	
34	73	14	3473-14-35 Dup ID	35		390019.6	818471.3	
34	73	14	3473-14-36	36		387550.1	820057.3	
34	73	14	3473-14-37	37		387806.1	820158.6	
34	73	14	3473-14-37 Dup ID	37		389945	818937	
34	73	14	3473-14-38	38		387904.8	820062.5	
34	73	14	3473-14-39	39		387445.9	819372.8	
34	73	14	3473-14-39 Dup ID	39		389848.7	818803.9	
34	73	14	3473-14-4	4		388456.3	819378.4	
34	73	14	3473-14-4 Dup ID	4		388974.3	818698.6	
34	73	14	3473-14-40	40		387444.4	819456.2	
34	73	14	3473-14-40 Dup ID	40		389918.8	818481.6	
34	73	14	3473-14-41	41		387445	819280.1	
34	73	14	3473-14-41 Dup ID	41		390120.4	818476.5	
34	73	14	3473-14-42	42		387984.1	819457.8	
34	73	14	3473-14-42 Dup ID	42		390143.7	818846.1	
34	73	14	3473-14-43	43		387592.5	820061.2	
34	73	14	3473-14-43 Dup ID	43		390052.4	818698.3	
34	73	14	3473-14-44	44		387508.7	820054.5	
34	73	14	3473-14-44 Dup ID	44		390216.7	818474.7	
34	73	14	3473-14-45	45		388076.6	819461.8	
34	73	14	3473-14-45 Dup ID	45		390109.2	818576.8	
34	73	14	3473-14-46	46		387627.5	820195.7	
34	73	14	3473-14-46 Dup ID	46		390244.4	818795	
34	73	14	3473-14-47	47		387633.3	820101.5	
34	73	14	3473-14-47 Dup ID	47		390155.2	818751.6	
34	73	14	3473-14-48	48		387808.9	820242.8	
34	73	14	3473-14-48 Dup ID	48		390056.1	818653.8	
34	73	14	3473-14-49	49		388032.5	819554	
34	73	14	3473-14-49 Dup ID	49		389945	818890.6	
34	73	14	3473-14-5	5		388657.6	819438.8	
34	73	14	3473-14-5 Dup ID	5		389396	818907.6	

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	14	3473-14-50	50		387354.1	819271.4	
34	73	14	3473-14-50 Dup ID	50		389948.7	818802	
34	73	14	3473-14-51	51		387447.7	819547.7	
34	73	14	3473-14-51 Dup ID	51		390221.9	818568.8	
34	73	14	3473-14-52	52		387360.2	819457	
34	73	14	3473-14-52 Dup ID	52		390110.7	818533.9	
34	73	14	3473-14-53	53		387536.7	819459.1	
34	73	14	3473-14-53 Dup ID	53		390219	818661.2	
34	73	14	3473-14-54	54		387402.4	819276.1	
34	73	14	3473-14-54 Dup ID	54		390395.2	818665.6	
34	73	14	3473-14-55	55		387550.7	819963.7	
34	73	14	3473-14-55 Dup ID	55		390139.3	818938.8	
34	73	14	3473-14-56	56		388034	819644.5	
34	73	14	3473-14-56 Dup ID	56		390046.6	818741.2	
34	73	14	3473-14-57	57		388081.8	819550.4	
34	73	14	3473-14-57 Dup ID	57		389735.7	818844.6	
34	73	14	3473-14-58	58		387543.4	819549.8	
34	73	14	3473-14-58 Dup ID-1	58		389826.6	818894	
34	73	14	3473-14-58 Dup ID-2	58		390044.9	818843.6	
34	73	14	3473-14-58 Dup ID-3	58		390151.5	818657.5	
34	73	14	3473-14-59	59		387403	819179.5	
34	73	14	3473-14-6	6		388100	819186.2	
34	73	14	3473-14-6 Dup ID-1	6		389172.7	818802.6	
34	73	14	3473-14-6 Dup ID-2	6		389466.9	818848.8	
34	73	14	3473-14-60	60		387403.6	819459.8	
34	73	14	3473-14-60 Dup ID	60		389661.2	818489	
34	73	14	3473-14-61	61		388122.6	819649.2	
34	73	14	3473-14-61 Dup ID	61		389724.4	818944.5	
34	73	14	3473-14-62	62		387504.9	819966.8	
34	73	14	3473-14-62 Dup ID	62		389969.3	818654.2	
34	73	14	3473-14-63	63		387632.8	819961.7	
34	73	14	3473-14-63 Dup ID	63		389639.9	818877.1	
34	73	14	3473-14-64	64		387310.4	819183.9	
34	73	14	3473-14-64 Dup ID-1	64		387374.4	818971.1	
34	73	14	3473-14-64 Dup ID-2	64		390047.8	818800.4	
34	73	14	3473-14-65	65		387497.3	819553.5	
34	73	14	3473-14-65 Dup ID	65		389678.5	818558.8	
34	73	14	3473-14-66	66		387498.8	819643	
34	73	14	3473-14-66 Dup ID	66		389731.9	818890.2	
34	73	14	3473-14-67	67		387492	819459.4	
34	73	14	3473-14-67 Dup ID	67		390044	818887.8	
34	73	14	3473-14-68	68		388126.9	819838.3	
34	73	14	3473-14-68 Dup ID	68		389648.7	818831.5	
34	73	14	3473-14-69	69		388070.3	819647.9	
34	73	14	3473-14-69 Dup ID	69		389548.3	818826.9	
34	73	14	3473-14-7	7		388083.4	819273.9	
34	73	14	3473-14-7 Dup ID	7		389281.4	818858.7	
34	73	14	3473-14-70	70		388167.1	819651.3	
34	73	14	3473-14-70 Dup ID	70		390021.9	818653.8	
34	73	14	3473-14-71	71		387359.9	819180	
34	73	14	3473-14-71 Dup ID	71		389673.7	818530.3	
34	73	14	3473-14-72	72		387374.4	818971.1	
34	73	14	3473-14-72 Dup ID	72		389597.6	818528.4	
34	73	14	3473-14-73	73		388304	819850.1	
34	73	14	3473-14-73C	73C		389839.2	818892.7	
34	73	14	3473-14-74	74		387455.6	819644	

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	14	3473-14-74 Dup ID	74		389156.1	818878.7	
34	73	14	3473-14-75	75		387551.4	819643.4	
34	73	14	3473-14-75 Dup ID	75		388960.9	818807.3	
34	73	14	3473-14-76	76		387331.8	818968.9	
34	73	14	3473-14-76 Dup ID	76		388692.6	818667.5	
34	73	14	3473-14-77	77		387802.3	820418.9	
34	73	14	3473-14-77 Dup ID	77		389549.1	818688.4	
34	73	14	3473-14-78	78		387726.6	820242.2	
34	73	14	3473-14-78 Dup ID	78		389555.8	818924.9	
34	73	14	3473-14-79	79		388216.4	819874.1	
34	73	14	3473-14-79 Dup ID	79		389153.3	818971.2	
34	73	14	3473-14-8	8		387910	819158.6	
34	73	14	3473-14-8 Dup ID	8		389337	818876	
34	73	14	3473-14-80	80		388201.3	820060.2	
34	73	14	3473-14-80 Dup ID	80		388683.5	818906.1	
34	73	14	3473-14-81	81		387347.4	818786.1	
34	73	14	3473-14-81 Dup ID	81		389477	818556.7	
34	73	14	3473-14-82	82		387801.6	820325.5	
34	73	14	3473-14-82 Dup ID	82		389577.5	818558.8	
34	73	14	3473-14-83	53		387679	820216.4	
34	73	14	3473-14-83 Dup ID	83		388680.5	819034.5	
34	73	14	3473-14-84	84		387411.8	819642.3	
34	73	14	3473-14-84 Dup ID	84		388719.6	817972.8	
34	73	14	3473-14-85	85		387254.5	818782.1	
34	73	14	3473-14-85 Dup ID	85		389800.2	818986.4	
34	73	14	3473-14-86	86		388373.8	820060.7	
34	73	14	3473-14-86 Dup ID	86		389558.7	818877.1	
34	73	14	3473-14-87	87		387804.8	820372.7	
34	73	14	3473-14-87 Dup ID	87		388676.5	819255.9	
34	73	14	3473-14-88	88		388292.5	820061.4	
34	73	14	3473-14-88 Dup ID	88		389483.1	818470	
34	73	14	3473-14-89	89		388288.3	820222.9	
34	73	14	3473-14-89 Dup ID	89		388461.8	817967.5	
34	73	14	3473-14-9	9		388089.6	819220.7	
34	73	14	3473-14-9 Dup ID-1	9		389363.5	818893.4	
34	73	14	3473-14-9 Dup ID-2	9		389369.4	818543.6	
34	73	14	3473-14-90	90		387806.9	820283.7	
34	73	14	3473-14-90 Dup ID	90		389486.2	818423.7	
34	73	14	3473-14-91	91		387990.7	820282.7	
34	73	14	3473-14-91 Dup ID	91		389402.8	818420.3	
34	73	14	3473-14-92	92		387307.1	818785.8	
34	73	14	3473-14-92 Dup ID	92		388316.2	817934	
34	73	14	3473-14-93	93		387311.8	818602	
34	73	14	3473-14-93 Dup ID	93		390027.7	818571.6	
34	73	14	3473-14-94	94		388385.9	817956.9	
34	73	14	3473-14-94 Dup ID	94		388461.2	820232.2	
34	73	14	3473-14-95	95		387987.6	820319	
34	73	14	3473-14-95 Dup ID	95		389398.9	818514.6	
34	73	14	3473-14-96	96		388179.2	820329.8	
34	73	14	3473-14-96 Dup ID	96		388668.1	819329	
34	73	14	3473-14-97	97		387499.9	819806.6	
34	73	14	3473-14-97 Dup ID	97		388879	819229.2	
34	73	14	3473-14-98	98		387267	818598	
34	73	14	3473-14-98 Dup ID	98		389309	818467.3	
34	73	14	3473-14-99	99		387270	818326	
34	73	14	3473-14-99 Dup ID	99		390083.7	818577.4	

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	14	3473-14-M-12	M-12	Uranium One	389889	818897	248
34	73	15	3473-15-100	100	UNC Teton	382070.9474	821969.0592	597
34	73	15	3473-15-1001	1001	Uranium One	381647.5341	821946.8618	661
34	73	15	3473-15-1002	1002	Uranium One	382852.3	823039.3	657
34	73	15	3473-15-1003	1003	Uranium One	383278.1	823035	638
34	73	15	3473-15-1004	1004	Uranium One	381597.5341	821896.8618	637
34	73	15	3473-15-1005	1005	Uranium One	382062.7649	822618.1625	801
34	73	15	3473-15-1006	1006	Uranium One	382452	822602	795
34	73	15	3473-15-1007	1007	Uranium One	382861.873	822615.038	801
34	73	15	3473-15-1008	1008	Uranium One	383254.6	822621	680
34	73	15	3473-15-1009	1009	Uranium One	381647.5341	821746.8618	635
34	73	15	3473-15-101	101	UNC Teton	381303.9075	823004.5732	699
34	73	15	3473-15-1010	1010	Uranium One	381664.3042	822613.4758	800
34	73	15	3473-15-1011	1011	Uranium One	382058.0781	822241.4487	796
34	73	15	3473-15-1012	1012	Uranium One	382418.0931	822233.9578	799
34	73	15	3473-15-1013	1013	Uranium One	381647.5341	821796.8618	801
34	73	15	3473-15-1014	1014	Uranium One	382001.8	821853.9	800
34	73	15	3473-15-1015	1015	Uranium One	382449.5	821854	797
34	73	15	3473-15-1016	1016	Uranium One	382858	821810	790
34	73	15	3473-15-1017	1017	Uranium One	381629.8038	822250.8022	798
34	73	15	3473-15-1018	1018	Uranium One	381747.5341	821796.8618	638
34	73	15	3473-15-1019	1019	Uranium One	381547.5341	821796.8618	638
34	73	15	3473-15-102	102	UNC Teton	381867.2717	822465.6678	619
34	73	15	3473-15-1020	1020	Uranium One	381647.5341	821896.8618	640
34	73	15	3473-15-1021	1021	Uranium One	381647.5341	821696.8618	639
34	73	15	3473-15-1022	1022	Uranium One	381247.5341	821796.8618	658
34	73	15	3473-15-1023	1023	Uranium One	381247.5341	821396.8618	659
34	73	15	3473-15-1024	1024	Uranium One	380847.5341	821396.8618	656
34	73	15	3473-15-1025	1025	Uranium One	380849	821790	685
34	73	15	3473-15-1026	1026	Uranium One	380847.5341	822196.8618	681
34	73	15	3473-15-1027	1027	Uranium One	380847.5341	820996.8618	636
34	73	15	3473-15-1028	1028	Uranium One	381247	820996	633
34	73	15	3473-15-1029	1029	Uranium One	381647.5341	820996.8618	639
34	73	15	3473-15-103	103	UNC Teton	382133.9	823378.5	716
34	73	15	3473-15-1030	1030	Uranium One	380847.534	820596.8618	653
34	73	15	3473-15-1031	1031	Uranium One	381247.5341	820596.8618	656
34	73	15	3473-15-1032	1032	Uranium One	381647.5341	820596.8618	251
34	73	15	3473-15-1033	1033	Uranium One	381597.5341	821796.8618	636
34	73	15	3473-15-1034	1034	Uranium One	381597.5341	821746.8618	641
34	73	15	3473-15-1035	1035	Uranium One	381697.5341	821796.8618	635
34	73	15	3473-15-1036	1036	Uranium One	381697.5341	821746.8618	640
34	73	15	3473-15-1037	1037	Uranium One	382858	821860	600
34	73	15	3473-15-1038	1038	Uranium One	382908	821860	654
34	73	15	3473-15-1039	1039	Uranium One	382908	821810	596
34	73	15	3473-15-104	104	UNC Teton	382406.8316	822652.9695	638
34	73	15	3473-15-1040	1040	Uranium One	381597.5341	821846.8618	640
34	73	15	3473-15-1041	1041	Uranium One	381697.5341	821846.8618	633
34	73	15	3473-15-1042	1042	Uranium One	382502	822602	620
34	73	15	3473-15-1043	1043	Uranium One	382502	822652	619
34	73	15	3473-15-1044	1044	Uranium One	382452	822652	627
34	73	15	3473-15-1045	1045	Uranium One	382911.873	822615.038	615
34	73	15	3473-15-1046	1046	Uranium One	382911.873	822665.038	618
34	73	15	3473-15-1047	1047	Uranium One	382861.873	822665.038	615
34	73	15	3473-15-1048	1048	Uranium One	382858	821910	595
34	73	15	3473-15-1049	1049	Uranium One	382908	821910	599
34	73	15	3473-15-105	105	UNC Teton	382753.5721	823124.078	638

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	15	3473-15-1050	1050	Uranium One	382958	821910	638
34	73	15	3473-15-1051	1051	Uranium One	382958	821860	607
34	73	15	3473-15-1052	1052	Uranium One	382958	821810	603
34	73	15	3473-15-1053	1053	Uranium One	382958	821760	604
34	73	15	3473-15-1054	1054	Uranium One	382908	821760	599
34	73	15	3473-15-1055	1055	Uranium One	382858	821760	599
34	73	15	3473-15-1056C#2	1056C	Uranium One	381656.4342	821911.3152	639
34	73	15	3473-15-1057	1057	Uranium One	385566.41	823181.49	903
34	73	15	3473-15-1058	1058	Uranium One	385566.41	821581.49	904
34	73	15	3473-15-1059	1059	Uranium One	385566.41	819981.49	906
34	73	15	3473-15-106	106	UNC Teton	382172.9268	823191.1785	678
34	73	15	3473-15-1060	1060	Uranium One	385566.41	818381.49	895
34	73	15	3473-15-1061	1061	Uranium One	383966.41	818381.49	903
34	73	15	3473-15-1062	1062	Uranium One	383966	819981	902
34	73	15	3473-15-1063	1063	Uranium One	382366.41	819981.49	900
34	73	15	3473-15-1064	1064	Uranium One	382366.41	818381.49	899
34	73	15	3473-15-1065	1065	Uranium One	380766.41	818381.49	899
34	73	15	3473-15-1066	1066	Uranium One	381247.5341	821996.8618	639
34	73	15	3473-15-1067	1067	Uranium One	381047.5	821796.8	643
34	73	15	3473-15-1068	1068	Uranium One	380847.5341	821596.8618	640
34	73	15	3473-15-1069	1069	Uranium One	380766.41	819181.49	701
34	73	15	3473-15-107	107	UNC Teton	381822.2238	823054.1633	698
34	73	15	3473-15-1070	1070	Uranium One	380766.41	819581.49	702
34	73	15	3473-15-108	108	UNC Teton	380675.8426	823184.7871	799
34	73	15	3473-15-109	109	UNC Teton	382174.0586	823092.6956	658
34	73	15	3473-15-110	110	UNC Teton	382585.9376	822740.5108	639
34	73	15	3473-15-111	111	UNC Teton	382632.2553	822237.4216	638
34	73	15	3473-15-112	112	UNC Teton	381824.8523	822958.4891	659
34	73	15	3473-15-113	113	UNC Teton	381262.0417	823025.8789	676
34	73	15	3473-15-114	114	UNC Teton	382782.7202	822740.1329	638
34	73	15	3473-15-115	115	UNC Teton	382813.5292	821741.1177	618
34	73	15	3473-15-116	116	UNC Teton	382371.9679	822001.5846	598
34	73	15	3473-15-117	117	UNC Teton	382979.248	822744.4373	638
34	73	15	3473-15-118	118	UNC Teton	382376.9206	821700.777	596
34	73	15	3473-15-121	121	UNC Teton	383151.9776	822738.4859	619
34	73	15	3473-15-122	122		382382.8612	821500.3593	
34	73	15	3473-15-123	123	UNC Teton	382221.9616	822571.9261	618
34	73	15	3473-15-124	124	UNC Teton	382996.4096	822560.827	637
34	73	15	3473-15-125	125	UNC Teton	382975.348	822930.973	638
34	73	15	3473-15-301C	301C	Uranium Resources INC.	382110.0073	821975.7008	571
34	73	15	3473-15-302	302	Uranium Resources INC.	381674.5938	822069.5608	627
34	73	15	3473-15-303	303		381674.6237	821982.7132	
34	73	15	3473-15-304	304	Uranium Resources INC.	382024.2229	822462.926	625
34	73	15	3473-15-305	305	Uranium Resources INC.	381914.7959	822133.8691	613
34	73	15	3473-15-306	306	Uranium Resources INC.	381877.3363	821985.6634	628
34	73	15	3473-15-307	307	Uranium Resources INC.	382221.5723	821988.2344	608
34	73	15	3473-15-308	308	Uranium Resources INC.	382352.481	822146.4151	600
34	73	15	3473-15-309	309	Uranium Resources INC.	382574.5161	822071.8172	636
34	73	15	3473-15-310	310	Uranium Resources INC.	383272.5686	822884.3233	607
34	73	15	3473-15-311	311	Uranium Resources INC.	383245.4188	822728.9979	608
34	73	15	3473-15-312	312		382006.4865	822107.7861	
34	73	15	3473-15-313	313	Uranium Resources INC.	382284.0384	822068.2381	607
34	73	15	3473-15-314	314	Uranium Resources INC.	382085.3585	822400.8937	618
34	73	15	3473-15-315	315	Uranium Resources INC.	380442.6224	822950.8632	772
34	73	15	3473-15-318	318	Uranium Resources INC.	380642.7171	822952.7728	753
34	73	15	3473-15-321	321	Uranium Resources INC.	380803.0542	822957.9502	744

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	15	3473-15-322	322		380829.2488	822862.0484	
34	73	15	3473-15-324	324	Uranium Resources INC.	381489.1386	823042.3124	654
34	73	15	3473-15-325	325	Uranium Resources INC.	381484.9231	823003.3068	670
34	73	15	3473-15-326	326	Uranium Resources INC.	381700.7242	823053.207	672
34	73	15	3473-15-327	327	Uranium Resources INC.	381634.722	822965.3902	663
34	73	15	3473-15-328	328	Uranium Resources INC.	381625.2435	822864.0467	670
34	73	15	3473-15-330	330	Uranium Resources INC.	382007.774	823029.2408	641
34	73	15	3473-15-331	331	Uranium Resources INC.	382027.2582	822934.4044	652
34	73	15	3473-15-332	332	Uranium Resources INC.	382072.7551	822813.097	655
34	73	15	3473-15-333	333	Uranium Resources INC.	382174.5015	822805.0604	627
34	73	15	3473-15-335	335	Uranium Resources INC.	382224.1146	822953.2044	628
34	73	15	3473-15-336	336	Uranium Resources INC.	382386.451	823242.9262	635
34	73	15	3473-15-337	337	Uranium Resources INC.	382389.2297	823156.8744	625
34	73	15	3473-15-339	339	Uranium Resources INC.	382916.5315	823222.1648	627
34	73	15	3473-15-340	340	Uranium Resources INC.	382998.4431	823166.5762	630
34	73	15	3473-15-356	356	Uranium Resources INC.	383325.5799	823149.5568	649
34	73	15	3473-15-357	357	Uranium Resources INC.	383394.4742	823072.3516	642
34	73	15	3473-15-359	359	Uranium Resources INC.	383142.3146	822554.161	600
34	73	15	3473-15-360	360	Uranium Resources INC.	383016.1522	822455.7969	595
34	73	15	3473-15-361	361	Uranium Resources INC.	382897.1272	822565.2671	595
34	73	15	3473-15-362	362	Uranium Resources INC.	382586.8946	822665.0928	608
34	73	15	3473-15-363	363	Uranium Resources INC.	382395.4839	822590.7331	626
34	73	15	3473-15-364	364	Uranium Resources INC.	382209.2106	822529.5613	618
34	73	15	3473-15-365	365	Uranium Resources INC.	381987.215	822527.7045	613
34	73	15	3473-15-366	366	Uranium Resources INC.	381942.255	822474.6674	615
34	73	15	3473-15-367	367	Uranium Resources INC.	381808.5325	822178.1505	623
34	73	15	3473-15-368	368	Uranium Resources INC.	381776.7568	821893.9157	612
34	73	15	3473-15-369	369	Uranium Resources INC.	382153.6394	821930.4541	597
34	73	15	3473-15-370	370	Uranium Resources INC.	382237.3956	822157.1819	603
34	73	15	3473-15-371	371	Uranium Resources INC.	382368.1548	821925.4968	597
34	73	15	3473-15-372	372	Uranium Resources INC.	382479.8702	821999.384	596
34	73	15	3473-15-373	373	Uranium Resources INC.	382620.6703	821815.1829	594
34	73	15	3473-15-374	374	Uranium Resources INC.	382720.7392	821791.5546	600
34	73	15	3473-15-375	375	Uranium Resources INC.	382526.2001	821699.5998	595
34	73	15	3473-15-376	376	Uranium Resources INC.	382545.2019	821609.083	594
34	73	15	3473-15-377	377	Uranium Resources INC.	382574.2138	821504.0361	596
34	73	15	3473-15-378	378	Uranium Resources INC.	382386.7454	821616.0049	598
34	73	15	3473-15-379	379	Uranium Resources INC.	382164.2893	821729.4221	616
34	73	15	3473-15-380	380	Uranium Resources INC.	382155.4664	821620.493	608
34	73	15	3473-15-382	382	Uranium Resources INC.	381917.4463	821627.7379	607
34	73	15	3473-15-383	383	Uranium Resources INC.	381747.882	821621.7102	610
34	73	15	3473-15-385	385	Uranium Resources INC.	381361.6238	821530.5049	630
34	73	15	3473-15-391	391	Uranium Resources INC.	380577.0286	821431.5478	650
34	73	15	3473-15-393	393	Uranium Resources INC.	381029.289	822614.0442	670
34	73	15	3473-15-395	395	Uranium Resources INC.	381094.8045	822417.5091	690
34	73	15	3473-15-397	397	Uranium Resources INC.	381141.9833	822226.2564	654
34	73	15	3473-15-398	398	Uranium Resources INC.	382579.3222	822842.2194	609
34	73	15	3473-15-399	399	Uranium Resources INC.	382593.8773	822573.711	607
34	73	15	3473-15-400	400	Uranium Resources INC.	382963.1796	823038.959	629
34	73	15	3473-15-401	401	Uranium Resources INC.	383194.4999	822971.3186	630
34	73	15	3473-15-402	402	Uranium Resources INC.	381751.5571	821669.549	616
34	73	15	3473-15-403	403	Uranium Resources INC.	382695.6915	821941.2684	616
34	73	15	3473-15-404	404	Uranium Resources INC.	382418.8602	822511.912	644
34	73	15	3473-15-405	405	Uranium Resources INC.	382561.7967	823194.7808	640
34	73	15	3473-15-406	406	Uranium Resources INC.	382018.9107	822986.1095	650
34	73	15	3473-15-407	407	Uranium Resources INC.	383154.3784	823168.1079	616

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	15	3473-15-408	408	Uranium Resources INC.	382962.3113	823085.799	627
34	73	15	3473-15-409	409	Uranium Resources INC.	382899.6792	821889.0865	655
34	73	15	3473-15-410	410	Uranium Resources INC.	383250.9445	823051.1754	603
34	73	15	3473-15-411	411	Uranium Resources INC.	382379.9287	823095.1752	629
34	73	15	3473-15-412	412	Uranium Resources INC.	381883.5563	822240.948	630
34	73	15	3473-15-413	413	Uranium Resources INC.	382127.1777	822804.5875	655
34	73	15	3473-15-414	414	Uranium Resources INC.	382116.077	822368.3182	632
34	73	15	3473-15-415	415	Uranium Resources INC.	381779.4793	822477.5883	656
34	73	15	3473-15-416	416	Uranium Resources INC.	382517.8728	821749.2968	582
34	73	15	3473-15-417	417	Uranium Resources INC.	383003.2131	822507.8014	610
34	73	15	3473-15-418	418	Uranium Resources INC.	382305.9858	822617.3315	605
34	73	15	3473-15-419	419	Uranium Resources INC.	382379.1343	821658.8749	597
34	73	15	3473-15-42	42		380447.8753	820221.4784	
34	73	15	3473-15-420	420	Uranium Resources INC.	382716.9983	823094.3306	614
34	73	15	3473-15-421C	421C	Uranium Resources INC.	383150.5408	822711.2239	608
34	73	15	3473-15-422	422	Uranium Resources INC.	383217.5915	822923.8097	612
34	73	15	3473-15-423	423	Uranium Resources INC.	383320.5673	822891.8685	608
34	73	15	3473-15-424	424		381718.552	822007.0379	
34	73	15	3473-15-425	425	Uranium Resources INC.	380638.8935	823055.8995	752
34	73	15	3473-15-426	426	Uranium Resources INC.	380448.3573	822996.6972	754
34	73	15	3473-15-427	427	Uranium Resources INC.	382203.6673	822477.5049	618
34	73	15	3473-15-428	428	Uranium Resources INC.	382201.0107	821854.4892	602
34	73	15	3473-15-429	429	Uranium Resources INC.	382561.592	823020.9282	614
34	73	15	3473-15-430	430	Uranium Resources INC.	380639.5307	823004.9729	750
34	73	15	3473-15-432	432	Uranium Resources INC.	381992.3778	822586.8971	644
34	73	15	3473-15-433	433	Uranium Resources INC.	383390.3668	821769.2913	654
34	73	15	3473-15-434	434	Uranium Resources INC.	381758.741	822167.8383	624
34	73	15	3473-15-441	441	Uranium Resources INC.	380546.289	821185.9039	642
34	73	15	3473-15-443	443	Uranium Resources INC.	381357.7211	820968.4028	595
34	73	15	3473-15-444	444		380464.3673	820134.0947	
34	73	15	3473-15-445	445	Uranium Resources INC.	380536.3649	821056.3638	623
34	73	15	3473-15-446	446	Uranium Resources INC.	381363.2346	821265.3535	595
34	73	15	3473-15-447	447		381129.6659	820128.5921	
34	73	15	3473-15-448	448	Uranium Resources INC.	381361.6238	821398.8503	593
34	73	15	3473-15-449	449	Uranium Resources INC.	381367.081	821334.526	575
34	73	15	3473-15-450	450		380843.9611	820132.4487	
34	73	15	3473-15-451	451	Uranium Resources INC.	382750.564	822615.7493	625
34	73	15	3473-15-452	452	Uranium Resources INC.	380534.7392	821001.2316	595
34	73	15	3473-15-453	453		380678.9176	820132.4487	
34	73	15	3473-15-454	454	Uranium Resources INC.	380546.9498	821128.404	575
34	73	15	3473-15-455	455		380573.2885	820135.7408	
34	73	15	3473-15-456	456		381491.7047	820955.1755	
34	73	15	3473-15-457	457	Uranium Resources INC.	380542.9804	821088.749	575
34	73	15	3473-15-47	47	UNC Teton	380521.8968	820926.4054	1069
34	73	15	3473-15-60	60	UNC Teton	382334.7684	820927.9432	
34	73	15	3473-15-61	61	UNC Teton	380477.2344	820043.0255	
34	73	15	3473-15-62	62	UNC Teton	381122.7697	820910.56	597
34	73	15	3473-15-63	63	UNC Teton	380458.4236	820630.8927	
34	73	15	3473-15-64	64	UNC Teton	380466.9724	822433.4932	654
34	73	15	3473-15-67	67	UNC Teton	381734.7672	820954.3393	554
34	73	15	3473-15-69	69		380436.8945	820360.1851	
34	73	15	3473-15-70	70	UNC Teton	381618.2941	820946.8953	539
34	73	15	3473-15-71	71	UNC Teton	381772.7066	822253.3676	636
34	73	15	3473-15-73	73	UNC Teton	381959.6495	822293.8197	635
34	73	15	3473-15-74	74	UNC Teton	381926.5812	821529.0695	619
34	73	15	3473-15-75	75	UNC Teton	381333.5381	823178.208	679

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	15	3473-15-78	78	UNC Teton	381753.5132	821519.4125	595
34	73	15	3473-15-79	79	UNC Teton	382057.5224	822311.0693	619
34	73	15	3473-15-80	80	UNC Teton	381006.9998	822898.3371	717
34	73	15	3473-15-81	81	UNC Teton	381849.0845	821855.1891	591
34	73	15	3473-15-82	82	UNC Teton	382163.2225	822337.5431	614
34	73	15	3473-15-83	83	UNC Teton	381861.9683	822272.172	618
34	73	15	3473-15-84	84	UNC Teton	381510.2213	822669.5813	638
34	73	15	3473-15-85	85	UNC Teton	382053.9097	821855.3196	590
34	73	15	3473-15-86	86	UNC Teton	381057.1252	822801.3601	719
34	73	15	3473-15-87	87	UNC Teton	381660.8445	822770.0434	659
34	73	15	3473-15-88	88	UNC Teton	381748.7133	821841.1683	597
34	73	15	3473-15-89	89	UNC Teton	382252.9525	821880.6409	597
34	73	15	3473-15-90	90	UNC Teton	381199.5238	823057.0967	698
34	73	15	3473-15-91	91	UNC Teton	381830.494	822854.1572	699
34	73	15	3473-15-92	92	UNC Teton	382091.1057	822082.6781	619
34	73	15	3473-15-93	93	UNC Teton	382511.0193	821895.3755	598
34	73	15	3473-15-94	94	UNC Teton	382182.139	823001.9269	696
34	73	15	3473-15-95	95	UNC Teton	381406.3623	822926.0342	677
34	73	15	3473-15-96	96	UNC Teton	382390.8721	823047.5679	659
34	73	15	3473-15-97	97	UNC Teton	381987.7923	822614.9957	637
34	73	15	3473-15-98	98	UNC Teton	382392.9653	822845.1155	628
34	73	15	3473-15-99	99	UNC Teton	382574.5671	823067.6914	658
34	73	15	3473-15-LMO-2	LMO-2	Uranium One	382846.4771	822715.4178	423
34	73	15	3473-15-LMO-2A	LMO-2A	Uranium One	382848.4535	822564.7971	261
34	73	15	3473-15-LMP-5	LMP-5	Uranium One	382852.3756	823089.3006	601
34	73	15	3473-15-LMU-2	LMU-2	Uranium One	382876.4771	822715.4178	637
34	73	15	3473-15-LMU-2A	LMU-2A	Uranium One	382878.4535	822564.7971	800
34	73	15	3473-15-LPW-3	LPW-3	Uranium One	382861.4771	822715.4178	601
34	73	15	3473-15-LPW-3A	LPW-3A	Uranium One	382863.4535	822564.7971	595
34	73	15	3473-15-M-11	M-11	Uranium One	382850	821950	570
34	73	15	3473-15-M-18	M-18	Uranium One	384628.9147	822109.1079	518
34	73	15	3473-15-M-21	M-21	Uranium One	383286.9032	820371.1254	536
34	73	15	3473-15-M-44	M-44	Uranium One	382052.165	818477.9211	525
34	73	15	3473-15-NPMW1	NPMW1	Uranium Resources INC.	383157.1132	822934.7943	627
34	73	15	3473-15-NPMW2	NPMW2	Uranium Resources INC.	383331.2234	822841.004	579
34	73	15	3473-15-NPMW3	NPMW3	Uranium Resources INC.	383332.5837	822637.6955	598
34	73	15	3473-15-NPMW4	NPMW4	Uranium Resources INC.	383158.6344	822549.0284	576
34	73	15	3473-15-NPMW5	NPMW5	Uranium Resources INC.	382987.6429	822627.9112	579
34	73	15	3473-15-NPMW6	NPMW6	Uranium Resources INC.	382982.3843	822832.9789	580
34	73	15	3473-15-UID1	UID1		383135.6992	822762.8779	
34	73	15	3473-15-UID2	UID2		383161.0738	822765.2692	
34	73	15	3473-15-UID3	UID3		383184.5337	822762.8779	
34	73	15	3473-15-UID4	UID4		383168.7341	822736.5728	
34	73	15	3473-15-UID5	UID5		383179.2671	822722.7027	
34	73	15	3473-15-UID6	UID6		383190.758	822712.1807	
34	73	15	3473-15-UID7	UID7		383135.6992	822709.7894	
34	73	15	3473-15-UID8	UID8		383162.0317	822691.1363	
34	73	15	3473-15-UID9	UID9		383151.4987	822724.6158	
34	73	16	3473-16-1	K1	Kerr McGee	379677.4	818715.3	655
34	73	16	3473-16-1001	1001	Uranium One	380048.3573	822996.6972	635
34	73	16	3473-16-1002	1002	Uranium One	378448.3573	822996.6972	1001
34	73	16	3473-16-1003	1003	Uranium One	376848.3573	822996.6972	1006
34	73	16	3473-16-1004	1004	Uranium One	375248.3573	822996.6972	1000
34	73	16	3473-16-1005	1005	Uranium One	375248.3573	821396.6972	1000
34	73	16	3473-16-1006	1006	Uranium One	376848.3573	821396.6972	1000
34	73	16	3473-16-1007	1007	Uranium One	378448.3573	821396.6972	848

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	16	3473-16-1008	1008	Uranium One	380048.3573	821396.6972	999
34	73	16	3473-16-1009	1009	Uranium One	380048.3573	819796.6972	998
34	73	16	3473-16-1010	1010	Uranium One	378448.3573	819796.6972	991
34	73	16	3473-16-1011	1011	Uranium One	376848.3573	819796.6972	955
34	73	16	3473-16-1012	1012	Uranium One	375248.3573	819796.6972	1000
34	73	16	3473-16-1013	1013	Uranium One	375248.3573	818196.6972	993
34	73	16	3473-16-1014	1014	Uranium One	376848.3573	818196.6972	999
34	73	16	3473-16-1015	1015	Uranium One	378448.3573	818196.6972	1000
34	73	16	3473-16-1016	1016	Uranium One	380048.3573	818196.6972	1001
34	73	16	3473-16-1017	1017	Uranium One	378448.3573	820996.6972	641
34	73	16	3473-16-1018	1018	Uranium One	378048.3573	821396.6972	626
34	73	16	3473-16-1019	1019	Uranium One	378448.3573	821796.6972	637
34	73	16	3473-16-1020	1020	Uranium One	378848.3573	821396.6972	637
34	73	16	3473-16-1021	1021	Uranium One	380048.3573	821196.6972	602
34	73	16	3473-16-1022	1022	Uranium One	380025	821592.9959	599
34	73	16	3473-16-1023	1023	Uranium One	379848.3573	821396.6972	597
34	73	16	3473-16-1024	1024	Uranium One	380248.3573	821396.6972	598
34	73	16	3473-16-1025	1025	Uranium One	380048.5684	823050.0445	797
34	73	16	3473-16-1026	1026	Uranium One	378448.3573	821996.6972	677
34	73	16	3473-16-1028	1028	Uranium One	379848.3573	817996.6972	600
34	73	16	3473-16-1029	1029	Uranium One	379648.3573	818191.6972	600
34	73	16	3473-16-1030	1030	Uranium One	379848.3573	818196.6972	599
34	73	16	3473-16-1031	1031	Uranium One	376058	818176	534
34	73	16	3473-16-1032	1032	Uranium One	376058	819776	679
34	73	16	3473-16-1033	1033	Uranium One	376058	818976	581
34	73	16	3473-16-1034	1034	Uranium One	377658	819776	700
34	73	16	3473-16-1035	1035	Uranium One	378548.3573	821996.6972	700
34	73	16	3473-16-1037	1037	Uranium One	378348.3573	821996.6972	699
34	73	16	3473-16-1038	1038	Uranium One	378348.3573	822096.6972	695
34	73	16	3473-16-1040	1040	Uranium One	378548.3573	822096.6972	701
34	73	16	3473-16-1041	1041	Uranium One	378348.3573	819696.6972	597
34	73	16	3473-16-1042	1042	Uranium One	378548.3573	819696.6972	595
34	73	16	3473-16-1043	1043	Uranium One	378548.3573	819896.6972	595
34	73	16	3473-16-1044	1044	Uranium One	378348.3573	819896.6972	596
34	73	16	3473-16-1045	1045	Uranium One	380048.3573	819996.6972	617
34	73	16	3473-16-1046	1046	Uranium One	380248.3573	819996.6972	616
34	73	16	3473-16-1047	1047	Uranium One	380248.3573	820196.6972	617
34	73	16	3473-16-1048	1048	Uranium One	380048.3573	820196.6972	641
34	73	16	3473-16-1049	1049	Uranium One	378848	822396	635
34	73	16	3473-16-1050	1050	Uranium One	379048	822396	599
34	73	16	3473-16-1051	1051	Uranium One	378848	822596	647
34	73	16	3473-16-1052	1052	Uranium One	379048	822596	637
34	73	16	3473-16-1053	1053	Uranium One	378398.3	822046.6	663
34	73	16	3473-16-1054	1054	Uranium One	378448.3	822046.6	622
34	73	16	3473-16-1055	1055	Uranium One	378498.3573	822046.6972	619
34	73	16	3473-16-1056	1056	Uranium One	378498.3573	821996.6972	640
34	73	16	3473-16-1057	1057	Uranium One	378498.3573	821946.6972	616
34	73	16	3473-16-1058	1058	Uranium One	378448.3573	821946.6972	617
34	73	16	3473-16-1059	1059	Uranium One	378398.3573	821946.6972	619
34	73	16	3473-16-1060	1060	Uranium One	378398	821996	623
34	73	16	3473-16-1061	1061	Uranium One	380366.41	819181.49	698
34	73	16	3473-16-1062	1062	Uranium One	378548.3573	822196.6972	704
34	73	16	3473-16-1063	1063	Uranium One	378648.3573	822196.6972	704
34	73	16	3473-16-1064	1064	Uranium One	378648.3573	822096.6972	702
34	73	16	3473-16-1065	1065	Uranium One	377639	821293	705
34	73	16	3473-16-1066	1066	Uranium One	379248.3573	821396.6972	744

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	16	3473-16-1067	1067	Uranium One	379448	822596	700
34	73	16	3473-16-1068	1068	Uranium One	379648	822596	700
34	73	16	3473-16-1069	1069	Uranium One	379648	822796	707
34	73	16	3473-16-1070	1070	Uranium One	379448	822796	705
34	73	16	3473-16-1071	1071	Uranium One	380048.3573	820996.6972	700
34	73	16	3473-16-1072	1072	Uranium One	380248.3573	820996.6972	702
34	73	16	3473-16-1073	1073	Uranium One	380248.3573	820796.6972	697
34	73	16	3473-16-1074	1074	Uranium One	380048.3573	820796.6972	702
34	73	16	3473-16-1075	1075	Uranium One	378848.3	818196.6	702
34	73	16	3473-16-1076	1076	Uranium One	379048.3	818196.6	702
34	73	16	3473-16-1077	1077	Uranium One	379048.3	818396.6	703
34	73	16	3473-16-1078	1078	Uranium One	378848.3	818396.6	703
34	73	16	3473-16-1079	1079	Uranium One	379448	822496	704
34	73	16	3473-16-1080	1080	Uranium One	379598	822496	705
34	73	16	3473-16-1081	1081	Uranium One	379648	822496	700
34	73	16	3473-16-1082	1082	Uranium One	379548	822596	700
34	73	16	3473-16-1083	1083	Uranium One	377539	821293	703
34	73	16	3473-16-1084	1084	Uranium One	377539	821193	703
34	73	16	3473-16-1085	1085	Uranium One	377639	821193	703
34	73	16	3473-16-1086	1086	Uranium One	379441	822962	706
34	73	16	3473-16-1087	1087	Uranium One	379641	822962	702
34	73	16	3473-16-1088	1088	Uranium One	377441	820598	702
34	73	16	3473-16-1089	1089	Uranium One	377641	820598	703
34	73	16	3473-16-1090	1090	Uranium One	377641	820798	702
34	73	16	3473-16-1091	1091	Uranium One	377441	820798	703
34	73	16	3473-16-1092	1092	Uranium One	379648	822396	705
34	73	16	3473-16-1093	1093	Uranium One	379748	822396	702
34	73	16	3473-16-1094	1094	Uranium One	379748	822496	703
34	73	16	3473-16-1095	1095	Uranium One	379748	822596	706
34	73	16	3473-16-1096	1096	Uranium One	377339	821193	702
34	73	16	3473-16-1097	1097	Uranium One	377339	821293	702
34	73	16	3473-16-1098	1098	Uranium One	377648.3573	821596.6972	702
34	73	16	3473-16-1099	1099	Uranium One	377848.3573	821596.6972	701
34	73	16	3473-16-1100	1100	Uranium One	378048.3573	821596.6972	702
34	73	16	3473-16-1102	1102	Uranium One	378248.3573	821796.6972	704
34	73	16	3473-16-1103	1103	Uranium One	377848.3	821796.6	701
34	73	16	3473-16-1104	1104	Uranium One	377648.3	821796.6	701
34	73	16	3473-16-1105	1105	Uranium One	377648.3573	820396.6972	705
34	73	16	3473-16-1106	1106	Uranium One	377648.3573	819996.6972	700
34	73	16	3473-16-1107	1107	Uranium One	377248.3573	819996.6972	1005
34	73	16	3473-16-1108	1108	Uranium One	377248	820350	701
34	73	16	3473-16-1109	1109	Uranium One	377539	821393	704
34	73	16	3473-16-1110	1110	Uranium One	377639	821393	701
34	73	16	3473-16-1111	1111	Uranium One	377539	821493	704
34	73	16	3473-16-1112	1112	Uranium One	377639	821493	702
34	73	16	3473-16-1113	1113	Uranium One	377739	821493	707
34	73	16	3473-16-1114	1114	Uranium One	377048.3573	819896.6972	708
34	73	16	3473-16-1115	1115	Uranium One	376948.3573	820196.6972	706
34	73	16	3473-16-1116	1116	Uranium One	377248.3573	820196.6972	704
34	73	16	3473-16-1117	1117	Uranium One	377048.3573	820396.6972	705
34	73	16	3473-16-1118	1118	Uranium One	378048.3573	821796.6972	705
34	73	16	3473-16-1119	1119	Uranium One	377339	821393	702
34	73	16	3473-16-1121	1121	Uranium One	377139	821293	702
34	73	16	3473-16-1122	1122	Uranium One	377139	821193	704
34	73	16	3473-16-1123	1123	Uranium One	377081	820798	706
34	73	16	3473-16-1124	1124	Uranium One	377241	820798	702

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	16	3473-16-1125	1125	Uranium One	377241	820598	705
34	73	16	3473-16-1126	1126	Uranium One	377041	820598	702
34	73	16	3473-16-1127	1127	Uranium One	376648.3573	819796.6972	706
34	73	16	3473-16-1128	1128	Uranium One	377048.3573	819796.6972	707
34	73	16	3473-16-M-10	M-10	Uranium One	380050.1	820025	600
34	73	17	3473-17-1000	1000	Uranium One	374315.2138	822850.5893	1005
34	73	17	3473-17-1001	1001	Uranium One	374315.2138	821250.5893	781
34	73	17	3473-17-1002	1002	Uranium One	374315.2138	819650.5893	725
34	73	17	3473-17-1003	1003	Uranium One	374315.2138	818050.5893	1002
34	73	17	3473-17-1004	1004	Uranium One	372715.2138	818050.5893	997
34	73	17	3473-17-1005	1005	Uranium One	372715.2138	819650.5893	978
34	73	17	3473-17-1006	1006	Uranium One	372715.2138	821250.5893	910
34	73	17	3473-17-1007	1007	Uranium One	372715.2138	822850.5893	1005
34	73	17	3473-17-119	119		375067.6	821975.9	
34	73	17	3473-17-120	120	UNC Teton	375037.8	820592.3	997
34	73	17	3473-17-126	126	UNC Teton	375044.1	819303.4	598
34	73	17	3473-17-71-1	71-1	Cordero	370188.1	818052.9	615
34	73	17	3473-17-71-10	71-10	Cordero	370140.4	818155	614
34	73	17	3473-17-71-11	71-11	Cordero	370187	818206.7	616
34	73	17	3473-17-71-2	71-2	Cordero	370286.1	818153.9	623
34	73	17	3473-17-71-3	71-3	Cordero	370088.8	818155	617
34	73	17	3473-17-71-4	71-4	Cordero	370189.2	818254.07	617
34	73	17	3473-17-71-5	71-5	Cordero	371786.7	818153.8	596
34	73	17	3473-17-71-6	71-6	Cordero	371785.6	818555.2	636
34	73	17	3473-17-71-7	71-7	Cordero	371787.2	818353.5	598
34	73	17	3473-17-71-8	71-8	Cordero	370188.1	818101.9	617
34	73	17	3473-17-71-9	71-9	Cordero	370235.6	818154.6	616
34	73	17	3473-17-ACE-70-120	M-120	Morrison Nuclear	374515.6	818180.3	615
34	73	17	3473-17-ACE-70-125	M-125	Morrison Nuclear	372598.4	820032.4	612
34	73	17	3473-17-ACE-70-135	M-135	Morrison Nuclear	373164.5	823039.2	457
34	73	17	3473-17-ACE-70-136	M-136	Morrison Nuclear	374519.5	823037.9	523
34	73	17	3473-17-ACE-70-15	N-15	Cordero	374893.6	817964.5	1000
34	73	18	3473-18-1000	1000	Uranium One	364700	822950	798
34	73	18	3473-18-1001	1001	Uranium One	366300	822950	806
34	73	18	3473-18-1002	1002	Uranium One	367900	822950	802
34	73	18	3473-18-1003	1003	Uranium One	369500	822950	803
34	73	18	3473-18-1004	1004	Uranium One	369500	821350	808
34	73	18	3473-18-1005	1005	Uranium One	367900	821350	802
34	73	18	3473-18-1006	1006	Uranium One	366300	821350	803
34	73	18	3473-18-1007	1007	Uranium One	364700	821350	807
34	73	18	3473-18-1008	1008	Uranium One	366700	819750	802
34	73	18	3473-18-1009	1009	Uranium One	367900	819750	987
34	73	18	3473-18-1010	1010	Uranium One	369500	819750	807
34	73	18	3473-18-1011	1011	Uranium One	369500	818150	807
34	73	18	3473-18-1012	1012	Uranium One	367900	818150	805
34	73	18	3473-18-1013	1013	Uranium One	366700	818150	791
34	73	18	3473-18-1014	1014	Uranium One	364700	823150	706
34	73	18	3473-18-1015	1015	Uranium One	364944	823152	710
34	73	18	3473-18-1016	1016	Uranium One	364950	822953	706
34	73	18	3473-18-1017	1017	Uranium One	364900	822750	706
34	73	18	3473-18-1018	1018	Uranium One	364715	822700	706
34	73	18	3473-18-1019	1019	Uranium One	369300	818150	708
34	73	18	3473-18-1020	1020	Uranium One	369300	818350	708
34	73	18	3473-18-1021	1021	Uranium One	369500	818350	700
34	73	18	3473-18-1022	1022	Uranium One	365150	822950	702
34	73	18	3473-18-1023	1023	Uranium One	365366	822954	704

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	18	3473-18-1024	1024	Uranium One	365150	823150	620
34	73	18	3473-18-1025	1025	Uranium One	365350	823150	702
34	73	18	3473-18-1026	1026	Uranium One	365550	822750	703
34	73	18	3473-18-1027	1027	Uranium One	365550	822950	701
34	73	18	3473-18-1028	1028	Uranium One	365550	823150	704
34	73	18	3473-18-24	24	UNC Teton	367716.7	818146.5	997
34	73	18	3473-18-34	34	UNC Teton	369047.4	818710.9	637
34	73	18	3473-18-FU-70-4	N-4	Cordero	368273.2	818391.7	636
34	73	19	3473-19-1000	1000	Uranium One	364700	817100	801
34	73	19	3473-19-1001	1001	Uranium One	366300	817250	805
34	73	19	3473-19-1002	1002	Uranium One	367900	817100	1002
34	73	19	3473-19-1003	1003	Uranium One	369500	817100	803
34	73	19	3473-19-1004	1004	Uranium One	369500	815500	799
34	73	19	3473-19-1005	1005	Uranium One	367900	815500	800
34	73	19	3473-19-1006	1006	Uranium One	366300	815500	803
34	73	19	3473-19-1008	1008	Uranium One	367900	813900	802
34	73	19	3473-19-30	30	UNC Teton	367303.5	816034.2	755
34	73	19	3473-19-33	33		368343.3	815420.8	
34	73	19	3473-19-70-2	70-2	Cordero	364690.4	816351.4	596
34	73	19	3473-19-FU-1	M-1	Morrison Nuclear	369511.6	817678.1	613
34	73	19	3473-19-FU-70-1	N-1	Cordero	369224.1	814714.5	654
34	73	19	3473-19-FU-70-3	N-3	Cordero	368299.8	817734.6	598
34	73	19	3473-19-FU-71-1	N-71-1	Cordero	369704.5	817688.5	598
34	73	19	3473-19-FU-71-2	N-71-2	Cordero	369516	817476.7	598
34	73	19	3473-19-FU-71-3	N-71-3	Cordero	365715.3	812799.5	522
34	73	19	3473-19-FU-78-1	M-78	Morrison Nuclear	365724.1	812697.3	798
34	73	19	3473-19-FU-8-1	M-8	Morrison Nuclear	367660.6	815241.1	600
34	73	20	3473-20-1000	1000	Uranium One	375000	817800	802
34	73	20	3473-20-1001	1001	Uranium One	373443.93	817839.18	806
34	73	20	3473-20-1002	1002	Uranium One	371843.93	817839.18	801
34	73	20	3473-20-1003	1003	Uranium One	370243.93	817839.18	803
34	73	20	3473-20-1004	1004	Uranium One	370243.93	816239.18	806
34	73	20	3473-20-1005	1005	Uranium One	371843.93	816239.18	800
34	73	20	3473-20-1006	1006	Uranium One	373443.93	816239.18	807
34	73	20	3473-20-1007	1007	Uranium One	375045	816249	805
34	73	20	3473-20-1008	1008	Uranium One	370000	815000	705
34	73	20	3473-20-1009	1009	Uranium One	370400	815000	698
34	73	20	3473-20-1010	1010	Uranium One	370400	814600	705
34	73	20	3473-20-1011	1011	Uranium One	370000	814600	703
34	73	20	3473-20-1012	1012	Uranium One	370000	814200	704
34	73	20	3473-20-1013	1013	Uranium One	370402	814200	700
34	73	20	3473-20-1014	1014	Uranium One	370400	813800	702
34	73	20	3473-20-1015	1015	Uranium One	370800	813800	702
34	73	20	3473-20-1016	1016	Uranium One	370800	813400	705
34	73	20	3473-20-1017	1017	Uranium One	372850	814300	708
34	73	20	3473-20-1018	1018	Uranium One	372850	814700	706
34	73	20	3473-20-1020	1020	Uranium One	373250	814300	702
34	73	20	3473-20-1021	1021	Uranium One	373650	814300	703
34	73	20	3473-20-1022	1022	Uranium One	373650	813900	702
34	73	20	3473-20-1023	1023	Uranium One	373250	813900	704
34	73	20	3473-20-1025	1025	Uranium One	373250	813500	704
34	73	20	3473-20-1026	1026	Uranium One	373650	814700	703
34	73	20	3473-20-1027	1027	Uranium One	374050	814700	706
34	73	20	3473-20-1028	1028	Uranium One	374050	815100	707
34	73	20	3473-20-1029	1029	Uranium One	374450	815100	706
34	73	20	3473-20-1030	1030	Uranium One	374450	814700	704

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	20	3473-20-1031	1031	Uranium One	374850	814700	703
34	73	20	3473-20-1032	1032	Uranium One	374850	815100	706
34	73	20	3473-20-1033	1033	Uranium One	372850	813500	703
34	73	20	3473-20-1034	1034	Uranium One	370202	814200	723
34	73	20	3473-20-1035	1035	Uranium One	370402	814400	722
34	73	20	3473-20-1036	1036	Uranium One	370602	814200	723
34	73	20	3473-20-1037	1037	Uranium One	370602	814400	723
34	73	20	3473-20-1038	1038	Uranium One	370202	814400	724
34	73	20	3473-20-1039	1039	Uranium One	375045	816449	701
34	73	20	3473-20-1040	1040	Uranium One	374845	816449	706
34	73	20	3473-20-1041	1041	Uranium One	374845	816249	706
34	73	20	3473-20-1042	1042	Uranium One	374845	816049	705
34	73	20	3473-20-1043	1043	Uranium One	375045	816049	703
34	73	20	3473-20-1044	1044	Uranium One	370400	815200	704
34	73	20	3473-20-1045	1045	Uranium One	370600	815200	704
34	73	20	3473-20-1046	1046	Uranium One	370200	815000	702
34	73	20	3473-20-1047	1047	Uranium One	370600	815000	706
34	73	20	3473-20-1048	1048	Uranium One	370600	814800	708
34	73	20	3473-20-1049	1049	Uranium One	370400	814800	706
34	73	20	3473-20-1050	1050	Uranium One	370200	814800	697
34	73	20	3473-20-1051	1051	Uranium One	370000	814800	704
34	73	20	3473-20-1052	1052	Uranium One	372000	813900	704
34	73	20	3473-20-1053	1053	Uranium One	372000	814085	703
34	73	20	3473-20-1054	1054	Uranium One	372000	814300	704
34	73	20	3473-20-1055	1055	Uranium One	372200	814300	701
34	73	20	3473-20-1056	1056	Uranium One	372400	814300	702
34	73	20	3473-20-1057	1057	Uranium One	372400	814100	701
34	73	20	3473-20-1058	1058	Uranium One	372400	813900	700
34	73	20	3473-20-1059	1059	Uranium One	374645	816049	700
34	73	20	3473-20-1060	1060	Uranium One	374645	815849	700
34	73	20	3473-20-1061	1061	Uranium One	374845	815849	700
34	73	20	3473-20-1062	1062	Uranium One	375045	815849	702
34	73	20	3473-20-1063	1063	Uranium One	374745	816449	701
34	73	20	3473-20-1064	1064	Uranium One	374845	816549	704
34	73	20	3473-20-1065	1065	Uranium One	374945	816449	703
34	73	20	3473-20-1066	1066	Uranium One	374845	816349	706
34	73	20	3473-20-1067	1067	Uranium One	370200	815200	704
34	73	20	3473-20-1068	1068	Uranium One	374650	815450	703
34	73	20	3473-20-1069	1069	Uranium One	374450	815450	704
34	73	20	3473-20-1070	1070	Uranium One	374250	815450	706
34	73	20	3473-20-1071	1071	Uranium One	374250	815650	706
34	73	20	3473-20-1072	1072	Uranium One	374450	815650	706
34	73	20	3473-20-1073	1073	Uranium One	374650	815650	706
34	73	20	3473-20-1074	1074	Uranium One	374250	815850	708
34	73	20	3473-20-1075	1075	Uranium One	374450	815850	708
34	73	20	3473-20-1076	1076	Uranium One	374250	816050	708
34	73	20	3473-20-1077	1077	Uranium One	374450	816050	709
34	73	20	3473-20-1078	1078	Uranium One	374250	816250	703
34	73	20	3473-20-1079	1079	Uranium One	374450	816250	704
34	73	20	3473-20-1080	1080	Uranium One	374650	816250	706
34	73	20	3473-20-1081	1081	Uranium One	374245	816449	703
34	73	20	3473-20-1082	1082	Uranium One	374445	816449	703
34	73	20	3473-20-1083	1083	Uranium One	374645	816449	708
34	73	20	3473-20-1084	1084	Uranium One	374450	816650	704
34	73	20	3473-20-1085	1085	Uranium One	374650	816650	703
34	73	20	3473-20-1086	1086	Uranium One	374850	816650	704

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	20	3473-20-1088	1088	Uranium One	371600	813500	1000
34	73	20	3473-20-1089	1089	Uranium One	372000	813500	702
34	73	20	3473-20-1090	1090	Uranium One	372400	813500	700
34	73	20	3473-20-1091	1091	Uranium One	372400	813100	704
34	73	20	3473-20-1092	1092	Uranium One	372000	813100	704
34	73	20	3473-20-1093	1093	Uranium One	371600	813100	704
34	73	20	3473-20-1094	1094	Uranium One	374250	814300	707
34	73	20	3473-20-1095	1095	Uranium One	374650	814300	706
34	73	20	3473-20-1096	1096	Uranium One	371550	817850	706
34	73	20	3473-20-1097	1097	Uranium One	371650	817850	706
34	73	20	3473-20-1098	1098	Uranium One	371450	817450	705
34	73	20	3473-20-1099	1099	Uranium One	371850	817650	706
34	73	20	3473-20-1100	1100	Uranium One	371650	817650	706
34	73	20	3473-20-1101	1101	Uranium One	371450	817650	704
34	73	20	3473-20-1102	1102	Uranium One	371850	817450	706
34	73	20	3473-20-1103	1103	Uranium One	371650	817450	705
34	73	20	3473-20-1104	1104	Uranium One	370000	813400	706
34	73	20	3473-20-1105	1105	Uranium One	370000	813000	709
34	73	20	3473-20-1106	1106	Uranium One	370400	813000	704
34	73	20	3473-20-1107	1107	Uranium One	370800	813000	703
34	73	20	3473-20-1108	1108	Uranium One	371200	813000	704
34	73	20	3473-20-1109	1109	Uranium One	372000	813300	706
34	73	20	3473-20-1110	1110	Uranium One	371800	813500	704
34	73	20	3473-20-1111	1111	Uranium One	372000	813700	704
34	73	20	3473-20-1112	1112	Uranium One	372200	813500	705
34	73	20	3473-20-1113	1113	Uranium One	372200	814500	706
34	73	20	3473-20-1114	1114	Uranium One	372400	814500	706
34	73	20	3473-20-1115	1115	Uranium One	372600	814480	705
34	73	20	3473-20-1116	1116	Uranium One	370000	813800	700
34	73	20	3473-20-1117	1117	Uranium One	374250	816650	692
34	73	20	3473-20-1118	1118	Uranium One	374250	816850	706
34	73	20	3473-20-1119	1119	Uranium One	374450	816850	707
34	73	20	3473-20-1120	1120	Uranium One	374650	816850	707
34	73	20	3473-20-1121	1121	Uranium One	374850	816850	705
34	73	20	3473-20-1122	1122	Uranium One	375050	816850	705
34	73	20	3473-20-31	31	UNC Teton	371189.2	812635.4	560
34	73	20	3473-20-8	8		371136.8	812675.1	
34	73	20	3473-20-M-14	M-14	Uranium One	374849	816404	501
34	73	20	3473-20-M-18	M-18	Uranium One	370000	813750	521
34	73	21	3473-21-127	127	UNC Teton	378291.2	815329.2	498
34	73	21	3473-21-128	128	UNC Teton	378045.5	816080.3	497
34	73	21	3473-21-129	129	UNC Teton	380108.5	814807.6	499
34	73	21	3473-21-130	130	UNC Teton	379155.1	815914	499
34	73	21	3473-21-131	131	UNC Teton	379669.8	815608.7	498
34	73	21	3473-21-132	132	UNC Teton	378310.3	815510	436
34	73	21	3473-21-133	133	UNC Teton	378767	815703.3	458
34	73	21	3473-21-134	134	UNC Teton	379131.2	816100.5	498
34	73	21	3473-21-135	135	UNC Teton	379664.4	815871.4	499
34	73	21	3473-21-136	136	UNC Teton	378313.7	815596.7	439
34	73	21	3473-21-137	137	UNC Teton	378806.9	815916.1	458
34	73	21	3473-21-138	138	UNC Teton	379974.2	815167.1	499
34	73	21	3473-21-139	139	UNC Teton	379685.4	816207.4	459
34	73	21	3473-21-140	140	UNC Teton	379118.2	816191.4	439
34	73	21	3473-21-141	141	UNC Teton	379780.3	815166.4	498
34	73	21	3473-21-142	142	UNC Teton	379969.1	815867.8	499
34	73	21	3473-21-143	143	UNC Teton	378769.3	816283.3	459

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	21	3473-21-144	144	UNC Teton	379687	816396.8	459
34	73	21	3473-21-145	145	UNC Teton	380031.5	815537.1	500
34	73	21	3473-21-146	146	UNC Teton	378814.3	816051.2	440
34	73	21	3473-21-147	147	UNC Teton	379909.5	815143.4	500
34	73	21	3473-21-148	148	UNC Teton	379051.8	815200.3	500
34	73	21	3473-21-149	149	UNC Teton	378284.4	814935.6	500
34	73	21	3473-21-150	150	UNC Teton	378291.4	815164.4	499
34	73	21	3473-21-151	151	UNC Teton	378019.6	815329	500
34	73	21	3473-21-152	152	UNC Teton	379053.4	814993.6	500
34	73	21	3473-21-153	153	UNC Teton	379366.7	814978.8	498
34	73	21	3473-21-154	154	UNC Teton	378293.1	815242.8	500
34	73	21	3473-21-155	155	UNC Teton	378691.3	815128	500
34	73	21	3473-21-156	156	UNC Teton	380001.5	814445.2	495
34	73	21	3473-21-157	157	UNC Teton	379079.4	814911.2	499
34	73	21	3473-21-158	158	UNC Teton	378165.6	815325.5	498
34	73	21	3473-21-159	159	UNC Teton	379088.7	814959.5	497
34	73	21	3473-21-160	160	UNC Teton	378297.4	815205.9	498
34	73	21	3473-21-161	161	UNC Teton	379677.4	814940.4	498
34	73	21	3473-21-162	162	UNC Teton	379758.8	814369	497
34	73	21	3473-21-163	163	UNC Teton	380189.1	814428.3	498
34	73	21	3473-21-164	164	UNC Teton	379749.3	813955.9	500
34	73	21	3473-21-165	165	UNC Teton	379643.8	815124	497
34	73	21	3473-21-166	166	UNC Teton	379467.2	814453.8	498
34	73	21	3473-21-167	167	UNC Teton	378942.8	813370.2	498
34	73	21	3473-21-168	168	UNC Teton	380007.5	814741.8	498
34	73	21	3473-21-169	169	UNC Teton	379568.4	814560.7	500
34	73	21	3473-21-170	170	UNC Teton	379276.3	814454.5	498
34	73	21	3473-21-171	171	UNC Teton	378093.6	815326.4	499
34	73	21	3473-21-172	172	UNC Teton	379084.4	814463.1	499
34	73	21	3473-21-173	173	UNC Teton	379462.7	814550.3	499
34	73	21	3473-21-174	174	UNC Teton	378128.6	815326	499
34	73	21	3473-21-175	175	UNC Teton	379995.9	814873.8	499
34	73	21	3473-21-176	176	UNC Teton	378711.4	814482.2	500
34	73	21	3473-21-177	177	UNC Teton	379468.1	814504.6	497
34	73	21	3473-21-178	178	UNC Teton	378963.8	814483.4	500
34	73	21	3473-21-179	179	UNC Teton	378551.9	814175.6	500
34	73	21	3473-21-180	180	UNC Teton	379645.9	814561.3	498
34	73	21	3473-21-181	181	UNC Teton	378566.8	814497	497
34	73	21	3473-21-182	182	UNC Teton	379047.3	814510.6	499
34	73	21	3473-21-183	183	UNC Teton	379640.8	814470.7	497
34	73	21	3473-21-184	184	UNC Teton	378142.8	814368.7	500
34	73	21	3473-21-186	186	UNC Teton	378698.1	814929.6	494
34	73	21	3473-21-37	37	UNC Teton	378228.8	816545	519
34	73	21	3473-21-38	38	UNC Teton	378036.4	816458.7	519
34	73	21	3473-21-40	40	UNC Teton	377844.8	816459.8	518
34	73	21	3473-21-41	41	UNC Teton	379797.5	817878.6	456
34	73	21	3473-21-42	42	UNC Teton	379368.9	817879.8	478
34	73	21	3473-21-43	43	UNC Teton	378111.9	814788.9	597
34	73	21	3473-21-45	45	UNC Teton	377896.5	816458.7	497
34	73	21	3473-21-48	48	UNC Teton	377893	816269.6	499
34	73	21	3473-21-50	50	UNC Teton	377953.4	816460.8	499
34	73	21	3473-21-51	51	UNC Teton	379079.8	814809.1	519
34	73	21	3473-21-52	52	UNC Teton	377848.6	816288.9	516
34	73	21	3473-21-53	53	UNC Teton	377898	816086.6	518
34	73	21	3473-21-54	54	UNC Teton	379129.1	816321.8	597
34	73	21	3473-21-55	55	UNC Teton	377993.8	816088.7	497

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	21	3473-21-58	58	UNC Teton	379581.1	814768	496
34	73	21	3473-21-60	60	UNC Teton	379109.1	816277.8	
34	73	21	3473-21-65	65	UNC Teton	378092.3	816087.8	499
34	73	21	3473-21-66	66	UNC Teton	378300.3	815934.7	500
34	73	21	3473-21-68	68	UNC Teton	380282.7	816331.2	434
34	73	21	3473-21-72	72	UNC Teton	380006.3	814834.5	497
34	73	21	3473-21-76	76	UNC Teton	379093.2	815660.5	498
34	73	21	3473-21-77	77	UNC Teton	378313.1	815695.9	499
34	73	21	3473-21-ACE-1-79	M-79	Morrison Nuclear	379368.8	814132.9	495
34	73	21	3473-21-ACE-70-13	N-13	Cordero	380192.2	814628.7	996
34	73	21	3473-21-ACE-70-25	N-25	Cordero	380125.3	812814.8	600
34	73	21	3473-21-M-15	M-15	Uranium One	380000	814800	379
34	73	21	3473-21-UID15	UID15		378308.6	815777.2	
34	73	21	3473-21-UID29	UID29		378541.9	814386.1	
34	73	21	3473-21-UID41	UID41		380233.5	814769.4	
34	73	21	3473-21-UID45	UID45		379555.7	817878.6	
34	73	21	3473-21-UID46	UID46		379629	817879.8	
34	73	21	3473-21-UID47	UID47		379664.4	817878.6	
34	73	21	3473-21-UID48	UID48		379694.9	817875	
34	73	22	3473-22-1	1		385495	816317.9	
34	73	22	3473-22-10	10		385490	813858.9	
34	73	22	3473-22-11	11		384475	812823.9	
34	73	22	3473-22-12	12		385099	812833.9	
34	73	22	3473-22-13	13		384437	813877.9	
34	73	22	3473-22-14	14		383998	813879.9	
34	73	22	3473-22-15	15		384757	812815.3	
34	73	22	3473-22-16	16		385087	813117.9	
34	73	22	3473-22-17	17		383573	813891.9	
34	73	22	3473-22-18	18		384629	812819.9	
34	73	22	3473-22-19	19		381805	814583.9	
34	73	22	3473-22-2	2		385551	812799.2	
34	73	22	3473-22-20	20		384857	813106.9	
34	73	22	3473-22-21	21		380963	814584.9	
34	73	22	3473-22-22	22		381976	815411.9	
34	73	22	3473-22-23	23		383543	814892.9	
34	73	22	3473-22-25	25		383527	814324.9	
34	73	22	3473-22-26	26		383572	812752.9	
34	73	22	3473-22-27	27		383541	814614.9	
34	73	22	3473-22-28	28		382029	814866.9	
34	73	22	3473-22-29	29		383542	814754.9	
34	73	22	3473-22-3	3		385509.3	816136.9	
34	73	22	3473-22-31	31		382642	815141.9	
34	73	22	3473-22-32	32		383549	814819.9	
34	73	22	3473-22-33	33		382001	815193.9	
34	73	22	3473-22-34	34		382608	814993.9	
34	73	22	3473-22-35	35		383540	814700.9	
34	73	22	3473-22-36	36		383161	814869.9	
34	73	22	3473-22-37	37		383156	814656.9	
34	73	22	3473-22-38	38		384022	814823.9	
34	73	22	3473-22-39	39		382618	814792.9	
34	73	22	3473-22-4	4		385562	813489.9	
34	73	22	3473-22-40	40		383999	815076.9	
34	73	22	3473-22-41	41		383142	814460.9	
34	73	22	3473-22-42	42		384012	814936.9	
34	73	22	3473-22-43	43		383151	814560.9	
34	73	22	3473-22-44	44		384007	815008.9	

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	22	3473-22-45	45		382625	814578.9	
34	73	22	3473-22-46	46		383148	814508.9	
34	73	22	3473-22-5	5		385512	816235.9	
34	73	22	3473-22-6	6		385273	816046.9	
34	73	22	3473-22-7	7		385531	814895.9	
34	73	22	3473-22-8	8		385418.5	814219.9	
34	73	22	3473-22-9	9		385290	815865.9	
34	73	22	3473-22-ACE-1-47	M-47	Morrison Nuclear	380713.3	816400	505
34	73	22	3473-22-ACE-70-20	N-20	Cordero	380534.8	817847.8	800
34	73	22	3473-22-M-16	M-16	Uranium One	382400	816700	497
34	73	23	3473-23-1	23-1	R.L. Peterson	387680	813400	500
34	73	23	3473-23-10	10		387681	816761.9	
34	73	23	3473-23-11	11		387505.4	816752.9	
34	73	23	3473-23-13	13		387040	816697.9	
34	73	23	3473-23-14	14		387515	816552.9	
34	73	23	3473-23-15	15		387056.6	816406.9	
34	73	23	3473-23-16	16		387523	816355.3	
34	73	23	3473-23-17	17		387708	816366.2	
34	73	23	3473-23-18	18		387800	816368.3	
34	73	23	3473-23-19	19		387767	816187.9	
34	73	23	3473-23-1Dup ID	1	R.L. Peterson	388084	817346.1	500
34	73	23	3473-23-2	2		388086.7	817175.9	
34	73	23	3473-23-20	20		387869	816183.9	
34	73	23	3473-23-21	21		387668	815977.9	
34	73	23	3473-23-22	22		387623	815980.1	
34	73	23	3473-23-23	23		387668	815977.9	
34	73	23	3473-23-24	24		387634	815785.9	
34	73	23	3473-23-25	25		387445	815779.1	
34	73	23	3473-23-26	26		387554	815781.9	
34	73	23	3473-23-27	27		387462	815584.9	
34	73	23	3473-23-28	28		387287	815580.9	
34	73	23	3473-23-29	29		387278	815770.9	
34	73	23	3473-23-3	3		388084	816985.9	
34	73	23	3473-23-30	30		385765.3	815611.6	
34	73	23	3473-23-32	32		385738	817418.9	
34	73	23	3473-23-33	33		387019	815741.9	
34	73	23	3473-23-34	34		385775	816514.9	
34	73	23	3473-23-35	35		386733	815635.9	
34	73	23	3473-23-36	36		385767	816964.9	
34	73	23	3473-23-37	37		388100	815647.9	
34	73	23	3473-23-38	38		385774.4	816730.1	
34	73	23	3473-23-39	39		387459	815676	
34	73	23	3473-23-4	4		388083	816886.9	
34	73	23	3473-23-40	40		386056	816718.9	
34	73	23	3473-23-41	41		386857	817779.9	
34	73	23	3473-23-42	42		386977	815961.9	
34	73	23	3473-23-43	43		386054	816921.9	
34	73	23	3473-23-44	44		385772	816617.9	
34	73	23	3473-23-45	45		386680	817480.9	
34	73	23	3473-23-46	46		386041	817108.9	
34	73	23	3473-23-47	47		385916	817111.9	
34	73	23	3473-23-48	48		386238	817369.9	
34	73	23	3473-23-49	49		387145.1	815974.9	
34	73	23	3473-23-5	5		388084	816938.8	
34	73	23	3473-23-50	50		386147.4	817364.5	
34	73	23	3473-23-51	51		386760	817793.8	

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	23	3473-23-52	52		387346.8	816418.2	
34	73	23	3473-23-53	53		386503.3	817471.2	
34	73	23	3473-23-54	54		387572.4	817708.8	
34	73	23	3473-23-55	55		387161.3	816412.1	
34	73	23	3473-23-56	56		386597.9	817473.6	
34	73	23	3473-23-57	57		389437.7	812992.9	
34	73	23	3473-23-58	58		386062.4	815143.7	
34	73	23	3473-23-59	59		387328	817651.8	
34	73	23	3473-23-6	6		387871	816877.9	
34	73	23	3473-23-60	60		386694	816408.6	
34	73	23	3473-23-61	61		386413.8	815145.9	
34	73	23	3473-23-62	62		386870.8	816403.3	
34	73	23	3473-23-63	63		387445.5	817674.9	
34	73	23	3473-23-64	64		387223.4	817080.2	
34	73	23	3473-23-65	65		386510.2	815157.5	
34	73	23	3473-23-7	7		387880	816777.9	
34	73	23	3473-23-8	8		387876.2	816826	
34	73	23	3473-23-9	9		387683	816807.9	
34	73	23	3473-23-M-17	M-17	Uranium One	389000	817000	502
34	73	24	3473-24-1	24-1	R.L. Peterson	395193	813982	600
34	73	24	3473-24-10	24-10	R.L. Peterson	395774	814025	238
34	73	24	3473-24-11	24-11	R.L. Peterson	396110	814873	298
34	73	24	3473-24-12	24-12	R.L. Peterson	396100	814780	295
34	73	24	3473-24-13	24-13	R.L. Peterson	396095	814729	298
34	73	24	3473-24-14	24-14	R.L. Peterson	396106	814833	298
34	73	24	3473-24-15	24-15	R.L. Peterson	395799	814578	296
34	73	24	3473-24-16	24-16	R.L. Peterson	396102	814805	297
34	73	24	3473-24-17	24-17	R.L. Peterson	395790	814477	295
34	73	24	3473-24-18	24-18	R.L. Peterson	395793	814527	291
34	73	24	3473-24-19	24-19	R.L. Peterson	395477	814401	297
34	73	24	3473-24-1X	24-1X	Nuclear Assurance Company	395859	815586	795
34	73	24	3473-24-2	24-2	R.L. Peterson	395239	814178	297
34	73	24	3473-24-20	24-20	R.L. Peterson	395481	814495	295
34	73	24	3473-24-21	24-21	R.L. Peterson	395206	814386	292
34	73	24	3473-24-21C	24-21C	Nuclear Assurance Company	395201	814385	277
34	73	24	3473-24-22	24-22	R.L. Peterson	395481	814539	294
34	73	24	3473-24-23	24-23	R.L. Peterson	395195	814429	294
34	73	29	3473-24-239	239		372148	812104	
34	73	24	3473-24-23C	24-23C	Nuclear Assurance Company	395189	814429	278
34	73	24	3473-24-24	24-24	R.L. Peterson	394884	814282	298
34	73	24	3473-24-25	24-25	R.L. Peterson	395182	814477	296
34	73	24	3473-24-25C	24-25C	Nuclear Assurance Company	395177	814476	262
34	73	24	3473-24-26	24-26	R.L. Peterson	395481	814451	297
34	73	24	3473-24-27	24-27	R.L. Peterson	395215	814342	293
34	73	24	3473-24-28	24-28	R.L. Peterson	394884	814330	296
34	73	24	3473-24-29	24-29	R.L. Peterson	395230	814299	296
34	73	24	3473-24-2X	24-2X	Nuclear Assurance Company	395225	815153	494
34	73	24	3473-24-3	24-3	R.L. Peterson	395780	813951	295
34	73	24	3473-24-30	24-30	R.L. Peterson	394884	814235	295
34	73	24	3473-24-31	24-31	R.L. Peterson	394553	814118	299
34	73	24	3473-24-32	24-32	R.L. Peterson	394883	814376	295
34	73	24	3473-24-33	24-33	R.L. Peterson	394885	814183	295
34	73	24	3473-24-34	24-34	R.L. Peterson	394564	814018	299
34	73	24	3473-24-35	24-35	R.L. Peterson	394554	814069	299
34	73	24	3473-24-36	24-36	R.L. Peterson	394284	813958	300
34	73	24	3473-24-37	24-37	R.L. Peterson	394549	814166	296

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	24	3473-24-38	24-38	R.L. Peterson	394382	813957	298
34	73	24	3473-24-39	24-39	R.L. Peterson	394439	813958	298
34	73	24	3473-24-4	24-4	R.L. Peterson	393570	814008	291
34	73	24	3473-24-40	24-40	Nuclear Assurance Company	395022	814263	300
34	73	24	3473-24-41	24-41	Nuclear Assurance Company	395016	814316	300
34	73	24	3473-24-42	24-42	Nuclear Assurance Company	395012	814366	300
34	73	24	3473-24-43	24-43	Nuclear Assurance Company	395006	814419	300
34	73	24	3473-24-44	24-44	Nuclear Assurance Company	395325	814381	301
34	73	24	3473-24-45	24-45	Nuclear Assurance Company	395326	814429	300
34	73	24	3473-24-46	24-46	Nuclear Assurance Company	394730	814331	300
34	73	24	3473-24-47	24-47	Nuclear Assurance Company	394734	814290	300
34	73	24	3473-24-48	24-48	Nuclear Assurance Company	394734	814232	340
34	73	24	3473-24-49	24-49	Nuclear Assurance Company	394735	814183	300
34	73	24	3473-24-5	24-5		393600	816560	
34	73	24	3473-24-50	24-50	Nuclear Assurance Company	395739	814631	279
34	73	24	3473-24-51	24-51	Nuclear Assurance Company	395323	814476	300
34	73	24	3473-24-52	24-52	Nuclear Assurance Company	395020	814211	301
34	73	24	3473-24-53	24-53	Nuclear Assurance Company	395324	814524	280
34	73	24	3473-24-54	24-54	Nuclear Assurance Company	394732	814136	300
34	73	24	3473-24-55	24-55	Nuclear Assurance Company	394730	814092	300
34	73	24	3473-24-56	24-56	Nuclear Assurance Company	395224	817831	802
34	73	24	3473-24-57	24-57	Nuclear Assurance Company	394884	814425	276
34	73	24	3473-24-58	24-58	Nuclear Assurance Company	394884	814476	276
34	73	24	3473-24-59	24-59	Nuclear Assurance Company	394386	814057	276
34	73	24	3473-24-6	24-6	R.L. Peterson	395483	813945	196
34	73	24	3473-24-60	24-60	Nuclear Assurance Company	394337	813958	277
34	73	24	3473-24-61	24-61	Nuclear Assurance Company	394386	814009	277
34	73	24	3473-24-62	24-62	Nuclear Assurance Company	395628	814498	316
34	73	24	3473-24-63	24-63	Nuclear Assurance Company	395951	814582	497
34	73	24	3473-24-64	24-64	Nuclear Assurance Company	395923	814122	196
34	73	24	3473-24-65	24-65	Nuclear Assurance Company	396110	814313	417
34	73	24	3473-24-66	24-66	Nuclear Assurance Company	395630	814446	275
34	73	24	3473-24-67	24-67	Nuclear Assurance Company	395951	814633	276
34	73	24	3473-24-68	24-68	Nuclear Assurance Company	395956	814530	275
34	73	24	3473-24-69	24-69	Nuclear Assurance Company	395928	814021	197
34	73	24	3473-24-7	24-7	R.L. Peterson	395773	814121	276
34	73	24	3473-24-70	24-70	Nuclear Assurance Company	395632	814392	277
34	73	24	3473-24-71	24-71	Nuclear Assurance Company	395630	814547	277
34	73	24	3473-24-72	24-72	Nuclear Assurance Company	396113	814262	217
34	73	24	3473-24-73	24-73	Nuclear Assurance Company	395929	814062	297
34	73	24	3473-24-74	24-74	Nuclear Assurance Company	395950	814483	316
34	73	24	3473-24-75	24-75	Nuclear Assurance Company	395953	814682	296
34	73	24	3473-24-76	24-76	Nuclear Assurance Company	395799	814627	277
34	73	24	3473-24-76C	24-76C	Malapai	395796.2	814636.7	279
34	73	24	3473-24-77	24-77	Nuclear Assurance Company	395810	814676	277
34	73	24	3473-24-78	24-78	Arizona Public Service Company	396101.9	814681.3	279
34	73	24	3473-24-79	24-79	Arizona Public Service Company	394729.6	814041.4	279
34	73	24	3473-24-8	24-8	R.L. Peterson	396099	814118	272
34	73	24	3473-24-80	24-80	Arizona Public Service Company	394885.7	814130.5	299
34	73	24	3473-24-81	24-81	Arizona Public Service Company	396103.9	814632.3	279
34	73	24	3473-24-82	24-82	Malapai	396114	814164	216
34	73	24	3473-24-83	24-83	Malapai	395945	814789	297
34	73	24	3473-24-84	24-84	Malapai	396143	814955	297
34	73	24	3473-24-85	24-85	Malapai	396173	814986	297
34	73	24	3473-24-86	24-86	Malapai	395943	814734	297
34	73	24	3473-24-9	24-9	R.L. Peterson	396108	814216	212

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	25	3473-25-1	25-1	R.L. Peterson	391586	807360	600
34	73	25	3473-25-10	25-10	Nuclear Assurance Company	391202	807733	316
34	73	25	3473-25-11	25-11	Nuclear Assurance Company	391981	808376	317
34	73	25	3473-25-12	25-12	Nuclear Assurance Company	392645	808632	317
34	73	25	3473-25-13	25-13	Nuclear Assurance Company	391970	807988	297
34	73	25	3473-25-14	25-14	Nuclear Assurance Company	391360	807462	313
34	73	25	3473-25-15	25-15	Nuclear Assurance Company	392642	808191	311
34	73	25	3473-25-16A	25-16A	Nuclear Assurance Company	391359	807354	316
34	73	25	3473-25-17	25-17	Nuclear Assurance Company	391993	807463	336
34	73	25	3473-25-18	25-18	Nuclear Assurance Company	392646	808406	309
34	73	25	3473-25-19	25-19	Nuclear Assurance Company	391993	807672	332
34	73	25	3473-25-2	25-2	R.L. Peterson	391459	807354	350
34	73	25	3473-25-20	25-20	Nuclear Assurance Company	392649	808521	312
34	73	25	3473-25-21	25-21	Nuclear Assurance Company	391994	807619	335
34	73	25	3473-25-22	25-22	Nuclear Assurance Company	391154	807321	333
34	73	25	3473-25-23	25-23	Nuclear Assurance Company	391456	807244	412
34	73	25	3473-25-3	25-3	R.L. Peterson	391686	807360	350
34	73	25	3473-25-4	25-4	R.L. Peterson	393370	807185	477
34	73	25	3473-25-5	25-5	R.L. Peterson	391539	807500	364
34	73	25	3473-25-6	25-6	R.L. Peterson	391380	808593	330
34	73	25	3473-25-7	25-7	Nuclear Assurance Company	391193	807931	336
34	73	25	3473-25-8	25-8	Nuclear Assurance Company	391971	808577	296
34	73	25	3473-25-9	25-9	Nuclear Assurance Company	392690	809243	317
34	73	26	3473-26-1	26-1	R.L. Peterson	390980	807400	600
34	73	26	3473-26-10	26-10	R.L. Peterson	389730	809600	400
34	73	26	3473-26-11	26-11	R.L. Peterson	387225	808370	400
34	73	26	3473-26-12	26-12	R.L. Peterson	387225	808520	420
34	73	26	3473-26-13	26-13	R.L. Peterson	387225	808445	378
34	73	26	3473-26-14	26-14	R.L. Peterson	387225	808410	419
34	73	26	3473-26-15	26-15	Nuclear Assurance Company	385663	812626	803
34	73	26	3473-26-16	26-16	Nuclear Assurance Company	386075	809991	803
34	73	26	3473-26-17	26-17	Nuclear Assurance Company	386094	811322	500
34	73	26	3473-26-18	26-18	Nuclear Assurance Company	386075	808665	500
34	73	26	3473-26-19	26-19	Nuclear Assurance Company	388735	810892	497
34	73	26	3473-26-2	26-2	R.L. Peterson	389053	810010	420
34	73	26	3473-26-20	26-20	Nuclear Assurance Company	388013	811909	797
34	73	26	3473-26-21	26-21	Nuclear Assurance Company	387566	812606	495
34	73	26	3473-26-2100	2100	Uranium One	386060	807391	460.7
34	73	26	3473-26-22	26-22	Nuclear Assurance Company	385939	812044	497
34	73	26	3473-26-23	26-23	Nuclear Assurance Company	386167	810663	597
34	73	26	3473-26-24	26-24	Nuclear Assurance Company	386262	809314	497
34	73	26	3473-26-25	26-25	Nuclear Assurance Company	386252	808049	757
34	73	26	3473-26-26	26-26	Nuclear Assurance Company	388055	808887	393
34	73	26	3473-26-27	26-27	Nuclear Assurance Company	389048	809217	479
34	73	26	3473-26-28	26-28	Nuclear Assurance Company	386656	807310	481
34	73	26	3473-26-29	26-29	Nuclear Assurance Company	386650	807995	355
34	73	26	3473-26-3	26-3	R.L. Peterson	387160	810010	457
34	73	26	3473-26-30	26-30	Nuclear Assurance Company	388050	808937	377
34	73	26	3473-26-31	26-31	Nuclear Assurance Company	389042	809443	376
34	73	26	3473-26-32	26-32	Nuclear Assurance Company	386655	807890	357
34	73	26	3473-26-33	26-33	Nuclear Assurance Company	389651	809838	336
34	73	26	3473-26-34	26-34	Nuclear Assurance Company	389041	809493	376
34	73	26	3473-26-35	26-35	Nuclear Assurance Company	389035	809544	375
34	73	26	3473-26-36	26-36	Nuclear Assurance Company	389241	809487	391
34	73	26	3473-26-37	26-37	Nuclear Assurance Company	388850	809208	373
34	73	26	3473-26-38	26-38	Nuclear Assurance Company	389238	809580	396

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	26	3473-26-39	26-39	Nuclear Assurance Company	389433	809581	375
34	73	26	3473-26-4	26-4	R.L. Peterson	387170	807396	397
34	73	26	3473-26-40	26-40	Nuclear Assurance Company	388478	809082	377
34	73	26	3473-26-41	26-41	Nuclear Assurance Company	388846	809315	376
34	73	26	3473-26-42	26-42	Nuclear Assurance Company	389238	809533	375
34	73	26	3473-26-43	26-43	Nuclear Assurance Company	388482	808976	377
34	73	26	3473-26-44	26-44	Nuclear Assurance Company	388847	809261	374
34	73	26	3473-26-45	26-45	Nuclear Assurance Company	388681	809079	397
34	73	26	3473-26-46	26-46	Nuclear Assurance Company	388845	809361	376
34	73	26	3473-26-47	26-47	Nuclear Assurance Company	388683	809026	394
34	73	26	3473-26-48	26-48	Nuclear Assurance Company	388685	808978	393
34	73	26	3473-26-49	26-49	Nuclear Assurance Company	388482	809026	397
34	73	26	3473-26-5	26-5	R.L. Peterson	387170	808697	392
34	73	26	3473-26-50	26-50	Nuclear Assurance Company	389029	809591	375
34	73	26	3473-26-51	26-51	Nuclear Assurance Company	389225	809646	376
34	73	26	3473-26-52	26-52	Nuclear Assurance Company	389406	809624	375
34	73	26	3473-26-53	26-53	Nuclear Assurance Company	389653	809777	375
34	73	26	3473-26-54	26-54	Nuclear Assurance Company	388290	808974	393
34	73	26	3473-26-55	26-55	Nuclear Assurance Company	388291	808923	397
34	73	26	3473-26-6	26-6	R.L. Peterson	387170	808050	401
34	73	26	3473-26-7	26-7	R.L. Peterson	390820	809920	350
34	73	26	3473-26-8	26-8	R.L. Peterson	389951	809300	360
34	73	26	3473-26-9	26-9	R.L. Peterson	389632	809702	380
34	73	26	3473-26-M-21	M-21	Uranium One	389487	809609	361
34	73	27	3473-27-205	205	UNC Teton	380457.4	808738.2	395
34	73	27	3473-27-206	206	UNC Teton	380444.5	809355	271
34	73	27	3473-27-207	207	UNC Teton	380446	809946.9	396
34	73	27	3473-27-208	208	UNC Teton	380454.6	810501.3	396
34	73	27	3473-27-209	209	UNC Teton	380476	811099.9	396
34	73	27	3473-27-210	210	UNC Teton	380454.1	808579	296
34	73	27	3473-27-3001	3001	Uranium One	381449	808136	280
34	73	27	3473-27-3002	3002	Uranium One	380849.425	808136.3387	800
34	73	27	3473-27-3003	3003	Uranium One	381249.425	808136.3387	440
34	73	27	3473-27-3004	3004	Uranium One	381649.425	808136.3387	440
34	73	27	3473-27-3005	3005	Uranium One	382049.425	808136.3387	440
34	73	27	3473-27-3006	3006	Uranium One	382449.425	808136.3387	440
34	73	27	3473-27-3007	3007	Uranium One	381049	808136	260
34	73	27	3473-27-3008	3008	Uranium One	380849.425	808536.3387	440
34	73	27	3473-27-3009	3009	Uranium One	381249.425	808536.3387	440
34	73	27	3473-27-3010	3010	Uranium One	381649.425	808536.3387	440
34	73	27	3473-27-3011	3011	Uranium One	382049.425	808536.3387	440
34	73	27	3473-27-3012	3012	Uranium One	382449.425	808536.3387	440
34	73	27	3473-27-3013	3013	Uranium One	380449.425	808936.3387	380
34	73	27	3473-27-3014	3014	Uranium One	380849.425	808936.3387	440
34	73	27	3473-27-3015	3015	Uranium One	381249.425	808936.3387	440
34	73	27	3473-27-3016	3016	Uranium One	381649.425	808936.3387	440
34	73	27	3473-27-3017	3017	Uranium One	382049.425	808936.3387	440
34	73	27	3473-27-3018	3018	Uranium One	382449.425	808936.3387	440
34	73	27	3473-27-3019	3019	Uranium One	380449.425	809336.3387	380
34	73	27	3473-27-3020	3020	Uranium One	380849.425	809336.3387	440
34	73	27	3473-27-3021	3021	Uranium One	381249.425	809336.3387	440
34	73	27	3473-27-3022	3022	Uranium One	381649.425	809336.3387	440
34	73	27	3473-27-3023	3023	Uranium One	382049.425	809336.3387	440
34	73	27	3473-27-3024	3024	Uranium One	382449.425	809336.3387	800
34	73	27	3473-27-3025	3025	Uranium One	380449.425	809736.3387	400
34	73	27	3473-27-3026	3026	Uranium One	380849.425	809736.3387	380

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	27	3473-27-3027	3027	Uranium One	381249.425	809736.3387	380
34	73	27	3473-27-3028	3028	Uranium One	381649.425	809736.3387	380
34	73	27	3473-27-3029	3029	Uranium One	382049.425	809736.3387	440
34	73	27	3473-27-3030	3030	Uranium One	382449.425	809736.3387	440
34	73	27	3473-27-3031	3031	Uranium One	380849.425	810136.3387	400
34	73	27	3473-27-3032	3032	Uranium One	381249.425	810136.3387	400
34	73	27	3473-27-3033	3033	Uranium One	381849.425	808936.3387	360
34	73	27	3473-27-3034	3034	Uranium One	382249	808936	360
34	73	27	3473-27-3035	3035	Uranium One	382849.425	808536.3387	380
34	73	27	3473-27-3036	3036	Uranium One	383090	808536	380
34	73	27	3473-27-3037	3037	Uranium One	381849.425	809336.3387	380
34	73	27	3473-27-3038	3038	Uranium One	382249	809336	380
34	73	27	3473-27-3039	3039	Uranium One	382051.8363	808743.4133	380
34	73	27	3473-27-3040	3040	Uranium One	381469.425	809736.3387	400
34	73	27	3473-27-3041	3041	Uranium One	384049.425	808136.3387	800
34	73	27	3473-27-3042	3042	Uranium One	380850.3947	808754.5497	380
34	73	27	3473-27-3043	3043	Uranium One	381849.425	809736.3387	420
34	73	27	3473-27-3044	3044	Uranium One	382449.425	810536.3387	740
34	73	27	3473-27-3045	3045	Uranium One	385249.425	807736.3387	500
34	73	27	3473-27-3046	3046	Uranium One	380846.6752	808849.2949	340
34	73	27	3473-27-3047	3047	Uranium One	380446.5374	808754.4516	320
34	73	27	3473-27-3048	3048	Uranium One	381652.169	808747.1289	360
34	73	27	3473-27-3049	3049	Uranium One	381545.6682	808137.1685	280
34	73	27	3473-27-3054	3054	Uranium One	381648.2127	809135.4866	380
34	73	27	3473-27-3055	3055	Uranium One	381850.8472	809136.2125	380
34	73	27	3473-27-3056	3056	Uranium One	382047.2117	809136.8971	380
34	73	27	3473-27-3057	3057	Uranium One	382246.9419	809137.623	380
34	73	27	3473-27-3058	3058	Uranium One	382247.1994	809526.9844	400
34	73	27	3473-27-3059	3059	Uranium One	382050.3095	809529.9193	400
34	73	27	3473-27-3060	3060	Uranium One	381850.3095	809529.9193	400
34	73	27	3473-27-3061	3061	Uranium One	381650.3095	809529.9193	400
34	73	27	3473-27-3062	3062	Uranium One	385249	807536	400
34	73	27	3473-27-3064	3064	Uranium One	382449.425	810136.3387	320
34	73	27	3473-27-3065	3065	Uranium One	383148	810536	400
34	73	27	3473-27-3066	3066	Uranium One	381249.425	810536.3387	500
34	73	27	3473-27-3067	3067	Uranium One	381248.2708	808748.121	380
34	73	27	3473-27-3068	3068	Uranium One	382449.3335	808743.3638	380
34	73	27	3473-27-3069	3069	Uranium One	382849.425	810536.3387	360
34	73	27	3473-27-3070	3070	Uranium One	381249.083	810636.2134	400
34	73	27	3473-27-3071	3071	Uranium One	381051.9425	808536.9482	380
34	73	27	3473-27-3072	3072	Uranium One	385251.9125	807639.0971	400
34	73	27	3473-27-3073	3073	Uranium One	381050.1286	807735.2017	400
34	73	27	3473-27-3074	3074	Uranium One	381249.425	807736.3387	400
34	73	27	3473-27-3075	3075	Uranium One	381447.1169	807735.2017	400
34	73	27	3473-27-3076	3076	Uranium One	384849.425	807736.3387	800
34	73	27	3473-27-3077	3077	Uranium One	380847.7632	809532.3865	380
34	73	27	3473-27-3078	3078	Uranium One	380451.2081	809530.5944	340
34	73	27	3473-27-3081	3081	Uranium One	382153.0223	808935.9191	380
34	73	27	3473-27-3082	3082	Uranium One	382300.134	808936.9572	380
34	73	27	3473-27-3083	3083	Uranium One	380852.5249	809635.9231	400
34	73	27	3473-27-3084	3084	Uranium One	381047.6614	809735.9382	420
34	73	27	3473-27-3085	3085	Uranium One	380849.1231	808653.1787	320
34	73	27	3473-27-3086	3086	Uranium One	380847.0457	808805.4314	340
34	73	27	3473-27-3087	3087	Uranium One	382448.9588	809935.135	320
34	73	27	3473-27-3088	3088	Uranium One	382948.7305	810535.5992	340
34	73	27	3473-27-3089	3089	Uranium One	382449.425	810936.3387	400

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	27	3473-27-3090	3090	Uranium One	380450.6521	809576.8556	360
34	73	27	3473-27-3092	3092	Uranium One	381948.29	809335.5765	380
34	73	27	3473-27-3093	3093	Uranium One	382148.7525	809334.1955	380
34	73	27	3473-27-3094	3094	Uranium One	380451.5397	809628.6178	340
34	73	27	3473-27-3095	3095	Uranium One	380849.8524	809689.2741	380
34	73	27	3473-27-3096	3096	Uranium One	380394.8821	810536.2359	340
34	73	27	3473-27-3098	3098	Uranium One	380392.206	810137.6109	360
34	73	27	3473-27-3099	3099	Uranium One	380394.1349	810933.9186	440
34	73	27	3473-27-3101	3101	Uranium One	382049.9645	809386.4607	340
34	73	27	3473-27-3102	3102	Uranium One	382249.7441	808887.5651	340
34	73	27	3473-27-3103	3103	Uranium One	382249.6501	808986.937	340
34	73	27	3473-27-3104	3104	Uranium One	381999.5069	809335.3287	380
34	73	27	3473-27-3105	3105	Uranium One	382049.4617	809286.7237	380
34	73	27	3473-27-3106	3106	Uranium One	381249.5971	809786.6753	400
34	73	27	3473-27-3107	3107	Uranium One	382050.5645	808687.367	400
34	73	27	3473-27-3111	3111	Uranium One	382248.8424	809036.9138	380
34	73	27	3473-27-3119	3119	Uranium One	382249	809286	360
34	73	27	3473-27-3121	3121	Uranium One	382249	809089	380
34	73	27	3473-27-3122	3122	Uranium One	382450	809138	380
34	73	27	3473-27-3124	3124	Uranium One	382250	809386	380
34	73	27	3473-27-3126	3126	Uranium One	382249	809236	380
34	73	27	3473-27-3127	3127	Uranium One	382299	809335	380
34	73	27	3473-27-3128	3128	Uranium One	381649	809630	380
34	73	27	3473-27-3129	3129	Uranium One	382050	808888	380
34	73	27	3473-27-3133	3133	Uranium One	380395	810336	360
34	73	27	3473-27-3145	3145	Uranium One	382050	808839	360
34	73	27	3473-27-3146	3146	Uranium One	382047	808986	380
34	73	27	3473-27-3149	3149	Uranium One	381052	810138	440
34	73	27	3473-27-3150	3150	Uranium One	381251	810933	480
34	73	27	3473-27-3163	3163	Uranium One	382052	808790	380
34	73	27	3473-27-3164	3164	Uranium One	381651	808797	400
34	73	27	3473-27-3174	3174	Uranium One	381649	807734	440
34	73	27	3473-27-3175	3175	Uranium One	380948	808134	400
34	73	27	3473-27-3176	3176	Uranium One	381498	808137	400
34	73	27	3473-27-ACE-1-114	M-114	Morrison Nuclear	382220	811762.5	597
34	73	27	3473-27-ACE-1-117	M-117	Morrison Nuclear	382260.6	809817.5	600
34	73	27	3473-27-ACE-1-125E	M-125B	Morrison Nuclear	382166.4	807669.5	610
34	73	27	3473-27-ACE-1-131E	M-131B	Morrison Nuclear	385054.5	809862.1	597
34	73	27	3473-27-ACE-1-139E	M-139B	Morrison Nuclear	385020.4	807611.7	610
34	73	27	3473-27-ACE-70-12	N-12	Cordero	381577.4	809059	456
34	73	27	3473-27-ACE-70-14	N-14	Cordero	381577.4	809059	597
34	73	27	3473-27-ACE-70-18	N-18	Cordero	381772.1	809808.4	410
34	73	27	3473-27-ACE-70-19	N-19	Cordero	382061.9	809049.7	398
34	73	27	3473-27-ACE-70-28	N-28	Cordero	382501	808856.1	460
34	73	27	3473-27-ACE-70-29	N-29	Cordero	381120.6	809192.4	420
34	73	27	3473-27-M-20	M-20	Uranium One	382104	808888	321
34	73	27	3473-27-N-14	N-14		381737.5	811036.3	
34	73	28	3473-28-194	194	UNC Teton	375231	812406.4	591
34	73	28	3473-28-195	195	UNC Teton	375842.6	812485.3	594
34	73	28	3473-28-196	196	UNC Teton	376431.4	812431.2	594
34	73	28	3473-28-197	197	UNC Teton	376987.5	812399.4	594
34	73	28	3473-28-200	200	UNC Teton	377903.5	812184.3	590
34	73	28	3473-28-201	201	UNC Teton	378314.9	812130.5	595
34	73	28	3473-28-202	202	UNC Teton	378722.6	812091.4	593
34	73	28	3473-28-3050	3050	Uranium One	380049.425	810536.3387	500
34	73	28	3473-28-3051	3051	Uranium One	379249.425	810536.3387	500

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	28	3473-28-3052	3052	Uranium One	379249.425	811336.3387	600
34	73	28	3473-28-3053	3053	Uranium One	378449.425	811336.3387	600
34	73	28	3473-28-3063	3063	Uranium One	379688.803	808736	340
34	73	28	3473-28-3079	3079	Uranium One	380049.425	809736.3387	400
34	73	28	3473-28-3080	3080	Uranium One	380147.0237	810535.6774	340
34	73	28	3473-28-3091	3091	Uranium One	380196.9628	810536.2359	340
34	73	28	3473-28-3097	3097	Uranium One	380198.277	810637.2913	360
34	73	28	3473-28-3100	3100	Uranium One	379575.0243	809912.5112	340
34	73	28	3473-28-3108	3108	Uranium One	380199.4607	810589.6068	380
34	73	28	3473-28-3109	3109	Uranium One	380197.3718	810485.8353	360
34	73	28	3473-28-3110	3110	Uranium One	380049	811336	400
34	73	28	3473-28-3112	3112	Uranium One	378049	808936	800
34	73	28	3473-28-3113	3113	Uranium One	378849	808936	800
34	73	28	3473-28-3114	3114	Uranium One	378849	809736	800
34	73	28	3473-28-3115	3115	Uranium One	378049	809736	800
34	73	28	3473-28-3116	3116	Uranium One	378049	810536	800
34	73	28	3473-28-3117	3117	Uranium One	378916	812126	800
34	73	28	3473-28-3118	3118	Uranium One	379716	812126	800
34	73	28	3473-28-3120	3120	Uranium One	378116	812126	800
34	73	28	3473-28-3123	3123	Uranium One	378049	808136	800
34	73	28	3473-28-3125	3125	Uranium One	378849	808136	340
34	73	28	3473-28-3130	3130	Uranium One	379650	808149	360
34	73	28	3473-28-3131	3131	Uranium One	379049	808936	300
34	73	28	3473-28-3132	3132	Uranium One	380247	810538	360
34	73	28	3473-28-3134	3134	Uranium One	378649	808136	320
34	73	28	3473-28-3135	3135	Uranium One	379049	808136	320
34	73	28	3473-28-3136	3136	Uranium One	378753	808935	320
34	73	28	3473-28-3137	3137	Uranium One	379199	808134	300
34	73	28	3473-28-3138	3138	Uranium One	378599	808136	280
34	73	28	3473-28-3139	3139	Uranium One	378699	808136	280
34	73	28	3473-28-3140	3140	Uranium One	378249	808936	300
34	73	28	3473-28-3141	3141	Uranium One	378049	808536	300
34	73	28	3473-28-3142	3142	Uranium One	378849	808536	300
34	73	28	3473-28-3143	3143	Uranium One	379249	808536	300
34	73	28	3473-28-3144	3144	Uranium One	378850	809334	400
34	73	28	3473-28-3147	3147	Uranium One	379252	807736	340
34	73	28	3473-28-3148	3148	Uranium One	380065	808136	340
34	73	28	3473-28-3151	3151	Uranium One	380250	809735	380
34	73	28	3473-28-3152	3152	Uranium One	379400	808136	280
34	73	28	3473-28-3153	3153	Uranium One	379049	808536	280
34	73	28	3473-28-3154	3154	Uranium One	378450	808935	280
34	73	28	3473-28-3156	3156	Uranium One	380088	808735	400
34	73	28	3473-28-3157	3157	Uranium One	378850	809135	400
34	73	28	3473-28-3158	3158	Uranium One	379050	807736	340
34	73	28	3473-28-3159	3159	Uranium One	378949	808536	400
34	73	28	3473-28-3160	3160	Uranium One	379549	808136	400
34	73	28	3473-28-3161	3161	Uranium One	378698	808186	320
34	73	28	3473-28-3162	3162	Uranium One	378699	808085	300
34	73	28	3473-28-3165	3165	Uranium One	379500	808136	300
34	73	28	3473-28-3166	3166	Uranium One	379599	808142	300
34	73	28	3473-28-3167	3167	Uranium One	379890	808736	320
34	73	28	3473-28-3168	3168	Uranium One	378950	807735	340
34	73	28	3473-28-3169	3169	Uranium One	379150	807735	340
34	73	28	3473-28-3170	3170	Uranium One	378850	807834	440
34	73	28	3473-28-3171	3171	Uranium One	378948	808135	320
34	73	28	3473-28-3172	3172	Uranium One	378499	808137	320

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	28	3473-28-3173	3173	Uranium One	379127	808137	320
34	73	28	3473-28-3177	3177	Uranium One	379990	808734	340
34	73	28	3473-28-3178	3178	Uranium One	378850	807734	300
34	73	28	3473-28-3179	3179	Uranium One	378850	807635	300
34	73	28	3473-28-3180	3180	Uranium One	380266	808136	340
34	73	28	3473-28-3182	3182	Uranium One	380065	807936	340
34	73	28	3473-28-ACE-1-87	M-87	Morrison Nuclear	379439.8	809912.8	598
34	73	28	3473-28-ACE-1-92	M-92	Morrison Nuclear	377577.4	811371.3	610
34	73	28	3473-28-ACE-70-11	N-11	Cordero	377396.3	812449.9	496
34	73	28	3473-28-ACE-70-21	N-21	Cordero	377324.1	811614.8	500
34	73	28	3473-28-ACE-70-5	N-5	Cordero	376164.9	810763.6	594
34	73	28	3473-28-ACE-70-7	N-7	Cordero	378552.1	810753.9	597
34	73	28	3473-28-ACE-70-8	N-8	Cordero	379163.9	810710.6	595
34	73	28	3473-28-ACE-70-9	N-9	Cordero	379736.3	810716.4	595
34	73	28	3473-28-M-19	M-19	Uranium One	378950	807850	361
34	73	28	3473-28-UID1	UID1		377373.7	810778.5	
34	73	28	3473-28-UID2	UID2		376403	809834.4	
34	73	29	3473-29-1116	1116		372542	811320	
34	73	29	3473-29-1116Dup ID	1116		372548	811229	
34	73	29	3473-29-1116Dup ID2	1116		372557	811139	
34	73	29	3473-29-226	226	UNC Teton	371975	809023	597
34	73	29	3473-29-228	228	UNC Teton	372140	811441	797
34	73	29	3473-29-231	231	UNC Teton	372135	811660	437
34	73	29	3473-29-232	232	UNC Teton	372140	811251	437
34	73	29	3473-29-233	233	UNC Teton	372140	811351	396
34	73	29	3473-29-234	234	UNC Teton	372139	812610	595
34	73	29	3473-29-235	235	UNC Teton	372143	811300	397
34	73	29	3473-29-236	236	UNC Teton	372136	811402	394
34	73	29	3473-29-237	237	UNC Teton	371728	811309	598
34	73	29	3473-29-238	238	UNC Teton	372539	811422	596
34	73	29	3473-29-240	240	UNC Teton	371721	811434	398
34	73	29	3473-29-241	241	UNC Teton	372133	812383	495
34	73	29	3473-29-242	242	UNC Teton	371724	811544	398
34	73	29	3473-29-245	245	UNC Teton	373003	811537	496
34	73	29	3473-29-246	246	UNC Teton	372528	811608	438
34	73	29	3473-29-247	247	UNC Teton	372138	812482	499
34	73	29	3473-29-248	248	UNC Teton	371182	811400	398
34	73	29	3473-29-250	250	UNC Teton	372536	811512	377
34	73	29	3473-29-251	251	UNC Teton	372962	812082	497
34	73	29	3473-29-252	252	UNC Teton	370703	811396	399
34	73	29	3473-29-253	253	UNC Teton	372728	811814	436
34	73	29	3473-29-255	255	UNC Teton	372884	811659	416
34	73	29	3473-29-256	256	UNC Teton	372138	812272	438
34	73	29	3473-29-260	260	UNC Teton	372945	811585	419
34	73	29	3473-29-261	261	UNC Teton	373420	811610	437
34	73	29	3473-29-265	265	UNC Teton	371731	811256	397
34	73	29	3473-29-266	266	UNC Teton	373167	811882	457
34	73	29	3473-29-267	267	UNC Teton	372845	811949	452
34	73	29	3473-29-268	268	UNC Teton	372703	811608	439
34	73	29	3473-29-271	271	UNC Teton	373249	811773	438
34	73	29	3473-29-273	273	UNC Teton	372614	811589	418
34	73	29	3473-29-274	274	UNC Teton	373154	811823	428
34	73	29	3473-29-ACE-1-102	M-102	Morrison Nuclear	374368.6	811907.8	597
34	73	29	3473-29-ACE-70-4	N-4	Cordero	374967.8	810732.2	497
34	73	29	3473-29-CRX-28	CRX-28	UNC Teton	370100	807400	602
34	73	2	3473-2-OW-1	2-OW-1		389346	802662	

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	2	3473-2-OW-2	2-OW-2		389240	802627	
34	73	2	3473-2-OW-3	2-OW-3		389281	802679	
34	73	2	3473-2-OW-4	2-OW-4		389341	802681	
34	73	2	3473-2-OW-5	2-OW-5		389254	802751	
34	73	2	3473-2-OW-6	2-OW-6		389290	802740	
34	73	2	3473-2-PW2	2-PW2		389311	802697	
34	73	2	3473-2-SX -01	SX-01	UNC Teton	388102	829492	496
34	73	34	3473-34-1	34-1	R.L. Peterson	384300	803550	500
34	73	34	3473-34-10	34-10	R.L. Peterson	383164	807140	380
34	73	34	3473-34-11	34-11	R.L. Peterson	383164	807190	379
34	73	34	3473-34-12	34-12	R.L. Peterson	382370	806800	399
34	73	34	3473-34-13	34-13	R.L. Peterson	382916	806290	294
34	73	34	3473-34-14	34-14	R.L. Peterson	382370	806700	296
34	73	34	3473-34-15	34-15	R.L. Peterson	384840	802500	299
34	73	34	3473-34-16	34-16	R.L. Peterson	383784	802137	297
34	73	34	3473-34-17	34-17	Nuclear Assurance Company	384765	807268	801
34	73	34	3473-34-18	34-18	Nuclear Assurance Company	383112	804339	803
34	73	34	3473-34-19	34-19	Nuclear Assurance Company	381615	807922	803
34	73	34	3473-34-2	34-2	R.L. Peterson	383370	807270	600
34	73	34	3473-34-20	34-20	Nuclear Assurance Company	384963	802073	803
34	73	34	3473-34-21	34-21	Nuclear Assurance Company	385278	807296	500
34	73	34	3473-34-3	34-3	R.L. Peterson	382917	806330	333
34	73	34	3473-34-4	34-4	R.L. Peterson	382318	806700	279
34	73	34	3473-34-5	34-5	R.L. Peterson	381708	806698	195
34	73	34	3473-34-6	34-6	R.L. Peterson	383165	806841	395
34	73	34	3473-34-7	34-7	R.L. Peterson	382312	805945	495
34	73	34	3473-34-747	34-747	Nuclear Assurance Company	385311	806520	359
34	73	34	3473-34-748	34-748	Nuclear Assurance Company	385216	807051	300
34	73	34	3473-34-749	34-749	Nuclear Assurance Company	385240	806448	337
34	73	34	3473-34-750	34-750	Nuclear Assurance Company	385220	806959	378
34	73	34	3473-34-751	34-751	Nuclear Assurance Company	385171	806375	319
34	73	34	3473-34-752	34-752	Nuclear Assurance Company	382687	806013	358
34	73	34	3473-34-753	34-753	Nuclear Assurance Company	382607	806606	298
34	73	34	3473-34-754	34-754	Nuclear Assurance Company	382620	806085	298
34	73	34	3473-34-755	34-755	Nuclear Assurance Company	382622	806703	299
34	73	34	3473-34-756	34-756	Nuclear Assurance Company	382638	806801	298
34	73	34	3473-34-757	34-757	Nuclear Assurance Company	382131	806993	318
34	73	34	3473-34-758	34-758	Nuclear Assurance Company	381997	806862	338
34	73	34	3473-34-759	34-759	Nuclear Assurance Company	382064	806920	298
34	73	34	3473-34-760	34-760	Nuclear Assurance Company	382636	806992	298
34	73	34	3473-34-761	34-761	Nuclear Assurance Company	382640	806892	198
34	73	34	3473-34-762	34-762	Nuclear Assurance Company	382640	806939	199
34	73	34	3473-34-763	34-763	Nuclear Assurance Company	382641	806837	198
34	73	34	3473-34-764	34-764	Nuclear Assurance Company	382554	806152	298
34	73	34	3473-34-765	34-765	Nuclear Assurance Company	385026	806233	378
34	73	34	3473-34-766	34-766	Nuclear Assurance Company	385101	806299	348
34	73	34	3473-34-767	34-767	Nuclear Assurance Company	385224	806860	380
34	73	34	3473-34-768	34-768	Nuclear Assurance Company	384210	806868	255
34	73	34	3473-34-769	34-769	Nuclear Assurance Company	384212	806664	300
34	73	34	3473-34-770	34-770	Nuclear Assurance Company	384212	806458	256
34	73	34	3473-34-771	34-771	Nuclear Assurance Company	384220	806253	280
34	73	34	3473-34-772	34-772	Nuclear Assurance Company	382484	806226	383
34	73	34	3473-34-773	34-773	Nuclear Assurance Company	384223	806353	273
34	73	34	3473-34-8	34-8	R.L. Peterson	383060	805850	298
34	73	34	3473-34-829	34-829	Nuclear Assurance Company	382586	806193	319
34	73	34	3473-34-830	34-830	Nuclear Assurance Company	382524	806114	319

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	34	3473-34-832	34-832	Nuclear Assurance Company	382521	806194	314
34	73	34	3473-34-833	34-833	Nuclear Assurance Company	382447	806260	317
34	73	34	3473-34-834	34-834	Nuclear Assurance Company	385004	806125	335
34	73	34	3473-34-835	34-835	Nuclear Assurance Company	383358	806325	386
34	73	34	3473-34-836	34-836	Nuclear Assurance Company	382896	806353	317
34	73	34	3473-34-837	34-837	Nuclear Assurance Company	382487	806080	294
34	73	34	3473-34-838	34-838	Nuclear Assurance Company	382620	806227	296
34	73	34	3473-34-839	34-839	Nuclear Assurance Company	382611	806423	297
34	73	34	3473-34-840	34-840	Nuclear Assurance Company	381742	806358	276
34	73	34	3473-34-841	34-841	Nuclear Assurance Company	382414	806292	296
34	73	34	3473-34-842	34-842	Nuclear Assurance Company	381717	806524	276
34	73	34	3473-34-843	34-843	Nuclear Assurance Company	381798	806173	276
34	73	34	3473-34-844	34-844	Nuclear Assurance Company	381735	806452	276
34	73	34	3473-34-845	34-845	Nuclear Assurance Company	383776	806384	274
34	73	34	3473-34-846	34-846	Nuclear Assurance Company	384596	806609	316
34	73	34	3473-34-847	34-847	Nuclear Assurance Company	381529	806370	296
34	73	34	3473-34-848	34-848	Nuclear Assurance Company	382613	806326	292
34	73	34	3473-34-849	34-849	Nuclear Assurance Company	384551	806387	296
34	73	34	3473-34-850	34-850	Nuclear Assurance Company	381526	806313	296
34	73	34	3473-34-851	34-851	Nuclear Assurance Company	381528	806420	279
34	73	34	3473-34-859	34-859	Nuclear Assurance Company	384583	806015	336
34	73	34	3473-34-860	34-860	Nuclear Assurance Company	383154	806328	316
34	73	34	3473-34-861	34-861	Nuclear Assurance Company	382918	806617	316
34	73	34	3473-34-862	34-862	Nuclear Assurance Company	383369	806014	312
34	73	34	3473-34-863	34-863	Nuclear Assurance Company	383377	805632	417
34	73	34	3473-34-864	34-864	Nuclear Assurance Company	384584	806708	376
34	73	34	3473-34-865	34-865	Nuclear Assurance Company	382914	806549	316
34	73	34	3473-34-866	34-866	Nuclear Assurance Company	383053	806380	331
34	73	34	3473-34-867	34-867	Nuclear Assurance Company	384207	806057	337
34	73	34	3473-34-9	34-9	R.L. Peterson	382913	806240	298
34	73	35	3473-35-0W-6	1-0W-6	Nuclear Assurance Company	387480	806663	261
34	73	35	3473-35-0W-7	1-0W-7		387498	806667	
34	73	35	3473-35-1	35-1	R.L. Peterson	389917	807250	497
34	73	35	3473-35-10	35-10	R.L. Peterson	390504	802667	179
34	73	35	3473-35-100	35-100	R.L. Peterson	387440	806421	279
34	73	35	3473-35-101	35-101	R.L. Peterson	387241	806484	259
34	73	35	3473-35-102	35-102	R.L. Peterson	387343	806612	280
34	73	35	3473-35-103	35-103	R.L. Peterson	387240	806583	259
34	73	35	3473-35-104	35-104	R.L. Peterson	387535	806420	279
34	73	35	3473-35-105	35-105	R.L. Peterson	387347	806789	260
34	73	35	3473-35-106	35-106	R.L. Peterson	387553	806619	278
34	73	35	3473-35-107	35-107	R.L. Peterson	387546	806817	279
34	73	35	3473-35-108	35-108	R.L. Peterson	387446	806804	280
34	73	35	3473-35-109	35-109	R.L. Peterson	387452	806712	280
34	73	35	3473-35-11	35-11	R.L. Peterson	389314	802587	174
34	73	35	3473-35-110	35-110	R.L. Peterson	387151	806196	232
34	73	35	3473-35-111	35-111	R.L. Peterson	387177	806040	235
34	73	35	3473-35-112	35-112	R.L. Peterson	386891	805807	216
34	73	35	3473-35-113	35-113	R.L. Peterson	386790	805803	216
34	73	35	3473-35-114	35-114	R.L. Peterson	386039	805800	199
34	73	35	3473-35-115	35-115	R.L. Peterson	386340	805604	239
34	73	35	3473-35-116	35-116	R.L. Peterson	386640	805593	179
34	73	35	3473-35-117	35-117	R.L. Peterson	386746	805591	199
34	73	35	3473-35-118	35-118	R.L. Peterson	386847	805599	198
34	73	35	3473-35-119	35-119	R.L. Peterson	386846	805395	179
34	73	35	3473-35-12	35-12	R.L. Peterson	389366	802843	216

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	35	3473-35-120	35-120	R.L. Peterson	386744	805402	177
34	73	35	3473-35-121	35-121	R.L. Peterson	386737	805203	179
34	73	35	3473-35-122	35-122	R.L. Peterson	386831	805196	177
34	73	35	3473-35-123	35-123	R.L. Peterson	386827	804998	178
34	73	35	3473-35-124	35-124	R.L. Peterson	386921	805001	235
34	73	35	3473-35-125	35-125	R.L. Peterson	386933	804598	212
34	73	35	3473-35-126	35-126	R.L. Peterson	386732	804600	137
34	73	35	3473-35-127	35-127	R.L. Peterson	386634	804603	138
34	73	35	3473-35-128	35-128	R.L. Peterson	387883	803382	158
34	73	35	3473-35-129	35-129	R.L. Peterson	387925	803272	136
34	73	35	3473-35-13	35-13	R.L. Peterson	388724	802838	196
34	73	35	3473-35-130	35-130	R.L. Peterson	387919	803076	119
34	73	35	3473-35-131	35-131	R.L. Peterson	388010	803050	138
34	73	35	3473-35-132	35-132	R.L. Peterson	388739	802639	179
34	73	35	3473-35-133	35-133	R.L. Peterson	388731	802747	198
34	73	35	3473-35-134	35-134	R.L. Peterson	388739	802594	178
34	73	35	3473-35-135	35-135	R.L. Peterson	389003	802656	176
34	73	35	3473-35-136	35-136	R.L. Peterson	389311	802723	200
34	73	35	3473-35-137	35-137	R.L. Peterson	389313	802772	199
34	73	35	3473-35-138	35-138	R.L. Peterson	389596	802651	198
34	73	35	3473-35-139	35-139	R.L. Peterson	388998	802609	173
34	73	35	3473-35-14	35-14	R.L. Peterson	388119	802839	
34	73	35	3473-35-140	35-140	R.L. Peterson	388743	802544	179
34	73	35	3473-35-141	35-141	R.L. Peterson	388412	802350	177
34	73	35	3473-35-142	35-142	R.L. Peterson	388320	802436	177
34	73	35	3473-35-143	35-143	R.L. Peterson	389599	802700	200
34	73	35	3473-35-144	35-144	R.L. Peterson	389605	802455	174
34	73	35	3473-35-145	35-145	R.L. Peterson	389316	802391	178
34	73	35	3473-35-146	35-146	R.L. Peterson	389650	802702	198
34	73	35	3473-35-147	35-147	R.L. Peterson	389600	802554	198
34	73	35	3473-35-148	35-148	R.L. Peterson	389910	802642	199
34	73	35	3473-35-148Dup ID	148		389150.9	802604	
34	73	35	3473-35-149	35-149	R.L. Peterson	389692	802649	198
34	73	35	3473-35-15	35-15	R.L. Peterson	387811	802546	502
34	73	35	3473-35-150	35-150	R.L. Peterson	389740	802773	199
34	73	35	3473-35-151	35-151	R.L. Peterson	389816	802788	198
34	73	35	3473-35-152	35-152	R.L. Peterson	388431	804256	239
34	73	35	3473-35-153	35-153	R.L. Peterson	388611	804256	239
34	73	35	3473-35-154	35-154	R.L. Peterson	388431	803893	238
34	73	35	3473-35-155	35-155	R.L. Peterson	388610	804347	239
34	73	35	3473-35-156	35-156	R.L. Peterson	388523	804259	239
34	73	35	3473-35-157	35-157	R.L. Peterson	387733	804349	175
34	73	35	3473-35-158	35-158	R.L. Peterson	387602	804350	178
34	73	35	3473-35-159	35-159	R.L. Peterson	387696	804562	176
34	73	35	3473-35-16	35-16	R.L. Peterson	385803	806066	358
34	73	35	3473-35-160	35-160	R.L. Peterson	387659	804771	197
34	73	35	3473-35-161	35-161	R.L. Peterson	387784	804351	178
34	73	35	3473-35-162	35-162	R.L. Peterson	387685	804351	175
34	73	35	3473-35-163	35-163	R.L. Peterson	387783	804566	194
34	73	35	3473-35-164	35-164	R.L. Peterson	387741	804565	194
34	73	35	3473-35-165	35-165	R.L. Peterson	387705	804773	195
34	73	35	3473-35-166	35-166	R.L. Peterson	387613	804773	200
34	73	35	3473-35-167	35-167	R.L. Peterson	387517	804770	259
34	73	35	3473-35-168	35-168	R.L. Peterson	387707	804940	259
34	73	35	3473-35-168C	35-168C	Nuclear Assurance Company	387706	804934	183
34	73	35	3473-35-169	35-169	R.L. Peterson	387570	804940	195

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	35	3473-35-17	35-17	R.L. Peterson	385853	806378	359
34	73	35	3473-35-170	35-170	R.L. Peterson	387661	804935	194
34	73	35	3473-35-171	35-171	R.L. Peterson	387541	805110	216
34	73	35	3473-35-172	35-172	R.L. Peterson	387416	805099	194
34	73	35	3473-35-173	35-173	R.L. Peterson	387501	805106	195
34	73	35	3473-35-174	35-174	R.L. Peterson	387483	804941	199
34	73	35	3473-35-175	35-175	R.L. Peterson	387541	805299	197
34	73	35	3473-35-176	35-176	R.L. Peterson	387492	805298	196
34	73	35	3473-35-177	35-177	R.L. Peterson	387398	805295	196
34	73	35	3473-35-178	35-178	R.L. Peterson	387291	805427	196
34	73	35	3473-35-179	35-179	R.L. Peterson	387192	805418	192
34	73	35	3473-35-18	35-18	R.L. Peterson	387804	802149	118
34	73	35	3473-35-180	35-180	R.L. Peterson	387398	805600	216
34	73	35	3473-35-181	35-181	R.L. Peterson	387298	805622	211
34	73	35	3473-35-182	35-182	R.L. Peterson	387399	805768	217
34	73	35	3473-35-183	35-183	R.L. Peterson	387294	805800	212
34	73	35	3473-35-184	35-184	R.L. Peterson	387188	805801	213
34	73	35	3473-35-185	35-185	R.L. Peterson	387300	805996	238
34	73	35	3473-35-186	35-186	R.L. Peterson	387398	805998	240
34	73	35	3473-35-187	35-187	R.L. Peterson	386740	805801	217
34	73	35	3473-35-188	35-188	R.L. Peterson	386698	805584	240
34	73	35	3473-35-189	35-189	R.L. Peterson	386842	805803	215
34	73	35	3473-35-19	35-19	R.L. Peterson	387757	802547	174
34	73	35	3473-35-190	35-190	R.L. Peterson	386941	805808	216
34	73	35	3473-35-191	35-191	R.L. Peterson	386796	805596	200
34	73	35	3473-35-192	35-192	R.L. Peterson	386694	805800	217
34	73	35	3473-35-193	35-193	R.L. Peterson	386776	805899	214
34	73	35	3473-35-194	35-194	R.L. Peterson	386900	805603	197
34	73	35	3473-35-195	35-195	R.L. Peterson	386803	805396	198
34	73	35	3473-35-196	35-196	R.L. Peterson	386996	805810	214
34	73	35	3473-35-197	35-197	R.L. Peterson	387253	805994	235
34	73	35	3473-35-198	35-198	R.L. Peterson	386777	805855	217
34	73	35	3473-35-199	35-199	R.L. Peterson	387129	806040	238
34	73	35	3473-351-OW-1	1-OW-1		387481	806776	
34	73	35	3473-35-2	35-2	R.L. Peterson	390678	804990	400
34	73	35	3473-35-20	35-20	R.L. Peterson	387863	802546	176
34	73	35	3473-35-200	35-200	R.L. Peterson	387200	806203	258
34	73	35	3473-35-2001	2001	Uranium One	387347	805556	401.1
34	73	35	3473-35-2002	2002	Uranium One	387545	805197	401.7
34	73	35	3473-35-2003	2003	Uranium One	387653	804655	401.4
34	73	35	3473-35-2004	2004	Uranium One	387753	804655	400.9
34	73	35	3473-35-2005	2005	Uranium One	387686	804463	401.3
34	73	35	3473-35-2006	2006	Uranium One	387786	804463	400.5
34	73	35	3473-35-2007	2007	Uranium One	387637	804247	400.6
34	73	35	3473-35-2008	2008	Uranium One	387737	804247	400.7
34	73	35	3473-35-2009	2009	Uranium One	387887	804247	400.9
34	73	35	3473-35-201	35-201	R.L. Peterson	387288	806212	258
34	73	35	3473-35-2010	2010	Uranium One	387851	804087	397.8
34	73	35	3473-35-2011	2011	Uranium One	387781	803018	398
34	73	35	3473-35-2012	2012	Uranium One	388422	802535	399.1
34	73	35	3473-35-2013	2013	Uranium One	388422	802434	400
34	73	35	3473-35-2014	2014	Uranium One	388617	802595	400.2
34	73	35	3473-35-2015	2015	Uranium One	388617	802493	399.7
34	73	35	3473-35-2016	2016	Uranium One	389078	802607	397.8
34	73	35	3473-35-2017	2017	Uranium One	389757	802694	396.2
34	73	35	3473-35-2018	2018	Uranium One	390432.8	802974	401.1

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	35	3473-35-2019	2019	Uranium One	389963	803774	400.6
34	73	35	3473-35-202	35-202	R.L. Peterson	387391	806224	255
34	73	35	3473-35-2020	2020	Uranium One	390275	804121	399.9
34	73	35	3473-35-2021	2021	Uranium One	390720	804204	397.5
34	73	35	3473-35-2022	2022	Uranium One	390592	804273	400.6
34	73	35	3473-35-2023	2023	Uranium One	390611	804587	399.3
34	73	35	3473-35-2024	2024	Uranium One	389070	806460	400.8
34	73	35	3473-35-2025	2025	Uranium One	388970	806558	400.2
34	73	35	3473-35-2026	2026	Uranium One	387298	806864	400.2
34	73	35	3473-35-2027	2027	Uranium One	387498	806561	401.4
34	73	35	3473-35-2028	2028	Uranium One	387294	806545	401.7
34	73	35	3473-35-2029	2029	Uranium One	387097	806306	401.2
34	73	35	3473-35-203	35-203	R.L. Peterson	387191	806383	260
34	73	35	3473-35-2030	2030	Uranium One	387080	805974	401.5
34	73	35	3473-35-2031	2031	Uranium One	387124	805715	396.6
34	73	35	3473-35-2032	2032	Uranium One	387622	805696	401.1
34	73	35	3473-35-2033	2033	Uranium One	387677	805598	401.1
34	73	35	3473-35-2034	2034	Uranium One	386667	805524	402.7
34	73	35	3473-35-2035	2035	Uranium One	387017	805194	401.9
34	73	35	3473-35-2036	2036	Uranium One	387392	804018	401
34	73	35	3473-35-2037	2037	Uranium One	387586	803917	400.7
34	73	35	3473-35-2038	2038	Uranium One	387275	803412	400.6
34	73	35	3473-35-204	35-204	R.L. Peterson	387293	806402	255
34	73	35	3473-35-2040	2040	Uranium One	386834	802558	424.4
34	73	35	3473-35-2041	2041	Uranium One	388911	802237	399.9
34	73	35	3473-35-2042	2042	Uranium One	389650	802746	240.3
34	73	35	3473-35-2043	2043	Uranium One	389520.6	802751.6	240.1
34	73	35	3473-35-2044	2044	Uranium One	389377.4	802763	239.1
34	73	35	3473-35-2045	2045	Uranium One	389076	802702	218.5
34	73	35	3473-35-2046	2046	Uranium One	388226	802324	218.3
34	73	35	3473-35-2047	2047	Uranium One	388171	802499	221.6
34	73	35	3473-35-2048	2048	Uranium One	387927	802304	219.5
34	73	35	3473-35-2049	2049	Uranium One	388017	802646	400.7
34	73	35	3473-35-205	35-205	R.L. Peterson	387398	806419	273
34	73	35	3473-35-2050	2050	Uranium One	387596	802549	218.7
34	73	35	3473-35-2051	2051	Uranium One	387876	802955	220.7
34	73	35	3473-35-2052	2052	Uranium One	387876	803205	220.3
34	73	35	3473-35-2053	2053	Uranium One	387902	803534	400.2
34	73	35	3473-35-2054	2054	Uranium One	387900	803699	220.3
34	73	35	3473-35-2055	2055	Uranium One	388145	803757	218.2
34	73	35	3473-35-2056	2056	Uranium One	387892	803871	218.6
34	73	35	3473-35-2057	2057	Uranium One	387995	804290	221.2
34	73	35	3473-35-2058	2058	Uranium One	387879	804463	241.5
34	73	35	3473-35-2059	2059	Uranium One	387613	804858	241.4
34	73	35	3473-35-206	35-206	R.L. Peterson	387490	806424	278
34	73	35	3473-35-2060	2060	Uranium One	387434	804851	241.7
34	73	35	3473-35-2061	2061	Uranium One	387670	805030	261.6
34	73	35	3473-35-2062	2062	Uranium One	387502	805030	261.9
34	73	35	3473-35-2063	2063	Uranium One	387760	805197	261.8
34	73	35	3473-35-2064	2064	Uranium One	387445	805198	261.3
34	73	35	3473-35-2065	2065	Uranium One	387391	805364	281.5
34	73	35	3473-35-2066	2066	Uranium One	387402	805858	400.6
34	73	35	3473-35-2067	2067	Uranium One	387661	806055	419.5
34	73	35	3473-35-2068	2068	Uranium One	387193	806686	302.2
34	73	35	3473-35-2069	2069	Uranium One	386778	806298	401.5
34	73	35	3473-35-207	35-207	R.L. Peterson	387193	806605	278

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	35	3473-35-2070	2070	Uranium One	386854	805092	241.3
34	73	35	3473-35-2071	2071	Uranium One	386876	804748	241.5
34	73	35	3473-35-2072	2072	Uranium One	389018	803372	219.7
34	73	35	3473-35-2073	2073	Uranium One	389428	803482	219.6
34	73	35	3473-35-2074	2074	Uranium One	389584	803499	218.1
34	73	35	3473-35-2075	2075	Uranium One	390286	803859	219.5
34	73	35	3473-35-2076	2076	Uranium One	390782	804387	260.2
34	73	35	3473-35-2077	2077	Uranium One	390764	804585	280.3
34	73	35	3473-35-2078	2078	Uranium One	390362	804657	280.4
34	73	35	3473-35-2079	2079	Uranium One	389971	804828	279.4
34	73	35	3473-35-208	35-208	R.L. Peterson	387294	806612	280
34	73	35	3473-35-2080	2080	Uranium One	389489	804765	278.9
34	73	35	3473-35-2081	2081	Uranium One	389687	802342	800.7
34	73	35	3473-35-2083	2083	Uranium One	387793	803872	241.9
34	73	35	3473-35-2084	2084	Uranium One	387892	803976	241.3
34	73	35	3473-35-2085	2085	Uranium One	387956	804099	221.1
34	73	35	3473-35-2086	2086	Uranium One	387737	804414	240.3
34	73	35	3473-35-2087	2087	Uranium One	387821.2	804657.3	263.7
34	73	35	3473-35-2088	2088	Uranium One	387705	804707.7	260.9
34	73	35	3473-35-2089	2089	Uranium One	387563	804706	261.1
34	73	35	3473-35-209	35-209	R.L. Peterson	387396	806613	276
34	73	35	3473-35-2090	2090	Uranium One	387434	804768	260.3
34	73	35	3473-35-2091	2091	Uranium One	387702	804903	280.8
34	73	35	3473-35-2092	2092	Uranium One	387718	805030	280.9
34	73	35	3473-35-2093	2093	Uranium One	387590	805030	281.8
34	73	35	3473-35-2094	2094	Uranium One	387429	805030	281.4
34	73	35	3473-35-2095	2095	Uranium One	387538	805696	402.5
34	73	35	3473-35-2096	2096	Uranium One	387520	805790	400.9
34	73	35	3473-35-2097	2097	Uranium One	387241	806433	302.1
34	73	35	3473-35-2098	2098	Uranium One	387497	806479	301
34	73	35	3473-35-2099	2099	Uranium One	386060	807291	460.5
34	73	35	3473-35-21	35-21	R.L. Peterson	387813	802648	174
34	73	35	3473-35-210	35-210	R.L. Peterson	387447	806615	275
34	73	35	3473-35-2101	2101	Uranium One	385783	807341	601.2
34	73	35	3473-35-2102	2102	Uranium One	387798	804247	221.7
34	73	35	3473-35-211	35-211	R.L. Peterson	387498	806619	279
34	73	35	3473-35-212	35-212	R.L. Peterson	387602	806623	276
34	73	35	3473-35-2123	2123	Uranium One	390599.3	802925.9	400.2
34	73	35	3473-35-2124	2124	Uranium One	390688.3	802985.3	399.8
34	73	35	3473-35-2125	2125	Uranium One	390686.5	803128.9	400.4
34	73	35	3473-35-2126	2126	Uranium One	388800.7	802597.5	218.5
34	73	35	3473-35-2128	2128	Uranium One	388248	802478	220.3
34	73	35	3473-35-2129	2129	Uranium One	388226	802375	212.5
34	73	35	3473-35-213	35-213	R.L. Peterson	387341	806701	279
34	73	35	3473-35-2130	2130	Uranium One	387927	802253	214.4
34	73	35	3473-35-2131	2131	Uranium One	388045	803867	200.1
34	73	35	3473-35-2132	2132	Uranium One	388080	803966	201.6
34	73	35	3473-35-2133	2133	Uranium One	387788	804303	201.1
34	73	35	3473-35-2134	2134	Uranium One	387680	804298	200.7
34	73	35	3473-35-2135	2135	Uranium One	387736	804516	201
34	73	35	3473-35-2136	2136	Uranium One	387788	804606	221.4
34	73	35	3473-35-2137	2137	Uranium One	387705	804606	219.9
34	73	35	3473-35-2138	2138	Uranium One	387654	804823	241.4
34	73	35	3473-35-2139	2139	Uranium One	387589	804979	261.2
34	73	35	3473-35-214	35-214	R.L. Peterson	387548	806721	278
34	73	35	3473-35-2140	2140	Uranium One	387496	805168	260.4

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	35	3473-35-2141	2141	Uranium One	387393	805198	257.8
34	73	35	3473-35-2142	2142	Uranium One	387445	805250	262
34	73	35	3473-35-2143	2143	Uranium One	387441	805344	281.6
34	73	35	3473-35-2144	2144	Uranium One	387286	805366	362.1
34	73	35	3473-35-2145	2145	Uranium One	387102	805405	361.7
34	73	35	3473-35-2146	2146	Uranium One	387672	805695	401.3
34	73	35	3473-35-2147	2147	Uranium One	387395	805663	400.8
34	73	35	3473-35-2148	2148	Uranium One	387342	805902	401.7
34	73	35	3473-35-2149	2149	Uranium One	387393	805948	401.1
34	73	35	3473-35-215	35-215	R.L. Peterson	387298	806786	279
34	73	35	3473-35-2150	2150	Uranium One	387393	806369	301
34	73	35	3473-35-2151	2151	Uranium One	387393	806473	302.1
34	73	35	3473-35-2152	2152	Uranium One	387240	806638	301.9
34	73	35	3473-35-2153	2153	Uranium One	387498	806811	302.3
34	73	35	3473-35-2154	2154	Uranium One	386902	806089	420.9
34	73	35	3473-35-2155	2155	Uranium One	386796	806199	421.6
34	73	35	3473-35-2156	2156	Uranium One	386585	806476	421.7
34	73	35	3473-35-216	35-216	R.L. Peterson	387398	806799	281
34	73	35	3473-35-217	35-217	R.L. Peterson	387494	806810	281
34	73	35	3473-35-218	35-218	R.L. Peterson	386352	806209	379
34	73	35	3473-35-219	35-219	R.L. Peterson	387544	806769	282
34	73	35	3473-35-22	35-22	R.L. Peterson	387809	802750	179
34	73	35	3473-35-220	35-220	R.L. Peterson	386371	806030	359
34	73	35	3473-35-221	35-221	R.L. Peterson	387551	806672	279
34	73	35	3473-35-222	35-222	R.L. Peterson	387399	806848	282
34	73	35	3473-35-223	35-223	R.L. Peterson	386636	806373	381
34	73	35	3473-35-224	35-224	R.L. Peterson	386641	806037	362
34	73	35	3473-35-225	35-225	R.L. Peterson	386681	806362	379
34	73	35	3473-35-226	35-226	R.L. Peterson	387340	806745	281
34	73	35	3473-35-227	35-227	R.L. Peterson	387341	806654	280
34	73	35	3473-35-228	35-228	R.L. Peterson	387439	806322	280
34	73	35	3473-35-229	35-229	R.L. Peterson	387249	806688	274
34	73	35	3473-35-23	35-23	R.L. Peterson	388418	802854	195
34	73	35	3473-35-230	35-230	R.L. Peterson	387442	806519	281
34	73	35	3473-35-231	35-231	R.L. Peterson	387545	806521	277
34	73	35	3473-35-232	35-232	R.L. Peterson	387246	806311	281
34	73	35	3473-35-233	35-233	R.L. Peterson	387340	806124	261
34	73	35	3473-35-234	35-234	R.L. Peterson	387234	806118	258
34	73	35	3473-35-235	35-235	R.L. Peterson	387135	806111	238
34	73	35	3473-35-236	35-236	R.L. Peterson	387388	806129	259
34	73	35	3473-35-237	35-237	R.L. Peterson	387197	806308	251
34	73	35	3473-35-238	35-238	R.L. Peterson	386997	805903	355
34	73	35	3473-35-239	35-239	R.L. Peterson	386995	805857	240
34	73	35	3473-35-24	35-24	R.L. Peterson	387659	802551	177
34	73	35	3473-35-240	35-240	R.L. Peterson	387046	805813	219
34	73	35	3473-35-241	35-241	R.L. Peterson	387097	805909	340
34	73	35	3473-35-242	35-242	R.L. Peterson	387095	805814	219
34	73	35	3473-35-243	35-243	R.L. Peterson	386696	805694	200
34	73	35	3473-35-244	35-244	R.L. Peterson	386767	805721	200
34	73	35	3473-35-245	35-245	R.L. Peterson	386896	805711	215
34	73	35	3473-35-246	35-246	R.L. Peterson	386998	805713	205
34	73	35	3473-35-247	35-247	R.L. Peterson	386948	805611	339
34	73	35	3473-35-248	35-248	R.L. Peterson	386801	805489	194
34	73	35	3473-35-249	35-249	R.L. Peterson	387339	805428	213
34	73	35	3473-35-25	35-25	R.L. Peterson	387856	802150	177
34	73	35	3473-35-250	35-250	R.L. Peterson	387388	805431	214

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	35	3473-35-251	35-251	R.L. Peterson	387436	805438	211
34	73	35	3473-35-252	35-252	R.L. Peterson	386750	805491	199
34	73	35	3473-35-253	35-253	R.L. Peterson	386066	804340	438
34	73	35	3473-35-254	35-254	R.L. Peterson	386632	804330	363
34	73	35	3473-35-255	35-255	R.L. Peterson	387232	804328	360
34	73	35	3473-35-256	35-256	R.L. Peterson	386052	804772	277
34	73	35	3473-35-257	35-257	R.L. Peterson	388821	804345	234
34	73	35	3473-35-258	35-258	R.L. Peterson	389031	804321	249
34	73	35	3473-35-259	35-259	R.L. Peterson	387206	805282	318
34	73	35	3473-35-26	35-26	R.L. Peterson	387747	802155	176
34	73	35	3473-35-260	35-260	R.L. Peterson	387244	805078	327
34	73	35	3473-35-261	35-261	R.L. Peterson	387053	805460	319
34	73	35	3473-35-262	35-262	R.L. Peterson	387064	805286	317
34	73	35	3473-35-263	35-263	R.L. Peterson	387062	805343	319
34	73	35	3473-35-264	35-264	R.L. Peterson	388841	803642	196
34	73	35	3473-35-265	35-265	R.L. Peterson	386806	805298	319
34	73	35	3473-35-266	35-266	R.L. Peterson	387058	805404	318
34	73	35	3473-35-267	35-267	R.L. Peterson	386962	805392	319
34	73	35	3473-35-268	35-268	R.L. Peterson	389288	804342	223
34	73	35	3473-35-269	35-269	R.L. Peterson	386747	805445	307
34	73	35	3473-35-27	35-27	R.L. Peterson	388922	802841	198
34	73	35	3473-35-270	35-270	R.L. Peterson	389127	803639	189
34	73	35	3473-35-271	35-271	R.L. Peterson	389584	804341	236
34	73	35	3473-35-272	35-272	R.L. Peterson	389912	803588	178
34	73	35	3473-35-273	35-273	R.L. Peterson	387243	805721	339
34	73	35	3473-35-274	35-274	R.L. Peterson	386745	805541	314
34	73	35	3473-35-275	35-275	R.L. Peterson	387392	803919	195
34	73	35	3473-35-276	35-276	R.L. Peterson	387830	804149	176
34	73	35	3473-35-277	35-277	R.L. Peterson	387734	804145	158
34	73	35	3473-35-278	35-278	R.L. Peterson	387741	803914	154
34	73	35	3473-35-279	35-279	R.L. Peterson	389915	803543	176
34	73	35	3473-35-28	35-28	R.L. Peterson	387260	802619	216
34	73	35	3473-35-280	35-280	R.L. Peterson	389911	803636	196
34	73	35	3473-35-281	35-281	R.L. Peterson	386803	805441	318
34	73	35	3473-35-282	35-282	R.L. Peterson	387878	804152	178
34	73	35	3473-35-283	35-283	R.L. Peterson	387941	803919	197
34	73	35	3473-35-284	35-284	R.L. Peterson	387779	804148	174
34	73	35	3473-35-285	35-285	R.L. Peterson	387793	803917	156
34	73	35	3473-35-286	35-286	R.L. Peterson	387989	803915	196
34	73	35	3473-35-287	35-287	R.L. Peterson	387927	804153	178
34	73	35	3473-35-288	35-288	R.L. Peterson	387707	803693	156
34	73	35	3473-35-289	35-289	R.L. Peterson	387805	803697	156
34	73	35	3473-35-29	35-29	R.L. Peterson	387826	802343	196
34	73	35	3473-35-290	35-290	R.L. Peterson	387349	805709	338
34	73	35	3473-35-290C	35-290C		387352	805716	
34	73	35	3473-35-291	35-291	R.L. Peterson	388035	803914	194
34	73	35	3473-35-292	35-292	R.L. Peterson	389517	803389	196
34	73	35	3473-35-293	35-293	R.L. Peterson	388035	803602	192
34	73	35	3473-35-294	35-294	R.L. Peterson	388144	803817	194
34	73	35	3473-35-295	35-295	R.L. Peterson	388089	803913	176
34	73	35	3473-35-296	35-296	R.L. Peterson	387780	803457	176
34	73	35	3473-35-297	35-297	R.L. Peterson	388085	803604	172
34	73	35	3473-35-298	35-298	R.L. Peterson	388194	803817	198
34	73	35	3473-35-299	35-299	R.L. Peterson	387875	803454	176
34	73	35	3473-35-3	35-3	R.L. Peterson	388715	804400	492
34	73	35	3473-35-30	35-30	R.L. Peterson	387048	802665	157

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	35	3473-35-300	35-300	R.L. Peterson	388149	803912	175
34	73	35	3473-35-301	35-301	R.L. Peterson	388031	803966	157
34	73	35	3473-35-302	35-302	R.L. Peterson	388243	803913	197
34	73	35	3473-35-303	35-303	R.L. Peterson	390010	803589	179
34	73	35	3473-35-304	35-304	R.L. Peterson	389819	803590	177
34	73	35	3473-35-305	35-305	R.L. Peterson	390022	803638	194
34	73	35	3473-35-306	35-306	R.L. Peterson	390109	803780	195
34	73	35	3473-35-307	35-307	R.L. Peterson	389822	803491	176
34	73	35	3473-35-308	35-308	R.L. Peterson	389724	803501	195
34	73	35	3473-35-309	35-309	R.L. Peterson	389822	803543	176
34	73	35	3473-35-31	35-31	R.L. Peterson	387825	803064	159
34	73	35	3473-35-310	35-310	R.L. Peterson	390024	803689	178
34	73	35	3473-35-311	35-311	R.L. Peterson	390110	803730	174
34	73	35	3473-35-312	35-312	R.L. Peterson	389726	803552	196
34	73	35	3473-35-313	35-313	R.L. Peterson	389722	803451	196
34	73	35	3473-35-314	35-314	R.L. Peterson	389584	803434	195
34	73	35	3473-35-315	35-315	R.L. Peterson	390205	803771	195
34	73	35	3473-35-316	35-316	R.L. Peterson	390111	803873	196
34	73	35	3473-35-317	35-317	R.L. Peterson	388286	803910	188
34	73	35	3473-35-318	35-318	R.L. Peterson	388194	803914	153
34	73	35	3473-35-319	35-319	R.L. Peterson	388034	804012	170
34	73	35	3473-35-32	35-32	R.L. Peterson	387448	802470	155
34	73	35	3473-35-320	35-320	R.L. Peterson	388035	804057	153
34	73	35	3473-35-321	35-321	R.L. Peterson	387989	804021	191
34	73	35	3473-35-322	35-322	R.L. Peterson	388097	803814	174
34	73	35	3473-35-323	35-323	R.L. Peterson	388085	804012	174
34	73	35	3473-35-324	35-324	R.L. Peterson	388036	804102	174
34	73	35	3473-35-325	35-325	R.L. Peterson	388085	804095	170
34	73	35	3473-35-326	35-326	R.L. Peterson	388133	804011	174
34	73	35	3473-35-327	35-327	R.L. Peterson	388185	804018	174
34	73	35	3473-35-328	35-328	R.L. Peterson	388038	804148	172
34	73	35	3473-35-329	35-329	R.L. Peterson	387915	804025	172
34	73	35	3473-35-33	35-33	R.L. Peterson	387484	802675	177
34	73	35	3473-35-330C	35-330C	R.L. Peterson	388146	803864	148
34	73	35	3473-35-331	35-331	R.L. Peterson	387772	804030	174
34	73	35	3473-35-332	35-332	R.L. Peterson	387681	804035	152
34	73	35	3473-35-333	35-333	R.L. Peterson	387586	804043	193
34	73	35	3473-35-334	35-334	R.L. Peterson	388041	804196	174
34	73	35	3473-35-335C	35-335C	R.L. Peterson	387448	806758	274
34	73	35	3473-35-336	35-336	R.L. Peterson	387977	804153	175
34	73	35	3473-35-337	35-337	R.L. Peterson	388043	804244	174
34	73	35	3473-35-338	35-338	R.L. Peterson	387978	804190	175
34	73	35	3473-35-339	35-339	R.L. Peterson	388045	804292	171
34	73	35	3473-35-34	35-34	R.L. Peterson	387824	803273	115
34	73	35	3473-35-340	35-340	R.L. Peterson	387683	804144	157
34	73	35	3473-35-341	35-341	R.L. Peterson	387537	804050	157
34	73	35	3473-35-342	35-342	R.L. Peterson	387742	803813	156
34	73	35	3473-35-343	35-343	R.L. Peterson	387836	803814	153
34	73	35	3473-35-344	35-344	R.L. Peterson	387944	803815	151
34	73	35	3473-35-345C	35-345C	R.L. Peterson	388100	803866	159
34	73	35	3473-35-346	35-346	R.L. Peterson	387831	804249	175
34	73	35	3473-35-347	35-347	R.L. Peterson	387999	803812	148
34	73	35	3473-35-348	35-348	R.L. Peterson	388044	803812	150
34	73	35	3473-35-349	35-349	R.L. Peterson	388088	804199	173
34	73	35	3473-35-35	35-35	R.L. Peterson	387365	802600	156
34	73	35	3473-35-350C	35-350C	R.L. Peterson	387808	804249	160

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	35	3473-35-351	35-351	R.L. Peterson	387995	804244	173
34	73	35	3473-35-352	35-352	R.L. Peterson	387945	804247	173
34	73	35	3473-35-353	35-353	R.L. Peterson	387879	804563	193
34	73	35	3473-35-354	35-354	R.L. Peterson	387781	804774	191
34	73	35	3473-35-355	35-355	R.L. Peterson	387759	804943	190
34	73	35	3473-35-356	35-356	R.L. Peterson	387671	805112	212
34	73	35	3473-35-357	35-357	R.L. Peterson	387429	804948	196
34	73	35	3473-35-358	35-358	Nuclear Assurance Company	387242	805290	215
34	73	35	3473-35-359	35-359	R.L. Peterson	387292	805294	195
34	73	35	3473-35-36	35-36	R.L. Peterson	388136	803604	198
34	73	35	3473-35-360C	35-360C	R.L. Peterson	388043	804281	177
34	73	35	3473-35-361	35-361	R.L. Peterson	387344	805295	212
34	73	35	3473-35-362	35-362	R.L. Peterson	387692	803813	149
34	73	35	3473-35-363	35-363	R.L. Peterson	387586	803606	336
34	73	35	3473-35-364	35-364	R.L. Peterson	387539	803603	133
34	73	35	3473-35-365	35-365	R.L. Peterson	387572	803406	154
34	73	35	3473-35-366	35-366	R.L. Peterson	387622	803300	131
34	73	35	3473-35-367	35-367	R.L. Peterson	387673	803397	152
34	73	35	3473-35-368	35-368	R.L. Peterson	387680	803504	150
34	73	35	3473-35-369	35-369	R.L. Peterson	387997	803704	155
34	73	35	3473-35-37	35-37	R.L. Peterson	388125	803392	178
34	73	35	3473-35-370	35-370	R.L. Peterson	388093	803706	192
34	73	35	3473-35-371	35-371	R.L. Peterson	387641	803812	153
34	73	35	3473-35-372	35-372	R.L. Peterson	387222	802864	501
34	73	35	3473-35-373	35-373	R.L. Peterson	387409	802205	136
34	73	35	3473-35-374	35-374	R.L. Peterson	387649	804557	191
34	73	35	3473-35-375	35-375	R.L. Peterson	387523	804941	210
34	73	35	3473-35-376	35-376	R.L. Peterson	387377	804944	192
34	73	35	3473-35-377	35-377	R.L. Peterson	386627	802868	497
34	73	35	3473-35-378	35-378	R.L. Peterson	388144	803704	190
34	73	35	3473-35-379	35-379	R.L. Peterson	386026	802872	334
34	73	35	3473-35-38	35-38	R.L. Peterson	387827	803385	179
34	73	35	3473-35-380	35-380	R.L. Peterson	387774	803387	170
34	73	35	3473-35-381	35-381	R.L. Peterson	387510	802197	498
34	73	35	3473-35-382	35-382	R.L. Peterson	387985	803600	185
34	73	35	3473-35-383	35-383	R.L. Peterson	388095	803662	183
34	73	35	3473-35-384	35-384	R.L. Peterson	387874	803266	178
34	73	35	3473-35-385	35-385	R.L. Peterson	388191	803703	185
34	73	35	3473-35-386	35-386	R.L. Peterson	387774	803281	158
34	73	35	3473-35-387	35-387	R.L. Peterson	387723	803289	157
34	73	35	3473-35-388	35-388	R.L. Peterson	387636	804139	138
34	73	35	3473-35-389	35-389	R.L. Peterson	387574	803305	151
34	73	35	3473-35-39	35-39	R.L. Peterson	388125	803189	157
34	73	35	3473-35-390	35-390	R.L. Peterson	387671	803294	152
34	73	35	3473-35-391	35-391	R.L. Peterson	387400	805706	338
34	73	35	3473-35-392	35-392	R.L. Peterson	386328	802864	228
34	73	35	3473-35-393	35-393	R.L. Peterson	387826	803165	136
34	73	35	3473-35-394	35-394	R.L. Peterson	387776	803179	133
34	73	35	3473-35-395	35-395	R.L. Peterson	387725	803187	149
34	73	35	3473-35-396	35-396	R.L. Peterson	387450	805698	358
34	73	35	3473-35-397	35-397	R.L. Peterson	387522	803411	216
34	73	35	3473-35-398	35-398	R.L. Peterson	387801	802252	155
34	73	35	3473-35-399	35-399	R.L. Peterson	387876	803153	136
34	73	35	3473-35-4	35-4	R.L. Peterson	388603	805317	398
34	73	35	3473-35-40	35-40	R.L. Peterson	387464	802572	219
34	73	35	3473-35-400	35-400	R.L. Peterson	387726	803081	137

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	35	3473-35-401	35-401	R.L. Peterson	387475	803414	198
34	73	35	3473-35-402	35-402	R.L. Peterson	387777	803071	128
34	73	35	3473-35-403	35-403	R.L. Peterson	387331	804946	198
34	73	35	3473-35-404	35-404	R.L. Peterson	387927	803143	131
34	73	35	3473-35-405	35-405	R.L. Peterson	387964	803061	130
34	73	35	3473-35-406	35-406	R.L. Peterson	387925	803453	158
34	73	35	3473-35-407	35-407	R.L. Peterson	387772	802850	114
34	73	35	3473-35-408	35-408	R.L. Peterson	387586	802689	178
34	73	35	3473-35-409	35-409	R.L. Peterson	387352	802495	156
34	73	35	3473-35-41	35-41	R.L. Peterson	387426	802361	138
34	73	35	3473-35-410	35-410	R.L. Peterson	390232	804839	258
34	73	35	3473-35-411	35-411	R.L. Peterson	390110	803823	193
34	73	35	3473-35-412	35-412	R.L. Peterson	390225	804649	238
34	73	35	3473-35-413	35-413	R.L. Peterson	390208	803873	196
34	73	35	3473-35-414	35-414	R.L. Peterson	390566	804356	236
34	73	35	3473-35-415	35-415	R.L. Peterson	389627	804544	259
34	73	35	3473-35-416	35-416	R.L. Peterson	390721	804339	217
34	73	35	3473-35-417	35-417	R.L. Peterson	389626	804443	238
34	73	35	3473-35-418	35-418	R.L. Peterson	390782	804338	236
34	73	35	3473-35-419	35-419	R.L. Peterson	389626	804392	239
34	73	35	3473-35-42	35-42	R.L. Peterson	387413	802260	139
34	73	35	3473-35-420	35-420	R.L. Peterson	390521	804140	215
34	73	35	3473-35-421	35-421	R.L. Peterson	390226	804542	239
34	73	35	3473-35-422	35-422	R.L. Peterson	390517	804042	215
34	73	35	3473-35-423	35-423	R.L. Peterson	390533	804529	239
34	73	35	3473-35-424	35-424	R.L. Peterson	390521	804087	215
34	73	35	3473-35-425	35-425	R.L. Peterson	390621	804138	236
34	73	35	3473-35-426	35-426	R.L. Peterson	390420	804038	215
34	73	35	3473-35-427	35-427	R.L. Peterson	390525	804417	238
34	73	35	3473-35-428	35-428	R.L. Peterson	390518	803994	209
34	73	35	3473-35-429	35-429	R.L. Peterson	390625	804438	239
34	73	35	3473-35-43	35-43	R.L. Peterson	387035	802558	157
34	73	35	3473-35-430	35-430	R.L. Peterson	390416	803939	216
34	73	35	3473-35-431	35-431	R.L. Peterson	390525	804376	236
34	73	35	3473-35-432	35-432	R.L. Peterson	390623	804092	215
34	73	35	3473-35-433	35-433	R.L. Peterson	390728	804389	239
34	73	35	3473-35-434	35-434	R.L. Peterson	390617	804034	212
34	73	35	3473-35-435	35-435	R.L. Peterson	390720	804285	240
34	73	35	3473-35-436	35-436	R.L. Peterson	390713	804091	216
34	73	35	3473-35-437	35-437	R.L. Peterson	390824	804349	239
34	73	35	3473-35-438	35-438	R.L. Peterson	390717	803992	215
34	73	35	3473-35-439	35-439	R.L. Peterson	390679	804483	238
34	73	35	3473-35-44	35-44	R.L. Peterson	387014	802462	134
34	73	35	3473-35-440	35-440	R.L. Peterson	390718	804039	238
34	73	35	3473-35-441	35-441	R.L. Peterson	390826	804234	239
34	73	35	3473-35-442	35-442	R.L. Peterson	390210	803925	191
34	73	35	3473-35-443	35-443	R.L. Peterson	390207	803819	197
34	73	35	3473-35-444	35-444	R.L. Peterson	390779	804488	256
34	73	35	3473-35-445	35-445	R.L. Peterson	390060	803776	195
34	73	35	3473-35-446	35-446	R.L. Peterson	390783	804284	259
34	73	35	3473-35-447	35-447	R.L. Peterson	390736	803139	174
34	73	35	3473-35-448	35-448	R.L. Peterson	390740	803089	174
34	73	35	3473-35-449	35-449	R.L. Peterson	390541	802981	151
34	73	35	3473-35-450	35-450	R.L. Peterson	390310	802837	117
34	73	35	3473-35-451	35-451	R.L. Peterson	390743	802940	195
34	73	35	3473-35-452	35-452	R.L. Peterson	390542	802933	153

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	35	3473-35-453	35-453	R.L. Peterson	390548	803080	157
34	73	35	3473-35-454	35-454	R.L. Peterson	390553	803123	153
34	73	35	3473-35-455	35-455	R.L. Peterson	390545	803031	158
34	73	35	3473-35-456	35-456	R.L. Peterson	390536	802884	154
34	73	35	3473-35-457	35-457	R.L. Peterson	390309	802785	119
34	73	35	3473-35-458	35-458	R.L. Peterson	390309	802887	118
34	73	35	3473-35-459	35-459	R.L. Peterson	390558	803171	154
34	73	35	3473-35-46	35-46	R.L. Peterson	387401	802156	139
34	73	35	3473-35-460	35-460	R.L. Peterson	390206	804342	219
34	73	35	3473-35-461	35-461	R.L. Peterson	389622	803781	218
34	73	35	3473-35-462	35-462	R.L. Peterson	389625	803981	219
34	73	35	3473-35-463	35-463	R.L. Peterson	389628	804192	240
34	73	35	3473-35-464	35-464	R.L. Peterson	390826	804883	280
34	73	35	3473-35-465	35-465	R.L. Peterson	390563	803217	160
34	73	35	3473-35-466	35-466	R.L. Peterson	390300	802697	119
34	73	35	3473-35-467	35-467	R.L. Peterson	390568	803265	160
34	73	35	3473-35-468	35-468	R.L. Peterson	390571	803315	160
34	73	35	3473-35-469	35-469	R.L. Peterson	390458	803157	123
34	73	35	3473-35-47	35-47	R.L. Peterson	387928	802848	176
34	73	35	3473-35-470	35-470	R.L. Peterson	390829	805603	302
34	73	35	3473-35-471	35-471	R.L. Peterson	390517	803261	159
34	73	35	3473-35-472	35-472	R.L. Peterson	390577	803365	158
34	73	35	3473-35-473	35-473	R.L. Peterson	390665	803268	153
34	73	35	3473-35-474	35-474	R.L. Peterson	390408	803150	140
34	73	35	3473-35-475	35-475	R.L. Peterson	390458	803067	159
34	73	35	3473-35-476	35-476	R.L. Peterson	390716	803272	173
34	73	35	3473-35-477	35-477	R.L. Peterson	390476	803213	157
34	73	35	3473-35-478	35-478	R.L. Peterson	390663	803316	153
34	73	35	3473-35-479	35-479	R.L. Peterson	390443	803110	138
34	73	35	3473-35-48	35-48	R.L. Peterson	387822	802858	178
34	73	35	3473-35-480	35-480	R.L. Peterson	390766	803269	173
34	73	35	3473-35-481	35-481	R.L. Peterson	390307	802982	118
34	73	35	3473-35-482	35-482	R.L. Peterson	390713	803324	155
34	73	35	3473-35-483	35-483	R.L. Peterson	390191	802828	118
34	73	35	3473-35-484	35-484	R.L. Peterson	390666	803225	174
34	73	35	3473-35-485	35-485	R.L. Peterson	390189	802719	99
34	73	35	3473-35-486	35-486	R.L. Peterson	390686	803187	155
34	73	35	3473-35-487	35-487	R.L. Peterson	390197	802933	120
34	73	35	3473-35-488	35-488	R.L. Peterson	390660	803364	155
34	73	35	3473-35-489	35-489	R.L. Peterson	389987	802662	179
34	73	35	3473-35-49	35-49	R.L. Peterson	387713	802851	178
34	73	35	3473-35-490	35-490	R.L. Peterson	390658	803408	175
34	73	35	3473-35-491	35-491	R.L. Peterson	390224	804189	218
34	73	35	3473-35-492	35-492	R.L. Peterson	390225	804237	216
34	73	35	3473-35-493	35-493	R.L. Peterson	390540	804680	229
34	73	35	3473-35-494	35-494	R.L. Peterson	390220	804136	216
34	73	35	3473-35-495	35-495	R.L. Peterson	390223	804083	218
34	73	35	3473-35-496	35-496	R.L. Peterson	389889	802597	199
34	73	35	3473-35-497	35-497	R.L. Peterson	389609	820400	176
34	73	35	3473-35-498	35-498	R.L. Peterson	389866	802560	178
34	73	35	3473-35-499	35-499	R.L. Peterson	389314	802813	199
34	73	35	3473-35-5	35-5	R.L. Peterson	390739	802990	393
34	73	35	3473-35-50	35-50	R.L. Peterson	387931	803373	174
34	73	35	3473-35-500	35-500	R.L. Peterson	389611	802361	176
34	73	35	3473-35-501	35-501	R.L. Peterson	389601	802504	173
34	73	35	3473-35-502	35-502	R.L. Peterson	389598	802602	177

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	35	3473-35-503	35-503	R.L. Peterson	389316	802539	198
34	73	35	3473-35-504	35-504	R.L. Peterson	389592	802746	217
34	73	35	3473-35-505	35-505	R.L. Peterson	389316	802442	179
34	73	35	3473-35-506	35-506	R.L. Peterson	389816	802558	176
34	73	35	3473-35-507	35-507	R.L. Peterson	388957	802704	178
34	73	35	3473-35-508	35-508	R.L. Peterson	389612	802313	176
34	73	35	3473-35-509	35-509	R.L. Peterson	389313	802488	179
34	73	35	3473-35-51	35-51	R.L. Peterson	387828	803457	178
34	73	35	3473-35-510	35-510	R.L. Peterson	389763	802560	180
34	73	35	3473-35-511	35-511	R.L. Peterson	389595	802797	217
34	73	35	3473-35-512	35-512	R.L. Peterson	389795	802643	199
34	73	35	3473-35-513	35-513	R.L. Peterson	389699	802557	176
34	73	35	3473-35-514	35-514	R.L. Peterson	389711	802356	175
34	73	35	3473-35-515	35-515	R.L. Peterson	389703	802455	173
34	73	35	3473-35-516	35-516	R.L. Peterson	389854	802696	197
34	73	35	3473-35-517C	35-517C	R.L. Peterson	387940	804025	153
34	73	35	3473-35-518C	35-518C	R.L. Peterson	387501	805116	193
34	73	35	3473-35-519C	35-519C	R.L. Peterson	387471	806804	278
34	73	35	3473-35-52	35-52	R.L. Peterson	387624	803403	154
34	73	35	3473-35-520C	35-520C	R.L. Peterson	389932	802619	175
34	73	35	3473-35-521	35-521	Nuclear Assurance Company	387694	802164	134
34	73	35	3473-35-522	35-522	Nuclear Assurance Company	387646	802163	136
34	73	35	3473-35-523	35-523	Nuclear Assurance Company	387597	802163	135
34	73	35	3473-35-524	35-524	Nuclear Assurance Company	387547	802161	137
34	73	35	3473-35-525	35-525	Nuclear Assurance Company	387650	802113	199
34	73	35	3473-35-526	35-526	Nuclear Assurance Company	387871	802401	177
34	73	35	3473-35-527	35-527	Nuclear Assurance Company	388023	802306	178
34	73	35	3473-35-528	35-528	Nuclear Assurance Company	388171	802422	177
34	73	35	3473-35-529	35-529	Nuclear Assurance Company	388125	802360	175
34	73	35	3473-35-53	35-53	R.L. Peterson	387609	802852	58
34	73	35	3473-35-530	35-530	Nuclear Assurance Company	388124	802311	177
34	73	35	3473-35-531	35-531	Nuclear Assurance Company	388128	802259	176
34	73	35	3473-35-532	35-532	Nuclear Assurance Company	388320	802582	179
34	73	35	3473-35-533	35-533	Nuclear Assurance Company	387548	802102	138
34	73	35	3473-35-534	35-534	Nuclear Assurance Company	388325	802338	175
34	73	35	3473-35-535	35-535	Nuclear Assurance Company	388332	802233	176
34	73	35	3473-35-536	35-536	Nuclear Assurance Company	388318	802537	177
34	73	35	3473-35-537	35-537	Nuclear Assurance Company	388519	802495	180
34	73	35	3473-35-538	35-538	Nuclear Assurance Company	388518	802443	178
34	73	35	3473-35-539	35-539	Nuclear Assurance Company	388516	802546	179
34	73	35	3473-35-54	35-54	R.L. Peterson	387508	802853	56
34	73	35	3473-35-540	35-540	Nuclear Assurance Company	388740	802445	177
34	73	35	3473-35-541	35-541	Nuclear Assurance Company	388867	802601	280
34	73	35	3473-35-542	35-542	Nuclear Assurance Company	388871	802502	180
34	73	35	3473-35-543	35-543	Nuclear Assurance Company	388867	802697	177
34	73	35	3473-35-544	35-544	Nuclear Assurance Company	388924	802659	180
34	73	35	3473-35-545	35-545	Nuclear Assurance Company	389148	802750	200
34	73	35	3473-35-546	35-546	Nuclear Assurance Company	389153	802704	200
34	73	35	3473-35-547	35-547	Nuclear Assurance Company	389154	802651	200
34	73	35	3473-35-549	35-549	Nuclear Assurance Company	389453	802759	216
34	73	35	3473-35-55	35-55	R.L. Peterson	387616	802959	49
34	73	35	3473-35-550	35-550	Nuclear Assurance Company	389477	802716	216
34	73	35	3473-35-551	35-551	Nuclear Assurance Company	389472	802642	239
34	73	35	3473-35-552	35-552	Nuclear Assurance Company	389451	802591	220
34	73	35	3473-35-553	35-553	Nuclear Assurance Company	389904	802757	219
34	73	35	3473-35-554	35-554	Nuclear Assurance Company	389925	802512	200

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	35	3473-35-555	35-555	Nuclear Assurance Company	389950	802567	199
34	73	35	3473-35-556	35-556	Nuclear Assurance Company	389974	802611	198
34	73	35	3473-35-557	35-557	Nuclear Assurance Company	390059	802667	197
34	73	35	3473-35-558	35-558	Nuclear Assurance Company	390160	802682	199
34	73	35	3473-35-559	35-559	Nuclear Assurance Company	389453	802806	217
34	73	35	3473-35-56	35-56	R.L. Peterson	387628	803506	135
34	73	35	3473-35-560	35-560	Nuclear Assurance Company	389620	802114	500
34	73	35	3473-35-561	35-561	Nuclear Assurance Company	388931	802990	199
34	73	35	3473-35-562	35-562	Nuclear Assurance Company	388880	802987	198
34	73	35	3473-35-563	35-563	Nuclear Assurance Company	388782	802966	197
34	73	35	3473-35-564	35-564	Nuclear Assurance Company	388830	802975	159
34	73	35	3473-35-565	35-565	Nuclear Assurance Company	389280	803446	196
34	73	35	3473-35-566	35-566	Nuclear Assurance Company	389277	803494	197
34	73	35	3473-35-567	35-567	Nuclear Assurance Company	389288	803343	198
34	73	35	3473-35-568	35-568	Nuclear Assurance Company	389282	803398	198
34	73	35	3473-35-569	35-569	Nuclear Assurance Company	389098	803242	198
34	73	35	3473-35-57	35-57	R.L. Peterson	387637	803606	135
34	73	35	3473-35-570	35-570	Nuclear Assurance Company	389100	803289	318
34	73	35	3473-35-571	35-571	Nuclear Assurance Company	389099	803339	237
34	73	35	3473-35-572	35-572	Nuclear Assurance Company	388898	803229	219
34	73	35	3473-35-573	35-573	Nuclear Assurance Company	389098	803441	237
34	73	35	3473-35-574	35-574	Nuclear Assurance Company	390209	803975	198
34	73	35	3473-35-575	35-575	Nuclear Assurance Company	390209	804024	198
34	73	35	3473-35-576	35-576	Nuclear Assurance Company	390415	804085	219
34	73	35	3473-35-577	35-577	Nuclear Assurance Company	390407	804137	218
34	73	35	3473-35-578	35-578	Nuclear Assurance Company	390408	804184	213
34	73	35	3473-35-579	35-579	Nuclear Assurance Company	390402	804234	220
34	73	35	3473-35-58	35-58	R.L. Peterson	387653	803714	136
34	73	35	3473-35-580	35-580	Nuclear Assurance Company	390679	804690	259
34	73	35	3473-35-581	35-581	Nuclear Assurance Company	390685	804589	239
34	73	35	3473-35-582	35-582	Nuclear Assurance Company	390687	804537	239
34	73	35	3473-35-583	35-583	Nuclear Assurance Company	389626	804642	259
34	73	35	3473-35-584	35-584	Nuclear Assurance Company	389621	804691	400
34	73	35	3473-35-585	35-585	Nuclear Assurance Company	389622	804740	255
34	73	35	3473-35-586	35-586	Nuclear Assurance Company	389526	804180	257
34	73	35	3473-35-587	35-587	Nuclear Assurance Company	389717	804192	238
34	73	35	3473-35-588	35-588	Nuclear Assurance Company	389622	804240	236
34	73	35	3473-35-589	35-589	Nuclear Assurance Company	389611	804791	257
34	73	35	3473-35-59	35-59	R.L. Peterson	387757	803695	179
34	73	35	3473-35-590	35-590	Nuclear Assurance Company	389971	804766	259
34	73	35	3473-35-591	35-591	Nuclear Assurance Company	390004	804674	259
34	73	35	3473-35-592	35-592	Nuclear Assurance Company	390032	804576	239
34	73	35	3473-35-593	35-593	Nuclear Assurance Company	389363	804685	260
34	73	35	3473-35-594	35-594	Nuclear Assurance Company	389081	804529	261
34	73	35	3473-35-595	35-595	Nuclear Assurance Company	389363	804783	260
34	73	35	3473-35-596	35-596	Nuclear Assurance Company	387158	804402	239
34	73	35	3473-35-597	35-597	Nuclear Assurance Company	387081	804471	222
34	73	35	3473-35-598	35-598	Nuclear Assurance Company	387003	804535	219
34	73	35	3473-35-599	35-599	Nuclear Assurance Company	386862	804662	218
34	73	35	3473-35-6	35-6	R.L. Peterson	389518	803026	260
34	73	35	3473-35-60	35-60	R.L. Peterson	387843	803919	199
34	73	35	3473-35-600	35-600	Nuclear Assurance Company	386709	804792	319
34	73	35	3473-35-601	35-601	Nuclear Assurance Company	386786	804728	179
34	73	35	3473-35-602	35-602	Nuclear Assurance Company	386324	804553	179
34	73	35	3473-35-603	35-603	Nuclear Assurance Company	386486	804443	179
34	73	35	3473-35-604	35-604	Nuclear Assurance Company	386791	804243	219

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	35	3473-35-605	35-605	Nuclear Assurance Company	386953	804130	218
34	73	35	3473-35-606	35-606	Nuclear Assurance Company	387038	804503	219
34	73	35	3473-35-607	35-607	Nuclear Assurance Company	386827	804693	159
34	73	35	3473-35-608	35-608	Nuclear Assurance Company	387293	805522	340
34	73	35	3473-35-609	35-609	Nuclear Assurance Company	387186	805531	339
34	73	35	3473-35-61	35-61	R.L. Peterson	387847	804032	175
34	73	35	3473-35-610	35-610	Nuclear Assurance Company	387347	805909	379
34	73	35	3473-35-611	35-611	Nuclear Assurance Company	387244	805909	380
34	73	35	3473-35-612	35-612	Nuclear Assurance Company	387144	805912	400
34	73	35	3473-35-613	35-613	Nuclear Assurance Company	386420	805913	399
34	73	35	3473-35-614	35-614	Nuclear Assurance Company	386292	805779	379
34	73	35	3473-35-615	35-615	Nuclear Assurance Company	387391	805510	360
34	73	35	3473-35-616	35-616	Nuclear Assurance Company	386743	806435	397
34	73	35	3473-35-617	35-617	Nuclear Assurance Company	386832	806435	398
34	73	35	3473-35-618	35-618	Nuclear Assurance Company	387599	806732	419
34	73	35	3473-35-619	35-619	Nuclear Assurance Company	387016	806049	379
34	73	35	3473-35-62	35-62	R.L. Peterson	387634	804040	171
34	73	35	3473-35-620	35-620	Nuclear Assurance Company	386060	807343	803
34	73	35	3473-35-621	35-621	Nuclear Assurance Company	387697	804861	260
34	73	35	3473-35-621C	35-621C	Nuclear Assurance Company	387698	804865	181
34	73	35	3473-35-622	35-622	Nuclear Assurance Company	387524	804854	259
34	73	35	3473-35-623	35-623	Nuclear Assurance Company	387342	804850	260
34	73	35	3473-35-624	35-624	Nuclear Assurance Company	386966	805291	320
34	73	35	3473-35-625	35-625	Nuclear Assurance Company	386903	805331	320
34	73	35	3473-35-626	35-626	Nuclear Assurance Company	386897	805440	320
34	73	35	3473-35-627	35-627	Nuclear Assurance Company	387448	805908	380
34	73	35	3473-35-628	35-628	Nuclear Assurance Company	387234	806050	380
34	73	35	3473-35-629	35-629	Nuclear Assurance Company	387444	806129	400
34	73	35	3473-35-63	35-63	R.L. Peterson	387645	804348	177
34	73	35	3473-35-630	35-630	Nuclear Assurance Company	387614	806535	280
34	73	35	3473-35-631	35-631	Nuclear Assurance Company	387465	806859	280
34	73	35	3473-35-632	35-632	Nuclear Assurance Company	387291	806713	280
34	73	35	3473-35-633	35-633	Nuclear Assurance Company	387650	806743	280
34	73	35	3473-35-634	35-634	Nuclear Assurance Company	387477	806913	271
34	73	35	3473-35-635	35-635	Nuclear Assurance Company	387236	806726	281
34	73	35	3473-35-636	35-636	Nuclear Assurance Company	387379	806052	381
34	73	35	3473-35-637	35-637	Nuclear Assurance Company	387061	806104	400
34	73	35	3473-35-638	35-638	Nuclear Assurance Company	386906	805907	221
34	73	35	3473-35-639	35-639	Nuclear Assurance Company	386859	805909	220
34	73	35	3473-35-64	35-64	R.L. Peterson	387599	804556	176
34	73	35	3473-35-640	35-640	Nuclear Assurance Company	387104	802375	140
34	73	35	3473-35-641	35-641	Nuclear Assurance Company	387104	802300	220
34	73	35	3473-35-642	35-642	Nuclear Assurance Company	387112	802180	110
34	73	35	3473-35-643	35-643	Nuclear Assurance Company	386640	805700	356
34	73	35	3473-35-644	35-644	Nuclear Assurance Company	386896	805860	220
34	73	35	3473-35-645	35-645	Nuclear Assurance Company	386725	805902	220
34	73	35	3473-35-646	35-646	Nuclear Assurance Company	386773	805953	220
34	73	35	3473-35-647	35-647	Nuclear Assurance Company	386057	807171	500
34	73	35	3473-35-648	35-648	Nuclear Assurance Company	387423	806911	280
34	73	35	3473-35-649	35-649	Nuclear Assurance Company	387482	806973	280
34	73	35	3473-35-65	35-65	R.L. Peterson	387562	804768	199
34	73	35	3473-35-650	35-650	Nuclear Assurance Company	387535	806907	278
34	73	35	3473-35-651	35-651	Nuclear Assurance Company	387293	806102	380
34	73	35	3473-35-652	35-652	Nuclear Assurance Company	387440	806054	380
34	73	35	3473-35-653	35-653	Nuclear Assurance Company	387515	805906	380
34	73	35	3473-35-654	35-654	Nuclear Assurance Company	386926	804885	178

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	35	3473-35-655	35-655	Nuclear Assurance Company	386441	804475	178
34	73	35	3473-35-656	35-656	Nuclear Assurance Company	387526	806847	278
34	73	35	3473-35-657	35-657	Nuclear Assurance Company	387430	806966	277
34	73	35	3473-35-658	35-658		387369	806915	
34	73	35	3473-35-659	35-659	Nuclear Assurance Company	387511	806101	379
34	73	35	3473-35-65C	35-65C	Nuclear Assurance Company	387562	804773	189
34	73	35	3473-35-66	35-66	R.L. Peterson	387348	804755	197
34	73	35	3473-35-660	35-660	Nuclear Assurance Company	386126	807138	439
34	73	35	3473-35-661	35-661	Nuclear Assurance Company	387568	805907	379
34	73	35	3473-35-662	35-662	Nuclear Assurance Company	386931	804819	177
34	73	35	3473-35-663	35-663	Nuclear Assurance Company	386878	804812	177
34	73	35	3473-35-664	35-664	Nuclear Assurance Company	386869	804881	175
34	73	35	3473-35-665	35-665	Nuclear Assurance Company	386788	805093	177
34	73	35	3473-35-666	35-666	Nuclear Assurance Company	386578	804599	178
34	73	35	3473-35-667	35-667	Nuclear Assurance Company	386399	804508	177
34	73	35	3473-35-668	35-668	Nuclear Assurance Company	386365	804529	175
34	73	35	3473-35-669	35-669	Nuclear Assurance Company	387946	803613	177
34	73	35	3473-35-67	35-67	R.L. Peterson	387834	804362	178
34	73	35	3473-35-670	35-670	Nuclear Assurance Company	387901	803609	177
34	73	35	3473-35-671	35-671	Nuclear Assurance Company	387852	803606	178
34	73	35	3473-35-672	35-672	Nuclear Assurance Company	387794	803602	177
34	73	35	3473-35-673	35-673	Nuclear Assurance Company	387740	803601	177
34	73	35	3473-35-674	35-674	Nuclear Assurance Company	387683	803619	177
34	73	35	3473-35-675	35-675	Nuclear Assurance Company	387752	803647	177
34	73	35	3473-35-676	35-676	Nuclear Assurance Company	387730	803551	177
34	73	35	3473-35-677	35-677	Nuclear Assurance Company	389522	803439	360
34	73	35	3473-35-678	35-678	Nuclear Assurance Company	390696	803405	239
34	73	35	3473-35-679	35-679	Nuclear Assurance Company	390704	803517	179
34	73	35	3473-35-68	35-68	R.L. Peterson	387832	804564	195
34	73	35	3473-35-680	35-680	Nuclear Assurance Company	390340	803076	140
34	73	35	3473-35-681	35-681	Nuclear Assurance Company	390075	803876	199
34	73	35	3473-35-682	35-682	Nuclear Assurance Company	390101	804121	217
34	73	35	3473-35-683	35-683	Nuclear Assurance Company	390316	803964	219
34	73	35	3473-35-684	35-684	Nuclear Assurance Company	390511	804274	239
34	73	35	3473-35-685	35-685	Nuclear Assurance Company	390322	804123	219
34	73	35	3473-35-686	35-686	Nuclear Assurance Company	390668	804275	237
34	73	35	3473-35-687	35-687	Nuclear Assurance Company	390005	804112	215
34	73	35	3473-35-688	35-688	Nuclear Assurance Company	390315	804179	217
34	73	35	3473-35-689	35-689	Nuclear Assurance Company	390321	804069	237
34	73	35	3473-35-69	35-69	R.L. Peterson	387832	804774	197
34	73	35	3473-35-690	35-690	Nuclear Assurance Company	390318	803864	197
34	73	35	3473-35-691	35-691	Nuclear Assurance Company	390458	804310	234
34	73	35	3473-35-692	35-692	Nuclear Assurance Company	389831	804743	252
34	73	35	3473-35-693	35-693	Nuclear Assurance Company	390432	804555	252
34	73	35	3473-35-694	35-694	Nuclear Assurance Company	390829	804585	254
34	73	35	3473-35-695	35-695	Nuclear Assurance Company	390529	804479	237
34	73	35	3473-35-696	35-696	Nuclear Assurance Company	388024	802255	237
34	73	35	3473-35-697	35-697	Nuclear Assurance Company	388020	802355	197
34	73	35	3473-35-698	35-698	Nuclear Assurance Company	389808	804794	257
34	73	35	3473-35-699	35-699	Nuclear Assurance Company	390372	804357	237
34	73	35	3473-35-7	35-7	R.L. Peterson	389974	802903	260
34	73	35	3473-35-70	35-70	R.L. Peterson	387617	804943	192
34	73	35	3473-35-700	35-700	Nuclear Assurance Company	387027	804827	295
34	73	35	3473-35-701	35-701	Nuclear Assurance Company	386977	804824	295
34	73	35	3473-35-702	35-702	Nuclear Assurance Company	387026	804993	235
34	73	35	3473-35-703	35-703	Nuclear Assurance Company	386971	804988	236

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	35	3473-35-704	35-704	Nuclear Assurance Company	386920	805097	174
34	73	35	3473-35-705	35-705	Nuclear Assurance Company	386918	805196	174
34	73	35	3473-35-706	35-706	Nuclear Assurance Company	386900	805502	436
34	73	35	3473-35-707	35-707	Nuclear Assurance Company	386901	805552	396
34	73	35	3473-35-708	35-708	Nuclear Assurance Company	386845	805697	216
34	73	35	3473-35-709	35-709	Nuclear Assurance Company	386590	805698	396
34	73	35	3473-35-71	35-71	R.L. Peterson	387622	805113	259
34	73	35	3473-35-710	35-710	Nuclear Assurance Company	386492	805698	396
34	73	35	3473-35-711	35-711	Nuclear Assurance Company	386108	805928	395
34	73	35	3473-35-712	35-712	Nuclear Assurance Company	387194	805468	392
34	73	35	3473-35-713	35-713	Nuclear Assurance Company	387195	805365	375
34	73	35	3473-35-7139	35-7139		388781	805947	
34	73	35	3473-35-714	35-714	Nuclear Assurance Company	387500	805600	395
34	73	35	3473-35-715	35-715	Nuclear Assurance Company	387570	805792	396
34	73	35	3473-35-716	35-716	Nuclear Assurance Company	387669	805907	395
34	73	35	3473-35-717	35-717	Nuclear Assurance Company	387622	805791	396
34	73	35	3473-35-718	35-718	Nuclear Assurance Company	387499	806003	408
34	73	35	3473-35-719	35-719	Nuclear Assurance Company	387677	805791	396
34	73	35	3473-35-72	35-72	R.L. Peterson	387463	805100	199
34	73	35	3473-35-720	35-720	Nuclear Assurance Company	387722	805907	396
34	73	35	3473-35-721	35-721	Nuclear Assurance Company	387820	805904	416
34	73	35	3473-35-722	35-722	Nuclear Assurance Company	387599	806004	415
34	73	35	3473-35-723	35-723	Nuclear Assurance Company	387728	805791	396
34	73	35	3473-35-724	35-724	Nuclear Assurance Company	386160	806014	396
34	73	35	3473-35-725	35-725	Nuclear Assurance Company	387621	805907	396
34	73	35	3473-35-725C	35-725C	Nuclear Assurance Company	387615	805906	377
34	73	35	3473-35-726	35-726	Nuclear Assurance Company	387703	806003	416
34	73	35	3473-35-727	35-727	Nuclear Assurance Company	387778	805783	401
34	73	35	3473-35-728	35-728	Nuclear Assurance Company	387804	806002	398
34	73	35	3473-35-729	35-729	Nuclear Assurance Company	387877	805789	399
34	73	35	3473-35-73	35-73	R.L. Peterson	387446	805297	299
34	73	35	3473-35-730	35-730	Nuclear Assurance Company	387738	806912	280
34	73	35	3473-35-731	35-731	Nuclear Assurance Company	386977	806204	420
34	73	35	3473-35-732	35-732	Nuclear Assurance Company	386490	805526	419
34	73	35	3473-35-733	35-733	Nuclear Assurance Company	386984	806108	419
34	73	35	3473-35-734	35-734	Nuclear Assurance Company	386148	806890	359
34	73	35	3473-35-735	35-735	Nuclear Assurance Company	386074	806812	399
34	73	35	3473-35-736	35-736	Nuclear Assurance Company	386425	806452	379
34	73	35	3473-35-737	35-737	Nuclear Assurance Company	385725	806260	379
34	73	35	3473-35-738	35-738	Nuclear Assurance Company	385655	806192	379
34	73	35	3473-35-739	35-739	Nuclear Assurance Company	385783	807259	379
34	73	35	3473-35-74	35-74	R.L. Peterson	387240	805422	194
34	73	35	3473-35-740	35-740	Nuclear Assurance Company	385722	807181	376
34	73	35	3473-35-741	35-741	Nuclear Assurance Company	387479	807073	276
34	73	35	3473-35-742	35-742	Nuclear Assurance Company	387636	806917	298
34	73	35	3473-35-743	35-743	Nuclear Assurance Company	387463	807026	278
34	73	35	3473-35-744	35-744	Nuclear Assurance Company	387587	806914	278
34	73	35	3473-35-745	35-745	Nuclear Assurance Company	386963	806302	417
34	73	35	3473-35-746	35-746	Nuclear Assurance Company	386557	806598	418
34	73	35	3473-35-75	35-75	R.L. Peterson	387241	805528	199
34	73	35	3473-35-76	35-76	R.L. Peterson	387243	805633	219
34	73	35	3473-35-77	35-77	R.L. Peterson	387454	805592	218
34	73	35	3473-35-774	35-774	Nuclear Assurance Company	387184	806088	400
34	73	35	3473-35-775	35-775	Nuclear Assurance Company	387615	806105	420
34	73	35	3473-35-776	35-776	Nuclear Assurance Company	387186	806141	400
34	73	35	3473-35-777	35-777	Nuclear Assurance Company	387905	805996	420

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	35	3473-35-778	35-778	Nuclear Assurance Company	387398	805613	400
34	73	35	3473-35-779	35-779	Nuclear Assurance Company	387290	805633	400
34	73	35	3473-35-78	35-78	R.L. Peterson	387456	805798	219
34	73	35	3473-35-780	35-780	Nuclear Assurance Company	390588	806398	395
34	73	35	3473-35-781	35-781	Nuclear Assurance Company	388244	803820	200
34	73	35	3473-35-782	35-782	Nuclear Assurance Company	388091	804267	200
34	73	35	3473-35-783	35-783	Nuclear Assurance Company	388132	805032	262
34	73	35	3473-35-784	35-784	Nuclear Assurance Company	389039	805646	397
34	73	35	3473-35-785	35-785	Nuclear Assurance Company	388040	805213	315
34	73	35	3473-35-786	35-786	Nuclear Assurance Company	387975	805399	296
34	73	35	3473-35-787	35-787	Nuclear Assurance Company	388007	805307	397
34	73	35	3473-35-78B	35-78B		386884	804350	
34	73	35	3473-35-79	35-79	R.L. Peterson	387240	805800	215
34	73	35	3473-35-790	35-790	Nuclear Assurance Company	388022	805262	297
34	73	35	3473-35-791	35-791	Nuclear Assurance Company	388658	806163	317
34	73	35	3473-35-792	35-792	Nuclear Assurance Company	386832	804433	321
34	73	35	3473-35-793	35-793	Nuclear Assurance Company	388379	806486	397
34	73	35	3473-35-794	35-794	Nuclear Assurance Company	389421	806668	381
34	73	35	3473-35-795	35-795	Nuclear Assurance Company	388439	806410	357
34	73	35	3473-35-796	35-796	Nuclear Assurance Company	389441	806622	377
34	73	35	3473-35-797	35-797	Nuclear Assurance Company	390254	806880	417
34	73	35	3473-35-798	35-798	Nuclear Assurance Company	388529	806359	377
34	73	35	3473-35-799	35-799	Nuclear Assurance Company	389484	806535	377
34	73	35	3473-35-8	35-8	R.L. Peterson	385733	805466	440
34	73	35	3473-35-80	35-80	R.L. Peterson	387348	805611	216
34	73	35	3473-35-800	35-800	Nuclear Assurance Company	388049	804344	197
34	73	35	3473-35-801	35-801	Nuclear Assurance Company	390086	807066	416
34	73	35	3473-35-802	35-802	Nuclear Assurance Company	388572	806259	362
34	73	35	3473-35-803	35-803	Nuclear Assurance Company	390013	807132	417
34	73	35	3473-35-804	35-804	Nuclear Assurance Company	390467	804593	237
34	73	35	3473-35-805	35-805	Nuclear Assurance Company	390399	804514	257
34	73	35	3473-35-806	35-806	Nuclear Assurance Company	389845	804884	357
34	73	35	3473-35-807	35-807	Nuclear Assurance Company	389844	804972	277
34	73	35	3473-35-808	35-808	Nuclear Assurance Company	388514	802597	177
34	73	35	3473-35-809	35-809	Nuclear Assurance Company	388542	802407	196
34	73	35	3473-35-81	35-81	R.L. Peterson	387351	805800	217
34	73	35	3473-35-810	35-810	Nuclear Assurance Company	387596	802499	157
34	73	35	3473-35-811	35-811	Nuclear Assurance Company	388026	802206	177
34	73	35	3473-35-812	35-812	Nuclear Assurance Company	388875	802461	177
34	73	35	3473-35-813	35-813	Nuclear Assurance Company	388875	802188	197
34	73	35	3473-35-814	35-814	Nuclear Assurance Company	386777	804516	239
34	73	35	3473-35-815	35-815	Nuclear Assurance Company	388017	802457	199
34	73	35	3473-35-816	35-816	Nuclear Assurance Company	387595	802449	179
34	73	35	3473-35-817	35-817	Nuclear Assurance Company	388498	802647	176
34	73	35	3473-35-818	35-818	Nuclear Assurance Company	387806	802057	199
34	73	35	3473-35-819	35-819	Nuclear Assurance Company	387702	802059	198
34	73	35	3473-35-82	35-82	R.L. Peterson	387348	805998	236
34	73	35	3473-35-820	35-820	Nuclear Assurance Company	387904	802063	199
34	73	35	3473-35-821	35-821	Nuclear Assurance Company	388797	802270	179
34	73	35	3473-35-822	35-822	Nuclear Assurance Company	388947	802114	176
34	73	35	3473-35-823	35-823	Nuclear Assurance Company	387616	802348	159
34	73	35	3473-35-824	35-824	Nuclear Assurance Company	389455	802540	200
34	73	35	3473-35-825	35-825	Nuclear Assurance Company	389029	802074	158
34	73	35	3473-35-826	35-826	Nuclear Assurance Company	388897	802410	180
34	73	35	3473-35-827	35-827	Nuclear Assurance Company	389210	802072	195
34	73	35	3473-35-828	35-828	Nuclear Assurance Company	389456	802438	179

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	35	3473-35-83	35-83	R.L. Peterson	387242	806208	258
34	73	35	3473-35-831	35-831	Nuclear Assurance Company	389465	802492	179
34	73	35	3473-35-84	35-84	R.L. Peterson	387242	806385	258
34	73	35	3473-35-85	35-85	R.L. Peterson	387341	806218	252
34	73	35	3473-35-852	35-852	Nuclear Assurance Company	387722	806102	394
34	73	35	3473-35-853	35-853	Nuclear Assurance Company	387932	805900	396
34	73	35	3473-35-854	35-854	Nuclear Assurance Company	387934	805785	396
34	73	35	3473-35-855	35-855	Nuclear Assurance Company	387772	806097	397
34	73	35	3473-35-856	35-856	Nuclear Assurance Company	387947	805996	395
34	73	35	3473-35-857	35-857	Nuclear Assurance Company	387861	806087	393
34	73	35	3473-35-858	35-858	Nuclear Assurance Company	387709	806184	397
34	73	35	3473-35-859	35-859	Arizona Public Service Company	386590.8	806530.9	380
34	73	35	3473-35-86	35-86	R.L. Peterson	387132	806482	259
34	73	35	3473-35-860	35-860	Arizona Public Service Company	386777.7	806199	380
34	73	35	3473-35-861	35-861	Arizona Public Service Company	385752.8	806195	319
34	73	35	3473-35-862	35-862	Arizona Public Service Company	386287.7	805878.4	339
34	73	35	3473-35-863	35-863	Arizona Public Service Company	386768.5	805194	179
34	73	35	3473-35-864	35-864	Arizona Public Service Company	386675.4	804605.5	159
34	73	35	3473-35-865	35-865	Arizona Public Service Company	386490.8	804344.6	158
34	73	35	3473-35-866	35-866	Arizona Public Service Company	388341.3	803922.7	219
34	73	35	3473-35-867	35-867	Arizona Public Service Company	388473.7	804256.5	238
34	73	35	3473-35-868	35-868	Arizona Public Service Company	389352.8	804723.8	260
34	73	35	3473-35-869	35-869	Arizona Public Service Company	389846.6	804830.8	258
34	73	35	3473-35-87	35-87	R.L. Peterson	386930	806596	267
34	73	35	3473-35-870	35-870	Arizona Public Service Company	390217.1	804747.2	258
34	73	35	3473-35-871	35-871	Arizona Public Service Company	389073.9	804623.9	258
34	73	35	3473-35-872	35-872	Arizona Public Service Company	386676.7	804656.6	140
34	73	35	3473-35-873	35-873	Arizona Public Service Company	386827.9	806197.8	380
34	73	35	3473-35-874	35-874	Arizona Public Service Company	389070.3	804672.7	258
34	73	35	3473-35-875	35-875	Malapai	386383.3	806778.2	380
34	73	35	3473-35-876	35-876	Malapai	386540.9	806528.9	379
34	73	35	3473-35-877	35-877	Malapai	386299.9	805830	357
34	73	35	3473-35-878	35-878	Malapai	388267.5	805497.6	336
34	73	35	3473-35-879	35-879	Malapai	386680.5	804239.4	197
34	73	35	3473-35-88	35-88	R.L. Peterson	387140	806378	259
34	73	35	3473-35-880	35-880	Malapai	388881.6	804560.5	256
34	73	35	3473-35-881	35-881	Malapai	390211.6	804793.9	278
34	73	35	3473-35-882	35-882	Malapai	390522.6	803939	198
34	73	35	3473-35-883	35-883	Malapai	389105.4	803388.8	198
34	73	35	3473-35-884	35-884	Malapai	388786.2	803220.4	178
34	73	35	3473-35-885	35-885	Malapai	386282.6	806778.7	376
34	73	35	3473-35-886	35-886	Malapai	386330.5	806781.6	378
34	73	35	3473-35-887	35-887	Malapai	388881.3	804510.3	258
34	73	35	3473-35-888	35-888	Malapai	388272.6	805602.7	337
34	73	35	3473-35-889	35-889	Malapai	386062.9	807095.1	377
34	73	35	3473-35-89	35-89	R.L. Peterson	386926	806391	259
34	73	35	3473-35-890	35-890	Malapai	385955.9	806073	337
34	73	35	3473-35-891	35-891	Malapai	386516.3	803945.4	195
34	73	35	3473-35-892	35-892	Malapai	386087	804035.9	116
34	73	35	3473-35-893	35-893	Malapai	388728.9	804450.3	256
34	73	35	3473-35-894	35-894	Malapai	388835.7	803221.6	175
34	73	35	3473-35-895	35-895	Malapai	388276.5	805550.3	337
34	73	35	3473-35-896	35-896	Malapai	386620.5	803946.5	196
34	73	35	3473-35-9	35-9	R.L. Peterson	390737	803189	195
34	73	35	3473-35-90	35-90	R.L. Peterson	386712	806391	254
34	73	35	3473-35-91	35-91	R.L. Peterson	386907	806186	236

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	35	3473-35-92	35-92	R.L. Peterson	386344	806403	359
34	73	35	3473-35-93	35-93	R.L. Peterson	386539	806394	315
34	73	35	3473-35-94	35-94	R.L. Peterson	387059	806188	359
34	73	35	3473-35-95	35-95	R.L. Peterson	387080	806043	218
34	73	35	3473-35-96	35-96	R.L. Peterson	387441	806230	239
34	73	35	3473-35-97	35-97	R.L. Peterson	387341	806318	255
34	73	35	3473-35-98	35-98	R.L. Peterson	387342	806416	279
34	73	35	3473-35-99	35-99	R.L. Peterson	387342	806512	277
34	73	35	3473-35-LMP-6	LMP-6	Uranium One	387430	806855	281
34	73	35	3473-35-LMP-7	LMP-7	Uranium One	387385	806320	260
34	73	35	3473-35-LMU-3	LMU-3	Uranium One	387500	806525	780
34	73	35	3473-35-LPW-4	LPW-4	Uranium One	387485	806525	260
34	73	35	3473-35-OW-2	1-OW-2		387595	806647	
34	73	35	3473-35-OW-3	1-OW-3		387422	806616	
34	73	35	3473-35-OW-4	1-OW-4		387364	806866	
34	73	35	3473-35-OW-5	1-OW-5		387475	806679	
34	73	35	3473-35-OW-8	1-OW-8		387528	806689	
34	73	35	3473-35-OW-9	1-OW-9		387481	806704	
34	73	35	3473-35-PW1	1-PW1		387501	806705	
34	73	35	3473-35-PW1A	1-PW1A		387500	806679	
34	73	35	3473-35-RW-01	RW-01		387485.7	806685.3	
34	73	35	3473-35-RW-02	RW-02		387535.9	806686.6	
34	73	35	3473-35-RW-02A	RW-02A		387535.9	806684.4	
34	73	36	3473-36-1	36-1	R.L. Peterson	391089	805037	
34	73	36	3473-36-10	36-10	R.L. Peterson	393761	804770	
34	73	36	3473-36-100	36-100	R.L. Peterson	391897	803798	
34	73	36	3473-36-101	36-101	R.L. Peterson	391895	803849	
34	73	36	3473-36-102	36-102	R.L. Peterson	391895	803744	
34	73	36	3473-36-103	36-103	R.L. Peterson	392701	804545	177
34	73	36	3473-36-104	36-104	R.L. Peterson	392683	804495	197
34	73	36	3473-36-105	36-105	R.L. Peterson	392934	804644	
34	73	36	3473-36-106	36-106	R.L. Peterson	391899	803897	
34	73	36	3473-36-107	36-107	R.L. Peterson	393453	804857	
34	73	36	3473-36-108	36-108	R.L. Peterson	392717	804592	213
34	73	36	3473-36-109	36-109	R.L. Peterson	392950	804690	
34	73	36	3473-36-11	36-11	R.L. Peterson	393711	804742	
34	73	36	3473-36-110	36-110	R.L. Peterson	393159	804791	
34	73	36	3473-36-111	36-111	R.L. Peterson	392409	803650	
34	73	36	3473-36-112	36-112	R.L. Peterson	393472	805004	
34	73	36	3473-36-113	36-113	R.L. Peterson	393452	804929	
34	73	36	3473-36-114	36-114	R.L. Peterson	392909	804555	
34	73	36	3473-36-115	36-115	R.L. Peterson	393158	804373	
34	73	36	3473-36-116	36-116	R.L. Peterson	392409	803205	
34	73	36	3473-36-117	36-117	R.L. Peterson	392056	803258	
34	73	36	3473-36-118	36-118	R.L. Peterson	391845	803898	
34	73	36	3473-36-119	36-119	R.L. Peterson	392923	804596	
34	73	36	3473-36-12	36-12	R.L. Peterson	393735	804757	
34	73	36	3473-36-120	36-120	R.L. Peterson	392565	804453	
34	73	36	3473-36-121	36-121	R.L. Peterson	391850	803786	
34	73	36	3473-36-122	36-122	R.L. Peterson	393159	804687	
34	73	36	3473-36-123	36-123	R.L. Peterson	392122	804112	
34	73	36	3473-36-124	36-124	R.L. Peterson	393434	804710	
34	73	36	3473-36-125	36-125	R.L. Peterson	393444	804754	
34	73	36	3473-36-126	36-126	R.L. Peterson	393450	804805	
34	73	36	3473-36-127	36-127	R.L. Peterson	393356	804242	
34	73	36	3473-36-128	36-128	R.L. Peterson	393666	805023	

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	36	3473-36-129	36-129	R.L. Peterson	393393	804448	
34	73	36	3473-36-13	36-13	R.L. Peterson	391558	806528	
34	73	36	3473-36-130	36-130	R.L. Peterson	393664	804933	
34	73	36	3473-36-131	36-131	R.L. Peterson	393372	804342	
34	73	36	3473-36-132	36-132	R.L. Peterson	393657	804819	
34	73	36	3473-36-133	36-133	R.L. Peterson	393386	804399	
34	73	36	3473-36-133C	36-133C	Nuclear Assurance Company	393389	804406	
34	73	36	3473-36-134	36-134	R.L. Peterson	393757	804840	
34	73	36	3473-36-135	36-135	R.L. Peterson	393592	804438	
34	73	36	3473-36-136	36-136	R.L. Peterson	393299	804800	
34	73	36	3473-36-137	36-137	R.L. Peterson	393156	804266	
34	73	36	3473-36-138	36-138	R.L. Peterson	393831	804912	
34	73	36	3473-36-139	36-139	R.L. Peterson	392908	804097	
34	73	36	3473-36-14	36-14	R.L. Peterson	391564	806935	
34	73	36	3473-36-140	36-140	R.L. Peterson	393870	804941	
34	73	36	3473-36-141	36-141	R.L. Peterson	393160	804366	
34	73	36	3473-36-142	36-142	R.L. Peterson	393311	804751	
34	73	36	3473-36-143	36-143	R.L. Peterson	393160	804319	
34	73	36	3473-36-144	36-144	R.L. Peterson	392560	804406	
34	73	36	3473-36-145	36-145	R.L. Peterson	393151	804215	
34	73	36	3473-36-146	36-146	R.L. Peterson	391795	803797	
34	73	36	3473-36-147	36-147	R.L. Peterson	392900	803991	
34	73	36	3473-36-148	36-148	R.L. Peterson	392405	804165	
34	73	36	3473-36-149	36-149	R.L. Peterson	392793	803910	198
34	73	36	3473-36-15	36-15	R.L. Peterson	391656	807224	
34	73	36	3473-36-150	36-150	R.L. Peterson	392556	804362	
34	73	36	3473-36-151	36-151	R.L. Peterson	393620	804534	
34	73	36	3473-36-152	36-152	R.L. Peterson	393159	804650	
34	73	36	3473-36-153	36-153	R.L. Peterson	392904	804038	
34	73	36	3473-36-154	36-154	R.L. Peterson	392355	804236	
34	73	36	3473-36-155	36-155	R.L. Peterson	392896	803939	
34	73	36	3473-36-156	36-156	R.L. Peterson	392797	803857	196
34	73	36	3473-36-157	36-157	R.L. Peterson	393631	804576	
34	73	36	3473-36-158	36-158	R.L. Peterson	390979	804498	
34	73	36	3473-36-159	36-159	R.L. Peterson	391025	804239	
34	73	36	3473-36-16	36-16	R.L. Peterson	390376	804077	
34	73	36	3473-36-160	36-160	R.L. Peterson	391122	804234	
34	73	36	3473-36-161	36-161	R.L. Peterson	390985	804600	
34	73	36	3473-36-162	36-162	R.L. Peterson	392322	804277	
34	73	36	3473-36-163	36-163	R.L. Peterson	393579	804583	
34	73	36	3473-36-164	36-164	Nuclear Assurance Company	390997	805029	
34	73	36	3473-36-165	36-165	Nuclear Assurance Company	391181	805044	
34	73	36	3473-36-166	36-166	Nuclear Assurance Company	391048	804811	
34	73	36	3473-36-167	36-167	Nuclear Assurance Company	391141	804720	
34	73	36	3473-36-168	36-168	Nuclear Assurance Company	393396	804494	
34	73	36	3473-36-169	36-169	Nuclear Assurance Company	393153	804168	
34	73	36	3473-36-17	36-17	R.L. Peterson	391031	804066	
34	73	36	3473-36-170	36-170	Nuclear Assurance Company	393024	804147	
34	73	36	3473-36-171	36-171	Nuclear Assurance Company	393397	804549	
34	73	36	3473-36-172	36-172	Nuclear Assurance Company	393165	804519	160
34	73	36	3473-36-173	36-173	Nuclear Assurance Company	392790	804011	200
34	73	36	3473-36-174	36-174	Nuclear Assurance Company	393023	804040	160
34	73	36	3473-36-175	36-175	Nuclear Assurance Company	393155	804117	180
34	73	36	3473-36-176	36-176	Nuclear Assurance Company	392794	803770	201
34	73	36	3473-36-177	36-177	Nuclear Assurance Company	392374	803987	220
34	73	36	3473-36-178	36-178	Nuclear Assurance Company	392408	804038	191

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	36	3473-36-179	36-179	Nuclear Assurance Company	392318	804313	201
34	73	36	3473-36-18	36-18	R.L. Peterson	390872	804024	
34	73	36	3473-36-180	36-180	Nuclear Assurance Company	392395	803948	197
34	73	36	3473-36-181	36-181	Nuclear Assurance Company	392803	803819	191
34	73	36	3473-36-182	36-182	Nuclear Assurance Company	392807	803691	200
34	73	36	3473-36-183	36-183	Nuclear Assurance Company	393020	804100	180
34	73	36	3473-36-184	36-184	Nuclear Assurance Company	392540	803400	261
34	73	36	3473-36-185	36-185	Nuclear Assurance Company	392461	803584	241
34	73	36	3473-36-186	36-186	Nuclear Assurance Company	392400	803898	221
34	73	36	3473-36-187	36-187	Nuclear Assurance Company	392567	804507	200
34	73	36	3473-36-188	36-188	Nuclear Assurance Company	392717	804641	201
34	73	36	3473-36-189	36-189	Nuclear Assurance Company	392493	803404	241
34	73	36	3473-36-19	36-19	R.L. Peterson	390978	804070	
34	73	36	3473-36-190	36-190	Nuclear Assurance Company	393028	803992	181
34	73	36	3473-36-191	36-191	Nuclear Assurance Company	392887	804415	181
34	73	36	3473-36-192	36-192	Nuclear Assurance Company	393311	804703	180
34	73	36	3473-36-193	36-193	Nuclear Assurance Company	392651	803529	201
34	73	36	3473-36-194	36-194	Nuclear Assurance Company	392811	803591	199
34	73	36	3473-36-195	36-195	Nuclear Assurance Company	392505	804080	201
34	73	36	3473-36-196	36-196	Nuclear Assurance Company	392384	804034	220
34	73	36	3473-36-197	36-197	Nuclear Assurance Company	392790	803963	197
34	73	36	3473-36-198	36-198	Nuclear Assurance Company	392653	803579	220
34	73	36	3473-36-199	36-199	Nuclear Assurance Company	393163	804587	156
34	73	36	3473-36-1X	36-1X	Nuclear Assurance Company	392419	802351	795
34	73	36	3473-36-2	36-2	R.L. Peterson	391306	804982	
34	73	36	3473-36-20	36-20	R.L. Peterson	390926	804241	
34	73	36	3473-36-200	36-200	Nuclear Assurance Company	392032	803646	240
34	73	36	3473-36-201	36-201	Nuclear Assurance Company	391996	803860	280
34	73	36	3473-36-202	36-202	Nuclear Assurance Company	393313	804677	180
34	73	36	3473-36-203	36-203	Nuclear Assurance Company	392027	803603	241
34	73	36	3473-36-204	36-204	Nuclear Assurance Company	391726	803643	236
34	73	36	3473-36-205	36-205	Nuclear Assurance Company	392093	804001	220
34	73	36	3473-36-206	36-206	Nuclear Assurance Company	391719	803541	280
34	73	36	3473-36-207	36-207	Nuclear Assurance Company	391728	803694	259
34	73	36	3473-36-208	36-208	Nuclear Assurance Company	392123	804044	216
34	73	36	3473-36-209	36-209	Nuclear Assurance Company	391719	803597	236
34	73	36	3473-36-21	36-21	R.L. Peterson	390874	803972	
34	73	36	3473-36-210	36-210	Nuclear Assurance Company	391709	803493	281
34	73	35	3473-36-2103	2103	Uranium One	391058	803210	219.5
34	73	35	3473-36-2104	2104	Uranium One	391253	803375	214.9
34	73	35	3473-36-2105	2105	Uranium One	391467	803423	238.7
34	73	35	3473-36-2106	2106	Uranium One	391467	803329	233.8
34	73	35	3473-36-2107	2107	Uranium One	391805	803593	260.7
34	73	35	3473-36-2108	2108	Uranium One	391952	803902	259.5
34	73	35	3473-36-2109	2109	Uranium One	392267	803952	258.8
34	73	36	3473-36-211	36-211	Nuclear Assurance Company	391994	802969	
34	73	36	3473-36-2110	2110	Uranium One	392442	804338	239.4
34	73	36	3473-36-2111	2111	Uranium One	392810	804552	239.4
34	73	36	3473-36-2112	2112	Uranium One	393036	804587	219.3
34	73	36	3473-36-2113	2113	Uranium One	393553	804855	199.7
34	73	36	3473-36-2114	2114	Uranium One	393780	804907	198.9
34	73	36	3473-36-2115	2115	Uranium One	393496	804492	199.6
34	73	36	3473-36-2116	2116	Uranium One	393269	804329	200.8
34	73	36	3473-36-2117	2117	Uranium One	392503.9	803554	239.2
34	73	36	3473-36-2118	2118	Uranium One	392430	803302	239.1
34	73	36	3473-36-2119	2119	Uranium One	392204	803106	217.8

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	36	3473-36-212	36-212	Nuclear Assurance Company	391603	802918	275
34	73	36	3473-36-2120	2120	Uranium One	391623	802803	239.7
34	73	36	3473-36-2121	2121	Uranium One	391500	802613	218.7
34	73	36	3473-36-2122	2122	Uranium One	391532	802402	199.6
34	73	36	3473-36-213	36-213	Nuclear Assurance Company	392175	803003	276
34	73	36	3473-36-214	36-214	Nuclear Assurance Company	391864	802977	257
34	73	36	3473-36-215	36-215	Nuclear Assurance Company	392019	802924	257
34	73	36	3473-36-2157	2157	Uranium One	391074	803246	219.2
34	73	36	3473-36-2158	2158	Uranium One	391264	803410	219.4
34	73	36	3473-36-2159	2159	Uranium One	391193	803284	221.4
34	73	36	3473-36-216	36-216	Nuclear Assurance Company	391787	803012	200
34	73	36	3473-36-2160	2160	Uranium One	391467	803472	241.8
34	73	36	3473-36-2161	2161	Uranium One	391641	803492	259.9
34	73	36	3473-36-2162	2162	Uranium One	391804	803644	260
34	73	36	3473-36-2163	2163	Uranium One	391894	803924	261.2
34	73	36	3473-36-2164	2164	Uranium One	392320	804015	261.1
34	73	36	3473-36-2165	2165	Uranium One	392621	804477	238.2
34	73	36	3473-36-2166	2166	Uranium One	392809.6	804604.3	238
34	73	36	3473-36-2167	2167	Uranium One	393035.5	804638.6	219.9
34	73	36	3473-36-2168	2168	Uranium One	393231	804688	238.3
34	73	36	3473-36-2169	2169	Uranium One	393369	804805	197
34	73	36	3473-36-217	36-217	Nuclear Assurance Company	391412	802308.	319
34	73	36	3473-36-2170	2170	Uranium One	393448	804898	200
34	73	36	3473-36-2171	2171	Uranium One	393645	804609	200.6
34	73	36	3473-36-2172	2172	Uranium One	393559	804534	200.9
34	73	36	3473-36-2173	2173	Uranium One	393438	804454	198.9
34	73	36	3473-36-2174	2174	Uranium One	393381	804394	199.7
34	73	36	3473-36-2175	2175	Uranium One	393201	804267	221.6
34	73	36	3473-36-2176	2176	Uranium One	393096	804216	218.9
34	73	36	3473-36-2177	2177	Uranium One	392960	804040	219.3
34	73	36	3473-36-2178	2178	Uranium One	392841	803858	220
34	73	36	3473-36-2179	2179	Uranium One	392480	803302	241.2
34	73	36	3473-36-218	36-218	Nuclear Assurance Company	391358	802329	220
34	73	36	3473-36-2180	2180	Uranium One	392354	803142	242.2
34	73	36	3473-36-2181	2181	Uranium One	392107	803106	218.3
34	73	36	3473-36-2182	2182	Uranium One	391908	803013	240.8
34	73	36	3473-36-2183	2183	Uranium One	391758	802948	241.1
34	73	36	3473-36-2184	2184	Uranium One	391673	802803	242
34	73	36	3473-36-2185	2185	Uranium One	391438	802613	220.5
34	73	36	3473-36-2186	2186	Uranium One	391582	802402	201.1
34	73	36	3473-36-2187	2187	Uranium One	391539	802221	201.9
34	73	36	3473-36-2188	2188	Uranium One	391935	803594	261.4
34	73	36	3473-36-219	36-219	Nuclear Assurance Company	391740	803036	220
34	73	36	3473-36-22	36-22	R.L. Peterson	390942	803087	
34	73	36	3473-36-220	36-220	Nuclear Assurance Company	391819	802975	216
34	73	36	3473-36-221	36-221	Nuclear Assurance Company	391915	802968	217
34	73	36	3473-36-222	36-222	Nuclear Assurance Company	390849	803145	319
34	73	36	3473-36-223	36-223	Nuclear Assurance Company	390839	803241	199
34	73	36	3473-36-224	36-224	Nuclear Assurance Company	390837	803290	200
34	73	36	3473-36-225	36-225	Nuclear Assurance Company	390845	803191	219
34	73	36	3473-36-226	36-226	Nuclear Assurance Company	390845	803091	230
34	73	36	3473-36-227	36-227	Nuclear Assurance Company	390845	803042	239
34	73	36	3473-36-228	36-228	Nuclear Assurance Company	390922	804292	237
34	73	36	3473-36-229	36-229	Nuclear Assurance Company	390927	804186	237
34	73	36	3473-36-22C	36-22C	Nuclear Assurance Company	390947	803087	
34	73	36	3473-36-23	36-23	R.L. Peterson	390975	804173	

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	36	3473-36-230	36-230	Nuclear Assurance Company	390920	804345	234
34	73	36	3473-36-231	36-231	Nuclear Assurance Company	391170	804308	257
34	73	36	3473-36-232	36-232	Nuclear Assurance Company	391245	804316	257
34	73	36	3473-36-233	36-233	Nuclear Assurance Company	390840	804638	257
34	73	36	3473-36-234	36-234	Nuclear Assurance Company	391565	807251	334
34	73	36	3473-36-235	36-235	Nuclear Assurance Company	391457	807150	314
34	73	36	3473-36-24	36-24	R.L. Peterson	392218	802412	
34	73	36	3473-36-25	36-25	R.L. Peterson	390941	803190	
34	73	36	3473-36-25C	36-25C	Nuclear Assurance Company	390936	803190	
34	73	36	3473-36-26	36-26	R.L. Peterson	391802	802447	
34	73	36	3473-36-27	36-27	R.L. Peterson	391608	802486	
34	73	36	3473-36-28	36-28	R.L. Peterson	391309	802548	
34	73	36	3473-36-29	36-29	R.L. Peterson	390940	803238	
34	73	36	3473-36-2X	36-2X	Nuclear Assurance Company	394300	802619	
34	73	36	3473-36-3	36-3	R.L. Peterson	393605	802174	
34	73	36	3473-36-30	36-30	R.L. Peterson	391504	802502	
34	73	36	3473-36-30C	36-30C	Nuclear Assurance Company	391502	802514	
34	73	36	3473-36-31	36-31	R.L. Peterson	391451	802510	
34	73	36	3473-36-31C	36-31C	Nuclear Assurance Company	391450	802523	
34	73	36	3473-36-32	36-32	R.L. Peterson	391551	802495	
34	73	36	3473-36-32C	36-32C	Nuclear Assurance Company	393389	802502	
34	73	36	3473-36-33	36-33	R.L. Peterson	391401	802516	
34	73	36	3473-36-34	36-34	R.L. Peterson	391500	802700	
34	73	36	3473-36-35	36-35	R.L. Peterson	391349	802525	
34	73	36	3473-36-36	36-36	R.L. Peterson	391144	803185	
34	73	36	3473-36-37	36-37	R.L. Peterson	390945	803138	
34	73	36	3473-36-37C	36-37C	Nuclear Assurance Company	390940	803138	
34	73	36	3473-36-38	36-38	R.L. Peterson	390943	803041	
34	73	36	3473-36-39	36-39	R.L. Peterson	391264	802355	
34	73	36	3473-36-3X	36-3X	Nuclear Assurance Company	395302	802533	
34	73	36	3473-36-4	36-4	R.L. Peterson	395953	802056	
34	73	36	3473-36-40	36-40	R.L. Peterson	391146	803323	
34	73	36	3473-36-41	36-41	R.L. Peterson	391455	802704	
34	73	36	3473-36-42	36-42	R.L. Peterson	391549	802696	
34	73	36	3473-36-43	36-43	R.L. Peterson	391796	802873	
34	73	36	3473-36-44	36-44	R.L. Peterson	391147	803373	
34	73	36	3473-36-45	36-45	R.L. Peterson	391455	802301	
34	73	36	3473-36-46	36-46	R.L. Peterson	391073	802413	
34	73	36	3473-36-47	36-47	R.L. Peterson	391364	803427	
34	73	36	3473-36-48	36-48	R.L. Peterson	391350	803280	
34	73	36	3473-36-49	36-49	R.L. Peterson	391600	802690	
34	73	36	3473-36-4X	36-4X	Nuclear Assurance Company	393633	803830	
34	73	36	3473-36-5	36-5	R.L. Peterson	393853	804806	
34	73	36	3473-36-50	36-50	R.L. Peterson	391147	803283	
34	73	36	3473-36-51	36-51	R.L. Peterson	391148	803238	
34	73	36	3473-36-52	36-52	R.L. Peterson	391554	802271	
34	73	36	3473-36-53	36-53	R.L. Peterson	391696	802891	
34	73	36	3473-36-54	36-54	R.L. Peterson	391326	802951	
34	73	36	3473-36-55	36-55	R.L. Peterson	391501	802288	
34	73	36	3473-36-56	36-56	R.L. Peterson	391507	802077	
34	73	36	3473-36-57	36-57	R.L. Peterson	391601	802256	
34	73	36	3473-36-58	36-58	R.L. Peterson	391461	802100	
34	73	36	3473-36-59	36-59	R.L. Peterson	391410	802116	
34	73	36	3473-36-5X	36-5X	Nuclear Assurance Company	395512	803220	
34	73	36	3473-36-6	36-6	R.L. Peterson	396003	804646	
34	73	36	3473-36-60	36-60	R.L. Peterson	391590	803635	

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	36	3473-36-61	36-61	R.L. Peterson	391960	803058	
34	73	36	3473-36-62	36-62	R.L. Peterson	391373	803478	
34	73	36	3473-36-63	36-63	R.L. Peterson	391743	802877	
34	73	36	3473-36-64	36-64	R.L. Peterson	391649	802904	
34	73	36	3473-36-65	36-65	R.L. Peterson	392065	803040	
34	73	36	3473-36-66	36-66	R.L. Peterson	391580	803533	
34	73	36	3473-36-67	36-67	R.L. Peterson	392016	803044	
34	73	36	3473-36-68	36-68	R.L. Peterson	391360	803378	
34	73	36	3473-36-69	36-69	R.L. Peterson	391913	803061	
34	73	36	3473-36-6X	36-6X	Nuclear Assurance Company	394831	805444	
34	73	36	3473-36-7	36-7	R.L. Peterson	393435	804645	
34	73	36	3473-36-70	36-70	R.L. Peterson	391890	803593	
34	73	36	3473-36-71	36-71	R.L. Peterson	392112	803035	
34	73	36	3473-36-72	36-72	R.L. Peterson	392155	803241	
34	73	36	3473-36-73	36-73	R.L. Peterson	392253	803225	
34	73	36	3473-36-74	36-74	R.L. Peterson	391574	803425	
34	73	36	3473-36-75	36-75	R.L. Peterson	392345	803412	
34	73	36	3473-36-76	36-76	R.L. Peterson	391577	803486	
34	73	36	3473-36-77	36-77	R.L. Peterson	391572	803374	
34	73	36	3473-36-78	36-78	R.L. Peterson	391354	803329	
34	73	36	3473-36-79	36-79	R.L. Peterson	391394	803645	
34	73	36	3473-36-7X	36-7X	Nuclear Assurance Company	393197	805975	
34	73	36	3473-36-8	36-8	R.L. Peterson	393524	804665	
34	73	36	3473-36-80	36-80	R.L. Peterson	392303	803218	
34	73	36	3473-36-81	36-81	R.L. Peterson	391889	803547	
34	73	36	3473-36-82	36-82	R.L. Peterson	392340	803510	
34	73	36	3473-36-83	36-83	R.L. Peterson	392347	803367	
34	73	36	3473-36-84	36-84	R.L. Peterson	392106	803768	
34	73	36	3473-36-85	36-85	R.L. Peterson	390978	804237	
34	73	36	3473-36-86	36-86	R.L. Peterson	392292	803170	
34	73	36	3473-36-87	36-87	R.L. Peterson	390876	804495	
34	73	36	3473-36-88	36-88	R.L. Peterson	391897	803695	
34	73	36	3473-36-89	36-89	R.L. Peterson	392168	803954	
34	73	36	3473-36-9	36-9	R.L. Peterson	393668	804720	
34	73	36	3473-36-90	36-90	R.L. Peterson	392234	804134	
34	73	36	3473-36-91	36-91	R.L. Peterson	392359	803211	
34	73	36	3473-36-92	36-92	R.L. Peterson	392168	803440	
34	73	36	3473-36-93	36-93	R.L. Peterson	392188	803999	
34	73	36	3473-36-94	36-94	R.L. Peterson	392205	804039	
34	73	36	3473-36-95	36-95	R.L. Peterson	392221	804087	
34	73	36	3473-36-96	36-96	R.L. Peterson	392251	804185	
34	73	36	3473-36-97	36-97	R.L. Peterson	392461	803195	
34	73	36	3473-36-98	36-98	R.L. Peterson	392441	803396	
34	73	36	3473-36-99	36-99	R.L. Peterson	392665	804446	
34	73	36	3473-36-M-24	M-24	Uranium One	393224	804658	360
34	73	3	3473-3-CRX-51	CRX-51		385800	831800	
34	73	3	3473-3-CRX-52	CRX-52		386300	831800	
34	73	3	3473-3-M-5	M-5	Uranium One	382924	831585	600
34	73	4	3473-4-10KM	10KM	Kerr McGee	376387	828726	450
34	73	4	3473-4-11KM	11KM	Kerr McGee	376779	828715	450
34	73	4	3473-4-12KM	12KM	Kerr McGee	376490	828637	450
34	73	4	3473-4-13KM	13KM	Kerr McGee	377203	828796	450
34	73	4	3473-4-14KM	14KM	Kerr McGee	377370	828807	450
34	73	4	3473-4-15KM	15KM	Kerr McGee	377676	828862	450
34	73	4	3473-4-16KM	16KM	Kerr McGee	377668	828750	450
34	73	4	3473-4-17KM	17KM	Kerr McGee	377420	829162	450

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	4	3473-4-18KM	18KM	Kerr McGee	377652	829136	460
34	73	4	3473-4-19KM	19KM	Kerr McGee	377944	828798	450
34	73	4	3473-4-20KM	20KM	Kerr McGee	378105	828797	460
34	73	4	3473-4-21KM	21KM	Kerr McGee	378584	828764	460
34	73	4	3473-4-22KM	22KM	Kerr McGee	378666	828885	460
34	73	4	3473-4-23KM	23KM	Kerr McGee	378912	828718	460
34	73	4	3473-4-24KM	24KM	Kerr McGee	379364	828743	360
34	73	4	3473-4-25KM	25KM	Kerr McGee	379220	828949	360
34	73	4	3473-4-26KM	26KM	Kerr McGee	379343	829010	360
34	73	4	3473-4-27KM	27KM	Kerr McGee	379512	829010	360
34	73	4	3473-4-28KM	28KM	Kerr McGee	379709	829012	360
34	73	4	3473-4-29KM	29KM	Kerr McGee	379606	829349	360
34	73	4	3473-4-30KM	30KM	Kerr McGee	379862	829381	360
34	73	4	3473-4-31KM	31KM	Kerr McGee	379102	828708	360
34	73	4	3473-4-32KM	32KM	Kerr McGee	379270	828690	360
34	73	4	3473-4-33KM	33KM	Kerr McGee	379318	828745	360
34	73	4	3473-4-34KM	34KM	Kerr McGee	379353	828814	360
34	73	4	3473-4-35KM	35KM	Kerr McGee	379458	828862	360
34	73	4	3473-4-36KM	36KM	Kerr McGee	379503	828916	360
34	73	4	3473-4-37KM	37KM	Kerr McGee	379603	828963	360
34	73	4	3473-4-38KM	38KM	Kerr McGee	379608	829064	360
34	73	4	3473-4-40C-KM	40C-KM	Kerr McGee	379852	829343	293
34	73	4	3473-4-42C-KM	42C-KM	Kerr McGee	378973	828770	330
34	73	4	3473-4-43C-KM	43C-KM	Kerr McGee	377585	828854	420
34	73	4	3473-4-47KM	47KM	Kerr McGee	375837	828739	460
34	73	4	3473-4-48KM	48KM	Kerr McGee	377201	828894	460
34	73	4	3473-4-4KM	4KM	Kerr McGee	375786	828894	450
34	73	4	3473-4-5KM	5KM	Kerr McGee	376099	828891	450
34	73	4	3473-4-6KM	6KM	Kerr McGee	376241	828852	450
34	73	4	3473-4-7KM	7KM	Kerr McGee	376387	828832	450
34	73	4	3473-4-8KM	8KM	Kerr McGee	376588	828783	450
34	73	4	3473-4-9KM	9KM	Kerr McGee	375983	828735	450
34	73	4	3473-4-CN-11	CN11	Union Pacific Railroad Company	375343	833327	438
34	73	4	3473-4-CN-12	CN12	Union Pacific Railroad Company	377501	833095	457
34	73	4	3473-4-CN-133	CN133	Union Pacific Railroad Company	375640	828632	440
34	73	4	3473-4-CN-149	CN149	Union Pacific Railroad Company	375645	828819	434
34	73	4	3473-4-CN-150	CN150	Union Pacific Railroad Company	376253	829012	423
34	73	4	3473-4-CN-151	CN151	Union Pacific Railroad Company	376235	828803	439
34	73	4	3473-4-CN-166	CN166	Union Pacific Railroad Company	375282	828985	420
34	73	4	3473-4-CN-167	CN167	Union Pacific Railroad Company	375457	828978	415
34	73	4	3473-4-CN-172	CN172	Union Pacific Railroad Company	375232	828787	425
34	73	4	3473-4-CN-173	CN173	Union Pacific Railroad Company	375459	828781	423
34	73	4	3473-4-CN-193	CN193	Union Pacific Railroad Company	377652	829227	709
34	73	4	3473-4-CN-203	CN203	Union Pacific Railroad Company	377466	828993	453
34	73	4	3473-4-CN-204	CN204	Union Pacific Railroad Company	377460	828796	454
34	73	4	3473-4-CN-206	CN206	Union Pacific Railroad Company	376917	828618	455
34	73	4	3473-4-CN-207	CN207	Union Pacific Railroad Company	376845	828778	437
34	73	4	3473-4-CN-208	CN208	Union Pacific Railroad Company	376843	828992	440
34	73	4	3473-4-CN-209	CN209	Union Pacific Railroad Company	377758	829793	399
34	73	4	3473-4-CN-210	CN210	Union Pacific Railroad Company	378046	830434	395
34	73	4	3473-4-CN-211	CN211	Union Pacific Railroad Company	378662	830488	395
34	73	4	3473-4-CN-212	CN212	Union Pacific Railroad Company	379267	830471	434
34	73	4	3473-4-CN-213	CN213	Union Pacific Railroad Company	379575	831200	477
34	73	4	3473-4-CN-214	CN214	Union Pacific Railroad Company	378988	831260	460
34	73	4	3473-4-CN-215	CN215	Union Pacific Railroad Company	378384	831283	439
34	73	4	3473-4-CN-216	CN216	Union Pacific Railroad Company	377477	830474	430

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	4	3473-4-CN-217	CN217	Union Pacific Railroad Company	378651	829922	433
34	73	4	3473-4-CN-218	CN218	Union Pacific Railroad Company	379271	829982	433
34	73	4	3473-4-CN-220	CN220	Union Pacific Railroad Company	378063	828932	494
34	73	4	3473-4-CN-221	CN221	Union Pacific Railroad Company	378668	828949	462
34	73	4	3473-4-CN-222	CN222	Union Pacific Railroad Company	378659	829300	457
34	73	4	3473-4-CN-223	CN223	Union Pacific Railroad Company	379257	829284	460
34	73	4	3473-4-CN-224	CN224	Union Pacific Railroad Company	378050	830214	461
34	73	4	3473-4-CN-225	CN225	Union Pacific Railroad Company	376547	831973	457
34	73	4	3473-4-CN-226	CN226	Union Pacific Railroad Company	376570	831779	438
34	73	4	3473-4-CN-227	CN227	Union Pacific Railroad Company	376576	831579	462
34	73	4	3473-4-CN-228	CN228	Union Pacific Railroad Company	377180	831246	476
34	73	4	3473-4-CN-229	CN229	Union Pacific Railroad Company	377174	831033	472
34	73	4	3473-4-CN-230	CN230	Union Pacific Railroad Company	377176	830821	477
34	73	4	3473-4-CN-231	CN231	Union Pacific Railroad Company	378054	830057	460
34	73	4	3473-4-CN-232	CN232	Union Pacific Railroad Company	378670	830292	452
34	73	4	3473-4-CN-233	CN233	Union Pacific Railroad Company	378663	830177	455
34	73	4	3473-4-CN-237	CN237	Union Pacific Railroad Company	378068	829136	511
34	73	4	3473-4-CN-238	CN238	Union Pacific Railroad Company	378072	829327	492
34	73	4	3473-4-CN-239	CN239	Union Pacific Railroad Company	378653	829443	452
34	73	4	3473-4-CN-250	CN250	Union Pacific Railroad Company	376841	828667	447
34	73	4	3473-4-CN-251	CN251	Union Pacific Railroad Company	376836	828824	458
34	73	4	3473-4-CN-257	CN257	Union Pacific Railroad Company	377263	828803	476
34	73	4	3473-4-CN-258	CN258	Union Pacific Railroad Company	377664	828801	457
34	73	4	3473-4-CN-259	CN259	Union Pacific Railroad Company	377458	828750	449
34	73	4	3473-4-CN-263	CN263	Union Pacific Railroad Company	376571	831378	492
34	73	4	3473-4-CN-264	CN264	Union Pacific Railroad Company	377170	831427	537
34	73	4	3473-4-CN-265	CN265	Union Pacific Railroad Company	378061	829873	480
34	73	4	3473-4-CN-270	CN270	Union Pacific Railroad Company	375454	828660	440
34	73	4	3473-4-CN-271	CN271	Union Pacific Railroad Company	377044	828602	458
34	73	4	3473-4-CN-272	CN272	Union Pacific Railroad Company	377045	828756	456
34	73	4	3473-4-CN-273	CN273	Union Pacific Railroad Company	377466	828894	455
34	73	4	3473-4-CN-274	CN274	Union Pacific Railroad Company	377694	828996	455
34	73	4	3473-4-CN-276	CN276	Union Pacific Railroad Company	377785	831589	479
34	73	4	3473-4-CN-28	CN28	Union Pacific Railroad Company	377142	831814	884
34	73	4	3473-4-CN-280	CN280	Union Pacific Railroad Company	376641	828752	458
34	73	4	3473-4-CN-281	CN281	Union Pacific Railroad Company	375857	829010	456
34	73	4	3473-4-CN-282	CN282	Union Pacific Railroad Company	375653	829069	452
34	73	4	3473-4-CN-287	CN287	Union Pacific Railroad Company	379862	829236	531
34	73	4	3473-4-CN-288	CN288	Union Pacific Railroad Company	379849	829840	531
34	73	4	3473-4-CN-289	CN289	Union Pacific Railroad Company	379550	831955	475
34	73	4	3473-4-CN-29	CN29	Union Pacific Railroad Company	375927	829763	556
34	73	4	3473-4-CN-290	CN290	Union Pacific Railroad Company	380180	831963	459
34	73	4	3473-4-CN-297	CN297	Union Pacific Railroad Company	379250	828949	455
34	73	4	3473-4-CN-298	CN298	Union Pacific Railroad Company	379663	829206	457
34	73	4	3473-4-CN-299	CN299	Union Pacific Railroad Company	380405	829833	478
34	73	4	3473-4-CN-30	CN30	Union Pacific Railroad Company	377151	829745	418
34	73	4	3473-4-CN-300	CN300	Union Pacific Railroad Company	377869	828807	480
34	73	4	3473-4-CN-301	CN301	Union Pacific Railroad Company	376043	829016	471
34	73	4	3473-4-CN-36	CN36	Union Pacific Railroad Company	376445	830548	459
34	73	4	3473-4-CN-39	CN39	Union Pacific Railroad Company	376982	831235	454
34	73	4	3473-4-CN-40	CN40	Union Pacific Railroad Company	376199	829171	457
34	73	4	3473-4-CN-42	CN42	Union Pacific Railroad Company	376959	829315	536
34	73	4	3473-4-CN-43	CN43	Union Pacific Railroad Company	375557	829260	496
34	73	4	3473-4-CN-5	CN5	Union Pacific Railroad Company	379838	831872	378
34	73	4	3473-4-CN-6	CN6	Union Pacific Railroad Company	378701	832074	438
34	73	4	3473-4-CN-7	CN7	Union Pacific Railroad Company	377482	831758	438

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	4	3473-4-CN-72	CN73	Union Pacific Railroad Company	375751	829901	437
34	73	4	3473-4-CN-74	CN74	Union Pacific Railroad Company	376301	829975	438
34	73	4	3473-4-CN-75	CN75	Union Pacific Railroad Company	375964	830004	438
34	73	4	3473-4-CN-76	CN76	Union Pacific Railroad Company	375970	829856	478
34	73	4	3473-4-CN-77	CN77	Union Pacific Railroad Company	375986	829650	438
34	73	4	3473-4-CN-78	CN78	Union Pacific Railroad Company	375761	830577	437
34	73	4	3473-4-CN-80	CN80	Union Pacific Railroad Company	376310	831189	417
34	73	4	3473-4-CN-82	CN82	Union Pacific Railroad Company	375709	831207	437
34	73	4	3473-4-CN-88	CN88	Union Pacific Railroad Company	376428	831866	437
34	73	4	3473-4-CN-9	CN9	Union Pacific Railroad Company	376337	832072	436
34	73	4	3473-4-CRX-1	CRX-1	UNC Teton	380062	833331	598
34	73	4	3473-4-CRX-10	CRX-10	UNC Teton	375261	832477	599
34	73	4	3473-4-CRX-2	CRX-2	UNC Teton	380086	832565	600
34	73	4	3473-4-CRX-3	CRX-3	UNC Teton	378649	833401	583
34	73	4	3473-4-CRX-394	CRX-394	UNC Teton	376300	831600	700
34	73	4	3473-4-CRX-4	CRX-4	UNC Teton	378635	832678	600
34	73	4	3473-4-CRX-408	CRX-408	UNC Teton	376300	831800	698
34	73	4	3473-4-CRX-409	CRX-409	UNC Teton	376300	831400	698
34	73	4	3473-4-CRX-5	CRX-5	UNC Teton	376834	832677	599
34	73	4	3473-4-CRX-50	CRX-50	UNC Teton	385300	831700	297
34	73	4	3473-4-CRX-53	CRX-53	UNC Teton	384600	832700	871
34	73	4	3473-4-CRX-6	CRX-6	UNC Teton	375138	832549	591
34	73	4	3473-4-CRX-61	CRX-61	UNC Teton	385000	832200	357
34	73	4	3473-4-CRX-7	CRX-7	UNC Teton	375136	832865	600
34	73	4	3473-4-CRX-8	CRX-8	UNC Teton	379943	832018	597
34	73	4	3473-4-CRX-9	CRX-9	UNC Teton	377642	832040	593
34	73	4	3473-4-KM-3	KM3	Kerr McGee	375986	828943	450
34	73	4	3473-4-M-4	M-4	Uranium One	377499	831550	600
34	73	4	3473-4-PRI-0450-045	0450-0450	Power Resources INC.	375498	829047	421
34	73	4	3473-4-PRI-0475-025	0475-0250	Power Resources INC.	375321	829142	704
34	73	4	3473-4-PRI-1400-035	1400-0350	Power Resources INC.	375419	829936	413
34	73	4	3473-4-PRI-1500-035	1500-0350	Power Resources INC.	375409	830041	404
34	73	4	3473-4-PRI-1600-035	1600-0350	Power Resources INC.	375405	830148	403.5
34	73	4	3473-4-U-12	U12	Urangesellschaft	379806	828865	321
34	73	4	3473-4-U-13	U13	Urangesellschaft	379574	828828	361
34	73	4	3473-4-U-14	U14	Urangesellschaft	379762	829022	321
34	73	4	3473-4-U-15	U15	Urangesellschaft	380367	829852	321
34	73	4	3473-4-U-16	U16	Urangesellschaft	379924	829140	341
34	73	4	3473-4-U-17	U17	Urangesellschaft	379960	829261	321
34	73	4	3473-4-U-18	U18	Urangesellschaft	380166	829652	307
34	73	4	3473-4-U-19	U19	Urangesellschaft	380251	829767	302
34	73	4	3473-4-U-20	U20	Urangesellschaft	378131	828695	381
34	73	4	3473-4-U-21	U21	Urangesellschaft	378254	828593	381
34	73	4	3473-4-U-22	U22	Urangesellschaft	378360	828707	381
34	73	4	3473-4-U-3	U3	Urangesellschaft	377037	828742	421
34	73	4	3473-4-U-4	U4	Urangesellschaft	377903	828702	401
34	73	4	3473-4-XR-26	XR26	Union Pacific Railroad Company	380380	829150	463
34	73	4	3473-4-XR-37	XR37	Union Pacific Railroad Company	380390	829550	280
34	73	4	3473-4-XR-58	XR58	Union Pacific Railroad Company	380175	831770	318
34	73	4	3473-4-XR-581	XR581	Union Pacific Railroad Company	380180	831720	317
34	73	4	3473-4-XR-582	XR582	Union Pacific Railroad Company	380165	831810	299
34	73	4	3473-4-XR-583	XR583	Union Pacific Railroad Company	380170	831875	300
34	73	4	3473-4-XR-584	XR584	Union Pacific Railroad Company	380175	831918	300
34	73	4	3473-4-XR-59	XR59	Union Pacific Railroad Company	379560	831543	361
34	73	4	3473-4-XR-60	XR60	Union Pacific Railroad Company	379000	831593	357
34	73	4	3473-4-XR-601	XR601	Union Pacific Railroad Company	380347	829780	299

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	4	3473-4-XR-602	XR602	Union Pacific Railroad Company	380330	829677	298
34	73	4	3473-4-XR-603	XR603	Union Pacific Railroad Company	380393	829962	299
34	73	4	3473-4-XR-604	XR604	Union Pacific Railroad Company	380419	830052	310
34	73	4	3473-4-XR-605	XR605	Union Pacific Railroad Company	379863	829334	317
34	73	4	3473-4-XR-606	XR606	Union Pacific Railroad Company	379858	829426	317
34	73	4	3473-4-XR-607	XR607	Union Pacific Railroad Company	379862	829520	317
34	73	4	3473-4-XR-608	XR608	Union Pacific Railroad Company	379243	829192	320
34	73	4	3473-4-XR-609	XR609	Union Pacific Railroad Company	379249	829081	318
34	73	4	3473-4-XR-61	XR61	Union Pacific Railroad Company	378391	831603	361
34	73	4	3473-4-XR-610	XR610	Union Pacific Railroad Company	379272	828843	320
34	73	4	3473-4-XR-611	XR611	Union Pacific Railroad Company	379260	828734	330
34	73	4	3473-4-XR-612	XR612	Union Pacific Railroad Company	378672	828649	337
34	73	4	3473-4-XR-613	XR613	Union Pacific Railroad Company	378640	828772	337
34	73	4	3473-4-XR-614	XR614	Union Pacific Railroad Company	378674	828841	337
34	73	4	3473-4-XR-615	XR615	Union Pacific Railroad Company	378074	829032	380
34	73	4	3473-4-XR-616	XR616	Union Pacific Railroad Company	378068	828733	370
34	73	4	3473-4-XR-617	XR617	Union Pacific Railroad Company	378252	828736	370
34	73	4	3473-4-XR-618	XR618	Union Pacific Railroad Company	378454	828748	360
34	73	4	3473-4-XR-619	XR619	Union Pacific Railroad Company	378256	828926	377
34	73	4	3473-4-XR-62	XR62	Union Pacific Railroad Company	377758	831785	377
34	73	4	3473-4-XR-620	XR620	Union Pacific Railroad Company	378456	828916	357
34	73	4	3473-4-XR-628	XR628	Union Pacific Railroad Company	380170	831843	300
34	73	4	3473-4-XR-629	XR629	Union Pacific Railroad Company	377000	828900	396
34	73	4	3473-4-XR-63	XR63	Union Pacific Railroad Company	379550	831743	356
34	73	4	3473-4-XR-630	XR630	Union Pacific Railroad Company	377000	828800	399
34	73	4	3473-4-XR-632	XR632	Union Pacific Railroad Company	376800	828900	400
34	73	4	3473-4-XR-633	XR633	Union Pacific Railroad Company	376800	828800	400
34	73	4	3473-4-XR-634	XR634	Union Pacific Railroad Company	376800	828600	400
34	73	4	3473-4-XR-635	XR635	Union Pacific Railroad Company	376600	829000	396
34	73	4	3473-4-XR-636	XR636	Union Pacific Railroad Company	376600	828900	417
34	73	4	3473-4-XR-637	XR637	Union Pacific Railroad Company	376600	828650	397
34	73	4	3473-4-XR-638	XR638	Union Pacific Railroad Company	379000	828800	339
34	73	4	3473-4-XR-639	XR639	Union Pacific Railroad Company	379000	828700	339
34	73	4	3473-4-XR-64	XR64	Union Pacific Railroad Company	378993	831813	360
34	73	4	3473-4-XR-640	XR640	Union Pacific Railroad Company	379200	828800	337
34	73	4	3473-4-XR-641	XR641	Union Pacific Railroad Company	379200	828700	339
34	73	4	3473-4-XR-642	XR642	Union Pacific Railroad Company	379400	828900	336
34	73	4	3473-4-XR-643	XR643	Union Pacific Railroad Company	379400	828800	336
34	73	4	3473-4-XR-644	XR644	Union Pacific Railroad Company	379600	829200	316
34	73	4	3473-4-XR-645	XR645	Union Pacific Railroad Company	379600	829100	317
34	73	4	3473-4-XR-646	XR646	Union Pacific Railroad Company	379800	829450	399
34	73	4	3473-4-XR-647	XR647	Union Pacific Railroad Company	379800	829350	319
34	73	4	3473-4-XR-648	XR648	Union Pacific Railroad Company	380000	829800	323
34	73	4	3473-4-XR-649	XR649	Union Pacific Railroad Company	380000	829600	292
34	73	4	3473-4-XR-65	XR65	Union Pacific Railroad Company	378625	831730	360
34	73	4	3473-4-XR-650	XR650	Union Pacific Railroad Company	380000	829500	300
34	73	4	3473-4-XR-651	XR651	Union Pacific Railroad Company	380200	829700	297
34	73	4	3473-4-XR-652	XR652	Union Pacific Railroad Company	380195	829548	297
34	73	4	3473-4-XR-657	XR657	Union Pacific Railroad Company	376600	828700	398
34	73	4	3473-4-XR-658	XR658	Union Pacific Railroad Company	376600	828850	397
34	73	4	3473-4-XR-659	XR659	Union Pacific Railroad Company	377000	828750	398
34	73	4	3473-4-XR-660	XR660	Union Pacific Railroad Company	377000	828850	397
34	73	4	3473-4-XR-661	XR661	Union Pacific Railroad Company	377200	828850	399
34	73	4	3473-4-XR-662	XR662	Union Pacific Railroad Company	377200	828700	400
34	73	4	3473-4-XR-663	XR663	Union Pacific Railroad Company	377600	828842	399
34	73	4	3473-4-XR-664	XR664	Union Pacific Railroad Company	377600	828750	399

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	4	3473-4-XR-665	XR665	Union Pacific Railroad Company	377801	828796	377
34	73	4	3473-4-XR-666	XR666	Union Pacific Railroad Company	377800	828650	377
34	73	4	3473-4-XR-667	XR667	Union Pacific Railroad Company	378000	828750	380
34	73	4	3473-4-XR-668	XR668	Union Pacific Railroad Company	378000	828650	379
34	73	4	3473-4-XR-669	XR669	Union Pacific Railroad Company	378200	828750	378
34	73	4	3473-4-XR-670	XR670	Union Pacific Railroad Company	378200	828850	378
34	73	4	3473-4-XR-671	XR671	Union Pacific Railroad Company	378200	829099	377
34	73	4	3473-4-XR-672	XR672	Union Pacific Railroad Company	378400	828900	358
34	73	4	3473-4-XR-673	XR673	Union Pacific Railroad Company	378400	828800	358
34	73	4	3473-4-XR-674	XR674	Union Pacific Railroad Company	378398	828704	359
34	73	4	3473-4-XR-675	XR675	Union Pacific Railroad Company	378993	828763	339
34	73	4	3473-4-XR-676	XR676	Union Pacific Railroad Company	379000	828650	339
34	73	4	3473-4-XR-678	XR678	Union Pacific Railroad Company	376720	828780	400
34	73	4	3473-4-XR-679	XR679	Union Pacific Railroad Company	376600	828950	398
34	73	4	3473-4-XR-680	XR680	Union Pacific Railroad Company	376400	828900	398
34	73	4	3473-4-XR-682	XR682	Union Pacific Railroad Company	376200	828900	397
34	73	4	3473-4-XR-683	XR683	Union Pacific Railroad Company	376000	828900	394
34	73	4	3473-4-XR-684	XR684	Union Pacific Railroad Company	376000	829000	397
34	73	4	3473-4-XR-685	XR685	Union Pacific Railroad Company	375800	828950	396
34	73	4	3473-4-XR-686	XR686	Union Pacific Railroad Company	375800	828850	397
34	73	4	3473-4-XR-687	XR687	Union Pacific Railroad Company	375600	828900	398
34	73	4	3473-4-XR-688	XR688	Union Pacific Railroad Company	375400	829050	400
34	73	4	3473-4-XR-689	XR689	Union Pacific Railroad Company	375400	829150	400
34	73	4	3473-4-XR-690	XR690	Union Pacific Railroad Company	375200	829150	397
34	73	4	3473-4-XR-691	XR691	Union Pacific Railroad Company	375200	829050	415
34	73	4	3473-4-XR-692	XR692	Union Pacific Railroad Company	378800	828750	337
34	73	4	3473-4-XR-693	XR693	Union Pacific Railroad Company	378800	828850	339
34	73	4	3473-4-XR-694	XR694	Union Pacific Railroad Company	380000	829400	300
34	73	4	3473-4-XR-695	XR695	Union Pacific Railroad Company	380400	829600	297
34	73	4	3473-4-XR-707	XR707	Union Pacific Railroad Company	377400	828700	400
34	73	4	3473-4-XR-708	XR708	Union Pacific Railroad Company	377400	828600	397
34	73	4	3473-4-XR-710	XR710	Union Pacific Railroad Company	378600	828700	338
34	73	4	3473-4-XR-73	XR73	Union Pacific Railroad Company	375620	830050	440
34	73	4	3473-4-XR-737	XR737	Union Pacific Railroad Company	375200	829200	420
34	73	4	3473-4-XR-738	XR738	Union Pacific Railroad Company	376000	828700	397
34	73	4	3473-4-XR-740	XR740	Union Pacific Railroad Company	376000	828800	400
34	73	4	3473-4-XR-743	XR743	Union Pacific Railroad Company	378008	828847	375
34	73	4	3473-4-XR-744	XR744	Union Pacific Railroad Company	378200	828700	380
34	73	4	3473-4-XR-745	XR745	Union Pacific Railroad Company	378400	828600	360
34	73	4	3473-4-XR-746	XR746	Union Pacific Railroad Company	378600	828650	338
34	73	4	3473-4-XR-747	XR747	Union Pacific Railroad Company	378800	828700	340
34	73	4	3473-4-XR-748	XR748	Union Pacific Railroad Company	379370	829010	318
34	73	4	3473-4-XR-749	XR749	Union Pacific Railroad Company	379600	829000	318
34	73	4	3473-4-XR-75	XR75	Union Pacific Railroad Company	376847	829679	457
34	73	4	3473-4-XR-750	XR750	Union Pacific Railroad Company	379600	829400	320
34	73	4	3473-4-XR-759	XR759	Union Pacific Railroad Company	377800	828700	400
34	73	4	3473-4-XR-76	XR76	Union Pacific Railroad Company	377420	829240	457
34	73	4	3473-4-XR-760	XR760	Union Pacific Railroad Company	378000	828900	378
34	73	4	3473-4-XR-761	XR761	Union Pacific Railroad Company	378000	828800	378
34	73	4	3473-4-XR-762	XR762	Union Pacific Railroad Company	378200	828725	380
34	73	4	3473-4-XR-763	XR763	Union Pacific Railroad Company	378200	829000	378
34	73	4	3473-4-XR-764	XR764	Union Pacific Railroad Company	378400	828850	360
34	73	4	3473-4-XR-765	XR765	Union Pacific Railroad Company	378400	828650	380
34	73	4	3473-4-XR-768	XR768	Union Pacific Railroad Company	378800	828650	340
34	73	4	3473-4-XR-769	XR769	Union Pacific Railroad Company	379000	828775	338
34	73	4	3473-4-XR-77	XR77	Union Pacific Railroad Company	376259	829676	437

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	4	3473-4-XR-770	XR770	Union Pacific Railroad Company	379200	828650	340
34	73	4	3473-4-XR-771	XR771	Union Pacific Railroad Company	379400	828750	337
34	73	4	3473-4-XR-772	XR772	Union Pacific Railroad Company	379400	828850	337
34	73	4	3473-4-XR-773	XR773	Union Pacific Railroad Company	379600	828900	320
34	73	4	3473-4-XR-775	XR775	Union Pacific Railroad Company	379600	829300	318
34	73	4	3473-4-XR-776	XR776	Union Pacific Railroad Company	380000	829450	320
34	73	4	3473-4-XR-777	XR777	Union Pacific Railroad Company	380008	829556	300
34	73	4	3473-4-XR-778	XR778	Union Pacific Railroad Company	380000	829650	298
34	73	4	3473-4-XR-779	XR779	Union Pacific Railroad Company	380200	829600	298
34	73	4	3473-4-XR-782	XR782	Union Pacific Railroad Company	377800	828750	400
34	73	4	3473-4-XR-783	XR783	Union Pacific Railroad Company	377200	828750	440
34	73	4	3473-4-XR-785	XR785	Union Pacific Railroad Company	375600	828950	400
34	73	4	3473-4-XR-786	XR786	Union Pacific Railroad Company	375400	829100	410
34	73	4	3473-4-XR-787	XR787	Union Pacific Railroad Company	375200	829100	418
34	73	4	3473-4-XR-802	XR802	Union Pacific Railroad Company	377800	828775	400
34	73	4	3473-4-XR-803	XR803	Union Pacific Railroad Company	377800	828725	400
34	73	4	3473-4-XR-805	XR805	Union Pacific Railroad Company	379560	831650	357
34	73	4	3473-4-XR-806	XR806	Union Pacific Railroad Company	378990	831680	360
34	73	4	3473-4-XR-817	XR817	Union Pacific Railroad Company	378990	831730	355
34	73	4	3473-4-XR-818	XR818	Union Pacific Railroad Company	379560	831700	360
34	73	4	3473-4-XR-819	XR819	Union Pacific Railroad Company	379560	831725	360
34	73	4	3473-4-XR-828	XR828	Union Pacific Railroad Company	379000	831732	358
34	73	4	3473-4-XR-837	XR837	Union Pacific Railroad Company	378800	831725	358
34	73	4	3473-4-XR-838	XR838	Union Pacific Railroad Company	379200	831700	357
34	73	4	3473-4-XR-839	XR839	Union Pacific Railroad Company	376570	831475	380
34	73	4	3473-4-XR-840	XR840	Union Pacific Railroad Company	377175	831625	380
34	73	4	3473-4-XR-841	XR841	Union Pacific Railroad Company	377770	831975	380
34	73	4	3473-4-XR-842	XR842	Union Pacific Railroad Company	378400	831700	318
34	73	4	3473-4-XR-843	XR843	Union Pacific Railroad Company	380000	831750	357
34	73	4	3473-4-XR-844	XR844	Union Pacific Railroad Company	380400	831900	298
34	73	4	3473-4-XR-846	XR846	Union Pacific Railroad Company	378380	831750	358
34	73	4	3473-4-XR-847	XR847	Union Pacific Railroad Company	378800	831800	358
34	73	4	3473-4-XR-848	XR848	Union Pacific Railroad Company	377760	831875	380
34	73	4	3473-4-XR-851	XR851	Union Pacific Railroad Company	377175	831530	380
34	73	4	3473-4-XR-852	XR852	Union Pacific Railroad Company	376570	831425	380
34	73	4	3473-4-XR-853	XR853	Union Pacific Railroad Company	379200	831650	357
34	73	4	3473-4-XR-854	XR854	Union Pacific Railroad Company	377760	831825	380
34	73	4	3473-4-XR-855	XR855	Union Pacific Railroad Company	379200	831725	358
34	73	4	3473-4-XR-856	XR856	Union Pacific Railroad Company	378800	831850	357
34	73	4	3473-4-XR-857	XR857	Union Pacific Railroad Company	378380	831765	360
34	73	4	3473-4-XR-858	XR858	Union Pacific Railroad Company	378380	831715	360
34	73	4	3473-4-XR-859	XR859	Union Pacific Railroad Company	380000	831850	317
34	73	4	3473-4-XR-860	XR860	Union Pacific Railroad Company	376570	831450	377
34	73	4	3473-4-XR-861	XR861	Union Pacific Railroad Company	377760	831800	378
34	73	4	3473-4-XR-867	XR867	Union Pacific Railroad Company	377175	831500	378
34	73	4	3473-4-XR-868	XR868	Union Pacific Railroad Company	378785	831830	360
34	73	4	3473-4-XR-869	XR869	Union Pacific Railroad Company	380440	831898	300
34	73	5	3473-5-M-3	M-3	Uranium One	372320	831515	601
34	73	5	3473-5-SX-05	SX-05	UNC Teton	371115	830511	496
34	73	6	3473-6-CRX-6	CRX-6	UNC Teton	375100	832600	
34	73	6	3473-6-CRX-7	CRX-7	UNC Teton	375100	832900	
34	73	6	3473-6-M-2	M-2	Uranium One	366905	830484	597
34	73	6	3473-6-SX-04	SX-04	UNC Teton	365720	828880	496
34	73	7	3473-7-1000	1000	Uranium One	364950	823350	700
34	73	7	3473-7-1001	1001	Uranium One	364950	823550	702
34	73	7	3473-7-1002	1002	Uranium One	365350	823550	706

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	7	3473-7-1003	1003	Uranium One	366550	823550	703
34	73	7	3473-7-1004	1004	Uranium One	368150	823550	706
34	73	7	3473-7-1005	1005	Uranium One	369748	823542	708
34	73	7	3473-7-1006	1006	Uranium One	369750	825150	706
34	73	7	3473-7-1007	1007	Uranium One	368150	825150	706
34	73	7	3473-7-1008	1008	Uranium One	366550	825150	705
34	73	7	3473-7-1009	1009	Uranium One	364950	825150	705
34	73	7	3473-7-1010	1010	Uranium One	364950	826750	708
34	73	7	3473-7-1011	1011	Uranium One	366550	826750	707
34	73	7	3473-7-1012	1012	Uranium One	368150	826750	707
34	73	7	3473-7-1013	1013	Uranium One	369750	826750	484
34	73	7	3473-7-1014	1014	Uranium One	369750	828350	708
34	73	7	3473-7-1015	1015	Uranium One	368150	828350	705
34	73	7	3473-7-1016	1016	Uranium One	366550	828350	707
34	73	7	3473-7-1017	1017	Uranium One	364950	828350	707
34	73	7	3473-7-1018	1018	Uranium One	364750	823550	706
34	73	7	3473-7-1019	1019	Uranium One	364950	823450	700
34	73	7	3473-7-1020	1020	Uranium One	365150	823550	704
34	73	7	3473-7-1021	1021	Uranium One	364950	823750	703
34	73	7	3473-7-1022	1022	Uranium One	369735	823450	703
34	73	7	3473-7-1023	1023	Uranium One	369550	823550	705
34	73	7	3473-7-1024	1024	Uranium One	369750	823750	706
34	73	7	3473-7-1025	1025	Uranium One	364850	823450	708
34	73	7	3473-7-1026	1026	Uranium One	365050	823450	705
34	73	7	3473-7-1027	1027	Uranium One	365050	823550	702
34	73	7	3473-7-1028	1028	Uranium One	364950	823650	704
34	73	7	3473-7-25	25		364821	825527	
34	73	7	3473-7-27	27		364791	824909	
34	73	7	3473-7-43-1	43-1		367592	826051	
34	73	7	3473-7-CRX-29	CRX-29	UNC Teton	364750	823850	
34	73	7	3473-7-CRX-63	CRX-63	UNC Teton	364820	824762	398
34	73	8	3473-8-CRX-30	CRX-30	UNC Teton	371450	824920	
34	73	8	3473-8-CRX-43	CRX-43	UNC Teton	371800	823600	
34	73	8	3473-8-CRX-44	CRX-44	UNC Teton	373900	823500	
34	73	8	3473-8-M-26	M-26	Uranium One	372206	825894	802
34	73	9	3473-9-1	1	Morrison Nuclear	380048.3573	823396.6972	807
34	73	9	3473-9-100	100	Uranium One	380048.3573	824196.6972	803
34	73	9	3473-9-1001water we	1001 water well	R.L. Peterson	379809.3	825077.5	900
34	73	9	3473-9-101	101	Uranium One	379648.3573	824196.6972	803
34	73	9	3473-9-102	102	Uranium One	379248.3573	824196.6972	803
34	73	9	3473-9-103	103	Uranium One	379248.3573	825796.6972	897
34	73	9	3473-9-104	104	Uranium One	379248.3573	827396.6972	906
34	73	9	3473-9-105	105	Uranium One	377648.3573	827396.6972	905
34	73	9	3473-9-106	106	Uranium One	377648.3573	825796.6972	894
34	73	9	3473-9-107	107	Uranium One	377648.3573	824196.6972	520
34	73	9	3473-9-108	108	Uranium One	376048.3573	824196.6972	940
34	73	9	3473-9-109	109	Uranium One	376048.3573	825796.6972	906
34	73	9	3473-9-110	110	Uranium One	376048.3573	827396.6972	900
34	73	9	3473-9-111	111	Uranium One	376048.3573	828196.6972	940
34	73	9	3473-9-112	112	Uranium One	377648.3573	828196.6972	839
34	73	9	3473-9-2	2	Uranium One	379648.3573	823396.6972	742
34	73	9	3473-9-3	3	Uranium One	379248.3573	823396.6972	805
34	73	9	3473-9-315	315		379211	824084.1	
34	73	9	3473-9-4	4	Uranium One	379248.3573	823796.6972	803
34	73	9	3473-9-426	426		379217	824129	
34	73	9	3473-9-5	5	Uranium One	379648.3573	823796.6972	802

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	73	9	3473-9-6	6	Uranium One	380048.3573	823796.6972	800
34	73	9	3473-9-74-1	74-1		377716.9	826043.9	
34	73	9	3473-9-CRX-31	CRX-31	UNC Teton	378300	825900	
34	73	9	3473-9-CRX-49	CRX-49	UNC Teton	378600	826550	
34	73	9	3473-9-Jay70-1	Jay70-1		375898	824158	
34	73	9	3473-9-Jay70-2	Jay70-2		378520	824173	
34	73	9	3473-9-Jay70-3	Jay70-3		377144	827615	
34	73	9	3473-9-Jay70-4	Jay70-4		379898	827569	
34	73	9	3473-9-Jay70-5	Jay70-5		377795	826088	
34	74	11	3474-11-100CEGB	100CEGB	Everest Minerals	356260	827146	563
34	74	11	3474-11-101CEGB	101CEGB	Everest Minerals	356272	826936	562
34	74	11	3474-11-103CEGB	103CEGB	Everest Minerals	356596	827217	563
34	74	11	3474-11-1050-0550	1050-0550	Power Resources INC.	354654	824353	455
34	74	11	3474-11-10KM	10KM	Kerr McGee	355860	827003	1000
34	74	11	3474-11-113CEGB	113CEGB	Everest Minerals	356526	825349	502
34	74	11	3474-11-11KM	11KM	Kerr McGee	355840	825583	1000
34	74	11	3474-11-1250-0550	1250-0550	Power Resources INC.	354644	824551	499
34	74	11	3474-11-12KM	12KM	Kerr McGee	355806	824160	1000
34	74	11	3474-11-131CEGB	131CEGB	Everest Minerals	356589	828316	563
34	74	11	3474-11-132CEGB	132CEGB	Everest Minerals	356268	827036	560
34	74	11	3474-11-134CEGB	134CEGB	Everest Minerals	356304	824733	462
34	74	11	3474-11-135CEGB	135CEGB	Everest Minerals	355349	823528	422
34	74	11	3474-11-139CEGB	139CEGB	Everest Minerals	356592	827264	562
34	74	11	3474-11-13KM	13KM	Kerr McGee	355831	824913	992
34	74	11	3474-11-1400-0550	1400-0550	Power Resources INC.	354636	824695	540
34	74	11	3474-11-146CEGB	146CEGB	Everest Minerals	356264	827083	563
34	74	11	3474-11-147CEGB	147CEGB	Everest Minerals	356444	827117	562
34	74	11	3474-11-14KM	14KM	Kerr McGee	355210	824177	916
34	74	11	3474-11-150CEGB	150CEGB	Everest Minerals	354629	824844	582
34	74	11	3474-11-155CEGB	155CEGB	Everest Minerals	354656	824051	462
34	74	11	3474-11-156CEGB	156CEGB	Everest Minerals	356785	827287	562
34	74	11	3474-11-158C-CEGB	158C-CEGB	Everest Minerals	356286	824714	464
34	74	11	3474-11-15KM	15KM	Kerr McGee	356413	824158	988
34	74	11	3474-11-160CEGB	160CEGB	Everest Minerals	356781	827390	538
34	74	11	3474-11-161CEGB	161CEGB	Everest Minerals	356370	827145	538
34	74	11	3474-11-162CEGB	162CEGB	Everest Minerals	355247	823527	419
34	74	11	3474-11-163CEGB	163CEGB	Everest Minerals	356086	826947	550
34	74	11	3474-11-164CEGB	164CEGB	Everest Minerals	355931	826712	558
34	74	11	3474-11-165CEGB	165CEGB	Everest Minerals	356287	826957	557
34	74	11	3474-11-16KM	16KM	Kerr McGee	355804	823417	987
34	74	11	3474-11-17KM	17KM	Kerr McGee	356754	827663	1006
34	74	11	3474-11-18KM	18KM	Kerr McGee	356670	826964	944
34	74	11	3474-11-19KM	19KM	Kerr McGee	356457	824841	1002
34	74	11	3474-11-20KM	20KM	Kerr McGee	356413	825557	1003
34	74	11	3474-11-21KM	21KM	Kerr McGee	355248	823426	1003
34	74	11	3474-11-2250-1150	2250-1150	Power Resources INC.	355246	825554	540
34	74	11	3474-11-2250-1250	2250-1250	Power Resources INC.	355347	825551	499
34	74	11	3474-11-2250-1300	2250-1300	Power Resources INC.	355399	825548	499
34	74	11	3474-11-2250-1350	2250-1350	Power Resources INC.	355450	825550	500
34	74	11	3474-11-22KM	22KM	Kerr McGee	355511	824172	802
34	74	11	3474-11-23KM	23KM	Kerr McGee	355138	825483	1203
34	74	11	3474-11-24KM	24KM	Kerr McGee	356110	824544	563
34	74	11	3474-11-25KM	25KM	Kerr McGee	356792	825559	563
34	74	11	3474-11-26KM	11-26KM	Kerr McGee	354100	825492	802
34	74	11	3474-11-27KM	27KM	Kerr McGee	355522	823815	602
34	74	11	3474-11-2850-1500	2850-1500	Power Resources INC.	355600	826150	555

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	11	3474-11-2850-1600	2850-1600	Power Resources INC.	355700	826150	558
34	74	11	3474-11-2850-1650	2850-1650	Power Resources INC.	355750	826150	553
34	74	11	3474-11-28KM	28KM	Kerr McGee	356487	826966	604
34	74	11	3474-11-29KM	29KM	Kerr McGee	355709	823811	596
34	74	11	3474-11-30KM	30KM	Kerr McGee	355823	824519	560
34	74	11	3474-11-31KM	31KM	Kerr McGee	356627	825351	603
34	74	11	3474-11-3200-1750	3200-1750	Power Resources INC.	355948	826424	559
34	74	11	3474-11-32KM	32KM	Kerr McGee	356712	825956	601
34	74	11	3474-11-33KM	33KM	Kerr McGee	356212	824544	603
34	74	11	3474-11-34KM	34KM	Kerr McGee	356112	824855	603
34	74	11	3474-11-35KM	35KM	Kerr McGee	356676	826760	602
34	74	11	3474-11-36KM	36KM	Kerr McGee	355050	823414	597
34	74	11	3474-11-37KM	37KM	Kerr McGee	355349	823424	599
34	74	11	3474-11-38KM	38KM	Kerr McGee	355228	823644	501
34	74	11	3474-11-39KM	39KM	Kerr McGee	355048	823516	501
34	74	11	3474-11-40KM	40KM	Kerr McGee	356015	824394	500
34	74	11	3474-11-41KM	41KM	Kerr McGee	356117	824394	503
34	74	11	3474-11-42KM	42KM	Kerr McGee	356664	824844	500
34	74	11	3474-11-43KM	43KM	Kerr McGee	356460	824693	503
34	74	11	3474-11-44KM	44KM	Kerr McGee	355408	823662	460
34	74	11	3474-11-45KM	45KM	Kerr McGee	355522	823911	458
34	74	11	3474-11-46KM	46KM	Kerr McGee	355643	824179	440
34	74	11	3474-11-47KM	47KM	Kerr McGee	355869	824192	461
34	74	11	3474-11-48KM	48KM	Kerr McGee	355776	824289	459
34	74	11	3474-11-49KM	49KM	Kerr McGee	355986	824549	500
34	74	11	3474-11-50KM	50KM	Kerr McGee	356117	824766	500
34	74	11	3474-11-51KM	51KM	Kerr McGee	356668	825050	520
34	74	11	3474-11-52KM	52KM	Kerr McGee	356524	825445	520
34	74	11	3474-11-53KM	53KM	Kerr McGee	356702	825759	420
34	74	11	3474-11-54KM	54KM	Kerr McGee	355151	823426	450
34	74	11	3474-11-55KM	55KM	Kerr McGee	355620	823913	460
34	74	11	3474-11-56KM	56KM	Kerr McGee	355706	823667	460
34	74	11	3474-11-57KM	57KM	Kerr McGee	355626	823806	440
34	74	11	3474-11-58KM	58KM	Kerr McGee	355425	823797	440
34	74	11	3474-11-59KM	59KM	Kerr McGee	355645	824030	460
34	74	11	3474-11-60KM	60KM	Kerr McGee	355827	824011	460
34	74	11	3474-11-61KM	61KM	Kerr McGee	356452	825039	498
34	74	11	3474-11-62KM	62KM	Kerr McGee	356321	824841	500
34	74	11	3474-11-63KM	63KM	Kerr McGee	355910	824391	460
34	74	11	3474-11-64KM	64KM	Kerr McGee	356567	825041	561
34	74	11	3474-11-65KM	65KM	Kerr McGee	355557	823663	420
34	74	11	3474-11-66KM	66KM	Kerr McGee	356588	825569	461
34	74	11	3474-11-67KM	67KM	Kerr McGee	356588	825569	500
34	74	11	3474-11-68KM	68KM	Kerr McGee	356792	825758	501
34	74	11	3474-11-69KM	69KM	Kerr McGee	356495	825140	564
34	74	11	3474-11-70KM	70KM	Kerr McGee	356523	825255	554
34	74	11	3474-11-71KM	71KM	Kerr McGee	356685	825565	564
34	74	11	3474-11-72KM	72KM	Kerr McGee	356235	824700	500
34	74	11	3474-11-73KM	73KM	Kerr McGee	356780	826350	555
34	74	11	3474-11-74KM	74KM	Kerr McGee	356800	827180	601
34	74	11	3474-11-83CEGB	83CEGB	Everest Minerals	354281	828603	639
34	74	11	3474-11-98CEGB	98CEGB	Everest Minerals	356435	827271	562
34	74	11	3474-11-99CEGB	99CEGB	Everest Minerals	356581	827422	562
34	74	12	3474-12-1	12-1	UNC Teton	364372	825065	
34	74	12	3474-12-3	12-3	UNC Teton	364189.6	828025	
34	74	12	3474-12-4	12-4	UNC Teton	363275	827934	

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	12	3474-12-444	444	UNC Teton	360120.8	825319.7	
34	74	12	3474-12-445	445	UNC Teton	360931.6	824855.6	
34	74	12	3474-12-448	448	UNC Teton	361389.1	824839.7	
34	74	12	3474-12-449	449	UNC Teton	360935.5	825322.8	
34	74	12	3474-12-450	450	UNC Teton	360928.8	823965.7	
34	74	12	3474-12-451	451	UNC Teton	361607.1	824822.6	
34	74	12	3474-12-452	452	UNC Teton	360951.5	825073	
34	74	12	3474-12-453	453	UNC Teton	360956.2	824373	
34	74	12	3474-12-454	454	UNC Teton	361171.9	824839.5	
34	74	12	3474-12-456	456	UNC Teton	360943.2	824614.6	
34	74	12	3474-12-457	457	UNC Teton	361491.9	824832.7	
34	74	12	3474-12-458	458	UNC Teton	361300.9	824840.3	
34	74	12	3474-12-459	459	UNC Teton	360941	824700.6	
34	74	12	3474-12-460	460	UNC Teton	360949.3	824749.8	
34	74	12	3474-12-461	461	UNC Teton	360842.8	824698.6	
34	74	12	3474-12-462	462	UNC Teton	361027.6	824701.1	
34	74	12	3474-12-463	463	UNC Teton	360378.3	824360.3	
34	74	12	3474-12-464	464	UNC Teton	360750.1	824698.6	
34	74	12	3474-12-466	466	UNC Teton	359982.8	825411	
34	74	12	3474-12-467	467	UNC Teton	361286.8	825107.9	
34	74	12	3474-12-468	468	UNC Teton	360070.9	824349.1	
34	74	12	3474-12-469	469	UNC Teton	360743.9	824782.5	
34	74	12	3474-12-471	471	UNC Teton	361265.2	825372	
34	74	12	3474-12-474	474	UNC Teton	360200.1	824348.4	
34	74	12	3474-12-475	475	UNC Teton	360840.7	824605	
34	74	12	3474-12-476	476	UNC Teton	360839.6	824508.4	
34	74	12	3474-12-477-T	477-T	UNC Teton	359565	823506.7	
34	74	12	3474-12-478-T	478-T	UNC Teton	359812.2	824337.8	
34	74	12	3474-12-479-T	479-T	UNC Teton	360038.1	824339.2	
34	74	12	3474-12-480-T	480-T	UNC Teton	359869.1	825312.1	
34	74	12	3474-12-481-T	481-T	UNC Teton	360943.2	825192.5	
34	74	12	3474-12-482-T	482-T	UNC Teton	360544.5	825182.3	
34	74	12	3474-12-483-T	483-T	UNC Teton	361303.2	825638.8	
34	74	12	3474-12-484-T	484-T	UNC Teton	360538.5	825317.9	
34	74	12	3474-12-485-T	485-T	UNC Teton	360940.7	825261.5	
34	74	12	3474-12-486-T	486-T	UNC Teton	361300	825531	
34	74	12	3474-12-487-T	487-T	UNC Teton	361505.4	825437.2	
34	74	12	3474-12-488-T	488-T	UNC Teton	359955.9	824445.6	
34	74	12	3474-12-491	491	UNC Teton	360304.8	824538.1	
34	74	12	3474-12-492	492	UNC Teton	360295.3	824630.7	
34	74	12	3474-12-493	493	UNC Teton	360308.3	824435	
34	74	12	3474-12-494	494	UNC Teton	361125.7	824751.9	
34	74	12	3474-12-495	495	UNC Teton	361310	824736.6	
34	74	12	3474-12-496	496	UNC Teton	360619.9	824629.9	
34	74	12	3474-12-497	497	UNC Teton	361135	824647.1	
34	74	12	3474-12-498	498	UNC Teton	361398.7	824743.8	
34	74	12	3474-12-500	500	UNC Teton	360615.5	824533.5	
34	74	12	3474-12-501	501	UNC Teton	360627.1	824730.8	
34	74	12	3474-12-502	502	UNC Teton	360624.6	824441.8	
34	74	12	3474-12-503	503	UNC Teton	360739.1	824591.2	
34	74	12	3474-12-504	504	UNC Teton	360506	824531.4	
34	74	12	3474-12-505	505	UNC Teton	360499.2	824631	
34	74	12	3474-12-506	506	UNC Teton	360496.6	824430	
34	74	12	3474-12-507	507	UNC Teton	360197.2	824442.2	
34	74	12	3474-12-508	508	UNC Teton	360199.9	824536.1	
34	74	12	3474-12-509	509	UNC Teton	360202.6	824637.5	

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	12	3474-12-510	510	UNC Teton	361308.1	824624	
34	74	12	3474-12-511	511	UNC Teton	361404.7	824632.1	
34	74	12	3474-12-514	514	UNC Teton	361428.9	825145.6	
34	74	12	3474-12-515	515	UNC Teton	361540.3	825143.6	
34	74	12	3474-12-516	516	UNC Teton	361685.8	825146.5	
34	74	12	3474-12-517	517	UNC Teton	361432.6	825437.3	
34	74	12	3474-12-518	518	UNC Teton	361422.4	825532.9	
34	74	12	3474-12-519	519	UNC Teton	361182	825519.3	
34	74	12	3474-12-520	520	UNC Teton	361031.4	825522	
34	74	12	3474-12-521	521	UNC Teton	360947.3	825412.9	
34	74	12	3474-12-522	522	UNC Teton	360853.7	825409	
34	74	12	3474-12-523	523	UNC Teton	361498.9	824731.2	
34	74	12	3474-12-524	524	UNC Teton	361603.1	824725.8	
34	74	12	3474-12-525	525	UNC Teton	361503.1	824926.3	
34	74	12	3474-12-526	526	UNC Teton	361600.3	824923.8	
34	74	12	3474-12-527	527	UNC Teton	361036.4	824752.4	
34	74	12	3474-12-528	528	UNC Teton	361036.4	824798.1	
34	74	12	3474-12-529	529	UNC Teton	361040.5	825322	
34	74	12	3474-12-531CEGB	531	Everest Minerals	359917	827247	400
34	74	12	3474-12-532CEGB	532	Everest Minerals	359717	827252	401
34	74	12	3474-12-DN-169	DN-169	Denison Mines, INC	359827.8	825157	356
34	74	12	3474-12-DN-170	DN-170	Denison Mines, INC	359817	825365	375
34	74	12	3474-12-DN-171	DN-171	Denison Mines, INC	359813.1	825560.4	376
34	74	12	3474-12-DN-172	172	Denison Mines, INC	359808.2	825762.8	
34	74	12	3474-12-DN-183	DN-183	Denison Mines, INC	359816.7	825459.1	
34	74	12	3474-12-DNM-20	DNM-20	Denison Mines, INC	361592	825765	377
34	74	12	3474-12-ID.T-488	488	UNC Teton	359954	824440	310
34	74	12	3474-12-IDA-1	1	UNC Teton	363064	825515	397
34	74	12	3474-12-IDA-10	10	UNC Teton	362551	825691	379
34	74	12	3474-12-IDA-100	100	UNC Teton	362296	825027	497
34	74	12	3474-12-IDA-101	101	UNC Teton	364204	825221	489
34	74	12	3474-12-IDA-102	102	UNC Teton	363746	825420	491
34	74	12	3474-12-IDA-103	103	UNC Teton	363595	825538	509
34	74	12	3474-12-IDA-104	104	UNC Teton	363640	825478	492
34	74	12	3474-12-IDA-105	105	UNC Teton	363636	825367	494
34	74	12	3474-12-IDA-106	106	UNC Teton	363675	825326	491
34	74	12	3474-12-IDA-107	107	UNC Teton	363785	825331	491
34	74	12	3474-12-IDA-108	108	UNC Teton	363745	825223	491
34	74	12	3474-12-IDA-109	109	UNC Teton	363577	825374	455
34	74	12	3474-12-IDA-11	11	UNC Teton	361943	825793	399
34	74	12	3474-12-IDA-110	110	UNC Teton	363577	825331	496
34	74	12	3474-12-IDA-111	111	UNC Teton	363194	825019	476
34	74	12	3474-12-IDA-112	112	UNC Teton	363517	825316	482
34	74	12	3474-12-IDA-113	113	UNC Teton	363700	825428	488
34	74	12	3474-12-IDA-114	114	UNC Teton	363739	825373	494
34	74	12	3474-12-IDA-115	115	UNC Teton	363728	825274	496
34	74	12	3474-12-IDA-116	116	UNC Teton	363785	825275	510
34	74	12	3474-12-IDA-117	117	UNC Teton	362901	825031	494
34	74	12	3474-12-IDA-118	118	UNC Teton	363825	825334	492
34	74	12	3474-12-IDA-119	119	UNC Teton	363794	825376	491
34	74	12	3474-12-IDA-12	12	UNC Teton	362875	826078	400
34	74	12	3474-12-IDA-12?	12?	UNC Teton	361087.1	825711.4	
34	74	12	3474-12-IDA-120	120	UNC Teton	362301	825228	500
34	74	12	3474-12-IDA-121	121	UNC Teton	363685	825373	491
34	74	12	3474-12-IDA-122	122	UNC Teton	363581	825275	513
34	74	12	3474-12-IDA-123	123	UNC Teton	363628	825272	477

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	12	3474-12-IDA-124	124	UNC Teton	363675	825259	497
34	74	12	3474-12-IDA-125	125	UNC Teton	363828	825269	494
34	74	12	3474-12-IDA-126	126	UNC Teton	363791	825224	491
34	74	12	3474-12-IDA-127	127	UNC Teton	363252	825481.6	
34	74	12	3474-12-IDA-128	128	UNC Teton	363103	825430	496
34	74	12	3474-12-IDA-129	129	UNC Teton	363006	825435	499
34	74	12	3474-12-IDA-13	13	UNC Teton	360973	825712	398
34	74	12	3474-12-IDA-130	130	UNC Teton	361710	825793	498
34	74	12	3474-12-IDA-131	131	UNC Teton	363842	825383	452
34	74	12	3474-12-IDA-132	132	UNC Teton	363941	825169	508
34	74	12	3474-12-IDA-133	133	UNC Teton	363875	825329	508
34	74	12	3474-12-IDA-134	134	UNC Teton	363907	825320	508
34	74	12	3474-12-IDA-135	135	UNC Teton	363878	825273	492
34	74	12	3474-12-IDA-136	136	UNC Teton	363002	825240	497
34	74	12	3474-12-IDA-137	137	UNC Teton	363104	825231	499
34	74	12	3474-12-IDA-138	138	UNC Teton	364015	825322	491
34	74	12	3474-12-IDA-139	139	UNC Teton	363905	825223	453
34	74	12	3474-12-IDA-14	14	UNC Teton	364105	824874	533
34	74	12	3474-12-IDA-140	140	UNC Teton	363923	825277	511
34	74	12	3474-12-IDA-141	141	UNC Teton	363974	825279	497
34	74	12	3474-12-IDA-142	142	UNC Teton	363973	825330	494
34	74	12	3474-12-IDA-143	143	UNC Teton	363503	825571	491
34	74	12	3474-12-IDA-144	144	UNC Teton	363888	825173	494
34	74	12	3474-12-IDA-145	145	UNC Teton	363967	825225	494
34	74	12	3474-12-IDA-146	146	UNC Teton	363981	825126	492
34	74	12	3474-12-IDA-147	147	UNC Teton	363884	825128	489
34	74	12	3474-12-IDA-148	148	UNC Teton	363867	825222	494
34	74	12	3474-12-IDA-149	149	UNC Teton	363940	825127	453
34	74	12	3474-12-IDA-15	15	UNC Teton	364110.4	825622.3	
34	74	12	3474-12-IDA-150	150	UNC Teton	363857	825167	390
34	74	12	3474-12-IDA-151	151	UNC Teton	363823	825118	456
34	74	12	3474-12-IDA-152	152	UNC Teton	363913	824827	490
34	74	12	3474-12-IDA-153	153	UNC Teton	363916	825028	394
34	74	12	3474-12-IDA-154	154	UNC Teton	363910.5	824930.1	
34	74	12	3474-12-IDA-155	155	UNC Teton	364006	825028	393
34	74	12	3474-12-IDA-156	156	UNC Teton	364014	824926	493
34	74	12	3474-12-IDA-157	157	UNC Teton	363861	825068	491
34	74	12	3474-12-IDA-158	158	UNC Teton	363906	825075	490
34	74	12	3474-12-IDA-159	159	UNC Teton	363955	825073	553
34	74	12	3474-12-IDA-16	16	Morrison Nuclear	363548	825621	699
34	74	12	3474-12-IDA-160	160	UNC Teton	362531	826225	490
34	74	12	3474-12-IDA-161	161	UNC Teton	363959	825027	493
34	74	12	3474-12-IDA-162	162	UNC Teton	364011	825075	494
34	74	12	3474-12-IDA-163	163	UNC Teton	364000	824968	494
34	74	12	3474-12-IDA-164	164	UNC Teton	364123	825019	496
34	74	12	3474-12-IDA-165	165	UNC Teton	364211.8	825023.4	
34	74	12	3474-12-IDA-166	166	UNC Teton	364211	824919	490
34	74	12	3474-12-IDA-167	167	UNC Teton	363224	825976	460
34	74	12	3474-12-IDA-168	168	UNC Teton	363757	825120	494
34	74	12	3474-12-IDA-169	169	UNC Teton	363185	825963	460
34	74	12	3474-12-IDA-17	17	UNC Teton	363508	824872	614
34	74	12	3474-12-IDA-170	170	UNC Teton	363266	825906	457
34	74	12	3474-12-IDA-171	171	UNC Teton	363217	825876	491
34	74	12	3474-12-IDA-172	172	UNC Teton	363199	825766	456
34	74	12	3474-12-IDA-173	173	UNC Teton	363245	825732	496
34	74	12	3474-12-IDA-174	174	UNC Teton	362651	826186	460

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	12	3474-12-IDA-175	175	UNC Teton	363197	826015	432
34	74	12	3474-12-IDA-176	176	UNC Teton	360520	825940	432
34	74	12	3474-12-IDA-177	177	UNC Teton	360822	825942	367
34	74	12	3474-12-IDA-178	178	UNC Teton	361118	825736	497
34	74	12	3474-12-IDA-179	179	UNC Teton	360971	825835	403
34	74	12	3474-12-IDA-18	18	UNC Teton	362911	824887	628
34	74	12	3474-12-IDA-180	180	UNC Teton	362600	825119	479
34	74	12	3474-12-IDA-181	181	UNC Teton	360517	826943	399
34	74	12	3474-12-IDA-182	182	UNC Teton	361714	826550	498
34	74	12	3474-12-IDA-183	183	UNC Teton	361126	826727	498
34	74	12	3474-12-IDA-184	184	UNC Teton	362302	825143	497
34	74	12	3474-12-IDA-185	185	UNC Teton	361117	825777	439
34	74	12	3474-12-IDA-186	186	UNC Teton	361118	825689	493
34	74	12	3474-12-IDA-187	187	UNC Teton	360817	825793	493
34	74	12	3474-12-IDA-188	188	UNC Teton	360824	826841	492
34	74	12	3474-12-IDA-189	189	UNC Teton	361420	826634	497
34	74	12	3474-12-IDA-19	19	UNC Teton	362896	825619	694
34	74	12	3474-12-IDA-190	190	UNC Teton	363007	825153	497
34	74	12	3474-12-IDA-191	191	UNC Teton	363046	825242	498
34	74	12	3474-12-IDA-192	192	UNC Teton	362897	825208	496
34	74	12	3474-12-IDA-193	193	UNC Teton	363102	825485	499
34	74	12	3474-12-IDA-194	194	UNC Teton	363007	825332	499
34	74	12	3474-12-IDA-195	195	UNC Teton	363102	825604	494
34	74	12	3474-12-IDA-196	196	UNC Teton	360822	825899	453
34	74	12	3474-12-IDA-197	197	UNC Teton	361417	826437	498
34	74	12	3474-12-IDA-198	198	UNC Teton	362597	825160	399
34	74	12	3474-12-IDA-199	199	UNC Teton	362318	825184	393
34	74	12	3474-12-IDA-2	2	UNC Teton	362139	825744	393
34	74	12	3474-12-IDA-20	20	Morrison Nuclear	362317	825619	612
34	74	12	3474-12-IDA-200	200	UNC Teton	362693	825181	399
34	74	12	3474-12-IDA-201	201	UNC Teton	362401	825187	397
34	74	12	3474-12-IDA-202	202	UNC Teton	362507	825157	399
34	74	12	3474-12-IDA-203	203	UNC Teton	362209	825230	399
34	74	12	3474-12-IDA-204	204	UNC Teton	363045	825441	500
34	74	12	3474-12-IDA-205	205	UNC Teton	359917	825647	459
34	74	12	3474-12-IDA-206	206	UNC Teton	360528	825851	396
34	74	12	3474-12-IDA-207	207	UNC Teton	361719	826432	438
34	74	12	3474-12-IDA-208	208	UNC Teton	361131	826546	393
34	74	12	3474-12-IDA-209	209	UNC Teton	360820	827040	455
34	74	12	3474-12-IDA-21	21	UNC Teton	362309	824885	612
34	74	12	3474-12-IDA-210	210	UNC Teton	360513	827030	499
34	74	12	3474-12-IDA-211	211	UNC Teton	360226	827444	397
34	74	12	3474-12-IDA-212	212	UNC Teton	359927	827449	391
34	74	12	3474-12-IDA-213	213	UNC Teton	360519	825891	500
34	74	12	3474-12-IDA-214	214	UNC Teton	360511	825798	440
34	74	12	3474-12-IDA-215	215	UNC Teton	360215	825734	500
34	74	12	3474-12-IDA-216	216	UNC Teton	361416	826527	497
34	74	12	3474-12-IDA-217	217	UNC Teton	361713	826475	416
34	74	12	3474-12-IDA-218	218	UNC Teton	361415	826489	395
34	74	12	3474-12-IDA-219	219	UNC Teton	360219	825930	400
34	74	12	3474-12-IDA-22	22	UNC Teton	363210	825626	453
34	74	12	3474-12-IDA-220	220	UNC Teton	359920	825845	392
34	74	12	3474-12-IDA-221	221	UNC Teton	362986	826016	429
34	74	12	3474-12-IDA-222	222	UNC Teton	362584	826224	456
34	74	12	3474-12-IDA-223	223	UNC Teton	364307	824917	398
34	74	12	3474-12-IDA-224	224	UNC Teton	364129	825102	436

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	12	3474-12-IDA-225	225	UNC Teton	364214	825118	463
34	74	12	3474-12-IDA-226	226	UNC Teton	364316	825030	
34	74	12	3474-12-IDA-227	227	UNC Teton	364406	825016	492
34	74	12	3474-12-IDA-228	228	UNC Teton	364414	824916	497
34	74	12	3474-12-IDA-229	229	UNC Teton	362741	826136	438
34	74	12	3474-12-IDA-23	23	UNC Teton	363207	825423	438
34	74	12	3474-12-IDA-230	230	UNC Teton	362839	826122	460
34	74	12	3474-12-IDA-231	231	UNC Teton	362937	826171	457
34	74	12	3474-12-IDA-232	232	UNC Teton	362976	826135	497
34	74	12	3474-12-IDA-233	233	UNC Teton	363465	825822	408
34	74	12	3474-12-IDA-234	234	UNC Teton	363346	825726	454
34	74	12	3474-12-IDA-235	235	UNC Teton	363253	825776	455
34	74	12	3474-12-IDA-236	236	UNC Teton	363094	826101	440
34	74	12	3474-12-IDA-237	237	UNC Teton	362854	826194	453
34	74	12	3474-12-IDA-238	238	UNC Teton	362717	826176	390
34	74	12	3474-12-IDA-239	239	UNC Teton	362580	826335	440
34	74	12	3474-12-IDA-24	24	UNC Teton	362611	825633	451
34	74	12	3474-12-IDA-240	240	UNC Teton	363353	825790	457
34	74	12	3474-12-IDA-241	241	UNC Teton	363493	825689	479
34	74	12	3474-12-IDA-242	242	UNC Teton	362221	826478	480
34	74	12	3474-12-IDA-243	243	UNC Teton	363056	826159	400
34	74	12	3474-12-IDA-244	244	UNC Teton	362415	826360	440
34	74	12	3474-12-IDA-245	245	UNC Teton	362299	826326	457
34	74	12	3474-12-IDA-246	246	UNC Teton	363136	826076	420
34	74	12	3474-12-IDA-247	247	UNC Teton	363472	825913	440
34	74	12	3474-12-IDA-248	248	UNC Teton	364102	825147	435
34	74	12	3474-12-IDA-249	249	UNC Teton	364195	825164	433
34	74	12	3474-12-IDA-25	25	UNC Teton	362605	825429	472
34	74	12	3474-12-IDA-250	250	UNC Teton	364057	825090	435
34	74	12	3474-12-IDA-251	251	UNC Teton	364146	825107	435
34	74	12	3474-12-IDA-252	252	UNC Teton	364244	825128	433
34	74	12	3474-12-IDA-253	253	UNC Teton	364111	825056	431
34	74	12	3474-12-IDA-254	254	UNC Teton	364203	825057	434
34	74	12	3474-12-IDA-255	255	UNC Teton	364409	825075	493
34	74	12	3474-12-IDA-256	256	UNC Teton	364355	825015	438
34	74	12	3474-12-IDA-257	257	UNC Teton	364463	825010	489
34	74	12	3474-12-IDA-258	258	UNC Teton	364406	824962	437
34	74	12	3474-12-IDA-259	259	UNC Teton	364322	824866	435
34	74	12	3474-12-IDA-26	26	UNC Teton	362918	826378	690
34	74	12	3474-12-IDA-260	260	UNC Teton	364366	824922	438
34	74	12	3474-12-IDA-262	262	UNC Teton	364310	824966	435
34	74	12	3474-12-IDA-263	263	UNC Teton	364241	825175	435
34	74	12	3474-12-IDA-264	264	UNC Teton	364151	825156	436
34	74	12	3474-12-IDA-265	265	UNC Teton	364247	825073	434
34	74	12	3474-12-IDA-266	266	UNC Teton	364157	825063	437
34	74	12	3474-12-IDA-267	267	UNC Teton	364048	825183	433
34	74	12	3474-12-IDA-268	268	UNC Teton	364093	825192	436
34	74	12	3474-12-IDA-269	269	UNC Teton	364014	825128	435
34	74	12	3474-12-IDA-26Dup II	26		362909.9	826378.1	
34	74	12	3474-12-IDA-27	27	UNC Teton	362929	827125	697
34	74	12	3474-12-IDA-270	270	UNC Teton	364055	825139	438
34	74	12	3474-12-IDA-271	271	UNC Teton	364415	824827	435
34	74	12	3474-12-IDA-272	272	UNC Teton	364435	824735	436
34	74	12	3474-12-IDA-273	273	UNC Teton	364155	825013	436
34	74	12	3474-12-IDA-274	274	UNC Teton	364250	825023	437
34	74	12	3474-12-IDA-275	275	UNC Teton	364253	824980	437

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	12	3474-12-IDA-276	276	UNC Teton	364265	824870	438
34	74	12	3474-12-IDA-277	277	UNC Teton	364364	824814	437
34	74	12	3474-12-IDA-278	278	UNC Teton	364123	824962	438
34	74	12	3474-12-IDA-279	279	UNC Teton	364140	825205	435
34	74	12	3474-12-IDA-28	28	UNC Teton	361716	827143	689
34	74	12	3474-12-IDA-280	280	UNC Teton	364093	825248	437
34	74	12	3474-12-IDA-281	281	UNC Teton	364048	825228	437
34	74	12	3474-12-IDA-282	282	UNC Teton	364008	825217	438
34	74	12	3474-12-IDA-283	283	UNC Teton	364209	824979	437
34	74	12	3474-12-IDA-284	284	UNC Teton	364165	824969	437
34	74	12	3474-12-IDA-285	285	UNC Teton	364361	824962	416
34	74	12	3474-12-IDA-286	286	UNC Teton	364363	824878	418
34	74	12	3474-12-IDA-287	287	UNC Teton	364221	824868	435
34	74	12	3474-12-IDA-288	288	UNC Teton	364443	824638	377
34	74	12	3474-12-IDA-289	289	UNC Teton	364509	825032	418
34	74	12	3474-12-IDA-29	29	UNC Teton	360504	827146	794
34	74	12	3474-12-IDA-290	290	UNC Teton	364493	825129	418
34	74	12	3474-12-IDA-291	291	UNC Teton	364133	825249	439
34	74	12	3474-12-IDA-292	292	UNC Teton	364123	825296	437
34	74	12	3474-12-IDA-293	293	UNC Teton	364060	825321	439
34	74	12	3474-12-IDA-294	294	UNC Teton	364010	825366	439
34	74	12	3474-12-IDA-295	295	UNC Teton	363880	825378	438
34	74	12	3474-12-IDA-296	296	UNC Teton	363922	825372	438
34	74	12	3474-12-IDA-297	297	UNC Teton	364022	825278	437
34	74	12	3474-12-IDA-298	298	UNC Teton	364061	825278	437
34	74	12	3474-12-IDA-299	299	UNC Teton	364678	824864.5	
34	74	12	3474-12-IDA-3	3	Morrison Nuclear	362148	825642	390
34	74	12	3474-12-IDA-30	30	UNC Teton	360520	826392	736
34	74	12	3474-12-IDA-300	300	UNC Teton	364677.3	824957.1	
34	74	12	3474-12-IDA-301	301	UNC Teton	364676.2	824766	
34	74	12	3474-12-IDA-302	302	UNC Teton	363794	825423	439
34	74	12	3474-12-IDA-303	303	UNC Teton	363699	825475	438
34	74	12	3474-12-IDA-304	304	UNC Teton	363750	825469	438
34	74	12	3474-12-IDA-305	305	UNC Teton	363592	825482	438
34	74	12	3474-12-IDA-306	306	UNC Teton	363544	825484	420
34	74	12	3474-12-IDA-307	307	UNC Teton	363742	825721	438
34	74	12	3474-12-IDA-308	308	UNC Teton	363748	825927	437
34	74	12	3474-12-IDA-309	309	UNC Teton	363644	825565	435
34	74	12	3474-12-IDA-31	31	UNC Teton	361727	826361	404
34	74	12	3474-12-IDA-310	310	UNC Teton	363596	825569	433
34	74	12	3474-12-IDA-311	311	UNC Teton	363549	825915	436
34	74	12	3474-12-IDA-312	312	UNC Teton	363553	825724	440
34	74	12	3474-12-IDA-313	313	UNC Teton	363437	825727	439
34	74	12	3474-12-IDA-314	314	UNC Teton	363435	825678	438
34	74	12	3474-12-IDA-315	315	UNC Teton	363547	825775	435
34	74	12	3474-12-IDA-316	316	UNC Teton	363642	825722	436
34	74	12	3474-12-IDA-317	317	UNC Teton	363550	825677	435
34	74	12	3474-12-IDA-318	318	UNC Teton	363383	825827	438
34	74	12	3474-12-IDA-319	319	UNC Teton	363287	826014	434
34	74	12	3474-12-IDA-32	32	UNC Teton	364115	825823	488
34	74	12	3474-12-IDA-320	320	UNC Teton	363297	825964	439
34	74	12	3474-12-IDA-321	321	UNC Teton	363259	825829	438
34	74	12	3474-12-IDA-322	322	UNC Teton	363158	825827	438
34	74	12	3474-12-IDA-323	323	UNC Teton	363154	825777	438
34	74	12	3474-12-IDA-324	324	UNC Teton	363491	825624	436
34	74	12	3474-12-IDA-325	325	UNC Teton	363261	825629	434

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	12	3474-12-IDA-326	326	UNC Teton	363158	825626	435
34	74	12	3474-12-IDA-327	327	UNC Teton	363198	825568	437
34	74	12	3474-12-IDA-328	328	UNC Teton	363209	825672	435
34	74	12	3474-12-IDA-329	329	UNC Teton	363500	825725	438
34	74	12	3474-12-IDA-33	33	UNC Teton	364117	826010	633
34	74	12	3474-12-IDA-330	330	UNC Teton	363497	825775	439
34	74	12	3474-12-IDA-331	331	UNC Teton	363445	825777	436
34	74	12	3474-12-IDA-332	332	UNC Teton	363387	825726	436
34	74	12	3474-12-IDA-333	333	UNC Teton	363384	825678	436
34	74	12	3474-12-IDA-334	334	UNC Teton	363376	825567	439
34	74	12	3474-12-IDA-335	335	UNC Teton	363369	825509	439
34	74	12	3474-12-IDA-336	336	UNC Teton	363360	825401	439
34	74	12	3474-12-IDA-337	337	UNC Teton	363475	825518	436
34	74	12	3474-12-IDA-338	338	UNC Teton	363430	825372	434
34	74	12	3474-12-IDA-339	339	UNC Teton	363481	825373	439
34	74	12	3474-12-IDA-34	34	UNC Teton	363544	825817	391
34	74	12	3474-12-IDA-340	340	UNC Teton	363730	825152	436
34	74	12	3474-12-IDA-341	341	UNC Teton	363684	825215	432
34	74	12	3474-12-IDA-342	342	UNC Teton	363809	825172	437
34	74	12	3474-12-IDA-343	343	UNC Teton	363582	825417	436
34	74	12	3474-12-IDA-344	344	UNC Teton	363423	825515	438
34	74	12	3474-12-IDA-345	345	UNC Teton	363478	825473	437
34	74	12	3474-12-IDA-346	346	UNC Teton	363380	825364	438
34	74	12	3474-12-IDA-347	347	UNC Teton	362887	826120	438
34	74	12	3474-12-IDA-348	348	UNC Teton	362939	826064	435
34	74	12	3474-12-IDA-349	349	UNC Teton	362989	826065	437
34	74	12	3474-12-IDA-35	35	Morrison Nuclear	363534	825415	483
34	74	12	3474-12-IDA-350	350	UNC Teton	363036	826065	438
34	74	12	3474-12-IDA-351	351	UNC Teton	362892	826016	438
34	74	12	3474-12-IDA-352	352	UNC Teton	363088	826015	438
34	74	12	3474-12-IDA-353	353	UNC Teton	363049	825962	433
34	74	12	3474-12-IDA-354	354	UNC Teton	362995	825964	438
34	74	12	3474-12-IDA-355	355	UNC Teton	362946	825965	439
34	74	12	3474-12-IDA-356	356	UNC Teton	363140	825962	438
34	74	12	3474-12-IDA-357	357	UNC Teton	363241	826067	436
34	74	12	3474-12-IDA-358	358	UNC Teton	363180	825915	435
34	74	12	3474-12-IDA-359	359	UNC Teton	363170	825871	433
34	74	12	3474-12-IDA-36	36	UNC Teton	362604	825224	494
34	74	12	3474-12-IDA-360	360	UNC Teton	363113	825831	438
34	74	12	3474-12-IDA-361	361	UNC Teton	363312	825904	438
34	74	12	3474-12-IDA-362	362	UNC Teton	363094	825963	433
34	74	12	3474-12-IDA-363	363	UNC Teton	363134	825913	438
34	74	12	3474-12-IDA-364	364	UNC Teton	362842	826070	439
34	74	12	3474-12-IDA-365	365	UNC Teton	362889	826071	437
34	74	12	3474-12-IDA-366	366	UNC Teton	363121	825870	436
34	74	12	3474-12-IDA-367	367	UNC Teton	363082	825913	437
34	74	12	3474-12-IDA-368	368	UNC Teton	363083	826066	436
34	74	12	3474-12-IDA-369	369	UNC Teton	363042	826115	396
34	74	12	3474-12-IDA-37	37	UNC Teton	363189	825518	494
34	74	12	3474-12-IDA-370	370	UNC Teton	359543	823333	797
34	74	12	3474-12-IDA-372	372	UNC Teton	363105	825779	438
34	74	12	3474-12-IDA-373	373	UNC Teton	363470	825866	438
34	74	12	3474-12-IDA-374	374	UNC Teton	362894	826171	398
34	74	12	3474-12-IDA-375	375	UNC Teton	362987	826167	398
34	74	12	3474-12-IDA-376	376	UNC Teton	363003	825781	439
34	74	12	3474-12-IDA-377	377	UNC Teton	362912	825764	437

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	12	3474-12-IDA-378	378	UNC Teton	359605	824254	596
34	74	12	3474-12-IDA-379	379	UNC Teton	359660	825157	559
34	74	12	3474-12-IDA-38	38	UNC Teton	362206	825534	494
34	74	12	3474-12-IDA-380	380	UNC Teton	359677	826058	531
34	74	12	3474-12-IDA-383	383	UNC Teton	363338	823328	838
34	74	12	3474-12-IDA-39	39	UNC Teton	362212	825725	492
34	74	12	3474-12-IDA-390	390	UNC Teton	364649.6	824591	
34	74	12	3474-12-IDA-391	391	UNC Teton	364630.3	826051.5	
34	74	12	3474-12-IDA-392	392	UNC Teton	364684.7	827286.5	
34	74	12	3474-12-IDA-393	393	UNC Teton	364594	828411	1056
34	74	12	3474-12-IDA-4	4	Morrison Nuclear	362528	825652	483
34	74	12	3474-12-IDA-40	40	UNC Teton	362613	825726	494
34	74	12	3474-12-IDA-400	400	UNC Teton	364621	827874	476
34	74	12	3474-12-IDA-401	401	UNC Teton	364653	827575.5	
34	74	12	3474-12-IDA-402	402	UNC Teton	364652.4	827669.1	
34	74	12	3474-12-IDA-403	403	UNC Teton	364650.7	827479.7	
34	74	12	3474-12-IDA-404	404	UNC Teton	364470	827564	468
34	74	12	3474-12-IDA-405	405	UNC Teton	364461	827510	414
34	74	12	3474-12-IDA-406	406	UNC Teton	364572	827562	470
34	74	12	3474-12-IDA-407	407	UNC Teton	364651.3	827620.6	
34	74	12	3474-12-IDA-408	408	UNC Teton	364653.5	827720	
34	74	12	3474-12-IDA-409	409	UNC Teton	364551	827455	470
34	74	12	3474-12-IDA-41	41	UNC Teton	361705	827825	689
34	74	12	3474-12-IDA-410	410	UNC Teton	364633.8	827383.9	
34	74	12	3474-12-IDA-411	411	UNC Teton	364277	827569	475
34	74	12	3474-12-IDA-412	412	UNC Teton	364652	827529.3	
34	74	12	3474-12-IDA-413	413	UNC Teton	364642.6	827430.9	
34	74	12	3474-12-IDA-414	414	UNC Teton	364559	827503	432
34	74	12	3474-12-IDA-415	415	UNC Teton	364295	827767	475
34	74	12	3474-12-IDA-416	416	UNC Teton	364111	827753	474
34	74	12	3474-12-IDA-417	417	UNC Teton	364373	827649	475
34	74	12	3474-12-IDA-418	418	UNC Teton	362922	828390	474
34	74	12	3474-12-IDA-419	419	UNC Teton	364376	827566	435
34	74	12	3474-12-IDA-42	42	UNC Teton	362933	827813	792
34	74	12	3474-12-IDA-420	420	UNC Teton	364507	827504	435
34	74	12	3474-12-IDA-421	421	UNC Teton	364432	827602	436
34	74	12	3474-12-IDA-422	422	UNC Teton	364528	827678	430
34	74	12	3474-12-IDA-423	423	UNC Teton	364421	827556	430
34	74	12	3474-12-IDA-424	424	UNC Teton	364311	827943	455
34	74	12	3474-12-IDA-425	425	UNC Teton	364459	827660	436
34	74	12	3474-12-IDA-426	426	UNC Teton	364481	827602	435
34	74	12	3474-12-IDA-427	427	UNC Teton	364433	827759	435
34	74	12	3474-12-IDA-428	428	UNC Teton	364299	827865	473
34	74	12	3474-12-IDA-429	429	UNC Teton	364589	827702	435
34	74	12	3474-12-IDA-43	43	UNC Teton	363542	826017	532
34	74	12	3474-12-IDA-430	430	UNC Teton	364381	827759	455
34	74	12	3474-12-IDA-431	431	UNC Teton	364220	827934	457
34	74	12	3474-12-IDA-432	432	UNC Teton	364587	827753	431
34	74	12	3474-12-IDA-433	433	UNC Teton	361779	828437	477
34	74	12	3474-12-IDA-434	434	UNC Teton	360280	828408	439
34	74	12	3474-12-IDA-435	435	UNC Teton	360070	827438	377
34	74	12	3474-12-IDA-436	436	UNC Teton	361760	828208	437
34	74	12	3474-12-IDA-437	437	UNC Teton	360389	827895	398
34	74	12	3474-12-IDA-438	438	UNC Teton	360385	827737	418
34	74	12	3474-12-IDA-439	439	UNC Teton	361205	827957	437
34	74	12	3474-12-IDA-44	44	UNC Teton	363442	825626	491

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	12	3474-12-IDA-440	440	UNC Teton	360406	827608	417
34	74	12	3474-12-IDA-441	441	UNC Teton	361192	828188	438
34	74	12	3474-12-IDA-442	442	UNC Teton	361776	828321	438
34	74	12	3474-12-IDA-443	443	UNC Teton	359577	823797	278
34	74	12	3474-12-IDA-444	444	UNC Teton	360120	825324	320
34	74	12	3474-12-IDA-445	445	UNC Teton	360931	824860	360
34	74	12	3474-12-IDA-446	446	UNC Teton	359561	823563	259
34	74	12	3474-12-IDA-447	447	UNC Teton	359554	823447	260
34	74	12	3474-12-IDA-448	448	UNC Teton	361389	824836	340
34	74	12	3474-12-IDA-449	449	UNC Teton	360935	825326	340
34	74	12	3474-12-IDA-45	45	UNC Teton	363328	825631	409
34	74	12	3474-12-IDA-450	450	UNC Teton	360923	823965	300
34	74	12	3474-12-IDA-451	451	UNC Teton	361608	824824	340
34	74	12	3474-12-IDA-452	452	UNC Teton	360940	825076	319
34	74	12	3474-12-IDA-453	453	UNC Teton	360937	824372	300
34	74	12	3474-12-IDA-454	454	UNC Teton	361171	824844	319
34	74	12	3474-12-IDA-455	455	UNC Teton	360136	823771	300
34	74	12	3474-12-IDA-456	456	UNC Teton	360941	824617	320
34	74	12	3474-12-IDA-457	457	UNC Teton	361492	824835	340
34	74	12	3474-12-IDA-458	458	UNC Teton	361300	824844	320
34	74	12	3474-12-IDA-459	459	UNC Teton	360939	824703	320
34	74	12	3474-12-IDA-46	46	UNC Teton	363311	825472	489
34	74	12	3474-12-IDA-460	460	UNC Teton	360938	824751	309
34	74	12	3474-12-IDA-461	461	UNC Teton	360842	824701	338
34	74	12	3474-12-IDA-462	462	UNC Teton	361027	824703	338
34	74	12	3474-12-IDA-463	463	UNC Teton	361308	825634	350.6
34	74	12	3474-12-IDA-464	464	UNC Teton	360751	824670	299
34	74	12	3474-12-IDA-465	465	UNC Teton	359844	823779	258
34	74	12	3474-12-IDA-466	466	UNC Teton	359983	825416	336
34	74	12	3474-12-IDA-467	467	UNC Teton	361287	825111	308
34	74	12	3474-12-IDA-468	468	UNC Teton	360067	824353	266
34	74	12	3474-12-IDA-469	469	UNC Teton	360744	824785	298
34	74	12	3474-12-IDA-47	47	UNC Teton	362198	826026	496
34	74	12	3474-12-IDA-470	470	UNC Teton	359711	823790	246
34	74	12	3474-12-IDA-471	471	UNC Teton	361265	825375	348
34	74	12	3474-12-IDA-472	472	UNC Teton	360894	824611	317
34	74	12	3474-12-IDA-473	473	UNC Teton	359781	823783	258
34	74	12	3474-12-IDA-474	474	UNC Teton	360198	824353	277
34	74	12	3474-12-IDA-475	475	UNC Teton	360839	824608	307
34	74	12	3474-12-IDA-476	476	UNC Teton	360837	824512	308
34	74	12	3474-12-IDA-477	477	UNC Teton	359564	823509	260.6
34	74	12	3474-12-IDA-478	478	UNC Teton	359811	824331	280.6
34	74	12	3474-12-IDA-479	479	UNC Teton	360035	824336	280.6
34	74	12	3474-12-IDA-48	48	UNC Teton	363210	825227	492
34	74	12	3474-12-IDA-481	481	UNC Teton	360946	825188	330.6
34	74	12	3474-12-IDA-482	482	UNC Teton	359861	825297	340.6
34	74	12	3474-12-IDA-484	484	UNC Teton	360539	825308	330.6
34	74	12	3474-12-IDA-485	485	UNC Teton	360940	825259	320.6
34	74	12	3474-12-IDA-486	486	UNC Teton	361306	825526	330.6
34	74	12	3474-12-IDA-487	487	UNC Teton	361515	825431	340.6
34	74	12	3474-12-IDA-488	488	UNC Teton	359814	824019	270.6
34	74	12	3474-12-IDA-489	489	UNC Teton	359916	824024	310
34	74	12	3474-12-IDA-49	49	UNC Teton	363433	825423	489
34	74	12	3474-12-IDA-490	490	UNC Teton	360020	824022	310
34	74	12	3474-12-IDA-491	491	UNC Teton	360306	824534	311
34	74	12	3474-12-IDA-492	492	UNC Teton	360296	824625	310

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	12	3474-12-IDA-493	493	UNC Teton	360310	824427	310
34	74	12	3474-12-IDA-494	494	UNC Teton	361132	824753	320
34	74	12	3474-12-IDA-495	495	UNC Teton	361321	824737	312
34	74	12	3474-12-IDA-496	496	UNC Teton	360625	824628	314
34	74	12	3474-12-IDA-497	497	UNC Teton	361143	824649	310
34	74	12	3474-12-IDA-498	498	UNC Teton	361408	824746	312
34	74	12	3474-12-IDA-499	499	UNC Teton	359876	824023	272
34	74	12	3474-12-IDA-5	5	Morrison Nuclear	363099	825557	440
34	74	12	3474-12-IDA-50	50	UNC Teton	363312	825431	488
34	74	12	3474-12-IDA-500	500	UNC Teton	360621	824533	310
34	74	12	3474-12-IDA-501	501	UNC Teton	360632	824727	310
34	74	12	3474-12-IDA-502	502	UNC Teton	360631	824437	310
34	74	12	3474-12-IDA-503	503	UNC Teton	360746	824592	310
34	74	12	3474-12-IDA-504	504	UNC Teton	360509	824528	310
34	74	12	3474-12-IDA-505	505	UNC Teton	360502	824626	310
34	74	12	3474-12-IDA-506	506	UNC Teton	360500	824425	310
34	74	12	3474-12-IDA-507	507	UNC Teton	360199	824437	310
34	74	12	3474-12-IDA-508	508	UNC Teton	360198	824532	310
34	74	12	3474-12-IDA-509	509	UNC Teton	360203	824633	310
34	74	12	3474-12-IDA-51	51	UNC Teton	362600	825322	497
34	74	12	3474-12-IDA-510	510	UNC Teton	361318	824625	310
34	74	12	3474-12-IDA-511	511	UNC Teton	361414	824635	310
34	74	12	3474-12-IDA-512	512	UNC Teton	359891	824170	310
34	74	12	3474-12-IDA-513	513	UNC Teton	359669	823566	310
34	74	12	3474-12-IDA-514	514	UNC Teton	361439	825143	360
34	74	12	3474-12-IDA-515	515	UNC Teton	361551	825146	360
34	74	12	3474-12-IDA-516	516	UNC Teton	361698	825147	360
34	74	12	3474-12-IDA-517	517	UNC Teton	361439	825433	360
34	74	12	3474-12-IDA-518	518	UNC Teton	361431	825527	360
34	74	12	3474-12-IDA-519	519	UNC Teton	361188	825515	360
34	74	12	3474-12-IDA-52	52	UNC Teton	363531	825520	494
34	74	12	3474-12-IDA-520	520	UNC Teton	361033	825515	360
34	74	12	3474-12-IDA-521	521	UNC Teton	360949	825406	360
34	74	12	3474-12-IDA-522	522	UNC Teton	360852	825403	360
34	74	12	3474-12-IDA-523	523	UNC Teton	361514	824732	320
34	74	12	3474-12-IDA-524	524	UNC Teton	361616	824728	320
34	74	12	3474-12-IDA-525	525	UNC Teton	361514	824929	320
34	74	12	3474-12-IDA-526	526	UNC Teton	361614	824926	320
34	74	12	3474-12-IDA-527	527	UNC Teton	361042	824754	320
34	74	12	3474-12-IDA-528	528	UNC Teton	361041	824798	320
34	74	12	3474-12-IDA-529	529	UNC Teton	361043	825317	360
34	74	12	3474-12-IDA-53	53	UNC Teton	363845	825427	491
34	74	12	3474-12-IDA-54	54	UNC Teton	363837	825220	490
34	74	12	3474-12-IDA-55	55	UNC Teton	363521	825204	406
34	74	12	3474-12-IDA-56	56	UNC Teton	363209	825826	500
34	74	12	3474-12-IDA-57	57	UNC Teton	363238	826018	511
34	74	12	3474-12-IDA-58	58	UNC Teton	363841	825824	509
34	74	12	3474-12-IDA-59	59	UNC Teton	362941	826016	513
34	74	12	3474-12-IDA-6	6	Morrison Nuclear	361952	825839	417
34	74	12	3474-12-IDA-60	60	UNC Teton	362654	826231	511
34	74	12	3474-12-IDA-61	61	UNC Teton	362215	826437	492
34	74	12	3474-12-IDA-62	62	UNC Teton	361717	826635	491
34	74	12	3474-12-IDA-63	63	UNC Teton	362310	825330	487
34	74	12	3474-12-IDA-64	64	UNC Teton	363222	825469	490
34	74	12	3474-12-IDA-65	65	UNC Teton	362898	825432	488
34	74	12	3474-12-IDA-66	66	UNC Teton	363438	825481	487

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	12	3474-12-IDA-67	67	UNC Teton	363483	825424	409
34	74	12	3474-12-IDA-68	68	UNC Teton	363525	825363	490
34	74	12	3474-12-IDA-69	69	UNC Teton	363817	825028	487
34	74	12	3474-12-IDA-7	7	Morrison Nuclear	361420	825776	397
34	74	12	3474-12-IDA-70	70	UNC Teton	363982	825226	486
34	74	12	3474-12-IDA-70-1	70-1	Cordero	363213	824059	598
34	74	12	3474-12-IDA-70-10	70-10	Cordero	362022	825914	401
34	74	12	3474-12-IDA-70-11	70-11	Cordero	361655	825633	400
34	74	12	3474-12-IDA-70-12	70-12	Cordero	361748	825399	397
34	74	12	3474-12-IDA-70-13	70-13	Cordero	361747	825034	400
34	74	12	3474-12-IDA-70-14	70-14	Cordero	361845	824809	400
34	74	12	3474-12-IDA-70-15	70-15	Cordero	361571	825770	396
34	74	12	3474-12-IDA-70-16	70-16	Cordero	361428	825869	397
34	74	12	3474-12-IDA-70-17	70-17	Cordero	362150	825588	400
34	74	12	3474-12-IDA-70-18	70-18	Cordero	362158	825462	400
34	74	12	3474-12-IDA-70-2	70-2	Cordero	362125	825799	455
34	74	12	3474-12-IDA-70-3	70-3	Cordero	362147	825697	461
34	74	12	3474-12-IDA-70-4	70-4	Cordero	363833	827662	455
34	74	12	3474-12-IDA-70-5	70-5	Cordero	363841	827462	456
34	74	12	3474-12-IDA-70-6	70-6	Cordero	362224	825931	396
34	74	12	3474-12-IDA-70-7	70-7	Cordero	362118	825985	395
34	74	12	3474-12-IDA-70-8	70-8	Cordero	363804	826946	401
34	74	12	3474-12-IDA-70-9	70-9	Cordero	363792	828092	416
34	74	12	3474-12-IDA-71	71	UNC Teton	363618	825311	488
34	74	12	3474-12-IDA-72	72	UNC Teton	363734	825327	491
34	74	12	3474-12-IDA-72-2	72-2	Pioneer Nuclear	360786	824066	360
34	74	12	3474-12-IDA-72-3	72-3	Pioneer Nuclear	359825	824991	340
34	74	12	3474-12-IDA-73	73	UNC Teton	363631	825421	488
34	74	12	3474-12-IDA-74	74	UNC Teton	363544	825572	497
34	74	12	3474-12-IDA-75	75	UNC Teton	363645	825525	485
34	74	12	3474-12-IDA-76	76	UNC Teton	363367	825452	492
34	74	12	3474-12-IDA-77	77	UNC Teton	363211	825710	491
34	74	12	3474-12-IDA-78	78	UNC Teton	363333	825673	486
34	74	12	3474-12-IDA-79	79	UNC Teton	363372	825645	487
34	74	12	3474-12-IDA-8	8	Morrison Nuclear	360978	825663	400
34	74	12	3474-12-IDA-80	80	UNC Teton	363415	825551	495
34	74	12	3474-12-IDA-81	81	UNC Teton	363512	825122	473
34	74	12	3474-12-IDA-82	82	UNC Teton	363264	826213	490
34	74	12	3474-12-IDA-83	83	UNC Teton	363343	826009	490
34	74	12	3474-12-IDA-84	84	UNC Teton	363219	825915	493
34	74	12	3474-12-IDA-85	85	UNC Teton	362945	826134	492
34	74	12	3474-12-IDA-86	86	UNC Teton	362839	826021	490
34	74	12	3474-12-IDA-87	87	UNC Teton	362960	825913	490
34	74	12	3474-12-IDA-88	88	UNC Teton	363036	826020	491
34	74	12	3474-12-IDA-89	89	UNC Teton	363150	826024	494
34	74	12	3474-12-IDA-9	9	Morrison Nuclear	360541	825459	399
34	74	12	3474-12-IDA-90	90	UNC Teton	361712	825742	497
34	74	12	3474-12-IDA-91	91	UNC Teton	361117	825837	495
34	74	12	3474-12-IDA-92	92	UNC Teton	360819	825836	494
34	74	12	3474-12-IDA-93	93	UNC Teton	360514	826039	498
34	74	12	3474-12-IDA-94	94	UNC Teton	360505	826842	495
34	74	12	3474-12-IDA-95	95	UNC Teton	362641	826131	490
34	74	12	3474-12-IDA-96	96	UNC Teton	362449	826236	499
34	74	12	3474-12-IDA-97	97	UNC Teton	362217	826526	498
34	74	12	3474-12-IDA-98	98	UNC Teton	362894	825246	497
34	74	12	3474-12-IDA-99	99	UNC Teton	362604	825028	496

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	12	3474-12-M16-1	M16-1	Morrison Nuclear	363837	827870	455
34	74	12	3474-12-M5-1	M5-1	Morrison Nuclear	362116.5	825925.1	
34	74	12	3474-12-M-6	M-6	Uranium One	363944.3	825255.1	382
34	74	12	3474-12-M9-1	M9-1	Morrison Nuclear	362124	825927	635
34	74	13	3474-13-0800-1800	0800-1800	Power Resources INC.	361148	818747	759
34	74	13	3474-13-0800-2000	0800-2000	Power Resources INC.	361346	818748	762
34	74	13	3474-13-1050-1900	1050-1900	Power Resources INC.	361245	818977	757
34	74	13	3474-13-10KM	10KM	Kerr McGee	360741	818237	720
34	74	13	3474-13-113	113	UNC Teton	360502	819490	778
34	74	13	3474-13-1150-1450	1150-1450	Power Resources INC.	360820	819905	784
34	74	13	3474-13-11KM	11KM	Kerr McGee	360937	818215	722
34	74	13	3474-13-12KM	12KM	Kerr McGee	360508	818351	720
34	74	13	3474-13-1300-2000	1300-2000	Power Resources INC.	361371	819254	757
34	74	13	3474-13-1300-2200	1300-2200	Power Resources INC.	361569	819254	762
34	74	13	3474-13-13KM	13KM	Kerr McGee	360268	818446	720
34	74	13	3474-13-14KM	14KM	Kerr McGee	360100	819180	799
34	74	13	3474-13-15KM	15KM	Kerr McGee	360300	819180	798
34	74	13	3474-13-16KM	16KM	Kerr McGee	360500	819180	800
34	74	13	3474-13-17KM	17KM	Kerr McGee	360700	819180	800
34	74	13	3474-13-18CEGB	18CEGB	Everest Minerals	360359	818774	780
34	74	13	3474-13-19CEGB	19CEGB	Everest Minerals	360337	818981	780
34	74	13	3474-13-1KM	1KM	Kerr McGee	361743	819390	920
34	74	13	3474-13-20CEGB	20CEGB	Everest Minerals	360531	818982	780
34	74	13	3474-13-21CEGB	21CEGB	Everest Minerals	360717	818989	800
34	74	13	3474-13-22CEGB	22CEGB	Everest Minerals	360913	819179	776
34	74	13	3474-13-23CEGB	23CEGB	Everest Minerals	364452	820749	716
34	74	13	3474-13-24CEGB	24CEGB	Everest Minerals	364125	821098	698
34	74	13	3474-13-25CEGB	25CEGB	Everest Minerals	364256	820741	
34	74	13	3474-13-26CEGB	26CEGB	Everest Minerals	359671	818404	749
34	74	13	3474-13-27CEGB	27CEGB	Everest Minerals	359654	818602	750
34	74	13	3474-13-28CEGB	28CEGB	Everest Minerals	359665	818803	750
34	74	13	3474-13-29CEGB	29CEGB	Everest Minerals	359664	818703	740
34	74	13	3474-13-2KM	2KM	Kerr McGee	361180	818143	1006
34	74	13	3474-13-30CEGB	30CEGB	Everest Minerals	360353	818672	780
34	74	13	3474-13-31CEGB	31CEGB	Everest Minerals	360432	818977	780
34	74	13	3474-13-32CEGB	32CEGB	Everest Minerals	360818	819003	800
34	74	13	3474-13-33CEGB	33CEGB	Everest Minerals	360424	819172	780
34	74	13	3474-13-34CEGB	34CEGB	Everest Minerals	360622	819175	780
34	74	13	3474-13-35CEGB	35CEGB	Everest Minerals	360823	819175	780
34	74	13	3474-13-36CEGB	36CEGB	Everest Minerals	360169	818442	702
34	74	13	3474-13-37CEGB	37CEGB	Everest Minerals	360755	818647	720
34	74	13	3474-13-38CEGB	38CEGB	Everest Minerals	361147	818647	720
34	74	13	3474-13-39 DUP ID	39 DUP ID	Kerr McGee	359495	821460	780
34	74	13	3474-13-39CEGB	39CEGB	Everest Minerals	361548	818657	780
34	74	13	3474-13-3KM	3KM	Kerr McGee	361142	818343	700
34	74	13	3474-13-40CEGB	40CEGB	Everest Minerals	361557	818953	800
34	74	13	3474-13-41CEGB	41CEGB	Everest Minerals	361522	818356	744
34	74	13	3474-13-42CEGB	42CEGB	Everest Minerals	360185	818186	700
34	74	13	3474-13-43CEGB	43CEGB	Everest Minerals	360574	819219	740
34	74	13	3474-13-44CEGB	44CEGB	Everest Minerals	360525	819076	780
34	74	13	3474-13-45CEGB	45CEGB	Everest Minerals	360921	819080	800
34	74	13	3474-13-466	466	UNC Teton	359929.7	819897.1	
34	74	13	3474-13-46CEGB	46CEGB	Everest Minerals	361561	819055	780
34	74	13	3474-13-473	473	UNC Teton	360344	819435.4	
34	74	13	3474-13-47CEGB	47CEGB	Everest Minerals	360767	818995	800
34	74	13	3474-13-48CEGB	48CEGB	Everest Minerals	360823	818897	780

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	13	3474-13-49 DUP ID	49DUP ID		363803	821199	780
34	74	13	3474-13-49CEGB	49CEGB	Everest Minerals	361348	818649	780
34	74	13	3474-13-4KM	4KM	Kerr McGee	361280	818043	760
34	74	13	3474-13-50CEGB	50CEGB	Everest Minerals	361527	818497	785
34	74	13	3474-13-51CEGB	51CEGB	Everest Minerals	360471	818219	1500
34	74	13	3474-13-52CEGB	52CEGB	Everest Minerals	360631	819075	780
34	74	13	3474-13-53CEGB	53CEGB	Everest Minerals	360820	818952	800
34	74	13	3474-13-54CEGB	54CEGB	Everest Minerals	361248	818647	780
34	74	13	3474-13-55CEGB	55CEGB	Everest Minerals	360077	819634	800
34	74	13	3474-13-56CEGB	56CEGB	Everest Minerals	360560	818659	780
34	74	13	3474-13-5KM	5KM	Kerr McGee	360748	818346	999
34	74	13	3474-13-6KM	6KM	Kerr McGee	361728	818326	1000
34	74	13	3474-13-7KM	7KM	Kerr McGee	360848	818453	820
34	74	13	3474-13-8KM	8KM	Kerr McGee	360753	818452	820
34	74	13	3474-13-9KM	9KM	Kerr McGee	360595	818040	1020
34	74	13	3474-13-IDA371	IDA371	UNC Teton	359538	822390	796
34	74	13	3474-13-IDA382	IDA382	UNC Teton	364051	820733	995
34	74	13	3474-13-IDA384	IDA384	UNC Teton	362193	821843	736
34	74	13	3474-13-IDA386	IDA386	UNC Teton	362930	820921	797
34	74	13	3474-13-IDA387	IDA387	UNC Teton	364134	820991	575
34	74	13	3474-13-IDA388	IDA388	UNC Teton	361932	820857	791
34	74	13	3474-13-IDA394	IDA394	UNC Teton	363426	820837	796
34	74	13	3474-13-IDA395	IDA395	UNC Teton	363725	820761	678
34	74	13	3474-13-IDA396	IDA396	UNC Teton	364398	822243	817
34	74	13	3474-13-IDA397	IDA397	UNC Teton	364134	820991	718
34	74	13	3474-13-IDA398	IDA398	UNC Teton	363960	820750	696
34	74	13	3474-13-IDA399	IDA399	UNC Teton	364103	820892	698
34	74	13	3474-13-IDA530	IDA530	UNC Teton	364272	820954	738
34	74	13	3474-13-L100	L100	UNC Teton	360004	820526	775
34	74	13	3474-13-L101	L101	UNC Teton	360604	819507	773
34	74	13	3474-13-L102	L102	UNC Teton	360665	819866	772
34	74	13	3474-13-L103	L103	UNC Teton	360554	820072	795
34	74	13	3474-13-L104	L104	UNC Teton	360743	820280	796
34	74	13	3474-13-L105	L105	UNC Teton	361067	819870	791
34	74	13	3474-13-L108	L108	UNC Teton	360492	819900	776
34	74	13	3474-13-L109	L109	UNC Teton	361094	819577	797
34	74	13	3474-13-L11	L11	UNC Teton	362239	819636	998
34	74	13	3474-13-L110	L110	UNC Teton	360557	820176	798
34	74	13	3474-13-L116	L116	UNC Teton	360535	820266	796
34	74	13	3474-13-L118	L118	UNC Teton	360643	820281	798
34	74	13	3474-13-L119	L119	UNC Teton	360516	820365	794
34	74	13	3474-13-L120	L120	UNC Teton	360483	820547	795
34	74	13	3474-13-L121	L121	UNC Teton	360308	820329	796
34	74	13	3474-13-L122	L122	UNC Teton	360494	820457	798
34	74	13	3474-13-L123	L123	UNC Teton	360412	820346	797
34	74	13	3474-13-L124	L124	UNC Teton	359463	820624	736
34	74	13	3474-13-L125	L125	UNC Teton	359479	821087	750
34	74	13	3474-13-L126	L126	UNC Teton	359742	820648	756
34	74	13	3474-13-L127	L127	UNC Teton	360436	821156	776
34	74	13	3474-13-L128	L128	UNC Teton	359947	820642	772
34	74	13	3474-13-L129	L129	UNC Teton	360815	820631	837
34	74	13	3474-13-L130	L130	UNC Teton	360617	820654	817
34	74	13	3474-13-L131	L131	UNC Teton	360705	820642	816
34	74	13	3474-13-L132	L132	UNC Teton	360634	820852	815
34	74	13	3474-13-L133	L133	UNC Teton	360616	820559	783
34	74	13	3474-13-L134	L134	UNC Teton	360718	820565	797

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	13	3474-13-L135	L135	UNC Teton	360836	820270	777
34	74	13	3474-13-L136	L136	UNC Teton	362155	818904	678
34	74	13	3474-13-L137	L137	UNC Teton	360660	820070	779
34	74	13	3474-13-L138	L138	UNC Teton	360688	820743	814
34	74	13	3474-13-L139	L139	UNC Teton	361379	820783	797
34	74	13	3474-13-L140	L140	UNC Teton	362177	819016	795
34	74	13	3474-13-L141	L141	UNC Teton	360720	819410	798
34	74	13	3474-13-L142	L142	UNC Teton	361123	820640	814
34	74	13	3474-13-L143	L143	UNC Teton	360909	819861	797
34	74	13	3474-13-L16	L16	UNC Teton	359447	819991	696
34	74	13	3474-13-L19	L19	UNC Teton	359451	819792	796
34	74	13	3474-13-L24	L24	UNC Teton	359457	819890	756
34	74	13	3474-13-L25	L25	UNC Teton	359446	819701	755
34	74	13	3474-13-L355	L355	UNC Teton	359634	819374	759
34	74	13	3474-13-L356	L356	UNC Teton	359645	819673	758
34	74	13	3474-13-L357	L357	UNC Teton	359652	819867	761
34	74	13	3474-13-L358	L358	UNC Teton	359841	819667	760
34	74	13	3474-13-L36	L36	UNC Teton	0	0	
34	74	13	3474-13-L364	L364	UNC Teton	359825	819872	760
34	74	13	3474-13-L365	L365	UNC Teton	360103	820059	779
34	74	13	3474-13-L366	L366	UNC Teton	360117	819765	779
34	74	13	3474-13-L403	L403	UNC Teton	359633	819576	760
34	74	13	3474-13-L404	L404	UNC Teton	359640	819774	760
34	74	13	3474-13-L412	L412	UNC Teton	359827	819782	752
34	74	13	3474-13-L414	L414	UNC Teton	360684	819612	780
34	74	13	3474-13-L415	L415	UNC Teton	360494	819599	778
34	74	13	3474-13-L416	L416	UNC Teton	360811	819413	780
34	74	13	3474-13-L417	L417	UNC Teton	360435	819402	780
34	74	13	3474-13-L418	L418	UNC Teton	360667	819736	761
34	74	13	3474-13-L419	L419	UNC Teton	360126	819588	780
34	74	13	3474-13-L420	L420	UNC Teton	360098	820164	700
34	74	13	3474-13-L421	L421	UNC Teton	362177	818073	900
34	74	13	3474-13-L422	L422	UNC Teton	360394	819596	762
34	74	13	3474-13-L423	L423	UNC Teton	360333	819399	776
34	74	13	3474-13-L424	L424	UNC Teton	360780	819568	774
34	74	13	3474-13-L425	L425	UNC Teton	360764	819856	777
34	74	13	3474-13-L426	L426	UNC Teton	360751	820061	777
34	74	13	3474-13-L427	L427	UNC Teton	360468	820096	797
34	74	13	3474-13-L428	L428	UNC Teton	363780	818070	900
34	74	13	3474-13-L429	L429	UNC Teton	360113	819851	780
34	74	13	3474-13-L430	L430	UNC Teton	359926	820061	752
34	74	13	3474-13-L431	L431	UNC Teton	360300	820422	778
34	74	13	3474-13-L441	L441	UNC Teton	360095	820259	778
34	74	13	3474-13-L442	L442	UNC Teton	359914	820149	760
34	74	13	3474-13-L443	L443	UNC Teton	360231	819395	780
34	74	13	3474-13-L444	L444	UNC Teton	360842	820051	798
34	74	13	3474-13-L445	L445	UNC Teton	360369	820109	780
34	74	13	3474-13-L446	L446	UNC Teton	360495	819703	768
34	74	13	3474-13-L447	L447	UNC Teton	360317	820244	773
34	74	13	3474-13-L448	L448	UNC Teton	360627	820458	800
34	74	13	3474-13-L449	L449	UNC Teton	359906	820243	849
34	74	13	3474-13-L450	L450	UNC Teton	360518	819398	769
34	74	13	3474-13-L451	L451	UNC Teton	360311	819737	770
34	74	13	3474-13-L452	L452	UNC Teton	360712	820455	791
34	74	13	3474-13-L453	L453	UNC Teton	360143	819395	751
34	74	13	3474-13-L454	L454	UNC Teton	359804	820136	751

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	13	3474-13-L455	L455	UNC Teton	359910	820346	751
34	74	13	3474-13-L456	L456	UNC Teton	360759	819959	772
34	74	13	3474-13-L457	L457	UNC Teton	360746	820170	789
34	74	13	3474-13-L458	L458	UNC Teton	360728	820367	790
34	74	13	3474-13-L459	L459	UNC Teton	360400	819721	769
34	74	13	3474-13-L460	L460	UNC Teton	359911	819861	750
34	74	13	3474-13-L639	L639	UNC Teton	360290	819592	757
34	74	13	3474-13-L644	L644	UNC Teton	360653	820175	799
34	74	13	3474-13-L645	L645	UNC Teton	360634	820360	800
34	74	13	3474-13-L646	L646	UNC Teton	360341	819495	779
34	74	13	3474-13-L647	L647	UNC Teton	360706	819512	777
34	74	13	3474-13-L648	L648	UNC Teton	360910	819419	780
34	74	13	3474-13-L649	L649	UNC Teton	360055	819393	759
34	74	13	3474-13-L650	L650	UNC Teton	363518	818877	716
34	74	13	3474-13-L651	L651	UNC Teton	362980	819270	600
34	74	13	3474-13-L652	L652	UNC Teton	362128	819505	619
34	74	13	3474-13-L653	L653	UNC Teton	362570	819364	599
34	74	13	3474-13-L654	L654	UNC Teton	360479	819985	780
34	74	13	3474-13-L655	L655	UNC Teton	359546	819794	757
34	74	13	3474-13-L656	L656	UNC Teton	359526	819689	757
34	74	13	3474-13-L657	L657	UNC Teton	360013	819850	759
34	74	13	3474-13-L658	L658	UNC Teton	360419	819491	774
34	74	13	3474-13-L659	L659	UNC Teton	359999	820246	720
34	74	13	3474-13-L66	L66	UNC Teton	359438	819469	755
34	74	13	3474-13-L660	L660	UNC Teton	360425	820256	779
34	74	13	3474-13-L661	L661	UNC Teton	360442	820172	780
34	74	13	3474-13-L662	L662	UNC Teton	359897	820433	757
34	74	13	3474-13-L663	L663	UNC Teton	359735	819782	758
34	74	13	3474-13-L664	L664	UNC Teton	359914	819775	760
34	74	13	3474-13-L665	L665	UNC Teton	360656	819972	777
34	74	13	3474-13-L666	L666	UNC Teton	360339	820180	778
34	74	13	3474-13-L667	L667	UNC Teton	360218	819958	778
34	74	13	3474-13-L668	L668	UNC Teton	360257	820090	778
34	74	13	3474-13-L669	L669	UNC Teton	360588	819716	775
34	74	13	3474-13-L67	L67	UNC Teton	360560	819975	796
34	74	13	3474-13-L670	L670	UNC Teton	359739	819584	757
34	74	13	3474-13-L671	L671	UNC Teton	360244	819505	759
34	74	13	3474-13-L672	L672	UNC Teton	362353	819436	597
34	74	13	3474-13-L68	L68	UNC Teton	362122	818669	796
34	74	13	3474-13-L69	L69	UNC Teton	362380	818030	498
34	74	13	3474-13-L70	L70	UNC Teton	362919	817980	618
34	74	13	3474-13-L71	L71	UNC Teton	362195	819136	958
34	74	13	3474-13-L72	L72	UNC Teton	362514	818611	638
34	74	13	3474-13-L73	L73	UNC Teton	363241	818036	618
34	74	13	3474-13-L74	L74	UNC Teton	362931	818020	618
34	74	13	3474-13-L75	L75	UNC Teton	364520	818050	638
34	74	13	3474-13-L76	L76	UNC Teton	360571	819883	797
34	74	13	3474-13-L77	L77	UNC Teton	360620	819411	797
34	74	13	3474-13-L78	L78	UNC Teton	359444	819603	749
34	74	13	3474-13-L79	L79	UNC Teton	359632	819473	778
34	74	13	3474-13-L83	L83	UNC Teton	0	0	615
34	74	13	3474-13-L86	L86	UNC Teton	359829	819445	778
34	74	13	3474-13-L87	L87	UNC Teton	360102	819957	788
34	74	13	3474-13-L88	L88	UNC Teton	360590	819603	794
34	74	13	3474-13-L90	L90	UNC Teton	359643	819985	777
34	74	13	3474-13-L91	L91	UNC Teton	360020	820452	769

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	13	3474-13-L92	L92	UNC Teton	360408	819915	778
34	74	13	3474-13-M-7	M-7	Uranium One	362482.7	822461.9	491
34	74	13	3474-13-M-9	M-9	Uranium One	359522	819727.4	600
34	74	14	3474-14-0050-2450	0050-2450	Power Resources INC.	356568	818069	596
34	74	14	3474-14-0100-2450	0100-2450	Power Resources INC.	356568	818119	599
34	74	14	3474-14-0250-2550	0250-2550	Power Resources INC.	356669	818265	618
34	74	14	3474-14-0300-2800	0300-2800	Power Resources INC.	356935	818236	636
34	74	14	3474-14-0400-3150	0400-3150	Power Resources INC.	357281	818379	621
34	74	14	3474-14-0500-3050	0500-3050	Power Resources INC.	357183	818463	661
34	74	14	3474-14-0550-2850	0550-2850	Power Resources INC.	356991	818492	639
34	74	14	3474-14-0600-3150	0600-3150	Power Resources INC.	357284	818592	640
34	74	14	3474-14-0700-3150	0700-3150	Power Resources INC.	357293	818690	658
34	74	14	3474-14-1000	1000	Uranium One	354400	820600	605
34	74	14	3474-14-1001	1001	Uranium One	355200	820600	605
34	74	14	3474-14-1002	1002	Uranium One	354800	820200	806
34	74	14	3474-14-1003	1003	Uranium One	354400	819800	602
34	74	14	3474-14-1004	1004	Uranium One	355200	819800	603
34	74	14	3474-14-1005	1005	Uranium One	354800	819400	603
34	74	14	3474-14-1006	1006	Uranium One	354400	819000	591
34	74	14	3474-14-1007	1007	Uranium One	355200	819000	605
34	74	14	3474-14-1008	1008	Uranium One	354900	818600	802
34	74	14	3474-14-1009	1009	Uranium One	354400	818200	604
34	74	14	3474-14-100KM	100KM	Kerr McGee	355070	819272	1000
34	74	14	3474-14-1010	1010	Uranium One	355215	818300	604
34	74	14	3474-14-101KM	101KM	Kerr McGee	354547	819290	977
34	74	14	3474-14-102KM	102KM	Kerr McGee	354593	818496	1000
34	74	14	3474-14-103KM	103KM	Kerr McGee	354685	818492	401
34	74	14	3474-14-104KM	104KM	Kerr McGee	354663	818296	400
34	74	14	3474-14-1050-3400	1050-3400	Power Resources INC.	357493	819048	700
34	74	14	3474-14-105KM	105KM	Kerr McGee	354541	818138	401
34	74	14	3474-14-107KM	107KM	Kerr McGee	357027	818314	701
34	74	14	3474-14-108KM	108KM	Kerr McGee	358200	819080	702
34	74	14	3474-14-109KM	109KM	Kerr McGee	358234	818814	700
34	74	14	3474-14-10KM	10KM	Kerr McGee	356712	818175	1000
34	74	14	3474-14-110KM	110KM	Kerr McGee	358656	819322	700
34	74	14	3474-14-111KM	111KM	Kerr McGee	357587	818251	701
34	74	14	3474-14-112KM	112KM	Kerr McGee	357822	818643	236
34	74	14	3474-14-113KM	113KM	Kerr McGee	357674	819114	721
34	74	14	3474-14-114KM	114KM	Kerr McGee	354925	819276	460
34	74	14	3474-14-115KM	115KM	Kerr McGee	355267	819287	460
34	73	14	3474-14-116KM	116KM	Kerr McGee	355269	819051	700
34	74	14	3474-14-117KM	117KM	Kerr McGee	358964	818786	700
34	74	14	3474-14-118KM	118KM	Kerr McGee	358619	818854	655
34	74	14	3474-14-119KM	119KM	Kerr McGee	358084	818729	655
34	74	14	3474-14-11KM	11KM	Kerr McGee	356280	819664	1001
34	74	14	3474-14-120KM	120KM	Kerr McGee	357568	818790	658
34	74	14	3474-14-121KM	121KM	Kerr McGee	357059	818444	653
34	74	14	3474-14-122KM	122KM	Kerr McGee	357380	818590	700
34	74	14	3474-14-123KM	123KM	Kerr McGee	358128	818900	700
34	74	14	3474-14-12KM	12KM	Kerr McGee	359256	819629	1002
34	74	14	3474-14-1300-4850	1300-4850	Power Resources INC.	358965	819281	705
34	74	14	3474-14-13KM	13KM	Kerr McGee	358783	818144	1001
34	74	14	3474-14-14Dup ID	14		356403	818093	
34	74	14	3474-14-15KM	15KM	Kerr McGee	354615	818214	1003
34	74	14	3474-14-16KM	16KM	Kerr McGee	355798	818271	1003
34	74	14	3474-14-1700-2900	1700-2900	Power Resources INC.	357117	819657	420

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	14	3474-14-1700-3000	1700-3000	Power Resources INC.	357217	819656	420
34	74	14	3474-14-1700-3100	1700-3100	Power Resources INC.	357317	819656	420
34	74	14	3474-14-17KM	17KM	Kerr McGee	357619	818162	1004
34	74	14	3474-14-18KM	18KM	Kerr McGee	357593	818490	744
34	74	14	3474-14-19KM	19KM	Kerr McGee	357861	818155	704
34	74	14	3474-14-1CEGB	1CEGB	Everest Minerals	358799	822920	300
34	74	14	3474-14-1KM	1KM	Kerr McGee	356384	818226	620
34	74	14	3474-14-20KM	20KM	Kerr McGee	358520	820540	1007
34	74	14	3474-14-2100-3300	2100-3300	Power Resources INC.	357389	820138	421
34	74	14	3474-14-2100-3400	3100-3400	Power Resources INC.	357489	820137	422
34	74	14	3474-14-2100-3450	2100-3450	Power Resources INC.	357538	820137	421
34	74	14	3474-14-21KM	21KM	Kerr McGee	358635	819595	1007
34	74	14	3474-14-22KM	22KM	Kerr McGee	357987	818941	1006
34	74	14	3474-14-23KM	23KM	Kerr McGee	359237	820037	701
34	74	14	3474-14-24KM	24KM	Kerr McGee	358612	819197	745
34	74	14	3474-14-25KM	25KM	Kerr McGee	357978	819070	765
34	74	14	3474-14-26KM	26KM	Kerr McGee	356956	818386	725
34	74	14	3474-14-27KM	27KM	Kerr McGee	359229	820236	721
34	74	14	3474-14-28KM	28KM	Kerr McGee	358638	819386	746
34	74	14	3474-14-29KM	29KM	Kerr McGee	357920	818743	745
34	74	14	3474-14-2KM	2KM	Kerr McGee	356707	818394	619
34	74	14	3474-14-300	300		355967.2171	822299.8923	
34	74	14	3474-14-308	308		356858.2494	822118.2269	
34	74	14	3474-14-30KM	30KM	Kerr McGee	356852	817997	766
34	74	14	3474-14-311	311		357002.6701	822183.7654	
34	74	14	3474-14-31KM	31KM	Kerr McGee	359240	819935	722
34	74	14	3474-14-32KM	32KM	Kerr McGee	358644	819503	742
34	74	14	3474-14-33KM	33KM	Kerr McGee	358078	819862	763
34	74	14	3474-14-34KM	34KM	Kerr McGee	357926	818816	741
34	74	14	3474-14-35KM	35KM	Kerr McGee	357920	818649	721
34	74	14	3474-14-36KM	36KM	Kerr McGee	357250	818134	721
34	74	14	3474-14-37KM	37KM	Kerr McGee	359093	819758	700
34	74	14	3474-14-38KM	38KM	Kerr McGee	358448	819189	702
34	74	14	3474-14-39KM	39KM	Kerr McGee	358653	819433	703
34	74	14	3474-14-3KM	3KM	Kerr McGee	357021	818121	619
34	74	14	3474-14-40KM	40KM	Kerr McGee	356810	818385	704
34	74	14	3474-14-41KM	41KM	Kerr McGee	354614	818294	703
34	74	14	3474-14-42KM	42KM	Kerr McGee	357657	818360	704
34	74	14	3474-14-43KM	43KM	Kerr McGee	357577	818594	705
34	74	14	3474-14-44KM	44KM	Kerr McGee	358357	819191	703
34	74	14	3474-14-45KM	45KM	Kerr McGee	358881	819751	696
34	74	14	3474-14-46KM	46KM	Kerr McGee	358463	819292	700
34	74	14	3474-14-47KM	47KM	Kerr McGee	357877	819034	700
34	74	14	3474-14-48KM	48KM	Kerr McGee	357716	818596	700
34	74	14	3474-14-49KM	49KM	Kerr McGee	359337	819950	697
34	74	14	3474-14-4KM	4KM	Kerr McGee	356925	818880	361
34	74	14	3474-14-50KM	50KM	Kerr McGee	358742	819298	700
34	74	14	3474-14-51KM	51KM	Kerr McGee	358719	818980	700
34	74	14	3474-14-52KM	52KM	Kerr McGee	357713	818165	697
34	74	14	3474-14-533B	533B	Kerr McGee	357741.8522	822458.5075	
34	74	14	3474-14-53KM	53KM	Kerr McGee	357578	818702	702
34	74	14	3474-14-54KM	54KM	Kerr McGee	357402	818351	704
34	74	14	3474-14-55KM	55KM	Kerr McGee	356766	818286	703
34	74	14	3474-14-56KM	56KM	Kerr McGee	358083	818644	703
34	74	14	3474-14-57	57		355049.3117	821579.9846	
34	74	14	3474-14-57KM	57KM	Kerr McGee	354783	818492	624

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	14	3474-14-582-T	582-T		356193.7571	822924.7302	
34	74	14	3474-14-58KM	58KM	Kerr McGee	358846	819385	705
34	74	14	3474-14-59KM	5KM	Kerr McGee	357876	819130	703
34	74	14	3474-14-5KM	5KM	Kerr McGee	357581	819631	361
34	74	14	3474-14-60KM	60KM	Kerr McGee	358069	819126	702
34	74	14	3474-14-61KM	61KM	Kerr McGee	358821	818984	700
34	74	14	3474-14-62KM	62KM	Kerr McGee	358817	819082	698
34	74	14	3474-14-63KM	63KM	Kerr McGee	358632	818770	700
34	74	14	3474-14-642CH	642CH	UNC Teton	356440	821857	236
34	74	14	3474-14-643	643		355916.014	822070.9519	
34	74	14	3474-14-64KM	64KM	Kerr McGee	359263	819812	657
34	74	14	3474-14-65KM	65KM	Kerr McGee	359077	819371	639
34	74	14	3474-14-66KM	66KM	Kerr McGee	359080	819179	660
34	74	14	3474-14-678CEGB	678CEGB	Everest Minerals	358320	821430	420
34	74	14	3474-14-679CEGB	679CEGB	Everest Minerals	358307	821534	420
34	74	14	3474-14-67KM	67KM	Kerr McGee	358814	819188	700
34	74	14	3474-14-680CEGB	680CEGB	Everest Minerals	358406	821575	440
34	74	14	3474-14-681CEGB	681CEGB	Everest Minerals	358443	821693	459
34	74	14	3474-14-682WCEGB	682W	Everest Minerals	357655	822150	420
34	74	14	3474-14-683CEGB	683CEGB	Everest Minerals	355050	821689	315
34	74	14	3474-14-684CEGB	684CEGB	Everest Minerals	356311	822345	270
34	74	14	3474-14-685CEGB	685CEGB	Everest Minerals	356357	822292	280
34	74	14	3474-14-686W-CEGE	686W-CEGB	Everest Minerals	356408	822340	279
34	74	14	3474-14-687CEGB	687CEGB	Everest Minerals	359099	819957	663
34	74	14	3474-14-688CEGB	688CEGB	Everest Minerals	359053	819622	703
34	74	14	3474-14-689CEGB	689CEGB	Everest Minerals	358974	819416	705
34	74	14	3474-14-68KM	68KM	Kerr McGee	358530	818963	697
34	74	14	3474-14-690CEGB	690CEGB	Everest Minerals	358866	819164	697
34	74	14	3474-14-691CEGB	691CEGB	Everest Minerals	358715	819078	725
34	74	14	3474-14-692CEGB	692CEGB	Everest Minerals	358322	819033	725
34	74	14	3474-14-693CEGB	693CEGB	Everest Minerals	358536	819381	703
34	74	14	3474-14-694CEGB	694CEGB	Everest Minerals	358335	819371	703
34	74	14	3474-14-695CEGB	695CEGB	Everest Minerals	358870	819064	725
34	74	14	3474-14-696CEGB	696CEGB	Everest Minerals	358230	819261	705
34	74	14	3474-14-697CEGB	697CEGB	Everest Minerals	358055	819329	725
34	74	14	3474-14-698CEGB	698CEGB	Everest Minerals	358078	818924	720
34	74	14	3474-14-699CEGB	699CEGB	Everest Minerals	357843	818866	665
34	74	14	3474-14-69KM	69KM	Kerr McGee	358534	819068	700
34	74	14	3474-14-6KM	6KM	Kerr McGee	357978	820410	380
34	74	14	3474-14-700CEGB	700CEGB	Everest Minerals	359002	819620	703
34	74	14	3474-14-701CEGB	701CEGB	Everest Minerals	359159	819623	703
34	74	14	3474-14-702CEGB	702CEGB	Everest Minerals	358534	819591	704
34	74	14	3474-14-703CEGB	703CEGB	Everest Minerals	358538	819496	703
34	74	14	3474-14-704CEGB	704CEGB	Everest Minerals	359101	819414	703
34	74	14	3474-14-705CEGB	705CEGB	Everest Minerals	358769	819033	725
34	74	14	3474-14-706CEGB	706CEGB	Everest Minerals	358560	819303	705
34	74	14	3474-14-707CEGB	707CEGB	Everest Minerals	357958	819221	724
34	74	14	3474-14-708CEGB	708CEGB	Everest Minerals	358341	819272	643
34	74	14	3474-14-709CEGB	709CEGB	Everest Minerals	357480	818783	664
34	74	14	3474-14-70KM	70KM	Kerr McGee	358968	818988	700
34	74	14	3474-14-710CEGB	710CEGB	Everest Minerals	357473	818559	645
34	74	14	3474-14-711CEGB	711CEGB	Everest Minerals	357743	818489	665
34	74	14	3474-14-712CEGB	712CEGB	Everest Minerals	357278	818529	665
34	74	14	3474-14-713CEGB	713CEGB	Everest Minerals	357681	818701	645
34	74	14	3474-14-714CEGB	714CEGB	Everest Minerals	357655	818994	726
34	74	14	3474-14-715CEGB	715CEGB	Everest Minerals	359166	819435	704

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	14	3474-14-716CEGB	716CEGB	Everest Minerals	359381	819541	704
34	74	14	3474-14-717CEGB	717CEGB	Everest Minerals	359169	819385	703
34	74	14	3474-14-718CEGB	718CEGB	Everest Minerals	359031	819418	703
34	74	14	3474-14-719CEGB	719CEGB	Everest Minerals	358228	819312	642
34	74	14	3474-14-71KM	71KM	Kerr McGee	358482	818761	700
34	74	14	3474-14-720CEGB	720CEGB	Everest Minerals	358002	818945	644
34	74	14	3474-14-721CEGB	721CEGB	Everest Minerals	358010	819225	643
34	74	14	3474-14-722CEGB	722CEGB	Everest Minerals	357286	818241	623
34	74	14	3474-14-723CEGB	723CEGB	Everest Minerals	356855	818392	665
34	74	14	3474-14-724CEGB	724CEGB	Everest Minerals	356789	818107	604
34	74	14	3474-14-725CEGB	725CEGB	Everest Minerals	356763	818078	604
34	74	14	3474-14-726CEGB	726CEGB	Everest Minerals	357659	819049	703
34	74	14	3474-14-727CEGB	727CEGB	Everest Minerals	357661	818906	702
34	74	14	3474-14-728CEGB	728CEGB	Everest Minerals	355665	819060	442
34	74	14	3474-14-729CEGB	729CEGB	Everest Minerals	356048	818280	402
34	74	14	3474-14-72KM	72KM	Kerr McGee	358141	818827	700
34	74	14	3474-14-730CEGB	730CEGB	Everest Minerals	357466	818893	686
34	74	14	3474-14-731CEGB	731CEGB	Everest Minerals	354114	819246	462
34	74	14	3474-14-732CEGB	732CEGB	Everest Minerals	357333	820010	402
34	74	14	3474-14-733CEGB	733CEGB	Everest Minerals	355240	819795	462
34	74	14	3474-14-73KM	73KM	Kerr McGee	357881	818910	696
34	74	14	3474-14-74KM	74KM	Kerr McGee	359147	818997	700
34	74	14	3474-14-75KM	75KM	Kerr McGee	358968	819080	701
34	74	14	3474-14-76KM	76KM	Kerr McGee	359264	819719	701
34	74	14	3474-14-77KM	77KM	Kerr McGee	358971	819171	696
34	74	14	3474-14-78KM	78KM	Kerr McGee	358815	819280	697
34	74	14	3474-14-79KM	79KM	Kerr McGee	359170	819720	698
34	74	14	3474-14-80KM	80KM	Kerr McGee	359202	819543	700
34	74	14	3474-14-81KM	81KM	Kerr McGee	358730	818778	700
34	74	14	3474-14-82?	82?		356768.4912	821834.5014	
34	74	14	3474-14-82KM	82KM	Kerr McGee	358631	818576	698
34	74	14	3474-14-83KM	83KM	Kerr McGee	358584	819226	695
34	74	14	3474-14-84KM	84KM	Kerr McGee	358427	819043	695
34	74	14	3474-14-85KM	85KM	Kerr McGee	357973	819129	697
34	74	14	3474-14-86KM	86KM	Kerr McGee	358162	819123	698
34	74	14	3474-14-87KM	87KM	Kerr McGee	357954	818496	697
34	74	14	3474-14-88KM	88KM	Kerr McGee	358278	818985	700
34	74	14	3474-14-89KM	89KM	Kerr McGee	359083	819083	696
34	74	14	3474-14-90KM	90KM	Kerr McGee	359081	819280	658
34	74	14	3474-14-91KM	91KM	Kerr McGee	358860	819490	698
34	74	14	3474-14-92KM	92KM	Kerr McGee	358752	819407	697
34	74	14	3474-14-93KM	93KM	Kerr McGee	358688	819216	697
34	74	14	3474-14-94KM	94KM	Kerr McGee	359327	819315	697
34	74	14	3474-14-95KM	95KM	Kerr McGee	356778	820547	1003
34	74	14	3474-14-96KM	96KM	Kerr McGee	356247	820550	1001
34	74	14	3474-14-97KM	97KM	Kerr McGee	355660	820553	977
34	74	14	3474-14-98KM	98KM	Kerr McGee	355659	820021	1003
34	74	14	3474-14-99KM	99KM	Kerr McGee	355655	819547	995
34	74	14	3474-14-BM-1	BM-1	UNC Teton	358229	821547	622
34	74	14	3474-14-BM-2	BM-2	UNC Teton	354792	822904	561
34	74	14	3474-14-CP-1	CP-1		355206.1953	821026.1357	
34	74	14	3474-14-CP-10	CP-10		355091.1953	821225.1357	
34	74	14	3474-14-CP-11	CP-11		354389.1953	822269.1357	
34	74	14	3474-14-CP-12	CP-12		354497.1953	819744.1357	
34	74	14	3474-14-CP-3	CP-3		354488.1953	822248.1357	
34	74	14	3474-14-CP-4	CP-4		357377.1953	821851.1357	

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	14	3474-14-CP-5	CP-5		357525.1953	821170.1357	
34	74	14	3474-14-CP-6	CP-6		359177.1953	820427.1357	
34	74	14	3474-14-CP-7	CP-7		358514.1953	823268.1357	
34	74	14	3474-14-CP-8	CP-8		356609.1953	822519.1357	
34	74	14	3474-14-CP-9	CP-9		355952.1953	821634.1357	
34	74	14	3474-14-IDA-381	IDA-381	UNC Teton	358879	823127	518
34	74	14	3474-14-L10	L10	UNC Teton	354361	823028	997
34	74	14	3474-14-L106	L106	UNC Teton	357819	822383	475
34	74	14	3474-14-L107	L107	UNC Teton	357906	822281	476
34	74	14	3474-14-L111	L111	UNC Teton	357816	822285	476
34	74	14	3474-14-L112	L112	UNC Teton	357712	822291	476
34	74	14	3474-14-L114	L114	UNC Teton	356212	822308	393
34	74	14	3474-14-L115	L115	UNC Teton	356407	822301	416
34	74	14	3474-14-L117	L117	UNC Teton	358021	822382	476
34	74	14	3474-14-L12	L12	UNC Teton	357103	820635	998
34	74	14	3474-14-L13	L13	UNC Teton	356830	822656	635
34	74	14	3474-14-L14	L14	UNC Teton	354374	822627	671
34	74	14	3474-14-L144	L144	UNC Teton	356318	822587	300
34	74	14	3474-14-L145	L145	UNC Teton	356315	822197	420
34	74	14	3474-14-L146	L146	UNC Teton	356029	822301	400
34	74	14	3474-14-L147	L147	UNC Teton	356596	822294	420
34	74	14	3474-14-L148	L148	UNC Teton	356828	822255	420
34	74	14	3474-14-L149	L149	UNC Teton	357615	822295	440
34	74	14	3474-14-L15	L15	UNC Teton	357450	820621	396
34	74	14	3474-14-L150CH	L150CH	UNC Teton	356852	822035	421
34	74	14	3474-14-L151	L151	UNC Teton	356596	822392	300
34	74	14	3474-14-L152	L152	UNC Teton	356602	822095	420
34	74	14	3474-14-L153	L153	UNC Teton	357039	822183	420
34	74	14	3474-14-L154	L154	UNC Teton	356032	822108	400
34	74	14	3474-14-L155	L155	UNC Teton	357425	822296	440
34	74	14	3474-14-L156	L156	UNC Teton	357226	822198	420
34	74	14	3474-14-L157	L157	UNC Teton	357612	822387	435
34	74	14	3474-14-L158	L158	UNC Teton	356294	822008	420
34	74	14	3474-14-L159	L159	UNC Teton	356599	821878	420
34	74	14	3474-14-L160	L160	UNC Teton	356603	822482	300
34	74	14	3474-14-L161	L161	UNC Teton	357625	822108	440
34	74	14	3474-14-L162	L162	UNC Teton	357917	821890	460
34	74	14	3474-14-L163	L163	UNC Teton	357041	822279	438
34	74	14	3474-14-L164	L164	UNC Teton	357211	822287	440
34	74	14	3474-14-L165	L165	UNC Teton	357422	822391	439
34	74	14	3474-14-L166	L166	UNC Teton	356600	821989	420
34	74	14	3474-14-L167	L167	UNC Teton	357603	822471	440
34	74	14	3474-14-L168	L168	UNC Teton	356599	821779	410
34	74	14	3474-14-L169	L169	UNC Teton	356292	821915	421
34	74	14	3474-14-L17	L17	UNC Teton	356837	822166	598
34	74	14	3474-14-L170	L170	UNC Teton	357619	822199	440
34	74	14	3474-14-L171	L171	UNC Teton	357701	822099	438
34	74	14	3474-14-L172	L172	UNC Teton	357792	822090	438
34	74	14	3474-14-L173	L173	UNC Teton	356029	821930	400
34	74	14	3474-14-L174	L174	UNC Teton	355829	821926	399
34	74	14	3474-14-L175	L175	UNC Teton	357753	821690	458
34	74	14	3474-14-L176	L176	UNC Teton	355604	821694	400
34	74	14	3474-14-L177	L177	UNC Teton	357598	822566	460
34	74	14	3474-14-L178	L178	UNC Teton	357815	821887	440
34	74	14	3474-14-L179	L179	UNC Teton	357041	822081	421
34	74	14	3474-14-L18	L18	UNC Teton	358027	822479	594

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	14	3474-14-L180	L180	UNC Teton	357235	822102	421
34	74	14	3474-14-L181	L181	UNC Teton	357429	822200	438
34	74	14	3474-14-L182	L182	UNC Teton	356803	821777	420
34	74	14	3474-14-L183	L183	UNC Teton	356605	821593	419
34	74	14	3474-14-L184	L184	UNC Teton	357801	822186	440
34	74	14	3474-14-L185	L185	UNC Teton	356500	822396	300
34	74	14	3474-14-L186	L186	UNC Teton	356286	821734	421
34	74	14	3474-14-L187	L187	UNC Teton	357419	822483	438
34	74	14	3474-14-L188	L188	UNC Teton	357204	822385	440
34	74	14	3474-14-L189	L189	UNC Teton	356022	821748	400
34	74	14	3474-14-L190	L190	UNC Teton	355826	822023	380
34	74	14	3474-14-L191	L191	UNC Teton	355846	821730	420
34	74	14	3474-14-L192	L192	UNC Teton	357044	822384	460
34	74	14	3474-14-L193	L193	UNC Teton	355600	821490	399
34	74	14	3474-14-L194	L194	UNC Teton	355626	821892	400
34	74	14	3474-14-L195	L195	UNC Teton	355404	821684	361
34	74	14	3474-14-L196	L196	UNC Teton	357035	821982	418
34	74	14	3474-14-L197	L197	UNC Teton	356397	821905	421
34	74	14	3474-14-L198	L198	UNC Teton	356495	821891	420
34	74	14	3474-14-L199	L199	UNC Teton	357635	821884	438
34	74	14	3474-14-L20	L20	UNC Teton	358002	820603	395
34	74	14	3474-14-L200	L200	UNC Teton	356951	821971	418
34	74	14	3474-14-L201	L201	UNC Teton	357034	821775	419
34	74	14	3474-14-L202	L202	UNC Teton	357648	821685	459
34	74	14	3474-14-L203	L203	UNC Teton	357025	821576	420
34	74	14	3474-14-L204	L204	UNC Teton	357026	821469	441
34	74	14	3474-14-L205	L205	UNC Teton	357435	821881	440
34	74	14	3474-14-L206	L206	UNC Teton	357632	821998	439
34	74	14	3474-14-L207	L207	UNC Teton	356014	821559	419
34	74	14	3474-14-L208	L208	UNC Teton	356276	821544	419
34	74	14	3474-14-L209	L209	UNC Teton	356021	821657	421
34	74	14	3474-14-L21	L21	UNC Teton	355237	822716	598
34	74	14	3474-14-L210	L210	UNC Teton	356026	821841	392
34	74	14	3474-14-L211	L211	UNC Teton	355926	821749	399
34	74	14	3474-14-L212	L212	UNC Teton	355601	822082	281
34	74	14	3474-14-L213	L213	UNC Teton	356197	821743	399
34	74	14	3474-14-L214	L214	UNC Teton	356104	821748	401
34	74	14	3474-14-L215	L215	UNC Teton	355603	821601	399
34	74	14	3474-14-L216	L216	UNC Teton	355404	821592	359
34	74	14	3474-14-L217	L217	UNC Teton	356280	821637	414
34	74	14	3474-14-L218	L218	UNC Teton	356264	821357	419
34	74	14	3474-14-L219	L219	UNC Teton	355810	821521	417
34	74	14	3474-14-L22	L22	UNC Teton	355227	822517	438
34	74	14	3474-14-L220	L220	UNC Teton	355241	821613	360
34	74	14	3474-14-L221	L221	UNC Teton	355122	821526	361
34	74	14	3474-14-L222	L222	UNC Teton	355401	821892	359
34	74	14	3474-14-L223	L223	UNC Teton	355599	821287	399
34	74	14	3474-14-L224	L224	UNC Teton	355822	821628	421
34	74	14	3474-14-L225	L225	UNC Teton	356183	821546	419
34	74	14	3474-14-L226	L226	UNC Teton	355398	821496	358
34	74	14	3474-14-L227	L227	UNC Teton	356290	821829	421
34	74	14	3474-14-L228	L228	UNC Teton	355251	821517	359
34	74	14	3474-14-L229	L229	UNC Teton	355120	821433	360
34	74	14	3474-14-L23	L23	UNC Teton	354353	822224	455
34	74	14	3474-14-L230	L230	UNC Teton	355003	821537	361
34	74	14	3474-14-L231	L231	UNC Teton	354587	821709	358

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	14	3474-14-L232	L232	UNC Teton	354799	821716	359
34	74	14	3474-14-L233	L233	UNC Teton	355609	822187	261
34	74	14	3474-14-L234	L234	UNC Teton	355409	822001	261
34	74	14	3474-14-L235	L235	UNC Teton	356396	821728	419
34	74	14	3474-14-L236	L236	UNC Teton	355402	821404	359
34	74	14	3474-14-L237	L237	UNC Teton	355625	821790	359
34	74	14	3474-14-L238	L238	UNC Teton	356399	821825	419
34	74	14	3474-14-L239	L239	UNC Teton	355001	821745	341
34	74	14	3474-14-L240	L240	UNC Teton	355001	821431	341
34	74	14	3474-14-L241	L241	UNC Teton	356525	821813	419
34	74	14	3474-14-L242	L242	UNC Teton	354587	821806	358
34	74	14	3474-14-L243	L243	UNC Teton	354586	821615	338
34	74	14	3474-14-L244	L244	UNC Teton	354791	821815	359
34	74	14	3474-14-L245	L245	UNC Teton	354808	821617	339
34	74	14	3474-14-L246	L246	UNC Teton	355608	822280	259
34	74	14	3474-14-L247	L247	UNC Teton	355607	821985	258
34	74	14	3474-14-L248	L248	UNC Teton	355825	822121	258
34	74	14	3474-14-L249	L249	UNC Teton	355409	822094	239
34	74	14	3474-14-L250	L250	UNC Teton	355019	821815	339
34	74	14	3474-14-L251	L251	UNC Teton	355018	821656	339
34	74	14	3474-14-L252	L252	UNC Teton	355026	821267	338
34	74	14	3474-14-L253	L253	UNC Teton	354476	821707	359
34	74	14	3474-14-L254	L254	UNC Teton	354276	821646	359
34	74	14	3474-14-L255	L255	UNC Teton	354831	823027	418
34	74	14	3474-14-L256	L256	UNC Teton	354740	823249	440
34	74	14	3474-14-L257	L257	UNC Teton	354652	822827	421
34	74	14	3474-14-L258	L258	UNC Teton	354369	822519	401
34	74	14	3474-14-L259	L259	UNC Teton	354371	822323	399
34	74	14	3474-14-L26	L26	UNC Teton	356850	822063	494
34	74	14	3474-14-L260	L260	UNC Teton	355414	822191	240
34	74	14	3474-14-L261	L261	UNC Teton	354818	821518	339
34	74	14	3474-14-L262	L262	UNC Teton	355811	822237	259
34	74	14	3474-14-L263	L263	UNC Teton	356034	822017	261
34	74	14	3474-14-L264	L264	UNC Teton	354820	821323	335
34	74	14	3474-14-L265	L265	UNC Teton	354247	821789	361
34	74	14	3474-14-L266	L266	UNC Teton	357145	821158	441
34	74	14	3474-14-L267	L267	UNC Teton	357934	821504	458
34	74	14	3474-14-L268	L268	UNC Teton	358133	821491	459
34	74	14	3474-14-L269	L269	UNC Teton	354615	821309	319
34	74	14	3474-14-L27	L27	UNC Teton	358011	822279	535
34	74	14	3474-14-L270	L270	UNC Teton	354733	822796	418
34	74	14	3474-14-L271	L271	UNC Teton	354546	822817	421
34	74	14	3474-14-L272	L272	UNC Teton	354645	822696	401
34	74	14	3474-14-L273	L273	UNC Teton	354736	822896	419
34	74	14	3474-14-L274	L274	UNC Teton	354256	822438	421
34	74	14	3474-14-L275	L275	UNC Teton	354457	822437	402
34	74	14	3474-14-L276	L276	UNC Teton	354843	823193	419
34	74	14	3474-14-L277	L277	UNC Teton	354736	823091	418
34	74	14	3474-14-L278	L278	UNC Teton	355843	822349	259
34	74	14	3474-14-L279	L279	UNC Teton	354827	822784	401
34	74	14	3474-14-L28	L28	UNC Teton	357591	820617	697
34	74	14	3474-14-L280	L280	UNC Teton	354406	821236	339
34	74	14	3474-14-L281	L281	UNC Teton	354643	823197	420
34	74	14	3474-14-L282	L282	UNC Teton	354729	822688	397
34	74	14	3474-14-L283	L283	UNC Teton	354568	822495	401
34	74	14	3474-14-L284	L284	UNC Teton	354595	821408	221

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	14	3474-14-L285	L285	UNC Teton	354508	821301	222
34	74	14	3474-14-L286	L286	UNC Teton	354253	822322	401
34	74	14	3474-14-L287	L287	UNC Teton	354939	823196	439
34	74	14	3474-14-L288	L288	UNC Teton	354928	822768	411
34	74	14	3474-14-L289	L289	UNC Teton	356925	821527	401
34	74	14	3474-14-L29	L29	UNC Teton	358092	820600	396
34	74	14	3474-14-L290	L290	UNC Teton	355843	823177	459
34	74	14	3474-14-L291	L291	UNC Teton	357652	821500	459
34	74	14	3474-14-L292	L292	UNC Teton	357225	821354	440
34	74	14	3474-14-L293	L293	UNC Teton	358127	821592	439
34	74	14	3474-14-L294	L294	UNC Teton	357930	821423	439
34	74	14	3474-14-L295	L295	UNC Teton	357449	821680	440
34	74	14	3474-14-L296	296	UNC Teton	357497	820806	382
34	74	14	3474-14-L297	L297	UNC Teton	358089	820783	400
34	74	14	3474-14-L298	L298	UNC Teton	358538	821123	439
34	74	14	3474-14-L299	L299	UNC Teton	358521	821473	459
34	74	14	3474-14-L30	L30	UNC Teton	356865	821965	457
34	74	14	3474-14-L301CH	L301CH	UNC Teton	356831	822049	387
34	74	14	3474-14-L302CH	L302CH	UNC Teton	356829	822085	265
34	74	14	3474-14-L303	L303	UNC Teton	356812	822042	497
34	74	14	3474-14-L304	L304	UNC Teton	356836	822108	103
34	74	14	3474-14-L305	L305	UNC Teton	356810	822347	389
34	74	14	3474-14-L306	L306	UNC Teton	356736	822043	392
34	74	14	3474-14-L307	L307	UNC Teton	356869	821859	381
34	74	14	3474-14-L309	L309	UNC Teton	356832	822137	255
34	74	14	3474-14-L31	L31	UNC Teton	358725	821302	535
34	74	14	3474-14-L310	L310	UNC Teton	356846	821983	255
34	74	14	3474-14-L312	L312	UNC Teton	356500	822051	267
34	74	14	3474-14-L313	L313	UNC Teton	357050	822130	249
34	74	14	3474-14-L314	L314	UNC Teton	356802	822065	497
34	74	14	3474-14-L315	L315	UNC Teton	356019	822286	78
34	74	14	3474-14-L316	L316	UNC Teton	356364	821451	418
34	74	14	3474-14-L317	L317	UNC Teton	356927	821862	265
34	74	14	3474-14-L318	L318	UNC Teton	354425	821646	358
34	74	14	3474-14-L319	L319	UNC Teton	356976	821568	275
34	74	14	3474-14-L32	L32	UNC Teton	357989	822092	494
34	74	14	3474-14-L320	L320	UNC Teton	356681	821822	257
34	74	14	3474-14-L321	L321	UNC Teton	357413	821348	440
34	74	14	3474-14-L322	L322	UNC Teton	355041	823198	438
34	74	14	3474-14-L323	L323	UNC Teton	357043	821148	421
34	74	14	3474-14-L324	L324	UNC Teton	357239	821161	441
34	74	14	3474-14-L325	L325	UNC Teton	357256	820958	421
34	74	14	3474-14-L326	L326	UNC Teton	357531	821879	420
34	74	14	3474-14-L327	L327	UNC Teton	357211	821541	439
34	74	14	3474-14-L328	L328	UNC Teton	358119	821689	439
34	74	14	3474-14-L329	L329	UNC Teton	357438	821494	440
34	74	14	3474-14-L33	L33	UNC Teton	356879	821869	435
34	74	14	3474-14-L330	L330	UNC Teton	358491	821684	439
34	74	14	3474-14-L331	L331	UNC Teton	358419	821479	461
34	74	14	3474-14-L332	L332	UNC Teton	358615	821467	481
34	74	14	3474-14-L333	L333	UNC Teton	357508	821343	440
34	74	14	3474-14-L334	L334	UNC Teton	358344	821121	439
34	74	14	3474-14-L335	L335	UNC Teton	357900	820789	400
34	74	14	3474-14-L336	L336	UNC Teton	358185	820781	399
34	74	14	3474-14-L337	L337	UNC Teton	357250	821054	421
34	74	14	3474-14-L338	L338	UNC Teton	358110	821780	461

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	14	3474-14-L339	L339	UNC Teton	358393	821690	479
34	74	14	3474-14-L34	L34	UNC Teton	357880	822084	456
34	74	14	3474-14-L340	L340	UNC Teton	358587	821702	500
34	74	14	3474-14-L341	L341	UNC Teton	358383	821883	501
34	74	14	3474-14-L342	L342	UNC Teton	357390	820809	379
34	74	14	3474-14-L343	L343	UNC Teton	357596	820798	400
34	74	14	3474-14-L344	L344	UNC Teton	357352	820953	380
34	74	14	3474-14-L345	L345	UNC Teton	357646	821599	419
34	74	14	3474-14-L346	L346	UNC Teton	358243	821123	441
34	74	14	3474-14-L347	L347	UNC Teton	358444	821119	440
34	74	14	3474-14-L348	L348	UNC Teton	358532	821217	440
34	74	14	3474-14-L349	L349	UNC Teton	358284	821883	457
34	74	14	3474-14-L35	L35	UNC Teton	358526	821313	500
34	74	14	3474-14-L350	L350	UNC Teton	358480	821881	480
34	74	14	3474-14-L351	L351	UNC Teton	358377	821981	480
34	74	14	3474-14-L352	L352	UNC Teton	358198	821881	460
34	74	14	3474-14-L353	L353	UNC Teton	358227	821022	442
34	74	14	3474-14-L354	L354	UNC Teton	357346	821055	381
34	74	14	3474-14-L359	L359	UNC Teton	358207	820903	421
34	74	14	3474-14-L36	L36	UNC Teton	358635	821307	479
34	74	14	3474-14-L360	L360	UNC Teton	355456	819360	760
34	74	14	3474-14-L361	L361	UNC Teton	354199	819392	800
34	74	14	3474-14-L362	L362	UNC Teton	358313	821483	461
34	74	14	3474-14-L363	L363	UNC Teton	358294	821783	460
34	74	14	3474-14-L367	L367	UNC Teton	355153	823200	433
34	74	14	3474-14-L368	L368	UNC Teton	354838	822907	432
34	74	14	3474-14-L369	L369	UNC Teton	354671	822878	388
34	74	14	3474-14-L37	L37	UNC Teton	354368	822427	413
34	74	14	3474-14-L370	L370	UNC Teton	354547	822712	395
34	74	14	3474-14-L371	L371	UNC Teton	354456	822353	395
34	74	14	3474-14-L372	L372	UNC Teton	354384	821340	334
34	74	14	3474-14-L373	L373	UNC Teton	355235	821705	357
34	74	14	3474-14-L374	L374	UNC Teton	356123	821834	388
34	74	14	3474-14-L375	L375	UNC Teton	356220	822213	288
34	74	14	3474-14-L376	L376	UNC Teton	356483	822304	290
34	74	14	3474-14-L377	L377	UNC Teton	356410	822484	294
34	74	14	3474-14-L378	L378	UNC Teton	356467	822215	291
34	74	14	3474-14-L379	L379	UNC Teton	354536	822885	393
34	74	14	3474-14-L38	L38	UNC Teton	356896	821768	412
34	74	14	3474-14-L380	L380	UNC Teton	356266	821453	409
34	74	14	3474-14-L381	L381	UNC Teton	356378	821538	421
34	74	14	3474-14-L382	L382	UNC Teton	356596	821696	421
34	74	14	3474-14-L383	L383	UNC Teton	354552	822366	395
34	74	14	3474-14-L384	L384	UNC Teton	355213	821817	356
34	74	14	3474-14-L385	L385	UNC Teton	356033	822268	271
34	74	14	3474-14-L386	L386	UNC Teton	356923	821481	395
34	74	14	3474-14-L387	L387	UNC Teton	356804	821679	416
34	74	14	3474-14-L388	L388	UNC Teton	356740	822166	416
34	74	14	3474-14-L389	L389	UNC Teton	357135	821986	416
34	74	14	3474-14-L39	L39	UNC Teton	357542	820619	297
34	74	14	3474-14-L390	L390	UNC Teton	357439	821982	437
34	74	14	3474-14-L391	L391	UNC Teton	357333	821885	438
34	74	14	3474-14-L392	L392	UNC Teton	357756	821499	450
34	74	14	3474-14-L393	L393	UNC Teton	357338	821140	415
34	74	14	3474-14-L394	L394	UNC Teton	357453	820941	397
34	74	14	3474-14-L395	L395	UNC Teton	358116	820893	415

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	14	3474-14-L396	L396	UNC Teton	358314	820898	415
34	74	14	3474-14-L397	L397	UNC Teton	358361	821218	440
34	74	14	3474-14-L398	L398	UNC Teton	358328	821382	457
34	74	14	3474-14-L399	L399	UNC Teton	356823	821491	395
34	74	14	3474-14-L40	L40	UNC Teton	357921	821335	417
34	74	14	3474-14-L400	L400	UNC Teton	358285	821674	456
34	74	14	3474-14-L401	L401	UNC Teton	354207	819960	420
34	74	14	3474-14-L402	L402	UNC Teton	355462	819976	420
34	74	14	3474-14-L405	L405	UNC Teton	355451	819673	418
34	74	14	3474-14-L406	L406	UNC Teton	354206	819672	298
34	74	14	3474-14-L407	L407	UNC Teton	355451	819509	418
34	74	14	3474-14-L408	L408	UNC Teton	355462	819840	338
34	74	14	3474-14-L409	L409	UNC Teton	354219	819806	278
34	74	14	3474-14-L41	L41	UNC Teton	354384	821840	393
34	74	14	3474-14-L410	L410	UNC Teton	355450	819591	418
34	74	14	3474-14-L411	L411	UNC Teton	355260	819494	418
34	74	14	3474-14-L413	L413	UNC Teton	354847	819821	414
34	74	14	3474-14-L42	L42	UNC Teton	355194	822134	418
34	74	14	3474-14-L43	L43	UNC Teton	357946	821699	435
34	74	14	3474-14-L432	L432	UNC Teton	358703	821464	457
34	74	14	3474-14-L433	L433	UNC Teton	358571	821876	457
34	74	14	3474-14-L434	L434	UNC Teton	358236	821373	437
34	74	14	3474-14-L435	L435	UNC Teton	358671	821903	477
34	74	14	3474-14-L436	L436	UNC Teton	354834	823095	434
34	74	14	3474-14-L437	L437	UNC Teton	354925	823091	436
34	74	14	3474-14-L438	L438	UNC Teton	355043	823097	434
34	74	14	3474-14-L439	L439	UNC Teton	354922	822985	436
34	74	14	3474-14-L44	L44	UNC Teton	357316	821352	454
34	74	14	3474-14-L440	L440	UNC Teton	354828	822679	438
34	74	14	3474-14-L45	L45	UNC Teton	356909	821672	432
34	74	14	3474-14-L46	L46	UNC Teton	354797	822552	399
34	74	14	3474-14-L461	L461	UNC Teton	354462	822517	417
34	74	14	3474-14-L462	L462	UNC Teton	355168	822001	237
34	74	14	3474-14-L463	L463	UNC Teton	355210	821907	236
34	74	14	3474-14-L464	L464	UNC Teton	354475	821808	354
34	74	14	3474-14-L465	L465	UNC Teton	354308	821204	335
34	74	14	3474-14-L466	L466	UNC Teton	356109	822017	414
34	74	14	3474-14-L467	L467	UNC Teton	356105	821929	416
34	74	14	3474-14-L468	L468	UNC Teton	356212	822131	417
34	74	14	3474-14-L469	L469	UNC Teton	356082	821658	416
34	74	14	3474-14-L47	L47	UNC Teton	355038	821230	398
34	74	14	3474-14-L470	L470	UNC Teton	356208	822488	295
34	74	14	3474-14-L471	L471	UNC Teton	356390	822192	416
34	74	14	3474-14-L472	L472	UNC Teton	356478	822086	416
34	74	14	3474-14-L473	L473	UNC Teton	356395	822000	415
34	74	14	3474-14-L474	L474	UNC Teton	356489	821987	416
34	74	14	3474-14-L475	L475	UNC Teton	357025	821261	434
34	74	14	3474-14-L476	L476	UNC Teton	357108	821536	434
34	74	14	3474-14-L477	L477	UNC Teton	357132	821457	434
34	74	14	3474-14-L478	L478	UNC Teton	357135	821258	436
34	74	14	3474-14-L479	L479	UNC Teton	357319	821540	436
34	74	14	3474-14-L48	L48	UNC Teton	356956	821347	433
34	74	14	3474-14-L480	L480	UNC Teton	357350	821672	436
34	74	14	3474-14-L482	L482	UNC Teton	357707	822487	436
34	74	14	3474-14-L483	L483	UNC Teton	357712	822392	432
34	74	14	3474-14-L484	L484	UNC Teton	357804	822486	434

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	14	3474-14-L485	L485	UNC Teton	357701	822196	434
34	74	14	3474-14-L486	L486	UNC Teton	357909	822181	437
34	74	14	3474-14-L487	L487	UNC Teton	357911	821776	471
34	74	14	3474-14-L488	L488	UNC Teton	358106	821881	476
34	74	14	3474-14-L489	L489	UNC Teton	358281	821981	475
34	74	14	3474-14-L49	L49	UNC Teton	354564	822586	358
34	74	14	3474-14-L490	L490	UNC Teton	358455	821972	474
34	74	14	3474-14-L491	L491	UNC Teton	358142	821371	453
34	74	14	3474-14-L492	L492	UNC Teton	358431	821309	456
34	74	14	3474-14-L493	L493	UNC Teton	358457	821215	456
34	74	14	3474-14-L494	L494	UNC Teton	358321	821030	436
34	74	14	3474-14-L495	L495	UNC Teton	358136	821018	436
34	74	14	3474-14-L496	L496	UNC Teton	354475	821607	351
34	74	14	3474-14-L497	L497	UNC Teton	355137	823103	436
34	74	14	3474-14-L498	L498	UNC Teton	354845	819645	416
34	74	14	3474-14-L499	L499	UNC Teton	355070	819493	417
34	74	14	3474-14-L50	L50	UNC Teton	354637	823004	436
34	74	14	3474-14-L500	L500	UNC Teton	357254	821663	434
34	74	14	3474-14-L501	L501	UNC Teton	356851	821851	383
34	74	14	3474-14-L502	L502	UNC Teton	357330	821772	435
34	74	14	3474-14-L503	L503	UNC Teton	357230	821448	434
34	74	14	3474-14-L504	L504	UNC Teton	356930	821291	434
34	74	14	3474-14-L505	L505	UNC Teton	357238	821245	431
34	74	14	3474-14-L506	L506	UNC Teton	357443	821428	435
34	74	14	3474-14-L507	L507	UNC Teton	355258	819365	436
34	74	14	3474-14-L508	L508	UNC Teton	355164	819501	415
34	74	14	3474-14-L509CH	L509CH	UNC Teton	356775	822044	401
34	74	14	3474-14-L51	L51	UNC Teton	354312	821335	354
34	74	14	3474-14-L510CH	L510CH	UNC Teton	357521	822392	419
34	74	14	3474-14-L511CH	L511CH	UNC Teton	356366	822396	278
34	74	14	3474-14-L512CH	L512CH	UNC Teton	355186	821716	319
34	74	14	3474-14-L513	L513	UNC Teton	356766	822223	418
34	74	14	3474-14-L514	L514	UNC Teton	356702	822272	423
34	74	14	3474-14-L515	L515	UNC Teton	356690	822162	418
34	74	14	3474-14-L516	L516	UNC Teton	356759	821899	399
34	74	14	3474-14-L517	L517	UNC Teton	356991	821977	400
34	74	14	3474-14-L518	L518	UNC Teton	356956	821912	400
34	74	14	3474-14-L519	L519	UNC Teton	357130	822381	438
34	74	14	3474-14-L52	L52	UNC Teton	357938	821600	450
34	74	14	3474-14-L520	L520	UNC Teton	357287	822440	439
34	74	14	3474-14-L521	L521	UNC Teton	357134	822229	439
34	74	14	3474-14-L522	L522	UNC Teton	357275	822199	419
34	74	14	3474-14-L523	L523	UNC Teton	357086	821985	400
34	74	14	3474-14-L524	L524	UNC Teton	357338	821980	435
34	74	14	3474-14-L525	L525	UNC Teton	357428	822074	439
34	74	14	3474-14-L526	L526	UNC Teton	357235	821879	439
34	74	14	3474-14-L527	L527	UNC Teton	357226	821770	438
34	74	14	3474-14-L528	L528	UNC Teton	357158	821657	438
34	74	14	3474-14-L529	L529	UNC Teton	357328	822333	438
34	74	14	3474-14-L53	L53	UNC Teton	355124	821628	375
34	74	14	3474-14-L530	L530	UNC Teton	357495	822544	438
34	74	14	3474-14-L531	L531	UNC Teton	357705	822533	438
34	74	14	3474-14-L532	L532	UNC Teton	358111	822292	449
34	74	14	3474-14-L533	L533	UNC Teton	358116	822388	437
34	74	14	3474-14-L534	L534	UNC Teton	358011	822184	448
34	74	14	3474-14-L535	L535	UNC Teton	357703	822046	437

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	14	3474-14-L536	L536	UNC Teton	357633	821939	438
34	74	14	3474-14-L537	L537	UNC Teton	357522	821936	438
34	74	14	3474-14-L538	L538	UNC Teton	357544	821769	439
34	74	14	3474-14-L539	L539	UNC Teton	357645	821779	438
34	74	14	3474-14-L54	L54	UNC Teton	357135	821349	434
34	74	14	3474-14-L540	L540	UNC Teton	357013	821912	398
34	74	14	3474-14-L541	L541	UNC Teton	357741	821791	458
34	74	14	3474-14-L542	L542	UNC Teton	357854	821694	459
34	74	14	3474-14-L543	L543	UNC Teton	358007	821771	458
34	74	14	3474-14-L544	L544	UNC Teton	358201	821821	459
34	74	14	3474-14-L545	L545	UNC Teton	358666	821985	496
34	74	14	3474-14-L546	L546	UNC Teton	358770	821911	477
34	74	14	3474-14-L547	L547	UNC Teton	358673	821779	476
34	74	14	3474-14-L548	L548	UNC Teton	358645	821597	495
34	74	14	3474-14-L549	L549	UNC Teton	358710	821353	478
34	74	14	3474-14-L55	L55	UNC Teton	354658	822570	375
34	74	14	3474-14-L550	L550	UNC Teton	358640	821208	458
34	74	14	3474-14-L551	L551	UNC Teton	358038	821364	458
34	74	14	3474-14-L552	L552	UNC Teton	357763	821397	457
34	74	14	3474-14-L553	L553	UNC Teton	357615	821344	438
34	74	14	3474-14-L554	L554	UNC Teton	357506	821235	435
34	74	14	3474-14-L555	L555	UNC Teton	357444	821779	435
34	74	14	3474-14-L556	L556	UNC Teton	357058	821652	418
34	74	14	3474-14-L557	L557	UNC Teton	356234	821838	415
34	74	14	3474-14-L558	L558	UNC Teton	356588	822193	417
34	74	14	3474-14-L559	L559	UNC Teton	356656	822395	298
34	74	14	3474-14-L56	L56	UNC Teton	355133	821740	350
34	74	14	3474-14-L560	L560	UNC Teton	356593	822534	296
34	74	14	3474-14-L561	L561	UNC Teton	356159	822304	295
34	74	14	3474-14-L562	L562	UNC Teton	358739	821597	493
34	74	14	3474-14-L563	L563	UNC Teton	357767	821345	457
34	74	14	3474-14-L564	L564	UNC Teton	356027	822169	398
34	74	14	3474-14-L565	L565	UNC Teton	356928	822098	398
34	74	14	3474-14-L566	L566	UNC Teton	355383	821774	300
34	74	14	3474-14-L568CH	L568CH	UNC Teton	354782	822841	373
34	74	14	3474-14-L570	L570	UNC Teton	356935	821840	94
34	74	14	3474-14-L571	L571	UNC Teton	357973	823119	440
34	74	14	3474-14-L572	L572	UNC Teton	356916	821960	259
34	74	14	3474-14-L573	L573	UNC Teton	356994	821856	274
34	74	14	3474-14-L574	L574	UNC Teton	356861	821814	265
34	74	14	3474-14-L575	L575	UNC Teton	357166	821934	379
34	74	14	3474-14-L576	L576	UNC Teton	356676	821869	384
34	74	14	3474-14-L577	L577	UNC Teton	357103	822685	458
34	74	14	3474-14-L578	L578	UNC Teton	357937	823121	327
34	74	14	3474-14-L58	L58	UNC Teton	357033	821347	434
34	74	14	3474-14-L581	L581	UNC Teton	354398	821631	299
34	74	14	3474-14-L582A-T	L582A-T	UNC Teton	356416	822913	459
34	74	14	3474-14-L583	L583	UNC Teton	357991	823121	170
34	74	14	3474-14-L584	L584	UNC Teton	354914	823258	421
34	74	14	3474-14-L585CH	L585CH	UNC Teton	354400	822411	400
34	74	14	3474-14-L586CH	L586CH	UNC Teton	354693	821715	336
34	74	14	3474-14-L587CH	L587CH	UNC Teton	355483	821403	349
34	74	14	3474-14-L588	L588	UNC Teton	356162	821840	259
34	74	14	3474-14-L588CH	L588CH	UNC Teton	356162	821840	259
34	74	14	3474-14-L589	L589	UNC Teton	354591	822999	400
34	74	14	3474-14-L59	L59	UNC Teton	354740	822993	418

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	14	3474-14-L590	L590	UNC Teton	354873	822838	399
34	74	14	3474-14-L591	L591	UNC Teton	354506	822716	380
34	74	14	3474-14-L592	L592	UNC Teton	354423	822607	380
34	74	14	3474-14-L593	L593	UNC Teton	355015	822976	399
34	74	14	3474-14-L594	L594	UNC Teton	354256	822476	380
34	74	14	3474-14-L595	L595	UNC Teton	354453	822307	380
34	74	14	3474-14-L596	L596	UNC Teton	354376	821771	340
34	74	14	3474-14-L597	L597	UNC Teton	354888	821773	340
34	74	14	3474-14-L598	L598	UNC Teton	354895	821623	339
34	74	14	3474-14-L599	L599	UNC Teton	354703	821606	340
34	74	14	3474-14-L60	L60	UNC Teton	355144	821832	359
34	74	14	3474-14-L600	L600	UNC Teton	354942	822897	400
34	74	14	3474-14-L601	L601	UNC Teton	354638	823059	399
34	74	14	3474-14-L602	L602	UNC Teton	355369	821798	320
34	74	14	3474-14-L603	L603	UNC Teton	357518	822138	437
34	74	14	3474-14-L604CH	L604CH	UNC Teton	357389	821602	410
34	74	14	3474-14-L605CH	L605CH	UNC Teton	357970	820704	386
34	74	14	3474-14-L606	L606	UNC Teton	356917	821198	420
34	74	14	3474-14-L607	L607	UNC Teton	356938	821109	418
34	74	14	3474-14-L608	L608	UNC Teton	357048	821056	419
34	74	14	3474-14-L609	L609	UNC Teton	357148	821057	419
34	74	14	3474-14-L61	L61	UNC Teton	354467	820507	318
34	74	14	3474-14-L610	L610	UNC Teton	357455	821054	398
34	74	14	3474-14-L611	L611	UNC Teton	357376	820873	399
34	74	14	3474-14-L612	L612	UNC Teton	357399	820696	400
34	74	14	3474-14-L613	L613	UNC Teton	357553	820926	398
34	74	14	3474-14-L614	L614	UNC Teton	357144	822080	419
34	74	14	3474-14-L615	L615	UNC Teton	357339	822250	439
34	74	14	3474-14-L616	L616	UNC Teton	357322	821267	419
34	74	14	3474-14-L617	L617	UNC Teton	357421	822551	455
34	74	14	3474-14-L618CH	L618CH	UNC Teton	358298	821317	440
34	74	14	3474-14-L619	L619	UNC Teton	356974	822275	439
34	74	14	3474-14-L62	L62	UNC Teton	354345	821588	346
34	74	14	3474-14-L620	L620	UNC Teton	356824	821150	418
34	74	14	3474-14-L621	L621	UNC Teton	356880	821032	420
34	74	14	3474-14-L622	L622	UNC Teton	357008	820999	420
34	74	14	3474-14-L623	L623	UNC Teton	356363	821645	420
34	74	14	3474-14-L624	L624	UNC Teton	355908	821634	418
34	74	14	3474-14-L625	L625	UNC Teton	356214	822008	419
34	74	14	3474-14-L626	L626	UNC Teton	355719	822126	278
34	74	14	3474-14-L627	L627	UNC Teton	357187	821211	400
34	74	14	3474-14-L628	L628	UNC Teton	357674	821970	415
34	74	14	3474-14-L629	L629	UNC Teton	355653	821671	420
34	74	14	3474-14-L63	L63	UNC Teton	354383	820985	328
34	74	14	3474-14-L630	L630	UNC Teton	356785	821074	420
34	74	14	3474-14-L631	L631	UNC Teton	356712	821155	418
34	74	14	3474-14-L632	L632	UNC Teton	354961	822847	398
34	74	14	3474-14-L633	L633	UNC Teton	355039	822894	399
34	74	14	3474-14-L634	L634	UNC Teton	355973	821921	399
34	74	14	3474-14-L635	L635	UNC Teton	357398	821262	418
34	74	14	3474-14-L636	L636	UNC Teton	357313	820883	399
34	74	14	3474-14-L637	L637	UNC Teton	356949	820951	419
34	74	14	3474-14-L638	L638	UNC Teton	356917	821442	399
34	74	14	3474-14-L64	L64	UNC Teton	354364	821698	359
34	74	14	3474-14-L640CH	L640CH	UNC Teton	355461	822032	239
34	74	14	3474-14-L641CH	L641CH	UNC Teton	355853	822193	250

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	14	3474-14-L65	L65	UNC Teton	354354	821102	209
34	74	14	3474-14-L674	L674	UNC Teton	356610	821044	618
34	74	14	3474-14-L675	L675	UNC Teton	355983	820943	618
34	74	14	3474-14-L676	L676	UNC Teton	356594	821288	598
34	74	14	3474-14-L677	L677	UNC Teton	356551	820888	618
34	74	14	3474-14-L7	L7	UNC Teton	359275	820635	998
34	74	14	3474-14-L8	L8	UNC Teton	355164	820698	996
34	74	14	3474-14-L80	L80	UNC Teton	358007	823052	455
34	74	14	3474-14-L81	L81	UNC Teton	357826	822719	480
34	74	14	3474-14-L82	L82	UNC Teton	356836	823107	467
34	74	14	3474-14-L84	L84	UNC Teton	356942	822076	413
34	74	14	3474-14-L85	L85	UNC Teton	357929	822476	478
34	74	14	3474-14-L89	L89	UNC Teton	356315	822397	397
34	74	14	3474-14-L9	L9	UNC Teton	358031	822666	585
34	74	14	3474-14-L93	L93	UNC Teton	356939	822177	416
34	74	14	3474-14-L94	L94	UNC Teton	356942	822124	416
34	74	14	3474-14-L95	L95	UNC Teton	356412	822397	396
34	74	14	3474-14-L96	L96	UNC Teton	356221	822403	390
34	74	14	3474-14-L97	L97	UNC Teton	356309	822300	385
34	74	14	3474-14-L98	L98	UNC Teton	356317	822495	395
34	74	14	3474-14-L99	L99	UNC Teton	357918	822378	473
34	74	14	3474-14-LMO-1	LMO-1	Uranium One	356425	822080	157
34	74	14	3474-14-LMP-1	LMP-1	Uranium One	356440.9084	822395.9095	400
34	74	14	3474-14-LMP-2	LMP-2	Uranium One	356457.9099	821704.9096	410
34	74	14	3474-14-LMP-3	LMP-3	Uranium One	356448.9084	822384.9095	281
34	74	14	3474-14-LMP-4	LMP-4	Uranium One	356438.9092	821704.9093	280
34	74	14	3474-14-LMU-1	LMU-1	Uranium One	356459.9086	822084.9087	513
34	74	14	3474-14-LPW-1	LPW-1	Uranium One	356449.9086	822084.9087	400
34	74	14	3474-14-LPW-2	LPW-2	Uranium One	356439.9086	822084.9087	280
34	74	14	3474-14-M-8	M-8	Uranium One	358350	821550	600
34	74	14	3474-14-MI-10	MI-10	UNC Teton	356955	822007	418
34	74	14	3474-14-MI-12	M-12	UNC Teton	356994	821976	401
34	74	14	3474-14-MI-2	MI-2	UNC Teton	356899	822050	398
34	74	14	3474-14-MI-6	MI-6	UNC Teton	356930	821976	423
34	74	14	3474-14-MI-8	MI-8	UNC Teton	356969	821946	401
34	74	14	3474-14-MM-1	MM-1	UNC Teton	356627	822148	402
34	74	14	3474-14-MM-10	MM-10	UNC Teton	358345	821701	429
34	74	14	3474-14-MM-2	MM-2	UNC Teton	357162	822231	440
34	74	14	3474-14-MM-3	MM-3	UNC Teton	357551	822307	441
34	74	14	3474-14-MM-4	MM-4	UNC Teton	358339	821616	441
34	74	14	3474-14-MM-5	MM-5	UNC Teton	355487	821637	380
34	74	14	3474-14-MM-6	MM-6	UNC Teton	354774	822944	399
34	74	14	3474-14-MM-7	MM-7	UNC Teton	357709	821613	443
34	74	14	3474-14-MM-8	MM-8	UNC Teton	355241	822766	384
34	74	14	3474-14-MM-9	MM-9	UNC Teton	354689	822713	366
34	74	14	3474-14-MR-3	MR-3	UNC Teton	356916	822013	422
34	74	14	3474-14-MR-5	MR-5	UNC Teton	356962	821976	420
34	74	14	3474-14-NI-1	NI-1	UNC Teton	356881	821858	278
34	74	14	3474-14-NI-10	NI-10	UNC Teton	356968	821790	300
34	74	14	3474-14-NI-12	NI-12	UNC Teton	356996	821747	282
34	74	14	3474-14-NI-2	NI-2	UNC Teton	356927	821881	274
34	74	14	3474-14-NI-3	NI-3	UNC Teton	356899	821808	279
34	74	14	3474-14-NI-4	NI-4	UNC Teton	356948	821837	279
34	74	14	3474-14-NI-6	NI-6	UNC Teton	356926	821766	301
34	74	14	3474-14-NI-8	NI-8	UNC Teton	356953	821723	280
34	74	14	3474-14-NM-1	NM-1	UNC Teton	357283	821853	320

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	14	3474-14-NM-2	NM-2	UNC Teton	355420	822054	240
34	74	14	3474-14-NM-3	NM-3	UNC Teton	354777	822989	284
34	74	14	3474-14-NM-4	NM-4	UNC Teton	358316	821700	322
34	74	14	3474-14-NR-1	NR-1	UNC Teton	356914	821848	279
34	74	14	3474-14-NR-3	NR-3	UNC Teton	356935	821799	243
34	74	14	3474-14-NR-5	NR-5	UNC Teton	356961	821758	280
34	74	14	3474-14-OM-1	0M-1	UNC Teton	356772	823097	83
34	74	14	3474-14-OM-2	OM-2	UNC Teton	356933	821820	148
34	74	14	3474-14-OM-3	OM-3	UNC Teton	357909	823124	119
34	74	14	3474-14-PN5-L567CH	L567CH	UNC Teton	358446	821752	448
34	74	14	3474-14-POT 4+	POT 4+		356991.1953	822869.1357	
34	74	14	3474-14-POT 8+	POT 8+		356987.1953	822495.1357	
34	74	14	3474-14-POT-12	POT 12		356971.1953	822066.1357	
34	74	15	3474-15-1	1		351441	819608	
34	74	15	3474-15-10	10		351156	821048	
34	74	15	3474-15-11	11		349215	819511	
34	74	15	3474-15-12	12		350695	819389	
34	74	15	3474-15-13	13		349723	821069	
34	74	15	3474-15-14	14		353155	821024	
34	74	15	3474-15-15	15		350282	822422	
34	74	15	3474-15-16	16		352586	822487	
34	74	15	3474-15-17	17		351413	818176	
34	74	15	3474-15-19	19		353688	819592	
34	74	15	3474-15-2	2		351379	820339	
34	74	15	3474-15-2 Dup ID	2D		351505	822145	
34	74	15	3474-15-20	20		352552	820301	
34	74	15	3474-15-21	21		352004	821044	
34	74	15	3474-15-22	22		350302	818193	
34	74	15	3474-15-23	23		353636	820267	
34	74	15	3474-15-24	24		351989.7	821182	
34	74	15	3474-15-25	25		352607	821690	
34	74	15	3474-15-26	26		353638	820306	
34	74	15	3474-15-27	27		352031	822480	
34	74	15	3474-15-28	28		353107	820289	
34	74	15	3474-15-29	29		353397	819922	
34	74	15	3474-15-3	3		351375	821772	
34	74	15	3474-15-30	30		352016	821658	
34	74	15	3474-15-31	31		352016	820316	
34	74	15	3474-15-32	32		351077	819393	
34	74	15	3474-15-33	33		350692	819658	
34	74	15	3474-15-34	34		353348	820421	
34	74	15	3474-15-35	35		353344	820623	
34	74	15	3474-15-36	36		352095	821042	
34	74	15	3474-15-37	37		351919	820928	
34	74	15	3474-15-38	38		351812	820703	
34	74	15	3474-15-39	39		351895	821177	
34	74	15	3474-15-4	4		351430	822694	
34	74	15	3474-15-40	40		352078	821275	
34	74	15	3474-15-41	41		352185	821648	
34	74	15	3474-15-42	42		352611	821594	
34	74	15	3474-15-43	43		352788	821772	
34	74	15	3474-15-44	44		352407	822483	
34	74	15	3474-15-45	45		352603	822651	
34	74	15	3474-15-46	46		351807	821184	
34	74	15	3474-15-47	47		351804.7	821094	
34	74	15	3474-15-48	48		351547	820696	

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	15	3474-15-49	49		352000	821105	
34	74	15	3474-15-50	50		352784	821593	
34	74	15	3474-15-51	51		352012.7	820932	
34	74	15	3474-15-52	52		353822	820371	
34	74	15	3474-15-53	53		353582	820459	
34	74	15	3474-15-54	54		353124	821591	
34	74	15	3474-15-55	55		351911	821019	
34	74	15	3474-15-56	56		352433	821609	
34	74	15	3474-15-57	57		353052	818076	
34	74	15	3474-15-57DupID	15		353132	822480	
34	74	15	3474-15-58	58		351803	821129	
34	74	15	3474-15-59	59		351814	820995	
34	74	15	3474-15-60	60		351612	821090	
34	74	15	3474-15-61	61		351615	820897	
34	74	15	3474-15-62	62		353143	820842	
34	74	15	3474-15-63	63		353149	820629	
34	74	15	3474-15-64	64		353826	820269	
34	74	15	3474-15-65	65		353826	820175	
34	74	15	3474-15-66	66		353829	820071	
34	74	15	3474-15-67	67		351358	820682	
34	74	15	3474-15-68	68		353148	820740	
34	74	15	3474-15-69	69		353046	820837	
34	74	15	3474-15-70	70		352959	820837	
34	74	15	3474-15-71	71		351336	820879	
34	74	15	3474-15-72	72		351612	820993	
34	74	15	3474-15-73	73		352165	821201	
34	74	15	3474-15-74	74		352449	821234	
34	74	15	3474-15-75	75		352445	821328	
34	74	15	3474-15-76	76		352612	821402	
34	74	15	3474-15-77	77		352970	822502	
34	74	15	3474-15-78	78		352775	822489	
34	74	1	3474-1-CRX-23	CRX-23	UNC Teton	360150	828850	605
34	74	1	3474-1-CRX-24	CRX-24	UNC Teton	361550	829500	604
34	74	1	3474-1-CRX-26	CRX-26	UNC Teton	359825	829800	603
34	74	23	3474-23-10	10	Kerr McGee	354571.21	817206.34	
34	74	23	3474-23-1000	1000	Uranium One	357105	817207	703
34	74	23	3474-23-1001	1001	Uranium One	357505	817603	702
34	74	23	3474-23-1002	1002	Uranium One	357500	816800	703
34	74	23	3474-23-1003	1003	Uranium One	357911	817209	704
34	74	23	3474-23-1004	1004	Uranium One	358310	817733	705
34	74	23	3474-23-1005	1005	Uranium One	358510	816810	704
34	74	23	3474-23-1006	1006	Uranium One	359102	817605	705
34	74	23	3474-23-1007	1007	Uranium One	358190	817583	600
34	74	23	3474-23-1008	1008	Uranium One	358202	817702	602
34	74	23	3474-23-1009	1009	Uranium One	358200	817808	603
34	74	23	3474-23-1010	1010	Uranium One	358299	817793	603
34	74	23	3474-23-1011	1011	Uranium One	358400	817807	601
34	74	23	3474-23-1012	1012	Uranium One	358400	817194	703
34	74	23	3474-23-1013	1013	Uranium One	358600	817198	701
34	74	23	3474-23-1014	1014	Uranium One	358802	817197	696
34	74	23	3474-23-1015	1015	Uranium One	358482	817210	702
34	74	23	3474-23-1016	1016	Uranium One	358695	817205	704
34	74	23	3474-23-1017	1017	Uranium One	358591	817316	701
34	74	23	3474-23-1018	1018	Uranium One	358604	817107	700
34	74	23	3474-23-1019	1019	Uranium One	358505	817398	700
34	74	23	3474-23-1020	1020	Uranium One	358600	817405	702

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	23	3474-23-1021	1021	Uranium One	358700	817404	701
34	74	23	3474-23-1022	1022	Uranium One	358000	817807	704
34	74	23	3474-23-1023	1023	Uranium One	357985	817987.8	701
34	74	23	3474-23-1024	1024	Uranium One	358197	817985	704
34	74	23	3474-23-1025	1025	Uranium One	357988	817702	700
34	74	23	3474-23-1026	1026	Uranium One	358491	817301	702
34	74	23	3474-23-1027	1027	Uranium One	358393	817296	702
34	74	23	3474-23-1028	1028	Uranium One	358389	817400	703
34	74	23	3474-23-1029	1029	Uranium One	358397	817500	700
34	74	23	3474-23-1030	1030	Uranium One	358497	817517	699
34	74	23	3474-23-1031	1031	Uranium One	358582	817797	700
34	74	23	3474-23-1032	1032	Uranium One	358394	817897	703
34	74	23	3474-23-1033	1033	Uranium One	358450	817409	703
34	74	23	3474-23-1034	1034	Uranium One	358550	817404	703
34	74	23	3474-23-1035	1035	Uranium One	358600	817359	703
34	74	23	3474-23-1036	1036	Uranium One	358344	817497	702
34	74	23	3474-23-1037	1037	Uranium One	358205	817502	702
34	74	23	3474-23-1038	1038	Uranium One	358007	817500	697
34	74	23	3474-23-1039	1039	Uranium One	358298	817979	699
34	74	23	3474-23-1040	1040	Uranium One	358445	817497	701
34	74	23	3474-23-1041	1041	Uranium One	357793	817701	700
34	74	23	3474-23-1042	1042	Uranium One	358704	817347	704
34	74	23	3474-23-1043	1043	Uranium One	358700	817296	703
34	74	23	3474-23-1044	1044	Uranium One	358748	817296	703
34	74	23	3474-23-1045	1045	Uranium One	358200	817897	703
34	74	23	3474-23-1046	1046	Uranium One	358300	817899	702
34	74	23	3474-23-1047	1047	Uranium One	358905	817605	700
34	74	23	3474-23-1048	1048	Uranium One	357698	817605	701
34	74	23	3474-23-1049	1049	Uranium One	357841	817616	704
34	74	23	3474-23-1050	1050	Uranium One	357898	817604	702
34	74	23	3474-23-1051	1051	Uranium One	357697	817702	703
34	74	23	3474-23-1052	1052	Uranium One	357301	817805	703
34	74	23	3474-23-1053	1053	Uranium One	357498	817800	702
34	74	23	3474-23-1054	1054	Uranium One	357697	817800	702
34	74	23	3474-23-1055	1055	Uranium One	358400	817856	701
34	74	23	3474-23-1056	1056	Uranium One	358546	817358	703
34	74	23	3474-23-1057	1057	Uranium One	357700	817747	703
34	74	23	3474-23-1058	1058	Uranium One	357653	817696	703
34	74	23	3474-23-1059	1059	Uranium One	357700	817648	700
34	74	23	3474-23-1060	1060	Uranium One	357751	817701	703
34	74	23	3474-23-1061	1061	Uranium One	357754	817646	703
34	74	23	3474-23-1062	1062	Uranium One	357815	817646	703
34	74	23	3474-23-1063	1063	Uranium One	357751	817595	703
34	74	23	3474-23-1064	1064	Uranium One	357853	817600	702
34	74	23	3474-23-1065	1065	Uranium One	358491	817348	701
34	74	23	3474-23-1066	1066	Uranium One	358541	817304	703
34	74	23	3474-23-1067	1067	Uranium One	357896	817693	703
34	74	23	3474-23-1068	1068	Uranium One	357448	817907	702
34	74	23	3474-23-1069	1069	Uranium One	357490	817909	703
34	74	23	3474-23-1070	1070	Uranium One	357547	817901	703
34	74	23	3474-23-1071	1071	Uranium One	357597	817799	703
34	74	23	3474-23-1072	1072	Uranium One	357654	817755	701
34	74	23	3474-23-1073	1073	Uranium One	357597	817700	703
34	74	23	3474-23-1074	1074	Uranium One	357646	817646	700
34	74	23	3474-23-1075	1075	Uranium One	357747	817748	698
34	74	23	3474-23-1076	1076	Uranium One	358645	817316	704

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	23	3474-23-1077	1077	Uranium One	358700	817253	702
34	74	23	3474-23-1078	1078	Uranium One	357343	817913	703
34	74	23	3474-23-1079	1079	Uranium One	357545	817788	702
34	74	23	3474-23-1080	1080	Uranium One	357600	817848	702
34	74	23	3474-23-1081	1081	Uranium One	357545	817848	703
34	74	23	3474-23-1082	1082	Uranium One	357412	817911	702
34	74	23	3474-23-1083	1083	Uranium One	357461	817951	696
34	74	23	3474-23-1084	1084	Uranium One	357503	817974	703
34	74	23	3474-23-1085	1085	Uranium One	357946	817696	703
34	74	23	3474-23-1086	1086	Uranium One	357946	817643	702
34	74	23	3474-23-1087	1087	Uranium One	357896	817643	702
34	74	23	3474-23-1088	1088	Uranium One	357202	817804	700
34	74	23	3474-23-1089	1089	Uranium One	357255	817907	700
34	74	23	3474-23-1090A	1090A	Uranium One	357347	817852	699
34	74	23	3474-23-1091	1091	Uranium One	357646	817789	702
34	74	23	3474-23-1092	1092	Uranium One	357570	817752	700
34	74	23	3474-23-1093	1093	Uranium One	357393	817951	702
34	74	23	3474-23-1094	1094	Uranium One	356900	817609	695
34	74	23	3474-23-1095	1095	Uranium One	358094	817978	694
34	74	23	3474-23-1096	1096	Uranium One	358000	817902	696
34	74	23	3474-23-1097	1097	Uranium One	358898	817302	700
34	74	23	3474-23-1098	1098	Uranium One	358900	817207	700
34	74	23	3474-23-1099	1099	Uranium One	358344	817895	698
34	74	23	3474-23-11	11	Kerr McGee	356350.01	817205.13	
34	74	23	3474-23-1100	1100	Uranium One	358382	817992	698
34	74	23	3474-23-1101	1101	Uranium One	358493	817895	698
34	74	23	3474-23-1102	1102	Uranium One	356896	817900	700
34	74	23	3474-23-1103	1103	Uranium One	357295	817960	693
34	74	23	3474-23-1104	1104	Uranium One	357498	817852	697
34	74	23	3474-23-1105	1105	Uranium One	356749	817905	697
34	74	23	3474-23-1106	1106	Uranium One	356748	817610	697
34	74	23	3474-23-1107	1107	Uranium One	357003	817905	698
34	74	23	3474-23-1108	1108	Uranium One	357003	817602	699
34	74	23	3474-23-1109	1109	Uranium One	357740	817954	698
34	74	23	3474-23-1110	1110	Uranium One	357746	817842	699
34	74	23	3474-23-1111	1111	Uranium One	356753	817273	698
34	74	23	3474-23-1112	1112	Uranium One	358700	817597	699
34	74	23	3474-23-1113	1113	Uranium One	358698	817953	698
34	74	23	3474-23-1114	1114	Uranium One	359120	817886	699
34	74	23	3474-23-1115	1115	Uranium One	356753	817751	699
34	74	23	3474-23-1116	1116	Uranium One	356900	817756	700
34	74	23	3474-23-1117	1117	Uranium One	357098	817908	697
34	74	23	3474-23-1118	1118	Uranium One	359303	817597	702
34	74	23	3474-23-1119	1119	Uranium One	359300	817408	701
34	74	23	3474-23-1120	1120	Uranium One	359100	817800.6	
34	74	23	3474-23-1121	1121	Uranium One	356900	817821	700
34	74	23	3474-23-1122	1122	Uranium One	357000	817746	700
34	74	23	3474-23-1123	1123	Uranium One	356906	817397	700
34	74	23	3474-23-1124	1124	Uranium One	356904	817495	699
34	74	23	3474-23-1125	1125	Uranium One	356827	817603	700
34	74	23	3474-23-1126	1126	Uranium One	357004	817820	696
34	74	23	3474-23-1127	1127	Uranium One	356904	817495	700
34	74	23	3474-23-1128	1128	Uranium One	357000	817501	701
34	74	23	3474-23-1129	1129	Uranium One	359200	817615	700
34	74	23	3474-23-1130	1130	Uranium One	359300	817715	701
34	74	23	3474-23-1131	1131	Uranium One	356823	817758	697

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	23	3474-23-1132	1132	Uranium One	356822	817690	700
34	74	23	3474-23-1133	1133	Uranium One	357182	817907	700
34	74	23	3474-23-1134	1134	Uranium One	358905	817455	700
34	74	23	3474-23-1135	1135	Uranium One	359005	817605	701
34	74	23	3474-23-1136	1136	Uranium One	358998	817302	697
34	74	23	3474-23-1137	1137	Uranium One	358998	817202	697
34	74	23	3474-23-1138	1138	Uranium One	357899	817906	700
34	74	23	3474-23-1139	1139	Uranium One	357899	817806	700
34	74	23	3474-23-1140	1140	Uranium One	358097	817802	698
34	74	23	3474-23-1141	1141	Uranium One	357640	817954	699
34	74	23	3474-23-1142	1142	Uranium One	357792	817921	698
34	74	23	3474-23-1143	1143	Uranium One	358097	817702	700
34	74	23	3474-23-1144	1144	Uranium One	356748	817683	698
34	74	23	3474-23-1145	1145	Uranium One	356823	817833	693
34	74	23	3474-23-1146	1146	Uranium One	356948	817683	699
34	74	23	3474-23-1147	1147	Uranium One	358493	817795	699
34	74	23	3474-23-1148	1148	Uranium One	358493	817695	700
34	74	23	3474-23-1149	1149	Uranium One	358593	817695	698
34	74	23	3474-23-1150	1150	Uranium One	356748	817408	700
34	74	23	3474-23-1151	1151	Uranium One	356823	817508	700
34	74	23	3474-23-1152	1152	Uranium One	356823	817408	697
34	74	23	3474-23-1154	1154	Uranium One	359200	817786	700
34	74	23	3474-23-1155	1155	Uranium One	359300	817786	699
34	74	23	3474-23-14	14	Kerr McGee	358248.9	816851.5	1003
34	74	23	3474-23-16	16	Kerr McGee	355080.5	817305.21	1006
34	74	23	3474-23-17	17	Kerr McGee	355769.2	817240.14	1006
34	74	23	3474-23-18	18	Kerr McGee	356057.94	817256.53	724
34	74	23	3474-23-19	19	Kerr McGee	356352.5	817773.42	725
34	74	23	3474-23-20	20		357357.79	817714.5	
34	74	23	3474-23-21	21		357364.23	817426.69	
34	74	23	3474-23-22	22		356840.69	817154.89	
34	74	23	3474-23-23	23		356553.33	817823.54	
34	74	23	3474-23-23-24	23-24		359322.35	817304.21	
34	74	23	3474-23-25	25		358877.52	817336.05	
34	74	23	3474-23-26	26		357460.78	817431.82	
34	74	23	3474-23-27	27		357464.69	817576.18	
34	74	23	3474-23-28	28		357464.75	817716.47	
34	74	23	3474-23-29	29		357663.42	817585.44	
34	74	23	3474-23-302C	302C	Uranium Resources INC.	358687.8	817087.9	192
34	74	23	3474-23-303	303	Uranium Resources INC.	357747	817166	215
34	74	23	3474-23-304	304	Uranium Resources INC.	358140	817145	576
34	74	23	3474-23-319	319	Uranium Resources INC.	358335	817147	214
34	74	23	3474-23-321	321	Uranium Resources INC.	358351	817343	378
34	74	23	3474-23-322	322	Uranium Resources INC.	359254	816630	284
34	74	23	3474-23-325	325	Uranium Resources INC.	358552	817351	234
34	74	23	3474-23-328	328	Uranium Resources INC.	358505	817354	234
34	74	23	3474-23-329	329	Uranium Resources INC.	358607.7	817359.8	212
34	74	23	3474-23-340	340	Uranium Resources INC.	358437	817144	396
34	74	23	3474-23-458	458	Uranium Resources INC.	358387.8	817145	234
34	74	23	3474-23-459	459	Uranium Resources INC.	359208.3	816443.9	295
34	74	23	3474-23-461	461	Uranium Resources INC.	359249	816533.9	275
34	74	23	3474-23-473	473	Uranium Resources INC.	358626.12	817247.7	225
34	74	23	3474-23-474	474	Uranium Resources INC.	358621.7	817354.3	214
34	74	23	3474-23-475	475	Uranium Resources INC.	358819.4	817180.3	225
34	74	23	3474-23-476	476	Uranium Resources INC.	358646.4	817164.9	204
34	74	23	3474-23-477	477	Uranium Resources INC.	358361.5	817144.1	204

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	23	3474-23-478	478	Uranium Resources INC.	358520.5	817235.5	214
34	74	23	3474-23-479	479	Uranium Resources INC.	358969.9	816805.7	244
34	74	23	3474-23-480	480	Uranium Resources INC.	359074.5	816667.9	245
34	74	23	3474-23-489	489	Uranium Resources INC.	358743.8	817037.6	225
34	74	23	3474-23-490	490	Uranium Resources INC.	358955.1	816962.8	235
34	74	23	3474-23-501	501	Uranium Resources INC.	359164.6	816699.8	265
34	74	23	3474-23-505	505	Uranium Resources INC.	359352.2	816535.4	295
34	74	23	3474-23-539	539	Uranium Resources INC.	359179.3	816592	294
34	74	23	3474-23-540	540	Uranium Resources INC.	359004.8	816888.5	255
34	74	23	3474-23-541	541	Uranium Resources INC.	358422.7	817348.5	212
34	74	23	3474-23-72-1	72-1		354338.1	816928.7	
34	74	23	3474-23-72-2	UID2		354350.9	817011	
34	74	23	3474-23-DN-176	DN-176	Denison Mines, INC	354252.8	816833.1	379
34	74	23	3474-23-DN-177	DN-177	Denison Mines, INC	354347.9	816833.1	375
34	74	23	3474-23-DN-178	DN-178	Denison Mines, INC	354452	816827.4	377
34	74	23	3474-23-DN-179	DN-179	Denison Mines, INC	354547.9	816828.2	397
34	74	23	3474-23-DN-180	DN-180	Denison Mines, INC	354649	816825.4	396
34	74	23	3474-23-DN-181	DN-181	Denison Mines, INC	354404.8	816829	395
34	74	23	3474-23-DN-182	DN-182	Denison Mines, INC	354453.6	816877.8	395
34	74	23	3474-23-DN-319	DN-319	Denison Mines, INC	354319.5	816831.5	379
34	74	23	3474-23-DN-320	DN-320	Denison Mines, INC	354307.9	816927.5	396
34	74	23	3474-23-DN-321	DN-321	Denison Mines, INC	354374.8	816829.9	378
34	74	23	3474-23-FU1	1	UNC Teton	358506.1	815991.3	497
34	74	23	3474-23-FU12	12	UNC Teton	358764.1	817089.5	599
34	74	23	3474-23-FU13	13	UNC Teton	358657.7	817085.4	596
34	74	23	3474-23-FU14	14	UNC Teton	358457.6	816723.3	596
34	74	23	3474-23-FU17	17	UNC Teton	358856.7	817094.4	628
34	74	23	3474-23-FU18	18	UNC Teton	358561.9	817083.8	292
34	74	23	3474-23-FU19	19	UNC Teton	358875.4	817004.7	294
34	74	23	3474-23-FU2	2	UNC Teton	355816.2	817037.2	454
34	74	23	3474-23-FU20	20	UNC Teton	358891.5	816926.2	275
34	74	23	3474-23-FU21	21	UNC Teton	359065.8	816918.9	294
34	74	23	3474-23-FU22	22	UNC Teton	359273.6	816721.6	293
34	74	23	3474-23-FU25	25	UNC Teton	359076	816728.8	293
34	74	23	3474-23-FU27	27	UNC Teton	358795.6	816895.7	289
34	74	23	3474-23-FU3	3	UNC Teton	357838.2	816778.3	518
34	74	23	3474-23-FU-40-1	M-40	Morrison Nuclear	358173.2	816390.7	598
34	74	23	3474-23-FU-44-1	M-44	Morrison Nuclear	357004.3	815735.2	597
34	74	23	3474-23-FU-5	5	UNC Teton	356032.7	816366.8	335
34	74	23	3474-23-FU-51-1	M-51	Morrison Nuclear	354644.7	817033.1	600
34	74	23	3474-23-FU6	6	UNC Teton	358027.5	815057.5	458
34	74	23	3474-23-FU-70-10	N-10	Cordero	355183.9	815745.8	460
34	74	23	3474-23-FU-70-12	N-12	Cordero	354327.6	817148	475
34	74	23	3474-23-FU-70-2	N-2	Cordero	356936.9	816664.9	596
34	74	23	3474-23-FU-70-5	N-5	Cordero	355785.9	816555.6	455
34	74	23	3474-23-FU-70-6	N-6	Cordero	355821.9	817085.6	455
34	74	23	3474-23-FU-70-7	N-7	Cordero	355461.5	816119.9	475
34	74	23	3474-23-FU-70-9	N-9	Cordero	354362.6	816649.6	460
34	74	23	3474-23-FU-71-4	71-4	Cordero	358171.4	816422.5	416
34	74	23	3474-23-FU-71-5	71-5	Cordero	358172	816335.2	460
34	74	23	3474-23-FU-71-6	71-6	Cordero	358172	816368.2	414
34	74	23	3474-23-FU8	8	UNC Teton	355954.7	815957.9	396
34	74	23	3474-23-K1	1	Kerr McGee	356744.64	817764.74	618
34	74	23	3474-23-K-10	K-10	Kerr McGee	354475.1	816648	1000
34	74	23	3474-23-K-11	K-11	Kerr McGee	356309.8	816653.3	1004
34	74	23	3474-23-K-13	K-13	Kerr McGee	356962.79	817374.51	1005

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	23	3474-23-K-14	14	Kerr McGee	358131.7	816646.1	1003
34	74	23	3474-23-K-16	K-16	Kerr McGee	355075.2	816648.1	1006
34	74	23	3474-23-K-17	K-17	Kerr McGee	355676.5	816647.9	1006
34	74	23	3474-23-K-18	K-18	Kerr McGee	356010.6	816626.4	724
34	74	23	3474-23-K-19	K-19	Kerr McGee	356308.7	817211.6	726
34	74	23	3474-23-M-13	M-13	Morrison Nuclear	359100	816750	501
34	74	23	3474-23-N-11	N-11	Cordero	354226.9	815308	
34	74	23	3474-23-N-13	N-13	Cordero	354283.7	817386.4	
34	74	23	3474-23-N-8	N-8	Cordero	354364.8	816927.5	
34	74	24	3474-24-10	10		363844.5	816515.5	
34	74	24	3474-24-1000	1000	Uranium One	359535	817181	900
34	74	24	3474-24-1001	1001	Uranium One	359923	817594	605
34	74	24	3474-24-1002	1002	Uranium One	359900	816800	604
34	74	24	3474-24-1003	1003	Uranium One	360300	817200	702
34	74	24	3474-24-1004	1004	Uranium One	360700	817600	703
34	74	24	3474-24-1005	1005	Uranium One	360700	816800	705
34	74	24	3474-24-1006	1006	Uranium One	361074	817177	704
34	74	24	3474-24-1007	1007	Uranium One	361480	817613	701
34	74	24	3474-24-1008	1008	Uranium One	361500	816815	704
34	74	24	3474-24-1009	1009	Uranium One	361900	817200	696
34	74	24	3474-24-1010	1010	Uranium One	362400	817600	701
34	74	24	3474-24-1011	1011	Uranium One	362400	816805	603
34	74	24	3474-24-1012	1012	Uranium One	362901	817203	703
34	74	24	3474-24-1013	1013	Uranium One	363305	817605	702
34	74	24	3474-24-1014	1014	Uranium One	363300	816804	903
34	74	24	3474-24-1015	1015	Uranium One	363696	817255	699
34	74	24	3474-24-1016	1016	Uranium One	364105	817600	703
34	74	24	3474-24-1017	1017	Uranium One	364102	816805	702
34	74	24	3474-24-1018	1018	Uranium One	364502	817201	701
34	74	24	3474-24-1019	1019	Uranium One	361717	817410	742
34	74	24	3474-24-1020	1020	Uranium One	362100	817400	742
34	74	24	3474-24-1021	1021	Uranium One	361802	817004	741
34	74	24	3474-24-1022	1022	Uranium One	362201	816994	741
34	74	24	3474-24-1023	1023	Uranium One	363700	816400	908
34	74	24	3474-24-1023A	1023A	Uranium One	362300	816900	744
34	74	24	3474-24-1024	1024	Uranium One	362502	816897	723
34	74	24	3474-24-1025	1025	Uranium One	362500	816700	742
34	74	24	3474-24-1026	1026	Uranium One	364500	816400	703
34	74	24	3474-24-1026A	1026A	Uranium One	362300	816700	742
34	74	24	3474-24-1027	1027	Uranium One	361391	817725	710
34	74	24	3474-24-1028	1028	Uranium One	361562	817699	700
34	74	24	3474-24-1029	1029	Uranium One	361390	817509	700
34	74	24	3474-24-1030	1030	Uranium One	361572	817522	702
34	74	24	3474-24-1031	1031	Uranium One	361566	817602	704
34	74	24	3474-24-1032	1032	Uranium One	361568	817556	704
34	74	24	3474-24-1033	1033	Uranium One	361517	817556	705
34	74	24	3474-24-1034	1034	Uranium One	361488	817548	704
34	74	24	3474-24-1035	1035	Uranium One	361554	817829	745
34	74	24	3474-24-1036	1036	Uranium One	361745	817553	744
34	74	24	3474-24-1037	1037	Uranium One	362499	817081	744
34	74	24	3474-24-1038	1038	Uranium One	362685	817082	741
34	74	24	3474-24-1039	1039	Uranium One	362700	816900	745
34	74	24	3474-24-1040	1040	Uranium One	361315	817504	703
34	74	24	3474-24-1041	1041	Uranium One	361508	817503	705
34	74	24	3474-24-1042	1042	Uranium One	361406	817400	633
34	74	24	3474-24-1043	1043	Uranium One	361300	817400	704

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	24	3474-24-1044	1044	Uranium One	361647	817551	703
34	74	24	3474-24-1045	1045	Uranium One	361411	817606	703
34	74	24	3474-24-1046	1046	Uranium One	361305	817808	701
34	74	24	3474-24-1047	1047	Uranium One	361703	817802	704
34	74	24	3474-24-1048	1048	Uranium One	361955	817557	704
34	74	24	3474-24-1049	1049	Uranium One	362500	817300	701
34	74	24	3474-24-1050	1050	Uranium One	362607	817106	700
34	74	24	3474-24-1051	1051	Uranium One	362400	817100	705
34	74	24	3474-24-1052	1052	Uranium One	361355	817672	706
34	74	24	3474-24-1053	1053	Uranium One	361697.2537	817544.3033	725
34	74	24	3474-24-1054	1054	Uranium One	361749.9361	817450.2554	727
34	74	24	3474-24-1055	1055	Uranium One	361650	817450	726
34	74	24	3474-24-1056	1056	Uranium One	361601	817548	725
34	74	24	3474-24-1057	1057	Uranium One	361849	817550	702
34	74	24	3474-24-1058	1058	Uranium One	361854	817448	706
34	74	24	3474-24-1059	1059	Uranium One	361950	817450	702
34	74	24	3474-24-1060	1060	Uranium One	361954	817748	705
34	74	24	3474-24-1061	1061	Uranium One	361648.949	817495.6461	706
34	74	24	3474-24-1062	1062	Uranium One	361698.8861	817495.6261	705
34	74	24	3474-24-1063	1063	Uranium One	361698.8861	817446.1993	705
34	74	24	3474-24-1064	1064	Uranium One	361800	817456	705
34	74	24	3474-24-1065	1065	Uranium One	361699.9185	817600.0561	706
34	74	24	3474-24-1066	1066	Uranium One	361750.0924	817598.5743	704
34	74	24	3474-24-1067	1067	Uranium One	362450	817100	706
34	74	24	3474-24-1068	1068	Uranium One	362500	817150	704
34	74	24	3474-24-1069	1069	Uranium One	362503	817059	704
34	74	24	3474-24-1070	1070	Uranium One	363332	817216	705
34	74	24	3474-24-1071	1071	Uranium One	363700	816800	704
34	74	24	3474-24-1072	1072	Uranium One	364158	817222	706
34	74	24	3474-24-1073	1073	Uranium One	364500	816800	704
34	74	24	3474-24-1074	1074	Uranium One	362550	817150	705
34	74	24	3474-24-1075	1075	Uranium One	362500	817200	701
34	74	24	3474-24-1076	1076	Uranium One	362600	817200	724
34	74	24	3474-24-1077	1077	Uranium One	362611	817051	723
34	74	24	3474-24-1078	1078	Uranium One	364500	816700	701
34	74	24	3474-24-1079	1079	Uranium One	361795	817553	700
34	74	24	3474-24-1080	1080	Uranium One	362058	817756	744
34	74	24	3474-24-1081	1081	Uranium One	364500	816900	693
34	74	24	3474-24-1082	1082	Uranium One	361443	817808	721
34	74	24	3474-24-1083	1083	Uranium One	361476	817755	718
34	74	24	3474-24-1084	1084	Uranium One	361554	817752	722
34	74	24	3474-24-1085	1085	Uranium One	361155	817648	721
34	74	24	3474-24-1086	1086	Uranium One	361208	817704	723
34	74	24	3474-24-1087	1087	Uranium One	361200	817801	720
34	74	24	3474-24-1088	1088	Uranium One	362100	817200	724
34	74	24	3474-24-1089	1089	Uranium One	361900	817100	719
34	74	24	3474-24-1090	1090	Uranium One	361700	817200	722
34	74	24	3474-24-1091	1091	Uranium One	360950	817649	701
34	74	24	3474-24-1092	1092	Uranium One	361855	817657	742
34	74	24	3474-24-1093	1093	Uranium One	361955	817657	740
34	74	24	3474-24-1094	1094	Uranium One	362055	817657	740
34	74	24	3474-24-1096	1096	Uranium One	362100	817300	722
34	74	24	3474-24-1097	1097	Uranium One	362200	817200	723
34	74	24	3474-24-1098	1098	Uranium One	364407	816805	721
34	74	24	3474-24-1099	1099	Uranium One	359502	817600	700
34	74	24	3474-24-11	11		362066.9	817181.1	1500

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	24	3474-24-1100	1100	Uranium One	359512	817900	697
34	74	24	3474-24-1101	1101	Uranium One	359906	817904	700
34	74	24	3474-24-1102	1102	Uranium One	360300	817900	702
34	74	24	3474-24-1103	1103	Uranium One	360703	817899	702
34	74	24	3474-24-1104	1104	Uranium One	361100	817900	712
34	74	24	3474-24-1105	1105	Uranium One	359499	817401	701
34	74	24	3474-24-1106	1106	Uranium One	359701	817598	702
34	74	24	3474-24-1107	1107	Uranium One	359888	817234.2	697
34	74	24	3474-24-1108	1108	Uranium One	360204	816809	701
34	74	24	3474-24-1109	1109	Uranium One	359493	817703	702
34	74	24	3474-24-1110	1110	Uranium One	359694	817901	701
34	74	24	3474-24-1111	1111	Uranium One	363500	816800	700
34	74	24	3474-24-1112	1112	Uranium One	364300	816800	700
34	74	24	3474-24-1113	1113	Uranium One	364400	816700	702
34	74	24	3474-24-1114	1114	Uranium One	359400	817597	701
34	74	24	3474-24-1115	1115	Uranium One	359500	817515	697
34	74	24	3474-24-1116	1116	Uranium One	359598	817598	697
34	74	24	3474-24-1117	1117	Uranium One	364412	816917	702
34	74	24	3474-24-1118	1118	Uranium One	364500	816600	701
34	74	24	3474-24-1119	1119	Uranium One	359410	817689	702
34	74	24	3474-24-1120	1120	Uranium One	359400	817500	701
34	74	24	3474-24-1121	1121	Uranium One	359510	817789	701
34	74	24	3474-24-1122	1122	Uranium One	359750	817812	700
34	74	24	3474-24-1123	1123	Uranium One	362903	817601	743
34	74	24	3474-24-1124	1124	Uranium One	363100	817200	742
34	74	24	3474-24-1125	1125	Uranium One	363300	817400	740
34	74	24	3474-24-1126	1126	Uranium One	363300	817000	740
34	74	24	3474-24-1127	1127	Uranium One	363500	817200	741
34	74	24	3474-24-1128	1128	Uranium One	363700	817600	738
34	74	24	3474-24-1129	1129	Uranium One	363875	816852	739
34	74	24	3474-24-1130	1130	Uranium One	364105	817000	740
34	74	24	3474-24-1131	1131	Uranium One	361700	817300	719
34	74	24	3474-24-1132	1132	Uranium One	361800	817200	720
34	74	24	3474-24-1133	1133	Uranium One	361800	817100	719
34	74	24	3474-24-1134	1134	Uranium One	362000	817200	719
34	74	24	3474-24-1139	1139	Uranium One	363507	816999	738
34	74	24	3474-24-15	15		362744.4	816526.6	
34	74	24	3474-24-16	16		363179.7	817339.4	
34	74	24	3474-24-23	23		359591.7	816710	
34	74	24	3474-24-28	28		362417.4	817257.6	
34	74	24	3474-24-29	29		362373.3	815584.7	
34	74	24	3474-24-305	305	Uranium Resources INC.	359433	816482	644
34	74	24	3474-24-307	307	Uranium Resources INC.	360211	816363	696
34	74	24	3474-24-31	31		360776.2	816665.5	
34	74	24	3474-24-311	311	Uranium Resources INC.	361356	815937	455
34	74	24	3474-24-314	314	Uranium Resources INC.	361761	816327	795
34	74	24	3474-24-317	317	Uranium Resources INC.	362470	816935	795
34	74	24	3474-24-32	32		362551.1	817250.6	
34	74	24	3474-24-323	323	Uranium Resources INC.	359912	816404	314
34	74	24	3474-24-324	324	Uranium Resources INC.	360196	816150	314
34	74	24	3474-24-326	326	Uranium Resources INC.	359625	816386	354
34	74	24	3474-24-327	327	Uranium Resources INC.	359894	816232	334
34	74	24	3474-24-35	35		360756	817338.6	
34	74	24	3474-24-460	460	Uranium Resources INC.	360524.4	815327.6	595
34	74	24	3474-24-462	462	Uranium Resources INC.	359576.1	816266.4	314
34	74	24	3474-24-463	463	Uranium Resources INC.	360308.1	814762.8	543

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	24	3474-24-464	464	Uranium Resources INC.	359797.3	815767.5	542
34	74	24	3474-24-465	465	Uranium Resources INC.	360419.1	815044.8	214

Table 3.3-1: Ludeman Drill Hole Records

Township	Range	Section	Hole Number	Short Hole ID	Company	Easting Coordinate	Northing Coordinate	Total Logged Depth
34	74	24	3474-24-466	466	Uranium Resources INC.	359856.8	815935.3	244
34	74	24	3474-24-467	467	Uranium Resources INC.	360359.6	814903.9	194
34	74	24	3474-24-468	468	Uranium Resources INC.	360391.2	814978.5	194
34	74	24	3474-24-469	469	Uranium Resources INC.	359795.7	815862.7	213
34	74	24	3474-24-470	470	Uranium Resources INC.	359777	815676.1	194
34	74	24	3474-24-472	472	Uranium Resources INC.	360405.1	815010.7	171
34	74	24	3474-24-491	491	Uranium Resources INC.	360160.4	815412.6	443
34	74	24	3474-24-492	492	Uranium Resources INC.	359888.7	815862.7	234
34	74	24	3474-24-493	493	Uranium Resources INC.	360486.1	814945	194
34	74	24	3474-24-494	494	Uranium Resources INC.	360092.4	815343.3	214
34	74	24	3474-24-496	496	Uranium Resources INC.	360160.6	815276.3	214
34	74	24	3474-24-497	497	Uranium Resources INC.	359963.5	815935.9	235
34	74	24	3474-24-498	498	Uranium Resources INC.	361153.9	814748.8	395
34	74	24	3474-24-499	499	Uranium Resources INC.	360090.9	815483.4	214
34	74	24	3474-24-500	500	Uranium Resources INC.	359525.3	816430.4	324
34	74	24	3474-24-502	502	Uranium Resources INC.	359691.1	816087.7	335
34	74	24	3474-24-503	503	Uranium Resources INC.	360325.5	815077	214
34	74	24	3474-24-506	506	Uranium Resources INC.	360295.1	815011.9	194
34	74	24	3474-24-507	307	Uranium Resources INC.	361304.4	814366.9	396
34	74	24	3474-24-509	501	Uranium Resources INC.	359762.3	816141.4	265
34	74	24	3474-24-510	510	Uranium Resources INC.	360155	815563.8	234
34	74	24	3474-24-513	513	Uranium Resources INC.	361331.14	814091.8	234
34	74	24	3474-24-514	514	Uranium Resources INC.	360229	815346.1	234
34	74	24	3474-24-515	515	Uranium Resources INC.	361329.7	814189.8	234
34	74	24	3474-24-516	516	Uranium Resources INC.	360758.2	814742.1	354
34	74	24	3474-24-518	518	Uranium Resources INC.	360535.1	814744.3	315
34	74	24	3474-24-519	519	Uranium Resources INC.	359785.6	815999.1	244
34	74	24	3474-24-520	520	Uranium Resources INC.	361321.3	813988.8	114
34	74	24	3474-24-521	521	Uranium Resources INC.	360949	825406	360
34	74	24	3474-24-522	522	Uranium Resources INC.	360852	825403	360
34	74	24	3474-24-523	523	Uranium Resources INC.	359522.3	816352	333
34	74	24	3474-24-524	524	Uranium Resources INC.	360246.9	815176.5	254
34	74	24	3474-24-525	525	Uranium Resources INC.	360000.5	815734.2	251
34	74	24	3474-24-526	526	Uranium Resources INC.	360716.7	814743.2	134
34	74	24	3474-24-527	527	Uranium Resources INC.	360228.1	815078.3	214
34	74	24	3474-24-528	528	Uranium Resources INC.	360093.7	815725.4	235
34	74	24	3474-24-529	529	Uranium Resources INC.	359742	815933.8	234
34	74	24	3474-24-530	530	Uranium Resources INC.	360260.4	815269.8	214
34	74	24	3474-24-531	531	Uranium Resources INC.	360582.8	814912.9	194
34	74	24	3474-24-532	532	Uranium Resources INC.	360133.2	815640.7	234
34	74	24	3474-24-533	533	Uranium Resources INC.	359394.4	816394.6	335
34	74	24	3474-24-534	534	Uranium Resources INC.	360179.8	815209.3	214
34	74	24	3474-24-535	535	Uranium Resources INC.	360064.9	815568.2	234
34	74	24	3474-24-536	536	Uranium Resources INC.	360560.9	814823.3	194
34	74	24	3474-24-537	537	Uranium Resources INC.	359791.5	815722.5	214
34	74	24	3474-24-538	538	Uranium Resources INC.	359693.8	816262.1	335
34	74	24	3474-24-542	542	Uranium Resources INC.	360161.8	815344.7	234
34	74	24	3474-24-543	543	Uranium Resources INC.	359971.7	815809.6	235
34	74	24	3474-24-544	544	Uranium Resources INC.	360107.1	815565.3	234
34	74	24	3474-24-545	545	Uranium Resources INC.	360039.9	815737.1	235
34	74	24	3474-24-7	7		363343.3	816782.7	
34	74	24	3474-24-9	9		362676.9	817268	
34	74	24	3474-24-FU-25-1	M-25	Morrison Nuclear	362393.3	817171.5	598
34	74	24	3474-24-FU-83-1	M-83	Morrison Nuclear	364002.4	814886.1	815
34	74	24	3474-24-FU-92-1	M-92	Morrison Nuclear	361815	812817.6	586
34	74	24	3474-24-FU-97-1	M-97	Morrison Nuclear	359850.1	814089.2	597

ADDENDUM 3.3-B

LUDEMAN SOILS TABLE

Table 3.3-2: Soil Mapping Unit Acreages

Map Symbol	Map Unit Description	Proposed Disturbance	Existing Disturbance	Proposed Disturbance Within Existing Disturbance	Total Disturbance
Ba	Bahl clay loam	0.00	0.05	0.00	0.05
Bo	Bowbac sandy loam	0.00	16.03	0.00	16.03
Ca	Cambria loam	10.12	23.15	0.00	33.27
Cl	Clarkelen fine sandy loam	0.00	48.20	0.00	48.20
CuNC	Cushman noncalcareous variant	0.00	4.18	0.00	4.18
Cu	Cushman very fine sandy loam	0.26	0.00	0.00	0.26
De	Decolney fine sandy loam	1.87	4.39	0.00	6.26
Dr	Draknab loamy sand	0.00	0.00	0.00	0.00
Dw	Dwyer fine sand	2.37	0.00	0.00	2.37
EmMV	Embry moderately deep variant	0.14	2.60	0.00	2.74
Fo	Forkwood loam	21.87	21.12	0.35	43.34
FoNC-ClNC-ThNC	Forkwood noncalcareous variant-Clarkelen noncalcareous variant-Theedle noncalcareous variant	104.09	0.00	0.00	104.09
Fo-Sh	Forkwood-Shingle complex	0.00	12.12	0.00	12.12
Fo-Th	Forkwood-Theedle complex	15.05	5.63	0.00	20.68
Ha	Haverdad loam	8.05	0.00	0.00	8.05
Hi	Hiland fine sandy loam	67.50	34.87	2.55	104.92
HiNC	Hiland noncalcareous variant	0.00	0.00	0.00	0.00
KeNC	Keeline noncalcareous variant	0.00	11.90	0.00	11.90
Ke	Keeline sandy loam	8.26	29.16	0.01	37.43
Ke-De-Th	Keeline-Decolney-Theedle complex	0.22	31.93	0.01	32.16
Ke-Or-Ta	Keeline-Orpha-Taluce complex	19.05	1.46	0.00	20.51
Ki	Kishona loam	160.54	60.69	0.03	221.26
Ki-Fo	Kishona-Forkwood complex	18.45	0.00	0.00	18.45
Lo-ThNC	Lolite-Theedle noncalcareous complex	0.00	0.00	0.00	0.00

Or	Orpha loamy sand	20.73	24.73	0.00	45.46
OrMV	Orpha moderately deep variant	0.00	4.68	0.00	4.68
Pe	Petrie clay loam	1.07	2.41	0.00	3.48
Re	Renohill clay loam	7.77	0.00	0.00	7.77
Sh	Shingle clay loam	80.08	25.33	0.00	105.41
ShNC	Shingle noncalcareous variant	1.42	0.00	0.00	1.42
Sh-Fo-EmMV	Shingle-Forkwood-Embry moderately deep variant complex	0.00	0.00	0.00	0.00
Sh-Th-Ki	Shingle-Theedle-Kishona complex	7.16	3.30	0.00	10.46
TaNC	Taluce noncalcareous variant	25.64	0.60	0.00	26.24
TaNC-Or	Taluce noncalcareous variant-Orpha complex	16.45	0.00	0.00	16.45
Th	Theedle loam	66.90	6.68	0.00	73.58
ThNC	Theedle noncalcareous variant	19.78	3.39	0.00	23.17
Th-CuNC	Theedle-Cushman noncalcareous variant complex	1.25	0.00	0.00	1.25
Tl	Tullock loamy sand	17.82	0.00	0.00	17.82
TlNC	Tullock noncalcareous variant	0.00	0.00	0.00	0.00
TlNC-Ta	Tullock noncalcareous variant-Taluce complex	0.00	0.00	0.00	0.00
TlNC-Tu	Tullock noncalcareous variant-Turnercrest complex	27.74	0.00	0.00	27.74
Tu	Turnercrest fine sandy loam	45.03	9.06	0.04	54.13
TuNC	Turnercrest noncalcareous variant	0.15	0.00	0.00	0.15
Ul	Ulm clay loam	1.22	2.55	0.00	3.77
Wo	Worf loam	34.28	0.00	0.00	34.28
WoNC	Worf noncalcareous variant	0.08	0.00	0.00	0.08
Zi	Zigweid loam	1.06	0.00	0.00	1.06
ZiNC-Th	Zigweid noncalcareous variant-Theedle complex	0.00	0.02	0.00	0.02
Total		**813.47**	**390.24**	**2.99**	**1,206.70**

Table 3.3-3: Soil Series Sample Summary

Soil Series	Number of Profiles Sampled for Chemical Analysis 1
Bahl	1
Bowbac	1
Cambria	2
Clarkelen	3
Clarkelen noncalcareous variant	1
Cushman	1
Cushman noncalcareous variant	1
Decolney	2
Draknab	1
Dwyer	1
Embry moderately deep variant	1
Forkwood	3
Forkwood noncalcareous variant	1
Haverdad	1
Hiland	2
Hiland noncalcareous variant	1
Keeline	3
Keeline noncalcareous variant	1
Kishona	3
Lolite	1
Orpha	2
Petrie	1
Renohill	1
Shingle	3
Shingle noncalcareous variant	1
Taluce	1
Taluce noncalcareous variant	1
Theedle	3
Theedle noncalcareous variant	1
Tullock	1
Tullock noncalcareous variant	1
Turnercrest	2
Turnercrest noncalcareous variant	1
Ulm	2
Worf	1
Worf noncalcareous variant	1
Zigweid	1
Zigweid noncalcareous variant	1
Total	56

[1]Samples were taken within proposed disturbed area, when possible, as defined by initial estimates of the ore body.

Table 3.3-4: Soil Sample Locations

Soil Sample Number[1]	Map Unit Symbol	Soil Series
137	Wo	Worf clay loam
138	TaNC	Taluce noncalcareous variant
139	Ha	Haverdad clay loam
140	Or	Orpha sandy clay loam
141	Tl	Tullock sandy clay loam
142	Ke-Or-Ta	Taluce sandy loam
146	Lo-ThNC	Lolite clay
148	Hi	Hiland sandy clay loam
150	TlNC-Tu	Turnercrest sandy loam
151	ThNC	Theedle noncalcareous variant
152	Ki-Fo	Forkwood sandy clay loam
153	Ke	Keeline sandy loam
154	Th	Theedle sandy clay loam
155	Hi	Hiland sandy clay loam
156	Ul	Ulm sandy clay loam
158	Ki	Kishona clay
159	Zi	Zigweid clay
160	Fo	Forkwood clay loam
161	Fo	Forkwood clay loam
162	ShNC	Shingle noncalcareous variant
163	Ki	Kishona clay/clay loam
164	Tu	Turnercrest sandy clay loam
165	Ki	Kishona clay loam
166	Dw	Dwyer loamy sand
168	FoNC-ClNC-ThNC	Clarkelen noncalcareous variant
170	Ca	Cambria sandy clay loam
171	Sh-Fo-EmMV	Shingle clay loam
172	Sh-Fo-EmMV	Embry moderately deep variant
173	Ke	Keeline sandy clay loam
174	Ba	Bahl clay loam
175	HiNC	Hiland noncalcareous variant
177	WoNC	Worf noncalcareous variant
178	Dr	Draknab sandy loam
180	Th	Theedle clay
181	TuNC	Turnercrest noncalcareous variant
182	Ke-Or-Ta	Orpha sandy loam
183	CuNC	Cushman noncalcareous variant
184	Sh	Shingle sandy loam/sandy clay loam
185	Cl	Clarkelen sandy loam

Soil Sample Number[1]	Map Unit Symbol	Soil Series
186	ZiNC-Th	Zigweid noncalcareous variant
187	Re	Renohill clay
188	Ke	Keeline sandy loam/sandy clay loam
189	Bo	Bowbac sandy clay
190	De	Decolney sandy loam
191	TlNC-Tu	Tullock noncalcareous variant
192	Sh	Shingle clay loam
193	Ul	Ulm clay loam
194	Pe	Petrie clay/clay loam
195	KeNC	Keeline noncalcareous variant
197	De	Decolney sandy loam
198	Th	Theedle sandy loam
199	FoNC-ClNC-ThNC	Forkwood noncalcareous variant
201	Ca	Cambria sandy loam/sandy clay loam
202	Cl	Clarkelen clay
203	Cu	Cushman clay loam
204	Cl	Clarkelen sandy clay loam

[1]Samples were taken within proposed disturbed area, when possible, as defined by initial estimates of the ore body.

Table 3.3-5: Summary of Marginal and Unsuitable Parameters within Sampled Profiles

Series	Sample Point	Depth (in)	Marginal[1]	Unsuitable[1]
Worf	137	5-12	Clay %	
Haverdad	139	36-46	Saturation % Clay %	
Orpha	140	35-45	Clay %	
		45-55	Saturation % Clay %	
		55-60	Clay %	
Tullock	141	0-11	Saturation %	
Taluce	142	8-16	Saturation %	
Lolite	146	0-9	Clay %	
		9-24	Clay %	
Turnercrest	150	20-35	Saturation %	
Theedle noncalcareous variant	151	7-24	Clay %	
Theedle	154	24-36	Clay %	
Hiland	155	37-48	pH	
Ulm	156	12-29	Clay %	
		29-37	Clay % Selenium	
		37-53	Clay %	
Kishona	158	0-12	Clay %	
Zigweid	159	0-14	Clay %	
		14-28	Clay %	
Forkwood	160	13-21	Clay %	
		33-55	Clay %	
		55-60	Clay %	
Forkwood	161	12-28	Clay %	
		28-46	Clay %	
Shingle noncalcareous variant	162	0-12	Clay %	
Kishona	163	0-7	Clay %	
		20-29	SAR	
		29-37	SAR	EC
		37-50		EC SAR
		50-60		EC SAR
Dwyer	166	0-7	Saturation %	
		21-36	Saturation %	

Series	Sample Point	Depth (in)	Marginal[1]	Unsuitable[1]
		36-48	Saturation %	
Embry moderately deep variant	172	0-12	Saturation %	
		12-19	Saturation %	
Bahl	174	3-10	Clay %	
		10-20	Clay %	
		20-36	Clay %	
		36-48	Selenium	
Hiland noncalcareous variant	175	0-4	Saturation % Sand % Selenium	
Draknab	178	2-12	Saturation %	
		12-18	Saturation %	
		29-35	Saturation %	
		35-60	Saturation %	
Theedle	180	0-2	Clay %	
		2-12	Clay %	
Clarkelen	185	31-48	Saturation %	
Renohill	187	0-8	Clay %	
		8-17	Clay %	
		17-22	Clay %	
Keeline	188	21-30		SAR
Bowbac	189	0-8		SAR
		18-24		SAR
Decolney	190	0-3	SAR	
Tullock noncalcareous variant	191	3-11	Saturation %	
Shingle	192	1-8	Clay %	
Ulm	193	3-10	Clay %	
		36-60	Clay % Selenium	
Petrie	194	0-8	Clay %	
		32-44	Clay %	
Keeline noncalcareous variant	195	0-9	Saturation %	
		9-18	Saturation %	
		18-37	Saturation %	
		37-48	Saturation %	
Decolney	197	0-4	Saturation %	
		4-10	Saturation %	
		10-19	Saturation %	
		19-36	Saturation %	

Series	Sample Point	Depth (in)	Marginal[1]	Unsuitable[1]
		36-48	Saturation % Sand %	
Theedle	198	0-6	Saturation %	
		6-22	Saturation %	
Forkwood noncalcareous variant	199	14-26	Saturation %	
		43-60	Saturation %	
Clarkelen	202	0-4	Clay %	
		4-17	Clay %	
Cushman	203	8-21	Clay %	
		21-40	Selenium	
Clarkelen	204	29-48	Saturation %	

[1]Marginal and unsuitable parameters based on lab analysis.

Table 3.3-6: Summary of Trends in Marginal and Unsuitable Parameters for Soil Series

Series	Unsuitable/Marginal Parameter[1]
Bahl	Clay %
Bowbac	SAR
Clarkelen	Saturation %
Cushman	Clay %, Selenium
Decolney	Saturation %
Draknab	Saturation %
Dwyer	Saturation %
Embry moderately deep variant	Saturation %
Forkwood	Clay %
Forkwood noncalcareous variant	Saturation %
Haverdad	Saturation %, Clay %
Hiland	pH
Hiland noncalcareous variant	Saturation %, Sand %, Selenium
Keeline	SAR
Keeline noncalcareous variant	Saturation %
Kishona	Clay %, EC, SAR
Lolite	Clay %
Orpha	Saturation %
Petrie	Clay %
Renohill	Clay %
Shingle	Clay %
Shingle noncalcareous variant	Clay %
Taluce	Saturation %
Theedle	Clay %
Theedle noncalcareous variant	Clay %
Tullock	Saturation %
Tullock noncalcareous variant	Saturation %
Ulm	Clay %, Selenium
Worf	Clay %
Zigweid	Clay %

[1]Marginal and unsuitable parameters based on lab analysis.

Table 3.3-7: Summary of Approximate Soil Salvage Depths

Map Symbol	Mapping Unit Description	Disturbance Areas1 (acres)	Salvage Depth (feet)	Total Volume (Acre feet)
Ba	Bahl clay loam	0.05	0.83	0.04
Bo	Bowbac sandy loam	16.03	0.00	0.00
Ca	Cambria loam	33.27	2.88	95.82
Cl	Clarkelen fine sandy loam	48.20	2.89	139.30
CuNC	Cushman noncalcareous variant	4.18	1.83	7.65
Cu	Cushman very fine sandy loam	0.26	0.67	0.17
De	Decolney fine sandy loam	6.26	2.08	13.02
Dw	Dwyer fine sand	2.37	4.00	9.48
EmMV	Embry moderately deep variant	2.74	1.58	4.33
Fo	Forkwood loam	43.34	1.78	77.15
FoNC-ClNC-ThNC	Forkwood noncalcareous variant-Clarkelen noncalcareous variant-Theedle noncalcareous variant	104.09	3.53	367.44
Fo-Sh	Forkwood-Shingle complex	12.12	1.33	16.16
Fo-Th	Forkwood-Theedle complex	20.68	1.88	38.88
Ha	Haverdad loam	8.05	1.67	13.44
Hi	Hiland fine sandy loam	104.92	1.50	157.38
KeNC	Keeline noncalcareous variant	11.90	4.00	47.60
Ke	Keeline sandy loam	37.43	2.69	100.69
Ke-De-Th	Keeline-Decolney-Theedle complex	32.16	2.25	72.36
Ke-Or-Ta	Keeline-Orpha-Taluce complex	20.51	2.33	47.79
Ki	Kishona loam	221.26	3.14	694.76
Ki-Fo	Kishona-Forkwood complex	18.45	2.46	45.39
Or	Orpha loamy sand	45.46	3.63	165.02
OrMV	Orpha moderately deep variant	4.68	2.92	13.67
Pe	Petrie clay loam	3.48	3.00	10.44
Re	Renohill clay loam	7.77	1.42	11.03
Sh	Shingle clay loam	105.41	0.89	93.81
ShNC	Shingle noncalcareous variant	1.42	1.00	1.42
Sh-Th-Ki	Shingle-Theedle-Kishona complex	10.46	2.00	20.92
TaNC	Taluce noncalcareous variant	26.24	1.25	32.80
TaNC-Or	Taluce noncalcareous variant-Orpha complex	16.45	2.44	40.14

Th	Theedle loam	73.58	1.98	145.69
ThNC	Theedle noncalcareous variant	23.17	0.58	13.44
Th-CuNC	Theedle-Cushman noncalcareous variant complex	1.25	1.90	2.38
Tl	Tullock loamy sand	17.82	1.25	22.28
TlNC-Tu	Tullock noncalcareous variant-Turnercrest complex	27.74	1.96	54.37
Tu	Turnercrest fine sandy loam	54.13	2.42	130.99
TuNC	Turnercrest noncalcareous variant	0.15	1.75	0.26
Ul	Ulm clay loam	3.77	2.71	10.22
Wo	Worf loam	34.28	1.58	54.16
WoNC	Worf noncalcareous variant	0.08	1.00	0.08
Zi	Zigweid loam	1.06	5.00	5.3
ZiNC-Th	Zigweid noncalcareous variant-Theedle complex	0.02	3.49	0.07
Average Salvage Depth of Permit/Project Area		**---**	**2.13**	**---**
Total		**1,206.70**	**---**	**2,777.34**

[1]Samples were taken within proposed disturbed area, when possible, as defined by initial estimates of the ore body.

Table 3.3-8: Summary of Wind and Water Erosion Hazards

Soil Sample Number	Soil Series	Water Erosion Hazard[1]	Wind Erosion Hazard[2]
137	Worf clay loam	Slight	Very Slight
138	Taluce noncalcareous variant	Negligible	Moderate
139	Haverdad clay loam	Slight	Slight
140	Orpha sandy clay loam	Very Slight	Moderate
141	Tullock sandy clay loam	Negligible	Moderate
142	Taluce sandy loam	Negligible	Severe
146	Lolite clay	Very Slight	Very Slight
148	Hiland sandy clay loam	Very Slight	Slight
150	Turnercrest sandy loam	Negligible	Severe
151	Theedle noncalcareous variant	Very Slight	Very Slight
152	Forkwood sandy clay loam	Very Slight	Slight
153	Keeline sandy loam	Negligible	Moderate
154	Theedle sandy clay loam	Very Slight	Slight
155	Hiland sandy clay loam	Very Slight	Slight
156	Ulm sandy clay loam	Very Slight	Slight
158	Kishona clay	Very Slight	Very Slight
159	Zigweid clay	Very Slight	Very Slight
160	Forkwood clay loam	Slight	Very Slight
161	Forkwood clay loam	Very Slight	Slight
162	Shingle noncalcareous variant	Slight	Very Slight
163	Kishona clay/clay loam	Slight	Very Slight
164	Turnercrest sandy clay loam	Very Slight	Slight
165	Kishona clay loam	Very Slight	Slight
166	Dwyer loamy sand	Negligible	Severe
168	Clarkelen noncalcareous variant	Very Slight	Moderate
170	Cambria sandy clay loam	Negligible	Moderate
171	Shingle clay loam	Slight	Very Slight
172	Embry moderately deep variant	Very Slight	Moderate
173	Keeline sandy clay loam	Very Slight	Moderate
174	Bahl clay loam	Slight	Very Slight
175	Hiland noncalcareous variant	Negligible	Severe
177	Worf noncalcareous variant	Very Slight	Slight
178	Draknab sandy loam	Very Slight	Moderate
180	Theedle clay	Slight	Very Slight
181	Turnercrest noncalcareous variant	Negligible	Moderate
182	Orpha sandy loam	Negligible	Severe
183	Cushman noncalcareous variant	Slight	Very Slight

Soil Sample Number	Soil Series	Water Erosion Hazard[1]	Wind Erosion Hazard[2]
184	Shingle sandy loam/sandy clay loam	Very Slight	Slight
185	Clarkelen sandy loam	Very Slight	Moderate
186	Zigweid noncalcareous variant	Slight	Very Slight
187	Renohill clay	Slight	Negligible
188	Keeline sandy loam/sandy clay loam	Very Slight	Moderate
189	Bowbac sandy clay	Negligible	Slight
190	Decolney sandy loam	Very Slight	Moderate
191	Tullock noncalcareous variant	Negligible	Moderate
192	Shingle clay loam	Very Slight	Very Slight
193	Ulm clay loam	Very Slight	Very Slight
194	Petrie clay/clay loam	Very Slight	Very Slight
195	Keeline noncalcareous variant	Very Slight	Moderate
197	Decolney sandy loam	Very Slight	Moderate
198	Theedle sandy loam	Very Slight	Moderate
199	Forkwood noncalcareous variant	Very Slight	Slight
201	Cambria sandy loam/sandy clay loam	Very Slight	Moderate
202	Clarkelen clay	Slight	Very Slight
203	Cushman clay loam	Very Slight	Slight
204	Clarkelen sandy clay loam	Very Slight	Slight

[1]Based on silt percentage found in A horizon from lab analysis.
[2]Based on sand percentage from 0 to 18 inches from lab analysis.

ADDENDUM 3.3-C

SOIL MAPPING UNIT DESCRIPTIONS

"Ba" – Bahl clay loam

The Bahl clay loam mapping unit consists of very deep, well drained soils formed on alluvial fans, fan aprons, hillslopes, and terraces in alluvium from clay shales. It occurs on alluvial fans, fan aprons, hillslopes, and terraces at elevations from 3,500 to 5,000 feet.

The mean annual precipitation is estimated to be 10 to 17 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 110 to 130 days.

Slopes are simple and range from 0 to 20 percent. Parent material consists of alluvium from clay shales.

A typical profile contains a 6 inch light brownish gray clay loam surface layer. The transition subsoil is a light brownish gray clay that is approximately 6 inches thick. The substratum is a light brownish gray clay that extends to approximately 48 inches in depth.

Permeability within the Bahl soil is slow. Runoff is slow on the gentler slopes and rapid on the steeper slopes. The water erosion hazard is slight and the wind erosion hazard is very slight.

Productivity and Reclamation Potential

There are five plant species that are common to this map unit: Western wheatgrass, Blue grama, Green needlegrass, Big sagebrush, and Prairie junegrass.

In a favorable year (above average moisture), the production is approximately 1,800 lbs/acres. In an unfavorable (drought) year, the production is approximately 750 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include low strength and shrink-swell. This map unit is a poor source for topsoil; limitations include sodium content and high clay content. This map unit is a poor source of overall reclamation material; limitations include high clay content, low organic matter content, high sodium content, and water erosion.

"Bo" – Bowbac sandy loam

The Bowbac sandy loam mapping unit consists of moderately deep, well drained soils formed in alluvium, eolian deposits or residuum derived primarily from argillaceous sandstone. It occurs on alluvial fans, terraces, dissected fan remnants, fan piedmonts, hillslopes, pediments, plateaus, ridges, and buttes at elevations from 3,500 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 15 percent. Parent material consists of alluvium, eolian deposits or residuum derived primarily from argillaceous sandstone.

A typical profile contains a 3 inch brown fine sandy loam surface layer. The transition subsoil is a yellowish brown sandy clay loam that is approximately 36 inches thick. The substratum is argillaceous sandstone.

Permeability within the Bowbac soil is moderate. Runoff is low on the gentler slopes and medium on the steeper slopes. The water erosion hazard is negligible and the wind erosion hazard is slight.

Productivity and Reclamation Potential

There are five plant species that are common to this map unit: Needleandthread, Prairie sandreed, Indian ricegrass, Silver sagebrush, and Threadleaf sedge.

In a favorable year (above average moisture), the production is approximately 1,600 lbs/acres. In an unfavorable (drought) year, the production is approximately 750 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock. This map unit is a fair source for topsoil; limitations include depth to bedrock and slope. This map unit is a poor source of overall reclamation material; limitations include wind erosion, droughtiness, depth to bedrock, and low organic matter content.

"Ca" – Cambria loam

The Cambria loam mapping unit consists of very deep, well drained soils formed in alluvium and slope alluvium from mixed sources. It occurs on fan remnants, fan piedmonts, alluvial fans, hills, ridges and terraces at elevations from 3,500 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 15 percent. Parent material consists of alluvium and slope alluvium from mixed sources.

A typical profile contains a 4 inch brown loam surface layer. The transition subsoil is a brown clay loam that is approximately 6 inches thick. The substratum is a pale brown loam that extends to approximately 50 inches in depth.

Permeability within the Cambria soil is moderate. Runoff is low on the gentler slopes and medium on the steeper slopes. The water erosion hazard is negligible to very slight and the wind erosion hazard is moderate.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Western wheatgrass, Needleandthread, Green needlegrass, Blue grama, Big sagebrush, and Indian ricegrass.

In a favorable year (above average moisture), the production is approximately 1,500 lbs/acres. In an unfavorable (drought) year, the production is approximately 700 lbs/acres.

According to NRCS information, this map unit is a good source for roadfill; there are no limitations listed. This map unit is a fair source for topsoil; limitations include slope. This map unit is a fair source of overall reclamation material; limitations include low organic matter content and water erosion.

"Cl" – Clarkelen fine sandy loam

The Clarkelen fine sandy loam mapping unit consists of very deep, well, moderately well, or somewhat excessively drained soils formed in stratified recent stream alluvium from mixed sedimentary sources. It occurs on flood plains and terraces adjacent to floodplains at elevations from 3,500 to 6,200 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 44 to 49 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 6 percent. Parent material consists of stratified but dominantly moderately coarse textured recent stream alluvium originally weathered from sedimentary rock.

A typical profile contains a 6 inch grayish brown fine sandy loam surface layer. The substratum is a light brownish gray stratified loam, fine sandy loam, loamy fine sand, and fine sand that extends to approximately 54 inches in depth.

Permeability within the Clarkelen soil is moderately rapid. Runoff is slow. The water erosion hazard is very slight to slight and the wind erosion hazard is very slight to moderate. The soil is subject to occasionally flooding for brief or very brief periods following intense storms in spring and summer or from snowmelt in spring.

Productivity and Reclamation Potential

There are eight plant species that are common to this map unit: Basin wildrye, Green needlegrass, Western wheatgrass, Sandberg bluegrass, Blue grama, Silver sagebrush, Snowberry, and Threadleaf sedge.

In a favorable year (above average moisture), the production is approximately 2,400 lbs/acres. In an unfavorable (drought) year, the production is approximately 1,200 lbs/acres.

According to NRCS information, this map unit is a good source for roadfill; there are no limitations listed. This map unit is a good source for topsoil; there are no limitations listed. This map unit is a fair source of overall reclamation material; limitations include low organic matter content and droughtiness.

"Cu" – Cushman very fine sandy loam

The Cushman very fine sandy loam mapping unit consists of moderately deep, well drained soils formed in slopewash alluvium and residuum from interbedded shales and siltstone and fine-grained argillaceous sandstone. It occurs on buttes, fan remnants, hills, piedmonts, ridges and terraces at elevations from 3,500 to 6,000 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 20 percent. Parent material consists of moderately fine textured slopewash alluvium and residuum. Surface erosion is common in overgrazed areas, and some thin eolian deposits overlie these soils in some areas.

A typical profile contains a 2 inch light brownish gray very fine sandy loam surface layer. The transition subsoil is a brown to yellowish brown clay loam that is approximately 12 inches thick. The substratum is a pale to very pale brown loam that extends to approximately 18 inches in depth.

Permeability within the Cushman soil is moderate. Runoff is medium. The water erosion hazard is very slight and the wind erosion hazard is slight.

Productivity and Reclamation Potential

There are four plant species that are common to this map unit: Needleandthread, Western wheatgrass, Blue grama, and Green needlegrass.

In a favorable year (above average moisture), the production is approximately 1,500 lbs/acres. In an unfavorable (drought) year, the production is approximately 700 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock and low strength. This map unit is a fair source for topsoil; limitations include depth to bedrock. This map unit is a fair source of overall reclamation material; limitations include depth to bedrock, low organic matter content, and water erosion.

"CuNC" – Cushman noncalcareous variant

The Cushman noncalcareous variant mapping unit consists of moderately deep, well drained soils formed in slopewash alluvium and residuum from interbedded shales and siltstone and fine-grained argillaceous sandstone. It occurs on buttes, fan remnants, hills, piedmonts, ridges and terraces at elevations from 3,500 to 6,000 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 20 percent. Parent material consists of moderately fine textured slopewash alluvium and residuum. Surface erosion is common in overgrazed areas, and some thin eolian deposits overlie these soils in some areas.

A typical profile contains a 2 inch light brownish gray very fine sandy loam surface layer. The transition subsoil is a brown to yellowish brown clay loam that is approximately 12 inches thick. The substratum is a pale to very pale brown loam that extends to approximately 18 inches in depth.

Permeability within the Cushman soil is moderate. Runoff is medium. The water erosion hazard is slight and the wind erosion hazard is very slight.

Productivity and Reclamation Potential

There are four plant species that are common to this map unit: Needleandthread, Western wheatgrass, Blue grama, and Green needlegrass.

In a favorable year (above average moisture), the production is approximately 1,500 lbs/acres. In an unfavorable (drought) year, the production is approximately 700 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock and low strength. This map unit is a fair source for topsoil; limitations include depth to bedrock. This map unit is a fair source of overall reclamation material; limitations include depth to bedrock, low organic matter content, and water erosion.

"De" – Decolney fine sandy loam

The Decolney fine sandy loam mapping unit consists of very deep, well drained soils formed in alluvium or eolian deposits derived from sedimentary beds. It occurs on stabilized dune topography including alluvial fans, fan remnants, pediments, terraces, plateaus, ridges and hills at elevations from 3,500 to 5,200 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 44 to 49 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 20 percent. Parent material consists of eolian or alluvium deposits derived from mixed sedimentary bedrock.

A typical profile contains a 3 inch brown fine sandy loam surface layer. The transition subsoil is a brown to yellowish brown sandy clay loam that is approximately 19 inches thick. The substratum is a brown to pale brown fine sandy loam that extends to approximately 38 inches in depth.

Permeability within the Decolney soil is moderate. Runoff is low on the gentler slopes and medium on the steeper slopes. The water erosion hazard is very slight and the wind erosion hazard is moderate.

Productivity and Reclamation Potential

There are eight plant species that are common to this map unit: Needleandthread, Prairie sandreed, Indian ricegrass, Little bluestem, Threadleaf sedge, Western wheatgrass, Blue grama, and Silver sagebrush.

In a favorable year (above average moisture), the production is approximately 1,600 lbs/acres. In an unfavorable (drought) year, the production is approximately 750 lbs/acres.

According to NRCS information, this map unit is a good source for roadfill; there are no limitations listed. This map unit is a good source for topsoil; there are no limitations listed. This map unit is a fair source of overall reclamation material; limitations include low organic matter content.

"Dr" – Draknab loamy sand

The Draknab loamy sand mapping unit consists of very deep, moderately well, well or excessively well drained soils formed in stratified recent stream alluvium. It occurs on flood plains and on adjacent low terrace positions at elevations from 3,500 to 6,000 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 44 to 49 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 6 percent. Parent material consists of coarse textured recent stream alluvium derived originally from sandstone-dominated sedimentary rock.

A typical profile contains a 2 inch yellowish brown loamy sand surface layer. The transition subsoil is a yellowish brown sandy loam that is approximately 6 inches thick. The substratum is a pale brown to very pale brown stratified sand, coarse sand, loamy coarse sand and loamy sand that extends to approximately 52 inches in depth.

Permeability within the Draknab soil is rapid. Runoff is negligible on the gentler slopes and very low on the steeper slopes. This soil is subject to rare to frequent flooding for very brief or brief periods during prolonged, high intensity storms in the spring and early summer. The water erosion hazard is very slight and the wind erosion hazard is moderate.

Productivity and Reclamation Potential

There are seven plant species that are common to this map unit: Prairie sandreed, Sand bluestem, Needleandthread, Fringed sagewort, Indian ricegrass, Sand dropseed, and Silver sagebrush.

In a favorable year (above average moisture), the production is approximately 3,000 lbs/acres. In an unfavorable (drought) year, the production is approximately 1,600 lbs/acres.

According to NRCS information, this map unit is a good source for roadfill; there are no limitations listed. This map unit is a fair source for topsoil; limitations include high sand content. This map unit is a poor source of overall reclamation material; limitations include wind erosion, high sand content, droughtiness, and low organic matter content.

"Dw" – Dwyer fine sand

The Dwyer fine sand mapping unit consists of very deep, excessively drained soils formed in eolian sand. It occurs on dune-like forms frequently on or near the edges of alluvial terraces at elevations from 3,500 to 5,600 feet.

The mean annual precipitation is estimated to be 10 to 16 inches. The mean annual air temperature is 48 degrees Fahrenheit. The frost-free season ranges from 110 to 130 days.

Slopes are irregular and range from 0 to 25 percent. Parent material consists of eolian sand.

A typical profile contains a 6 inch pale brown fine sand surface layer. The substratum is a very pale brown fine sand that extends to approximately 54 inches in depth.

Permeability within the Dwyer soil is rapid. Runoff is very slow on the gentler slopes and medium on the steeper slopes. The water erosion hazard is negligible and the wind erosion hazard is severe.

Productivity and Reclamation Potential

There are eight plant species that are common to this map unit: Prairie sandreed, Sand bluestem, Needleandthread, Indian ricegrass, Sand dropseed, Silver sagebrush, Threadleaf sedge, and Western wheatgrass.

In a favorable year (above average moisture), the production is approximately 1,700 lbs/acres. In an unfavorable (drought) year, the production is approximately 900 lbs/acres.

According to NRCS information, this map unit is a good source for roadfill; there are no limitations listed. This map unit is a poor source for topsoil; limitations include high sand content and slope. This map unit is a poor source of overall reclamation material; limitations include high sand content, wind erosion, droughtiness, and low organic matter content.

"EmMV" – Embry moderately deep variant

The Embry moderately deep variant mapping unit consists of moderately deep, well drained soils formed in alluvium and eolian deposits derived from sandstone. It occurs on hills, dunes, terraces and alluvial fans at elevations from 4,200 to 6,000 feet.

The mean annual precipitation is estimated to be 10 to 15 inches. The annual air temperature is 45 to 50 degrees Fahrenheit. The frost-free season ranges from 110 to 130 days.

Slopes range from 0 to 20 percent. Parent material consists of alluvium and eolian deposits derived from noncalcareous sandstone.

A typical profile contains a 6 inch light brownish gray sandy loam surface layer. The substratum is a light brownish gray to pale brown sandy loam that extends to approximately 34 inches in depth.

Permeability within the Embry soil is moderately rapid. Runoff is slow on the gentler slopes and medium on the steeper slopes. The water erosion hazard is very slight and the wind erosion hazard is moderate.

Productivity and Reclamation Potential

There are eight plant species that are common to this map unit: Needleandthread, Prairie sandreed, Indian ricegrass, Little bluestem, Blue grama, Silver sagebrush, Threadleaf sedge, and Western wheatgrass.

In a favorable year (above average moisture), the production is approximately 1,600 lbs/acres. In an unfavorable (drought) year, the production is approximately 750 lbs/acres.

According to NRCS information, this map unit is a good source for roadfill; there are no limitations listed. This map unit is a fair source for topsoil; limitations include slope. This map unit is a fair source of overall reclamation material; limitations include low organic matter content.

"Fo" – Forkwood loam

The Forkwood loam mapping unit consists of very deep, well drained soils formed in alluvium. It occurs on terraces, alluvial fans, fan remnants, hills, ridges and pediments at elevations from 3,500 to 6,000 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 15 percent. Parent material consists of slopewash alluvium derived from interbedded shales and argillaceous sandstone.

A typical profile contains a 5 inch brown loam surface layer. The transition subsoil is a brown to light brownish gray clay loam that is approximately 25 inches thick. The substratum is a light brownish gray loam that extends to approximately 30 inches in depth.

Permeability within the Forkwood soil is moderate. Runoff is low on the gentler slopes and medium on the steeper slopes. The water erosion hazard is very slight to slight and the wind erosion hazard is very slight to slight.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Needleandthread, Western wheatgrass, Blue grama, Big sagebrush, Little bluestem, and Winterfat.

In a favorable year (above average moisture), the production is approximately 1,900 lbs/acres. In an unfavorable (drought) year, the production is approximately 700 lbs/acres.

According to NRCS information, this map unit is a good source for roadfill; there are no limitations listed. This map unit is a good source for topsoil; there are no limitations listed. This map unit is a fair source of overall reclamation material; limitations include low organic matter content and water erosion.

"FoNC-ClNC-ThNC" – Forkwood noncalcareous variant-Clarkelen noncalcareous variant-Theedle noncalcareous variant complex

Forkwood noncalcareous variant

The Forkwood noncalcareous variant mapping unit consists of very deep, well drained soils formed in alluvium. It occurs on terraces, alluvial fans, fan remnants, hills, ridges and pediments at elevations from 3,500 to 6,000 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 15 percent. Parent material consists of slopewash alluvium derived from interbedded shales and argillaceous sandstone.

A typical profile contains a 5 inch brown loam surface layer. The transition subsoil is a brown to light brownish gray clay loam that is approximately 25 inches thick. The substratum is a light brownish gray loam that extends to approximately 30 inches in depth.

Permeability within the Forkwood soil is moderate. Runoff is low on the gentler slopes and medium on the steeper slopes. The water erosion hazard is very slight and the wind erosion hazard is slight.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Needleandthread, Western wheatgrass, Blue grama, Big sagebrush, Little bluestem, and Winterfat.

In a favorable year (above average moisture), the production is approximately 1,900 lbs/acres. In an unfavorable (drought) year, the production is approximately 700 lbs/acres.

According to NRCS information, this map unit is a good source for roadfill; there are no limitations listed. This map unit is a good source for topsoil; there are no limitations listed. This map unit is a fair source of overall reclamation material; limitations include low organic matter content and water erosion.

Clarkelen noncalcareous variant

The Clarkelen noncalcareous variant mapping unit consists of very deep, well,

moderately well, or somewhat excessively drained soils formed in stratified recent stream alluvium from mixed sedimentary sources. It occurs on flood plains and terraces adjacent to floodplains at elevations from 3,500 to 6,200 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 44 to 49 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 6 percent. Parent material consists of stratified but dominantly moderately coarse textured recent stream alluvium originally weathered from sedimentary rock.

A typical profile contains a 6 inch grayish brown fine sandy loam surface layer. The substratum is a light brownish gray stratified loam, fine sandy loam, loamy fine sand, and fine sand that extends to approximately 54 inches in depth.

Permeability within the Clarkelen soil is moderately rapid. Runoff is slow. The water erosion hazard is very slight and the wind erosion hazard is moderate. The soil is subject to occasionally flooding for brief or very brief periods following intense storms in spring and summer or from snowmelt in spring.

Productivity and Reclamation Potential

There are eight plant species that are common to this map unit: Basin wildrye, Green needlegrass, Western wheatgrass, Sandberg bluegrass, Blue grama, Silver sagebrush, Snowberry, and Threadleaf sedge.

In a favorable year (above average moisture), the production is approximately 2,400 lbs/acres. In an unfavorable (drought) year, the production is approximately 1,200 lbs/acres.

According to NRCS information, this map unit is a good source for roadfill; there are no limitations listed. This map unit is a good source for topsoil; there are no limitations listed. This map unit is a fair source of overall reclamation material; limitations include low organic matter content and droughtiness.

Theedle noncalcareous variant

The Theedle noncalcareous variant mapping unit consists of moderately deep, well drained soils formed in residuum and slope alluvium weathered from soft sandstone. It occurs on rock-controlled fan aprons, fan pediments, and undulating to rolling uplands at elevations from 3,500 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 45 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 75 percent. Parent material consists of medium textured slope alluvium and residuum derived primarily from interbedded sandstone and shale.

A typical profile contains a 4 inch light brownish gray loam surface layer. The transition subsoil is a light brownish gray loam that is approximately 4 inches thick. The substratum is a light gray loam that extends to approximately 20 inches in depth.

Permeability within the Theedle soil is moderate. Runoff is slow on the gentler slopes and rapid on the steeper slopes. The water erosion hazard is very slight and the wind erosion hazard is very slight.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Needleandthread, Western wheatgrass, Blue grama, Big sagebrush, Little bluestem, and Winterfat.

In a favorable year (above average moisture), the production is approximately 1,900 lbs/acres. In an unfavorable (drought) year, the production is approximately 700 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock, low strength, shrink-swell, and slope. This map unit is a poor source for topsoil; limitations include slope and depth to bedrock. This map unit is a fair source of overall reclamation material; limitations include depth to bedrock, low organic matter content, droughtiness, and water erosion.

"Fo-Sh" – Forkwood-Shingle complex

Forkwood loam

The Forkwood loam mapping unit consists of very deep, well drained soils formed in alluvium. It occurs on terraces, alluvial fans, fan remnants, hills, ridges and pediments at elevations from 3,500 to 6,000 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 15 percent. Parent material consists of slopewash alluvium derived from interbedded shales and argillaceous sandstone.

A typical profile contains a 5 inch brown loamsurface layer. The transition subsoil is a brown to light brownish gray clay loam that is approximately 25 inches thick. The substratum is a light brownish gray loam that extends to approximately 30 inches in depth.

Permeability within the Forkwood soil is moderate. Runoff is low on the gentler slopes and medium on the steeper slopes. The water erosion hazard is very slight to slight and the wind erosion hazard is very slight to slight.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Needleandthread, Western wheatgrass, Blue grama, Big sagebrush, Little bluestem, and Winterfat.

In a favorable year (above average moisture), the production is approximately 1,900 lbs/acres. In an unfavorable (drought) year, the production is approximately 700 lbs/acres.

According to NRCS information, this map unit is a good source for roadfill; there are no limitations listed. This map unit is a good source for topsoil; there are no limitations listed. This map unit is a fair source of overall reclamation material; limitations include low organic matter content and water erosion.

Shingle clay loam

The Shingle clay loam mapping unit consists of very shallow or shallow, well drained soils formed in residuum or colluviums derived from interbedded shale and sandstone or in alluvium from mudstone. It occurs on bedrock controlled hillslopes and ridges at elevations from 3,200 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 80 percent. Parent material consists of colluviums and residuum weathered from soft, interbedded sandstone and shale or in alluvium from mudstone.

A typical profile contains a 4 inch light brownish gray clay loam surface layer. The transition subsoil is a light yellowish brown clay loam that is approximately 4 inches thick. The substratum is a light yellowish brown clay loam that extends to approximately 7 inches in depth.

Permeability within the Shingle soil is moderate. Runoff is medium on the gentler slopes and high on the steeper slopes. The water erosion hazard is very slight to slight and the wind erosion hazard is very slight to slight.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Bluebunch wheatgrass, Western wheatgrass, Blue grama, Needleandthread, Threadleaf sedge, and Big sagebrush.

In a favorable year (above average moisture), the production is approximately 1,200 lbs/acres. In an unfavorable (drought) year, the production is approximately 450 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock and slope. This map unit is a poor source for topsoil; limitations include depth to bedrock, rock fragments, and slope. This map unit is a poor source of overall reclamation material; limitations include droughtiness, depth to bedrock, and low organic matter content.

"Fo-Th" – Forkwood-Theedle complex

Forkwood loam

The Forkwood loam mapping unit consists of very deep, well drained soils formed in alluvium. It occurs on terraces, alluvial fans, fan remnants, hills, ridges and pediments at elevations from 3,500 to 6,000 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 15 percent. Parent material consists of slopewash alluvium derived from interbedded shales and argillaceous sandstone.

A typical profile contains a 5 inch brown loam surface layer. The transition subsoil is a brown to light brownish gray clay loam that is approximately 25 inches thick. The substratum is a light brownish gray loam that extends to approximately 30 inches in depth.

Permeability within the Forkwood soil is moderate. Runoff is low on the gentler slopes and medium on the steeper slopes. The water erosion hazard is very slight to slight and the wind erosion hazard is very slight to slight.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Needleandthread, Western wheatgrass, Blue grama, Big sagebrush, Little bluestem, and Winterfat.

In a favorable year (above average moisture), the production is approximately 1,900 lbs/acres. In an unfavorable (drought) year, the production is approximately 700 lbs/acres.

According to NRCS information, this map unit is a good source for roadfill; there are no limitations listed. This map unit is a good source for topsoil; there are no limitations listed. This map unit is a fair source of overall reclamation material; limitations include low organic matter content and water erosion.

Theedle loam

The Theedle loam mapping unit consists of moderately deep, well drained soils formed in residuum and slope alluvium weathered from soft sandstone. It occurs on rock-controlled fan aprons, fan pediments, and undulating to rolling uplands at elevations from 3,500 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 45 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 75 percent. Parent material consists of medium textured slope alluvium and residuum derived primarily from interbedded sandstone and shale.
A typical profile contains a 4 inch light brownish gray loam surface layer. The transition subsoil is a light brownish gray loam that is approximately 4 inches thick. The substratum is a light gray loam that extends to approximately 20 inches in depth.

Permeability within the Theedle soil is moderate. Runoff is slow on the gentler slopes and rapid on the steeper slopes. The water erosion hazard is very slight to slight and the wind erosion hazard is very slight to moderate.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Needleandthread, Western wheatgrass, Blue grama, Big sagebrush, Little bluestem, and Winterfat.

In a favorable year (above average moisture), the production is approximately 1,900 lbs/acres. In an unfavorable (drought) year, the production is approximately 700 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock, low strength, shrink-swell, and slope. This map unit is a poor source for topsoil; limitations include slope and depth to bedrock. This map unit is a fair source of overall reclamation material; limitations include depth to bedrock, low organic matter content, droughtiness, and water erosion.

"Ha" – Haverdad loam

The Haverdad loam mapping unit consists of very deep, well drained soils formed in stratified alluvium. It occurs on floodplains and low terraces at elevations from 3,500 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 17 inches. The annual air temperature is 43 to 52 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 6 percent. Parent material consists of alluvium from mixed sources.

A typical profile contains a 4 inch pale brown loam surface layer. The substratum is a pale brown loam or clay loam stratified with fine sandy loam, sandy loam, loam, silt loam, and silty clay loam that extends to approximately 56 inches in depth.

Permeability within the Haverdad soil is moderate. Runoff is slow. Flooding for brief periods occurs during spring runoff and after thunder showers. The water erosion hazard is slight and the wind erosion hazard is slight.

Productivity and Reclamation Potential

There are five plant species that are common to this map unit: Green needlegrass, Cottonwood, Needleandthread, Slender wheatgrass, and Western wheatgrass.

In a favorable year (above average moisture), the production is approximately 3,000 lbs/acres. In an unfavorable (drought) year, the production is approximately 1,600 lbs/acres.

According to NRCS information, this map unit is a fair source for roadfill; limitations include low strength and shrink-swell. This map unit is a good source for topsoil; there are no limitations listed. This map unit is a poor source of overall reclamation material; limitations include high alkalinity and low organic matter content.

"Hi" – Hiland fine sandy loam

The Hiland fine sandy loam mapping unit consists of very deep, well drained soils formed in alluvium or eolian deposits. It occurs on relict surfaces consisting of terraces, fans, fan remnants, pediments, ridges, hills and stabilized dunes at elevations from 3,500 to 6,300 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 20 percent. Parent material consists of moderately coarse alluvium and eolian material derived predominantly from sandstone.

A typical profile contains a 6 inch brown to pale brown fine sandy loam surface layer. The transition subsoil is a brown, yellowish brown, or pale brown sandy clay loam that is approximately 25 inches thick. The substratum is a light yellowish brown fine sandy loam that extends to approximately 29 inches in depth.

Permeability within the Hiland soil is moderate. Runoff is low on the gentler slopes and medium on the steeper slopes. The water erosion hazard is very slight and the wind erosion hazard is slight.

Productivity and Reclamation Potential

There are seven plant species that are common to this map unit: Needleandthread, Prairie sandreed, Thickspike wheatgrass, Threadleaf sedge, Blue grama, Sand bluestem, and Silver sagebrush.

In a favorable year (above average moisture), the production is approximately 1,600 lbs/acres. In an unfavorable (drought) year, the production is approximately 750 lbs/acres.

According to NRCS information, this map unit is a good source for roadfill; there are no limitations listed. This map unit is a fair source for topsoil; limitations include slope. This map unit is a poor source of overall reclamation material; limitations include wind erosion and low organic matter content.

"HiNC" – Hiland noncalcareous variant

The Hiland noncalcareous variant mapping unit consists of very deep, well drained soils formed in alluvium or eolian deposits. It occurs on relict surfaces consisting of terraces, fans, fan remnants, pediments, ridges, hills and stabilized dunes at elevations from 3,500 to 6,300 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 20 percent. Parent material consists of moderately coarse alluvium and eolian material derived predominantly from sandstone.

A typical profile contains a 6 inch brown to pale brown fine sandy loam surface layer. The transition subsoil is a brown, yellowish brown, or pale brown sandy clay loam that is approximately 25 inches thick. The substratum is a light yellowish brown fine sandy loam that extends to approximately 29 inches in depth.

Permeability within the Hiland soil is moderate. Runoff is low on the gentler slopes and medium on the steeper slopes. The water erosion hazard is negligible and the wind erosion hazard is severe.

Productivity and Reclamation Potential

There are seven plant species that are common to this map unit: Needleandthread, Prairie sandreed, Thickspike wheatgrass, Threadleaf sedge, Blue grama, Sand bluestem, and Silver sagebrush.

In a favorable year (above average moisture), the production is approximately 1,600 lbs/acres. In an unfavorable (drought) year, the production is approximately 750 lbs/acres.

According to NRCS information, this map unit is a good source for roadfill; there are no limitations listed. This map unit is a fair source for topsoil; limitations include slope. This map unit is a poor source of overall reclamation material; limitations include wind erosion and low organic matter content.

"Ke" – Keeline sandy loam

The Keeline sandy loam mapping unit consists of very deep, well or somewhat excessively drained soils formed in alluvium or eolian deposits derived from sandstone. It occurs on upland ridgetops, hillslopes, terraces, benches, alluvial fans, and fan remnants at elevations from 3,500 to 6,200 feet.

The mean annual precipitation is estimated to be 10 to 15 inches. The annual air temperature is 44 to 49 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 40 percent. Parent material consists of moderately coarse alluvium or eolian deposits derived from calcareous sandstone.

A typical profile contains a 3 inch yellowish brown sandy loam surface layer. The transition subsoil is a pale brown sandy loam that is approximately 5 inches thick. The substratum is a very pale brown sandy loam that extends to approximately 52 inches in depth.

Permeability within the Keeline soil is moderately rapid. Runoff is slow. The water erosion hazard is negligible to very slight and the wind erosion hazard is moderate.

Productivity and Reclamation Potential

There are five plant species that are common to this map unit: Needleandthread, Prairie sandreed, Big sagebrush, Blue grama, and Threadleaf sedge.

In a favorable year (above average moisture), the production is approximately 1,600 lbs/acres. In an unfavorable (drought) year, the production is approximately 750 lbs/acres.

According to NRCS information, this map unit is a good source for roadfill; there are no limitations listed. This map unit is a good source for topsoil; there are no limitations listed. This map unit is a fair source of overall reclamation material; limitations include low organic matter content.

"KeNC" – Keeline noncalcareous variant

The Keeline noncalcareous variant mapping unit consists of very deep, well or somewhat excessively drained soils formed in alluvium or eolian deposits derived from sandstone. It occurs on upland ridgetops, hillslopes, terraces, benches, alluvial fans, and fan remnants at elevations from 3,500 to 6,200 feet.

The mean annual precipitation is estimated to be 10 to 15 inches. The annual air temperature is 44 to 49 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 40 percent. Parent material consists of moderately coarse alluvium or eolian deposits derived from calcareous sandstone.

A typical profile contains a 3 inch yellowish brown sandy loam surface layer. The transition subsoil is a pale brown sandy loam that is approximately 5 inches thick. The substratum is a very pale brown sandy loam that extends to approximately 52 inches in depth.

Permeability within the Keeline soil is moderately rapid. Runoff is slow. The water erosion hazard is very slight and the wind erosion hazard is moderate.

Productivity and Reclamation Potential

There are five plant species that are common to this map unit: Needleandthread, Prairie sandreed, Big sagebrush, Blue grama, and Threadleaf sedge.

In a favorable year (above average moisture), the production is approximately 1,600 lbs/acres. In an unfavorable (drought) year, the production is approximately 750 lbs/acres.

According to NRCS information, this map unit is a good source for roadfill; there are no limitations listed. This map unit is a good source for topsoil; there are no limitations listed. This map unit is a fair source of overall reclamation material; limitations include low organic matter content.

"Ke-De-Th" – Keeline-Decolney-Theedle complex

Keeline sandy loam

The Keeline sandy loam mapping unit consists of very deep, well or somewhat excessively drained soils formed in alluvium or eolian deposits derived from sandstone. It occurs on upland ridgetops, hillslopes, terraces, benches, alluvial fans, and fan remnants at elevations from 3,500 to 6,200 feet.

The mean annual precipitation is estimated to be 10 to 15 inches. The annual air temperature is 44 to 49 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 40 percent. Parent material consists of moderately coarse alluvium or eolian deposits derived from calcareous sandstone.

A typical profile contains a 3 inch yellowish brown sandy loam surface layer. The transition subsoil is a pale brown sandy loam that is approximately 5 inches thick. The substratum is a very pale brown sandy loam that extends to approximately 52 inches in depth.

Permeability within the Keeline soil is moderately rapid. Runoff is slow. The water erosion hazard is negligible to very slight and the wind erosion hazard is moderate.

Productivity and Reclamation Potential

There are five plant species that are common to this map unit: Needleandthread, Prairie sandreed, Big sagebrush, Blue grama, and Threadleaf sedge.

In a favorable year (above average moisture), the production is approximately 1,600 lbs/acres. In an unfavorable (drought) year, the production is approximately 750 lbs/acres.

According to NRCS information, this map unit is a good source for roadfill; there are no limitations listed. This map unit is a good source for topsoil; there are no limitations listed. This map unit is a fair source of overall reclamation material; limitations include low organic matter content.

Decolney fine sandy loam

The Decolney fine sandy loam mapping unit consists of very deep, well drained soils formed in alluvium or eolian deposits derived from sedimentary beds. It occurs on

stabilized dune topography including alluvial fans, fan remnants, pediments, terraces, plateaus, ridges and hills at elevations from 3,500 to 5,200 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 44 to 49 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.
Slopes range from 0 to 20 percent. Parent material consists of eolian or alluvium deposits derived from mixed sedimentary bedrock.

A typical profile contains a 3 inch brown fine sandy loam surface layer. The transition subsoil is a brown to yellowish brown sandy clay loam that is approximately 19 inches thick. The substratum is a brown to pale brown fine sandy loam that extends to approximately 38 inches in depth.

Permeability within the Decolney soil is moderate. Runoff is low on the gentler slopes and medium on the steeper slopes. The water erosion hazard is very slight and the wind erosion hazard is moderate.

Productivity and Reclamation Potential

There are eight plant species that are common to this map unit: Needleandthread, Prairie sandreed, Indian ricegrass, Little bluestem, Threadleaf sedge, Western wheatgrass, Blue grama, and Silver sagebrush.

In a favorable year (above average moisture), the production is approximately 1,600 lbs/acres. In an unfavorable (drought) year, the production is approximately 750 lbs/acres.

According to NRCS information, this map unit is a good source for roadfill; there are no limitations listed. This map unit is a good source for topsoil; there are no limitations listed. This map unit is a fair source of overall reclamation material; limitations include low organic matter content.

Theedle loam

The Theedle loam mapping unit consists of moderately deep, well drained soils formed in residuum and slope alluvium weathered from soft sandstone. It occurs on rock-controlled fan aprons, fan pediments, and undulating to rolling uplands at elevations from 3,500 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 45 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130

days.

Slopes range from 0 to 75 percent. Parent material consists of medium textured slope alluvium and residuum derived primarily from interbedded sandstone and shale.

A typical profile contains a 4 inch light brownish gray loam surface layer. The transition subsoil is a light brownish gray loam that is approximately 4 inches thick. The substratum is a light gray loam that extends to approximately 20 inches in depth.

Permeability within the Theedle soil is moderate. Runoff is slow on the gentler slopes and rapid on the steeper slopes. The water erosion hazard is very slight to slight and the wind erosion hazard is very slight to moderate.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Needleandthread, Western wheatgrass, Blue grama, Big sagebrush, Little bluestem, and Winterfat.

In a favorable year (above average moisture), the production is approximately 1,900 lbs/acres. In an unfavorable (drought) year, the production is approximately 700 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock, low strength, shrink-swell, and slope. This map unit is a poor source for topsoil; limitations include slope and depth to bedrock. This map unit is a fair source of overall reclamation material; limitations include depth to bedrock, low organic matter content, droughtiness, and water erosion.

"Ke-Or-Ta" – Keeline-Orpha-Taluce complex

Keeline sandy loam

The Keeline sandy loam mapping unit consists of very deep, well or somewhat excessively drained soils formed in alluvium or eolian deposits derived from sandstone. It occurs on upland ridgetops, hillslopes, terraces, benches, alluvial fans, and fan remnants at elevations from 3,500 to 6,200 feet.

The mean annual precipitation is estimated to be 10 to 15 inches. The annual air temperature is 44 to 49 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 40 percent. Parent material consists of moderately coarse alluvium or eolian deposits derived from calcareous sandstone.

A typical profile contains a 3 inch yellowish brown sandy loam surface layer. The transition subsoil is a pale brown sandy loam that is approximately 5 inches thick. The substratum is a very pale brown sandy loam that extends to approximately 52 inches in depth.

Permeability within the Keeline soil is moderately rapid. Runoff is slow. The water erosion hazard is negligible to very slight and the wind erosion hazard is moderate.

Productivity and Reclamation Potential

There are five plant species that are common to this map unit: Needleandthread, Prairie sandreed, Big sagebrush, Blue grama, and Threadleaf sedge.

In a favorable year (above average moisture), the production is approximately 1,600 lbs/acres. In an unfavorable (drought) year, the production is approximately 750 lbs/acres.

According to NRCS information, this map unit is a good source for roadfill; there are no limitations listed. This map unit is a good source for topsoil; there are no limitations listed. This map unit is a fair source of overall reclamation material; limitations include low organic matter content.

Orpha loamy sand

The Orpha loamy sand mapping unit consists of very deep, excessively drained soils formed in alluvium or eolian sand from mixed sources. It occurs on rolling dunes, hills,

terraces, floodplains, uplands, valley side slopes, toeslopes, and footslopes at elevations from 3,500 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 18 inches. The annual air temperature is 44 to 50 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 45 percent. Parent material consists of alluvium or eolian deposits generally adjacent to and downwind of sandy parent sources.

A typical profile contains a 6 inch grayish brown loamy sand surface layer. The substratum is a light brownish gray sand that extends to approximately 54 inches in depth.

Permeability within the Orpha soil is rapid or very rapid. Runoff is very low on the gentler slopes and low on the steeper slopes. The water erosion hazard is negligible to very slight and the wind erosion hazard is moderate to severe.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Sand bluestem, Needleandthread, Prairie sandreed, Little bluestem, Thickspike wheatgrass, and Sand sagebrush.

In a favorable year (above average moisture), the production is approximately 1,800 lbs/acres. In an unfavorable (drought) year, the production is approximately 900 lbs/acres.

According to NRCS information, this map unit is a good source for roadfill; there are no limitations listed. This map unit is a poor source for topsoil; limitations include high sand content. This map unit is a poor source of overall reclamation material; limitations include high sand content, wind erosion, low organic matter content, and droughtiness.

Taluce sandy loam

The Taluce sandy loam mapping unit consists of very shallow or shallow, well drained soils formed in residuum and slope alluvium derived from sandstone. It occurs on ridges and hills at elevations from 3,500 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 17 inches. The annual air temperature is 42 to 51 degrees Fahrenheit. The frost-free season ranges from 100 to 130 days.

Slopes range from 3 to 70 percent. Parent material consists of residuum and slope alluvium derived from sandstone.

A typical profile contains a 4 inch yellowish brown sandy loam surface layer. The substratum is a light yellowish brown sandy loam that extends to approximately 5 inches in depth.

Permeability within the Taluce soil is rapid. Runoff is medium on the gentler slopes and rapid on the steeper slopes. The water erosion hazard is negligible and the wind erosion hazard is severe.

Productivity and Reclamation Potential

There are eight plant species that are common to this map unit: Needleandthread, Prairie sandreed, Blue grama, Indian ricegrass, Little bluestem, Sand bluestem, Threadleaf sedge, and Western wheatgrass.

In a favorable year (above average moisture), the production is approximately 1,300 lbs/acres. In an unfavorable (drought) year, the production is approximately 600 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock and slope. This map unit is a poor source for topsoil; limitations include slope and depth to bedrock. This map unit is a poor source of overall reclamation material; limitations include depth to bedrock, low organic matter content, and droughtiness.

"Ki" – Kishona loam

The Kishona loam mapping unit consists of very deep, well drained soils formed in alluvium. It occurs on fan aprons, alluvial fans, fan remnants, hills, ridges and terraces at elevations from 3,500 to 6,700 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 6 percent but range up to 30 percent on dissected slopes. Parent material consists of alluvium derived from sandstones and shales.

A typical profile contains a 4 inch brown loam surface layer. The transition subsoil is a very pale brown silty clay loam that is approximately 20 inches thick. The substratum is a pale brown loam that extends to approximately 36 inches in depth.

Permeability within the Kishona soil is moderate. Runoff is slow on gentler slopes and medium on steeper slopes. The water erosion hazard is very slight to slight and the wind erosion hazard is very slight to slight.

Productivity and Reclamation Potential

There are seven plant species that are common to this map unit: Needleandthread, Western wheatgrass, Blue grama, Green needlegrass, Big sagebrush, Little bluestem, and Thickspike wheatgrass.

In a favorable year (above average moisture), the production is approximately 1,500 lbs/acres. In an unfavorable (drought) year, the production is approximately 700 lbs/acres.

According to NRCS information, this map unit is a fair source for roadfill; limitations include low strength and shrink-swell. This map unit is a good source for topsoil; there are no limitations listed. This map unit is a fair source of overall reclamation material; limitations include low organic matter content and water erosion.

"Ki-Fo" – Kishona-Forkwood complex

Kishona loam

The Kishona loam mapping unit consists of very deep, well drained soils formed in alluvium. It occurs on fan aprons, alluvial fans, fan remnants, hills, ridges and terraces at elevations from 3,500 to 6,700 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 6 percent but range up to 30 percent on dissected slopes. Parent material consists of alluvium derived from sandstones and shales.

A typical profile contains a 4 inch brown loam surface layer. The transition subsoil is a very pale brown silty clay loam that is approximately 20 inches thick. The substratum is a pale brown loam that extends to approximately 36 inches in depth.

Permeability within the Kishona soil is moderate. Runoff is slow on gentler slopes and medium on steeper slopes. The water erosion hazard is very slight to slight and the wind erosion hazard is very slight to slight.

Productivity and Reclamation Potential

There are seven plant species that are common to this map unit: Needleandthread, Western wheatgrass, Blue grama, Green needlegrass, Big sagebrush, Little bluestem, and Thickspike wheatgrass.

In a favorable year (above average moisture), the production is approximately 1,500 lbs/acres. In an unfavorable (drought) year, the production is approximately 700 lbs/acres.

According to NRCS information, this map unit is a fair source for roadfill; limitations include low strength and shrink-swell. This map unit is a good source for topsoil; there are no limitations listed. This map unit is a fair source of overall reclamation material; limitations include low organic matter content and water erosion.

Forkwood loam

The Forkwood loam mapping unit consists of very deep, well drained soils formed in alluvium. It occurs on terraces, alluvial fans, fan remnants, hills, ridges and pediments at

elevations from 3,500 to 6,000 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.
Slopes range from 0 to 15 percent. Parent material consists of slopewash alluvium derived from interbedded shales and argillaceous sandstone.

A typical profile contains a 5 inch brown loam surface layer. The transition subsoil is a brown to light brownish gray clay loam that is approximately 25 inches thick. The substratum is a light brownish gray loam that extends to approximately 30 inches in depth.

Permeability within the Forkwood soil is moderate. Runoff is low on the gentler slopes and medium on the steeper slopes. The water erosion hazard is very slight to slight and the wind erosion hazard is very slight to slight.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Needleandthread, Western wheatgrass, Blue grama, Big sagebrush, Little bluestem, and Winterfat.

In a favorable year (above average moisture), the production is approximately 1,900 lbs/acres. In an unfavorable (drought) year, the production is approximately 700 lbs/acres.

According to NRCS information, this map unit is a good source for roadfill; there are no limitations listed. This map unit is a good source for topsoil; there are no limitations listed. This map unit is a fair source of overall reclamation material; limitations include low organic matter content and water erosion.

"Lo-ThNC" – Lolite-Theedle noncalcareous complex

Lolite clay

The Lolite clay mapping unit consists of shallow, well drained soils formed in residuum. It occurs on ridges and hillsides at elevations from 4,900 to 6,500 feet.

The mean annual precipitation is estimated to be 9 to 14 inches. The annual air temperature is 42 to 51 degrees Fahrenheit. The frost-free season ranges from 110 to 130 days.

Slopes range from 3 to 45 percent. Parent material consists of residuum derived from sodic, noncalcareous shale.

A typical profile contains a 2 inch light brownish gray clay surface layer. The transition subsoil is light brownish gray clay that is approximately 4 inches thick. The substratum is gray clay that extends to approximately 4 inches in depth.

Permeability within the Lolite soil is slow. Runoff is rapid. The water erosion hazard is very slight and the wind erosion hazard is very slight.

Productivity and Reclamation Potential

There are eight plant species that are common to this map unit: Bluebunch wheatgrass, Bottlebrush squirreltail, Gardner's saltbrush, Indian ricegrass, Western wheatgrass, Birdfoot sagebrush, Sandberg bluegrass, and other perennial forbs.

In a favorable year (above average moisture), the production is approximately 200 lbs/acres. In an unfavorable (drought) year, the production is approximately 50 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock, low strength, slope, and shrink-swell. This map unit is a poor source for topsoil; limitations include depth to bedrock, high clay content, slope, and high sodium content. This map unit is a poor source of overall reclamation material; limitations include droughtiness, high sodium content, depth to bedrock, high clay content, and high salinity.

Theedle noncalcareous variant

The Theedle noncalcareous variant mapping unit consists of moderately deep, well drained soils formed in residuum and slope alluvium weathered from soft sandstone. It occurs on rock-controlled fan aprons, fan pediments, and undulating to rolling uplands at

elevations from 3,500 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 45 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.
Slopes range from 0 to 75 percent. Parent material consists of medium textured slope alluvium and residuum derived primarily from interbedded sandstone and shale.

A typical profile contains a 4 inch light brownish gray loam surface layer. The transition subsoil is a light brownish gray loam that is approximately 4 inches thick. The substratum is a light gray loam that extends to approximately 20 inches in depth.

Permeability within the Theedle soil is moderate. Runoff is slow on the gentler slopes and rapid on the steeper slopes. The water erosion hazard is very slight and the wind erosion hazard is very slight.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Needleandthread, Western wheatgrass, Blue grama, Big sagebrush, Little bluestem, and Winterfat.

In a favorable year (above average moisture), the production is approximately 1,900 lbs/acres. In an unfavorable (drought) year, the production is approximately 700 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock, low strength, shrink-swell, and slope. This map unit is a poor source for topsoil; limitations include slope and depth to bedrock. This map unit is a fair source of overall reclamation material; limitations include depth to bedrock, low organic matter content, droughtiness, and water erosion.

"Or" – Orpha loamy sand

The Orpha loamy sand mapping unit consists of very deep, excessively drained soils formed in alluvium or eolian sand from mixed sources. It occurs on rolling dunes, hills, terraces, floodplains, uplands, valley side slopes, toeslopes, and footslopes at elevations from 3,500 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 18 inches. The annual air temperature is 44 to 50 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 45 percent. Parent material consists of alluvium or eolian deposits generally adjacent to and downwind of sandy parent sources.

A typical profile contains a 6 inch grayish brown loamy sand surface layer. The substratum is a light brownish gray sand that extends to approximately 54 inches in depth.

Permeability within the Orpha soil is rapid or very rapid. Runoff is very low on the gentler slopes and low on the steeper slopes. The water erosion hazard is negligible to very slight and the wind erosion hazard is moderate to severe.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Sand bluestem, Needleandthread, Prairie sandreed, Little bluestem, Thickspike wheatgrass, and Sand sagebrush.

In a favorable year (above average moisture), the production is approximately 1,800 lbs/acres. In an unfavorable (drought) year, the production is approximately 900 lbs/acres.

According to NRCS information, this map unit is a good source for roadfill; there are no limitations listed. This map unit is a poor source for topsoil; limitations include high sand content. This map unit is a poor source of overall reclamation material; limitations include high sand content, wind erosion, low organic matter content, and droughtiness.

"Pe" – Petrie clay loam

The Petrie clay loam mapping unit consists of deep, well drained soils formed in alluvium derived from sodic sedimentary rock. It occurs on fan aprons, fan pediments, and alluvial terraces at elevations from 3,700 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 16 inches. The annual air temperature is 43 to 49 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 10 percent. Parent material consists of alluvium derived from sodic shale and siltstone.

A typical profile contains a 1 inch light yellowish brown clay loam surface layer. The transition subsoil is a light yellowish brown clay loam that is approximately 4 inches thick. The substratum is a light yellowish brown clay that extends to approximately 55 inches in depth.

Permeability within the Petrie soil is very slow. Runoff is slow on the gentler slopes and medium on the steeper slopes. The water erosion hazard is very slight and the wind erosion hazard is very slight.

Productivity and Reclamation Potential

There are eight plant species that are common to this map unit: Gardner's saltbrush, Bottlebrush squirreltail, Indian ricegrass, Western wheatgrass, Alkali sacaton, Birdfoot sagebrush, Greasewood, and Winterfat.

In a favorable year (above average moisture), the production is approximately 650 lbs/acres. In an unfavorable (drought) year, the production is approximately 300 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include low strength and shrink-swell hazard. This map unit is a poor source for topsoil; limitations include high sodium content, high clay content, high salinity, and many rock fragments. This map unit is a poor source of overall reclamation material; limitations include high sodium content, high clay content, high alkalinity, water erosion hazard, and low organic matter content.

"Re" – Renohill clay loam

The Renohill clay loam mapping unit consists of moderately deep, well drained soils formed in alluvium, colluviums, and residuum. It occurs on bedrock controlled plateaus, alluvial fans, hills and ridges at elevations from 3,500 to 6,000 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 43 to 47 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 30 percent. Parent material consists of alluvium, colluviums, and residuum derived from calcareous shale.

A typical profile contains a 4 inch light brownish gray clay loam surface layer. The transition subsoil is a grayish brown heavy clay loam that is approximately 3 inches thick. The substratum is a light olive brown, light yellowish brown, and light brownish gray clay or clay loam that extends to approximately 23 inches in depth.

Permeability within the Renohill soil is slow. Runoff is low on the gentler slopes and high on the steeper slopes. The water erosion hazard is slight and the wind erosion hazard is negligible.

Productivity and Reclamation Potential

There are four plant species that are common to this map unit: Needleandthread, Western wheatgrass, Blue grama, and Green needlegrass.

In a favorable year (above average moisture), the production is approximately 1,500 lbs/acres. In an unfavorable (drought) year, the production is approximately 700 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include low strength, shallow depth to bedrock, and shrink-swell susceptibility. This map unit is a fair source for topsoil; limitations include high clay content and shallow depth to bedrock. This map unit is a fair source of overall reclamation material; limitations include low organic matter content, high clay content, shallow depth to bedrock, and water erosion susceptibility.

"Sh" – Shingle clay loam

The Shingle clay loam mapping unit consists of very shallow or shallow, well drained soils formed in residuum or colluviums derived from interbedded shale and sandstone or in alluvium from mudstone. It occurs on bedrock controlled hillslopes and ridges at elevations from 3,200 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 80 percent. Parent material consists of colluviums and residuum weathered from soft, interbedded sandstone and shale or in alluvium from mudstone.

A typical profile contains a 4 inch light brownish gray clay loam surface layer. The transition subsoil is a light yellowish brown clay loam that is approximately 4 inches thick. The substratum is a light yellowish brown clay loam that extends to approximately 7 inches in depth.

Permeability within the Shingle soil is moderate. Runoff is medium on the gentler slopes and high on the steeper slopes. The water erosion hazard is very slight to slight and the wind erosion hazard is very slight to slight.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Bluebunch wheatgrass, Western wheatgrass, Blue grama, Needleandthread, Threadleaf sedge, and Big sagebrush.

In a favorable year (above average moisture), the production is approximately 1,200 lbs/acres. In an unfavorable (drought) year, the production is approximately 450 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock and slope. This map unit is a poor source for topsoil; limitations include depth to bedrock, rock fragments, and slope. This map unit is a poor source of overall reclamation material; limitations include droughtiness, depth to bedrock, and low organic matter content.

"ShNC" – Shingle noncalcareous variant

The Shingle noncalcareous variant mapping unit consists of very shallow or shallow, well drained soils formed in residuum or colluviums derived from interbedded shale and sandstone or in alluvium from mudstone. It occurs on bedrock controlled hillslopes and ridges at elevations from 3,200 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 80 percent. Parent material consists of colluviums and residuum weathered from soft, interbedded sandstone and shale or in alluvium from mudstone.

A typical profile contains a 4 inch light brownish gray clay loam surface layer. The transition subsoil is a light yellowish brown clay loam that is approximately 4 inches thick. The substratum is a light yellowish brown clay loam that extends to approximately 7 inches in depth.

Permeability within the Shingle soil is moderate. Runoff is medium on the gentler slopes and high on the steeper slopes. The water erosion hazard is slight and the wind erosion hazard is very slight.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Bluebunch wheatgrass, Western wheatgrass, Blue grama, Needleandthread, Threadleaf sedge, and Big sagebrush.

In a favorable year (above average moisture), the production is approximately 1,200 lbs/acres. In an unfavorable (drought) year, the production is approximately 450 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock and slope. This map unit is a poor source for topsoil; limitations include depth to bedrock, rock fragments, and slope. This map unit is a poor source of overall reclamation material; limitations include droughtiness, depth to bedrock, and low organic matter content.

"Sh-Fo-EmMV" – Shingle-Forkwood-Embry moderately deep variant complex

Shingle clay loam

The Shingle clay loam mapping unit consists of very shallow or shallow, well drained soils formed in residuum or colluviums derived from interbedded shale and sandstone or in alluvium from mudstone. It occurs on bedrock controlled hillslopes and ridges at elevations from 3,200 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 80 percent. Parent material consists of colluviums and residuum weathered from soft, interbedded sandstone and shale or in alluvium from mudstone.

A typical profile contains a 4 inch light brownish gray clay loam surface layer. The transition subsoil is a light yellowish brown clay loam that is approximately 4 inches thick. The substratum is a light yellowish brown clay loam that extends to approximately 7 inches in depth.

Permeability within the Shingle soil is moderate. Runoff is medium on the gentler slopes and high on the steeper slopes. The water erosion hazard is very slight to slight and the wind erosion hazard is very slight to slight.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Bluebunch wheatgrass, Western wheatgrass, Blue grama, Needleandthread, Threadleaf sedge, and Big sagebrush.

In a favorable year (above average moisture), the production is approximately 1,200 lbs/acres. In an unfavorable (drought) year, the production is approximately 450 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock and slope. This map unit is a poor source for topsoil; limitations include depth to bedrock, rock fragments, and slope. This map unit is a poor source of overall reclamation material; limitations include droughtiness, depth to bedrock, and low organic matter content.

Forkwood loam

The Forkwood loam mapping unit consists of very deep, well drained soils formed in alluvium. It occurs on terraces, alluvial fans, fan remnants, hills, ridges and pediments at elevations from 3,500 to 6,000 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.
Slopes range from 0 to 15 percent. Parent material consists of slopewash alluvium derived from interbedded shales and argillaceous sandstone.

A typical profile contains a 5 inch brown loamsurface layer. The transition subsoil is a brown to light brownish gray clay loam that is approximately 25 inches thick. The substratum is a light brownish gray loam that extends to approximately 30 inches in depth.

Permeability within the Forkwood soil is moderate. Runoff is low on the gentler slopes and medium on the steeper slopes. The water erosion hazard is very slight to slight and the wind erosion hazard is very slight to slight.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Needleandthread, Western wheatgrass, Blue grama, Big sagebrush, Little bluestem, and Winterfat.

In a favorable year (above average moisture), the production is approximately 1,900 lbs/acres. In an unfavorable (drought) year, the production is approximately 700 lbs/acres.

According to NRCS information, this map unit is a good source for roadfill; there are no limitations listed. This map unit is a good source for topsoil; there are no limitations listed. This map unit is a fair source of overall reclamation material; limitations include low organic matter content and water erosion.

Embry moderately deep variant

The Embry moderately deep variant mapping unit consists of moderately deep, well drained soils formed in alluvium and eolian deposits derived from sandstone. It occurs on hills, dunes, terraces and alluvial fans at elevations from 4,200 to 6,000 feet.

The mean annual precipitation is estimated to be 10 to 15 inches. The annual air

temperature is 45 to 50 degrees Fahrenheit. The frost-free season ranges from 110 to 130 days.

Slopes range from 0 to 20 percent. Parent material consists of alluvium and eolian deposits derived from noncalcareous sandstone.

A typical profile contains a 6 inch light brownish gray sandy loam surface layer. The substratum is a light brownish gray to pale brown sandy loam that extends to approximately 34 inches in depth.

Permeability within the Embry soil is moderately rapid. Runoff is slow on the gentler slopes and medium on the steeper slopes. The water erosion hazard is very slight and the wind erosion hazard is moderate.

Productivity and Reclamation Potential
There are eight plant species that are common to this map unit: Needleandthread, Prairie sandreed, Indian ricegrass, Little bluestem, Blue grama, Silver sagebrush, Threadleaf sedge, and Western wheatgrass.

In a favorable year (above average moisture), the production is approximately 1,600 lbs/acres. In an unfavorable (drought) year, the production is approximately 750 lbs/acres.

According to NRCS information, this map unit is a good source for roadfill; there are no limitations listed. This map unit is a fair source for topsoil; limitations include slope. This map unit is a fair source of overall reclamation material; limitations include low organic matter content.

"Sh-Th-Ki" – Shingle-Theedle-Kishona complex

Shingle clay loam

The Shingle clay loam mapping unit consists of very shallow or shallow, well drained soils formed in residuum or colluviums derived from interbedded shale and sandstone or in alluvium from mudstone. It occurs on bedrock controlled hillslopes and ridges at elevations from 3,200 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 80 percent. Parent material consists of colluviums and residuum weathered from soft, interbedded sandstone and shale or in alluvium from mudstone.

A typical profile contains a 4 inch light brownish gray clay loam surface layer. The transition subsoil is a light yellowish brown clay loam that is approximately 4 inches thick. The substratum is a light yellowish brown clay loam that extends to approximately 7 inches in depth.

Permeability within the Shingle soil is moderate. Runoff is medium on the gentler slopes and high on the steeper slopes. The water erosion hazard is very slight to slight and the wind erosion hazard is very slight to slight.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Bluebunch wheatgrass, Western wheatgrass, Blue grama, Needleandthread, Threadleaf sedge, and Big sagebrush.

In a favorable year (above average moisture), the production is approximately 1,200 lbs/acres. In an unfavorable (drought) year, the production is approximately 450 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock and slope. This map unit is a poor source for topsoil; limitations include depth to bedrock, rock fragments, and slope. This map unit is a poor source of overall reclamation material; limitations include droughtiness, depth to bedrock, and low organic matter content.

Theedle loam

The Theedle loam mapping unit consists of moderately deep, well drained soils formed in residuum and slope alluvium weathered from soft sandstone. It occurs on rock-controlled fan aprons, fan pediments, and undulating to rolling uplands at elevations from 3,500 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 45 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.
Slopes range from 0 to 75 percent. Parent material consists of medium textured slope alluvium and residuum derived primarily from interbedded sandstone and shale.

A typical profile contains a 4 inch light brownish gray loam surface layer. The transition subsoil is a light brownish gray loam that is approximately 4 inches thick. The substratum is a light gray loam that extends to approximately 20 inches in depth.

Permeability within the Theedle soil is moderate. Runoff is slow on the gentler slopes and rapid on the steeper slopes. The water erosion hazard is very slight to slight and the wind erosion hazard is very slight to moderate.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Needleandthread, Western wheatgrass, Blue grama, Big sagebrush, Little bluestem, and Winterfat.

In a favorable year (above average moisture), the production is approximately 1,900 lbs/acres. In an unfavorable (drought) year, the production is approximately 700 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock, low strength, shrink-swell, and slope. This map unit is a poor source for topsoil; limitations include slope and depth to bedrock. This map unit is a fair source of overall reclamation material; limitations include depth to bedrock, low organic matter content, droughtiness, and water erosion.

Kishona loam

The Kishona loam mapping unit consists of very deep, well drained soils formed in alluvium. It occurs on fan aprons, alluvial fans, fan remnants, hills, ridges and terraces at elevations from 3,500 to 6,700 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 6 percent but range up to 30 percent on dissected slopes. Parent material consists of alluvium derived from sandstones and shales.

A typical profile contains a 4 inch brown loam surface layer. The transition subsoil is a very pale brown silty clay loam that is approximately 20 inches thick. The substratum is a pale brown loam that extends to approximately 36 inches in depth.

Permeability within the Kishona soil is moderate. Runoff is slow on gentler slopes and medium on steeper slopes. The water erosion hazard is very slight to slight and the wind erosion hazard is very slight to slight.

Productivity and Reclamation Potential

There are seven plant species that are common to this map unit: Needleandthread, Western wheatgrass, Blue grama, Green needlegrass, Big sagebrush, Little bluestem, and Thickspike wheatgrass.

In a favorable year (above average moisture), the production is approximately 1,500 lbs/acres. In an unfavorable (drought) year, the production is approximately 700 lbs/acres.

According to NRCS information, this map unit is a fair source for roadfill; limitations include low strength and shrink-swell. This map unit is a good source for topsoil; there are no limitations listed. This map unit is a fair source of overall reclamation material; limitations include low organic matter content and water erosion.

"TaNC" – Taluce noncalcareous variant

The Taluce noncalcareous variant mapping unit consists of very shallow or shallow, well drained soils formed in residuum and slope alluvium derived from sandstone. It occurs on ridges and hills at elevations from 3,500 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 17 inches. The annual air temperature is 42 to 51 degrees Fahrenheit. The frost-free season ranges from 100 to 130 days.

Slopes range from 3 to 70 percent. Parent material consists of residuum and slope alluvium derived from sandstone.

A typical profile contains a 4 inch yellowish brown sandy loam surface layer. The substratum is a light yellowish brown sandy loam that extends to approximately 5 inches in depth.

Permeability within the Taluce soil is rapid. Runoff is medium on the gentler slopes and rapid on the steeper slopes. The water erosion hazard is negligible and the wind erosion hazard is moderate.

Productivity and Reclamation Potential

There are eight plant species that are common to this map unit: Needleandthread, Prairie sandreed, Blue grama, Indian ricegrass, Little bluestem, Sand bluestem, Threadleaf sedge, and Western wheatgrass.

In a favorable year (above average moisture), the production is approximately 1,300 lbs/acres. In an unfavorable (drought) year, the production is approximately 600 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock and slope. This map unit is a poor source for topsoil; limitations include slope and depth to bedrock. This map unit is a poor source of overall reclamation material; limitations include depth to bedrock, low organic matter content, and droughtiness.

"TaNC-Or" – Taluce noncalcareous variant-Orpha complex

Taluce noncalcareous variant

The Taluce noncalcareous variant mapping unit consists of very shallow or shallow, well drained soils formed in residuum and slope alluvium derived from sandstone. It occurs on ridges and hills at elevations from 3,500 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 17 inches. The annual air temperature is 42 to 51 degrees Fahrenheit. The frost-free season ranges from 100 to 130 days.

Slopes range from 3 to 70 percent. Parent material consists of residuum and slope alluvium derived from sandstone.

A typical profile contains a 4 inch yellowish brown sandy loam surface layer. The substratum is a light yellowish brown sandy loam that extends to approximately 5 inches in depth.

Permeability within the Taluce soil is rapid. Runoff is medium on the gentler slopes and rapid on the steeper slopes. The water erosion hazard is negligible and the wind erosion hazard is moderate.

Productivity and Reclamation Potential

There are eight plant species that are common to this map unit: Needleandthread, Prairie sandreed, Blue grama, Indian ricegrass, Little bluestem, Sand bluestem, Threadleaf sedge, and Western wheatgrass.

In a favorable year (above average moisture), the production is approximately 1,300 lbs/acres. In an unfavorable (drought) year, the production is approximately 600 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock and slope. This map unit is a poor source for topsoil; limitations include slope and depth to bedrock. This map unit is a poor source of overall reclamation material; limitations include depth to bedrock, low organic matter content, and droughtiness.

Orpha loamy sand

The Orpha loamy sand mapping unit consists of very deep, excessively drained soils

formed in alluvium or eolian sand from mixed sources. It occurs on rolling dunes, hills, terraces, floodplains, uplands, valley side slopes, toeslopes, and footslopes at elevations from 3,500 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 18 inches. The annual air temperature is 44 to 50 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 45 percent. Parent material consists of alluvium or eolian deposits generally adjacent to and downwind of sandy parent sources.

A typical profile contains a 6 inch grayish brown loamy sand surface layer. The substratum is a light brownish gray sand that extends to approximately 54 inches in depth.

Permeability within the Orpha soil is rapid or very rapid. Runoff is very low on the gentler slopes and low on the steeper slopes. The water erosion hazard is negligible to very slight and the wind erosion hazard is moderate to severe.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Sand bluestem, Needleandthread, Prairie sandreed, Little bluestem, Thickspike wheatgrass, and Sand sagebrush.

In a favorable year (above average moisture), the production is approximately 1,800 lbs/acres. In an unfavorable (drought) year, the production is approximately 900 lbs/acres.

According to NRCS information, this map unit is a good source for roadfill; there are no limitations listed. This map unit is a poor source for topsoil; limitations include high sand content. This map unit is a poor source of overall reclamation material; limitations include high sand content, wind erosion, low organic matter content, and droughtiness.

"Th" – Theedle loam

The Theedle loam mapping unit consists of moderately deep, well drained soils formed in residuum and slope alluvium weathered from soft sandstone. It occurs on rock-controlled fan aprons, fan pediments, and undulating to rolling uplands at elevations from 3,500 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 45 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 75 percent. Parent material consists of medium textured slope alluvium and residuum derived primarily from interbedded sandstone and shale.

A typical profile contains a 4 inch light brownish gray loam surface layer. The transition subsoil is a light brownish gray loam that is approximately 4 inches thick. The substratum is a light gray loam that extends to approximately 20 inches in depth.

Permeability within the Theedle soil is moderate. Runoff is slow on the gentler slopes and rapid on the steeper slopes. The water erosion hazard is very slight to slight and the wind erosion hazard is very slight to moderate.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Needleandthread, Western wheatgrass, Blue grama, Big sagebrush, Little bluestem, and Winterfat.

In a favorable year (above average moisture), the production is approximately 1,900 lbs/acres. In an unfavorable (drought) year, the production is approximately 700 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock, low strength, shrink-swell, and slope. This map unit is a poor source for topsoil; limitations include slope and depth to bedrock. This map unit is a fair source of overall reclamation material; limitations include depth to bedrock, low organic matter content, droughtiness, and water erosion.

"ThNC" – Theedle noncalcareous variant

The Theedle noncalcareous variant mapping unit consists of moderately deep, well drained soils formed in residuum and slope alluvium weathered from soft sandstone. It occurs on rock-controlled fan aprons, fan pediments, and undulating to rolling uplands at elevations from 3,500 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 45 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 75 percent. Parent material consists of medium textured slope alluvium and residuum derived primarily from interbedded sandstone and shale.

A typical profile contains a 4 inch light brownish gray loam surface layer. The transition subsoil is a light brownish gray loam that is approximately 4 inches thick. The substratum is a light gray loam that extends to approximately 20 inches in depth.

Permeability within the Theedle soil is moderate. Runoff is slow on the gentler slopes and rapid on the steeper slopes. The water erosion hazard is very slight and the wind erosion hazard is very slight.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Needleandthread, Western wheatgrass, Blue grama, Big sagebrush, Little bluestem, and Winterfat.

In a favorable year (above average moisture), the production is approximately 1,900 lbs/acres. In an unfavorable (drought) year, the production is approximately 700 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock, low strength, shrink-swell, and slope. This map unit is a poor source for topsoil; limitations include slope and depth to bedrock. This map unit is a fair source of overall reclamation material; limitations include depth to bedrock, low organic matter content, droughtiness, and water erosion.

"Th-CuNc" – Theedle-Cushman noncalcareous variant complex

Theedle loam

The Theedle loam mapping unit consists of moderately deep, well drained soils formed in residuum and slope alluvium weathered from soft sandstone. It occurs on rock-controlled fan aprons, fan pediments, and undulating to rolling uplands at elevations from 3,500 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 45 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 75 percent. Parent material consists of medium textured slope alluvium and residuum derived primarily from interbedded sandstone and shale.

A typical profile contains a 4 inch light brownish gray loam surface layer. The transition subsoil is a light brownish gray loam that is approximately 4 inches thick. The substratum is a light gray loam that extends to approximately 20 inches in depth.

Permeability within the Theedle soil is moderate. Runoff is slow on the gentler slopes and rapid on the steeper slopes. The water erosion hazard is very slight to slight and the wind erosion hazard is very slight to moderate.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Needleandthread, Western wheatgrass, Blue grama, Big sagebrush, Little bluestem, and Winterfat.

In a favorable year (above average moisture), the production is approximately 1,900 lbs/acres. In an unfavorable (drought) year, the production is approximately 700 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock, low strength, shrink-swell, and slope. This map unit is a poor source for topsoil; limitations include slope and depth to bedrock. This map unit is a fair source of overall reclamation material; limitations include depth to bedrock, low organic matter content, droughtiness, and water erosion.

Cushman non-calcareous variant

The Cushman noncalcareous variant mapping unit consists of moderately deep, well

drained soils formed in slopewash alluvium and residuum from interbedded shales and siltstone and fine-grained argillaceous sandstone. It occurs on buttes, fan remnants, hills, piedmonts, ridges and terraces at elevations from 3,500 to 6,000 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.
Slopes range from 0 to 20 percent. Parent material consists of moderately fine textured slopewash alluvium and residuum. Surface erosion is common in overgrazed areas, and some thin eolian deposits overlie these soils in some areas.

A typical profile contains a 2 inch light brownish gray very fine sandy loam surface layer. The transition subsoil is a brown to yellowish brown clay loam that is approximately 12 inches thick. The substratum is a pale to very pale brown loam that extends to approximately 18 inches in depth.

Permeability within the Cushman soil is moderate. Runoff is medium. The water erosion hazard is slight and the wind erosion hazard is very slight.

Productivity and Reclamation Potential

There are four plant species that are common to this map unit: Needleandthread, Western wheatgrass, Blue grama, and Green needlegrass.

In a favorable year (above average moisture), the production is approximately 1,500 lbs/acres. In an unfavorable (drought) year, the production is approximately 700 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock and low strength. This map unit is a fair source for topsoil; limitations include depth to bedrock. This map unit is a fair source of overall reclamation material; limitations include depth to bedrock, low organic matter content, and water erosion.

"Tl" – Tullock loamy sand

The Tullock loamy sand mapping unit consists of moderately deep, excessively drained soils formed in residuum, alluvium or eolian deposits derived from sandstone. It occurs on dunes, hills and ridges at elevations from 3,500 to 6,000 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 47 to 53 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 45 percent. Parent material consists of eolian deposits and residuum derived from sandstone.

A typical profile contains a 5 inch brown loamy sand surface layer. The substratum is a brown and pale brown loamy sand that extends to approximately 26 inches in depth.

Permeability within the Tullock soil is rapid. Runoff is negligible on the gentler slopes and low on the steeper slopes. The water erosion hazard is negligible and the wind erosion hazard is moderate.

Productivity and Reclamation Potential

There are seven plant species that are common to this map unit: Prairie sandreed, Sand bluestem, Fringed sagewort, Indian ricegrass, Needleandthread, Sand dropseed, and Silver sagebrush.

In a favorable year (above average moisture), the production is approximately 1,700 lbs/acres. In an unfavorable (drought) year, the production is approximately 900 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock. This map unit is a poor source for topsoil; limitations include high sand content, steep slope, and shallow depth to bedrock. This map unit is a poor source of overall reclamation material; limitations include high sand content, wind erosion susceptibility, droughtiness, low organic matter content, and shallow depth to bedrock.

"TlNC" – Tullock noncalcareous variant

The Tullock noncalcareous variant mapping unit consists of moderately deep, excessively drained soils formed in residuum, alluvium or eolian deposits derived from sandstone. It occurs on dunes, hills and ridges at elevations from 3,500 to 6,000 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 47 to 53 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 45 percent. Parent material consists of eolian deposits and residuum derived from sandstone.

A typical profile contains a 5 inch brown loamy sand surface layer. The substratum is a brown and pale brown loamy sand that extends to approximately 26 inches in depth.

Permeability within the Tullock soil is rapid. Runoff is negligible on the gentler slopes and low on the steeper slopes. The water erosion hazard is negligible and the wind erosion hazard is moderate.

Productivity and Reclamation Potential

There are seven plant species that are common to this map unit: Prairie sandreed, Sand bluestem, Fringed sagewort, Indian ricegrass, Needleandthread, Sand dropseed, and Silver sagebrush.

In a favorable year (above average moisture), the production is approximately 1,700 lbs/acres. In an unfavorable (drought) year, the production is approximately 900 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock. This map unit is a poor source for topsoil; limitations include high sand content, steep slope, and shallow depth to bedrock. This map unit is a poor source of overall reclamation material; limitations include high sand content, wind erosion susceptibility, droughtiness, low organic matter content, and shallow depth to bedrock.

"TlNC-Ta" – Tullock noncalcareous variant-Taluce complex

Tullock noncalcareous variant

The Tullock noncalcareous variant mapping unit consists of moderately deep, excessively drained soils formed in residuum, alluvium or eolian deposits derived from sandstone. It occurs on dunes, hills and ridges at elevations from 3,500 to 6,000 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 47 to 53 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 45 percent. Parent material consists of eolian deposits and residuum derived from sandstone.

A typical profile contains a 5 inch brown loamy sand surface layer. The substratum is a brown and pale brown loamy sand that extends to approximately 26 inches in depth.

Permeability within the Tullock soil is rapid. Runoff is negligible on the gentler slopes and low on the steeper slopes. The water erosion hazard is negligible and the wind erosion hazard is moderate.

Productivity and Reclamation Potential

There are seven plant species that are common to this map unit: Prairie sandreed, Sand bluestem, Fringed sagewort, Indian ricegrass, Needleandthread, Sand dropseed, and Silver sagebrush.

In a favorable year (above average moisture), the production is approximately 1,700 lbs/acres. In an unfavorable (drought) year, the production is approximately 900 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock. This map unit is a poor source for topsoil; limitations include high sand content, steep slope, and shallow depth to bedrock. This map unit is a poor source of overall reclamation material; limitations include high sand content, wind erosion susceptibility, droughtiness, low organic matter content, and shallow depth to bedrock.

Taluce sandy loam

The Taluce sandy loam mapping unit consists of very shallow or shallow, well drained

soils formed in residuum and slope alluvium derived from sandstone. It occurs on ridges and hills at elevations from 3,500 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 17 inches. The annual air temperature is 42 to 51 degrees Fahrenheit. The frost-free season ranges from 100 to 130 days.
Slopes range from 3 to 70 percent. Parent material consists of residuum and slope alluvium derived from sandstone.

A typical profile contains a 4 inch yellowish brown sandy loam surface layer. The substratum is a light yellowish brown sandy loam that extends to approximately 5 inches in depth.

Permeability within the Taluce soil is rapid. Runoff is medium on the gentler slopes and rapid on the steeper slopes. The water erosion hazard is negligible and the wind erosion hazard is severe.

Productivity and Reclamation Potential

There are eight plant species that are common to this map unit: Needleandthread, Prairie sandreed, Blue grama, Indian ricegrass, Little bluestem, Sand bluestem, Threadleaf sedge, and Western wheatgrass.

In a favorable year (above average moisture), the production is approximately 1,300 lbs/acres. In an unfavorable (drought) year, the production is approximately 600 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock and slope. This map unit is a poor source for topsoil; limitations include slope and depth to bedrock. This map unit is a poor source of overall reclamation material; limitations include depth to bedrock, low organic matter content, and droughtiness.

"TlNC-Tu" – Tullock noncalcareous variant-Turnercrest complex

Tullock noncalcareous variant

The Tullock noncalcareous variant mapping unit consists of moderately deep, excessively drained soils formed in residuum, alluvium or eolian deposits derived from sandstone. It occurs on dunes, hills and ridges at elevations from 3,500 to 6,000 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 47 to 53 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 45 percent. Parent material consists of eolian deposits and residuum derived from sandstone.

A typical profile contains a 5 inch brown loamy sand surface layer. The substratum is a brown and pale brown loamy sand that extends to approximately 26 inches in depth.

Permeability within the Tullock soil is rapid. Runoff is negligible on the gentler slopes and low on the steeper slopes. The water erosion hazard is negligible and the wind erosion hazard is moderate.

Productivity and Reclamation Potential

There are seven plant species that are common to this map unit: Prairie sandreed, Sand bluestem, Fringed sagewort, Indian ricegrass, Needleandthread, Sand dropseed, and Silver sagebrush.

In a favorable year (above average moisture), the production is approximately 1,700 lbs/acres. In an unfavorable (drought) year, the production is approximately 900 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock. This map unit is a poor source for topsoil; limitations include high sand content, steep slope, and shallow depth to bedrock. This map unit is a poor source of overall reclamation material; limitations include high sand content, wind erosion susceptibility, droughtiness, low organic matter content, and shallow depth to bedrock.

Turnercrest fine sandy loam

The Turnercrest fine sandy loam mapping unit consists of moderately deep, well drained

soils formed in eolian or alluvium deposits and residuum derived from soft sandstone. It occurs on bedrock-controlled hills, fan remnants, ridges, and structural benches at elevations from 3,200 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 15 inches. The annual air temperature is 45 to 53 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.
Slopes range from 0 to 30 percent. Parent material consists of eolian or alluvium deposits and sandy residuum.

A typical profile contains a 2 inch brown fine sandy loam surface layer. The substratum is a brown to light gray fine sandy loam that extends to approximately 23 inches in depth.

Permeability within the Turnercrest soil is moderately rapid. Runoff is very low on the gentler slopes and medium on the steeper slopes. The water erosion hazard is negligible to very slight and the wind erosion hazard is slight to severe.

Productivity and Reclamation Potential

There are three plant species that are common to this map unit: Needleandthread, Prairie sandreed, and Indian ricegrass.

In a favorable year (above average moisture), the production is approximately 1,600 lbs/acres. In an unfavorable (drought) year, the production is approximately 750 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock. This map unit is a fair source for topsoil; limitations include steep slope, high sand content, and shallow depth to bedrock. This map unit is a fair source of overall reclamation material; limitations include droughtiness, low organic matter content, high sand content, water erosion susceptibility, and shallow depth to bedrock.

"Tu" –Turnercrest fine sandy loam

The Turnercrest fine sandy loam mapping unit consists of moderately deep, well drained soils formed in eolian or alluvium deposits and residuum derived from soft sandstone. It occurs on bedrock-controlled hills, fan remnants, ridges, and structural benches at elevations from 3,200 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 15 inches. The annual air temperature is 45 to 53 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 30 percent. Parent material consists of eolian or alluvium deposits and sandy residuum.

A typical profile contains a 2 inch brown fine sandy loam surface layer. The substratum is a brown to light gray fine sandy loam that extends to approximately 23 inches in depth.

Permeability within the Turnercrest soil is moderately rapid. Runoff is very low on the gentler slopes and medium on the steeper slopes. The water erosion hazard is negligible to very slight and the wind erosion hazard is slight to severe.

Productivity and Reclamation Potential

There are three plant species that are common to this map unit: Needleandthread, Prairie sandreed, and Indian ricegrass.

In a favorable year (above average moisture), the production is approximately 1,600 lbs/acres. In an unfavorable (drought) year, the production is approximately 750 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock. This map unit is a fair source for topsoil; limitations include steep slope, high sand content, and shallow depth to bedrock. This map unit is a fair source of overall reclamation material; limitations include droughtiness, low organic matter content, high sand content, water erosion susceptibility, and shallow depth to bedrock.

"TuNC" –Turnercrest noncalcareous variant

The Turnercrest noncalcareous variant mapping unit consists of moderately deep, well drained soils formed in eolian or alluvium deposits and residuum derived from soft sandstone. It occurs on bedrock-controlled hills, fan remnants, ridges, and structural benches at elevations from 3,200 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 15 inches. The annual air temperature is 45 to 53 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 30 percent. Parent material consists of eolian or alluvium deposits and sandy residuum.

A typical profile contains a 2 inch brown fine sandy loam surface layer. The substratum is a brown to light gray fine sandy loam that extends to approximately 23 inches in depth.

Permeability within the Turnercrest soil is moderately rapid. Runoff is very low on the gentler slopes and medium on the steeper slopes. The water erosion hazard is negligible and the wind erosion hazard is moderate.

Productivity and Reclamation Potential

There are three plant species that are common to this map unit: Needleandthread, Prairie sandreed, and Indian ricegrass.

In a favorable year (above average moisture), the production is approximately 1,600 lbs/acres. In an unfavorable (drought) year, the production is approximately 750 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock. This map unit is a fair source for topsoil; limitations include steep slope, high sand content, and shallow depth to bedrock. This map unit is a fair source of overall reclamation material; limitations include droughtiness, low organic matter content, high sand content, water erosion susceptibility, and shallow depth to bedrock.

"Ul" –Ulm clay loam

The Ulm clay loam mapping unit consists of very deep, well drained soils formed in calcareous alluvium derived from sedimentary rock. It occurs on relict terraces, alluvial fans, fan remnants, plateaus, ridges and hills at elevations from 3,500 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 46 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 18 percent. Parent material consists of fine and medium textured alluvium derived from interbedded shales and argillaceous sandstone.

A typical profile contains a 4 inch grayish brown clay loam surface layer. The transition subsoil is a brown clay that is approximately 21 inches thick. The substratum is a pale brown clay loam that extends to approximately 35 inches in depth.

Permeability within the Ulm soil is moderate to slow. Runoff is medium. The water erosion hazard is very slight and the wind erosion hazard is very slight to slight.

Productivity and Reclamation Potential

There are five plant species that are common to this map unit: Green needlegrass, Western wheatgrass, Blue grama, Big sagebrush, and Cusick's bluegrass

In a favorable year (above average moisture), the production is approximately 1,400 lbs/acres. In an unfavorable (drought) year, the production is approximately 600 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include low strength and shrink-swell susceptibility. This map unit is a poor source for topsoil; limitations include high clay content. This map unit is a poor source of overall reclamation material; limitations include high clay content, low organic matter content, and water erosion susceptibility.

"Wo" –Worf loam

The Worf loam mapping unit consists of very shallow or shallow, well drained soils formed in residuum and colluvial slopewash weathered from sedimentary rock. It occurs on upland hills and ridges at elevations from 3,500 to 5,600 feet.

The mean annual precipitation is estimated to be 10 to 17 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 30 percent. Parent material consists of calcareous materials weathered from sedimentary bedrock.

A typical profile contains a 3 inch grayish brown loam surface layer. The transition subsoil is a grayish brown loam that is approximately 2 inches thick. The substratum is a brown to light yellowish brown clay loam or loam that extends to approximately 9 inches in depth.

Permeability within the Worf soil is moderate. Runoff is medium on the gentler slopes and rapid on the steeper slopes. The water erosion hazard is slight and the wind erosion hazard is very slight.

Productivity and Reclamation Potential

There are nine plant species that are common to this map unit: Bluebunch wheatgrass, Blue grama, Needleandthread, Western wheatgrass, Big sagebrush, Indian ricegrass, Needleleaf sedge, Sideoats grama, and Threadleaf sedge.

In a favorable year (above average moisture), the production is approximately 1,200 lbs/acres. In an unfavorable (drought) year, the production is approximately 450 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include shallow depth to bedrock, low strength, shrink-swell susceptibility, and steep slope. This map unit is a poor source for topsoil; limitations include shallow depth to bedrock, steep slope, and high clay content. This map unit is a poor source of overall reclamation material; limitations include wind erosion susceptibility, shallow depth to bedrock, droughtiness, low organic matter content, and high clay content.

"WoNC" –Worf noncalcareous variant

The Worf noncalcareous variant mapping unit consists of very shallow or shallow, well drained soils formed in residuum and colluvial slopewash weathered from sedimentary rock. It occurs on upland hills and ridges at elevations from 3,500 to 5,600 feet.

The mean annual precipitation is estimated to be 10 to 17 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 30 percent. Parent material consists of noncalcareous materials weathered from sedimentary bedrock.

A typical profile contains a 3 inch grayish brown loam surface layer. The transition subsoil is a grayish brown loam that is approximately 2 inches thick. The substratum is a brown to light yellowish brown clay loam or loam that extends to approximately 9 inches in depth.

Permeability within the Worf soil is moderate. Runoff is medium on the gentler slopes and rapid on the steeper slopes. The water erosion hazard is very slight and the wind erosion hazard is slight.

Productivity and Reclamation Potential

There are nine plant species that are common to this map unit: Bluebunch wheatgrass, Blue grama, Needleandthread, Western wheatgrass, Big sagebrush, Indian ricegrass, Needleleaf sedge, Sideoats grama, and Threadleaf sedge.

In a favorable year (above average moisture), the production is approximately 1,200 lbs/acres. In an unfavorable (drought) year, the production is approximately 450 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include shallow depth to bedrock, low strength, shrink-swell susceptibility, and steep slope. This map unit is a poor source for topsoil; limitations include shallow depth to bedrock, steep slope, and high clay content. This map unit is a poor source of overall reclamation material; limitations include wind erosion susceptibility, shallow depth to bedrock, droughtiness, low organic matter content, and high clay content.

"Zi" – Zigweid loam

The Zigweid loam mapping unit consists of very deep, well drained soils formed in alluvium from mixed sedimentary sources. It occurs on fan aprons, alluvial fans, fan piedmonts, fan remnants, terraces, ridges and hills at elevations from 3,500 to 6,600 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 20 percent. Parent material consists of calcareous, moderately fine textured sediments derived from interbedded shale and soft sandstone.

A typical profile contains a 4 inch light brownish gray loam surface layer. The transition subsoil is a brown clay loam that is approximately 13 inches thick. The substratum is a brown to pale brown loam or clay loam that extends to approximately 43 inches in depth.

Permeability within the Zigweid soil is moderate. Runoff is medium on the gentler slopes and rapid on the steeper slopes. The water erosion hazard is very slight and the wind erosion hazard is very slight.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Western wheatgrass, Needleandthread, Big sagebrush, Bluebunch wheatgrass, Green needlegrass, and Muttongrass.

In a favorable year (above average moisture), the production is approximately 1,400 lbs/acres. In an unfavorable (drought) year, the production is approximately 600 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include low strength and shrink-swell susceptibility. This map unit is a good source for topsoil; there are no limitations listed. This map unit is a fair source of overall reclamation material; limitations include low organic matter content and water erosion susceptibility.

"ZiNC-Th" – Zigweid noncalcareous variant-Theedle complex

Zigweid noncalcareous variant

The Zigweid noncalcareous variant mapping unit consists of very deep, well drained soils formed in alluvium from mixed sedimentary sources. It occurs on fan aprons, alluvial fans, fan piedmonts, fan remnants, terraces, ridges and hills at elevations from 3,500 to 6,600 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 43 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.

Slopes range from 0 to 20 percent. Parent material consists of noncalcareous, moderately fine textured sediments derived from interbedded shale and soft sandstone.

A typical profile contains a 4 inch light brownish gray loam surface layer. The transition subsoil is a brown clay loam that is approximately 13 inches thick. The substratum is a brown to pale brown loam or clay loam that extends to approximately 43 inches in depth.

Permeability within the Zigweid soil is moderate. Runoff is medium on the gentler slopes and rapid on the steeper slopes. The water erosion hazard is slight and the wind erosion hazard is very slight.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Western wheatgrass, Needleandthread, Big sagebrush, Bluebunch wheatgrass, Green needlegrass, and Muttongrass.

In a favorable year (above average moisture), the production is approximately 1,400 lbs/acres. In an unfavorable (drought) year, the production is approximately 600 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include low strength and shrink-swell susceptibility. This map unit is a good source for topsoil; there are no limitations listed. This map unit is a fair source of overall reclamation material; limitations include low organic matter content and water erosion susceptibility.

Theedle loam

The Theedle loam mapping unit consists of moderately deep, well drained soils formed in residuum and slope alluvium weathered from soft sandstone. It occurs on rock-controlled fan aprons, fan pediments, and undulating to rolling uplands at elevations from 3,500 to 6,500 feet.

The mean annual precipitation is estimated to be 10 to 14 inches. The annual air temperature is 45 to 51 degrees Fahrenheit. The frost-free season ranges from 105 to 130 days.
Slopes range from 0 to 75 percent. Parent material consists of medium textured slope alluvium and residuum derived primarily from interbedded sandstone and shale.
A typical profile contains a 4 inch light brownish gray loam surface layer. The transition subsoil is a light brownish gray loam that is approximately 4 inches thick. The substratum is a light gray loam that extends to approximately 20 inches in depth.

Permeability within the Theedle soil is moderate. Runoff is slow on the gentler slopes and rapid on the steeper slopes. The water erosion hazard is very slight to slight and the wind erosion hazard is very slight to moderate.

Productivity and Reclamation Potential

There are six plant species that are common to this map unit: Needleandthread, Western wheatgrass, Blue grama, Big sagebrush, Little bluestem, and Winterfat.

In a favorable year (above average moisture), the production is approximately 1,900 lbs/acres. In an unfavorable (drought) year, the production is approximately 700 lbs/acres.

According to NRCS information, this map unit is a poor source for roadfill; limitations include depth to bedrock, low strength, shrink-swell, and slope. This map unit is a poor source for topsoil; limitations include slope and depth to bedrock. This map unit is a fair source of overall reclamation material; limitations include depth to bedrock, low organic matter content, droughtiness, and water erosion.

ADDENDUM 3.3-D

SAMPLED SOIL SERIES DESCRIPTIONS

WORF
CLAY LOAM

Soil Mapping Unit "Wo"
Lab Sample ID: C08100869-001_003
BKS Sample ID: #137

Typical Pedon: Worf clay loam- rangeland. (Colors are for dry soil unless otherwise stated.)

The Worf series consists of well drained soils that are very shallow or shallow to bedrock. They formed in residuum and colluvial slopewash weathered from sedimentary rock. Worf soils are on upland hills and ridges and have slopes of 0 to 30 percent. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 45 degrees F.

A - 0 to 2 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; strong very fine granular structure; soft, very friable, slightly sticky and slightly plastic; many fine and very fine roots; noneffervescent; neutral (pH 6.6); clear smooth boundary. (2 to 4 inches thick)

AB - 2 to 5 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure parting to moderate very fine granular; slightly hard, very friable, moderately sticky and slightly plastic; many fine and very fine roots; few faint clay films on vertical faces of peds; noneffervescent; neutral (pH 6.6); clear smooth boundary. (2 to 3 inches thick)

Bw - 5 to 12 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; moderate fine prismatic structure parting to moderate fine subangular blocky; hard, very friable, moderately sticky and moderately plastic; many fine roots; many distinct clay films on faces of peds, common faint clay films in root channels and pores; noneffervescent; neutral (pH 6.8); clear wavy boundary. (4 to 11 inches thick)

C - 12 to 19 inches; light yellowish brown (10YR 6/4) gravelly clay loam, yellowish brown (10YR 5/4) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, friable, moderately sticky and slightly plastic; common fine and medium roots; noneffervescent, neutral (pH 7.0); gradual wavy boundary. (4 to 7 inches thick)

Cr - 19 to 60 inches; moderately to strongly calcareous grey, white and brown shale interbedded with sandstone.

Type Location - Johnson County, Wyoming; refer to waypoint 137 on map included in

this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to calcareous material ranges from 4 to 10 inches; depth to bedrock ranges from 8 to 20 inches. The soil is 90 to 100 percent base saturated. Rock fragments range from 0 to 15 percent but are typically less than 5 percent and are mostly soft shale fragments. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, and is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 53 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days.

The A horizon has hue of 2.5Y or 10YR, value of 5 or 6 dry, 3 or 4 moist, and chroma of 2 or 3. Texture is loamy sand, loam, or fine sandy loam. Reaction is neutral or slightly alkaline.

The Bt horizon has hue of 2.5Y through 7.5YR, value of 5 or 6 dry, 4 or 5 moist, and chroma of 2 through 4. It is typically light clay loam but may be loam or sandy clay loam with clay ranging from 18 to 35 percent, silt from 20 to 55 percent, and sand from 15 to 50 percent with 15 to 35 percent being fine sand or coarser. Reaction is neutral to moderately alkaline.

The Bk or Btk horizon has hue of 5Y through 10YR, value of 5 through 7 dry, 4 through 6 moist, and chroma of 2 through 4. Calcium carbonate equivalent is 3 to 12 percent. Texture is loam or fine sandy loam in the Bk and clay loam or sandy clay loam in the Btk. Reaction is slightly alkaline through strongly alkaline.

Range in Characteristics (according to field observations, lab analysis): A cambic and C horizon were identified instead of an argillic and calcic horizons. Textures are finer than typical for this series.

Taxonomic Class - Loamy, mixed, superactive, mesic, shallow Ustic Haplargids

Suitability for Topsoil (According to WDEQ Guideline 1) – Marginal texture (clay) was found from 5-12 inches. Estimated stripping depth is 19 inches.

Geographic Setting (According to Official Series Description) - These soils are on upland hills and ridges. Slopes range from 0 to 30 percent and are both simple and complex. Elevation is 3,500 to 5,600 feet. These soils formed in calcareous materials weathered from sedimentary bedrock. The mean annual precipitation is 12 inches with over half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. Precipitation ranges from 10 to 17

inches. The mean annual temperature is 43 to 51 degrees F. The frost-free season is about 105 to 130 days.

TALUCE
NONCALCAREOUS VARIANT

Soil Mapping Unit "TaNC"
Lab Sample ID: C08100869-004_005
BKS Sample ID: #138

Typical Pedon: Taluce sandy loam-on a convex north-facing slope, used as rangeland. (Colors are for dry soil unless otherwise stated.)

The Taluce series consists of well drained soils that are very shallow or shallow to soft sandstone. They formed in residuum and slope alluvium derived from sandstone. They are on ridges and hills. Slopes range from 3 to 70 percent. The mean annual precipitation is about 12 inches, and the mean annual air temperature is about 46 degrees F.

A - 0 to 4 inches; light yellowish brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/4) moist; moderate fine and medium granular structure; soft, very friable, nonsticky and nonplastic; common fine roots; noneffervescent, neutral (pH 7.2); clear smooth boundary. (1 to 4 inches thick)

C - 4 to 15 inches; very pale brown (10YR 7/4) gravelly sandy loam, light yellowish brown (10YR 6/4) moist; weak medium platy rock structure; slightly hard, very friable, nonsticky and nonplastic; common fine roots; noneffervescent, slightly alkaline (pH 7.4). (5 to 18 inches thick)

Cr - 15 inches; soft, platy, slightly to noncalcareous sandstone.

Type Location - Natrona County, Wyoming; refer to waypoint 138 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to bedrock ranges from 6 to 20 inches. Rock fragments range from 0 to 15 percent. The particle-size control section has 10 to 18 percent clay. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F and is never moist in some or all parts for as long as 60 consecutive days when the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27. It is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period.

The A horizon has a hue of 10YR or 2.5Y value of 4 to 6 dry, 3 to 5 moist, and chroma of 2 to 6. It is fine sandy loam, very fine sandy loam, sandy loam, loamy sand or loamy fine sand. Reaction is neutral to moderately alkaline. Some pedons have a thin Bw horizon.

Rock fragments range from 0 to 20 percent.

The C horizon has hue of 2.5Y or 10YR, value of 5 through 7 dry, 4 or 5 moist, and chroma of 2 through 6. It is sandy loam, fine sandy loam or very fine sandy loam and has 10 to 18 percent clay. Reaction is slightly alkaline to strongly alkaline. Rock fragments range from 0 to 20 percent.

The Cr horizon is slightly calcareous sandstone that can be interbedded with mudstone or shale.

Range in Characteristics (according to field observations, lab analysis): The profile is noncalcareous throughout.

Taxonomic Class - Loamy, mixed, superactive, noncalcareous, mesic, shallow Ustic Torriorthents

Suitability for Topsoil (According to WDEQ Guideline 1) – No marginal or unsuitable parameters were found for this profile. Estimated stripping depth is 15 inches.

Geographic Setting (According to Official Series Description) - Taluce soils are on ridges and hills. Slope ranges from 3 to 70 percent. They formed in residuum and slope alluvium derived from sandstone. The mean annual precipitation ranges from 10 to 17 inches with over half of the precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. The mean annual air temperature is 42 to 51 degrees F. Elevation is 3,500 to 6,500 feet. The frost-free season is 100 to 130 days.

HAVERDAD
CLAY LOAM

Soil Mapping Unit "Ha"
Lab Sample ID: C08100869-006_010
BKS Sample ID: #139

Typical Pedon: Haverdad clay loam-utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Haverdad series consists of very deep, well drained soils formed in stratified alluvium on flood plains and low terraces. Permeability is moderate. Slopes range from 0 to 6 percent. The mean annual precipitation is about 11 inches, and the mean annual temperature is about 45 degrees F.

A - 0 to 2 inches; brown (10YR 4/3) clay loam, very dark brown (10YR 2/2) moist; moderate medium subangular structure parting to weak fine granular; slightly hard, friable, slightly sticky and slightly plastic; many fine roots throughout; carbonates are disseminated throughout; strongly effervescent; neutral (pH 7.2); gradual smooth boundary. (2 to 8 inches thick)

AC - 2 to 7 inches; grayish brown (10YR 5/2) clay loam, very dark gray (10YR 3/1) moist; moderate medium subangular structure parting to weak fine granular; slightly hard, friable, slightly sticky and slightly plastic; many fine roots throughout; noneffervescent; neutral (pH 7.2); gradual smooth boundary. (2 to 8 inches thick)

C1 - 7 to 16 inches; light brownish gray (10YR 6/2) loam, dark brownish gray (10YR 4/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine roots throughout; carbonates are disseminated throughout; slightly effervescent; slightly alkaline (pH 7.4); clear smooth boundary.

C2 - 16 to 20 inches; very pale brown (10YR 7/4) loam, stratified with fine sandy loam, sand loam, clay loam, and silt loam, yellowish brown (10YR 5/4) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots throughout; noneffervescent; slightly alkaline (pH 7.4); gradual smooth boundary.

2Ck1 - 20 to 36 inches; light brownish gray (10YR 6/2) clay loam, stratified with fine sandy loam, loam, silt loam, and silty clay loam, grayish brown (10YR 5/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots throughout; carbonates are disseminated throughout; strongly effervescent; slightly alkaline (pH 7.6); gradual smooth boundary.

2Ck2 - 36 to 46 inches; yellowish brown (10YR 5/4) clay, stratified with fine sandy loam, loam, silt loam, and silty clay loam, dark yellowish brown (10YR 4/4) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots throughout; carbonates are disseminated throughout; moderately effervescent; slightly alkaline (pH 7.7); gradual smooth boundary.

2Ck3 - 46 to 60 inches; yellowish brown (10YR 5/4) silty clay loam, stratified with fine sandy loam, loam, silt loam, and clay loam, dark yellowish brown (10YR 4/4) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots throughout; carbonates are disseminated throughout; strongly effervescent; slightly alkaline (pH 7.7); gradual smooth boundary.

Type Location - Niobrara County, Wyoming; refer to waypoint 139 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) –
Soil moisture: The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F or more. This soil is moist for 60 consecutive days when the soil temperature at 20 inches is 41 degrees F, which occurs about April 21-27, but is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period.
Mean annual soil temperature: 48 to 53 degrees F and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 195 days.
Organic carbon content: .5 to 1.0 percent and decreases irregularly with depth
Rock fragments: 0 to 15 percent gravel
EC (mmhos/cm): 0 to 8 mmhos throughout but where irrigated some soils may range up to 16 mmhos
Calcium sulfate occurs in some pedons.
The soil is typically calcareous to the surface, but some pedons are leached as deep as 20 inches.

A horizon:
Hue: 10YR or 2.5Y
Value: 4 through 6 dry, 3 through 5 moist
Chroma: 2 through 4 dry or moist
Texture: loam, clay loam, silt loam, silty clay loam, very fine sandy loam, fine sandy loam, sandy loam
Reaction: slightly alkaline through strongly alkaline

Some pedons have an AC horizon.

C horizon:
Hue: 10YR or 2.5Y
Value: 5 through 7 dry, 4 to 6 moist
Chroma: 2 through 4 dry or moist
Texture: variable but when averaged is loam or light clay loam with 18 to 35 percent clay
Calcium carbonate equivalent: 1 to 15 percent which changes erratically between strata
Reaction: slightly alkaline through strongly alkaline

Range in Characteristics (according to field observations, lab analysis): Calcic horizons were found towards the bottom of the profile, which is not typical for this series.

Taxonomic Class - Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torrifluvents

Suitability for Topsoil (According to WDEQ Guideline 1) – Marginal texture (clay) was found from 36-46 inches. Saturation percentage was marginal at 36-46 inches. Estimated stripping depth is 20 inches.

Geographic Setting (According to Official Series Description) –
Parent material: alluvium from mixed sources
Landform: floodplains and low terraces
Elevations: 3,500 to 6,500 feet
Slopes: 0 to 6 percent
Mean annual precipitation: about 11 inches, ranging 10 to 17, with over half of annual precipitation falling in April, May, and June
Mean annual temperature: about 45 degrees F and ranges from 43 to 52 degrees F
Frost-free period: 105 to 130 days

ORPHA
SANDY CLAY LOAM

Soil Mapping Unit "Or"
Lab Sample ID: C08100869-011_016
BKS Sample ID: #140

Typical Pedon: Orpha sandy clay loam-on a west facing dune slope of 6 percent; utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Orpha series consists of very deep, excessively drained soils on rolling dunes, hills, terraces, floodplains, uplands, valley side slopes, toeslopes, and footslopes. They formed in alluviium or eolian sand from mixed sources. Slopes range from 0 to 45 percent. The mean annual precipitation is about 12 inches, and the mean annual air temperature is about 46 degrees F.

A - 0 to 2 inches; brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; weak medium and coarse granular structure; loose, soft, nonsticky and nonplastic; noneffervescent; neutral (pH 7.0); gradual wavy boundary. (2 to 6 inches thick)

AC - 2 to 9 inches; pale brown (10YR 6/3) sandy clay loam, brown (10YR 5/3) moist; weak medium and coarse granular structure; loose, soft, nonsticky and nonplastic; noneffervescent; slightly alkaline (pH 7.0); gradual wavy boundary. (2 to 7 inches thick)

C1 - 9 to 13 inches; brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist; single grain, loose, nonsticky and nonplastic; noneffervescent; slightly alkaline (pH 7.4).

C2 - 13 to 20 inches; grayish brown (10YR 5/2) sandy loam, dark grayish brown (10YR 4/2) moist; single grain, loose, nonsticky and nonplastic; noneffervescent; slightly alkaline (pH 7.4).

C3 - 20 to 28 inches; grayish brown (10YR 5/2) gravelly sandy loam, dark grayish brown (10YR 4/2) moist; single grain, loose, nonsticky and nonplastic; noneffervescent; slightly alkaline (pH 7.5).

C4 - 28 to 35 inches; brown (10YR 5/3) gravelly sandy loam, brown (10YR 4/3) moist; single grain, loose, nonsticky and nonplastic; noneffervescent; slightly alkaline (pH 7.5).

2C5 - 35 to 45 inches; light gray (10YR 7/1) clay, gray (10YR 6/1) moist; moderate fine prismatic structure parting to moderate fine subangular blocky; hard, very friable, moderately sticky and moderately plastic; many distinct clay films on faces of peds, common faint clay films in root channels and pores; noneffervescent; slightly alkaline (pH 7.6); clear wavy boundary.

2C6 - 45 to 55 inches; white (10YR 8/1) clay, light gray (10YR 7/1) moist; moderate fine prismatic structure parting to moderate fine subangular blocky; hard, very friable, moderately sticky and moderately plastic; many distinct clay films on faces of peds, common faint clay films in root channels and pores; moderately effervescent; moderately alkaline (pH 7.9); clear wavy boundary.

2Cn - 55 to 60 inches; white (10YR 8/1) clay, light gray (10YR 7/1) moist; moderate fine prismatic structure parting to moderate fine subangular blocky; hard, very friable, moderately sticky and moderately plastic; many distinct clay films on faces of peds, common faint clay films in root channels and pores; strongly effervescent; slightly alkaline (pH 7.6); clear wavy boundary.

Type Location - Converse County, Wyoming; refer to waypoint 140 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Rock fragments are less than 15 percent in the particle-size control section. Depth to carbonates is typically greater than 40 inches but may be 30 inches in some pedons. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F. It is never moist in all parts for as long as 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 44 to 52 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 7 dry, 3 to 6 moist, and chroma of 2 to 4. Texture is sand, fine sand, loamy sand and loamy fine sand. Reaction is neutral or slightly alkaline.

The C horizon has hue of 10YR or 2.5Y, value of 5 to 8 dry, 4 to 7 moist, and chroma of 2 to 6. Texture is sand, fine sand, loamy sand or loamy fine sand. Some pedons may have thin strata of sandy loam or fine sandy loam where they are near the parent source. Reaction ranges from neutral to moderately alkaline. Some pedons have AC horizons.

Range in Characteristics (according to field observations, lab analysis): Textures in the top 35 inches are slightly finer than typical. The bottom portion of the profile has a fine texture, which is not typical of this series.

Taxonomic Class - Mixed, mesic Ustic Torripsamments

Suitability for Topsoil (According to WDEQ Guideline 1) – Marginal texture (clay) was found from 35-60 inches. Saturation percentage was marginal at 45-55 inches. Estimated stripping depth is 45 inches.

Rock fragments range from 0 to 20 percent.

The C horizon has hue of 2.5Y or 10YR, value of 5 through 7 dry, 4 or 5 moist, and chroma of 2 through 6. It is sandy loam, fine sandy loam or very fine sandy loam and has 10 to 18 percent clay. Reaction is slightly alkaline to strongly alkaline. Rock fragments range from 0 to 20 percent.

The Cr horizon is slightly calcareous sandstone that can be interbedded with mudstone or shale.

Range in Characteristics (according to field observations, lab analysis): The profile is noncalcareous throughout.

Taxonomic Class - Loamy, mixed, superactive, noncalcareous, mesic, shallow Ustic Torriorthents

Suitability for Topsoil (According to WDEQ Guideline 1) – No marginal or unsuitable parameters were found for this profile. Estimated stripping depth is 15 inches.

Geographic Setting (According to Official Series Description) - Taluce soils are on ridges and hills. Slope ranges from 3 to 70 percent. They formed in residuum and slope alluvium derived from sandstone. The mean annual precipitation ranges from 10 to 17 inches with over half of the precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. The mean annual air temperature is 42 to 51 degrees F. Elevation is 3,500 to 6,500 feet. The frost-free season is 100 to 130 days.

HAVERDAD
CLAY LOAM

Soil Mapping Unit "Ha"
Lab Sample ID: C08100869-006_010
BKS Sample ID: #139

Typical Pedon: Haverdad clay loam-utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Haverdad series consists of very deep, well drained soils formed in stratified alluvium on flood plains and low terraces. Permeability is moderate. Slopes range from 0 to 6 percent. The mean annual precipitation is about 11 inches, and the mean annual temperature is about 45 degrees F.

A - 0 to 2 inches; brown (10YR 4/3) clay loam, very dark brown (10YR 2/2) moist; moderate medium subangular structure parting to weak fine granular; slightly hard, friable, slightly sticky and slightly plastic; many fine roots throughout; carbonates are disseminated throughout; strongly effervescent; neutral (pH 7.2); gradual smooth boundary. (2 to 8 inches thick)

AC - 2 to 7 inches; grayish brown (10YR 5/2) clay loam, very dark gray (10YR 3/1) moist; moderate medium subangular structure parting to weak fine granular; slightly hard, friable, slightly sticky and slightly plastic; many fine roots throughout; noneffervescent; neutral (pH 7.2); gradual smooth boundary. (2 to 8 inches thick)

C1 - 7 to 16 inches; light brownish gray (10YR 6/2) loam, dark brownish gray (10YR 4/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine roots throughout; carbonates are disseminated throughout; slightly effervescent; slightly alkaline (pH 7.4); clear smooth boundary.

C2 - 16 to 20 inches; very pale brown (10YR 7/4) loam, stratified with fine sandy loam, sand loam, clay loam, and silt loam, yellowish brown (10YR 5/4) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots throughout; noneffervescent; slightly alkaline (pH 7.4); gradual smooth boundary.

2Ck1 - 20 to 36 inches; light brownish gray (10YR 6/2) clay loam, stratified with fine sandy loam, loam, silt loam, and silty clay loam, grayish brown (10YR 5/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots throughout; carbonates are disseminated throughout; strongly effervescent; slightly alkaline (pH 7.6); gradual smooth boundary.

2Ck2 - 36 to 46 inches; yellowish brown (10YR 5/4) clay, stratified with fine sandy loam, loam, silt loam, and silty clay loam, dark yellowish brown (10YR 4/4) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots throughout; carbonates are disseminated throughout; moderately effervescent; slightly alkaline (pH 7.7); gradual smooth boundary.

2Ck3 - 46 to 60 inches; yellowish brown (10YR 5/4) silty clay loam, stratified with fine sandy loam, loam, silt loam, and clay loam, dark yellowish brown (10YR 4/4) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots throughout; carbonates are disseminated throughout; strongly effervescent; slightly alkaline (pH 7.7); gradual smooth boundary.

Type Location - Niobrara County, Wyoming; refer to waypoint 139 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) –
Soil moisture: The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F or more. This soil is moist for 60 consecutive days when the soil temperature at 20 inches is 41 degrees F, which occurs about April 21-27, but is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period.
Mean annual soil temperature: 48 to 53 degrees F and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 195 days.
Organic carbon content: .5 to 1.0 percent and decreases irregularly with depth
Rock fragments: 0 to 15 percent gravel
EC (mmhos/cm): 0 to 8 mmhos throughout but where irrigated some soils may range up to 16 mmhos
Calcium sulfate occurs in some pedons.
The soil is typically calcareous to the surface, but some pedons are leached as deep as 20 inches.

A horizon:
Hue: 10YR or 2.5Y
Value: 4 through 6 dry, 3 through 5 moist
Chroma: 2 through 4 dry or moist
Texture: loam, clay loam, silt loam, silty clay loam, very fine sandy loam, fine sandy loam, sandy loam
Reaction: slightly alkaline through strongly alkaline

Some pedons have an AC horizon.

C horizon:
Hue: 10YR or 2.5Y
Value: 5 through 7 dry, 4 to 6 moist
Chroma: 2 through 4 dry or moist
Texture: variable but when averaged is loam or light clay loam with 18 to 35 percent clay
Calcium carbonate equivalent: 1 to 15 percent which changes erratically between strata
Reaction: slightly alkaline through strongly alkaline

Range in Characteristics (according to field observations, lab analysis): Calcic horizons were found towards the bottom of the profile, which is not typical for this series.

Taxonomic Class - Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torrifluvents

Suitability for Topsoil (According to WDEQ Guideline 1) – Marginal texture (clay) was found from 36-46 inches. Saturation percentage was marginal at 36-46 inches. Estimated stripping depth is 20 inches.

Geographic Setting (According to Official Series Description) –
Parent material: alluvium from mixed sources
Landform: floodplains and low terraces
Elevations: 3,500 to 6,500 feet
Slopes: 0 to 6 percent
Mean annual precipitation: about 11 inches, ranging 10 to 17, with over half of annual precipitation falling in April, May, and June
Mean annual temperature: about 45 degrees F and ranges from 43 to 52 degrees F
Frost-free period: 105 to 130 days

ORPHA
SANDY CLAY LOAM

Soil Mapping Unit "Or"
Lab Sample ID: C08100869-011_016
BKS Sample ID: #140

Typical Pedon: Orpha sandy clay loam-on a west facing dune slope of 6 percent; utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Orpha series consists of very deep, excessively drained soils on rolling dunes, hills, terraces, floodplains, uplands, valley side slopes, toeslopes, and footslopes. They formed in alluviium or eolian sand from mixed sources. Slopes range from 0 to 45 percent. The mean annual precipitation is about 12 inches, and the mean annual air temperature is about 46 degrees F.

A - 0 to 2 inches; brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; weak medium and coarse granular structure; loose, soft, nonsticky and nonplastic; noneffervescent; neutral (pH 7.0); gradual wavy boundary. (2 to 6 inches thick)

AC - 2 to 9 inches; pale brown (10YR 6/3) sandy clay loam, brown (10YR 5/3) moist; weak medium and coarse granular structure; loose, soft, nonsticky and nonplastic; noneffervescent; slightly alkaline (pH 7.0); gradual wavy boundary. (2 to 7 inches thick)

C1 - 9 to 13 inches; brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist; single grain, loose, nonsticky and nonplastic; noneffervescent; slightly alkaline (pH 7.4).

C2 - 13 to 20 inches; grayish brown (10YR 5/2) sandy loam, dark grayish brown (10YR 4/2) moist; single grain, loose, nonsticky and nonplastic; noneffervescent; slightly alkaline (pH 7.4).

C3 - 20 to 28 inches; grayish brown (10YR 5/2) gravelly sandy loam, dark grayish brown (10YR 4/2) moist; single grain, loose, nonsticky and nonplastic; noneffervescent; slightly alkaline (pH 7.5).

C4 - 28 to 35 inches; brown (10YR 5/3) gravelly sandy loam, brown (10YR 4/3) moist; single grain, loose, nonsticky and nonplastic; noneffervescent; slightly alkaline (pH 7.5).

2C5 - 35 to 45 inches; light gray (10YR 7/1) clay, gray (10YR 6/1) moist; moderate fine prismatic structure parting to moderate fine subangular blocky; hard, very friable, moderately sticky and moderately plastic; many distinct clay films on faces of peds, common faint clay films in root channels and pores; noneffervescent; slightly alkaline (pH 7.6); clear wavy boundary.

2C6 - 45 to 55 inches; white (10YR 8/1) clay, light gray (10YR 7/1) moist; moderate fine prismatic structure parting to moderate fine subangular blocky; hard, very friable, moderately sticky and moderately plastic; many distinct clay films on faces of peds, common faint clay films in root channels and pores; moderately effervescent; moderately alkaline (pH 7.9); clear wavy boundary.

2Cn - 55 to 60 inches; white (10YR 8/1) clay, light gray (10YR 7/1) moist; moderate fine prismatic structure parting to moderate fine subangular blocky; hard, very friable, moderately sticky and moderately plastic; many distinct clay films on faces of peds, common faint clay films in root channels and pores; strongly effervescent; slightly alkaline (pH 7.6); clear wavy boundary.

Type Location - Converse County, Wyoming; refer to waypoint 140 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Rock fragments are less than 15 percent in the particle-size control section. Depth to carbonates is typically greater than 40 inches but may be 30 inches in some pedons. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F. It is never moist in all parts for as long as 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 44 to 52 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 7 dry, 3 to 6 moist, and chroma of 2 to 4. Texture is sand, fine sand, loamy sand and loamy fine sand. Reaction is neutral or slightly alkaline.

The C horizon has hue of 10YR or 2.5Y, value of 5 to 8 dry, 4 to 7 moist, and chroma of 2 to 6. Texture is sand, fine sand, loamy sand or loamy fine sand. Some pedons may have thin strata of sandy loam or fine sandy loam where they are near the parent source. Reaction ranges from neutral to moderately alkaline. Some pedons have AC horizons.

Range in Characteristics (according to field observations, lab analysis): Textures in the top 35 inches are slightly finer than typical. The bottom portion of the profile has a fine texture, which is not typical of this series.

Taxonomic Class - Mixed, mesic Ustic Torripsamments

Suitability for Topsoil (According to WDEQ Guideline 1) – Marginal texture (clay) was found from 35-60 inches. Saturation percentage was marginal at 45-55 inches. Estimated stripping depth is 45 inches.

Geographic Setting (According to Official Series Description) - Orpha soils occur primarily as rolling or hilly dunes. They are on hills, valley side slopes, footslopes, toeslopes, stream terraces, broad floodplains and uplands. They formed in alluvium or eolian deposits generally adjacent to and downwind of sandy parent sources. Slopes are usually 0 to 45 percent. In Nebraska slopes are as high as 60 percent. Elevations are 3,500 to 6,500 feet. Precipitation ranges from 10 to 18 inches with over half the annual precipitation falling in April, May, and June. The mean annual air temperature ranges from 44 to 50 degrees F. The frost-free season is about 105 to 130 days.

TULLOCK
SANDY CLAY LOAM

Soil Mapping Unit "Tl"
Lab Sample ID: C08100869-017_018
BKS Sample ID: #141

Typical Pedon: Tullock sandy clay loam-in rangeland. (Colors are for dry soil unless otherwise stated.)

The Tullock series consists of moderately deep, excessively drained soils formed in residuum, alluvium or eolian deposits derived from sandstone. They are on dunes, hills and ridges. Slopes are 0 to 45 percent. The mean annual precipitation is about 12 inches. The mean annual air temperature is about 46 degrees F.

A - 0 to 2 inches; light yellowish brown (10YR 6/4) sandy clay loam, yellowish brown (10YR 5/4) moist; weak medium and fine granular structure; loose; noneffervescent; neutral (pH 7.2); clear wavy boundary. (2 to 6 inches thick)

AC - 2 to 11 inches; light yellowish brown (10YR 6/4) sandy clay loam, yellowish brown (10YR 5/4) moist; weak medium and fine granular structure; loose; noneffervescent; neutral (pH 7.2); clear wavy boundary.

C - 11 to 15 inches; very pale brown (10YR 7/3) gravelly sandy clay loam, pale brown (10YR 6/3) moist; massive; loose; noneffervescent; slightly alkaline (pH 7.7); clear wavy boundary. (0 to 18 inches thick)

Ck - 15 to 21 inches; pale brown (10YR 6/3) gravelly sandy clay loam, brown (10YR 5/3) moist; massive; loose; strongly effervescent; carbonates disseminated throughout; slightly alkaline (pH 7.7); clear wavy boundary.

Cr - 21 inches; soft, violently calcareous sandstone.

Type Location - Converse County, Wyoming; refer to waypoint 141 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - These soils typically effervesce throughout but some in some pedons the A horizon is leached. Depth to paralithic contact is 20 to 40 inches. The soil has 0 to 15 percent rock fragments. These soils are usually dry in the moisture control section for 60 consecutive days and 90 cumulative days between July 15 and October 25. The soil temperature at a depth of 20 inches is 41 degrees F or warmer for 175 to 192 days. The mean annual soil temperature is 47 to 53 degrees F.

The A horizon has hue of 2.5Y or 10YR value of 5 or 6 and 3 to 5 moist, and chroma of 2 to 5. It is loamy sand, sand, loamy fine sand, fine sandy loam or fine sand. It is neutral to moderately alkaline.

Some pedons have an AC horizon. When present, it has hue or 2.5Y or 10YR, value of 5 or 6 and 4 or 5 moist, and chroma of 3 or 4. It is loamy sand, loamy fine sand, fine sand or sand.

The C horizon has hue of 2.5Y or 10YR, value of 5 to 7 and 4 to 6 moist, and chroma of 2 to 6. It is loamy sand, loamy fine sand, fine sand or sand. It is slightly alkaline or moderately alkaline.

The Cr horizon is soft calcareous sandstone which may be interbeded with conglomerate or shale in some areas.

Range in Characteristics (according to field observations, lab analysis): Textures are finer than typical for this series. A calcic horizon was identified, which is not typical.

Taxonomic Class - Mixed, mesic Ustic Torripsamments

Suitability for Topsoil (According to WDEQ Guideline 1) – Saturation percentage was marginal at 0-11 inches. Estimated stripping depth is 15 inches.

Geographic Setting (According to Official Series Description) - Tullock soils are on dunes and footslopes and toeslopes of hills and ridges. They formed in eolian deposits and residuum derived from sandstone. Slopes are 0 to 45 percent. Elevation is 3500 to 6,000 feet. Mean annual soil temperature is 47 to 53 degrees F. Mean annual precipitation is 10 to 14 inches. The frost-free period is 105 to 130 days.

TALUCE
SANDY LOAM

Soil Mapping Unit "Ta"
Lab Sample ID: C08100869-019_020
BKS Sample ID: #142

Typical Pedon: Taluce sandy loam-on a convex north-facing slope, used as rangeland. (Colors are for dry soil unless otherwise stated.)

The Taluce series consists of well drained soils that are very shallow or shallow to soft sandstone. They formed in residuum and slope alluvium derived from sandstone. They are on ridges and hills. Slopes range from 3 to 70 percent. The mean annual precipitation is about 12 inches, and the mean annual air temperature is about 46 degrees F.

A - 0 to 1 inch; grayish brown (10YR 5/2) sandy loam, dark grayish brown (10YR 4/2) moist; moderate fine and medium granular structure; soft, very friable, nonsticky and nonplastic; common fine roots; noneffervescent, slightly alkaline (pH 7.8); clear smooth boundary. (1 to 4 inches thick)

AC - 1 to 8 inches; light brownish gray (10YR 6/2) sandy loam, grayish brown (10YR 5/2) moist; moderate fine and medium granular structure; soft, very friable, nonsticky and nonplastic; common fine roots; noneffervescent, slightly alkaline (pH 7.8); clear smooth boundary.

Ck - 8 to 16 inches; very pale brown (10YR 8/2) sandy loam, light gray (10YR 7/2) moist; weak medium platy rock structure; slightly hard, very friable, nonsticky and nonplastic; common fine roots; strongly to violently effervescent, calcium carbonate disseminated; moderately alkaline (pH 7.9). (5 to 18 inches thick)

Cr - 16 inches; soft, platy sandstone.

Type Location - Natrona County, Wyoming; refer to waypoint 142 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to bedrock ranges from 6 to 20 inches. Typically, these soils are calcareous throughout, but some pedons are leached to a depth of as much as 4 inches. Rock fragments range from 0 to 15 percent. The particle-size control section has 10 to 18 percent clay. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F and is never moist in some or all parts for as long as 60 consecutive days when the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27. It is dry in all parts of the moisture control

section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period.

The A horizon has a hue of 10YR or 2.5Y value of 4 to 6 dry, 3 to 5 moist, and chroma of 2 to 6. It is fine sandy loam, very fine sandy loam, sandy loam, loamy sand or loamy fine sand. Reaction is neutral to moderately alkaline. Some pedons have a thin Bw horizon. Rock fragments range from 0 to 20 percent.

The C horizon has hue of 2.5Y or 10YR, value of 5 through 7 dry, 4 or 5 moist, and chroma of 2 through 6. It is sandy loam, fine sandy loam or very fine sandy loam and has 10 to 18 percent clay. Some pedons have slight accumulations of calcium carbonate. Reaction is slightly alkaline to strongly alkaline. Rock fragments range from 0 to 20 percent.

The Cr horizon is calcareous sandstone that can be interbedded with mudstone or shale.

Range in Characteristics (according to field observations, lab analysis): This profile contains an AC and calcic horizon, which are not typical.

Taxonomic Class - Loamy, mixed, superactive, calcareous, mesic, shallow Ustic Torriorthents

Suitability for Topsoil (According to WDEQ Guideline 1) – Saturation percentage was marginal at 8-16 inches. Estimated stripping depth is 8 inches.

Geographic Setting (According to Official Series Description) - Taluce soils are on ridges and hills. Slope ranges from 3 to 70 percent. They formed in residuum and slope alluvium derived from sandstone. The mean annual precipitation ranges from 10 to 17 inches with over half of the precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. The mean annual air temperature is 42 to 51 degrees F. Elevation is 3,500 to 6,500 feet. The frost-free season is 100 to 130 days.

LOLITE
CLAY

Soil Mapping Unit "Lo"
Lab Sample ID: C08100869-021_022
BKS Sample ID: #146

Typical Pedon: Lolite clay-rangeland. (Colors are for dry soil unless otherwise stated.)

The Lolite series consists of well drained, slowly permeable soils that are shallow to noncalcareous sodic shale on ridges and hillsides. They formed in residuum. Slopes range from 3 to 45 percent. The mean annual precipitation is about 11 inches, and the mean annual temperature is about 45 degrees F.

A - 0 to 3 inches; gray (5YR 6/1) clay, dark gray (5YR 4/1) moist; weak fine granular structure; slightly hard, friable, sticky and plastic; common fine roots; noneffervescent; slightly alkaline (pH 7.4); clear wavy boundary. (0.25 to 3 inches thick)

Bt - 3 to 9 inches; pinkish gray (7.5YR 7/2) clay, brown (7.5YR 5/2) moist; weak medium subangular blocky structure; hard, firm, sticky and plastic; common fine roots; noneffervescent; slightly alkaline (pH 7.4); clear wavy boundary. (0 to 6 inches thick)

C - 9 to 24 inches; light brownish gray (10YR 6/2) clay, grayish brown(10YR 5/2) moist; fine platy shale rock structure; hard, firm, sticky and plastic; few fine roots; few fine clusters of sodium sulfate crystals inherited from the parent material; ESP of 35; noneffervescent; slightly alkaline (pH 7.6). (3 to 18 inches thick)

Cr - 24 inches; soft, platy, strongly sodic shale.

Type Location - Natrona County, Wyoming; refer to waypoint 146 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to bedrock ranges from 6 to 20 inches. The particle-size control section is clay, silty clay, or clay loam with 35 to 55 percent clay and less than 35 percent fine sand or coarser. The mean annual soil temperature is 47 to 52 degrees F. Hue is 2.5Y or 5Y, value is 5 or 6 dry, 3 through 5 moist, and chroma is 1 through 3. It is mildly alkaline or moderately alkaline.

The A horizon typically is noncalcareous, however, in some pedons it is calcareous from dust and overflow. ESP is less than 15. Salinity is less than 4 mmhos. A vesicular crust is on some pedons.

The By horizon has less than 5 percent gypsum. ESP is less than 15. Salinity is less than 4 mmhos. Some pedons do not have a By horizon.

The C horizon has platy shale rock structure, however, roots can penetrate the platy fragments. Salt crystals, dominantly sodium sulfate, are inherited from the parent material with only slight alteration. ESP is commonly greater than 20 and ranges from 15 to 60. Salinity is commonly greater than 10 mmhos and ranges from 8 to 20 mmhos.

The Cr is soft, platy, noncalcareous, sodic shale. It is frequently more than 20 feet thick.

Range in Characteristics (according to field observations, lab analysis): An argillic horizon was found in place of a gypsic horizon.

Taxonomic Class - Clayey, mixed, superactive, nonacid, mesic, shallow Typic Torriorthents

Suitability for Topsoil (According to WDEQ Guideline 1) – Marginal texture (clay) was found from 0-24 inches. Estimated stripping depth is 9 inches.

Geographic Setting (According to Official Series Description) - Lolite soils are on ridges and hillsides. Slopes range from 3 to 45 percent and are mainly convex. They formed in residuum derived from sodic, noncalcareous shale. These soils are often intermixed with rock outcrop and gullied land. The mean annual precipitation is 9 to 14 inches, and the mean annual temperature is 42 to 51 degrees F. The frost-free season is 110 to 130 days. Elevation is 4,900 to 6,500 feet.

HILAND
SANDY CLAY LOAM

Soil Mapping Unit "Hi"
Lab Sample ID: C08100869-023_027
BKS Sample ID: #148

Typical Pedon: Hiland sandy clay loam-on northeast facing slope of 3 percent; utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Hiland series consists of very deep, well drained soils formed in alluvium or eolian deposits on relict surfaces consisting of terraces, fans, fan remnants pediments, ridges, hills and stabilized dunes. Permeability is moderate. Slopes range from 0 to 20 percent. The average annual precipitation is about 12 inches, and the mean annual air temperature is about 45 degrees F.

A - 0 to 3 inches; brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; weak medium granular structure parting to weak fine granular; slightly hard, friable, nonsticky and nonplastic; many very fine and common fine roots; noneffervescent; neutral (pH 7.0); abrupt smooth boundary. (2 to 5 inches thick)

Bw - 3 to 9 inches; yellowish brown (10YR 5/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; strong medium prismatic structure parting to strong fine and medium angular blocky; hard, friable, moderately sticky and moderately plastic; many very fine roots in a mat at the top of the horizon and common very fine roots between peds; many fine pores; noneffervescent; neutral (pH 7.0); clear wavy boundary.

BC - 9 to 17 inches; light yellowish brown (10YR 6/4) sandy clay loam, yellowish brown (10YR 5/4) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; hard, friable, moderately sticky and moderately plastic; common very fine roots between peds; many fine pores; noneffervscent; neutral (pH 7.3); gradual wavy boundary.

Ck1 - 17 to 24 inches; very pale brown (10YR 7/3) clay loam to loam, pale brown (10YR 6/3) moist; weak coarse prismatic structure parting to moderate medium and coarse subangular blocky; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; many fine pores; few fine and medium rounded light gray (10YR 7/2) masses of carbonate throughout; strongly effervescent; moderately alkaline (pH 8.1); gradual smooth boundary.

Ck2 - 24 to 37 inches; very pale brown (10YR 7/3) sandy clay loam, pale brown (10YR 6/3) moist; weak coarse prismatic structure parting to moderate medium and coarse subangular blocky; slightly hard, very friable, nonsticky and nonplastic; common very

fine roots; many fine pores; few fine and medium rounded light gray (10YR 7/2) masses of carbonate throughout; strongly effervescent; moderately alkaline (pH 8.2); gradual smooth boundary.

C - 37 to 60 inches; light yellowish brown (10YR 6/4) sandy clay loam, yellowish brown (10YR 5/4) moist; weak coarse prismatic structure parting to moderate medium and coarse subangular blocky; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; many fine pores; slightly effervescent; moderately alkaline (pH 8.3); gradual smooth boundary.

Type Location - Converse County, Wyoming; refer to waypoint 148 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Gravel ranges from 0 to 15 percent in the solum and from 0 to 30 percent in the 2C or Bk horizons. The base of the Bt or Btk ranges from 15 to 35 inches. Depth to continuous carbonate accumulation ranges from 14 to 32 inches. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F and is never moist in all parts for as long as 60 consecutive days when the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, but is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 52 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days. EC ranges from 0 to 2 mmhos from the surface to the base of the Bt and from 1 to 4 mmhos below the base of the Bt. Bedrock is deeper than 60 inches.

The A horizon has hue of 10YR, value of 4 to 6 dry and 3 to 5 moist, and chroma of 2 to 4. It is sandy loam, fine sandy loam, very fine sandy loam, sandy clay loam or loamy sand. Vesicular crust occurs on some pedons. This horizon is neutral to moderately alkaline.

The E horizon has hue of 10YR, value of 4 to 6 and 3 to 5 moist, and chroma of 2 to 4. It is fine sandy loam, very fine sandy loam, sandy loam, sandy clay loam or loamy sand. It is neutral or slightly alkaline.

The Bt horizon has hue of 2.5Y to 7.5YR, value of 4 to 6 dry and 3 to 5 moist, and chroma of 2 to 4. It has a weighted clay content of 20 to 35 percent and is sandy clay loam; however, parts of this horizon may be sandy loam. This horizon is typically noncalcareous. Reaction is neutral to moderately alkaline.

If a Btk horizon is present, it has the same ranges as defined for the Bt except that it is replugged with carbonate and reaction ranges from moderately to strongly alkaline.

The Bk horizon has hue of 2.5Y or 10YR, value of 5 to 7 dry and 4 to 7 moist, and chroma of 2 to 4. It is sandy loam, loamy sand, fine sandy loam or sandy clay loam; or, when other textures occur, the horizon average must be sandy loam, loamy sand or fine sandy loam. It is not a calcic horizon. It does not have 5 percent more calcium carbonate equivalent than the underlying horizon or has less than 5 percent secondary carbonates. It is moderately or strongly alkaline. Exchangeable sodium is less than 15 percent even though field tests indicate strongly alkaline reactions.

Some pedons have a 2Bk, 2C or C horizon. The 2C and 2Bk horizons may contain more rock fragments. Contrasting textures of sand may occur below 40 inches. It is calcareous but typically has less than 5 percent calcium carbonate equivalent.

Range in Characteristics (according to field observations, lab analysis): Cambic and BC horizons were found in place of E and argillic horizons. The Ck1 horizon has a finer texture than what is typical of this series.

Taxonomic Class - Fine-loamy, mixed, superactive, mesic Ustic Haplargids

Suitability for Topsoil (According to WDEQ Guideline 1) – No marginal or unsuitable parameters were found. Estimated stripping depth is 17 inches.

Geographic Setting (According to Official Series Description) - Hiland soils are on relict surfaces consisting of terraces, fan remnants, pediments, fans, ridges, hills and stabilized dunes. Slopes are 0 to 20 percent. They formed in moderately coarse alluvium and eolian material derived predominantly from sandstone. Elevations are 3,500 to 6,300 feet. The average annual precipitation is about 12 inches with over half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. Precipitation ranges from 10 to 14 inches. The mean annual air temperature is 43 to 51 degrees F. The frost-free season is 105 to 130 days.

TURNERCREST
SANDY LOAM

Soil Mapping Unit "Tu"
Lab Sample ID: C08100869-028_031
BKS Sample ID: #150

Typical Pedon: Turnercrest sandy loam-on a northeast facing hill footslope of 8 percent; utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Turnercrest soils consist of moderately deep, well drained soils formed in eolian or alluvium deposits and residuum derived from soft sandstone. They are on bedrock-controlled hills, fan remnants, ridges and structural benches. Slopes range from 0 to 30 percent. The average annual precipitation is about 12, and the mean annual air temperature is about 47 degrees F.

A - 0 to 2 inches; light brownish gray (10YR 6/2) sandy loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, very friable; many fine and very fine roots; noneffervescent; neutral (pH 7.3); clear smooth boundary. (2 to 6 inches thick)

Bw1 - 2 to 5 inches; light brownish gray (10YR 6/2) sandy loam, grayish brown (10YR 5/2) moist; weak medium and coarse subangular blocky structure; soft, friable; common fine and very fine roots; noneffervescent; neutral (pH 7.3); gradual smooth boundary. (0 to 8 inches thick)

Bw2 - 5 to 12 inches; light brownish gray (10YR 5/2) sandy loam, dark grayish brown (10YR 4/2) moist; weak medium and coarse subangular blocky structure; soft, friable; common fine and very fine roots; noneffervescent; slightly alkaline (pH 7.7); gradual smooth boundary. (0 to 8 inches thick)

C1 - 12 to 20 inches; light gray (10YR 7/2) loamy sand, pale brown (10YR 6/3) moist; massive; slightly hard, very friable; few fine roots to 15 inches; moderately effervescent; carbonates disseminated and as few fine filaments; moderately alkaline (pH 8.3); clear wavy boundary.

C2 - 20 to 35 inches; very pale brown (10YR 7/3) loamy sand, light yellowish brown (10YR 6/4) moist; massive; slightly hard, very friable; few fine roots to 15 inches; slightly effervescent; carbonates disseminated and as few fine filaments; moderately alkaline (pH 8.4); clear wavy boundary.

Cr - 35 inches; soft, tan and white, noncalcareous sandstone.

Type Location - Weston County, Wyoming; refer to waypoint 150 on map included in

this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to soft, calcareous sandstone ranges from 20 to 40 inches. These soils are typically calcareous throughout but may be leached as much as to 6 inches in some pedons. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F or warmer and is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 53 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days. The particle-size control section is fine sandy loam or sandy loam with 7 to 18 percent clay and 52 to 80 percent sand with more than 15 percent being fine sand or coarser. EC is 0 to 2 mmhos throughout the soil. Rock fragments may be present but break down on pretreatment and do not have lithic properties.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 6 and 3 to 5 moist, and chroma of 2 to 4. Textures are loamy sand, loamy fine sand, fine sandy loam or sandy loam. Reaction is neutral to moderately alkaline.

The Bw horizon, where present, has hue of 10YR or 2.5Y, value of 5 or 6 and 3 to 5 moist, and chroma of 2 or 3. Depth to the base of the Bw horizon is less than 10 inches. Texture is fine sandy loam or sandy loam. Reaction is slightly alkaline or moderately alkaline.

The Bk has hue of 10YR or 2.5Y, value of 5 to 7 and 3 to 6 moist, and chroma of 2 or 3. Texture is fine sandy loam, very fine sandy loam or sandy loam. Reaction is slightly or moderately alkaline.

The C horizon, when present, has hue of 10YR or 2.5Y, value of 5 to 7 and 4 to 6 moist, and chroma of 2 to 4. Texture is fine sandy loam, very fine sandy loam or sandy loam. Some pedons have thin layers of loamy fine sand. Reaction is slightly alkaline or moderately alkaline.

The Cr horizon has a paralithic contact to soft, calcareous sandstone. The sandstone has hue of 10YR or 2.5Y.

Range in Characteristics (according to field observations, lab analysis): This profile is less calcareous than typical, resulting in cambic horizons rather than calcic.

Taxonomic Class - Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents

Suitability for Topsoil (According to WDEQ Guideline 1) – Saturation percentage was

marginal at 20-35 inches. Estimated stripping depth is 20 inches.

Geographic Setting (According to Official Series Description) - Turnercrest soils are on hills, ridges, fan remnants and structural benches. They formed in eolian or alluvium deposits and sandy residuum. Slopes are 0 to 30 percent. Elevations are 3,200 to 6,500 feet. The average annual precipitation is 10 to 15 inches with over half falling as snow or rain in April, May, and June and less than one inch falling in each month of July, August, September, and October. The mean annual air temperature is 45 to 53 degrees F. The frost-free season is 105 to 130 days.

THEEDLE
NONCALCAREOUS VARIANT

Soil Mapping Unit "ThNC"
Lab Sample ID: C08100869-032_033
BKS Sample ID: #151

Typical Pedon: Theedle clay loam-on west facing hill footslope of 6 percent; rangeland. (Colors are for dry soil unless otherwise stated.)

The Theedle series consists of well drained soils that are moderately deep to soft bedrock. They formed in residuum and slope alluvium weathered from soft sandstone. The Theedle soils are on hills, ridges and fan remnants. Slopes are 0 to 75 percent. The mean annual precipitation is about 12 inches, and the mean annual air temperature is 45 degrees F.

A - 0 to 4 inches; very pale brown (10YR 7/3) clay loam, brown (10YR 5/3) moist; weak granular structure; slightly hard, friable, nonsticky and nonplastic; many very fine, fine, and medium roots; noneffervescent; slightly alkaline (pH 7.6); clear smooth boundary. (0 to 5 inches thick)

AC - 4 to 7 inches; very pale brown (10YR 7/3) clay loam, brown (10YR 5/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; common very fine, fine, and medium roots; noneffervescent; slightly alkaline (pH 7.6); clear smooth boundary. (3 to 10 inches thick)

C - 7 to 24 inches; very pale brown (10YR 8/4) clay, light yellowish brown (10YR 6/4) moist; massive; slightly hard, friable, sticky and nonplastic; few fine and very fine roots; noneffervescent; slightly alkaline (pH 7.7); clear smooth boundary. (14 to 26 inches thick)

Cr - 24 inches; light gray, soft, noncalcareous shale.

Type Location - Weston County, Wyoming; refer to waypoint 151 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to soft, gray, calcareous sandstone or sandy shale ranges from 20 to 40 inches but is typically less than 32 inches. The soil lacks a cambic horizon, but structural Bw horizons are present in about half the pedons observed. The soil is typically calcareous throughout but may be leached up to 5 inches. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F and is dry in all parts of the moisture control section for at least 60 consecutive days from July

15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 51 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days. The particle size control section averages between 18 and 35 percent clay and is loam, clay loam, or sandy clay loam with more than 15 but less than 35 percent fine or coarser sand. The soil has up to 10 percent rock fragments throughout.
The A horizon has hue of 10YR or 2.5Y, value of 3 to 6 dry, 3 to 5 moist, and chroma of 2 to 4. It is loam, clay loam or fine sandy loam. Reaction ranges from neutral to moderately alkaline. EC is 0 to 2 mmhos/cm.

The BCk (or AC and Bw, when present) has hue of 10YR or 2.5Y, value of 5 or 6 dry, 3 to 5 moist, and chroma of 2 to 4. Texture is loam, clay loam or sandy clay loam. Reaction is slightly alkaline to strongly alkaline. EC is 0 to 4 mmhos/cm.

The C horizon has hue of 10YR or 2.5Y, value of 5 to 7 dry, 4 to 7 moist, and chroma of 2 to 5. Texture is loam, clay loam or sandy clay loam. Reaction is slightly alkaline to strongly alkaline. EC is less than 8 mmhos/cm. Carbonates usually average between 5 and 14 percent with slight segregation in some pedons.

Range in Characteristics (according to field observations, lab analysis): This profile is noncalcareous throughout. The C horizon has a finer texture than what is typical for this series.

Taxonomic Class - Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents

Suitability for Topsoil (According to WDEQ Guideline 1) – Marginal texture (clay) was found from 7-24 inches. Estimated stripping depth is 7 inches.

Geographic Setting (According to Official Series Description) - Theedle soils are on rock-controlled fan aprons, fan pediments, and undulating to rolling uplands. They may occupy all components of the hillslope profile but typically are on the lower shoulder, footslope, and toeslope. Slopes range from 0 to 75 percent. The soils formed in medium textured slope alluvium and residuum derived primarily from interbedded sandstone and shale. Elevation is 3,500 to 6,500 feet. The average annual precipitation is 12 inches with over half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. Precipitation ranges from 10 to 14 inches. The mean annual air temperature ranges from 45 to 51 degrees F. The frost-free season is 105 to 130 days.

FORKWOOD
SANDY CLAY LOAM

Soil Mapping Unit "Fo"
Lab Sample ID: C08100869-034_038
BKS Sample ID: #152

Typical Pedon: Forkwood sandy clay loam-utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Forkwood series consists of very deep, well drained soils formed in alluvium. Forkwood soils are on terraces, alluvial fans, fan remnants, hills, ridges and pediments. Slopes range from 0 to 15 percent. The mean annual precipitation is about 11 inches, and the mean annual air temperature is about 45 degrees F.

A - 0 to 5 inches; grayish brown (10YR 5/2) sandy clay loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many fine and medium roots throughout; noneffervescent; slightly alkaline (pH 7.6); abrupt smooth boundary. (1 to 6 inches thick)

AB - 5 to 9 inches; light brownish gray (10YR 6/2) sandy clay loam, grayish brown (10YR 5/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many fine and medium roots throughout; noneffervescent; slightly alkaline (pH 7.6); abrupt smooth boundary.

Bt - 9 to 19 inches; dark yellowish brown (10YR 4/6) sandy clay loam, dark yellowish brown (10YR 3/6) moist; strong medium angular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; common fine and medium roots throughout; common distinct clay films on faces of peds; noneffervescent; slightly alkaline (pH 7.6); clear smooth boundary. (6 to 20 inches thick)

Ck1 - 19 to 39 inches; gray (10YR 6/1) clay loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure parting to weak fine subangular blocky; slightly hard, friable, slightly sticky and sligtly plastic; few fine roots throughout; few fine threads and masses of carbonates throughout; violently effervescent; moderately alkaline (pH 8.1); gradual wavy boundary.

Ck2 - 39 to 55 inches; gray (10YR 5/1) sandy clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure parting to weak fine subangular blocky; slightly hard, friable, slightly sticky and sligtly plastic; few fine roots throughout; few fine threads and masses of carbonates throughout; moderately effervescent; moderately alkaline (pH 8.3); gradual wavy boundary.

C - 55 to 60 inches; light yellowish brown (10YR 6/4) sandy clay loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; few fine roots throughout; slightly effervescent; moderately alkaline (pH 8.3). (0 to 40 inches thick)

Type Location - Niobrara County, Wyoming; refer to waypoint 152 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to the base of the argillic horizon is 10 to 33 inches, and depth to continuous horizons of carbonate accumulation is 10 to 33 inches. Rock fragments range from 0 to 15 percent. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, and is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature ranges from 47 to 53 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days. EC ranges from 0 to 4 mmhos/cm throughout the profile. Bedrock is deeper than 60 inches.

The A horizon has hue of 2.5Y or 10YR, value of 4 to 6 dry and 3 to 5 moist, and chroma of 2 to 4. A vesicular crust occurs on some pedons. Texture is very fine sandy loam, loam, clay loam or fine sandy loam. Reaction is neutral through moderately alkaline.

The Bt horizon has hue of 2.5Y, 10YR or 7.5YR, value of 4 to 7 dry and 3 to 5 moist, and chroma of 2 to 4. Texture is loam or clay loam with 18 to 35 percent clay and more than 15 but less than 35 percent fine sand or coarser. Reaction is neutral through moderately alkaline.

The Btk horizon has hue of 2.5Y or 10YR, value of 4 to 7 dry and 3 to 5 moist, and chroma of 2 to 4. Texture is loam or clay loam. It is slightly alkaline or moderately alkaline. It has 3 to 12 percent calcium carbonate equivalent.

The Bk horizon has hue of 5Y, 2.5Y or 10YR, value of 5 to 7 dry and 4 to 6 moist, and chroma of 2 to 4. Texture is loam, fine sandy loam, very fine sandy loam or clay loam. This horizon has 1 to 14 percent authigenic calcium carbonate accumulation. It is moderately alkaline or strongly alkaline.

The C horizon, when present, has hue of 5Y to 10YR, value of 5 to 7 dry, 4 to 6 moist, and chroma of 2 to 4. Carbonates range from 1 to 8 percent and are mostly allogenic. ESP ranges from 4 to 12. Reaction is moderately or strongly alkaline.

Range in Characteristics (according to field observations, lab analysis): The AB horizon is not typical for this series. Textures are slightly sandier than typical for the series.

Taxonomic Class - Fine-loamy, mixed, superactive, mesic Ustic Haplargids

Suitability for Topsoil (According to WDEQ Guideline 1) – No marginal or unsuitable parameters were found for this profile. Estimated stripping depth is 19 inches.

Geographic Setting (According to Official Series Description) - Forkwood soils are on terraces, alluvial fans, fan remnants, hills, ridges and pediments. Slopes are 0 to 15 percent. The soils formed in slopewash alluvium derived from interbedded shales and argillaceous sandstone. Elevations are 3,500 to 6,000 feet. The average annual precipitation is 10 to 14 inches with over half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. The mean annual air temperature ranges from 43 to 51 degrees F. The estimated frost-free season is about 105 to 130 days depending upon elevation, aspect, and air drainage.

KEELINE
SANDY LOAM

Soil Mapping Unit "Ke"
Lab Sample ID: C08100869-039_043
BKS Sample ID: #153

Typical Pedon: Keeline sandy loam-on east facing shoulder slope of 4 percent; utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Keeline series consists of very deep, well or somewhat excessively drained soils formed in alluvium or eolian deposits derived from sandstone. Keeline soils are on upland ridgetops, hillslopes, terraces, benches, alluvial fans, and fan remnants. Slopes range from 0 to 40 percent. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 46 degrees F.

A - 0 to 2 inches; yellow (10YR 7/6) sandy loam, brownish yellow (10YR 6/6) moist; weak fine subangular blocky and granular structure; soft, very friable, nonsticky and nonplastic; noneffervescent; neutral (pH 7.3); abrupt smooth boundary. (2 to 8 inches thick)

AC - 2 to 5 inches; light yellowish brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; noneffervescent; neutral (pH 7.3); clear smooth boundary. (0 to 7 inches thick)

C - 5 to 16 inches; light brownish gray (10YR 6/2) sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; noneffervescent; slightly alkaline (pH 7.5); gradual smooth boundary. (8 to 50 inches thick)

Ck1 - 16 to 46 inches; pale brown (10YR 6/3) sandy clay loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; violently effervescent; calcium carbonate disseminated; moderately alkaline (pH 8.3); gradual smooth boundary. (0 to 30 inches thick)

Ck2 - 46 to 60 inches; gray (10YR 6/1) sandy clay loam, grayish brown (10YR 5/2) moist; massive; soft, very friable, nonsticky and nonplastic; strongly effervescent, calcium carbonate disseminated; moderately alkaline (pH 8.4).

Type Location - Converse County, Wyoming; refer to waypoint 153 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Free carbonates typically occur throughout the profile, but some pedons may be leached as much as 6 inches. The control section averages fine sandy loam or sandy loam with 5 to 18 percent clay. Rock fragments range from 0 to 15 percent. Some thin strata of coarser material may occur. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, and is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 52 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days. EC ranges from 0 to 4 mmhos throughout the profile. Bedrock is deeper than 60 inches.

The A horizon has hue of 7.5YR through 2.5Y, value of 5 through 7 dry, 4 or 5 moist, and chroma of 2 through 4. It is sandy loam and less commonly loamy sand, fine sandy loam, or loamy fine sand. Reaction is neutral to moderately alkaline.

The Bw horizon, when present, has the same properties of the A except for structure which is usually weak subangular blocky.

Some pedons have an AC horizon.

The C horizon has hue of 7.5YR through 5Y, value of 4 through 7 dry, 4 through 6 moist, and chroma of 2 through 4. Texture averages sandy loam or fine sandy loam. Some pedons have subhorizons of very fine sandy loam or loamy fine sand. Reaction is moderately or strongly alkaline and some pedons have weak, discontinuous accumulations of calcium carbonate.

Range in Characteristics (according to field observations, lab analysis): This profile contains calcic horizons, which are not typical of this series. These calcic horizons are finer in texture than the C horizons are typically for this series.

Taxonomic Class - Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents

Suitability for Topsoil (According to WDEQ Guideline 1) – No marginal or unsuitable parameters were found for this profile. Estimated stripping depth is 16 inches.

Geographic Setting (According to Official Series Description) - Keeline soils are on terraces, benches, alluvial fans, fan remnants, ridgetop and hillslope positions. Slopes are 0 to 40 percent. These soils formed in moderately coarse alluvium or eolian deposits derived from calcareous sandstone. Elevations are 3,500 to 6,200 feet. The average annual precipitation is 12 inches with over one-half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August,

September, and October. Precipitation ranges from 10 to 15 inches. The mean annual temperature is about 46 degrees F but ranges from 44 to 49 degrees F. The frost-free season is about 105 to 130 days.

THEEDLE
SANDY CLAY LOAM

Soil Mapping Unit "Th"
Lab Sample ID: C08100869-044_047
BKS Sample ID: #154

Typical Pedon: Theedle sandy clay loam-on west facing hill footslope of 6 percent; rangeland. (Colors are for dry soil unless otherwise stated.)

The Theedle series consists of well drained soils that are moderately deep to soft bedrock. They formed in residuum and slope alluvium weathered from soft sandstone. The Theedle soils are on hills, ridges and fan remnants. Slopes are 0 to 75 percent. The mean annual precipitation is about 12 inches, and the mean annual air temperature is 45 degrees F.

A - 0 to 2 inches; pale brown (10YR 6/3) sandy clay loam, brown (10YR 4/3) moist; weak granular structure; slightly hard, friable, nonsticky and nonplastic; many very fine, fine, and medium roots; noneffervescent; slightly alkaline (pH 7.6); clear smooth boundary. (0 to 5 inches thick)

AC - 2 to 7 inches; pale brown (10YR 6/3) sandy clay loam, brown (10YR 4/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; common very fine, fine, and medium roots; noneffervescent; slightly alkaline (pH 7.6); clear smooth boundary. (4 to 10 inches thick)

C - 7 to 18 inches; light brownish gray (10YR 6/2) sandy clay, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, sticky and nonplastic; few fine and very fine roots; noneffervescent, slightly alkaline (pH 7.7); clear smooth boundary.

Ck1 - 18 to 24 inches; light brownish gray (10YR 6/2) clay loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, sticky and nonplastic; few fine and very fine roots; violently effervescent, calcium carbonate disseminated; moderately alkaline (pH 7.9); clear smooth boundary.

Ck2 - 24 to 36 inches; light reddish brown (2.5YR 7/3) clay, reddish brown (2.5YR 5/3) moist; massive; slightly hard, friable, sticky and nonplastic; few fine and very fine roots; strongly effervescent, calcium carbonate disseminated; moderately alkaline (pH 8.0); clear smooth boundary.

Cr - 36 inches; light gray, soft, moderately calcareous shale.

Type Location - Weston County, Wyoming; refer to waypoint 154 on map included in

this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to soft, gray, calcareous sandstone or sandy shale ranges from 20 to 40 inches but is typically less than 32 inches. The soil lacks a cambic horizon, but structural Bw horizons are present in about half the pedons observed. The soil is typically calcareous throughout but may be leached up to 5 inches. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F and is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 51 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days. The particle size control section averages between 18 and 35 percent clay and is loam, clay loam, or sandy clay loam with more than 15 but less than 35 percent fine or coarser sand. The soil has up to 10 percent rock fragments throughout.

The A horizon has hue of 10YR or 2.5Y, value of 3 to 6 dry, 3 to 5 moist, and chroma of 2 to 4. It is loam, clay loam or fine sandy loam. Reaction ranges from neutral to moderately alkaline. EC is 0 to 2 mmhos/cm.

The BCk (or AC and Bw, when present) has hue of 10YR or 2.5Y, value of 5 or 6 dry, 3 to 5 moist, and chroma of 2 to 4. Texture is loam, clay loam or sandy clay loam. Reaction is slightly alkaline to strongly alkaline. EC is 0 to 4 mmhos/cm.

The C horizon has hue of 10YR or 2.5Y, value of 5 to 7 dry, 4 to 7 moist, and chroma of 2 to 5. Texture is loam, clay loam or sandy clay loam. Reaction is slightly alkaline to strongly alkaline. EC is less than 8 mmhos/cm. Carbonates usually average between 5 and 14 percent with slight segregation in some pedons.

Range in Characteristics (according to field observations, lab analysis): The calcic horizons towards the bottom of the profile are not typical. The textures are finer than typical of this series.

Taxonomic Class - Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents

Suitability for Topsoil (According to WDEQ Guideline 1) – Marginal texture (clay) was found from 24-36 inches. Estimated stripping depth is 12 inches.

Geographic Setting (According to Official Series Description) - Theedle soils are on rock-controlled fan aprons, fan pediments, and undulating to rolling uplands. They may occupy all components of the hillslope profile but typically are on the lower shoulder, footslope, and toeslope. Slopes range from 0 to 75 percent. The soils formed in medium textured slope alluvium and residuum derived primarily from interbedded sandstone and

shale. Elevation is 3,500 to 6,500 feet. The average annual precipitation is 12 inches with over half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. Precipitation ranges from 10 to 14 inches. The mean annual air temperature ranges from 45 to 51 degrees F. The frost-free season is 105 to 130 days.

HILAND
SANDY CLAY LOAM

Soil Mapping Unit "Hi"
Lab Sample ID: C08100869-048_053
BKS Sample ID: #155

Typical Pedon: Hiland sandy clay loam-on northeast facing slope of 3 percent; utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Hiland series consists of very deep, well drained soils formed in alluvium or eolian deposits on relict surfaces consisting of terraces, fans, fan remnants pediments, ridges, hills and stabilized dunes. Permeability is moderate. Slopes range from 0 to 20 percent. The average annual precipitation is about 12 inches, and the mean annual air temperature is about 45 degrees F.

A - 0 to 2 inches; grayish brown (10YR 5/2) sandy clay loam, dark grayish brown (10YR 4/2) moist; weak medium granular structure parting to weak fine granular; slightly hard, friable, nonsticky and nonplastic; many very fine and common fine roots; noneffervescent; slightly alkaline (pH 7.8); abrupt smooth boundary. (2 to 5 inches thick)

Bt1 - 2 to 11 inches; yellowish brown (10YR 5/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; strong medium prismatic structure parting to strong fine and medium angular blocky; hard, friable, moderately sticky and moderately plastic; many very fine roots in a mat at the top of the horizon and common very fine roots between peds; many fine pores; many prominent continuous dark brown (7.5YR 3/3) clay films on faces of peds; noneffervescent; slightly alkaline (pH 7.8); clear wavy boundary.

Bt2 - 11 to 19 inches; light yellowish brown (10YR 6/4) sandy clay loam to sandy clay, yellowish brown (10YR 5/4) moist; strong medium prismatic structure parting to moderate medium subangular blocky; hard, firm, moderately sticky and moderately plastic; common very fine roots between peds; many fine pores; common prominent continuous dark brown (10YR 3/3) clay films on faces of peds and occur as fillings in root channels and pipes; noneffervescent; neutral (pH 7.3); gradual wavy boundary.

BCk - 19 to 26 inches; light brownish gray (10YR 6/2) sandy clay loam, grayish brown (10YR 5/2) moist; weak coarse prismatic structure parting to moderate medium and coarse subangular blocky; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; many fine pores; few fine and medium rounded light gray (10YR 7/2) masses of carbonate throughout; violently effervescent; moderately alkaline (pH 8.0); gradual smooth boundary.

Ck - 26 to 37 inches; light brownish gray (10YR 6/2) sandy clay loam, grayish brown

(10YR 5/2) moist; weak coarse prismatic structure parting to moderate medium and coarse subangular blocky; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; many fine pores; strongly effervescent; moderately alkaline (pH 8.2); gradual smooth boundary.

C1 - 37 to 48 inches; light yellowish brown (10YR 6/4) sandy clay loam, yellowish brown (10YR 5/4) moist; weak coarse prismatic structure parting to moderate medium and coarse subangular blocky; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; many fine pores; moderately effervescent; strongly alkaline (pH 8.7); gradual smooth boundary.

C2 - 48 to 60 inches; light yellowish brown (2.5Y 6/4) coarse sandy clay loam, yellowish brown (2.5Y 5/4) moist; weak coarse prismatic structure parting to moderate medium and coarse subangular blocky; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; many fine pores; slightly effervescent; moderately alkaline (pH 8.1); gradual smooth boundary.

Type Location - Converse County, Wyoming; refer to waypoint 155 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Gravel ranges from 0 to 15 percent in the solum and from 0 to 30 percent in the 2C or Bk horizons. The base of the Bt or Btk ranges from 15 to 35 inches. Depth to continuous carbonate accumulation ranges from 14 to 32 inches. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F and is never moist in all parts for as long as 60 consecutive days when the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, but is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 52 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days. EC ranges from 0 to 2 mmhos from the surface to the base of the Bt and from 1 to 4 mmhos below the base of the Bt. Bedrock is deeper than 60 inches.

The A horizon has hue of 10YR, value of 4 to 6 dry and 3 to 5 moist, and chroma of 2 to 4. It is sandy loam, fine sandy loam, very fine sandy loam, sandy clay loam or loamy sand. Vesicular crust occurs on some pedons. This horizon is neutral to moderately alkaline.

The E horizon has hue of 10YR, value of 4 to 6 and 3 to 5 moist, and chroma of 2 to 4. It is fine sandy loam, very fine sandy loam, sandy loam, sandy clay loam or loamy sand. It is neutral or slightly alkaline.

The Bt horizon has hue of 2.5Y to 7.5YR, value of 4 to 6 dry and 3 to 5 moist, and chroma of 2 to 4. It has a weighted clay content of 20 to 35 percent and is sandy clay loam; however, parts of this horizon may be sandy loam. This horizon is typically noncalcareous. Reaction is neutral to moderately alkaline.

If a Btk horizon is present, it has the same ranges as defined for the Bt except that it is replugged with carbonate and reaction ranges from moderately to strongly alkaline.

The Bk horizon has hue of 2.5Y or 10YR, value of 5 to 7 dry and 4 to 7 moist, and chroma of 2 to 4. It is sandy loam, loamy sand, fine sandy loam or sandy clay loam; or, when other textures occur, the horizon average must be sandy loam, loamy sand or fine sandy loam. It is not a calcic horizon. It does not have 5 percent more calcium carbonate equivalent than the underlying horizon or has less than 5 percent secondary carbonates. It is moderately or strongly alkaline. Exchangeable sodium is less than 15 percent even though field tests indicate strongly alkaline reactions.

Some pedons have a 2Bk, 2C or C horizon. The 2C and 2Bk horizons may contain more rock fragments. Contrasting textures of sand may occur below 40 inches. It is calcareous but typically has less than 5 percent calcium carbonate equivalent.

Range in Characteristics (according to field observations, lab analysis): This profile does not have an E horizon, but has 2 C horizons at the bottom, which is not typical for this series.

Taxonomic Class - Fine-loamy, mixed, superactive, mesic Ustic Haplargids

Suitability for Topsoil (According to WDEQ Guideline 1) – Marginal pH (alkaline) was found from 37-48 inches. Estimated stripping depth is 19 inches.

Geographic Setting (According to Official Series Description) - Hiland soils are on relict surfaces consisting of terraces, fan remnants, pediments, fans, ridges, hills and stabilized dunes. Slopes are 0 to 20 percent. They formed in moderately coarse alluvium and eolian material derived predominantly from sandstone. Elevations are 3,500 to 6,300 feet. The average annual precipitation is about 12 inches with over half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. Precipitation ranges from 10 to 14 inches. The mean annual air temperature is 43 to 51 degrees F. The frost-free season is 105 to 130 days.

ULM
SANDY CLAY LOAM

Soil Mapping Unit "Ul"
Lab Sample ID: C08100869-054_058
BKS Sample ID: #156

Typical Pedon: Ulm sandy clay loam-rangeland. (Colors are for dry soil unless otherwise stated.)

The Ulm series consists of very deep, well drained soils that formed in calcareous alluvium derived from sedimentary rock. Ulm soils are on relict terraces, alluvial fans, fan remnants, plateaus, ridges and hills. Slopes are 0 to 18 percent. The mean annual precipitation is about 12 inches, and the mean air annual temperature is about 47 degrees F.

A - 0 to 3 inches; grayish brown (10YR 5/2) sandy clay loam, dark grayish brown (10YR 4/2) moist; strong fine granular structure; slightly hard, friable, sticky and plastic; many fine and few medium roots; noneffervescent; neutral (pH 6.6); clear smooth boundary. (2 to 5 inches thick)

Bt1 - 3 to 12 inches; brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; strong coarse prismatic structure parting to strong medium and coarse angular blocky; very hard, very firm, very sticky and very plastic; common fine and few medium roots; many prominent clay films on faces of peds; noneffervescent; neutral (pH 6.6); clear wavy boundary. (6 to 23 inches thick)

Bt2 - 12 to 29 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; strong coarse prismatic structure parting to strong medium and coarse angular blocky; very hard, very firm, very sticky and very plastic; common fine and few medium roots; many prominent clay films on faces of peds; moderately effervescent; slightly alkaline (pH 7.7); clear wavy boundary. (6 to 23 inches thick)

Bn - 29 to 37 inches; pale brown (10YR 6/3) clay, brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few fine and medium roots; slightly effervescent; sodium as scattered distinct masses, seams and streaks; slightly alkaline (pH 7.8); clear wavy boundary.

Cn - 37 to 53 inches; pale brown (10YR 6/3) clay, brown (10YR 5/3) moist; massive; hard, firm, sticky and plastic; sodium as scattered distinct masses, seams and streaks; noneffervescent; slightly alkaline (pH 7.6).

Ck - 53 to 60 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist;

massive; hard, firm, sticky and plastic; calcium carbonate as common distinct masses, seams and streaks; 5 percent partially weathered shale and sandstone channers; strongly effervescent; slightly alkaline (pH 7.7).

Type Location - Campbell County, Wyoming; refer to waypoint 156 on map included in this report.
Range in Soil Characteristics (According to Official Series Description) - Depth to calcareous material ranges from 12 to 33 inches. Rock fragments range from 0 to 15 percent channers. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, and is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 53 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days.

The A horizon has hue of 2.5Y or 10YR, value of 5 to 7 dry and 3 to 5 moist, and chroma of 1 to 4. Texture is loam or clay loam. It usually has granular structure but has subangular blocky structure in some pedons. This horizon is soft or slightly hard. Reaction is neutral or slightly alkaline.

The Bt horizon has hue of 2.5Y or 10YR, value of 5 or 6 dry and 3 to 5 moist, and chroma of 2 to 4. Where colors are dark enough to be mollic the values are derived from parent material weathered from dark colored shales. Texture is usually clay loam, silty clay loam, silty clay or clay with clay ranging from 35 to 50 percent, silt from 10 to 40 percent, and sand from 15 to 50 percent with more than 15 percent fine sand or coarser. This horizon usually has prismatic structure but has angular or subangular blocky structure in some pedons. Reaction is neutral to moderately alkaline.

The Btk horizon has hue of 5Y, 2.5Y or 10YR, value of 5 to 7 dry and 4 to 6 moist, and chroma of 2 to 4. Texture is clay, clay loam, silty clay or silty clay loam. Reaction is slightly alkaline or moderately alkaline. The calcium carbonate equivalent ranges from 6 to 12 percent.

The Bk horizon has hue of 5Y, 2.5Y or 10YR, value of 5 to 7 dry and 4 to 6 moist, and chroma of 2 to 4. Texture is clay loam, silty clay loam, silty clay, sandy clay loam, loam or clay. It has 6 to 15 percent calcium carbonate equivalent. Reaction is moderately alkaline or strongly alkaline. Some areas have a sandy or gravelly substratum below 40 inches.

Some pedons have a C horizon.

Range in Characteristics (according to field observations, lab analysis): In this profile, the calcic horizon(s) is found only at the bottom of the profile, which is not typical. Also,

natric horizons were found for this profile.

Taxonomic Class - Fine, smectitic, mesic Ustic Haplargids

Suitability for Topsoil (According to WDEQ Guideline 1) – Marginal texture (clay) was found from 12-53 inches. Marginal selenium levels were found from 29-37 inches. Estimated stripping depth is 29 inches.

Geographic Setting (According to Official Series Description) - Ulm soils are on relict alluvial terraces, alluvial fans, fan remnants, plateaus and footslopes and toeslopes of hills. Slopes are 0 to 18 percent. The soils formed in fine and medium textured alluvium derived from interbedded shales and agrillaceous sandstone. Elevations are 3,500 to 6,500 feet. The mean annual precipitation is 10 to 14 inches with over half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. The mean annual air temperature ranges from 46 to 51 degrees F. The frost-free season is 105 to 130 days.

KISHONA
CLAY

Soil Mapping Unit "Ki"
Lab Sample ID: C08100869-059_063
BKS Sample ID: #158

Typical Pedon: Kishona clay-in rangeland. (Colors are for dry soil unless otherwise stated.)

The Kishona series consists of very deep, well drained soils formed in alluvium on fan aprons, alluvial fans, fan remnants, hills, ridges and terraces. Permeability is moderate. Slopes range from 0 to 30 percent. The average annual precipitation is about 12 inches, and the mean annual temperature is about 46 degrees F.

A - 0 to 2 inches; brown (10YR 5/3) clay, dark brown (10YR 3/3) moist; moderate medium and fine granular structure; soft, very friable, slightly sticky and nonplastic; common fine roots throughout; noneffervescent; neutral (pH 7.1); clear smooth boundary. (1 to 6 inches thick)

Bw - 2 to 12 inches; very pale brown (10YR 7/3) clay, brown (10YR 5/3) moist; weak medium and coarse angular structure; hard, friable, slightly sticky and slightly plastic; few fine and very fine roots throughout; noneffervescent; neutral (pH 7.1); gradual smooth boundary. (0 to 30 inches thick)

BC - 12 to 25 inches; very pale brown (10YR 7/3) clay loam, brown (10YR 5/3) moist; weak, medium and coarse angular structure; hard, friable, slightly sticky and slightly plastic; few fine and very fine roots throughout; slightly effervescent; slightly alkaline (pH 7.6); gradual smooth boundary.

C1 - 25 to 33 inches; pale brown (10YR 6/3) sandy loam to sandy clay loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slight sticky and nonplastic; few very fine roots throughout; noneffervescent; moderately alkaline (pH 7.9).

C2 - 33 to 48 inches; pale brown (10YR 6/3) sandy clay loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slight sticky and nonplastic; few very fine roots throughout; moderately effervescent; moderately alkaline (pH 8.0).

C3 - 48 to 58 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 5/3) moist; massive; slightly hard, friable, slight sticky and nonplastic; few very fine roots throughout; noneffervescent; moderately alkaline (pH 8.1).

Cr - 58 inches; moderately calcareous tan and gray sandstone

Type Location - Niobrara County, Wyoming; refer to waypoint 158 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Rock fragments ranges from 0 to 15 percent. The mean annual soil temperature ranges from 48 to 53 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 190 to 202 days. The depth to carbonates ranges from 0 to 10 inches. Saline phases are recognized. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F and is never moist in some or all parts for as long as 90 consecutive days when the soil temperature at a depth of 20 inches is 48 degrees F or more. This soil is moist for 60 consecutive days when the soil temperature at a depth of 20 inches is 41 degrees F, which occurs April 21-27, but is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during that period.

The A horizon has hue of 2.5Y or 10YR, value of 4 to 6 dry, 3 to 5 moist, and chroma of 2 to 4. It is very fine sandy loam, fine sandy loam, loam, silt loam, silty clay loam or clay loam. It is neutral to moderately alkaline.

Some pedons have a thin, noncalcareous Bw horizon that has its base at a depth of less than 10 inches.

The Bk and C horizons have hue of 5Y, 2.5Y or 10YR, value of 5 to 7 dry, 4 or 5 moist, and chroma of 2 to 4. They are loam, clay loam or silty clay loam and have 20 to 35 percent clay, 20 to 55 percent silt, and 15 to 35 percent fine sand or coarser. Reaction ranges from moderately alkaline to very strongly alkaline. Carbonates in the Bk horizon range from 3 to 14 percent and occur as accumulations in small masses, streaks or seams that decrease with increasing depth, or they are disseminated throughout. The Bk horizon has an EC of 0 to 8 mmhos/cm.

Range in Characteristics (according to field observations, lab analysis): This profile has a BC horizon instead of a calcic horizon. The top of the profile is finer than typical, and the bottom is sandier than typical.

Taxonomic Class - Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents

Suitability for Topsoil (According to WDEQ Guideline 1) – Marginal texture (clay) was found from 0-12 inches. Estimated stripping depth is 48 inches.

Geographic Setting (According to Official Series Description) - Kishona soils are on dissected alluvial fans, fan remnants, fan aprons, hills, ridges and terraces. Slopes are typically 0 to 6 percent but range up to 30 percent on dissected slopes. The soils formed

in alluvium derived from sandstones and shales. Elevation is 3,500 to 6,700 feet. The average annual precipitation ranges from 10 to 14 inches with over one-half falling in April, May and June and less than one inch falling in each month of July, August, September, and October. The mean annual air temperature is about 45 degrees F but ranges from 43 to 51 degrees F. The frost-free season is about 105 to 130 days.

ZIGWEID
CLAY

Soil Mapping Unit "Zi"
Lab Sample ID: C08100869-064_067
BKS Sample ID: #159

Typical Pedon: Zigweid clay-on a 3 percent southwest facing slope; utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Zigweid series consists of very deep, well drained soils formed in alluvium from mixed sedimentary sources on fan aprons, alluvial fans, fan piedmonts, fan remnants, terraces, ridges and hills. Slopes range from 0 to 20 percent. Permeability is moderate. The mean annual precipitation is about 13 inches, and the mean annual air temperature is about 46 degrees F.

A - 0 to 3 inches; light brownish gray (10YR 6/2) clay, dark grayish brown (10YR 4/2) moist; moderate fine and medium granular structure; slight hard, friable, nonsticky and nonplastic; many very fine and fine roots throughout; noneffervescent; slightly alkaline (pH 7.4); clear smooth boundary.

Bw - 3 to 14 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots throughout and few medium throughout; noneffervescent; slightly alkaline (pH 7.4); gradual wavy boundary. (6 to 14 inches thick)

Bk - 14 to 28 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots throughout; common fine irregular light gray (10YR 7/2) carbonate threads throughout; moderately effervescent; moderately alkaline (pH 7.9); gradual wavy boundary.

Ck - 28 to 37 inches; pale brown (10YR 6/3) clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; common fine irregular light gray (10YR 7/2) carbonate threads throughout; moderately effervescent; moderately alkaline (pH 8.1).

C - 37 to 60 inches; pale brown (10YR 6/3) sandy clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; moderately effervescent; moderately alkaline (pH 8.1).

Type Location - Campbell County, Wyoming; refer to waypoint 159 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to carbonates ranges from 0 to 8 inches. Depth to the Bk horizon and the base of the cambic horizon ranges from 10 to 22 inches. The particle-size control section and soil profile are clay loam or loam. Clay ranges from 18 to 35 percent, silt from 20 to 55 percent, and sand from 15 to 50 percent with more than 15 percent but less than 35 percent fine sand or coarser. Rock fragments range from 0 to 15 but are typically less than 5 percent and are mostly soft shale chips. The moisture control section is usually dry in all parts for 90 cumulative days following the summer solstice and for 60 consecutive days during this period. The mean annual soil temperature is 47 to 53 degrees F. The soil temperature at a depth of 20 inches is 41 degrees F or warmer for 175 to 192 days.

The A horizon has hue of 5Y, 2.5Y or 10YR, value of 4 to 6 dry, 3 to 5 moist, and chroma of 2 or 3. It is loam or clay loam. Reaction is neutral to moderately alkaline.

The Bw horizon has hue of 5Y, 2.5Y or 10YR, value of 5 or 6 dry, 4 or 5 moist, and chroma of 2 to 4. It is loam or clay loam. Reaction is slightly alkaline or moderately alkaline.

The Bk horizon has hue of 5Y, 2.5Y or 10YR, value of 5 to 7 dry, 4 to 6 moist, and chroma of 2 to 4. It is loam or clay loam. It has 5 to 14 percent calcium carbonate equivalent and may have a few scattered crystals of calcium sulfate. Reaction is moderately alkaline or strongly alkaline.

Some pedons have a C horizon with similar properties as the Bk horizon. Some pedons may have sandy clay loam textures below 40 inches. It typically has 3 to 5 percent less calcium carbonate than the overlying Bk horizon.

Range in Characteristics (according to field observations, lab analysis): The upper two feet of the profile have a finer texture than typical.

Taxonomic Class - Fine-loamy, mixed, superactive, mesic Ustic Haplocambids

Suitability for Topsoil (According to WDEQ Guideline 1) – Marginal texture (clay) was found from 0-28 inches. Estimated stripping depth is 60 inches.

Geographic Setting (According to Official Series Description) - These soils are on fan aprons, alluvial fans, terraces, fan piedmonts, fan remnants, ridges and hills. In many areas they are dissected. Slopes range from 0 to 20 percent. These soils formed in calcareous, moderately fine textured sediments derived from interbedded shale and soft

sandstone. Elevations are 3,500 to 6,600 feet. The mean annual precipitation is 13 inches with over half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. Precipitation ranges from 10 to 14 inches. The mean annual temperature is about 46 degrees F, and ranges from 43 to 51 degrees F. The frost-free season is about 105 to 130 days.

FORKWOOD
CLAY LOAM

Soil Mapping Unit "Fo"
Lab Sample ID: C08100869-068_072
BKS Sample ID: #160

Typical Pedon: Forkwood clay loam-utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Forkwood series consists of very deep, well drained soils formed in alluvium. Forkwood soils are on terraces, alluvial fans, fan remnants, hills, ridges and pediments. Slopes range from 0 to 15 percent. The mean annual precipitation is about 11 inches, and the mean annual air temperature is about 45 degrees F.

A - 0 to 2 inches; brown (10YR 5/3) clay loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many fine and medium roots throughout; noneffervescent; slightly alkaline (pH 7.5); abrupt smooth boundary. (1 to 6 inches thick)

Bt1 - 2 to 13 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; strong medium angular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; common fine and medium roots throughout; common distinct clay films on faces of peds; noneffervescent; slightly alkaline (pH 7.5); clear smooth boundary. (6 to 20 inches thick)

Bt2 - 13 to 21 inches; brown (10YR 5/3) clay to clay loam, brown (10YR 4/3) moist; strong medium angular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; common fine and medium roots throughout; common distinct clay films on faces of peds; moderately effervescent; moderately alkaline (pH 8.1); clear smooth boundary. (6 to 20 inches thick)

Bt3 - 21 to 33 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; strong medium angular blocky structure; hard, firm, moderately sticky and moderately plastic; few fine and medium roots throughout; few faint clay films on faces of peds; few masses of carbonates; moderately effervescent; moderately alkaline (pH 8.1); clear smooth boundary. (3 to 12 inches thick)

Ck1 - 33 to 55 inches; light brownish gray (2.5Y 6/2) gravelly clay, grayish brown (2.5Y 5/2) moist; massive; soft, very friable, slightly sticky and slightly plastic; few fine roots throughout; few masses of carbonates throughout; slightly effervescent; moderately alkaline (pH 8.1). (0 to 40 inches thick)

Ck2 - 55 to 60 inches; light brownish gray (2.5Y 6/2) clay to clay loam, grayish brown (2.5Y 5/2) moist; massive; soft, very friable, slightly sticky and slightly plastic; few fine roots throughout; few masses of carbonates throughout; slightly effervescent; moderately alkaline (pH 8.1). (0 to 40 inches thick)

Type Location - Niobrara County, Wyoming; refer to waypoint 160 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to the base of the argillic horizon is 10 to 33 inches, and depth to continuous horizons of carbonate accumulation is 10 to 33 inches. Rock fragments range from 0 to 15 percent. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, and is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature ranges from 47 to 53 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days. EC ranges from 0 to 4 mmhos/cm throughout the profile. Bedrock is deeper than 60 inches.

The A horizon has hue of 2.5Y or 10YR, value of 4 to 6 dry and 3 to 5 moist, and chroma of 2 to 4. A vesicular crust occurs on some pedons. Texture is very fine sandy loam, loam, clay loam or fine sandy loam. Reaction is neutral through moderately alkaline.

The Bt horizon has hue of 2.5Y, 10YR or 7.5YR, value of 4 to 7 dry and 3 to 5 moist, and chroma of 2 to 4. Texture is loam or clay loam with 18 to 35 percent clay and more than 15 but less than 35 percent fine sand or coarser. Reaction is neutral through moderately alkaline.

The Btk horizon has hue of 2.5Y or 10YR, value of 4 to 7 dry and 3 to 5 moist, and chroma of 2 to 4. Texture is loam or clay loam. It is slightly alkaline or moderately alkaline. It has 3 to 12 percent calcium carbonate equivalent.

The Bk horizon has hue of 5Y, 2.5Y or 10YR, value of 5 to 7 dry and 4 to 6 moist, and chroma of 2 to 4. Texture is loam, fine sandy loam, very fine sandy loam or clay loam. This horizon has 1 to 14 percent authigenic calcium carbonate accumulation. It is moderately alkaline or strongly alkaline.

The C horizon, when present, has hue of 5Y to 10YR, value of 5 to 7 dry, 4 to 6 moist, and chroma of 2 to 4. Carbonates range from 1 to 8 percent and are mostly allogenic. ESP ranges from 4 to 12. Reaction is moderately or strongly alkaline.

Range in Characteristics (according to field observations, lab analysis): The calcic horizons are found as C horizons rather than B or BC horizons. Textures are somewhat

finer than typical throughout this profile.

Taxonomic Class - Fine-loamy, mixed, superactive, mesic Ustic Haplargids

Suitability for Topsoil (According to WDEQ Guideline 1) – Marginal texture (clay) was found from 13-21 inches and 33-60 inches. Estimated stripping depth is 33 inches.

Geographic Setting (According to Official Series Description) - Forkwood soils are on terraces, alluvial fans, fan remnants, hills, ridges and pediments. Slopes are 0 to 15 percent. The soils formed in slopewash alluvium derived from interbedded shales and argillaceous sandstone. Elevations are 3,500 to 6,000 feet. The average annual precipitation is 10 to 14 inches with over half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. The mean annual air temperature ranges from 43 to 51 degrees F. The estimated frost-free season is about 105 to 130 days depending upon elevation, aspect, and air drainage.

FORKWOOD
CLAY LOAM

Soil Mapping Unit "Fo"
Lab Sample ID: C08100869-073_076
BKS Sample ID: #161

Typical Pedon: Forkwood clay loam-utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Forkwood series consists of very deep, well drained soils formed in alluvium. Forkwood soils are on terraces, alluvial fans, fan remnants, hills, ridges and pediments. Slopes range from 0 to 15 percent. The mean annual precipitation is about 11 inches, and the mean annual air temperature is about 45 degrees F.

A - 0 to 2 inches; brown (10YR 5/3) clay loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many fine and medium roots throughout; noneffervescent; slightly alkaline (pH 7.7); abrupt smooth boundary. (1 to 6 inches thick)

Bt - 2 to 12 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; strong medium angular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; common fine and medium roots throughout; common distinct clay films on faces of peds; noneffervescent; slightly alkaline; (pH 7.7) clear smooth boundary. (6 to 20 inches thick)

Btk - 12 to 28 inches; light brownish gray (2.5Y 6/2) clay, dark grayish brown (2.5Y 4/2) moist; strong medium angular blocky structure; hard, firm, moderately sticky and moderately plastic; few fine and medium roots throughout; few faint clay films on faces of peds; few masses of carbonates; strongly effervescent; slightly alkaline (pH 7.4); clear smooth boundary. (3 to 16 inches thick)

Bn - 28 to 46 inches; light brownish gray (2.5Y 6/2) clay, light olive brown (2.5Y 5/4) moist; moderate medium subangular blocky structure parting to weak fine subangular blocky; slightly hard, friable, slightly sticky and sligtly plastic; few fine roots throughout; many coarse threads and masses of sodium throughout; moderately effervescent; slightly alkaline (pH 7.6); gradual wavy boundary. (9 to 45 inches thick)

BCk - 46 to 51 inches; light brownish gray (2.5Y 6/2) sandy clay loam, grayish brown (2.5Y 5/2) moist; massive; soft, very friable, slightly sticky and slightly plastic; few fine roots throughout; violently effervescent; slightly alkaline (pH 7.6). (0 to 40 inches thick)

Ck - 51 to 60 inches; light brownish gray (2.5Y 6/2) sandy clay loam, grayish brown

(2.5Y 5/2) moist; massive; soft, very friable, slightly sticky and slightly plastic; few fine roots throughout; strongly effervescent; slightly alkaline (pH 7.6). (0 to 40 inches thick)

Type Location - Niobrara County, Wyoming; refer to waypoint 161 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to the base of the argillic horizon is 10 to 33 inches, and depth to continuous horizons of carbonate accumulation is 10 to 33 inches. Rock fragments range from 0 to 15 percent. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, and is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature ranges from 47 to 53 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days. EC ranges from 0 to 4 mmhos/cm throughout the profile. Bedrock is deeper than 60 inches.

The A horizon has hue of 2.5Y or 10YR, value of 4 to 6 dry and 3 to 5 moist, and chroma of 2 to 4. A vesicular crust occurs on some pedons. Texture is very fine sandy loam, loam, clay loam or fine sandy loam. Reaction is neutral through moderately alkaline.

The Bt horizon has hue of 2.5Y, 10YR or 7.5YR, value of 4 to 7 dry and 3 to 5 moist, and chroma of 2 to 4. Texture is loam or clay loam with 18 to 35 percent clay and more than 15 but less than 35 percent fine sand or coarser. Reaction is neutral through moderately alkaline.

The Btk horizon has hue of 2.5Y or 10YR, value of 4 to 7 dry and 3 to 5 moist, and chroma of 2 to 4. Texture is loam or clay loam. It is slightly alkaline or moderately alkaline. It has 3 to 12 percent calcium carbonate equivalent.

The Bk horizon has hue of 5Y, 2.5Y or 10YR, value of 5 to 7 dry and 4 to 6 moist, and chroma of 2 to 4. Texture is loam, fine sandy loam, very fine sandy loam or clay loam. This horizon has 1 to 14 percent authigenic calcium carbonate accumulation. It is moderately alkaline or strongly alkaline.

The C horizon, when present, has hue of 5Y to 10YR, value of 5 to 7 dry, 4 to 6 moist, and chroma of 2 to 4. Carbonates range from 1 to 8 percent and are mostly allogenic. ESP ranges from 4 to 12. Reaction is moderately or strongly alkaline.

Range in Characteristics (according to field observations, lab analysis): The typical calcic horizon is replaced by a natric horizon in this profile. The textures from 12-46 inches are finer than what is typical for this series.

Taxonomic Class - Fine-loamy, mixed, superactive, mesic Ustic Haplargids

Suitability for Topsoil (According to WDEQ Guideline 1) – Magrinal texture (clay) was found from 12-46 inches. Estimated stripping depth is 12 inches.

Geographic Setting (According to Official Series Description) - Forkwood soils are on terraces, alluvial fans, fan remnants, hills, ridges and pediments. Slopes are 0 to 15 percent. The soils formed in slopewash alluvium derived from interbedded shales and argillaceous sandstone. Elevations are 3,500 to 6,000 feet. The average annual precipitation is 10 to 14 inches with over half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. The mean annual air temperature ranges from 43 to 51 degrees F. The estimated frost-free season is about 105 to 130 days depending upon elevation, aspect, and air drainage.

SHINGLE
NONCALCAREOUS VARIANT

Soil Mapping Unit "ShNC"
Lab Sample ID: C08100869_077
BKS Sample ID: #162

Typical Pedon: Shingle clay to clay loam-rangeland. (Colors are for dry soil unless otherwise stated.)

The Shingle series consists of well drained soils that are very shallow or shallow to bedrock. They formed in residuum and colluvium derived from interbedded shale and sandstone or in alluvium from mudstone. Shingle soils are on bedrock controlled hillslopes and ridges. Slopes are 0 to 80 percent. The mean annual precipitation is about 13 inches, and the mean annual temperature is 45 degrees F.

A - 0 to 5 inches; light brownish gray (10YR 6/2) clay to clay loam, dark grayish brown (10YR 4/2) moist; moderate very fine granular structure; soft, very friable, moderately sticky and moderately plastic; noneffervescent, neutral (pH 7.2); clear smooth boundary. (1 to 6 inches thick)

C - 5 to 12 inches; light yellowish brown (2.5Y 6/3) clay to clay loam, light olive brown (2.5Y 5/3) moist; massive; hard, variable, moderately sticky and moderately plastic; noneffervescent; neutral (pH 7.2); clear wavy boundary. (4 to 15 inches thick)

Cr - 12 inches; soft, slightly to moderately calcareous shale interbedded with lenses of soft sandstone.

Type Location - Goshen County, Wyoming; refer to waypoint 162 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to soft bedrock and paralithic contact ranges from 4 to 20 inches. The mean annual soil temperature is 47 to 53 degrees F. The soils commonly are calcareous throughout, but some pedons are leached to 6 inches. The particle size control section averages 20 to 35 percent clay and has more than 15 percent but less than 35 percent fine or coarser sand. The soil is usually dry. The moisture control section is usually moist in April, May and early June. It is dry for 60 consecutive days or more during the 90 day period following the summer solstice. EC is 0 to 2 mmhos throughout.

The A horizon has hue of 5Y through 7.5YR, value of 5 through 7 dry, 3 through 6 moist, and chroma of 1 through 6. Reaction is neutral through strongly alkaline. Some pedons have a light gravel lag on the surface. Texture is loam, silt loam, clay loam, silty clay

loam, cobbly loam, and gravelly clay loam. Rock fragments or shale channers range from 0 to 35 percent.

A Bw or AC horizon, when present, has the combined properties of the A and C horizons.
The C horizon has hue of 5Y through 7.5YR, value of 4 through 7 dry, 3 through 6 moist, and chroma of 1 through 6. It is loam, silt loam, clay loam or silty clay loam. Rock fragments or shale channers range from 0 to 35 percent. Reaction is slightly alkaline through strongly alkaline.

Range in Characteristics (according to field observations, lab analysis): This profile is noncalcareous throughout. Textures are slightly finer that what is typical for this series.

Taxonomic Class - Loamy, mixed, superactive, calcareous, mesic, shallow Ustic Torriorthents

Suitability for Topsoil (According to WDEQ Guideline 1) – Marginal texture (clay) was found from 0-12 inches. Estimated stripping depth is 12 inches.

Geographic Setting (According to Official Series Description) - The Shingle soils occur on all hillslope positions. Slopes are 0 to 80 percent. These soils formed in colluvium and residuum weathered from soft, interbedded sandstone and shale or in alluvium from mudstone. Elevation is 3,200 to 6,500 feet. The mean annual precipitation is about 10 to 14 inches, most of which falls in April, May, and June. The mean annual temperature is about 45 degrees F but ranges from 43 to 51 degrees F. The frost-free season is about 105 to 130 days.

KISHONA
CLAY LOAM

Soil Mapping Unit "Ki"
Lab Sample ID: C08100869-078_083
BKS Sample ID: #163

Typical Pedon: Kishona clay to clay loam-in rangeland. (Colors are for dry soil unless otherwise stated.)

The Kishona series consists of very deep, well drained soils formed in alluvium on fan aprons, alluvial fans, fan remnants, hills, ridges and terraces. Permeability is moderate. Slopes range from 0 to 30 percent. The average annual precipitation is about 12 inches, and the mean annual temperature is about 46 degrees F.

A - 0 to 2 inches; brown (10YR 5/3) clay to clay loam, dark brown (10YR 3/3) moist; moderate medium and fine granular structure; soft, very friable, slightly sticky and nonplastic; common fine roots throughout; moderately effervescent; slightly alkaline (pH 7.4); clear smooth boundary. (1 to 6 inches thick)

ABk - 2 to 7 inches; brown (10YR 5/3) clay to clay loam, dark brown (10YR 3/3) moist; moderate medium and fine granular structure; soft, very friable, slightly sticky and nonplastic; common fine roots throughout; strongly effervescent; slightly alkaline (pH 7.4); clear smooth boundary. (1 to 6 inches thick)

Bk - 7 to 20 inches; very pale brown (10YR 7/3) clay loam, brown (10YR 5/3) moist; weak medium and coarse angular structure; hard, friable, slightly sticky and slightly plastic; few fine and very fine roots throughout; common fine masses of carbonates; violently effervescent; slightly alkaline (pH 7.8); gradual smooth boundary. (0 to 30 inches thick)

Bkn - 20 to 29 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; weak medium and coarse angular structure; hard, friable, slightly sticky and slightly plastic; few fine and very fine roots throughout; many large masses of sodium; common fine masses of carbonates; strongly effervescent; moderately alkaline (pH 8.2); gradual smooth boundary. (0 to 30 inches thick)

BCn - 29 to 37 inches; very pale brown (10YR 7/3) clay loam, brown (10YR 5/3) moist; weak medium and coarse angular structure; hard, friable, slightly sticky and slightly plastic; few fine and very fine roots throughout; many large masses of sodium; slightly effervescent; moderately alkaline (pH 8.3); gradual smooth boundary. (0 to 30 inches thick)

C1 - 37 to 50 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slight sticky and nonplastic; few very fine roots throughout; scattered moderate masses of sodium; slightly effervescent; moderately alkaline (pH 8.3).

C2 - 50 to 60 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slight sticky and nonplastic; few very fine roots throughout; scattered moderate masses of sodium; slightly effervescent; moderately alkaline (pH 8.3).

Type Location - Niobrara County, Wyoming; refer to waypoint 163 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Rock fragments ranges from 0 to 15 percent. The mean annual soil temperature ranges from 48 to 53 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 190 to 202 days. The depth to carbonates ranges from 0 to 10 inches. Saline phases are recognized. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F and is never moist in some or all parts for as long as 90 consecutive days when the soil temperature at a depth of 20 inches is 48 degrees F or more. This soil is moist for 60 consecutive days when the soil temperature at a depth of 20 inches is 41 degrees F, which occurs April 21-27, but is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during that period.

The A horizon has hue of 2.5Y or 10YR, value of 4 to 6 dry, 3 to 5 moist, and chroma of 2 to 4. It is very fine sandy loam, fine sandy loam, loam, silt loam, silty clay loam or clay loam. It is neutral to moderately alkaline.

Some pedons have a thin, noncalcareous Bw horizon that has its base at a depth of less than 10 inches.

The Bk and C horizons have hue of 5Y, 2.5Y or 10YR, value of 5 to 7 dry, 4 or 5 moist, and chroma of 2 to 4. They are loam, clay loam or silty clay loam and have 20 to 35 percent clay, 20 to 55 percent silt, and 15 to 35 percent fine sand or coarser. Reaction ranges from moderately alkaline to very strongly alkaline. Carbonates in the Bk horizon range from 3 to 14 percent and occur as accumulations in small masses, streaks or seams that decrease with increasing depth, or they are disseminated throughout. The Bk horizon has an EC of 0 to 8 mmhos/cm.

Range in Characteristics (according to field observations, lab analysis): Multiple natric horizons were found, which is not typical of this series. The A horizon has a slightly finer texture than typical.

Taxonomic Class - Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents

Suitability for Topsoil (According to WDEQ Guideline 1) –Marginal clay content was found from 0-7 inches. Marginal SAR levels were found from 20-37 inches and unsuitable SAR levels were found from 37-60 inches. Unsuitable EC levels were found from 29-60 inches. Estimated stripping depth is 29 inches.

Geographic Setting (According to Official Series Description) - Kishona soils are on dissected alluvial fans, fan remnants, fan aprons, hills, ridges and terraces. Slopes are typically 0 to 6 percent but range up to 30 percent on dissected slopes. The soils formed in alluvium derived from sandstones and shales. Elevation is 3,500 to 6,700 feet. The average annual precipitation ranges from 10 to 14 inches with over one-half falling in April, May and June and less than one inch falling in each month of July, August, September, and October. The mean annual air temperature is about 45 degrees F but ranges from 43 to 51 degrees F. The frost-free season is about 105 to 130 days.

TURNERCREST
SANDY CLAY LOAM

Soil Mapping Unit "Tu"
Lab Sample ID: C08100869-084_086
BKS Sample ID: #164

Typical Pedon: Turnercrest sandy clay loam-on a northeast facing hill footslope of 8 percent; utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Turnercrest soils consist of moderately deep, well drained soils formed in eolian or alluvium deposits and residuum derived from soft sandstone. They are on bedrock-controlled hills, fan remnants, ridges and structural benches. Slopes range from 0 to 30 percent. The average annual precipitation is about 12, and the mean annual air temperature is about 47 degrees F.

A - 0 to 3 inches; brown (10YR 5/3) sandy clay loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable; many fine and very fine roots; noneffervescent; neutral (pH 7.3); clear smooth boundary. (2 to 6 inches thick)

Bw - 3 to 10 inches; brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; weak medium and coarse subangular blocky structure; soft, friable; common fine and very fine roots; noneffervescent; neutral (pH 7.3); gradual smooth boundary. (0 to 8 inches thick)

Ck1 - 10 to 20 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; weak medium and coarse subangular blocky structure; soft, friable; common fine and very fine roots; strongly effervescent; carbonates occurs in filaments and few masses; moderately alkaline (pH 7.9); gradual smooth boundary.

Ck2 - 20 to 34 inches; light gray (10YR 7/2) gravelly clay loam, pale brown (10YR 6/3) moist; massive; slightly hard, very friable; few fine roots to 15 inches; strongly effervescent; carbonates disseminated and as few fine filaments; moderately alkaline (pH 8.0); clear wavy boundary.

C - 34 to 38 inches; light gray (10YR 7/2) gravelly clay loam, pale brown (10YR 6/3) moist; massive; slightly hard, very friable; few fine roots to 15 inches; slightly effervescent; moderately alkaline (pH 8.0); clear wavy boundary.

Cr - 38 inches; soft, light gray and very pale brown, noncalcareous sandstone.

Type Location - Weston County, Wyoming; refer to waypoint 164 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to soft, calcareous sandstone ranges from 20 to 40 inches. These soils are typically calcareous throughout but may be leached as much as to 6 inches in some pedons. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F or warmer and is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 53 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days. The particle-size control section is fine sandy loam or sandy loam with 7 to 18 percent clay and 52 to 80 percent sand with more than 15 percent being fine sand or coarser. EC is 0 to 2 mmhos throughout the soil. Rock fragments may be present but break down on pretreatment and do not have lithic properties.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 6 and 3 to 5 moist, and chroma of 2 to 4. Textures are loamy sand, loamy fine sand, fine sandy loam or sandy loam. Reaction is neutral to moderately alkaline.

The Bw horizon, where present, has hue of 10YR or 2.5Y, value of 5 or 6 and 3 to 5 moist, and chroma of 2 or 3. Depth to the base of the Bw horizon is less than 10 inches. Texture is fine sandy loam or sandy loam. Reaction is slightly alkaline or moderately alkaline.

The Bk has hue of 10YR or 2.5Y, value of 5 to 7 and 3 to 6 moist, and chroma of 2 or 3. Texture is fine sandy loam, very fine sandy loam or sandy loam. Reaction is slightly or moderately alkaline.

The C horizon, when present, has hue of 10YR or 2.5Y, value of 5 to 7 and 4 to 6 moist, and chroma of 2 to 4. Texture is fine sandy loam, very fine sandy loam or sandy loam. Some pedons have thin layers of loamy fine sand. Reaction is slightly alkaline or moderately alkaline.

The Cr horizon has a paralithic contact to soft, calcareous sandstone. The sandstone has hue of 10YR or 2.5Y.

Range in Characteristics (according to field observations, lab analysis): Textures are much finer than those typical of this series.

Taxonomic Class - Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents

Suitability for Topsoil (According to WDEQ Guideline 1) – No marginal or unsuitable parameters were found for this profile. Estimated stripping depth is 38 inches.

Geographic Setting (According to Official Series Description) - Turnercrest soils are on hills, ridges, fan remnants and structural benches. They formed in eolian or alluvium deposits and sandy residuum. Slopes are 0 to 30 percent. Elevations are 3,200 to 6,500 feet. The average annual precipitation is 10 to 15 inches with over half falling as snow or rain in April, May, and June and less than one inch falling in each month of July, August, September, and October. The mean annual air temperature is 45 to 53 degrees F. The frost-free season is 105 to 130 days.

KISHONA
CLAY LOAM

Soil Mapping Unit "Ki"
Lab Sample ID: C08100869-087_091
BKS Sample ID: #165

Typical Pedon: Kishona sandy clay loam-in rangeland. (Colors are for dry soil unless otherwise stated.)

The Kishona series consists of very deep, well drained soils formed in alluvium on fan aprons, alluvial fans, fan remnants, hills, ridges and terraces. Permeability is moderate. Slopes range from 0 to 30 percent. The average annual precipitation is about 12 inches, and the mean annual temperature is about 46 degrees F.

A - 0 to 2 inches; brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; moderate medium and fine granular structure; soft, very friable, slightly sticky and nonplastic; common fine roots throughout; strongly effervescent; moderately alkaline (pH 7.9); clear smooth boundary. (1 to 6 inches thick)

Bk1 - 2 to 17 inches; very pale brown (10YR 7/3) clay loam, brown (10YR 5/3) moist; weak medium and coarse angular structure; hard, friable, slightly sticky and slightly plastic; few fine and very fine roots throughout; common fine masses of carbonates; violently effervescent; moderately alkaline (pH 7.9); gradual smooth boundary. (0 to 30 inches thick)

Bk2 - 17 to 27 inches; very pale brown (10YR 7/3) clay loam, brown (10YR 5/3) moist; weak medium and coarse angular structure; hard, friable, slightly sticky and slightly plastic; few fine and very fine roots throughout; common fine masses of carbonates; strongly effervescent; moderately alkaline (pH 8.4); gradual smooth boundary. (0 to 30 inches thick)

C - 27 to 36 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slight sticky and nonplastic; few very fine roots throughout; moderately effervescent; moderately alkaline (pH 8.4).

Cn - 36 to 60 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slight sticky and nonplastic; few very fine roots throughout; few small masses of sodium; slightly effervescent; moderately alkaline (pH 8.2).

Type Location - Niobrara County, Wyoming; refer to waypoint 165 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Rock fragments ranges from 0 to 15 percent. The mean annual soil temperature ranges from 48 to 53 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 190 to 202 days. The depth to carbonates ranges from 0 to 10 inches. Saline phases are recognized. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F and is never moist in some or all parts for as long as 90 consecutive days when the soil temperature at a depth of 20 inches is 48 degrees F or more. This soil is moist for 60 consecutive days when the soil temperature at a depth of 20 inches is 41 degrees F, which occurs April 21-27, but is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during that period.

The A horizon has hue of 2.5Y or 10YR, value of 4 to 6 dry, 3 to 5 moist, and chroma of 2 to 4. It is very fine sandy loam, fine sandy loam, loam, silt loam, silty clay loam or clay loam. It is neutral to moderately alkaline.

Some pedons have a thin, noncalcareous Bw horizon that has its base at a depth of less than 10 inches.

The Bk and C horizons have hue of 5Y, 2.5Y or 10YR, value of 5 to 7 dry, 4 or 5 moist, and chroma of 2 to 4. They are loam, clay loam or silty clay loam and have 20 to 35 percent clay, 20 to 55 percent silt, and 15 to 35 percent fine sand or coarser. Reaction ranges from moderately alkaline to very strongly alkaline. Carbonates in the Bk horizon range from 3 to 14 percent and occur as accumulations in small masses, streaks or seams that decrease with increasing depth, or they are disseminated throughout. The Bk horizon has an EC of 0 to 8 mmhos/cm.

Range in Characteristics (according to field observations, lab analysis): A natric horizon was found at the bottom of the profile, which is not typical for this series.

Taxonomic Class - Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents

Suitability for Topsoil (According to WDEQ Guideline 1) – No marginal or unsuitable parameters were found for this profile. Estimated stripping depth is 36 inches.

Geographic Setting (According to Official Series Description) - Kishona soils are on dissected alluvial fans, fan remnants, fan aprons, hills, ridges and terraces. Slopes are typically 0 to 6 percent but range up to 30 percent on dissected slopes. The soils formed in alluvium derived from sandstones and shales. Elevation is 3,500 to 6,700 feet. The average annual precipitation ranges from 10 to 14 inches with over one-half falling in April, May and June and less than one inch falling in each month of July, August, September, and October. The mean annual air temperature is about 45 degrees F but

ranges from 43 to 51 degrees F. The frost-free season is about 105 to 130 days.

DWYER
LOAMY SAND

Soil Mapping Unit "Dw"
Lab Sample ID: C08100869-092_095
BKS Sample ID: #166

Typical Pedon: Dwyer loamy sand-grassland. (Colors are for dry soil unless otherwise stated.)

The Dwyer series consists of very deep, excessively drained soils that formed in eolian sand. Dwyer soils are on dune-like forms frequently on or near the edges of alluvial terraces and have slopes of 0 to 25 percent. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 48 degrees F.

A - 0 to 2 inches; pale brown (10YR 6/3) loamy sand, dark grayish brown (10YR 4/2) moist; single grain; loose; noneffervescent; slightly alkaline (pH 7.6); gradual smooth boundary. (2 to 8 inches thick)

C1 - 2 to 7 inches; very pale brown (10YR 7/3) loamy sand, grayish brown (10YR 5/2) moist; single grain; loose; noneffervescent; slightly alkaline (pH 7.6).

C2 - 7 to 13 inches; very pale brown (10YR 7/3) sandy loam, grayish brown (10YR 5/2) moist; single grain; loose; moderately effervescent; moderately alkaline (pH 7.9).

Ck1 - 13 to 21 inches; very pale brown (10YR 7/3) sandy loam, grayish brown (10YR 5/2) moist; single grain; loose; strongly effervescent; moderately alkaline (pH 7.9).

Ck2 - 21 to 36 inches; very pale brown (10YR 7/3) very gravelly very fine sandy loam, grayish brown (10YR 5/2) moist; single grain; loose; violently effervescent; moderately alkaline (pH 8.2).

Ck3 - 36 to 48 inches; very pale brown (10YR 7/3) very gravelly loamy very fine sand, grayish brown (10YR 5/2) moist; single grain; loose; strongly effervescent; slightly alkaline (pH 7.8).

Cr - 48 inches; tan sandstone

Type Location - Goshen County, Wyoming; refer to waypoint 166 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) –

Typically, this soil is calcareous throughout but is leached in the upper part of the series control section in some pedons.
The control section is sand, loamy sand, fine sand, or loamy fine sand.
Coarse fragments range from 0 to 15 percent but are commonly less than 3 percent. These soils may have a weak and inconsistent accumulation of secondary calcium carbonate at any depth but are not considered to have a continuous Bk horizon.
The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F and is never moist in some or all parts for as long as 60 consecutive days when the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, but is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 53 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days. Bedrock is deeper than 60 inches.

A horizon :
Hue: 2.5Y or 10YR
Value: 5 through 7 dry, 3 through 5 moist
Chroma: 2 or 3
Texture: Fine sand, loamy fine sand or loamy sand
Clay content: 2-10 percent
Sand content: greater than 80 percent
Reaction: mildly alkaline through strongly alkaline but is slightly acid or neutral in some pedons

AC horizon:
Texture: loamy fine sand or fine sand is in some pedon.

C horizon
Hue: 2.5Y through 7.5YR
Value: 5 through 7 dry, 3 through 5 moist
Chroma:2 through 4
Texture: Fine sand or loamy fine sand
Clay content: 2-10 percent
Sand content: greater than 80 percent
Reaction: moderately alkaline or strongly alkaline and may contain few small carbonate concretions or seams of calcium carbonate erratically at any depth

Range in Characteristics (according to field observations, lab analysis): Multiple calcic horizons were found towards the bottom of this profile, which is not typical of this series.

Taxonomic Class - Mixed, mesic Ustic Torripsamments

Suitability for Topsoil (According to WDEQ Guideline 1) – Saturation percentage was marginal from 0-7 inches and 21-48 inches. Estimated stripping depth is 48 inches.

Geographic Setting (According to Official Series Description) –
Landscape: terraces and rolling uplands
Landform: hill slopes and dune-like forms frequently on or near the edges of alluvial terraces
Slopes: irregular, ranging from 0 to 25 percent
Elevation: 3,500 to 5,600 feet
Parent material: eolian sand
Average annual precipitation: 14 inches with about half of the precipitation occurring in April, May, and June
Mean annual precipitation: 10 to 16 inches
Mean annual temperature: 48 degrees F, and the mean summer temperature is 68 degrees F
Frost-free season: 110 to 130 day.

CLARKELEN
NONCALCAREOUS VARIANT

Soil Mapping Unit "ClNC"
Lab Sample ID: C08100869-096_100
BKS Sample ID: #168

Typical Pedon: Clarkelen loam-utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Clarkelen series consists of very deep, well, moderately well or somewhat excessively drained soils formed in stratified recent stream alluvium from mixed sedimentary sources. Clarkelen soils are on flood plains and terraces. Slopes range from 0 to 6 percent. The average annual precipitation is about 12 inches, and the mean annual air temperature is about 46 degrees F.

A - 0 to 4 inch; grayish brown (10YR 5/2) loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, very friable; nonsticky and nonplastic; common fine and very fine, and few medium roots throughout; noneffervescent; slightly acid (pH 6.2); gradual smooth boundary. (1 to 6 inches thick)

AC - 4 to 9 inch; grayish brown (10YR 5/2) loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, very friable; nonsticky and nonplastic; common fine and very fine, and few medium roots throughout; noneffervescent; slightly acid (pH 6.2); gradual smooth boundary.

C1 - 9 to 29 inches; light brownish gray (10YR 6/2) weakly stratified loam, dark grayish brown (10YR 4/2) moist; massive; thin stratifications; soft, very friable, nonsticky and nonplastic; common fine and very fine, and few medium roots throughout; noneffervescent; neutral (pH 6.6); abrupt wavy boundary.

C2 - 29 to 41 inches; light brownish gray (10YR 6/2) and pale brown (10YR 6/3) stratified loam, grayish brown (10YR 5/2) moist; massive; thin stratifications; slight hard, friable, nonsticky and nonplastic; few fine and very fine roots; noneffervescent; neutral (pH 6.9); abrupt wavy boundary.

C3 - 41 to 51 inches; light brownish gray (10YR 6/2) sandy loam to sandy clay loam, grayish brown (10YR 5/2) moist; single grain; loose, nonsticky and nonplastic; few fine roots; noneffervescent; neutral (pH 7.0); abrupt smooth boundary.

C4 - 51 to 60 inches; grayish brown (10YR 5/2) sandy loam, dark grayish brown (10YR 4/2) moist; massive; thin stratifications; slightly hard, friable, nonsticky and nonplastic; few fine roots; noneffervescent; neutral (pH 7.0).

Type Location - Niobrara County, Wyoming; refer to waypoint 168 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) – This soil typically lacks horizons of continuous carbonate accumulation. Depth to carbonates ranges from 0 to 8 inches. Rock fragments are typically less than 5 percent but may range to 15 percent. Organic matter content decreases irregularly with depth; and thin, highly variable textural strata usually occur between 6 and 24 inches. The particle-size control section contains from 5 to 18 percent clay and is sandy loam, fine sandy loam or loam when averaged. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F and is never moist in all parts for as long as 60 consecutive days when the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, but is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 52 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 7 dry and 3 to 6 moist, and chroma of 2 to 4. Texture typically is sandy loam or fine sandy loam but may range from loamy sand to clay loam depending upon the most recent deposition. Reaction ranges from neutral to moderately alkaline. It has an EC of 0 to 4 mmhos/cm. Nitrogen and phosphorus levels are not abnormally enriched. Some pedons have an AC horizon up to 8 inches thick.

The C horizon has hue of 7.5YR, 10YR or 2.5Y, value of 5 to 7 dry and 4 to 6 moist, and chroma of 2 to 4. Texture centers on sandy loam, fine sandy loam or loam, but strata of very fine sandy loam, loam, silt loam, loamy fine sand, loamy sand, fine sand or sand of varying thickness occur. Skeletal material may occur below 40 inches in some pedons. Reaction ranges from slightly alkaline to strongly alkaline. EC is typically 4 mmhos/cm or less but may range up to 8 when irrigated or where it receives saline discharge from surrounding shale beds.

Range in Characteristics (according to field observations, lab analysis): The pH is acidic rather than neutral or alkaline for the A and AC horizons and neutral instead of alkaline for the C horizons.

Taxonomic Class - Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torrifluvents

Suitability for Topsoil (According to WDEQ Guideline 1) – No marginal or unsuitable parameters were found for this profile. Estimated stripping depth is 60 inches.

Geographic Setting (According to Official Series Description) – Clarkelen soils are on flood plains and terraces adjacent to floodplains. Slopes are 0 to 6 percent. The soils formed in stratified but dominantly moderately coarse textured recent stream alluvium originally weathered from sedimentary rock. Elevation is 3,500 to 6,200 feet. The average annual precipitation is 12 inches with over half falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. Precipitation ranges from 10 to 14 inches. The mean annual air temperature ranges from 44 to 49 degrees F. The frost-free season is about 105 to 130 days.

CAMBRIA
SANDY CLAY LOAM

Soil Mapping Unit "Ca"
Lab Sample ID: C08100869-101_104
BKS Sample ID: #170

Typical Pedon: Cambria sandy clay loam on rangeland. (Colors are for dry soil unless otherwise stated.)

The Cambria series consists of very deep, well drained, moderately permeable soils that formed in alluvium and slope alluvium on fan remnants, alluvial fans, fan piedmonts, terraces, ridges and hills. Slopes range from 0 to 15 percent and are usually simple but may be complex where the area has been dissected by ephemeral streams. The mean annual precipitation is about 12 inches, and the mean annual air temperature is about 45 degrees F.

A - 0 to 2 inches; brown (10YR 5/3) extremely gravelly sandy clay loam, dark brown (10YR 3/3) moist; weak thin platy structure; soft, very friable, slightly sticky and slightly plastic; common fine and very fine roots; noneffervescent; neutral (pH 6.9); clear smooth boundary. (2 to 5 inches thick)

Bt - 2 to 9 inches; brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, moderately sticky and moderately plastic; common distinct dark brown (10YR 3/3) clay films on faces of peds; noneffervescent; neutral (pH 6.9); clear wavy boundary. (5 to 8 inches thick)

Bk - 9 to 29 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; soft, very friable, slightly sticky and slightly plastic; strongly effervescent; common fine irregular light gray (10YR 7/2) carbonate threads throughout; slightly alkaline (pH 7.8); gradual wavy boundary.

C - 29 to 40 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; moderately effervescent; moderately alkaline (pH 8.1).

Cn - 40 to 60 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; slightly effervescent; scattered small sodium masses throughout; moderately alkaline (pH 7.9).

Type Location - Campbell County, Wyoming; refer to waypoint 170 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) –
Soil moisture: The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, and is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 48 to 52 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days.
Depth to the base of the argillic horizon: 10 inches or less
Depth to secondary calcium carbonate: 3 to 10 inches but ranges to 15 inches in some pedons
Particle-size control section: It is loam, clay loam, silty clay loam or sandy clay loam. The part below the argillic horizon averages 18 to 35 percent clay, 10 to 50 percent silt, and 20 to 70 percent sand with more than 15 but less than 52 percent coarser than very fine sand.

A horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 2 to 4 dry or moist
Texture: fine sandy loam, sandy loam, loam, very fine sandy loam or silt loam
Reaction: typically neutral or slightly alkaline but may be moderately alkaline in some pedons

Some pedons have an AB horizon up to 4 inches thick.

Bt horizon:
Hue: 7.5YR, 10YR or 2.5Y
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 2 to 4 dry or moist
Texture: loam, clay loam, silty clay loam or sandy clay loam
Reaction: neutral to moderately alkaline

A thin Btk horizon may be present above the Bk horizon in some pedons and have properties of both the Bt and Bk.

Bk horizon:
Hue: 10YR or 2.5Y
Value: 5 to 8 dry, 4 to 6 moist
Chroma: 2 to 4 dry or moist
Texture: typically loam or clay loam but some subhorizons have sandy loam, fine sandy

loam, very fine sandy loam, silt loam, silty clay loam or sandy clay loam strata
Calcium carbonate equivalent: averages less than 15 percent, but discontinuous strata may exceed 15 percent in some pedons
Reaction: moderately or strongly alkaline with less than 15 percent ESP

Some pedons have a C horizon

Range in Characteristics (according to field observations, lab analysis): A natric horizon was identified for this profile, which is not typical of this series. The A horizon has a finer texture than what is typical.

Taxonomic Class - Fine-loamy, mixed, superactive, mesic Ustic Haplargids

Suitability for Topsoil (According to WDEQ Guideline 1) – No marginal or unsuitable parameter were found for this profile. Estimated stripping depth is 9 inches.

Geographic Setting (According to Official Series Description) –
Parent material: alluvium and slope alluvium from mixed sources
Landform: fan remnants, fan piedmonts, alluvial fans, hills, ridges and terraces
Slopes: 0 to 15 percent
Elevations: 3,500 to 6,500 feet
Average annual precipitation: 10 to 14 inches with over one-half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October
Mean annual air temperature: 43 to 51 degrees F
Frost-free season: 105 to 130 days

SHINGLE
CLAY LOAM

Soil Mapping Unit "Sh"
Lab Sample ID: C08100869-105
BKS Sample ID: #171

Typical Pedon: Shingle clay loam-rangeland. (Colors are for dry soil unless otherwise stated.)

The Shingle series consists of well drained soils that are very shallow or shallow to bedrock. They formed in residuum and colluvium derived from interbedded shale and sandstone or in alluvium from mudstone. Shingle soils are on bedrock controlled hillslopes and ridges. Slopes are 0 to 80 percent. The mean annual precipitation is about 13 inches, and the mean annual temperature is 45 degrees F.

A - 0 to 3 inches; light brownish gray (10YR 6/2) clay loam, dark grayish brown (10YR 4/2) moist; moderate very fine granular structure; soft, very friable, moderately sticky and moderately plastic; noneffervescent; slightly alkaline (pH 7.6); clear smooth boundary. (1 to 6 inches thick)

Ck - 3 to 7 inches; light yellowish brown (2.5Y 6/3) heavy clay loam, light olive brown (2.5Y 5/3) moist; massive; hard, variable, moderately sticky and moderately plastic; strongly effervescent, lime disseminated; slightly alkaline (pH 7.6); clear wavy boundary. (4 to 15 inches thick)

Cr - 7 inches; soft, strongly calcareous shale interbedded with lenses of soft sandstone

Type Location - Goshen County, Wyoming; refer to waypoint 171 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to soft bedrock and paralithic contact ranges from 4 to 20 inches. The mean annual soil temperature is 47 to 53 degrees F. The soils commonly are calcareous throughout, but some pedons are leached to 6 inches. The particle size control section averages 20 to 35 percent clay and has more than 15 percent but less than 35 percent fine or coarser sand. The soil is usually dry. The moisture control section is usually moist in April, May and early June. It is dry for 60 consecutive days or more during the 90 day period following the summer solstice. EC is 0 to 2 mmhos throughout.

The A horizon has hue of 5Y through 7.5YR, value of 5 through 7 dry, 3 through 6 moist, and chroma of 1 through 6. Reaction is neutral through strongly alkaline. Some pedons have a light gravel lag on the surface. Texture is loam, silt loam, clay loam, silty clay

loam, cobbly loam, and gravelly clay loam. Rock fragments or shale channers range from 0 to 35 percent.

A Bw or AC horizon, when present, has the combined properties of the A and C horizons.
The C horizon has hue of 5Y through 7.5YR, value of 4 through 7 dry, 3 through 6 moist, and chroma of 1 through 6. It is loam, silt loam, clay loam or silty clay loam. Rock fragments or shale channers range from 0 to 35 percent. Reaction is slightly alkaline through strongly alkaline.

Range in Characteristics (according to field observations, lab analysis): There is a calcic horizon found at the bottom of the profile, which is not typical for this series.

Taxonomic Class - Loamy, mixed, superactive, calcareous, mesic, shallow Ustic Torriorthents

Suitability for Topsoil (According to WDEQ Guideline 1) – No marginal or unsuitable parameters were found for this profile. The estimated stripping depth is 7 inches.

Geographic Setting (According to Official Series Description) - The Shingle soils occur on all hillslope positions. Slopes are 0 to 80 percent. These soils formed in colluvium and residuum weathered from soft, interbedded sandstone and shale or in alluvium from mudstone. Elevation is 3,200 to 6,500 feet. The mean annual precipitation is about 10 to 14 inches, most of which falls in April, May, and June. The mean annual temperature is about 45 degrees F but ranges from 43 to 51 degrees F. The frost-free season is about 105 to 130 days.

EMBRY
MODERATELY DEEP VARIANT

Soil Mapping Unit "EmMV"
Lab Sample ID: C08100869-106_108
BKS Sample ID: #172

Typical Pedon: Embry sandy clay loam-utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The soils of the Embry series are very deep, well-drained soils formed in alluvium and eolian deposits derived from sandstone. They are on hills, dunes, terraces and alluvial fans. Slopes are 0 to 20 percent. The mean annual precipitation is about 12 inches and the mean annual air temperature is about 46 degrees F.

A - 0 to 4 inches; light brownish gray (10YR 6/2) fine sandy clay loam, dark grayish brown (10YR 4/2) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; noneffervescent; neutral (pH 7.1); clear smooth boundary. (4 to 16 inches thick)

AC - 4 to 12 inches; light brownish gray (10YR 6/2) fine sandy clay loam, dark grayish brown (10YR 4/2) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; noneffervescent; neutral (pH 7.1); clear smooth boundary.

C1 - 12 to 19 inches; light brownish gray (10YR 6/2) sandy loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few fine vesicular pores; noneffervescent; slightly alkaline (pH 7.5); gradual wavy boundary.

C2 - 19 to 29 inches; pale brown (10YR 6/3) coarse sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; noneffervescent; slightly alkaline (pH 7.6).

Cr - 29 inches; strongly calcareous mixed gley shale.

Type Location - Johnson County, Wyoming; refer to waypoint 172 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - These soils are typically noncalcareous throughout, however some pedons may effervesce below a depth of 40 inches. Rock fragments range from 0 to 15 percent but are typically less than 5 percent and are mainly gravel size sandstone fragments. The control section is typically sandy loam but clay ranges from 5 to 18 percent, silt from 5 to 40 percent, and sand from 50 to 83 percent with more than 35 percent fine sand or coarser. The moisture control

section is dry for 60 consecutive days and 90 cumulative days between July 15 and October 25. The mean annual soil temperature ranges from 47 degrees to 53 degrees F.

The A horizon has hue of 2.5Y to 7.5YR, value of 5 or 6 dry and 4 or 5 moist, and chroma of 1 to 4. This horizon is slightly acid to slightly alkaline.

The C horizon has hue of 2.5Y to 7.5YR, value of 5 to 7 dry and 4 to 6 moist, and chroma of 2 to 4. It is sandy loam or fine sandy loam. It is slightly acid to moderately alkaline.

Range in Characteristics (according to field observations, lab analysis): This profile is moderately deep to paralithic material, rather than deep.

Taxonomic Class - Coarse-loamy, mixed, superactive, nonacid, mesic Ustic Torriorthents

Suitability for Topsoil (According to WDEQ Guideline 1) – Saturation percentage was marginal at 0-19 inches. Estimated stripping depth is 19 inches.

Geographic Setting (According to Official Series Description) - Embry soils are on alluvial fans, hills, dunes and terraces. Slopes are 0 to 20 percent. Elevation is 4200 to 6000 feet. These soils formed in alluvium and eolian deposits derived from noncalcareous sandstone. Annual precipitation ranges from 10 to 15 inches most of which falls as rain or snow in April, May, and June. The mean annual air temperature is 45 to 50 degrees F. The frost-free period is 110 to 130 days.

KEELINE
SANDY CLAY LOAM

Soil Mapping Unit "Ke"
Lab Sample ID: C08100869-109_113
BKS Sample ID: #173

Typical Pedon: Keeline sandy clay loam-on east facing shoulder slope of 4 percent; utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Keeline series consists of very deep, well or somewhat excessively drained soils formed in alluvium or eolian deposits derived from sandstone. Keeline soils are on upland ridgetops, hillslopes, terraces, benches, alluvial fans, and fan remnants. Slopes range from 0 to 40 percent. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 46 degrees F.

A - 0 to 2 inches; yellowish brown (10YR 5/4) sandy clay loam, brown (10YR 4/3) moist; weak fine subangular blocky and granular structure; soft, very friable, nonsticky and nonplastic; strongly effervescent; calcium carbonate disseminated; slightly alkaline (pH 7.6); abrupt smooth boundary. (2 to 8 inches thick)

Ck1 - 2 to 15 inches; very pale brown (10YR 7/3) sandy clay loam, light yellowish brown (10YR 6/4) moist; massive; soft, very friable, nonsticky and nonplastic; strongly effervescent; calcium carbonate disseminated; slightly alkaline (pH 7.6); gradual smooth boundary. (8 to 50 inches thick)

Ck2 - 15 to 31 inches; very pale brown (10YR 7/3) sandy clay loam, pale brown (10YR 6/3) moist; massive; soft, very friable, nonsticky and nonplastic; moderately effervescent; calcium carbonate disseminated; moderately alkaline (pH 8.0); gradual smooth boundary. (0 to 25 inches thick)

C1 - 31 to 37 inches; very pale brown (10YR 7/3) sandy loam to sandy clay loam, light yellowish brown (10YR 6/4) moist; massive; soft, very friable, nonsticky and nonplastic; slightly effervescent; moderately alkaline (pH 7.9).

C2 - 37 to 55 inches; very pale brown (10YR 7/3) coarse sandy loam, light yellowish brown (10YR 6/4) moist; massive; soft, very friable, nonsticky and nonplastic; noneffervescent; slightly alkaline (pH 7.8).

C3 - 55 to 60 inches; very pale brown (10YR 7/3) loam, light yellowish brown (10YR 6/4) moist; massive; soft, very friable, nonsticky and nonplastic; noneffervescent; neutral (pH 7.2).

Type Location - Converse County, Wyoming; refer to waypoint 173 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Free carbonates typically occur throughout the profile, but some pedons may be leached as much as 6 inches. The control section averages fine sandy loam or sandy loam with 5 to 18 percent clay. Rock fragments range from 0 to 15 percent. Some thin strata of coarser material may occur. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, and is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 52 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days. EC ranges from 0 to 4 mmhos throughout the profile. Bedrock is deeper than 60 inches.

The A horizon has hue of 7.5YR through 2.5Y, value of 5 through 7 dry, 4 or 5 moist, and chroma of 2 through 4. It is sandy loam and less commonly loamy sand, fine sandy loam, or loamy fine sand. Reaction is neutral to moderately alkaline.

The Bw horizon, when present, has the same properties of the A except for structure which is usually weak subangular blocky.

Some pedons have an AC horizon.

The C horizon has hue of 7.5YR through 5Y, value of 4 through 7 dry, 4 through 6 moist, and chroma of 2 through 4. Texture averages sandy loam or fine sandy loam. Some pedons have subhorizons of very fine sandy loam or loamy fine sand. Reaction is moderately or strongly alkaline and some pedons have weak, discontinuous accumulations of calcium carbonate.

Range in Characteristics (according to field observations, lab analysis): Two calcic horizons were identified for this profile, which is not typical of this series. Slightly finer textures were found from 0 to 37 inches in this profile.

Taxonomic Class - Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents

Suitability for Topsoil (According to WDEQ Guideline 1) – No marginal or unsuitable parameters were found for this profile. Estimated stripping depth is 60 inches.

Geographic Setting (According to Official Series Description) - Keeline soils are on terraces, benches, alluvial fans, fan remnants, ridgetop and hillslope positions. Slopes are 0 to 40 percent. These soils formed in moderately coarse alluvium or eolian deposits

derived from calcareous sandstone. Elevations are 3,500 to 6,200 feet. The average annual precipitation is 12 inches with over one-half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. Precipitation ranges from 10 to 15 inches. The mean annual temperature is about 46 degrees F but ranges from 44 to 49 degrees F. The frost-free season is about 105 to 130 days.

BAHL
CLAY LOAM

Soil Mapping Unit "Ba"
Lab Sample ID: C08100869-114_118
BKS Sample ID: #174

Typical Pedon: Bahl clay loam-on north-facing terrace with slope of 3 percent; utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Bahl series consists of very deep, well drained soils formed on alluvial fans, fan aprons, hillslopes, and terraces in alluvium from clay shales. Slopes range from 0 to 20 percent. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 46 degrees F.

A - 0 to 3 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; weak angular blocky structure; very hard, very firm, very sticky and plastic; common fine and medium roots; noneffervescent; neutral (pH 7.1); clear wavy boundary. (3 to 6 inches thick)

AB - 3 to 10 inches; light brownish gray (2.5Y 6/2) clay, grayish brown (2.5Y 5/2) moist; weak angular blocky structure; very hard, very firm, very sticky and plastic; common fine and medium roots; moderately effervescent; slightly alkaline (pH 7.5); clear wavy boundary.

Bk - 10 to 20 inches; light brownish gray (2.5Y 6/2) clay, grayish brown (2.5Y 5/2) moist; weak angular blocky structure; very hard, very firm, very sticky and plastic; few fine and medium roots; strongly effervescent, calcium carbonate is disseminated; slightly alkaline (pH 7.8); gradual wavy boundary (4 to 15 inches thick).

Cn1 - 20 to 36 inches; light brownish gray (2.5Y 6/2) clay, grayish brown (2.5Y 5/2) moist; massive; very hard, very firm, very sticky and plastic; few fine roots; noneffervescent, sodium is disseminated; slightly alkaline (pH 7.6).

Cn2 - 36 to 48 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; massive; very hard, very firm, very sticky and plastic; few fine roots; noneffervescent, sodium is disseminated; slightly alkaline (pH 7.6).

Type Location - Weston County, Wyoming; refer to waypoint 132 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - The soil is usually calcareous throughout but is noncalcareous in the upper few inches of some

pedons. The particle size control section is clay or clay loam with 35 to 55 percent clay. Deep, wide cracks are present and are open for 6 to 8 months. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F and is never moist in some or all parts for as long as 60 consecutive days when the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, but is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 51 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days.

The A horizon has hue of 10YR through 5Y, value of 5 through 7 dry, 3 through 5 moist, and chroma of 2 or 3. Texture is clay loam or clay, and clay ranges form 30 to 45 percent. EC ranges from 0 to 2 mmhos. Reaction is neutral through moderately alkaline.

The AC horizon, has the same ranges as allowed for the combined ranges of the A and C horizons. A Bw may be present in some pedons but does not meet the criteria for a cambic horizon.

Some pedons have a Bk horizon, that is not a calcic horizon, with properties similar to the C horizon. Pedons with Bk horizons may have an AB horizon with properties similar to the A and Bk horizons.

The C horizon has hue of 10YR through 5Y, value of 5 through 7 dry, 4 through 6 moist, and chroma of 2 through 4. Texture is typically clay but may be clay loam, and clay ranges from 35 to 55 percent. EC ranges from 2 to 4 mmhos. Reaction is slightly alkaline through strongly alkaline.

Range in Characteristics (according to field observations, lab analysis): Two natric C horizons were found in this profile, in place of one normal C horizon.

Taxonomic Class - Fine, smectitic, calcareous, mesic Ustertic Torriorthents

Suitability for Topsoil (According to WDEQ Guideline 1) – Marginal texture (clay) was found from 3-36 inches. Selenium levels were marginal from 36-48 inches. Estimated stripping depth is 10 inches.

Geographic Setting (According to Official Series Description) - Bahl soils are on alluvial fans, fan aprons, hillslopes, and terraces. Slopes are simple and range from 0 to 20 percent. The soils formed in alluvium from clay shales. Elevation is 3,500 to 5,000 feet. The average annual precipitation is 10 to 17 inches of which about half falls in April, May, and June. The average annual temperature is 43 to 51 degrees F. The frost-free season is about 110 to 130 days.

HILAND
NONCALCAREOUS VARIANT

Soil Mapping Unit "HiNC"
Lab Sample ID: C08100869-119_123
BKS Sample ID: #175

Typical Pedon: Hiland sand-on northeast facing slope of 3 percent; utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Hiland series consists of very deep, well drained soils formed in alluvium or eolian deposits on relict surfaces consisting of terraces, fans, fan remnants pediments, ridges, hills and stabilized dunes. Permeability is moderate. Slopes range from 0 to 20 percent. The average annual precipitation is about 12 inches, and the mean annual air temperature is about 45 degrees F.

A - 0 to 4 inches; brown (10YR 5/3) sand, brown (10YR 4/3) moist; weak medium granular structure parting to weak fine granular; slightly hard, friable, nonsticky and nonplastic; many very fine and common fine roots; noneffervescent; neutral (pH 6.7); abrupt smooth boundary. (2 to 5 inches thick)

Bt1 - 4 to 17 inches; brown (7.5YR 5/4) sandy clay loam, brown (7.5YR 4/4) moist; strong medium prismatic structure parting to strong fine and medium angular blocky; hard, friable, moderately sticky and moderately plastic; many very fine roots in a mat at the top of the horizon and common very fine roots between peds; many fine pores; many prominent continuous dark brown (7.5YR 3/3) clay films on faces of peds; noneffervescent; neutral (pH 6.9); clear wavy boundary.

Bt2 - 17 to 33 inches; yellowish brown (10YR 5/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; strong medium prismatic structure parting to moderate medium subangular blocky; hard, firm, moderately sticky and moderately plastic; common very fine roots between peds; many fine pores; common prominent continuous dark brown (10YR 3/3) clay films on faces of peds and occur as fillings in root channels and pipes; noneffervescent; neutral (pH 7.3); gradual wavy boundary.

C1 - 33 to 41 inches; light yellowish brown (2.5Y 6/3) sandy loam to sandy clay loam, light olive brown (2.5Y 5/3) moist; weak coarse prismatic structure parting to moderate medium and coarse subangular blocky; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; many fine pores; noneffervescent; slightly alkaline (pH 7.7); gradual smooth boundary.

C2 - 41 to 48 inches; light yellowish brown (2.5Y 6/3) sandy clay loam, light olive brown (2.5Y 5/3) moist; common fine and medium distinct yellowish brown (10YR 5/6) and

common fine light brownish gray (10YR 6/2) relic redoximorphic features; weak coarse prismatic structure parting to moderate medium and coarse subangular blocky; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; many fine pores; noneffervescent; moderately alkaline (pH 8.0); gradual smooth boundary.

Type Location - Converse County, Wyoming; refer to waypoint 133 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Gravel ranges from 0 to 15 percent in the solum and from 0 to 30 percent in the 2C or Bk horizons. The base of the Bt or Btk ranges from 15 to 35 inches. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F and is never moist in all parts for as long as 60 consecutive days when the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, but is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 52 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days. EC ranges from 0 to 2 mmhos from the surface to the base of the Bt and from 1 to 4 mmhos below the base of the Bt. Bedrock is deeper than 60 inches.

The A horizon has hue of 10YR, value of 4 to 6 dry and 3 to 5 moist, and chroma of 2 to 4. It is sandy loam, fine sandy loam, very fine sandy loam, sandy clay loam or loamy sand. Vesicular crust occurs on some pedons. This horizon is neutral to moderately alkaline.

The E horizon has hue of 10YR, value of 4 to 6 and 3 to 5 moist, and chroma of 2 to 4. It is fine sandy loam, very fine sandy loam, sandy loam, sandy clay loam or loamy sand. It is neutral or slightly alkaline.

The Bt horizon has hue of 2.5Y to 7.5YR, value of 4 to 6 dry and 3 to 5 moist, and chroma of 2 to 4. It has a weighted clay content of 20 to 35 percent and is sandy clay loam; however, parts of this horizon may be sandy loam. This horizon is typically noncalcareous. Reaction is neutral to moderately alkaline.

If a Btk horizon is present, it has the same ranges as defined for the Bt except that it is replugged with carbonate and reaction ranges from moderately to strongly alkaline.

The Bk horizon has hue of 2.5Y or 10YR, value of 5 to 7 dry and 4 to 7 moist, and chroma of 2 to 4. It is sandy loam, loamy sand, fine sandy loam or sandy clay loam; or, when other textures occur, the horizon average must be sandy loam, loamy sand or fine sandy loam. It is not a calcic horizon. It does not have 5 percent more calcium carbonate equivalent than the underlying horizon or has less than 5 percent secondary carbonates. It

is moderately or strongly alkaline. Exchangeable sodium is less than 15 percent even though field tests indicate strongly alkaline reactions.

Some pedons have a 2Bk, 2C or C horizon. The 2C and 2Bk horizons may contain more rock fragments. Contrasting textures of sand may occur below 40 inches. It is calcareous but typically has less than 5 percent calcium carbonate equivalent.
Range in Characteristics (according to field observations, lab analysis): Profile is noncalcareous throughout. There was no E horizon identified in this profile. Two C horizons were found in place of the calcic B horizon at the bottom of the profile. The A horizon is sandier than what is typical of this series.

Taxonomic Class - Fine-loamy, mixed, superactive, mesic Ustic Haplargids

Suitability for Topsoil (According to WDEQ Guideline 1) – Marginal texture (sand) was found from 0-4 inches. Saturation percentage was marginal from 0-4 inches. Estimated stripping depth is 41 inches.

Geographic Setting (According to Official Series Description) - Hiland soils are on relict surfaces consisting of terraces, fan remnants, pediments, fans, ridges, hills and stabilized dunes. Slopes are 0 to 20 percent. They formed in moderately coarse alluvium and eolian material derived predominantly from sandstone. Elevations are 3,500 to 6,300 feet. The average annual precipitation is about 12 inches with over half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. Precipitation ranges from 10 to 14 inches. The mean annual air temperature is 43 to 51 degrees F. The frost-free season is 105 to 130 days.

WORF
NONCALCAREOUS VARIANT

Soil Mapping Unit "WoNC"
Lab Sample ID: C08100869-124_125
BKS Sample ID: #177

Typical Pedon: Worf sandy loam to sandy clay loam- rangeland. (Colors are for dry soil unless otherwise stated.)

The Worf series consists of well drained soils that are very shallow or shallow to bedrock. They formed in residuum and colluvial slopewash weathered from sedimentary rock. Worf soils are on upland hills and ridges and have slopes of 0 to 30 percent. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 45 degrees F.

A - 0 to 2 inches; grayish brown (10YR 5/2) sandy loam to sandy clay loam, dark grayish brown (10YR 4/2) moist; strong very fine granular structure; soft, very friable, slightly sticky and slightly plastic; many fine and very fine roots; noneffervescent; neutral (pH 7.0); clear smooth boundary. (2 to 4 inches thick)

Bt - 2 to 15 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; moderate fine prismatic structure parting to moderate fine subangular blocky; hard, very friable, moderately sticky and moderately plastic; many fine roots; many distinct clay films on faces of peds, common faint clay films in root channels and pores; noneffervescent; neutral (pH 6.8); clear wavy boundary. (4 to 13 inches thick)

Cr - 15 inches; noncalcareous sandstone interbedded with loamstone.

Type Location - Johnson County, Wyoming; refer to waypoint 21 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to bedrock ranges from 8 to 20 inches. The soil is 90 to 100 percent base saturated. Rock fragments range from 0 to 15 percent but are typically less than 5 percent and are mostly soft shale fragments. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, and is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 53 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days.

The A horizon has hue of 2.5Y or 10YR, value of 5 or 6 dry, 3 or 4 moist, and chroma of

2 or 3. Texture is loamy sand, loam, or fine sandy loam. Reaction is neutral or slightly alkaline.

The Bt horizon has hue of 2.5Y through 7.5YR, value of 5 or 6 dry, 4 or 5 moist, and chroma of 2 through 4. It is typically light clay loam but may be loam or sandy clay loam with clay ranging from 18 to 35 percent, silt from 20 to 55 percent, and sand from 15 to 50 percent with 15 to 35 percent being fine sand or coarser. Reaction is neutral to moderately alkaline.

The Bk or Btk horizon has hue of 5Y through 10YR, value of 5 through 7 dry, 4 through 6 moist, and chroma of 2 through 4. Calcium carbonate equivalent is 3 to 12 percent. Texture is loam or fine sandy loam in the Bk and clay loam or sandy clay loam in the Btk. Reaction is slightly alkaline through strongly alkaline.

Range in Characteristics (according to field observations, lab analysis): This profile is noncalcareous throughout. No calcic horizon was found for this profile, which is not typical of this series.

Taxonomic Class - Loamy, mixed, superactive, mesic, shallow Ustic Haplargids

Suitability for Topsoil (According to WDEQ Guideline 1) – No marginal or unsuitable parameters were found for this profile. Estimated stripping depth is 12 inches.

Geographic Setting (According to Official Series Description) - These soils are on upland hills and ridges. Slopes range from 0 to 30 percent and are both simple and complex. Elevation is 3,500 to 5,600 feet. These soils formed in noncalcareous materials weathered from sedimentary bedrock. The mean annual precipitation is 12 inches with over half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. Precipitation ranges from 10 to 17 inches. The mean annual temperature is 43 to 51 degrees F. The frost-free season is about 105 to 130 days.

DRAKNAB
SANDY LOAM

Soil Mapping Unit "Dr"
Lab Sample ID: C08100869-126_131
BKS Sample ID: #178

Typical Pedon: Draknab sandy loam-on an east facing, very gentle sloping flood plain; utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Draknab series consists of very deep, moderately well, well or excessively drained soils formed in stratified recent stream alluvium. Draknab soils are on flood plains and on adjacent low terrace positions. Slopes range from 0 to 6 percent. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 46 degrees F.

A - 0 to 2 inches; yellowish brown (10YR 5/4) sandy loam, brown (10YR 4/3) moist; weak medium and fine granular structure; soft, very friable, nonsticky and nonplastic; noneffervescent; neutral (pH 6.8); abrupt smooth boundary. (2 to 6 inches thick)

AC - 2 to 12 inches; yellowish brown (10YR 5/4) sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure parting to weak medium granular; soft, very friable, nonsticky and nonplastic; noneffervescent; neutral (pH 7.2); clear wavy boundary. (0 to 10 inches thick)

C1 - 12 to 18 inches; very pale brown (10YR 7/3) sandy loam, yellowish brown (10YR 5/4) moist; single grain; loose, nonsticky and nonplastic; noneffervescent; neutral (pH 7.2); clear wavy boundary. (6 to 15 inches thick)

C2 - 18 to 29 inches; pale brown, coarse sandy clay loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; noneffervescent; slightly alkaline (pH 7.7); gradual smooth boundary. (0 to 24 inches thick)

C3 - 29 to 35 inches; very pale brown (10YR 7/3), stratified sandy loam, pale brown (10YR 6/3) moist; single grain; loose, nonsticky and nonplastic; noneffervescent; neutral (pH 7.0).

C4 - 35 to 60 inches; very pale brown (10YR 7/3), stratified sandy loam, pale brown (10YR 6/3) moist; single grain; loose, nonsticky and nonplastic; moderately effervescent; moderately alkaline (pH 8.0).

Type Location - Converse County, Wyoming; refer to waypoint 40 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Carbonates occur throughout the profile, but the surface to depths of 10 inches may be free of carbonates, depending upon the source material of the most recent deposition. Organic matter content decreases irregularly with depth. Thin, highly variable textural strata usually occur between depths of 10 and 30 inches. Rock fragments are gravel size and typically are less than 5 percent throughout the profile, but may range to 15 percent. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F and is never moist in some or all parts for as long as 60 consecutive days when the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, but is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 52 degrees F and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days. EC ranges from 0 to 4 mmhos/cm throughout the soil.

The A horizon has hue of 2.5Y, 10YR or 7.5YR, value of 5 to 7 and 3 to 6 moist, and chroma of 2 to 4. Texture is loamy sand, sandy loam, loamy fine sand, fine sandy loam, very fine sandy loam or loam. Reaction is neutral to moderately alkaline.

The C horizon has hue of 2.5Y, 10YR or 7.5YR, value of 5 to 7 and 4 to 7 moist, and chroma of 2 to 4. Texture is loamy sand, loamy coarse sand, coarse sand, loamy fine sand or sand. Many pedons have stratification of varying thickness and texture, very fine sandy loam and sandy loam being the more common. Reaction ranges from slightly alkaline to strongly alkaline.

Range in Characteristics (according to field observations, lab analysis): This profile contains a horizon at 18-29 inches with a higher clay % than what is typical for this series.

Taxonomic Class - Sandy, mixed, mesic Ustic Torrifluvents

Suitability for Topsoil (According to WDEQ Guideline 1) – Saturation percentage was marginal from 2-18 inches and 29-60 inches. Estimated stripping depth is 60 inches.

Geographic Setting (According to Official Series Description) - Draknab soils are on flood plains and low terraces adjacent to flood plains. Slopes are 0 to 6 percent. The soils formed in coarse textured recent stream alluvium derived originally from sandstone-dominated sedimentary rock. Elevations are 3,500 to 6,000 feet. The average annual precipitation is 12 inches with over half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. Precipitation ranges from 10 to 14 inches. The mean annual temperature is about 46 degrees F, but ranges from 44 to 49 degrees F. The frost-free season is about 105 to 130 days.

THEEDLE
CLAY

Soil Mapping Unit "Th"
Lab Sample ID: C08100869-132_135
BKS Sample ID: #180

Typical Pedon: Theedle clay -on west facing hill footslope of 6 percent; rangeland. (Colors are for dry soil unless otherwise stated.)

The Theedle series consists of well drained soils that are moderately deep to soft bedrock. They formed in residuum and slope alluvium weathered from soft sandstone. The Theedle soils are on hills, ridges and fan remnants. Slopes are 0 to 75 percent. The mean annual precipitation is about 12 inches, and the mean annual air temperature is 45 degrees F.

A - 0 to 2 inches; light brownish gray (10YR 6/2) clay, dark grayish brown (10YR 4/2) moist; weak granular structure; slightly hard, friable, nonsticky and nonplastic; many very fine, fine, and medium roots; noneffervescent; moderately alkaline (pH 8.1); clear smooth boundary. (0 to 5 inches thick)

AC - 2 to 12 inches; light brownish gray (2.5Y 6/2) clay to clay loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, friable, nonsticky and nonplastic; common very fine, fine, and medium roots; noneffervescent; neutral (pH 6.8); clear smooth boundary. (4 to 10 inches thick)

C1 - 12 to 19 inches; light gray (2.5Y 7/2) clay loam, grayish brown (2.5Y 5/2) moist; massive; slightly hard, friable, sticky and nonplastic; few fine and very fine roots; noneffervescent; neutral (pH 6.8); clear smooth boundary.

C2 - 19 to 37 inches; light gray (2.5Y 7/2) clay loam, grayish brown (2.5Y 5/2) moist; massive; slightly hard, friable, sticky and nonplastic; few fine and very fine roots; moderately effervescent; neutral (pH 7.2); clear smooth boundary. (14 to 26 inches thick)

Cr - 37 inches; light gray, soft, noncalcareous sandstone.

Type Location - Weston County, Wyoming; refer to waypoint 41 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to soft, gray, calcareous sandstone or sandy shale ranges from 20 to 40 inches but is typically less than 32 inches. The soil lacks a cambic horizon, but structural Bw horizons are present in about half the pedons observed. The soil is typically calcareous throughout but may be

leached up to 5 inches. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F and is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 51 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days. The particle size control section averages between 18 and 35 percent clay and is loam, clay loam, or sandy clay loam with more than 15 but less than 35 percent fine or coarser sand. The soil has up to 10 percent rock fragments throughout.

The A horizon has hue of 10YR or 2.5Y, value of 3 to 6 dry, 3 to 5 moist, and chroma of 2 to 4. It is loam, clay loam or fine sandy loam. Reaction ranges from neutral to moderately alkaline. EC is 0 to 2 mmhos/cm.

The BCk (or AC and Bw, when present) has hue of 10YR or 2.5Y, value of 5 or 6 dry, 3 to 5 moist, and chroma of 2 to 4. Texture is loam, clay loam or sandy clay loam. Reaction is slightly alkaline to strongly alkaline. EC is 0 to 4 mmhos/cm.

The C horizon has hue of 10YR or 2.5Y, value of 5 to 7 dry, 4 to 7 moist, and chroma of 2 to 5. Texture is loam, clay loam or sandy clay loam. Reaction is slightly alkaline to strongly alkaline. EC is less than 8 mmhos/cm. Carbonates usually average between 5 and 14 percent with slight segregation in some pedons.

Range in Characteristics (according to field observations, lab analysis): Higher clay %'s are found from 0-12 inches in this profile than what is typical of this series.

Taxonomic Class - Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents

Suitability for Topsoil (According to WDEQ Guideline 1) – Marginal texture (clay) was found from 0-12 inches. Estimated stripping depth is 37 inches.

Geographic Setting (According to Official Series Description) - Theedle soils are on rock-controlled fan aprons, fan pediments, and undulating to rolling uplands. They may occupy all components of the hillslope profile but typically are on the lower shoulder, footslope, and toeslope. Slopes range from 0 to 75 percent. The soils formed in medium textured slope alluvium and residuum derived primarily from interbedded sandstone and shale. Elevation is 3,500 to 6,500 feet. The average annual precipitation is 12 inches with over half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. Precipitation ranges from 10 to 14 inches. The mean annual air temperature ranges from 45 to 51 degrees F. The frost-free season is 105 to 130 days.

TURNERCREST
NONCALCAREOUS VARIANT

Soil Mapping Unit "Tu"
Lab Sample ID: C08100869-136_138
BKS Sample ID: #181

Typical Pedon: Turnercrest sandy clay loam-on a northeast facing hill footslope of 8 percent; utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Turnercrest soils consist of moderately deep, well drained soils formed in eolian or alluvium deposits and residuum derived from soft sandstone. They are on bedrock-controlled hills, fan remnants, ridges and structural benches. Slopes range from 0 to 30 percent. The average annual precipitation is about 12, and the mean annual air temperature is about 47 degrees F.

A - 0 to 2 inches; brown (10YR 5/3) sandy clay loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable; many fine and very fine roots; noneffervescent; neutral (pH 6.7); clear smooth boundary. (2 to 6 inches thick)

Bw - 2 to 9 inches; brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist; weak medium and coarse subangular blocky structure; soft, friable; common fine and very fine roots; noneffervescent; neutral (pH 6.8); gradual smooth boundary. (0 to 8 inches thick)

C1 - 9 to 16 inches; light gray (10YR 7/2) sandy loam to sandy clay loam, pale brown (10YR 6/3) moist; massive; slightly hard, very friable; few fine roots to 15 inches; noneffervescent; neutral (pH 7.2); clear wavy boundary.

C2 - 16 to 21 inches; light gray (10YR 7/2) sandy loam to sandy clay loam, pale brown (10YR 6/3) moist; massive; slightly hard, very friable; few fine roots to 15 inches; noneffervescent; neutral (pH 7.2); clear wavy boundary.

Cr - 21 inches; soft, light gray and very pale brown, strongly calcareous sandstone.

Type Location - Weston County, Wyoming; refer to waypoint 43 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to soft, calcareous sandstone ranges from 20 to 40 inches. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F or warmer and is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 53 degrees F, and the

soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days. The particle-size control section is fine sandy loam or sandy loam with 7 to 18 percent clay and 52 to 80 percent sand with more than 15 percent being fine sand or coarser. EC is 0 to 2 mmhos throughout the soil. Rock fragments may be present but break down on pretreatment and do not have lithic properties.
The A horizon has hue of 10YR or 2.5Y, value of 4 to 6 and 3 to 5 moist, and chroma of 2 to 4. Textures are loamy sand, loamy fine sand, fine sandy loam or sandy loam. Reaction is neutral to moderately alkaline.

The Bw horizon, where present, has hue of 10YR or 2.5Y, value of 5 or 6 and 3 to 5 moist, and chroma of 2 or 3. Depth to the base of the Bw horizon is less than 10 inches. Texture is fine sandy loam or sandy loam. Reaction is slightly alkaline or moderately alkaline.

The Bk has hue of 10YR or 2.5Y, value of 5 to 7 and 3 to 6 moist, and chroma of 2 or 3. Texture is fine sandy loam, very fine sandy loam or sandy loam. Reaction is slightly or moderately alkaline.

The C horizon, when present, has hue of 10YR or 2.5Y, value of 5 to 7 and 4 to 6 moist, and chroma of 2 to 4. Texture is fine sandy loam, very fine sandy loam or sandy loam. Some pedons have thin layers of loamy fine sand. Reaction is slightly alkaline or moderately alkaline.

The Cr horizon has a paralithic contact to soft, calcareous sandstone. The sandstone has hue of 10YR or 2.5Y.

Range in Characteristics (according to field observations, lab analysis): This profile is noncalcareous throughout. No calcic horizons are found in this profile, which is not typical. The A and C horizons in this profile have a higher clay % than what is typical of this series.

Taxonomic Class - Coarse-loamy, mixed, superactive, noncalcareous, mesic Ustic Torriorthents

Suitability for Topsoil (According to WDEQ Guideline 1) – No marginal or unsuitable parameters were found for this profile. Estimated stripping depth is 21 inches.

Geographic Setting (According to Official Series Description) - Turnercrest soils are on hills, ridges, fan remnants and structural benches. They formed in eolian or alluvium deposits and sandy residuum. Slopes are 0 to 30 percent. Elevations are 3,200 to 6,500 feet. The average annual precipitation is 10 to 15 inches with over half falling as snow or rain in April, May, and June and less than one inch falling in each month of July, August, September, and October. The mean annual air temperature is 45 to 53 degrees F. The

frost-free season is 105 to 130 days.

ORPHA
SANDY LOAM

Soil Mapping Unit "Or"
Lab Sample ID: C08100869-139_142
BKS Sample ID: #182

Typical Pedon: Orpha sandy loam-on a west facing dune slope of 6 percent; utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Orpha series consists of very deep, excessively drained soils on rolling dunes, hills, terraces, floodplains, uplands, valley side slopes, toeslopes, and footslopes. They formed in alluviium or eolian sand from mixed sources. Slopes range from 0 to 45 percent. The mean annual precipitation is about 12 inches, and the mean annual air temperature is about 46 degrees F.

A - 0 to 2 inches; grayish brown (10YR 5/2) sandy loam, dark grayish brown (10YR 4/2) moist; weak medium and coarse granular structure; loose, soft, nonsticky and nonplastic; noneffervescent; neutral (pH 6.8); gradual wavy boundary. (2 to 6 inches thick)

C1 - 2 to 15 inches; light brownish gray (10YR 6/2) sandy loam, grayish brown (10YR 5/2) moist; single grain, loose, nonsticky and nonplastic; noneffervescent; neutral (pH 7.2).

C2 - 15 to 44 inches; light brownish gray (10YR 6/2) sandy loam, grayish brown (10YR 5/2) moist; single grain, loose, nonsticky and nonplastic; noneffervescent; slightly alkaline (pH 7.8).

Type Location - Converse County, Wyoming; refer to waypoint 44 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Rock fragments are less than 15 percent in the particle-size control section. Depth to carbonates is typically greater than 40 inches but may be 30 inches in some pedons. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F. It is never moist in all parts for as long as 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 44 to 52 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 7 dry, 3 to 6 moist, and chroma of 2 to 4. Texture is sand, fine sand, loamy sand and loamy fine sand. Reaction is neutral or slightly alkaline.

The C horizon has hue of 10YR or 2.5Y, value of 5 to 8 dry, 4 to 7 moist, and chroma of 2 to 6. Texture is sand, fine sand, loamy sand or loamy fine sand. Some pedons may have thin strata of sandy loam or fine sandy loam where they are near the parent source. Reaction ranges from neutral to moderately alkaline. Some pedons have AC horizons.
Range in Characteristics (according to field observations, lab analysis): Textures are slightly finer than what is typical for this series.

Taxonomic Class - Mixed, mesic Ustic Torripsamments

Suitability for Topsoil (According to WDEQ Guideline 1) – No marginal or unsuitable parameters were found for this profile. Estimated stripping depth is 44 inches.

Geographic Setting (According to Official Series Description) - Orpha soils occur primarily as rolling or hilly dunes. They are on hills, valley side slopes, footslopes, toeslopes, stream terraces, broad floodplains and uplands. They formed in alluvium or eolian deposits generally adjacent to and downwind of sandy parent sources. Slopes are usually 0 to 45 percent. In Nebraska slopes are as high as 60 percent. Elevations are 3,500 to 6,500 feet. Precipitation ranges from 10 to 18 inches with over half the annual precipitation falling in April, May, and June. The mean annual air temperature ranges from 44 to 50 degrees F. The frost-free season is about 105 to 130 days.

CUSHMAN
NONCALCAREOUS VARIANT

Soil Mapping Unit "CuNC"
Lab Sample ID: C08100869-143_144
BKS Sample ID: #183

Typical Pedon: Cushman clay loam-on south facing slope of about 3 percent under native grass vegetation. (Colors are for dry soil unless otherwise stated.)

The Cushman series consists of well drained soils that are moderately deep to bedrock. These soils formed in slopewash alluvium and residuum from interbedded shales and siltstone and fine-grained argillaceous sandstone. Cushman soils are on buttes, fan remnants, hills, piedmonts, ridges and terraces. Slopes are 0 to 20 percent. The mean annual precipitation is about 13 inches, and the mean annual air temperature is about 45 degrees F.

A - 0 to 4 inches; light brownish gray (10YR 6/2) clay loam, dark brown (10YR 3/3) moist; moderate medium granular structure; soft, friable, slightly sticky and slightly plastic; common very fine, fine, and few medium roots; noneffervescent; neutral (pH 7.2); clear smooth boundary. (2 to 6 inches thick)

AB - 4 to 8 inches; light brownish gray (10YR 6/2) clay loam, dark brown (10YR 3/3) moist; moderate medium granular structure; soft, friable, slightly sticky and slightly plastic; common very fine, fine, and few medium roots; noneffervescent; neutral (pH 7.2); clear smooth boundary.

Bt - 8 to 22 inches; brown (10YR 5/3) silt loam to loam, dark yellowish brown (10YR 3/4) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, moderately sticky and moderately plastic; common very fine, fine and few medium roots; few faint clay films on faces of peds and lining pores; noneffervescent; slightly alkaline (pH 7.6); clear smooth boundary.

Cr - 22 inches; soft, thickly stratified gray and brown strongly calcareous shale; reaction of crushed fragments strongly alkaline; these shales extend to depths greater than 10 feet.

Type Location - Sheridan County, Wyoming; refer to waypoint 47 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to a paralithic contact and bedrock is typically about 28 to 32 inches but ranges from 20 to 40 inches. Depth to continuous horizons of carbonate accumulation is 7 to 26 inches. Depth to the base of the argillic horizon ranges from 10 to 26 inches. Rock fragments range

from 0 to 15 percent and are soft shale channers or semirounded sandstone pebbles. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, and is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 53 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days. EC ranges from 0 to 2 mmhos throughout.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 6 dry, 3 to 5 moist, and chroma of 2 to 4. Reaction is neutral or slightly alkaline.

The Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6 dry, 3 to 5 moist, and chroma of 2 to 4. Texture of the Bt is clay loam or loam with 20 to 35 percent clay and more than 15 percent but less than 35 percent fine sand or coarser. Reaction is neutral to moderately alkaline.

The Btk horizon has hue of 10YR or 2.5Y, value of 5 to 7 dry, 4 to 6 moist, and chroma of 2 to 4. Texture is loam or clay loam with 20 to 35 percent clay. Reaction is moderately alkaline or strongly alkaline. Calcium carbonate ranges from 3 to 12 percent.

The Bk horizon has hue of 10YR and 2.5Y, value of 6 to 8 dry, 4 to 6 moist, and chroma of 2 to 4. Texture is loam or clay loam with 20 to 30 percent total clay of which about 2 to 4 percent is carbonate clay. Reaction is typically moderately alkaline but may be strongly alkaline when sodic shales are present. Calcium carbonate equivalent is 5 to 15 percent, but some horizons may exceed 15 percent but are discontinuous or too thin to be considered as a calcic.

The Cr is weakly consolidated sedimentary rock. It is primarily calcareous shale; but siltstone or thinly interbedded fine grained argillaceous sandstone is common. The rock is typically moderately alkaline or strongly alkaline when crushed, but slightly alkaline or neutral shales are not uncommon.

Range in Characteristics (according to field observations, lab analysis): This profile is noncalcareous throughout. This profile has an AB horizon, but no calcic B horizons, which is not typical of this series.

Taxonomic Class - Fine-loamy, mixed, superactive, mesic Ustic Haplargids

Suitability for Topsoil (According to WDEQ Guideline 1) – No marginal or unsuitable parameters were found for this profile. Estimated stripping depth is 22 inches.

Geographic Setting (According to Official Series Description) - Cushman soils are on

buttes, fan remnants fan piedmonts, hills and ridges. Slopes range from 0 to 20 percent. The soils formed in moderately fine textured slopewash alluvium and residuum. Surface erosion is common in overgrazed areas, and some thin eolian deposits overlie these soils in some areas. Elevations are 3,500 to 6,000 feet. The mean annual precipitation is 13 inches and ranges from 10 to 14 inches with over half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September and October. The mean annual temperature is 43 to 51 degrees F. The frost-free season is about 105 to 130 days depending upon elevation, aspect, and air drainage.

from 0 to 15 percent and are soft shale channers or semirounded sandstone pebbles. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, and is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 53 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days. EC ranges from 0 to 2 mmhos throughout.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 6 dry, 3 to 5 moist, and chroma of 2 to 4. Reaction is neutral or slightly alkaline.

The Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6 dry, 3 to 5 moist, and chroma of 2 to 4. Texture of the Bt is clay loam or loam with 20 to 35 percent clay and more than 15 percent but less than 35 percent fine sand or coarser. Reaction is neutral to moderately alkaline.

The Btk horizon has hue of 10YR or 2.5Y, value of 5 to 7 dry, 4 to 6 moist, and chroma of 2 to 4. Texture is loam or clay loam with 20 to 35 percent clay. Reaction is moderately alkaline or strongly alkaline. Calcium carbonate ranges from 3 to 12 percent.

The Bk horizon has hue of 10YR and 2.5Y, value of 6 to 8 dry, 4 to 6 moist, and chroma of 2 to 4. Texture is loam or clay loam with 20 to 30 percent total clay of which about 2 to 4 percent is carbonate clay. Reaction is typically moderately alkaline but may be strongly alkaline when sodic shales are present. Calcium carbonate equivalent is 5 to 15 percent, but some horizons may exceed 15 percent but are discontinuous or too thin to be considered as a calcic.

The Cr is weakly consolidated sedimentary rock. It is primarily calcareous shale; but siltstone or thinly interbedded fine grained argillaceous sandstone is common. The rock is typically moderately alkaline or strongly alkaline when crushed, but slightly alkaline or neutral shales are not uncommon.

Range in Characteristics (according to field observations, lab analysis): This profile is noncalcareous throughout. This profile has an AB horizon, but no calcic B horizons, which is not typical of this series.

Taxonomic Class - Fine-loamy, mixed, superactive, mesic Ustic Haplargids

Suitability for Topsoil (According to WDEQ Guideline 1) – No marginal or unsuitable parameters were found for this profile. Estimated stripping depth is 22 inches.

Geographic Setting (According to Official Series Description) - Cushman soils are on

buttes, fan remnants fan piedmonts, hills and ridges. Slopes range from 0 to 20 percent. The soils formed in moderately fine textured slopewash alluvium and residuum. Surface erosion is common in overgrazed areas, and some thin eolian deposits overlie these soils in some areas. Elevations are 3,500 to 6,000 feet. The mean annual precipitation is 13 inches and ranges from 10 to 14 inches with over half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September and October. The mean annual temperature is 43 to 51 degrees F. The frost-free season is about 105 to 130 days depending upon elevation, aspect, and air drainage.

SHINGLE
SANDY LOAM TO SANDY CLAY LOAM

Soil Mapping Unit "Sh"
Lab Sample ID: C08100869-145_146
BKS Sample ID: #184

Typical Pedon: Shingle sandy loam to sandy clay loam-rangeland. (Colors are for dry soil unless otherwise stated.)

The Shingle series consists of well drained soils that are very shallow or shallow to bedrock. They formed in residuum and colluvium derived from interbedded shale and sandstone or in alluvium from mudstone. Shingle soils are on bedrock controlled hillslopes and ridges. Slopes are 0 to 80 percent. The mean annual precipitation is about 13 inches, and the mean annual temperature is 45 degrees F.

A - 0 to 5 inches; light brownish gray (10YR 6/2) sandy loam to sandy clay loam, dark grayish brown (10YR 4/2) moist; moderate very fine granular structure; soft, very friable, moderately sticky and moderately plastic; noneffervescent; neutral (pH 7.1); clear smooth boundary. (1 to 6 inches thick)

AC - 5 to 8 inches; light yellowish brown (2.5Y 6/3) sandy loam to sandy clay loam, light olive brown (2.5Y 5/3) moist; weak medium subangular blocky structure; hard, friable, moderately sticky and moderately plastic; noneffervescent; neutral (pH 7.1); gradual smooth boundary. (0 to 5 inches thick)

Ck - 8 to 17 inches; light yellowish brown (2.5Y 6/3) clay loam, light olive brown (2.5Y 5/3) moist; massive; hard, variable, moderately sticky and moderately plastic; strongly effervescent, lime disseminated; neutral (pH 7.2); clear wavy boundary. (4 to 15 inches thick)

Cr - 17 inches; soft, strongly calcareous shale interbedded with lenses of soft sandstone.

Type Location - Goshen County, Wyoming; refer to waypoint 122 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to soft bedrock and paralithic contact ranges from 4 to 20 inches. The mean annual soil temperature is 47 to 53 degrees F. The soils commonly are calcareous throughout, but some pedons are leached to 6 inches. The particle size control section averages 20 to 35 percent clay and has more than 15 percent but less than 35 percent fine or coarser sand. The soil is usually dry. The moisture control section is usually moist in April, May and

early June. It is dry for 60 consecutive days or more during the 90 day period following the summer solstice. EC is 0 to 2 mmhos throughout.

The A horizon has hue of 5Y through 7.5YR, value of 5 through 7 dry, 3 through 6 moist, and chroma of 1 through 6. Reaction is neutral through strongly alkaline. Some pedons have a light gravel lag on the surface. Texture is loam, silt loam, clay loam, silty clay loam, cobbly loam, and gravelly clay loam. Rock fragments or shale channers range from 0 to 35 percent.

A Bw or AC horizon, when present, has the combined properties of the A and C horizons.

The C horizon has hue of 5Y through 7.5YR, value of 4 through 7 dry, 3 through 6 moist, and chroma of 1 through 6. It is loam, silt loam, clay loam or silty clay loam. Rock fragments or shale channers range from 0 to 35 percent. Reaction is slightly alkaline through strongly alkaline.

Range in Characteristics (according to field observations, lab analysis): A calcic horizon was identified at the bottom of this profile, which is not typical for this series. The A and AC horizons have a sandier texture than what is typical of this series.

Taxonomic Class - Loamy, mixed, superactive, calcareous, mesic, shallow Ustic Torriorthents

Suitability for Topsoil (According to WDEQ Guideline 1) – No marginal or unsuitable parameters were found for this profile. Estimated stripping depth is 17 inches.

Geographic Setting (According to Official Series Description) - The Shingle soils occur on all hillslope positions. Slopes are 0 to 80 percent. These soils formed in colluvium and residuum weathered from soft, interbedded sandstone and shale or in alluvium from mudstone. Elevation is 3,200 to 6,500 feet. The mean annual precipitation is about 10 to 14 inches, most of which falls in April, May, and June. The mean annual temperature is about 45 degrees F but ranges from 43 to 51 degrees F. The frost-free season is about 105 to 130 days.

CLARKELEN
SANDY LOAM

Soil Mapping Unit "Cl"
Lab Sample ID: C08100869-147_150
BKS Sample ID: #185

Typical Pedon: Clarkelen sandy loam-utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Clarkelen series consists of very deep, well, moderately well or somewhat excessively drained soils formed in stratified recent stream alluvium from mixed sedimentary sources. Clarkelen soils are on flood plains and terraces. Slopes range from 0 to 6 percent. The average annual precipitation is about 12 inches, and the mean annual air temperature is about 46 degrees F.

A - 0 to 2 inches; grayish brown (10YR 5/2) sandy loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, very friable; nonsticky and nonplastic; common fine and very fine, and few medium roots throughout; noneffervescent; neutral (pH 7.2); gradual smooth boundary. (1 to 6 inches thick)

AC - 2 to 19 inches; grayish brown (10YR 5/2) sandy clay loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, very friable; nonsticky and nonplastic; common fine and very fine, and few medium roots throughout; noneffervescent; neutral (pH 7.0); gradual smooth boundary.

Ck1 - 19 to 31 inches; light brownish gray (10YR 6/2) weakly stratified sandy clay loam, dark grayish brown (10YR 4/2) moist; massive; thin stratifications; soft, very friable, nonsticky and nonplastic; common fine and very fine, and few medium roots throughout; calcium carbonate disseminated throughout; strongly effervescent; slightly alkaline (pH 7.5); abrupt wavy boundary.

Ck2 - 31 to 48 inches; light brownish gray (10YR 6/2) and pale brown (10YR 6/3) stratified sandy loam to sandy clay loam, grayish brown (10YR 5/2) moist; massive; thin stratifications; slight hard, friable, nonsticky and nonplastic; few fine and very fine roots; calcium carbonate disseminated throughout; strongly effervescent; slightly alkaline (pH 7.6); abrupt wavy boundary.

Type Location - Niobrara County, Wyoming; refer to waypoint 123 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) – This soil typically lacks horizons of continuous carbonate accumulation. Depth to carbonates

ranges from 0 to 8 inches. Rock fragments are typically less than 5 percent but may range to 15 percent. Organic matter content decreases irregularly with depth; and thin, highly variable textural strata usually occur between 6 and 24 inches. The particle-size control section contains from 5 to 18 percent clay and is sandy loam, fine sandy loam or loam when averaged. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F and is never moist in all parts for as long as 60 consecutive days when the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, but is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 52 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 7 dry and 3 to 6 moist, and chroma of 2 to 4. Texture typically is sandy loam or fine sandy loam but may range from loamy sand to clay loam depending upon the most recent deposition. Reaction ranges from neutral to moderately alkaline. It has an EC of 0 to 4 mmhos/cm. Nitrogen and phosphorus levels are not abnormally enriched. Some pedons have an AC horizon up to 8 inches thick.

The C horizon has hue of 7.5YR, 10YR or 2.5Y, value of 5 to 7 dry and 4 to 6 moist, and chroma of 2 to 4. Texture centers on sandy loam, fine sandy loam or loam, but strata of very fine sandy loam, loam, silt loam, loamy fine sand, loamy sand, fine sand or sand of varying thickness occur. Skeletal material may occur below 40 inches in some pedons. Reaction ranges from slightly alkaline to strongly alkaline. EC is typically 4 mmhos/cm or less but may range up to 8 when irrigated or where it receives saline discharge from surrounding shale beds.

Range in Characteristics (according to field observations, lab analysis): The C horizons of this profile were identified as calcic horizons, which is not typical of this series. This profile contains a slightly higher clay % than what is typical.

Taxonomic Class - Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torrifluvents

Suitability for Topsoil (According to WDEQ Guideline 1) – Saturation percentage was marginal at 31-48 inches. Estimated stripping depth is 31 inches.

Geographic Setting (According to Official Series Description) – Clarkelen soils are on flood plains and terraces adjacent to floodplains. Slopes are 0 to 6 percent. The soils formed in stratified but dominantly moderately coarse textured recent stream alluvium originally weathered from sedimentary rock. Elevation is 3,500 to 6,200 feet. The average annual precipitation is 12 inches with over half falling in April, May, and June

and less than one inch falling in each month of July, August, September, and October. Precipitation ranges from 10 to 14 inches. The mean annual air temperature ranges from 44 to 49 degrees F. The frost-free season is about 105 to 130 days.

ZIGWEID
NONCALCAREOUS VARIANT

Soil Mapping Unit "ZiNC"
Lab Sample ID: C08100869-151_155
BKS Sample ID: #186

Typical Pedon: Zigweid clay loam-on a 3 percent southwest facing slope; utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Zigweid series consists of very deep, well drained soils formed in alluvium from mixed sedimentary sources on fan aprons, alluvial fans, fan piedmonts, fan remnants, terraces, ridges and hills. Slopes range from 0 to 20 percent. Permeability is moderate. The mean annual precipitation is about 13 inches, and the mean annual air temperature is about 46 degrees F.

A - 0 to 4 inches; light brownish gray (10YR 6/2) heavy clay loam, dark grayish brown (10YR 4/2) moist; moderate fine and medium granular structure; slight hard, friable, nonsticky and nonplastic; many very fine and fine roots throughout; noneffervescent; slightly alkaline (pH 7.6); clear smooth boundary. (4 to 8 inches thick)

AB - 4 to 8 inches; light brownish gray (10YR 6/2) clay loam, dark grayish brown (10YR 4/2) moist; moderate fine and medium granular structure; slight hard, friable, nonsticky and nonplastic; many very fine and fine roots throughout; noneffervescent; slightly alkaline (pH 7.6); clear smooth boundary.

Bw1 - 8 to 18 inches; brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots throughout and few medium throughout; noneffervescent; neutral (pH 7.0); gradual wavy boundary. (6 to 14 inches thick)

Bw2 - 18 to 31 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots throughout and few medium throughout; noneffervescent; neutral (pH 6.9); gradual wavy boundary. (6 to 14 inches thick)

C1 - 31 to 43 inches; brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots throughout; noneffervescent; slightly alkaline (pH 7.5); gradual wavy boundary.

C2 - 43 to 60 inches; pale brown (10YR 6/3) sandy clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; noneffervescent; neutral (pH 7.0).
Type Location - Campbell County, Wyoming; refer to waypoint 124 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to carbonates ranges from 0 to 8 inches. Depth to the Bk horizon and the base of the cambic horizon ranges from 10 to 22 inches. The particle-size control section and soil profile are clay loam or loam. Clay ranges from 18 to 35 percent, silt from 20 to 55 percent, and sand from 15 to 50 percent with more than 15 percent but less than 35 percent fine sand or coarser. Rock fragments range from 0 to 15 but are typically less than 5 percent and are mostly soft shale chips. The moisture control section is usually dry in all parts for 90 cumulative days following the summer solstice and for 60 consecutive days during this period. The mean annual soil temperature is 47 to 53 degrees F. The soil temperature at a depth of 20 inches is 41 degrees F or warmer for 175 to 192 days.

The A horizon has hue of 5Y, 2.5Y or 10YR, value of 4 to 6 dry, 3 to 5 moist, and chroma of 2 or 3. It is loam or clay loam. Reaction is neutral to moderately alkaline.

The Bw horizon has hue of 5Y, 2.5Y or 10YR, value of 5 or 6 dry, 4 or 5 moist, and chroma of 2 to 4. It is loam or clay loam. Reaction is slightly alkaline or moderately alkaline.

The Bk horizon has hue of 5Y, 2.5Y or 10YR, value of 5 to 7 dry, 4 to 6 moist, and chroma of 2 to 4. It is loam or clay loam. It has 5 to 14 percent calcium carbonate equivalent and may have a few scattered crystals of calcium sulfate. Reaction is moderately alkaline or strongly alkaline.

Some pedons have a C horizon with similar properties as the Bk horizon. Some pedons may have sandy clay loam textures below 40 inches. It typically has 3 to 5 percent less calcium carbonate than the overlying Bk horizon.

Range in Characteristics (according to field observations, lab analysis): This profile is noncalcareous throughout. This profile has an AB horizon, but no calcic B horizons, which is not typical of this series. This profile has a sandy clay loam texture above 40 inches, which is also not typical.

Taxonomic Class - Fine-loamy, mixed, superactive, mesic Ustic Haplocambids

Suitability for Topsoil (According to WDEQ Guideline 1) – No marginal or unsuitable parameters were found for this profile. Estimated stripping depth is 60 inches.

Geographic Setting (According to Official Series Description) - These soils are on fan aprons, alluvial fans, terraces, fan piedmonts, fan remnants, ridges and hills. In many areas they are dissected. Slopes range from 0 to 20 percent. These soils formed in calcareous, moderately fine textured sediments derived from interbedded shale and soft sandstone. Elevations are 3,500 to 6,600 feet. The mean annual precipitation is 13 inches with over half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. Precipitation ranges from 10 to 14 inches. The mean annual temperature is about 46 degrees F, and ranges from 43 to 51 degrees F. The frost-free season is about 105 to 130 days.

RENOHILL
CLAY

Soil Mapping Unit "Re"
Lab Sample ID: C08100869-156_158
BKS Sample ID: #187

Typical Pedon: Renohill silty clay-rangeland. (Colors are for dry soil unless otherwise stated.)

The Renohill series consists of well drained soils that are moderately deep to soft bedrock. These soils formed in alluvium, colluvium, and residuum. Renohill soils are on bedrock controlled plateaus, alluvial fans, hills and ridges. Slopes are 0 to 30 percent. The mean annual precipitation is about 12 inches, and the mean annual air temperature is about 45 degrees F.

A - 0 to 3 inches; light brownish gray (10YR 6/2) clay, dark grayish brown (10YR 4/2) moist; strong fine granular structure; soft, very friable, slightly sticky and slightly plastic; common medium and fine roots; noneffervescent; neutral (pH 7.2); clear smooth boundary. (1 to 6 inches thick)

BA - 3 to 8 inches; grayish brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure parting to moderate medium granular; slightly hard, friable, sticky and plastic; common fine and medium roots; noneffervescent; neutral (pH 7.2); clear smooth boundary. (0 to 5 inches thick)

Bt1 - 8 to 12 inches; light olive brown (2.5Y 5/4) heavy clay, olive brown (2.5Y 4/4) moist; moderate medium prismatic parting to moderate medium angular blocky; very hard, firm, very sticky and very plastic; common fine and medium roots; many prominent clay films on faces of peds and lining root channels and pores; moderately effervescent; slightly alkaline (pH 7.5); clear smooth boundary. (4 to 16 inches thick)

Bt2 - 12 to 17 inches; light yellowish brown (2.5Y 6/4) heavy clay, light olive brown (2.5Y 5/4) moist; weak coarse angular and subangular blocky structure; very hard, firm, sticky and plastic; few faint clay films on faces of peds; slightly effervescent; slightly alkaline (pH 7.5); gradual smooth boundary. (4 to 16 inches thick)

Bn - 17 to 22 inches; light brownish gray (2.5Y 6/2) heavy clay, grayish brown (2.5Y 5/2) moist; massive; very hard, firm, sticky and plastic; noneffervescent, sodium occurs as common soft masses and threads; about 5 percent soft shale chips; neutral (pH 7.1); clear smooth boundary. (5 to 20 inches thick)

Cr - 22 inches; soft, noncalcareous shale with thin lenses of sandstone

Type Location - Campbell County, Wyoming; refer to waypoint 62 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to bedrock and the paralithic contact ranges from 20 to 40 inches. Depth to the base of the argillic horizon ranges from 12 to 28 inches. Depth to carbonates ranges from 10 to 20 inches. Rock fragments are typically less than 5 percent but may range from 0 to 15 percent. The majority of the rock fragments are soft and break down upon pretreatment. The mean annual soil temperature is about 47 to 53 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days.

The A horizon has hue of 2.5Y or 10YR, value of 4 to 6 dry and 3 to 5 moist, and chroma of 2 or 3. It is clay loam, fine sandy loam or loam. Reaction is neutral or slightly alkaline.

The Bt horizon has hue of 2.5Y or 10YR, value of 4 to 6 dry and 4 or 5 moist, and chroma of 2 to 5. Texture is clay or heavy clay loam with 35 to 50 percent clay. EC is less than 2 mmhos. Reaction is neutral to moderately alkaline. This horizon is typically noncalcareous throughout but may be effervescent immediately above the Btk horizon.

The Btk horizon has hue of 2.5Y or 10YR, value of 5 to 7 dry and 4 to 6 moist, and chroma of 2 to 4. Texture is clay, clay loam, silty clay loam or silty clay with 35 to 50 percent clay. Secondary carbonates range from 3 to 12 percent. EC ranges up to 4 mmhos/cm. Reaction is moderately alkaline or strongly alkaline.

The Bk horizon has hue of 2.5Y or 10YR, value of 5 to 7 dry and 4 to 6 moist, and chroma of 2 to 6. Texture is clay loam, clay, silty clay loam or silty clay with 28 to 42 percent clay. Secondary carbonates range from 5 to 15 percent. EC ranges up to 4 mmhos/cm. Reaction is moderately alkaline or strongly alkaline.

The Cr horizon consists of soft, effervescent shale interbedded with thin lenses of sandstone or siltstone. In some pedons the bedrock is noneffervescent.

Range in Characteristics (according to field observations, lab analysis): There is a natric B horizon instead of a calcic B horizon for this profile. The A horizon in this profile has a finer texture than what is typical for this series.

Taxonomic Class - Fine, smectitic, mesic Ustic Haplargids

Suitability for Topsoil (According to WDEQ Guideline 1) – Marginal texture (clay) was found from 0-22 inches. Estimated stripping depth is 17 inches.

Geographic Setting (According to Official Series Description) - Renohill soils are on

bedrock controlled plateaus, alluvial fans, hills and ridges. They formed in alluvium, colluvium and residuum derived from calcareous shale. Slopes are 0 to 30 percent. Elevations are 3,500 to 6,000 feet. The mean annual precipitation ranges from 10 to 14 inches most of which falls as snow and rain in April, May, and early June. The mean annual air temperature ranges from 43 to 47 degrees F. The frost-free period is 105 to 130 days.

KEELINE
SANDY LOAM TO SANDY CLAY LOAM

Soil Mapping Unit "Ke"
Lab Sample ID: C08100869-159_162
BKS Sample ID: #188

Typical Pedon: Keeline sandy loam to sandy clay loam-on east facing shoulder slope of 4 percent; utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Keeline series consists of very deep, well or somewhat excessively drained soils formed in alluvium or eolian deposits derived from sandstone. Keeline soils are on upland ridgetops, hillslopes, terraces, benches, alluvial fans, and fan remnants. Slopes range from 0 to 40 percent. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 46 degrees F.

A - 0 to 3 inches; yellowish brown (10YR 5/4) sandy loam to sandy clay loam, brown (10YR 4/3) moist; weak fine subangular blocky and granular structure; soft, very friable, nonsticky and nonplastic; noneffervescent; slightly alkaline (pH 7.6); abrupt smooth boundary. (2 to 8 inches thick)

AC - 3 to 9 inches; pale brown (10YR 6/3) sandy loam to sandy clay loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; noneffervescent; slightly alkaline (pH 7.6); clear smooth boundary. (0 to 7 inches thick)

C1 - 9 to 21 inches; very pale brown (10YR 7/3) fine sandy loam to fine sandy clay loam, light yellowish brown (10YR 6/4) moist; massive; soft, very friable, nonsticky and nonplastic; moderately effervescent; moderately alkaline (pH 8.0); gradual smooth boundary. (8 to 50 inches thick)

C2 - 21 to 30 inches; very pale brown (10YR 7/3) very fine sandy clay loam, pale brown (10YR 6/3) moist; massive; soft, very friable, nonsticky and nonplastic; strongly effervescent; calcium carbonate disseminated; moderately alkaline (pH 8.2); gradual smooth boundary. (0 to 25 inches thick)

C3 - 30 to 48 inches; very pale brown (10YR 7/3) very fine sandy clay loam, light yellowish brown (10YR 6/4) moist; massive; soft, very friable, nonsticky and nonplastic; strongly effervescent, calcium carbonate disseminated; neutral (pH 7.0).

Type Location - Converse County, Wyoming; refer to waypoint 83 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Free carbonates typically occur throughout the profile, but some pedons may be leached as much as 6 inches. The control section averages fine sandy loam or sandy loam with 5 to 18 percent clay. Rock fragments range from 0 to 15 percent. Some thin strata of coarser material may occur. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, and is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 52 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days. EC ranges from 0 to 4 mmhos throughout the profile. Bedrock is deeper than 60 inches.

The A horizon has hue of 7.5YR through 2.5Y, value of 5 through 7 dry, 4 or 5 moist, and chroma of 2 through 4. It is sandy loam and less commonly loamy sand, fine sandy loam, or loamy fine sand. Reaction is neutral to moderately alkaline.

The Bw horizon, when present, has the same properties of the A except for structure which is usually weak subangular blocky.

Some pedons have an AC horizon.

The C horizon has hue of 7.5YR through 5Y, value of 4 through 7 dry, 4 through 6 moist, and chroma of 2 through 4. Texture averages sandy loam or fine sandy loam. Some pedons have subhorizons of very fine sandy loam or loamy fine sand. Reaction is moderately or strongly alkaline and some pedons have weak, discontinuous accumulations of calcium carbonate.

Range in Characteristics (according to field observations, lab analysis): This texture has a slightly higher clay % than what is typical for this series.

Taxonomic Class - Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents

Suitability for Topsoil (According to WDEQ Guideline 1) – An unsuitable SAR was found from 21-30 inches. Estimated stripping depth is 21 inches.

Geographic Setting (According to Official Series Description) - Keeline soils are on terraces, benches, alluvial fans, fan remnants, ridgetop and hillslope positions. Slopes are 0 to 40 percent. These soils formed in moderately coarse alluvium or eolian deposits derived from calcareous sandstone. Elevations are 3,500 to 6,200 feet. The average annual precipitation is 12 inches with over one-half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. Precipitation ranges from 10 to 15 inches. The mean annual

temperature is about 46 degrees F but ranges from 44 to 49 degrees F. The frost-free season is about 105 to 130 days.

BOWBAC
SANDY CLAY

Soil Mapping Unit "Bo"
Lab Sample ID: C08100869-163_165
BKS Sample ID: #189

Typical Pedon: Bowbac sandy clay -on a northeast facing slope of 1 percent under native vegetation. (Colors are for dry soil unless otherwise stated.)

The Bowbac series consists of moderately deep, well drained soils formed in alluvium, eolian deposits or residuum derived primarily from argillaceous sandstone. They occupy alluvial fans, terraces, dissected fan remnants, fan piedmonts, hillslopes, pediments, plateaus, ridges and buttes. Slopes are 0 to 15 percent and both simple and complex. The mean annual precipitation is about 13 inches, and the mean annual temperature is about 46 degrees F.

A - 0 to 3 inches; brown (10YR 5/3) sandy clay, dark brown (10YR 3/3) moist; weak fine and very fine granular structure; soft, very friable, nonsticky and nonplastic; many fine and very fine roots; noneffervescent; slightly alkaline (pH 7.8); abrupt wavy boundary. (2 to 7 inches thick)

Bt - 3 to 8 inches; yellowish brown (10YR 5/4) heavy sandy clay, brown (10YR 4/3) moist; moderate coarse and medium prismatic structure parting to moderate medium and coarse angular blocky; hard, friable, slightly sticky and moderately plastic; common fine and very fine, few medium and coarse roots; many distinct clay films on faces of peds; noneffervescent; slightly alkaline (pH 7.8); clear wavy boundary.

Btk - 8 to 18 inches; yellowish brown (10YR 5/4) very fine sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium and coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium fine and very fine roots; common distinct clay films on faces of peds; violently effervescent; moderately alkaline (pH 8.0); clear wavy boundary.

Bk - 18 to 24 inches; very pale brown (10YR 7/3) clay loam, brown (10YR 5/3) moist; massive; soft, friable, slightly plastic; few medium, fine and very fine roots; violently effervescent, calcium carbonate as few fine and medium soft masses; neutral (pH 7.3); abrupt smooth boundary. (6 to 18 inches thick)

Cr - 24 inches; slightly hard, violently effervescent, argillaceous sandstone.

Type Location - Campbell County, Wyoming; refer to waypoint 80 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to soft sandstone ranges from 20 to 40 inches. Depth to continuous carbonate accumulation ranges from 10 to 35 inches, and depth to the base of the argillic horizon ranges from 10 to 35 inches. Coarse fragments range from 0 to 15 percent and are soft sandstone channers or semirounded gravel. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F and is never moist in some or all parts for as long as 60 consecutive days when the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, but is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 53 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days. EC ranges from 0 to 2 mmhos throughout the profile.

The A horizon has hue of 2.5Y through 7.5YR, value of 4 through 6 dry, 3 through 5 moist, and chroma of 2 through 4. Textures are loamy fine sand, sandy loam, sandy clay loam, fine sandy loam, very fine sandy loam, or loam. Reaction is typically neutral or slightly alkaline but ranges to moderately alkaline in some pedons.

The Bt horizon has hue of 2.5Y through 7.5YR, value of 4 through 6 dry, 3 through 5 moist, and chroma of 2 through 4. In pedons where mollic colors are present in this horizon, the layer is too thin to meet the requirements for a mollic epipedon. Texture is sandy clay loam with more than 35 percent fine sand or coarser. Clay ranges from 20 to 35 percent. Reaction is typically slightly alkaline but may range from neutral to moderately alkaline.

Some pedons have a Btk horizon.

The Bk horizon has hue of 2.5Y through 7.5YR, value of 5 through 7 dry, 4 through 6 moist, and chroma of 2 through 6. Texture is typically sandy loam or sandy clay loam but may be fine sandy loam or very fine sandy loam. Carbonates range from 6 to 14 percent. This horizon does not meet the requirements of a diagnostic calcic. Discontinuous horizons with greater than 15 percent carbonates occur in some pedons. Reaction is moderately or strongly alkaline with less than 15 percent ESP.

The Cr is a paralithic contact to calcareous, argillaceous sandstone. This material is weakly consolidated and does restrict the movement of water and, therefore, roots. Interbedded shales may be present in some areas and may form the contact.

Range in Characteristics (according to field observations, lab analysis): The texture of the Bk horizon is finer than typical for this series.

Taxonomic Class - Fine-loamy, mixed, superactive, mesic Ustic Haplargids

Suitability for Topsoil (According to WDEQ Guideline 1) – SAR is unsuitable from 0-8 inches and 18-24 inches. Estimated stripping depth is 0 inches.

Geographic Setting (According to Official Series Description) - Bowbac soils are on alluvial fans, terraces, dissected fan remnants, fan piedmonts, hillslopes, pediments, plateaus, ridges and buttes. Slopes are 0 to 15 percent. Elevations are 3,500 to 6,500 feet. The average annual precipitation is 13 inches with over half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. Precipitation ranges from 10 to 14 inches. The mean annual temperature ranges from 43 to 51 degrees F. The frost-free season is about 105 to 130 days.

DECOLNEY
SANDY LOAM

Soil Mapping Unit "De"
Lab Sample ID: C08100869-166_169
BKS Sample ID: #190

Typical Pedon: Decolney sandy loam-on a north facing slope of 3 percent; utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Decolney series consists of very deep, well drained soils that formed in alluvium or eolian deposits derived from sedimentary beds. Decolney soils are on stabilized dune topography on uplands. Slopes range from 0 to 20 percent. The mean annual precipitation is about 13 inches, and the mean annual air temperature is about 47 degrees F.

A - 0 to 3 inches; brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable; nonsticky and nonplastic; many fine and very fine roots; common fine pores; noneffervescent; neutral (pH 7.3); abrupt smooth boundary. (2 to 5 inches thick)

Bt - 3 to 14 inches; yellowish brown (10YR 5/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate coarse prismatic structure parting to moderate coarse subangular blocky; hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; common fine pores; many faint dark brown (10YR 3/3) clay films on faces of peds and lining pores; noneffervescent; moderately alkaline (pH 7.9); clear wavy boundary.

Ck - 14 to 38 inches; brown (10YR 5/3) very fine sandy clay loam, brown (10YR 4/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; few fine and very fine roots; calcium carbonate disseminated; violently effervescent; slightly alkaline (pH 7.8); abrupt wavy boundary.

C - 38 to 48 inches; pale brown (10YR 6/3) coarse sandy clay loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; slightly effervescent; slightly alkaline (pH 7.4).

Type Location - Campbell County, Wyoming; refer to waypoint 104 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to the base of the argillic horizon is 10 to 30 inches. Depth to carbonates is greater than 40 inches. The mean annual soil temperature is 47 to 52 degrees F. The soil is usually dry at a depth of 20 inches when the temperature is 41 degrees F. The moisture control section

is dry for at least 60 consecutive days and 90 cumulative days between July 15 and October 25. The soil temperature is 41 degrees F or greater for 175 to 192 days. Rock fragments range from 0 to 10 percent.

The A horizon has hue of 10YR or 7.5YR, value of 4 to 6 dry, 3 or 4 moist, and chroma of 2 or 3. It is fine sandy loam, sandy loam, sandy clay loam or loam. It is neutral or slightly alkaline.
The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5 dry, 3 or 4 moist, and chroma of 3 or 4. It is sandy clay loam. It has 20 to 35 percent clay and more than 35 percent fine or coarser sand in the particle-size control section. It is neutral to moderately alkaline.

The C horizon has hue of 10YR or 7.5YR, value of 4 to 6 dry, 4 or 5 moist, and chroma of 2 to 4. It is fine sandy loam, sandy loam or sandy clay loam with 10 to 24 percent clay and more than 35 percent fine or coarser sand. It is slightly alkaline or moderately alkaline.

Range in Characteristics (according to field observations, lab analysis): A calcic C horizon was identified for this profile, which is not typical of this series.

Taxonomic Class - Fine-loamy, mixed, superactive, mesic Ustic Haplargids

Suitability for Topsoil (According to WDEQ Guideline 1) – SAR is marginal from 0-3 inches. Estimated stripping depth is 14 inches.

Geographic Setting (According to Official Series Description) - Decolney soils are on stabilized dune topography including alluvial fans, fan remnants, pediments, terraces, plateaus, ridges and hills. They formed in eolian or alluvium deposits derived from mixed sedimentary bedrock. Slopes are 0 to 20 percent. Elevations range from 3,500 to 5,200 feet. The mean annual precipitation is 10 to 14 inches, about half of which falls as rain or snow from late March through June. The mean annual air temperature ranges from 44 to 49 degrees F. The frost-free period is estimated to range from 105 to 130 days.

TULLOCK
NONCALCAREOUS VARIANT

Soil Mapping Unit "TlNC"
Lab Sample ID: C08100869-170_173
BKS Sample ID: #191

Typical Pedon: Tullock sandy loam to sandy clay loam-in rangeland. (Colors are for dry soil unless otherwise stated.)

The Tullock series consists of moderately deep, excessively drained soils formed in residuum, alluvium or eolian deposits derived from sandstone. They are on dunes, hills and ridges. Slopes are 0 to 45 percent. The mean annual precipitation is about 12 inches. The mean annual air temperature is about 46 degrees F.

A - 0 to 3 inches; brown (10YR 5/3) sandy loam to sandy clay loam, brown (10YR 4/3) moist; weak medium and fine granular structure; loose; noneffervescent; slightly alkaline (pH 7.5); clear wavy boundary. (2 to 6 inches thick)

AC - 3 to 11 inches; brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist; weak medium and fine granular structure; loose; noneffervescent; slightly alkaline (pH 7.6); clear wavy boundary.

C1 - 11 to 18 inches; brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist; massive; loose; noneffervescent; moderately alkaline (pH 8.1); clear wavy boundary. (0 to 18 inches thick)

C2 - 18 to 34 inches; pale brown (10YR 6/3) gravelly sandy loam to sandy clay loam, brown (10YR 5/3) moist; massive; loose; noneffervescent; moderately alkaline (pH 8.1); clear wavy boundary.

Cr - 34 inches; soft moderately calcareous sandstone.

Type Location - Converse County, Wyoming; refer to waypoint 84 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - These soils typically effervesce throughout but some in some pedons the A horizon is leached. Depth to paralithic contact is 20 to 40 inches. The soil has 0 to 15 percent rock fragments. These soils are usually dry in the moisture control section for 60 consecutive days and 90 cumulative days between July 15 and October 25. The soil temperature at a depth of 20 inches is 41 degrees F or warmer for 175 to 192 days. The mean annual soil temperature is 47 to 53 degrees F.

The A horizon has hue of 2.5Y or 10YR value of 5 or 6 and 3 to 5 moist, and chroma of 2 to 5. It is loamy sand, sand, loamy fine sand, fine sandy loam or fine sand. It is neutral to moderately alkaline.

Some pedons have an AC horizon. When present, it has hue or 2.5Y or 10YR, value of 5 or 6 and 4 or 5 moist, and chroma of 3 or 4. It is loamy sand, loamy fine sand, fine sand or sand.

The C horizon has hue of 2.5Y or 10YR, value of 5 to 7 and 4 to 6 moist, and chroma of 2 to 6. It is loamy sand, loamy fine sand, fine sand or sand. It is slightly alkaline or moderately alkaline.

The Cr horizon is soft calcareous sandstone which may be interbeded with conglomerate or shale in some areas.

Range in Characteristics (according to field observations, lab analysis): This profile is noncalcareous throughout. Textures are slightly finer in the A and C2 horizons than what is typical for this series.

Taxonomic Class - Mixed, mesic Ustic Torripsamments

Suitability for Topsoil (According to WDEQ Guideline 1) – Saturation percentage is marginal from 3-11 inches. Estimated stripping depth is 18 inches.

Geographic Setting (According to Official Series Description) - Tullock soils are on dunes and footslopes and toeslopes of hills and ridges. They formed in eolian deposits and residuum derived from sandstone. Slopes are 0 to 45 percent. Elevation is 3500 to 6,000 feet. Mean annual soil temperature is 47 to 53 degrees F. Mean annual precipitation is 10 to 14 inches. The frost-free period is 105 to 130 days.

SHINGLE
CLAY LOAM

Soil Mapping Unit "Sh"
Lab Sample ID: C08100869-174_175
BKS Sample ID: #192

Typical Pedon: Shingle clay loam-rangeland. (Colors are for dry soil unless otherwise stated.)

The Shingle series consists of well drained soils that are very shallow or shallow to bedrock. They formed in residuum and colluvium derived from interbedded shale and sandstone or in alluvium from mudstone. Shingle soils are on bedrock controlled hillslopes and ridges. Slopes are 0 to 80 percent. The mean annual precipitation is about 13 inches, and the mean annual temperature is 45 degrees F.

A - 0 to 1 inch; light brownish gray (10YR 6/2) clay loam, dark grayish brown (10YR 4/2) moist; moderate very fine granular structure; soft, very friable, moderately sticky and moderately plastic; slightly effervescent; neutral (pH 7.1); clear smooth boundary. (1 to 6 inches thick)

C - 1 to 8 inches; light yellowish brown (2.5Y 6/3) clay, light olive brown (2.5Y 5/3) moist; massive; hard, variable, moderately sticky and moderately plastic; slightly effervescent; neutral (pH 7.3); clear wavy boundary. (4 to 15 inches thick)

Cr - 8 inches; soft, strongly calcareous shale interbedded with lenses of soft sandstone.

Type Location - Goshen County, Wyoming; refer to waypoint 87 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to soft bedrock and paralithic contact ranges from 4 to 20 inches. The mean annual soil temperature is 47 to 53 degrees F. The soils commonly are calcareous throughout, but some pedons are leached to 6 inches. The particle size control section averages 20 to 35 percent clay and has more than 15 percent but less than 35 percent fine or coarser sand. The soil is usually dry. The moisture control section is usually moist in April, May and early June. It is dry for 60 consecutive days or more during the 90 day period following the summer solstice. EC is 0 to 2 mmhos throughout.

The A horizon has hue of 5Y through 7.5YR, value of 5 through 7 dry, 3 through 6 moist, and chroma of 1 through 6. Reaction is neutral through strongly alkaline. Some pedons have a light gravel lag on the surface. Texture is loam, silt loam, clay loam, silty clay loam, cobbly loam, and gravelly clay loam. Rock fragments or shale channers range from

0 to 35 percent.

A Bw or AC horizon, when present, has the combined properties of the A and C horizons.

The C horizon has hue of 5Y through 7.5YR, value of 4 through 7 dry, 3 through 6 moist, and chroma of 1 through 6. It is loam, silt loam, clay loam or silty clay loam. Rock fragments or shale channers range from 0 to 35 percent. Reaction is slightly alkaline through strongly alkaline.
Range in Characteristics (according to field observations, lab analysis): The C horizon for this profile has a finer texture than what is typical for this series.

Taxonomic Class - Loamy, mixed, superactive, calcareous, mesic, shallow Ustic Torriorthents

Suitability for Topsoil (According to WDEQ Guideline 1) – Marginal texture (clay) was found from 1-8 inches. Estimated stripping depth is 8 inches.

Geographic Setting (According to Official Series Description) - The Shingle soils occur on all hillslope positions. Slopes are 0 to 80 percent. These soils formed in colluvium and residuum weathered from soft, interbedded sandstone and shale or in alluvium from mudstone. Elevation is 3,200 to 6,500 feet. The mean annual precipitation is about 10 to 14 inches, most of which falls in April, May, and June. The mean annual temperature is about 45 degrees F but ranges from 43 to 51 degrees F. The frost-free season is about 105 to 130 days.

ULM
CLAY LOAM

Soil Mapping Unit "Ul"
Lab Sample ID: C08100869-176_180
BKS Sample ID: #193

Typical Pedon: Ulm clay loam-rangeland. (Colors are for dry soil unless otherwise stated.)

The Ulm series consists of very deep, well drained soils that formed in calcareous alluvium derived from sedimentary rock. Ulm soils are on relict terraces, alluvial fans, fan remnants, plateaus, ridges and hills. Slopes are 0 to 18 percent. The mean annual precipitation is about 12 inches, and the mean air annual temperature is about 47 degrees F.

A - 0 to 3 inches; grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2) moist; strong fine granular structure; slightly hard, friable, sticky and plastic; many fine and few medium roots; noneffervescent; neutral (pH 6.6); clear smooth boundary. (2 to 5 inches thick)

Bt - 3 to 10 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; strong coarse prismatic structure parting to strong medium and coarse angular blocky; very hard, very firm, very sticky and very plastic; common fine and few medium roots; many prominent clay films on faces of peds; noneffervescent; slightly alkaline (pH 7.5); clear wavy boundary. (6 to 23 inches thick)

Bk1 - 10 to 18 inches; pale brown (10YR 6/3) clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few fine and medium roots; strongly effervescent; calcium carbonate as common distinct masses, seams and streaks; moderately alkaline (pH 7.9); clear wavy boundary.

Bk2 - 18 to 36 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; massive; hard, firm, sticky and plastic; calcium carbonate as common distinct masses, seams and streaks; strongly effervescent; moderately alkaline (pH 8.0).

Cn - 36 to 60 inches; pale brown (10YR 6/3) clay, brown (10YR 5/3) moist; massive; hard, firm, sticky and plastic; sodium as common distinct masses, seams and streaks; slightly effervescent; slightly alkaline (pH 7.8).

Type Location - Campbell County, Wyoming; refer to waypoint 88 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to calcareous material ranges from 12 to 33 inches. Rock fragments range from 0 to 15 percent channers. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, and is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 53 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days.

The A horizon has hue of 2.5Y or 10YR, value of 5 to 7 dry and 3 to 5 moist, and chroma of 1 to 4. Texture is loam or clay loam. It usually has granular structure but has subangular blocky structure in some pedons. This horizon is soft or slightly hard. Reaction is neutral or slightly alkaline.

The Bt horizon has hue of 2.5Y or 10YR, value of 5 or 6 dry and 3 to 5 moist, and chroma of 2 to 4. Where colors are dark enough to be mollic the values are derived from parent material weathered from dark colored shales. Texture is usually clay loam, silty clay loam, silty clay or clay with clay ranging from 35 to 50 percent, silt from 10 to 40 percent, and sand from 15 to 50 percent with more than 15 percent fine sand or coarser. This horizon usually has prismatic structure but has angular or subangular blocky structure in some pedons. Reaction is neutral to moderately alkaline.

The Btk horizon has hue of 5Y, 2.5Y or 10YR, value of 5 to 7 dry and 4 to 6 moist, and chroma of 2 to 4. Texture is clay, clay loam, silty clay or silty clay loam. Reaction is slightly alkaline or moderately alkaline. The calcium carbonate equivalent ranges from 6 to 12 percent.

The Bk horizon has hue of 5Y, 2.5Y or 10YR, value of 5 to 7 dry and 4 to 6 moist, and chroma of 2 to 4. Texture is clay loam, silty clay loam, silty clay, sandy clay loam, loam or clay. It has 6 to 15 percent calcium carbonate equivalent. Reaction is moderately alkaline or strongly alkaline. Some areas have a sandy or gravelly substratum below 40 inches.

Some pedons have a C horizon.

Range in Characteristics (according to field observations, lab analysis): A natric C horizon was identified at the bottom of this profile, which is not typical of this series.

Taxonomic Class - Fine, smectitic, mesic Ustic Haplargids

Suitability for Topsoil (According to WDEQ Guideline 1) – Marginal texture (clay) was found from 3-10 inches and 36-60 inches. Estimated stripping depth is 36 inches.

Geographic Setting (According to Official Series Description) - Ulm soils are on relict alluvial terraces, alluvial fans, fan remnants, plateaus and footslopes and toeslopes of hills. Slopes are 0 to 18 percent. The soils formed in fine and medium textured alluvium derived from interbedded shales and agrillaceous sandstone. Elevations are 3,500 to 6,500 feet. The mean annual precipitation is 10 to 14 inches with over half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. The mean annual air temperature ranges from 46 to 51 degrees F. The frost-free season is 105 to 130 days.

PETRIE
CLAY TO CLAY LOAM

Soil Mapping Unit "Pe"
Lab Sample ID: C08100869-181_184
BKS Sample ID: #194

Typical Pedon: Petrie clay to clay loam-rangeland. (Colors are for dry soil unless otherwise stated.)

The Petrie series consists of deep, well drained soils that formed in alluvium derived from sodic sedimentary rock. These soils are on fan aprons, fan pediments, and alluvial terraces. Slopes are 0 to 10 percent. The mean annual precipitation is about 13 inches, and the mean annual temperature is about 45 degrees F.

A - 0 to 3 inches; light yellowish brown (2.5Y 6/4) clay to clay loam, light olive brown (2.5Y 5/4) moist; moderate medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and medium roots; noneffervescent; slightly alkaline (pH 7.5); clear smooth boundary. (1 to 6 inches thick)

AC - 3 to 8 inches; light yellowish brown (2.5Y 6/4) clay to clay loam, light olive brown (2.5Y 5/4) moist; weak medium subangular blocky structure parting to moderate coarse granular; slightly hard, friable, slightly sticky and slightly plastic; common fine and few medium roots; noneffervescent; slightly alkaline (pH 7.5); clear wavy boundary. (2 to 7 inches thick)

C1 - 8 to 17 inches; light yellowish brown (2.5Y 6/4) clay loam, light olive brown (2.5Y 5/4) moist; massive; very hard, firm, sticky and plastic; few fine roots; strongly effervescent; moderately alkaline (pH 8.0); gradual wavy boundary.

C2 - 17 to 32 inches; light yellowish brown (2.5Y 6/4) clay loam, light olive brown (2.5Y 5/4) moist; massive; very hard, very firm, sticky and plastic; few fine roots; strongly effervescent; moderately alkaline (pH 8.4).

C3 - 32 to 44 inches; light yellowish brown (2.5Y 6/4) clay to clay loam, light olive brown (2.5Y 5/4) moist; massive; very hard, very firm, sticky and plastic; few fine roots; slightly effervescent; moderately alkaline (pH 8.1).

Cr - 44 inches; noneffervescent mixed black and gray shale.

Type Location - Natrona County, Wyoming; refer to waypoint 16 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - These soils are typically calcareous throughout but may be leached a few inches in some pedons. The mean annual soil temperature is 47 to 53 degrees F. The particle size control section is a clay, silty clay, clay loam, or silty clay loam with 35 to 60 percent clay. Exchangeable sodium ranges from 15 to 40 percent throughout the control section. Rock fragments are typically less than 5 percent but range from 0 to 15 percent rounded pebbles. Calcium carbonate equivalent ranges from 1 to about 8 percent. The majority of the carbonates and gypsum are autogenetic with only minor secondary accumulations with depth.

The A horizon has hue of 2.5Y through 7.5YR, value of 5 through 7 dry, 3 through 5 moist, and chroma of 2 through 4. Cracks one cm wide extend to the surface of most pedons. EC ranges from 2 to 4 mmhos. Reaction is moderately through very strongly alkaline.

The AC horizon has hue of 2.5Y through 7.5YR, value of 5 through 7 dry, 4 through 6 moist, and chroma of 2 through 4. Texture is typically clay loam or clay but may be silty clay or silty clay loam. Cracks one cm wide extend through this horizon. EC ranges from 2 to 4 mmhos. Reaction is strongly or very strongly alkaline. Some pedons have a Bw horizon in place of the AC horizon. This is allowed since the distinction is difficult at best between the two.

The C horizon has hue of 2.5Y through 7.5YR, value of 5 through 7 dry, 4 through 6 moist, and chroma of 2 through 4. Texture is typically clay loam or clay but may be silty clay or silty clay loam. Cracks are common to a depth of 30 inches or more in this horizon. Autogenetic carbonates and gypsum range from few to common soft masses and nests of crystals. EC ranges from 4 to 8 mmhos in nonirrigated areas. Some areas, where irrigated, have seasonal water tables and EC may range up to 16 mmhos. Reaction is strongly or very strongly alkaline.

Range in Characteristics (according to field observations, lab analysis): This profile is less alkaline than what is typical of this series.

Taxonomic Class - Fine, smectitic, calcareous, mesic Ustertic Torriorthents

Suitability for Topsoil (According to WDEQ Guideline 1) – Marginal texture (clay) was found from 0-8 inches and 32-44 inches. Estimated stripping depth is 36 inches.

Geographic Setting (According to Official Series Description) - Petrie soils are on fan aprons, fan pediments, alluvial terraces, and to a limited extent low energy alluvial fans. These soils formed in alluvium derived from sodic shale and siltstone. Slopes are 0 to 10 percent. Elevation is 3,700 to 6,500 feet. The mean annual precipitation is about 13 inches and ranges from 10 to 16 inches of which about half falls as snow or rain in April, May, and early June. The mean annual air temperature ranges from 43 to 49 degrees F.

The frost-free season is estimated to range from 105 to 130 days depending upon elevation, aspect, and local air drainage.

KEELINE
NONCALCAREOUS VARIANT

Soil Mapping Unit "KeNC"
Lab Sample ID: C08100869-185_188
BKS Sample ID: #195

Typical Pedon: Keeline very fine sandy loam-on east facing shoulder slope of 4 percent; utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Keeline series consists of very deep, well or somewhat excessively drained soils formed in alluvium or eolian deposits derived from sandstone. Keeline soils are on upland ridgetops, hillslopes, terraces, benches, alluvial fans, and fan remnants. Slopes range from 0 to 40 percent. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 46 degrees F.

A - 0 to 3 inches; yellowish brown (10YR 5/4) very fine sandy loam, brown (10YR 4/3) moist; weak fine subangular blocky and granular structure; soft, very friable, nonsticky and nonplastic; noneffervescent; neutral (pH 7.3); abrupt smooth boundary. (2 to 8 inches thick)

AC - 3 to 9 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; noneffervescent; neutral (pH 7.3); clear smooth boundary. (0 to 7 inches thick)

C1 - 9 to 18 inches; very pale brown (10YR 7/3) very fine sandy loam, light yellowish brown (10YR 6/4) moist; massive; soft, very friable, nonsticky and nonplastic; noneffervescent; slightly alkaline (pH 7.4); gradual smooth boundary. (8 to 50 inches thick)

C2 - 18 to 37 inches; very pale brown (10YR 7/3) very fine sandy loam, pale brown (10YR 6/3) moist; massive; soft, very friable, nonsticky and nonplastic; noneffervescent; slightly alkaline (pH 7.8); gradual smooth boundary. (0 to 25 inches thick)

C3 - 37 to 48 inches; very pale brown (10YR 7/3) very fine sandy loam, light yellowish brown (10YR 6/4) moist; massive; soft, very friable, nonsticky and nonplastic; noneffervescent; moderately alkaline (pH 8.0).

Type Location - Converse County, Wyoming; refer to waypoint 23 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Free carbonates typically occur throughout the profile, but some pedons may be leached as much as 6 inches. The control section averages fine sandy loam or sandy loam with 5 to 18 percent clay. Rock fragments range from 0 to 15 percent. Some thin strata of coarser material may occur. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, and is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 52 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days. EC ranges from 0 to 4 mmhos throughout the profile. Bedrock is deeper than 60 inches.

The A horizon has hue of 7.5YR through 2.5Y, value of 5 through 7 dry, 4 or 5 moist, and chroma of 2 through 4. It is sandy loam and less commonly loamy sand, fine sandy loam, or loamy fine sand. Reaction is neutral to moderately alkaline.

The Bw horizon, when present, has the same properties of the A except for structure which is usually weak subangular blocky.

Some pedons have an AC horizon.

The C horizon has hue of 7.5YR through 5Y, value of 4 through 7 dry, 4 through 6 moist, and chroma of 2 through 4. Texture averages sandy loam or fine sandy loam. Some pedons have subhorizons of very fine sandy loam or loamy fine sand. Reaction is moderately or strongly alkaline and some pedons have weak, discontinuous accumulations of calcium carbonate.

Range in Characteristics (according to field observations, lab analysis): This profile is noncalcareous throughout.

Taxonomic Class - Coarse-loamy, mixed, superactive, noncalcareous, mesic Ustic Torriorthents

Suitability for Topsoil (According to WDEQ Guideline 1) – Saturation percentage is marginal from 0-48 inches. Estimated stripping depth is 48 inches.

Geographic Setting (According to Official Series Description) - Keeline soils are on terraces, benches, alluvial fans, fan remnants, ridgetop and hillslope positions. Slopes are 0 to 40 percent. These soils formed in moderately coarse alluvium or eolian deposits derived from calcareous sandstone. Elevations are 3,500 to 6,200 feet. The average annual precipitation is 12 inches with over one-half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. Precipitation ranges from 10 to 15 inches. The mean annual

temperature is about 46 degrees F but ranges from 44 to 49 degrees F. The frost-free season is about 105 to 130 days.

DECOLNEY
SANDY LOAM

Soil Mapping Unit "De"
Lab Sample ID: C08100869-189_193
BKS Sample ID: #197

Typical Pedon: Decolney sandy loam-on a north facing slope of 3 percent; utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Decolney series consists of very deep, well drained soils that formed in alluvium or eolian deposits derived from sedimentary beds. Decolney soils are on stabilized dune topography on uplands. Slopes range from 0 to 20 percent. The mean annual precipitation is about 13 inches, and the mean annual air temperature is about 47 degrees F.

A - 0 to 4 inches; brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable; nonsticky and nonplastic; many fine and very fine roots; common fine pores; noneffervescent; neutral (pH 7.1); abrupt smooth boundary. (2 to 5 inches thick)

Bt - 4 to 10 inches; yellowish brown (10YR 5/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate coarse prismatic structure parting to moderate coarse subangular blocky; hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; common fine pores; many faint dark brown (10YR 3/3) clay films on faces of peds and lining pores; noneffervescent; neutral (pH 7.3); clear wavy boundary.

C1 - 10 to 19 inches; brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; few fine and very fine roots; noneffervescent; slightly alkaline (pH 7.6); abrupt wavy boundary. (5 to 21 inches thick)

C2 - 19 to 36 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; noneffervescent; moderately alkaline (pH 8.2).

C3 - 36 to 48 inches; pale brown (10YR 6/3) sand, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; noneffervescent; moderately alkaline (pH 8.3).

Type Location - Campbell County, Wyoming; refer to waypoint 25 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to the base of the argillic horizon is 10 to 30 inches. Depth to carbonates is greater than 40

inches. The mean annual soil temperature is 47 to 52 degrees F. The soil is usually dry at a depth of 20 inches when the temperature is 41 degrees F. The moisture control section is dry for at least 60 consecutive days and 90 cumulative days between July 15 and October 25. The soil temperature is 41 degrees F or greater for 175 to 192 days. Rock fragments range from 0 to 10 percent.

The A horizon has hue of 10YR or 7.5YR, value of 4 to 6 dry, 3 or 4 moist, and chroma of 2 or 3. It is fine sandy loam, sandy loam, sandy clay loam or loam. It is neutral or slightly alkaline.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5 dry, 3 or 4 moist, and chroma of 3 or 4. It is sandy clay loam. It has 20 to 35 percent clay and more than 35 percent fine or coarser sand in the particle-size control section. It is neutral to moderately alkaline.

The C horizon has hue of 10YR or 7.5YR, value of 4 to 6 dry, 4 or 5 moist, and chroma of 2 to 4. It is fine sandy loam, sandy loam or sandy clay loam with 10 to 24 percent clay and more than 35 percent fine or coarser sand. It is slightly alkaline or moderately alkaline.

Range in Characteristics (according to field observations, lab analysis): The textures from 19-48 inches are coarser than typical for this series.

Taxonomic Class - Fine-loamy, mixed, superactive, mesic Ustic Haplargids

Suitability for Topsoil (According to WDEQ Guideline 1) – Marginal texture (sand) was found from 36-48 inches. Saturation percentage was marginal from 0-48 inches. Estimated stripping depth is 36 inches.

Geographic Setting (According to Official Series Description) - Decolney soils are on stabilized dune topography including alluvial fans, fan remnants, pediments, terraces, plateaus, ridges and hills. They formed in eolian or alluvium deposits derived from mixed sedimentary bedrock. Slopes are 0 to 20 percent. Elevations range from 3,500 to 5,200 feet. The mean annual precipitation is 10 to 14 inches, about half of which falls as rain or snow from late March through June. The mean annual air temperature ranges from 44 to 49 degrees F. The frost-free period is estimated to range from 105 to 130 days.

THEEDLE
SANDY LOAM

Soil Mapping Unit "Th"
Lab Sample ID: C08100869-194_195
BKS Sample ID: #198

Typical Pedon: Theedle sandy loam-on west facing hill footslope of 6 percent; rangeland. (Colors are for dry soil unless otherwise stated.)

The Theedle series consists of well drained soils that are moderately deep to soft bedrock. They formed in residuum and slope alluvium weathered from soft sandstone. The Theedle soils are on hills, ridges and fan remnants. Slopes are 0 to 75 percent. The mean annual precipitation is about 12 inches, and the mean annual air temperature is 45 degrees F.

A - 0 to 2 inches; light brownish gray (10YR 6/2) sandy loam, dark grayish brown (10YR 4/2) moist; weak granular structure; slightly hard, friable, nonsticky and nonplastic; many very fine, fine, and medium roots; noneffervescent; neutral (pH 6.6); clear smooth boundary. (0 to 5 inches thick)

AB - 2 to 6 inches; light brownish gray (10YR 6/2) sandy loam, dark grayish brown (10YR 4/2) moist; weak granular structure; slightly hard, friable, nonsticky and nonplastic; many very fine, fine, and medium roots; noneffervescent; neutral (pH 6.6); clear smooth boundary.

Bw - 6 to 18 inches; light brownish gray (2.5Y 6/2) sandy loam to sandy clay loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, friable, nonsticky and nonplastic; common very fine, fine, and medium roots; noneffervescent; slightly alkaline (pH 7.4); clear smooth boundary. (4 to 12 inches thick)

C - 18 to 22 inches; light gray (2.5Y 7/2) sandy loam to sandy clay loam, grayish brown (2.5Y 5/2) moist; massive; slightly hard, friable, sticky and nonplastic; few fine and very fine roots; slightly effervescent; slightly alkaline (pH 7.4); clear smooth boundary.

Cr - 22 inches; light gray, soft, strongly calcareous sandstone.

Type Location - Weston County, Wyoming; refer to waypoint 26 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to soft, gray, calcareous sandstone or sandy shale ranges from 20 to 40 inches but is typically less than 32 inches. The soil lacks a cambic horizon, but structural Bw horizons are present in

about half the pedons observed. The soil is typically calcareous throughout but may be leached up to 5 inches. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F and is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 51 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days. The particle size control section averages between 18 and 35 percent clay and is loam, clay loam, or sandy clay loam with more than 15 but less than 35 percent fine or coarser sand. The soil has up to 10 percent rock fragments throughout.

The A horizon has hue of 10YR or 2.5Y, value of 3 to 6 dry, 3 to 5 moist, and chroma of 2 to 4. It is loam, clay loam or fine sandy loam. Reaction ranges from neutral to moderately alkaline. EC is 0 to 2 mmhos/cm.

The BCk (or AC and Bw, when present) has hue of 10YR or 2.5Y, value of 5 or 6 dry, 3 to 5 moist, and chroma of 2 to 4. Texture is loam, clay loam or sandy clay loam. Reaction is slightly alkaline to strongly alkaline. EC is 0 to 4 mmhos/cm.

The C horizon has hue of 10YR or 2.5Y, value of 5 to 7 dry, 4 to 7 moist, and chroma of 2 to 5. Texture is loam, clay loam or sandy clay loam. Reaction is slightly alkaline to strongly alkaline. EC is less than 8 mmhos/cm. Carbonates usually average between 5 and 14 percent with slight segregation in some pedons.

Range in Characteristics (according to field observations, lab analysis): The AB, Bw, and C horizons are slightly more coarse than what is typical of this series.

Taxonomic Class - Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents

Suitability for Topsoil (According to WDEQ Guideline 1) – Saturation percentage was marginal from 0-22 inches. Estimated stripping depth is 22 inches.

Geographic Setting (According to Official Series Description) - Theedle soils are on rock-controlled fan aprons, fan pediments, and undulating to rolling uplands. They may occupy all components of the hillslope profile but typically are on the lower shoulder, footslope, and toeslope. Slopes range from 0 to 75 percent. The soils formed in medium textured slope alluvium and residuum derived primarily from interbedded sandstone and shale. Elevation is 3,500 to 6,500 feet. The average annual precipitation is 12 inches with over half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. Precipitation ranges from 10 to 14 inches. The mean annual air temperature ranges from 45 to 51 degrees F. The frost-free season is 105 to 130 days.

FORKWOOD
NONCALCAREOUS VARIANT

Soil Mapping Unit "FoNC"
Lab Sample ID: C08100869-196_200
BKS Sample ID: #199

Typical Pedon: Forkwood sandy clay loam-utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Forkwood series consists of very deep, well drained soils formed in alluvium. Forkwood soils are on terraces, alluvial fans, fan remnants, hills, ridges and pediments. Slopes range from 0 to 15 percent. The mean annual precipitation is about 11 inches, and the mean annual air temperature is about 45 degrees F.

A - 0 to 3 inches; brown (10YR 5/3) sandy clay loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many fine and medium roots throughout; noneffervescent; moderately acid (pH 6.0); abrupt smooth boundary. (1 to 6 inches thick)

AB - 3 to 14 inches; brown (10YR 5/3) sandy loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many fine and medium roots throughout; noneffervescent; neutral (pH 6.6); abrupt smooth boundary.

Bt1 - 14 to 26 inches; brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; strong medium angular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; common fine and medium roots throughout; common distinct clay films on faces of peds; noneffervescent; neutral (pH 7.1); clear smooth boundary. (6 to 20 inches thick)

Bt2 - 26 to 43 inches; light brownish gray (2.5Y 6/2) sandy clay loam, dark grayish brown (2.5Y 4/2) moist; strong medium angular blocky structure; hard, firm, moderately sticky and moderately plastic; few fine and medium roots throughout; few faint clay films on faces of peds; noneffervescent; neutral (pH 7.2); clear smooth boundary.

C - 43 to 60 inches; light brownish gray (2.5Y 6/2) sandy clay loam, grayish brown (2.5Y 5/2) moist; massive; soft, very friable, slightly sticky and slightly plastic; few fine roots throughout; noneffervescent; slightly alkaline (pH 7.4). (0 to 40 inches thick)

Type Location - Niobrara County, Wyoming; refer to waypoint 27 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to the base of the argillic horizon is 10 to 33 inches, and depth to continuous horizons of carbonate accumulation is 10 to 33 inches. Rock fragments range from 0 to 15 percent. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, and is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature ranges from 47 to 53 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days. EC ranges from 0 to 4 mmhos/cm throughout the profile. Bedrock is deeper than 60 inches.

The A horizon has hue of 2.5Y or 10YR, value of 4 to 6 dry and 3 to 5 moist, and chroma of 2 to 4. A vesicular crust occurs on some pedons. Texture is very fine sandy loam, loam, clay loam or fine sandy loam. Reaction is neutral through moderately alkaline.

The Bt horizon has hue of 2.5Y, 10YR or 7.5YR, value of 4 to 7 dry and 3 to 5 moist, and chroma of 2 to 4. Texture is loam or clay loam with 18 to 35 percent clay and more than 15 but less than 35 percent fine sand or coarser. Reaction is neutral through moderately alkaline.

The Btk horizon has hue of 2.5Y or 10YR, value of 4 to 7 dry and 3 to 5 moist, and chroma of 2 to 4. Texture is loam or clay loam. It is slightly alkaline or moderately alkaline. It has 3 to 12 percent calcium carbonate equivalent.

The Bk horizon has hue of 5Y, 2.5Y or 10YR, value of 5 to 7 dry and 4 to 6 moist, and chroma of 2 to 4. Texture is loam, fine sandy loam, very fine sandy loam or clay loam. This horizon has 1 to 14 percent authigenic calcium carbonate accumulation. It is moderately alkaline or strongly alkaline.

The C horizon, when present, has hue of 5Y to 10YR, value of 5 to 7 dry, 4 to 6 moist, and chroma of 2 to 4. Carbonates range from 1 to 8 percent and are mostly allogenic. ESP ranges from 4 to 12. Reaction is moderately or strongly alkaline.

Range in Characteristics (according to field observations, lab analysis): This profile is noncalcareous throughout. An AB horizon was found for this profile, which is not typical for this series. The texture from 14-60 inches is sandy clay loam, which is not a typical texture for this series.

Taxonomic Class - Fine-loamy, mixed, superactive, mesic Ustic Haplargids

Suitability for Topsoil (According to WDEQ Guideline 1) – Saturation percentage was marginal from 14-26 inches and 43-60 inches. Estimated stripping depth is 60 inches.

Geographic Setting (According to Official Series Description) - Forkwood soils are on terraces, alluvial fans, fan remnants, hills, ridges and pediments. Slopes are 0 to 15 percent. The soils formed in slopewash alluvium derived from interbedded shales and argillaceous sandstone. Elevations are 3,500 to 6,000 feet. The average annual precipitation is 10 to 14 inches with over half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. The mean annual air temperature ranges from 43 to 51 degrees F. The estimated frost-free season is about 105 to 130 days depending upon elevation, aspect, and air drainage.

CAMBRIA
SANDY LOAM TO SANDY CLAY LOAM

Soil Mapping Unit "Ca"
Lab Sample ID: C08100869-201_205
BKS Sample ID: #201

Typical Pedon: Cambria sandy loam to sandy clay loam on rangeland. (Colors are for dry soil unless otherwise stated.)

The Cambria series consists of very deep, well drained, moderately permeable soils that formed in alluvium and slope alluvium on fan remnants, alluvial fans, fan piedmonts, terraces, ridges and hills. Slopes range from 0 to 15 percent and are usually simple but may be complex where the area has been dissected by ephemeral streams. The mean annual precipitation is about 12 inches, and the mean annual air temperature is about 45 degrees F.

A - 0 to 2 inches; brown (10YR 5/3) sandy loam to sandy clay loam, dark brown (10YR 3/3) moist; weak thin platy structure; soft, very friable, slightly sticky and slightly plastic; common fine and very fine roots; noneffervescent; neutral (pH 7.1); clear smooth boundary. (2 to 5 inches thick)

Bt - 2 to 10 inches; brown (10YR 5/3) sandy clay, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, moderately sticky and moderately plastic; common distinct dark brown (10YR 3/3) clay films on faces of peds; noneffervescent; slightly alkaline (pH 7.5); clear wavy boundary. (5 to 8 inches thick)

Btk - 10 to 31 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; soft, very friable, slightly sticky and slightly plastic; strongly effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.

C1 - 31 to 42 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; moderately effervescent; moderately alkaline (pH 8.3).

C2 - 42 to 48 inches; pale brown (10YR 6/3) sandy clay loam, brown (10YR 5/3) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; slightly effervescent; moderately alkaline (pH 8.1).

Type Location - Campbell County, Wyoming; refer to waypoint 170 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) –
Soil moisture: The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, and is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 48 to 52 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days.
Depth to the base of the argillic horizon: 10 inches or less
Depth to secondary calcium carbonate: 3 to 10 inches but ranges to 15 inches in some pedons
Particle-size control section: It is loam, clay loam, silty clay loam or sandy clay loam. The part below the argillic horizon averages 18 to 35 percent clay, 10 to 50 percent silt, and 20 to 70 percent sand with more than 15 but less than 52 percent coarser than very fine sand.

A horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 2 to 4 dry or moist
Texture: fine sandy loam, sandy loam, loam, very fine sandy loam or silt loam
Reaction: typically neutral or slightly alkaline but may be moderately alkaline in some pedons

Some pedons have an AB horizon up to 4 inches thick.

Bt horizon:
Hue: 7.5YR, 10YR or 2.5Y
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 2 to 4 dry or moist
Texture: loam, clay loam, silty clay loam or sandy clay loam
Reaction: neutral to moderately alkaline

A thin Btk horizon may be present above the Bk horizon in some pedons and have properties of both the Bt and Bk.

Bk horizon:
Hue: 10YR or 2.5Y
Value: 5 to 8 dry, 4 to 6 moist
Chroma: 2 to 4 dry or moist
Texture: typically loam or clay loam but some subhorizons have sandy loam, fine sandy loam, very fine sandy loam, silt loam, silty clay loam or sandy clay loam strata
Calcium carbonate equivalent: averages less than 15 percent, but discontinuous strata

may exceed 15 percent in some pedons
Reaction: moderately or strongly alkaline with less than 15 percent ESP

Some pedons have a C horizon

Range in Characteristics (according to field observations, lab analysis): Two C horizons were found in this profile, instead of two calcic B horizons, which is not typical of this series. This profile's Bt horizon is a sandy clay, which is not a typical texture for that horizon.

Taxonomic Class - Fine-loamy, mixed, superactive, mesic Ustic Haplargids

Suitability for Topsoil (According to WDEQ Guideline 1) – No marginal or unsuitable parameters were found for this profile. Estimated stripping depth is 60 inches.

Geographic Setting (According to Official Series Description) –
Parent material: alluvium and slope alluvium from mixed sources
Landform: fan remnants, fan piedmonts, alluvial fans, hills, ridges and terraces
Slopes: 0 to 15 percent
Elevations: 3,500 to 6,500 feet
Average annual precipitation: 10 to 14 inches with over one-half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September, and October
Mean annual air temperature: 43 to 51 degrees F
Frost-free season: 105 to 130 days

CLARKELEN CLAY

Soil Mapping Unit "Cl"
Lab Sample ID: C08100869-206_210
BKS Sample ID: #202

Typical Pedon: Clarkelen clay-utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Clarkelen series consists of very deep, well, moderately well or somewhat excessively drained soils formed in stratified recent stream alluvium from mixed sedimentary sources. Clarkelen soils are on flood plains and terraces. Slopes range from 0 to 6 percent. The average annual precipitation is about 12 inches, and the mean annual air temperature is about 46 degrees F.

A - 0 to 4 inches; grayish brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, very friable; nonsticky and nonplastic; common fine and very fine, and few medium roots throughout; noneffervescent; neutral (pH 7.1); gradual smooth boundary. (1 to 6 inches thick)

C1 - 4 to 17 inches; light brownish gray (10YR 6/2) silty clay, dark grayish brown (10YR 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; common fine and very fine, and few medium roots throughout; noneffervescent; slightly alkaline (pH 7.6); abrupt wavy boundary.

C2 - 17 to 27 inches; light brownish gray (10YR 6/2) and pale brown (10YR 6/3) stratified loam, grayish brown (10YR 5/2) moist; massive; thin stratifications; slight hard, friable, nonsticky and nonplastic; few fine and very fine roots; noneffervescent; moderately alkaline (pH 8.0); abrupt wavy boundary.

C3 - 27 to 36 inches; light brownish gray (10YR 6/2) sandy clay loam, grayish brown (10YR 5/2) moist; single grain; loose, nonsticky and nonplastic; few fine roots; moderately effervescent; slightly alkaline (pH 7.4); abrupt smooth boundary.

C4 - 36 to 43 inches; grayish brown (10YR 5/2) sandy loam to sandy clay loam, dark grayish brown (10YR 4/2) moist; massive; thin stratifications; slightly hard, friable, nonsticky and nonplastic; few fine roots; noneffervescent; slightly alkaline (pH 7.6).

C5 - 43 to 48 inches; grayish brown (10YR 5/2) coarse sandy loam to sandy clay loam, dark grayish brown (10YR 4/2) moist; massive; thin stratifications; slightly hard, friable, nonsticky and nonplastic; few fine roots; slightly effervescent; slightly alkaline (pH 7.6).

Type Location - Niobrara County, Wyoming; refer to waypoint 102 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) – This soil typically lacks horizons of continuous carbonate accumulation. Depth to carbonates ranges from 0 to 8 inches. Rock fragments are typically less than 5 percent but may range to 15 percent. Organic matter content decreases irregularly with depth; and thin, highly variable textural strata usually occur between 6 and 24 inches. The particle-size control section contains from 5 to 18 percent clay and is sandy loam, fine sandy loam or loam when averaged. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F and is never moist in all parts for as long as 60 consecutive days when the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, but is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 52 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 7 dry and 3 to 6 moist, and chroma of 2 to 4. Texture typically is sandy loam or fine sandy loam but may range from loamy sand to clay loam depending upon the most recent deposition. Reaction ranges from neutral to moderately alkaline. It has an EC of 0 to 4 mmhos/cm. Nitrogen and phosphorus levels are not abnormally enriched. Some pedons have an AC horizon up to 8 inches thick.

The C horizon has hue of 7.5YR, 10YR or 2.5Y, value of 5 to 7 dry and 4 to 6 moist, and chroma of 2 to 4. Texture centers on sandy loam, fine sandy loam or loam, but strata of very fine sandy loam, loam, silt loam, loamy fine sand, loamy sand, fine sand or sand of varying thickness occur. Skeletal material may occur below 40 inches in some pedons. Reaction ranges from slightly alkaline to strongly alkaline. EC is typically 4 mmhos/cm or less but may range up to 8 when irrigated or where it receives saline discharge from surrounding shale beds.

Range in Characteristics (according to field observations, lab analysis): The top 17 and bottom 12 inches of this profile have a finer texture than what is typical of this series.

Taxonomic Class - Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torrifluvents

Suitability for Topsoil (According to WDEQ Guideline 1) – Marginal texture (clay and silty clay) was found from 0-17 inches. Estimated stripping depth is 48 inches.

Geographic Setting (According to Official Series Description) – Clarkelen soils are on

flood plains and terraces adjacent to floodplains. Slopes are 0 to 6 percent. The soils formed in stratified but dominantly moderately coarse textured recent stream alluvium originally weathered from sedimentary rock. Elevation is 3,500 to 6,200 feet. The average annual precipitation is 12 inches with over half falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. Precipitation ranges from 10 to 14 inches. The mean annual air temperature ranges from 44 to 49 degrees F. The frost-free season is about 105 to 130 days.

CUSHMAN
CLAY LOAM

Soil Mapping Unit "Cu"
Lab Sample ID: C08100869-211_214
BKS Sample ID: #203

Typical Pedon: Cushman clay loam-on south facing slope of about 3 percent under native grass vegetation. (Colors are for dry soil unless otherwise stated.)

The Cushman series consists of well drained soils that are moderately deep to bedrock. These soils formed in slopewash alluvium and residuum from interbedded shales and siltstone and fine-grained argillaceous sandstone. Cushman soils are on buttes, fan remnants, hills, piedmonts, ridges and terraces. Slopes are 0 to 20 percent. The mean annual precipitation is about 13 inches, and the mean annual air temperature is about 45 degrees F.

A - 0 to 2 inches; light brownish gray (10YR 6/2) clay loam, dark brown (10YR 3/3) moist; moderate medium granular structure; soft, friable, slightly sticky and slightly plastic; common very fine, fine, and few medium roots; noneffervescent; slightly alkaline (pH 7.6); clear smooth boundary. (2 to 6 inches thick)

Bt - 2 to 8 inches; brown (10YR 5/3) sandy clay, dark yellowish brown (10YR 3/4) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, moderately sticky and moderately plastic; common very fine, fine and few medium roots; few faint clay films on faces of peds and lining pores; noneffervescent; slightly alkaline (pH 7.6); clear smooth boundary.

Btk - 8 to 21 inches; pale brown (10YR 6/3) clay, yellowish brown (10YR 5/4) moist; moderate coarse prismatic structure parting to moderate fine and very fine subangular blocky; hard, firm, moderately sticky and moderately plastic; few fine roots; few faint clay films on faces of peds; strongly effervescent; calcium carbonate on faces of peds and in pores as common distinct irregularly shaped filaments and masses; moderately alkaline (pH 8.0); clear smooth boundary. (0 to 13 inches thick)

Cn - 21 to 40 inches; very pale brown (10YR 8/2) loam, pale brown (10YR 6/3) moist; weak coarse subangular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; slightly effervescent; sodium as common prominent irregularly shaped, masses and many fine filaments; moderately alkaline (pH 7.9); clear smooth boundary. (7 to 19 inches thick)

Cr - 40 inches; soft, thickly stratified gray and brown slightly calcareous shale; these shales extend to depths greater than 10 feet.

Type Location - Sheridan County, Wyoming; refer to waypoint 103 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) - Depth to a paralithic contact and bedrock is typically about 28 to 32 inches but ranges from 20 to 40 inches. Depth to continuous horizons of carbonate accumulation is 7 to 26 inches. Depth to the base of the argillic horizon ranges from 10 to 26 inches. Rock fragments range from 0 to 15 percent and are soft shale channers or semirounded sandstone pebbles. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, and is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 53 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days. EC ranges from 0 to 2 mmhos throughout.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 6 dry, 3 to 5 moist, and chroma of 2 to 4. Reaction is neutral or slightly alkaline.

The Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6 dry, 3 to 5 moist, and chroma of 2 to 4. Texture of the Bt is clay loam or loam with 20 to 35 percent clay and more than 15 percent but less than 35 percent fine sand or coarser. Reaction is neutral to moderately alkaline.

The Btk horizon has hue of 10YR or 2.5Y, value of 5 to 7 dry, 4 to 6 moist, and chroma of 2 to 4. Texture is loam or clay loam with 20 to 35 percent clay. Reaction is moderately alkaline or strongly alkaline. Calcium carbonate ranges from 3 to 12 percent.

The Bk horizon has hue of 10YR and 2.5Y, value of 6 to 8 dry, 4 to 6 moist, and chroma of 2 to 4. Texture is loam or clay loam with 20 to 30 percent total clay of which about 2 to 4 percent is carbonate clay. Reaction is typically moderately alkaline but may be strongly alkaline when sodic shales are present. Calcium carbonate equivalent is 5 to 15 percent, but some horizons may exceed 15 percent but are discontinuous or too thin to be considered as a calcic.

The Cr is weakly consolidated sedimentary rock. It is primarily calcareous shale; but siltstone or thinly interbedded fine grained argillaceous sandstone is common. The rock is typically moderately alkaline or strongly alkaline when crushed, but slightly alkaline or neutral shales are not uncommon.

Range in Characteristics (according to field observations, lab analysis): This profile has a natric C horizon in place of a calcic B horizon at the bottom of the profile, which is not

typical of this series. The A and Btk horizons for this horizon are finer in texture than what is typical. This profile's Bt has a higher percentage of sand and clay than what is typical.

Taxonomic Class - Fine-loamy, mixed, superactive, mesic Ustic Haplargids

Suitability for Topsoil (According to WDEQ Guideline 1) – Marginal texture (clay) was found from 8-21 inches. Selenium was marginal from 21-40 inches. Estimated stripping depth is 8 inches.

Geographic Setting (According to Official Series Description) - Cushman soils are on buttes, fan remnants fan piedmonts, hills and ridges. Slopes range from 0 to 20 percent. The soils formed in moderately fine textured slopewash alluvium and residuum. Surface erosion is common in overgrazed areas, and some thin eolian deposits overlie these soils in some areas. Elevations are 3,500 to 6,000 feet. The mean annual precipitation is 13 inches and ranges from 10 to 14 inches with over half of the annual precipitation falling in April, May, and June and less than one inch falling in each month of July, August, September and October. The mean annual temperature is 43 to 51 degrees F. The frost-free season is about 105 to 130 days depending upon elevation, aspect, and air drainage.

CLARKELEN
SANDY CLAY LOAM

Soil Mapping Unit "Cl"
Lab Sample ID: C08100869-215_218
BKS Sample ID: #204

Typical Pedon: Clarkelen sandy clay loam-utilized as rangeland. (Colors are for dry soil unless otherwise stated.)

The Clarkelen series consists of very deep, well, moderately well or somewhat excessively drained soils formed in stratified recent stream alluvium from mixed sedimentary sources. Clarkelen soils are on flood plains and terraces. Slopes range from 0 to 6 percent. The average annual precipitation is about 12 inches, and the mean annual air temperature is about 46 degrees F.

A - 0 to 3 inches; grayish brown (10YR 5/2) sandy clay loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, very friable; nonsticky and nonplastic; common fine and very fine, and few medium roots throughout; noneffervescent; slightly alkaline (pH 7.6); gradual smooth boundary. (1 to 6 inches thick)

AC - 3 to 9 inches; grayish brown (10YR 5/2) sandy clay loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, very friable; nonsticky and nonplastic; common fine and very fine, and few medium roots throughout; noneffervescent; slightly alkaline (pH 7.6); gradual smooth boundary.

C1 - 9 to 22 inches; light brownish gray (10YR 6/2) weakly stratified sandy loam to sandy clay loam, dark grayish brown (10YR 4/2) moist; massive; thin stratifications; soft, very friable, nonsticky and nonplastic; common fine and very fine, and few medium roots throughout; slightly effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary.

C2 - 22 to 25 inches; light brownish gray (10YR 6/2) and pale brown (10YR 6/3) stratified sandy clay loam, grayish brown (10YR 5/2) moist; massive; thin stratifications; slight hard, friable, nonsticky and nonplastic; few fine and very fine roots; moderately effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

Cn - 25 to 29 inches; light brownish gray (10YR 6/2) sandy clay loam, grayish brown (10YR 5/2) moist; single grain; loose, nonsticky and nonplastic; few fine roots; sodium disseminated throughout; slightly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.

C3 - 29 to 48 inches; grayish brown (10YR 5/2) loamy coarse sand, dark grayish brown (10YR 4/2) moist; massive; thin stratifications; slightly hard, friable, nonsticky and

nonplastic; few fine roots; noneffervescent; moderately alkaline (pH 8.4).

Type Location - Niobrara County, Wyoming; refer to waypoint 100 on map included in this report.

Range in Soil Characteristics (According to Official Series Description) – This soil typically lacks horizons of continuous carbonate accumulation. Depth to carbonates ranges from 0 to 8 inches. Rock fragments are typically less than 5 percent but may range to 15 percent. Organic matter content decreases irregularly with depth; and thin, highly variable textural strata usually occur between 6 and 24 inches. The particle-size control section contains from 5 to 18 percent clay and is sandy loam, fine sandy loam or loam when averaged. The soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F and is never moist in all parts for as long as 60 consecutive days when the soil temperature at a depth of 20 inches is 41 degrees F, which occurs about April 21-27, but is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 52 degrees F, and the soil temperature at a depth of 20 inches is 41 degrees F or more for 175 to 192 days.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 7 dry and 3 to 6 moist, and chroma of 2 to 4. Texture typically is sandy loam or fine sandy loam but may range from loamy sand to clay loam depending upon the most recent deposition. Reaction ranges from neutral to moderately alkaline. It has an EC of 0 to 4 mmhos/cm. Nitrogen and phosphorus levels are not abnormally enriched. Some pedons have an AC horizon up to 8 inches thick.

The C horizon has hue of 7.5YR, 10YR or 2.5Y, value of 5 to 7 dry and 4 to 6 moist, and chroma of 2 to 4. Texture centers on sandy loam, fine sandy loam or loam, but strata of very fine sandy loam, loam, silt loam, loamy fine sand, loamy sand, fine sand or sand of varying thickness occur. Skeletal material may occur below 40 inches in some pedons. Reaction ranges from slightly alkaline to strongly alkaline. EC is typically 4 mmhos/cm or less but may range up to 8 when irrigated or where it receives saline discharge from surrounding shale beds.

Range in Characteristics (according to field observations, lab analysis): This profile has a natric C horizon, which is not typical of the series. Sandy clay loam is not a typical texture for the C horizons.

Taxonomic Class - Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torrifluvents

Suitability for Topsoil (According to WDEQ Guideline 1) – Saturation percentage was

marginal from 29-48 inches. Estimated stripping depth is 25 inches.

Geographic Setting (According to Official Series Description) – Clarkelen soils are on flood plains and terraces adjacent to floodplains. Slopes are 0 to 6 percent. The soils formed in stratified but dominantly moderately coarse textured recent stream alluvium originally weathered from sedimentary rock. Elevation is 3,500 to 6,200 feet. The average annual precipitation is 12 inches with over half falling in April, May, and June and less than one inch falling in each month of July, August, September, and October. Precipitation ranges from 10 to 14 inches. The mean annual air temperature ranges from 44 to 49 degrees F. The frost-free season is about 105 to 130 days.

ADDENDUM 3.3-E

SOIL LABORATORY ANALYSIS

LABORATORY ANALYTICAL REPORT

Client: BKS Environmental Associates Inc
Project: 539A Ludeman Uranium
Workorder: C08100869

Report Date: 12/17/08
Date Received: 10/17/08

		Analysis	EC SatPst	Saturation SatPst	pH SatPst	Ca SatPst	Mg SatPst	Na SatPst	SAR	Sand	Silt	Clay	Texture	Coarse Frags	Se-ABDTPA
		Units	mmhos/cm	%	s_u_	meq/L	meq/L	meq/L	unitless	%	%	%		%	mg/kg-dry
Sample ID	Client Sample ID	Depth	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results
C08100869-001	137	0-5	0.52	30.4	6.6	2.94	1.55	0.32	0.21	30	36	34	CL	< 1	0.018
C08100869-002	137	5-12	0.43	38.5	6.8	2.26	1.23	0.36	0.28	20	28	52	C	< 1	0.004
C08100869-003	137	12-19	0.77	31.8	7.0	4.61	2.3	0.5	0.28	26	38	36	CL	< 1	0.005
C08100869-004	138	0-4	0.48	31.0	7.2	3.11	1.14	0.31	0.21	72	12	16	SL	< 1	< 0.002
C08100869-005	138	4-15	0.37	35.2	7.4	2.40	0.82	0.24	0.19	68	18	14	SL	< 1	< 0.002
C08100869-006	139	0-7	4.08	73.3	7.2	27.0	17.7	9.7	2.06	38	32	30	CL	< 1	0.081
C08100869-007	139	7-20	1.98	45.1	7.4	10.8	6.4	4.8	1.65	42	34	24	L	< 1	0.013
C08100869-008	139	20-36	1.23	50.3	7.6	6.05	3.62	3.36	1.54	30	38	32	CL	< 1	0.012
C08100869-009	139	36-46	1.08	87.4	7.7	5.27	3.20	3.25	1.59	12	38	50	C	< 1	0.046
C08100869-010	139	46-60	1.05	67.3	7.7	5.70	3.07	2.23	1.07	18	44	38	SiCL	< 1	0.093
C08100869-011	140	0-9	0.63	54.1	7.6	4.58	1.76	0.16	0.09	52	22	26	SCL	< 1	0.005
C08100869-012	140	9-20	0.38	52.9	7.4	2.75	0.94	0.20	0.15	70	14	16	SL	< 1	0.005
C08100869-013	140	20-35	0.39	33.9	7.5	1.65	0.86	1.06	0.94	64	22	14	SL	< 1	0.004
C08100869-014	140	35-45	0.90	74.3	7.6	2.55	1.8	3.9	2.66	16	24	58	C	< 1	0.033
C08100869-015	140	45-55	1.69	87.2	7.9	6.83	4.6	8.5	2.71	26	20	54	C	< 1	0.155
C08100869-016	140	55-60	4.02	68.5	7.6	27.9	16.2	10.0	2.13	14	16	70	C	16	0.288
C08100869-017	141	0-11	0.85	19.3	7.2	4.30	2.14	0.30	0.17	62	12	26	SCL	5	0.005
C08100869-018	141	11-21	0.46	27.0	7.7	2.68	1.50	0.26	0.18	64	14	22	SCL	4	0.003
C08100869-019	142	0-8	0.59	25.8	7.8	3.81	1.16	0.23	0.15	82	8	12	SL	< 1	< 0.002
C08100869-020	142	8-16	0.58	22.3	7.9	3.68	1.10	0.25	0.16	78	10	12	SL	1	< 0.002
C08100869-021	146	0-9	0.73	47.2	7.4	5.63	1.36	0.59	0.32	25	20	55	C	4	0.026
C08100869-022	146	9-24	3.42	62.4	7.6	28.6	15.2	5.4	1.19	19	28	53	C	16	0.038
C08100869-023	148	0-9	1.19	38.2	7.0	8.13	4.88	0.53	0.21	53	25	22	SCL	3	0.007
C08100869-024	148	9-17	0.59	25.1	7.3	2.76	1.68	0.65	0.37	51	23	26	SCL	4	0.007
C08100869-025	148	17-24	0.53	37.5	8.1	2.44	1.69	0.76	0.54	43	30	27	CL - L	5	0.005
C08100869-026	148	24-37	0.35	29.5	8.2	1.25	1.07	1.02	0.95	63	15	22	SCL	5	0.004
C08100869-027	148	37-60	1.09	35.2	8.3	2.32	2.35	5.25	3.45	53	24	23	SCL	3	0.038
C08100869-028	150	0-5	0.36	28.8	7.3	2.22	0.66	0.34	0.28	73	12	15	SL	2	0.006
C08100869-029	150	5-12	0.24	27.1	7.7	1.62	0.49	0.15	0.15	75	11	14	SL	2	0.003
C08100869-030	150	12-20	0.33	26.6	8.3	2.08	0.67	0.22	0.19	83	8	9	LS	2	0.005
C08100869-031	150	20-35	0.92	15.8	8.4	5.91	2.34	1.33	0.66	81	10	9	LS	2	0.003
C08100869-032	151	0-7	2.74	55.7	7.6	24.7	8.65	3.02	0.74	33	29	38	CL	3	0.009
C08100869-033	151	7-24	0.39	28.1	7.7	1.65	1.10	1.01	0.87	11	39	50	C	11	0.029
C08100869-034	152	0-9	0.58	33.6	7.6	3.90	1.42	0.33	0.21	53	23	24	SCL	3	0.011
C08100869-035	152	9-19	0.38	39.9	7.6	1.72	0.93	0.78	0.68	51	19	30	SCL	3	0.016
C08100869-036	152	19-39	0.52	44.6	8.1	1.50	1.30	2.15	1.62	45	24	31	CL	2	0.008
C08100869-037	152	39-55	0.85	37.4	8.3	1.59	1.40	5.10	4.19	49	23	28	SCL	1	0.014
C08100869-038	152	55-60	1.00	52.7	8.3	1.23	1.43	7.03	6.11	53	13	34	SCL	3	0.025
C08100869-039	153	0-5	0.33	36.7	7.3	1.98	1.02	0.28	0.23	67	16	17	SL	< 1	0.008
C08100869-040	153	5-16	0.30	30.5	7.5	1.84	0.92	0.21	0.18	63	20	17	SL	< 1	0.005

ENERGY LABORATORIES
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LABORATORY ANALYTICAL REPORT

Client: BKS Environmental Associates Inc
Project: 539A Ludeman Uranium
Workorder: C08100869

Report Date: 12/17/08
Date Received: 10/17/08

		Analysis	B-CACL2	Organic Matter
		Units	mg/kg-dry	%
Sample ID	Client Sample ID	Depth	Results	Results
C08100869-001	137	0-5	0.54	1.8
C08100869-002	137	5-12	0.64	< 0.2
C08100869-003	137	12-19	0.48	0.8
C08100869-004	138	0-4	< 0.43	0.9
C08100869-005	138	4-15	< 0.44	0.6
C08100869-006	139	0-7	3.5	6.6
C08100869-007	139	7-20	1.3	1.5
C08100869-008	139	20-36	1.2	1.6
C08100869-009	139	36-46	1.1	1.0
C08100869-010	139	46-60	0.76	0.6
C08100869-011	140	0-9	0.45	2.1
C08100869-012	140	9-20	< 0.43	1.1
C08100869-013	140	20-35	< 0.43	0.6
C08100869-014	140	35-45	0.61	0.7
C08100869-015	140	45-55	1.1	0.6
C08100869-016	140	55-60	1.7	0.8
C08100869-017	141	0-11	< 0.44	0.8
C08100869-018	141	11-21	< 0.44	0.5
C08100869-019	142	0-8	< 0.43	0.4
C08100869-020	142	8-16	< 0.43	0.5
C08100869-021	146	0-9	0.70	2.1
C08100869-022	146	9-24	0.54	0.9
C08100869-023	148	0-9	< 0.43	1.2
C08100869-024	148	9-17	< 0.44	0.9
C08100869-025	148	17-24	< 0.43	0.7
C08100869-026	148	24-37	< 0.43	0.5
C08100869-027	148	37-60	1.3	0.5
C08100869-028	150	0-5	< 0.44	1.1
C08100869-029	150	5-12	< 0.43	0.9
C08100869-030	150	12-20	< 0.43	0.7
C08100869-031	150	20-35	< 0.43	0.3
C08100869-032	151	0-7	< 0.43	1.4
C08100869-033	151	7-24	< 0.43	0.8
C08100869-034	152	0-9	0.81	1.8
C08100869-035	152	9-19	0.70	1.1
C08100869-036	152	19-39	0.63	0.7
C08100869-037	152	39-55	1.3	0.4
C08100869-038	152	55-60	2.5	0.4
C08100869-039	153	0-5	< 0.43	1.4
C08100869-040	153	5-16	< 0.43	0.7

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LABORATORY ANALYTICAL REPORT

Client: BKS Environmental Associates Inc
Project: 539A Ludeman Uranium
Workorder: C08100869

Report Date: 12/17/08
Date Received: 10/17/08

Sample ID	Client Sample ID	Analysis	EC SatPst	Saturation SatPst	pH SatPst	Ca SatPst	Mg SatPst	Na SatPst	SAR	Sand	Silt	Clay	Texture	Coarse Frags	Se-ABDTPA
		Units	mmhos/cm	%	s_u_	meq/L	meq/L	meq/L	unitless	%	%	%		%	mg/kg-dry
		Depth	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results
C08100869-041	153	16-31	0.58	32.8	8.2	2.45	1.54	1.56	1.11	65	8	27	SCL	2	0.004
C08100869-042	153	31-46	0.60	34.5	8.4	1.14	1.08	3.07	2.92	59	11	30	SCL	4	0.012
C08100869-043	153	46-60	2.01	34.4	8.4	4.53	4.79	9.87	4.59	53	15	32	SCL	1	0.050
C08100869-044	154	0-7	0.86	33.2	7.6	2.92	2.43	2.84	1.80	49	18	33	SCL	2	0.018
C08100869-045	154	7-18	0.83	43.1	7.7	1.33	1.02	1.65	1.52	47	15	38	SC	7	0.009
C08100869-046	154	18-24	2.37	40.1	7.9	2.16	1.65	1.32	0.96	41	20	39	CL	3	0.032
C08100869-047	154	24-38	2.76	53.7	8.0	8.68	7.68	7.31	2.57	29	23	48	C	6	0.090
C08100869-048	155	0-11	0.23	33.3	7.8	1.15	0.73	0.32	0.33	48	18	34	SCL	6	0.006
C08100869-049	155	11-19	0.32	51.8	7.3	1.77	1.06	0.27	0.23	51	14	35	SCL - SC	4	0.004
C08100869-050	155	19-26	0.77	40.7	8.0	3.67	1.83	1.80	1.09	53	17	30	SCL	2	0.005
C08100869-051	155	26-37	0.54	35.7	8.2	1.58	1.17	2.52	2.15	65	8	27	SCL	3	0.006
C08100869-052	155	37-48	0.39	35.6	8.7	0.64	0.41	0.48	0.66	63	13	24	SCL	4	0.016
C08100869-053	155	48-60	1.34	46.3	8.1	5.40	3.91	4.15	1.93	71	7	22	SCL	2	0.078
C08100869-054	156	0-12	0.66	37.0	6.6	2.24	1.44	2.54	1.88	53	17	30	SCL	3	0.009
C08100869-055	156	12-29	1.65	65.0	7.7	5.59	3.60	8.42	3.94	13	27	60	C	8	0.106
C08100869-056	156	29-37	4.63	58.6	7.8	30.4	16.9	16.0	3.31	11	35	54	C	6	0.327
C08100869-057	156	37-53	3.62	45.1	7.6	23.3	12.2	12.0	2.85	33	22	45	C	6	0.229
C08100869-058	156	53-60	2.83	45.2	7.7	14.4	7.63	11.8	3.57	39	24	37	CL	3	0.159
C08100869-059	158	0-12	1.23	44.5	7.1	8.95	3.57	0.53	0.21	33	24	43	C	5	0.012
C08100869-060	158	12-25	0.81	39.8	7.6	6.11	2.57	0.50	0.24	39	25	36	CL	3	0.012
C08100869-061	158	25-33	0.44	34.4	7.9	3.02	1.40	0.49	0.33	61	19	20	SL - SCL	5	0.010
C08100869-062	158	33-48	0.59	27.2	8.0	2.70	1.61	1.85	1.26	63	15	22	SCL	2	0.014
C08100869-063	158	48-60	0.99	28.3	8.1	3.43	2.37	4.34	2.56	88	2	10	LS	1	0.009
C08100869-064	159	0-14	0.54	41.3	7.4	2.94	1.83	1.30	0.84	27	23	50	C	3	0.010
C08100869-065	159	14-28	1.63	44.7	7.9	6.89	5.24	5.28	2.15	31	27	42	C	4	0.031
C08100869-066	159	28-37	2.64	42.6	8.1	14.7	11.5	7.58	2.10	45	23	32	CL	5	0.069
C08100869-067	159	37-60	1.93	26.6	8.1	8.22	5.55	6.50	2.48	49	21	30	SCL	5	0.111
C08100869-068	160	0-13	0.48	39.5	7.5	3.04	1.86	0.96	0.61	33	33	34	CL	4	0.011
C08100869-069	160	13-21	0.69	37.9	8.1	3.00	1.88	2.70	1.73	33	27	40	C - CL	5	0.011
C08100869-070	160	21-33	1.92	33.4	8.1	6.86	5.76	6.63	2.46	39	25	36	CL	3	0.060
C08100869-071	160	33-55	1.71	42.3	8.1	7.14	4.31	6.03	2.53	25	33	42	C	4	0.103
C08100869-072	160	55-60	1.30	44.1	8.1	4.98	2.96	4.83	2.43	33	27	40	C - CL	4	0.086
C08100869-073	161	0-12	0.48	43.4	7.7	2.15	1.51	1.93	1.43	41	21	38	CL	3	0.010
C08100869-074	161	12-28	2.43	40.8	7.4	8.64	6.6	9.8	3.54	31	26	43	C	4	0.099
C08100869-075	161	28-46	5.44	41.3	7.6	21.5	14.4	10.6	2.50	27	29	44	C	6	0.265
C08100869-076	161	46-60	4.23	25.2	7.6	25.0	15.3	14.3	3.20	61	15	24	SCL	3	0.089
C08100869-077	162	0-12	0.47	35.9	7.2	2.68	1.40	0.65	0.60	29	31	40	C - CL	4	0.018
C08100869-078	163	0-7	1.22	38.5	7.4	8.84	3.97	1.08	0.43	25	35	40	C - CL	4	0.013
C08100869-079	163	7-20	3.73	39.8	7.8	20.9	15.1	13.5	3.19	23	41	36	CL	7	0.027
C08100869-080	163	20-29	7.98	38.9	8.2	17.1	38.8	55.0	10.5	22	58	20	SIL	6	0.074

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LABORATORY ANALYTICAL REPORT

Client: BKS Environmental Associates Inc
Project: 539A Ludeman Uranium
Workorder: C08100869

Report Date: 12/17/08
Date Received: 10/17/08

		Analysis	B-CACL2	Organic Matter
		Units	mg/kg-dry	%
Sample ID	Client Sample ID	Depth	Results	Results
C08100869-041	153	16-31	< 0.43	0.7
C08100869-042	153	31-46	0.58	0.4
C08100869-043	153	46-60	1.7	0.4
C08100869-044	154	0-7	0.59	1.0
C08100869-045	154	7-18	0.59	0.7
C08100869-046	154	18-24	0.70	0.5
C08100869-047	154	24-36	0.95	0.4
C08100869-048	155	0-11	< 0.43	1.0
C08100869-049	155	11-19	0.45	0.8
C08100869-050	155	19-26	0.65	0.7
C08100869-051	155	26-37	0.73	0.5
C08100869-052	155	37-48	1.2	0.4
C08100869-053	155	48-60	0.92	0.2
C08100869-054	156	0-12	< 0.44	0.9
C08100869-055	156	12-29	1.4	0.8
C08100869-056	156	29-37	1.8	0.5
C08100869-057	156	37-53	0.92	0.4
C08100869-058	156	53-60	0.55	0.4
C08100869-059	158	0-12	0.87	1.4
C08100869-060	158	12-25	0.78	0.8
C08100869-061	158	25-33	< 0.44	0.4
C08100869-062	158	33-48	0.45	0.5
C08100869-063	158	48-60	< 0.44	0.3
C08100869-064	159	0-14	0.63	1.1
C08100869-065	159	14-28	1.4	0.8
C08100869-066	159	28-37	1.3	0.5
C08100869-067	159	37-60	0.63	0.4
C08100869-068	160	0-13	< 0.43	1.3
C08100869-069	160	13-21	0.61	0.8
C08100869-070	160	21-33	0.90	0.6
C08100869-071	160	33-55	0.76	0.4
C08100869-072	160	55-60	0.64	0.5
C08100869-073	161	0-12	0.54	0.9
C08100869-074	161	12-28	1.5	0.7
C08100869-075	161	28-46	1.5	0.2
C08100869-076	161	46-60	0.49	< 0.2
C08100869-077	162	0-12	< 0.43	0.6
C08100869-078	163	0-7	0.53	1.0
C08100869-079	163	7-20	0.50	0.9
C08100869-080	163	20-29	2.1	0.2

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LABORATORY ANALYTICAL REPORT

Client: BKS Environmental Associates Inc
Project: 539A Ludeman Uranium
Workorder: C08100869

Report Date: 12/17/08
Date Received: 10/17/08

		Analysis	EC SatPst	Saturation SatPst	pH SatPst	Ca SatPst	Mg SatPst	Na SatPst	SAR	Sand	Silt	Clay	Texture	Coarse Frags	Se-ABDTPA
		Units	mmhos/cm	%	s_u_	meq/L	meq/L	meq/L	unitless	%	%	%		%	mg/kg-dry
Sample ID	Client Sample ID	Depth	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results
C08100869-081	163	29-37	12.1	41.0	8.3	19.8	65.4	93.6	14.4	61	19	20	SL - SCL	4	0.055
C08100869-082	163	37-50	15.0	35.0	8.3	24.6	86.3	121	16.3	63	15	22	SCL	5	0.045
C08100869-083	163	50-60	14.6	34.2	8.3	22.6	84.5	118	16.2	88	2	10	LS	5	0.035
C08100869-084	164	0-10	1.62	32.6	7.3	10.8	6.41	1.96	0.67	27	23	50	C	2	0.012
C08100869-085	164	10-20	0.53	28.9	7.9	2.76	1.98	1.02	0.66	31	27	42	C	3	0.008
C08100869-086	164	20-34	0.95	39.4	8.0	1.99	2.51	4.97	3.32	45	23	32	CL	8	0.077
C08100869-087	165	0-17	0.66	36.6	7.9	4.36	2.97	0.60	0.31	49	21	30	SCL	4	0.016
C08100869-088	165	17-27	0.64	37.1	8.4	1.80	2.88	2.43	1.59	33	33	34	CL	4	0.017
C08100869-089	165	27-36	1.24	29.8	8.4	1.67	4.34	6.96	4.04	33	27	40	C - CL	3	0.024
C08100869-090	165	36-48	5.12	31.6	8.2	19.5	32.5	20.3	4.01	39	25	36	CL	8	0.125
C08100869-091	165	48-60	6.11	31.6	8.2	20.0	40.5	27.9	5.09	25	33	42	C	< 1	0.276
C08100869-092	166	0-7	0.91	21.1	7.6	6.42	2.58	0.55	0.26	33	27	40	C - CL	4	0.008
C08100869-093	166	7-21	0.48	26.8	7.9	3.56	1.06	0.37	0.24	41	21	38	CL	4	0.005
C08100869-094	166	21-36	0.49	21.4	8.2	3.14	1.22	0.72	0.49	31	26	43	C	4	0.008
C08100869-095	166	36-48	0.69	20.1	7.8	4.21	2.32	0.90	0.50	27	29	44	C	2	0.006
C08100869-096	168	0-9	0.40	35.7	6.2	2.72	1.17	0.23	0.17	61	15	24	SCL	3	0.007
C08100869-097	168	9-29	0.22	29.0	6.6	0.87	0.37	0.11	0.13	29	31	40	C - CL	3	0.009
C08100869-098	168	29-41	0.23	27.0	6.9	1.58	0.65	0.21	0.20	25	35	40	C - CL	3	0.003
C08100869-099	168	41-51	0.30	26.3	7.0	1.86	0.86	0.39	0.34	23	41	36	CL	1	0.006
C08100869-100	168	51-60	0.20	25.8	7.0	1.15	0.54	0.30	0.33	22	58	20	SIL	3	0.008
C08100869-101	170	0-9	0.58	31.3	6.9	3.18	2.34	0.68	0.41	63	3	34	SCL	4	0.008
C08100869-102	170	9-29	0.67	33.7	7.8	2.65	2.68	1.87	1.15	33	37	30	CL	3	0.008
C08100869-103	170	29-40	1.27	31.1	8.1	3.77	4.98	5.35	2.58	45	23	32	CL	4	0.028
C08100869-104	170	40-60	3.90	35.4	7.9	26.3	18.5	12.6	2.86	39	29	32	CL	4	0.130
C08100869-105	171	0-7	0.74	36.2	7.6	5.02	2.60	0.66	0.34	33	31	36	CL	5	0.009
C08100869-106	172	0-12	0.40	21.4	7.1	3.12	1.46	0.21	0.14	61	17	22	SCL	2	0.009
C08100869-107	172	12-19	0.30	23.6	7.5	2.08	1.00	0.24	0.19	71	11	18	SL	2	0.008
C08100869-108	172	19-29	0.46	34.5	7.6	2.94	1.63	0.93	0.62	81	5	14	SL	4	0.007
C08100869-109	173	0-15	0.52	29.8	7.6	4.32	1.50	0.15	0.09	65	11	24	SCL	< 1	0.006
C08100869-110	173	15-31	0.42	31.9	8.0	2.29	2.01	0.15	0.10	59	17	24	SCL	< 1	0.004
C08100869-111	173	31-37	0.57	30.7	7.9	2.32	3.09	0.20	0.12	53	27	20	SL - SCL	< 1	0.004
C08100869-112	173	37-55	0.43	29.4	7.8	1.81	2.29	0.20	0.14	69	13	18	SL	1	0.004
C08100869-113	173	55-60	0.65	28.4	7.2	2.53	2.69	0.20	0.12	39	39	22	L	5	0.005
C08100869-114	174	0-3	0.51	38.4	7.1	3.89	1.50	0.28	0.17	33	35	32	CL	3	0.008
C08100869-115	174	3-10	0.43	40.5	7.5	2.58	0.79	1.24	0.98	29	27	44	C	3	0.008
C08100869-116	174	10-20	0.82	48.0	7.8	1.48	0.57	4.43	4.40	27	27	46	C	3	0.008
C08100869-117	174	20-36	5.45	48.3	7.6	32.4	13.6	22.9	4.78	29	21	50	C	3	0.132
C08100869-118	174	36-48	7.30	43.5	7.6	42.4	18.1	30.5	5.56	27	41	32	CL	3	0.716
C08100869-119	175	0-4	7.24	24.5	6.7	8.98	2.8	1.4	0.58	92	< 1	8	S	< 1	0.710
C08100869-120	175	4-17	1.24	32.0	6.9	3.67	1.71	0.56	0.34	51	17	32	SCL	10	0.009

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LABORATORY ANALYTICAL REPORT

Client: BKS Environmental Associates Inc
Project: 539A Ludeman Uranium
Workorder: C08100869

Report Date: 12/17/08
Date Received: 10/17/08

		Analysis	B-CACL2	Organic Matter
		Units	mg/kg-dry	%
Sample ID	Client Sample ID	Depth	Results	Results
C08100869-081	163	29-37	2.4	< 0.2
C08100869-082	163	37-50	1.2	< 0.2
C08100869-083	163	50-60	1.1	< 0.2
C08100869-084	164	0-10	0.44	0.8
C08100869-085	164	10-20	< 0.43	1.0
C08100869-086	164	20-34	0.59	0.6
C08100869-087	165	0-17	< 0.43	1.2
C08100869-088	165	17-27	0.52	0.5
C08100869-089	165	27-36	0.89	0.4
C08100869-090	165	36-48	2.2	0.4
C08100869-091	165	48-60	2.8	0.4
C08100869-092	166	0-7	< 0.44	1.0
C08100869-093	166	7-21	< 0.43	0.8
C08100869-094	166	21-36	< 0.43	0.4
C08100869-095	166	36-48	< 0.43	0.3
C08100869-096	168	0-9	< 0.43	4.0
C08100869-097	168	9-29	< 0.43	1.4
C08100869-098	168	29-41	< 0.43	1.1
C08100869-099	168	41-51	< 0.43	< 0.2
C08100869-100	168	51-60	< 0.43	0.5
C08100869-101	170	0-9	< 0.43	1.4
C08100869-102	170	9-29	0.75	0.8
C08100869-103	170	29-40	0.92	0.4
C08100869-104	170	40-60	1.8	0.4
C08100869-105	171	0-7	0.57	2.2
C08100869-106	172	0-12	< 0.44	1.1
C08100869-107	172	12-19	< 0.43	0.7
C08100869-108	172	19-29	< 0.43	0.6
C08100869-109	173	0-15	0.46	0.9
C08100869-110	173	15-31	< 0.44	0.5
C08100869-111	173	31-37	< 0.43	0.6
C08100869-112	173	37-55	< 0.43	0.5
C08100869-113	173	55-60	< 0.44	0.5
C08100869-114	174	0-3	0.51	2.5
C08100869-115	174	3-10	< 0.43	1.4
C08100869-116	174	10-20	0.59	1.0
C08100869-117	174	20-36	1.5	0.8
C08100869-118	174	36-48	1.2	0.8
C08100869-119	175	0-4	0.69	1.1
C08100869-120	175	4-17	0.75	1.2

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LABORATORY ANALYTICAL REPORT

Client: BKS Environmental Associates Inc
Project: 539A Ludeman Uranium
Workorder: C08100869

Report Date: 12/17/08
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		Analysis	EC SatPst	Saturation SatPst	pH SatPst	Ca SatPst	Mg SatPst	Na SatPst	SAR	Sand	Silt	Clay	Texture	Coarse Frags	Se-ABDTPA
		Units	mmhos/cm	%	s_u_	meq/L	meq/L	meq/L	unitless	%	%	%		%	mg/kg-dry
Sample ID	Client Sample ID	Depth	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results
C08100869-121	175	17-33	0.59	40.9	7.3	1.81	0.87	0.68	0.59	53	15	32	SCL	6	0.009
C08100869-122	175	33-41	0.32	40.6	7.7	1.30	0.65	1.81	1.84	69	11	20	SL - SCL	3	< 0.002
C08100869-123	175	41-48	0.62	39.6	8.0	1.67	0.85	3.55	3.17	51	15	34	SCL	11	< 0.002
C08100869-124	177	0-2	0.33	28.9	7.0	2.20	1.05	0.29	0.23	47	23	30	SCL	6	0.009
C08100869-125	177	2-15	0.19	31.5	6.8	1.25	0.51	0.22	0.24	41	25	34	CL	6	0.006
C08100869-126	178	0-2	0.30	29.1	6.8	1.70	0.85	0.11	0.10	69	19	12	SL	3	0.002
C08100869-127	178	2-12	0.32	24.7	7.2	1.91	0.92	0.16	0.13	71	11	18	SL	3	0.003
C08100869-128	178	12-18	0.15	24.3	7.2	1.02	0.48	0.16	0.19	63	19	18	SL	4	0.004
C08100869-129	178	18-29	0.28	25.0	7.7	1.81	0.79	0.28	0.24	73	3	24	SCL	2	< 0.002
C08100869-130	178	29-35	0.29	24.9	7.0	1.58	0.90	0.32	0.29	81	4	15	SL	2	< 0.002
C08100869-131	178	35-60	0.47	23.5	8.0	2.56	1.66	0.56	0.38	78	6	16	SL	3	< 0.002
C08100869-132	180	0-2	0.53	51.2	8.1	4.14	1.60	0.11	0.07	21	33	46	C	3	0.007
C08100869-133	180	2-12	0.39	40.4	6.8	2.90	0.95	0.26	0.19	37	23	40	C - CL	5	0.016
C08100869-134	180	12-19	0.72	49.8	6.8	6.18	2.03	0.71	0.35	33	29	38	CL	3	0.008
C08100869-135	180	19-37	1.22	34.4	7.2	9.67	3.44	0.89	0.35	41	23	36	CL	3	0.010
C08100869-136	181	0-2	0.51	30.8	6.7	3.94	1.60	0.50	0.30	63	13	24	SCL	1	0.006
C08100869-137	181	2-9	0.29	28.5	6.8	2.21	0.77	0.19	0.15	71	11	18	SL	3	0.004
C08100869-138	181	9-21	0.34	25.0	7.2	2.60	0.93	0.22	0.16	73	7	20	SL - SCL	3	0.002
C08100869-139	182	0-2	0.56	26.8	6.8	4.59	1.89	0.10	0.06	79	7	14	SL	< 1	0.005
C08100869-140	182	2-15	0.21	27.0	7.2	1.10	0.49	0.28	0.31	82	2	16	SL	< 1	0.003
C08100869-141	182	15-30	0.23	29.0	7.8	1.58	0.63	0.16	0.15	80	8	12	SL	< 1	< 0.002
C08100869-142	182	30-44	0.23	31.3	7.9	0.96	0.59	0.47	0.54	74	12	14	SL	< 1	0.002
C08100869-143	183	0-8	0.81	39.0	7.2	6.94	2.19	1.17	0.55	38	32	30	CL	3	0.012
C08100869-144	183	8-22	1.04	44.4	7.6	4.25	2.15	5.46	3.06	26	50	24	SIL - L	5	0.021
C08100869-145	184	0-8	0.33	34.8	7.1	2.85	0.72	0.22	0.17	54	26	20	SL - SCL	4	0.012
C08100869-146	184	8-17	0.44	35.7	7.2	3.61	1.18	0.29	0.19	42	28	30	CL	4	0.010
C08100869-147	185	0-2	0.60	31.0	7.2	4.30	1.98	0.23	0.13	62	24	14	SL	2	0.008
C08100869-148	185	2-19	0.35	29.7	7.0	2.25	1.13	0.22	0.17	61	17	22	SCL	2	0.006
C08100869-149	185	19-31	0.51	30.1	7.5	2.72	1.61	0.97	0.68	60	14	26	SCL	3	0.005
C08100869-150	185	31-48	0.68	23.4	7.6	2.64	1.72	2.41	1.64	70	10	20	SL - SCL	2	0.008
C08100869-151	186	0-8	0.67	25.7	7.6	2.73	1.72	2.33	1.56	28	42	30	CL	3	0.023
C08100869-152	186	8-18	0.49	34.1	7.0	4.01	1.81	0.28	0.16	48	20	32	SCL	5	0.015
C08100869-153	186	18-31	0.52	32.0	6.9	3.88	1.39	0.28	0.17	34	34	32	CL	5	0.016
C08100869-154	186	31-43	0.61	30.4	7.5	4.85	1.45	0.60	0.34	52	22	26	SCL	3	0.022
C08100869-155	186	43-69	0.79	32.2	7.0	6.20	2.30	0.63	0.31	50	20	30	SCL	3	0.027
C08100869-156	187	0-8	0.55	43.8	7.2	2.57	0.90	2.61	1.99	24	26	50	C	6	0.016
C08100869-157	187	8-17	2.09	95.1	7.5	10.1	4.00	9.70	3.66	18	30	52	C	6	0.052
C08100869-158	187	17-22	0.63	30.8	7.1	5.12	1.80	0.49	0.26	12	38	50	C	20	0.087
C08100869-159	188	0-9	0.35	29.6	7.6	2.64	1.14	0.19	0.14	62	18	20	SL - SCL	3	0.005
C08100869-160	188	9-21	0.37	29.4	8.0	1.96	1.45	0.56	0.43	72	8	20	SL - SCL	4	< 0.002

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LABORATORY ANALYTICAL REPORT

Client: BKS Environmental Associates Inc
Project: 539A Ludeman Uranium
Workorder: C08100869

Report Date: 12/17/08
Date Received: 10/17/08

Sample ID	Client Sample ID	Analysis / Units / Depth	B-CACL2 mg/kg-dry Results	Organic Matter % Results
C08100869-121	175	17-33	< 0.44	0.7
C08100869-122	175	33-41	< 0.43	0.5
C08100869-123	175	41-48	< 0.43	0.2
C08100869-124	177	0-2	< 0.43	2.5
C08100869-125	177	2-15	< 0.43	1.4
C08100869-126	178	0-2	< 0.43	2.6
C08100869-127	178	2-12	< 0.44	1.2
C08100869-128	178	12-18	0.51	0.9
C08100869-129	178	18-29	< 0.44	0.6
C08100869-130	178	29-35	< 0.43	0.3
C08100869-131	178	35-60	< 0.43	0.5
C08100869-132	180	0-2	0.62	5.1
C08100869-133	180	2-12	0.58	1.7
C08100869-134	180	12-19	0.75	1.1
C08100869-135	180	19-37	0.76	1.1
C08100869-136	181	0-2	< 0.44	1.6
C08100869-137	181	2-9	< 0.43	1.0
C08100869-138	181	9-21	0.51	0.5
C08100869-139	182	0-2	< 0.44	1.6
C08100869-140	182	2-15	< 0.43	0.3
C08100869-141	182	15-30	< 0.43	0.2
C08100869-142	182	30-44	< 0.43	< 0.2
C08100869-143	183	0-8	0.47	2.3
C08100869-144	183	8-22	0.64	1.3
C08100869-145	184	0-8	< 0.43	1.2
C08100869-146	184	8-17	< 0.43	0.9
C08100869-147	185	0-2	< 0.43	2.4
C08100869-148	185	2-19	< 0.43	0.8
C08100869-149	185	19-31	< 0.43	0.9
C08100869-150	185	31-48	0.44	0.3
C08100869-151	186	0-8	0.64	2.4
C08100869-152	186	8-18	0.49	1.2
C08100869-153	186	18-31	0.57	1.1
C08100869-154	186	31-43	< 0.43	1.0
C08100869-155	186	43-60	< 0.43	0.9
C08100869-156	187	0-8	0.54	1.2
C08100869-157	187	8-17	0.70	1.0
C08100869-158	187	17-22	< 0.43	0.6
C08100869-159	188	0-9	< 0.43	1.0
C08100869-160	188	9-21	< 0.43	0.6

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Client: BKS Environmental Associates Inc
Project: 539A Ludeman Uranium
Workorder: C08100869

Report Date: 12/17/08
Date Received: 10/17/08

		Analysis	EC SatPst	Saturation SatPst	pH SatPst	Ca SatPst	Mg SatPst	Na SatPst	SAR	Sand	Silt	Clay	Texture	Coarse Frags	Se-ABDTPA
		Units	mmhos/cm	%	s_u_	meq/L	meq/L	meq/L	unitless	%	%	%		%	mg/kg-dry
Sample ID	Client Sample ID	Depth	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results
C08100869-161	188	21-30	1.11	28.2	8.2	0.56	0.27	11.3	17.7	61	9	30	SCL	3	< 0.002
C08100869-162	188	30-48	0.57	37.4	7.0	0.67	1.55	4.40	4.19	65	7	28	SCL	5	< 0.002
C08100869-163	189	0-8	1.73	40.2	7.8	0.29	0.97	18.8	23.9	49	13	38	SC	5	0.006
C08100869-164	189	8-18	0.58	38.2	8.0	0.42	1.28	4.15	4.55	51	19	30	SCL	4	0.004
C08100869-165	189	18-24	2.17	26.7	7.3	0.31	2.39	23.9	20.7	33	33	34	CL	7	0.003
C08100869-166	190	0-3	1.14	39.6	7.3	0.31	0.93	11.4	14.6	69	19	12	SL	3	0.004
C08100869-167	190	3-14	0.81	28.9	7.9	0.49	0.93	7.18	8.54	61	11	28	SCL	3	0.003
C08100869-168	190	14-38	3.34	28.2	7.8	5.69	12.9	18.1	5.97	69	9	22	SCL	5	0.007
C08100869-169	190	38-48	0.50	31.5	7.4	0.54	0.96	4.08	4.73	61	17	22	SCL	2	0.075
C08100869-170	191	0-3	0.41	30.7	7.5	0.42	0.32	2.57	4.24	69	11	20	SL - SCL	1	< 0.002
C08100869-171	191	3-11	0.40	20.7	7.6	0.32	0.31	3.23	5.62	77	7	16	SL	3	0.007
C08100869-172	191	11-18	0.38	27.8	8.1	0.31	0.32	3.04	5.41	71	13	18	SL	1	0.006
C08100869-173	191	18-34	0.37	26.3	8.1	0.42	0.33	2.77	4.52	73	7	20	SL - SCL	6	0.006
C08100869-174	192	0-1	0.42	31.2	7.1	0.58	0.41	3.45	4.96	43	25	32	CL	6	0.006
C08100869-175	192	1-8	0.47	46.7	7.3	0.39	0.34	4.00	6.67	19	35	46	C	12	0.008
C08100869-176	193	0-3	2.12	27.8	6.6	5.66	2.79	0.44	0.21	45	25	30	CL	3	0.005
C08100869-177	193	3-10	0.45	36.5	7.5	3.10	1.59	0.61	0.40	25	31	44	C	6	0.009
C08100869-178	193	10-18	0.60	40.7	7.9	2.06	1.47	3.20	2.42	31	39	30	CL	4	0.010
C08100869-179	193	18-36	2.64	38.2	8.0	5.70	4.89	17.3	7.55	29	39	32	CL	5	0.173
C08100869-180	193	36-60	7.32	43.5	7.8	28.0	28.7	43.3	8.17	29	21	50	C	6	0.565
C08100869-181	194	0-8	0.92	37.1	7.5	6.35	2.96	1.31	0.61	38	22	40	C - CL	7	0.011
C08100869-182	194	8-17	0.48	39.2	8.0	3.28	2.21	0.42	0.26	24	42	34	CL	5	0.010
C08100869-183	194	17-32	0.72	35.7	8.4	1.64	2.32	3.87	2.78	26	38	36	CL	9	0.008
C08100869-184	194	32-44	7.09	37.6	8.1	28.9	44.5	30.6	5.07	30	30	40	C - CL	7	0.242
C08100869-185	195	0-9	1.54	21.4	7.3	9.67	5.61	1.87	0.68	74	16	10	SL	3	0.006
C08100869-186	195	9-18	0.52	21.0	7.4	3.76	1.55	0.29	0.18	72	12	16	SL	5	0.005
C08100869-187	195	18-37	0.55	21.2	7.8	4.16	1.46	0.35	0.21	74	14	12	SL	4	0.004
C08100869-188	195	37-48	0.55	21.7	8.0	3.06	1.93	0.31	0.20	73	13	14	SL	5	0.009
C08100869-189	197	0-4	0.85	22.3	7.1	2.47	1.12	0.08	0.06	64	22	14	SL	4	0.013
C08100869-190	197	4-10	0.26	24.0	7.3	1.73	0.82	0.18	0.16	70	6	24	SCL	9	0.013
C08100869-191	197	10-19	0.28	21.9	7.6	1.51	0.83	0.25	0.23	74	10	16	SL	3	0.008
C08100869-192	197	19-36	0.36	19.6	8.2	2.00	1.09	0.37	0.30	90	< 1	10	LS	2	0.007
C08100869-193	197	36-48	0.47	18.5	8.3	2.13	1.75	1.01	0.73	92	2	6	S	2	0.010
C08100869-194	198	0-6	0.34	21.2	6.6	1.95	1.08	0.44	0.36	66	20	14	SL	3	0.013
C08100869-195	198	6-22	0.50	24.7	7.4	2.76	1.97	0.49	0.32	54	26	20	SL - SCL	2	0.013
C08100869-196	199	0-3	0.72	28.7	6.0	3.86	1.72	0.13	0.08	52	26	22	SCL	4	0.015
C08100869-197	199	3-14	0.70	42.9	6.6	2.11	0.85	0.14	0.12	58	28	16	SL	4	0.016
C08100869-198	199	14-26	0.27	24.0	7.1	1.67	0.76	0.20	0.18	54	18	28	SCL	3	0.009
C08100869-199	199	26-43	0.17	30.3	7.2	1.00	0.45	0.23	0.27	56	14	30	SCL	2	0.010
C08100869-200	199	43-60	0.25	24.2	7.4	1.55	0.72	0.28	0.27	52	26	22	SCL	3	0.007

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Client: BKS Environmental Associates Inc
Project: 539A Ludeman Uranium
Workorder: C08100869

Report Date: 12/17/08
Date Received: 10/17/08

		Analysis	B-CACL2	Organic Matter
		Units	mg/kg-dry	%
Sample ID	Client Sample ID	Depth	Results	Results
C08100869-161	188	21-30	< 0.43	0.5
C08100869-162	188	30-46	< 0.44	0.4
C08100869-163	189	0-8	< 0.43	1.8
C08100869-164	189	8-18	< 0.44	1.0
C08100869-165	189	18-24	< 0.43	0.6
C08100869-166	190	0-3	< 0.43	2.6
C08100869-167	190	3-14	< 0.43	0.9
C08100869-168	190	14-38	0.50	0.6
C08100869-169	190	38-48	1.2	0.3
C08100869-170	191	0-3	< 0.44	2.4
C08100869-171	191	3-11	< 0.43	0.9
C08100869-172	191	11-18	< 0.43	0.5
C08100869-173	191	18-34	< 0.43	0.4
C08100869-174	192	0-1	< 0.44	1.2
C08100869-175	192	1-8	< 0.44	1.0
C08100869-176	193	0-3	< 0.43	1.7
C08100869-177	193	3-10	< 0.43	1.1
C08100869-178	193	10-18	0.51	0.7
C08100869-179	193	18-36	1.1	0.5
C08100869-180	193	36-60	0.74	0.4
C08100869-181	194	0-8	< 0.43	2.4
C08100869-182	194	8-17	< 0.43	1.6
C08100869-183	194	17-32	0.45	0.7
C08100869-184	194	32-44	2.0	0.6
C08100869-185	195	0-9	< 0.43	0.8
C08100869-186	195	9-18	< 0.43	0.7
C08100869-187	195	18-37	< 0.43	0.5
C08100869-188	195	37-48	0.64	0.3
C08100869-189	197	0-4	0.49	1.7
C08100869-190	197	4-10	0.68	0.8
C08100869-191	197	10-19	< 0.43	0.8
C08100869-192	197	19-36	< 0.43	0.2
C08100869-193	197	36-48	0.63	< 0.2
C08100869-194	198	0-6	0.58	0.9
C08100869-195	198	6-22	0.72	1.1
C08100869-196	199	0-3	0.44	5.1
C08100869-197	199	3-14	< 0.43	1.5
C08100869-198	199	14-26	< 0.43	1.1
C08100869-199	199	26-43	< 0.43	0.7
C08100869-200	199	43-60	< 0.44	1.0

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LABORATORY ANALYTICAL REPORT

Client: BKS Environmental Associates Inc
Project: 539A Ludeman Uranium
Workorder: C08100869

Report Date: 12/17/08
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Sample ID	Client Sample ID	Analysis / Depth	EC SatPst	Saturation SatPst	pH SatPst	Ca SatPst	Mg SatPst	Na SatPst	SAR	Sand	Silt	Clay	Texture	Coarse Frags	Se-ABDTPA
		Units	mmhos/cm	%	s_u_	meq/L	meq/L	meq/L	unitless	%	%	%		%	mg/kg-dry
		Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results
C08100869-201	201	0-2	0.51	27.4	7.1	3.16	2.06	0.14	0.09	60	20	20	SL - SCL	6	0.009
C08100869-202	201	2-10	0.50	37.2	7.5	2.94	2.22	0.45	0.28	62	< 1	38	SC	8	0.012
C08100869-203	201	10-31	0.49	30.7	8.2	2.23	2.75	2.06	1.31	40	26	34	CL	4	0.010
C08100869-204	201	31-42	1.09	29.9	8.3	2.68	3.47	4.98	2.84	44	26	30	CL	4	0.034
C08100869-205	201	42-48	4.20	32.1	8.1	23.2	21.3	13.0	2.76	46	22	32	SCL	4	0.094
C08100869-206	202	0-4	0.65	40.7	7.1	4.58	2.33	0.47	0.25	20	36	44	C	1	0.005
C08100869-207	202	4-17	0.58	46.4	7.6	4.24	1.43	0.85	0.50	14	42	44	SiC	12	0.007
C08100869-208	202	17-27	1.52	40.2	8.0	9.82	3.73	3.42	1.32	46	30	24	L	6	0.044
C08100869-209	202	27-36	3.02	36.8	7.4	22.2	11.2	6.35	1.56	48	26	26	SCL	9	0.218
C08100869-210	202	36-48	3.17	25.6	7.6	23.2	13.2	5.86	1.33	62	18	20	SL - SCL	3	0.151
C08100869-211	203	0-2	0.56	38.5	7.6	2.88	1.81	1.58	1.03	40	22	38	CL	4	0.012
C08100869-212	203	2-8	0.44	41.7	7.6	2.29	1.35	1.07	0.80	46	18	36	SC	6	0.007
C08100869-213	203	8-21	0.97	47.6	8.0	2.84	1.99	5.24	3.38	30	26	44	C	4	0.034
C08100869-214	203	21-40	5.59	48.6	7.9	28.8	20.6	24.4	4.93	28	46	26	L	9	0.347
C08100869-215	204	0-9	0.81	34.8	7.6	5.78	2.56	0.74	0.36	54	24	22	SCL	5	0.008
C08100869-216	204	9-22	0.57	31.4	8.2	3.10	1.86	1.11	0.70	60	20	20	SL - SCL	10	0.007
C08100869-217	204	22-29	3.68	32.3	8.4	22.3	14.6	11.3	2.63	62	14	24	SCL	3	0.073
C08100869-218	204	29-48	1.59	22.4	8.4	7.69	4.00	4.83	1.99	88	< 1	12	LS	< 1	0.018

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Workorder: C08100869

Report Date: 12/17/08
Date Received: 10/17/08

		Analysis	B-CACL2	Organic Matter
		Units	mg/kg-dry	%
Sample ID	Client Sample ID	Depth	Results	Results
C08100869-201	201	0-2	< 0.43	2.3
C08100869-202	201	2-10	< 0.43	1.2
C08100869-203	201	10-31	< 0.43	0.8
C08100869-204	201	31-42	0.72	0.5
C08100869-205	201	42-48	1.2	0.3
C08100869-206	202	0-4	0.52	2.4
C08100869-207	202	4-17	< 0.43	1.6
C08100869-208	202	17-27	0.48	1.0
C08100869-209	202	27-36	0.97	1.2
C08100869-210	202	36-45	0.48	0.6
C08100869-211	203	0-2	0.74	1.3
C08100869-212	203	2-8	0.52	1.2
C08100869-213	203	8-21	1.9	0.9
C08100869-214	203	21-40	1.9	0.7
C08100869-215	204	0-9	0.45	1.4
C08100869-216	204	9-22	0.68	0.4
C08100869-217	204	22-29	1.6	0.7
C08100869-218	204	29-48	0.65	0.9

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PSA Texture

Method: ASA mono # 9 15-5.2

Batch ID: 1.00
Date Started: 12/24/08

Test Code: PSA-TEXTURE-S
Analyst: CAYLAH

Sample #	40 Sec Read	40 Sec Temp °C	8 Hour Read	8 Hour Temp °C	Recheck Sand	Recheck Silt	Recheck Clay	Recheck Texture	Original Sand	Original Silt	Original Clay	Original Texture
1	6.00	17.0	5.00	22.5								
1												
C08100869-001 A	41.5	17.0	22.0	22.5	29	37	34	CL	30	36	34	CL
C08100869-002 A	54.0	17.0	36.0	22.5	4	34	62	C	20	28	52	C
C08100869-003 A	50.0	17.0	31.0	22.5	12	36	52	C	26	38	36	CL
C08100869-088 A	42.0	17.0	27.0	22.5	28	28	44	C	45	25	30	CL
C08100869-090 A	40.5	17.0	25.5	22.5	31	28	41	C	33	37	30	CL
C08100869-091 A	32.0	17.0	20.0	22.5	48	22	30	SCL	43	21	36	C
C08100869-092 A	23.0	17.0	17.0	22.5	66	10	24	SCL	81	9	10	C - CL
C08100869-094 A	18.0	17.0	15.0	22.5	76	4	20	SL - SCL	83	3	14	C
C08100869-095 A	21.0	17.0	16.5	22.5	70	7	23	SCL	87	1	12	C
C08100869-097 A	35.0	17.0	19.5	22.5	42	29	29	CL	51	31	18	C - CL
C08100869-098 A	32.0	17.0	13.0	22.5	48	36	16	L	51	33	16	C - CL
C08100869-103 A	37.0	17.0	27.0	22.5	38	18	44	C	45	23	32	CL
C08100869-104 A	39.0	17.0	27.0	22.5	34	22	44	C	39	29	32	CL
C08100869-129 A	21.0	17.0	16.0	22.5	70	8	22	SCL	73	3	24	SCL
C08100869-138 A	23.0	17.0	19.0	22.5	66	6	28	SCL	73	7	20	SL - SCL
C08100869-165 A	43.0	17.0	22.0	22.5	26	40	34	CL	33	33	34	CL
C08100869-168 A	27.0	17.0	22.0	22.5	58	8	34	SCL	69	9	22	SCL
C08100869-210 A	26.0	17.0	12.0	22.5	60	26	14	SL	62	18	20	SL - SCL

PSA Texture

Method: ASA mono # 9 15-5.2

Batch ID: 1.00
Date Started: 12/31/08

Test Code: PSA-TEXTURE-S
Analyst: Missy Linda

Sample #	40 Sec Read	40 Sec Temp °C	8 Hour Read	8 Hour Temp °C	Recheck Sand	Recheck Silt	Recheck Clay	Recheck Texture	Original Sand	Original Silt	Original Clay	Original Texture
1	6.00	19.0	5.00	23.0								
1												
C08100869-017 A	25.0	19.0	18.0	23.0	62	12	26	SCL	62	12	26	SCL
C08100869-018 A	24.5	19.0	15.5	23.0	66	13	21	SCL	64	14	22	SCL
C08100869-024 A	33.0	19.0	17.0	23.0	49	27	24	SCL	51	23	26	SCL
C08100869-025 A	36.5	19.0	20.0	23.0	42	28	30	CL	43	30	27	CL - L
C08100869-026 A	27.0	19.0	15.0	23.0	61	19	20	SL - SCL	63	15	22	SCL
C08100869-027 A	32.0	19.0	17.5	23.0	51	24	25	SCL	53	24	23	SCL
C08100869-053 A	23.0	19.0	15.0	23.0	69	11	20	SL - SCL	71	7	22	SCL
C08100869-061 A	29.5	19.0	16.0	23.0	56	22	22	SCL	61	19	20	SL - SCL
C08100869-062 A	31.0	19.0	15.0	23.0	53	27	20	SL - SCL	63	15	22	SCL
C08100869-076 A	27.0	19.0	16.0	23.0	61	17	22	SCL	61	15	24	SCL
C08100869-078 A	47.0	19.0	23.0	23.0	21	43	36	CL	25	35	40	C - CL
C08100869-079 A	46.5	19.0	22.5	23.0	22	43	35	CL	23	41	36	CL
C08100869-084 A	34.0	19.0	19.5	23.0	47	24	29	SCL	27	23	50	C
C08100869-085 A	38.0	19.0	20.0	23.0	39	31	30	CL	31	27	42	C
C08100869-086 A	39.5	19.0	13.0	23.0	36	48	16	L	45	23	32	CL
C08100869-099 A	28.5	19.0	13.5	23.0	58	25	17	SL	23	41	36	CL
C08100869-100 A	27.5	19.0	13.0	23.0	60	24	16	SL	22	58	20	SiL
C08100869-106 A	26.5	19.0	15.0	23.0	62	18	20	SL - SCL	61	17	22	SCL
C08100869-109 A	26.0	19.0	14.5	23.0	63	18	19	SL	65	11	24	SCL
C08100869-110 A	26.0	19.0	15.0	23.0	63	17	20	SL - SCL	59	17	24	SCL

LABORATORY ANALYTICAL REPORT

Client: Uranium One Americas
Project: 539A Ludeman Uranium
Workorder: C08100869

Report Date: 12/17/08
Date Received: 10/17/08

		Analysis	Sand	Silt	Clay	Texture	Coarse Frags
		Units	%	%	%		%
Sample ID	Client Sample ID	Depth	Results	Results	Results	Results	Results
C08100869-001	137	0-5	30	36	34	CL	< 1
C08100869-002	137	5-12	20	28	52	C	< 1
C08100869-003	137	12-19	26	38	36	CL	< 1
C08100869-004	138	0-4	72	12	16	SL	< 1
C08100869-005	138	4-15	68	18	14	SL	< 1
C08100869-006	139	0-7	38	32	30	CL	< 1
C08100869-007	139	7-20	42	34	24	L	< 1
C08100869-008	139	20-36	30	38	32	CL	< 1
C08100869-009	139	36-46	12	38	50	C	< 1
C08100869-010	139	46-60	18	44	38	SiCL	< 1
C08100869-011	140	0-9	52	22	26	SCL	< 1
C08100869-012	140	9-20	70	14	16	SL	< 1
C08100869-013	140	20-35	64	22	14	SL	< 1
C08100869-014	140	35-45	18	24	58	C	< 1
C08100869-015	140	45-55	26	20	54	C	< 1
C08100869-016	140	55-60	14	16	70	C	16
C08100869-017	141	0-11	62	12	26	SCL	5
C08100869-018	141	11-21	64	14	22	SCL	4
C08100869-019	142	0-8	82	6	12	SL	< 1
C08100869-020	142	8-16	78	10	12	SL	1
C08100869-021	146	0-9	25	20	55	C	4
C08100869-022	146	9-24	19	28	53	C	16
C08100869-023	148	0-9	53	25	22	SCL	3
C08100869-024	148	9-17	51	23	26	SCL	4
C08100869-025	148	17-24	43	30	27	CL - L	5
C08100869-026	148	24-37	63	15	22	SCL	5
C08100869-027	148	37-60	53	24	23	SCL	3
C08100869-028	150	0-5	73	12	15	SL	2
C08100869-029	150	5-12	75	11	14	SL	2
C08100869-030	150	12-20	83	8	9	LS	2
C08100869-031	150	20-35	81	10	9	LS	2
C08100869-032	151	0-7	33	29	38	CL	3
C08100869-033	151	7-24	11	39	50	C	11
C08100869-034	152	0-9	53	23	24	SCL	3
C08100869-035	152	9-19	51	19	30	SCL	3
C08100869-036	152	19-39	45	24	31	CL	2
C08100869-037	152	39-55	49	23	28	SCL	1
C08100869-038	152	55-60	53	13	34	SCL	3
C08100869-039	153	0-5	67	16	17	SL	< 1
C08100869-040	153	5-16	63	20	17	SL	< 1

LABORATORY ANALYTICAL REPORT

Client: Uranium One Americas
Project: 539A Ludeman Uranium
Workorder: C08100869

Report Date: 12/17/08
Date Received: 10/17/08

Sample ID	Client Sample ID	Analysis / Units / Depth	Sand % Results	Silt % Results	Clay % Results	Texture Results	Coarse Frags % Results
C08100869-041	153	16-31	65	8	27	SCL	2
C08100869-042	153	31-46	59	11	30	SCL	4
C08100869-043	153	46-60	53	15	32	SCL	1
C08100869-044	154	0-7	49	18	33	SCL	2
C08100869-045	154	7-18	47	15	38	SC	7
C08100869-046	154	18-24	41	20	39	CL	3
C08100869-047	154	24-36	29	23	48	C	6
C08100869-048	155	0-11	48	18	34	SCL	6
C08100869-049	155	11-19	51	14	35	SCL - SC	4
C08100869-050	155	19-26	53	17	30	SCL	2
C08100869-051	155	26-37	65	8	27	SCL	3
C08100869-052	155	37-48	63	13	24	SCL	4
C08100869-053	155	48-60	71	7	22	SCL	2
C08100869-054	156	0-12	53	17	30	SCL	3
C08100869-055	156	12-29	13	27	60	C	8
C08100869-056	156	29-37	11	35	54	C	6
C08100869-057	156	37-53	33	22	45	C	6
C08100869-058	156	53-60	39	24	37	CL	3
C08100869-059	158	0-12	33	24	43	C	5
C08100869-060	158	12-25	39	25	36	CL	3
C08100869-061	158	25-33	61	19	20	SL - SCL	5
C08100869-062	158	33-48	63	15	22	SCL	2
C08100869-063	158	48-60	88	2	10	LS	1
C08100869-064	159	0-14	27	23	50	C	3
C08100869-065	159	14-28	31	27	42	C	4
C08100869-066	159	28-37	45	23	32	CL	5
C08100869-067	159	37-60	49	21	30	SCL	5
C08100869-068	160	0-13	33	33	34	CL	4
C08100869-069	160	13-21	33	27	40	C - CL	5
C08100869-070	160	21-33	39	25	36	CL	3
C08100869-071	160	33-55	25	33	42	C	4
C08100869-072	160	55-60	33	27	40	C - CL	4
C08100869-073	161	0-12	41	21	38	CL	3
C08100869-074	161	12-28	31	26	43	C	4
C08100869-075	161	28-46	27	29	44	C	6
C08100869-076	161	46-60	61	15	24	SCL	3
C08100869-077	162	0-12	29	31	40	C - CL	4
C08100869-078	163	0-7	25	35	40	C - CL	4
C08100869-079	163	7-20	23	41	36	CL	7
C08100869-080	163	20-29	22	58	20	SiL	6

LABORATORY ANALYTICAL REPORT

Client: Uranium One Americas
Project: 539A Ludeman Uranium
Workorder: C08100869

Report Date: 12/17/08
Date Received: 10/17/08

		Analysis	Sand	Silt	Clay	Texture	Coarse Frags
		Units	%	%	%		%
Sample ID	Client Sample ID	Depth	Results	Results	Results	Results	Results
C08100869-081	163	29-37	29	41	30	CL	4
C08100869-082	163	37-50	31	39	30	CL	5
C08100869-083	163	50-60	33	33	34	CL	5
C08100869-084	164	0-10	47	25	28	SCL	2
C08100869-085	164	10-20	41	27	32	CL	3
C08100869-086	164	20-34	39	25	36	CL	8
C08100869-087	165	0-17	31	37	32	CL	4
C08100869-088	165	17-27	45	25	30	CL	4
C08100869-089	165	27-36	42	26	32	CL	3
C08100869-090	165	36-48	33	37	30	CL	8
C08100869-091	165	48-60	43	21	36	CL	< 1
C08100869-092	166	0-7	81	9	10	LS	4
C08100869-093	166	7-21	73	11	16	SL	4
C08100869-094	166	21-36	83	3	14	SL	4
C08100869-095	166	36-48	87	1	12	LS	2
C08100869-096	168	0-9	39	37	24	L	3
C08100869-097	168	9-29	51	31	18	L	3
C08100869-098	168	29-41	51	33	16	L	3
C08100869-099	168	41-51	62	18	20	SL - SCL	1
C08100869-100	168	51-60	63	19	18	SL	3
C08100869-101	170	0-9	63	3	34	SCL	4
C08100869-102	170	9-29	33	37	30	CL	3
C08100869-103	170	29-40	45	23	32	CL	4
C08100869-104	170	40-60	39	29	32	CL	4
C08100869-105	171	0-7	33	31	36	CL	5
C08100869-106	172	0-12	61	17	22	SCL	2
C08100869-107	172	12-19	71	11	18	SL	2
C08100869-108	172	19-29	81	5	14	SL	4
C08100869-109	173	0-15	65	11	24	SCL	< 1
C08100869-110	173	15-31	59	17	24	SCL	< 1
C08100869-111	173	31-37	53	27	20	SL - SCL	< 1
C08100869-112	173	37-55	69	13	18	SL	1
C08100869-113	173	55-60	39	39	22	L	5
C08100869-114	174	0-3	33	35	32	CL	3
C08100869-115	174	3-10	29	27	44	C	3
C08100869-116	174	10-20	27	27	46	C	3
C08100869-117	174	20-36	29	21	50	C	3
C08100869-118	174	36-48	27	41	32	CL	3
C08100869-119	175	0-4	92	< 1	8	S	< 1
C08100869-120	175	4-17	51	17	32	SCL	10

LABORATORY ANALYTICAL REPORT

Client: Uranium One Americas
Project: 539A Ludeman Uranium
Workorder: C08100869

Report Date: 12/17/08
Date Received: 10/17/08

		Analysis	Sand	Silt	Clay	Texture	Coarse Frags
		Units	%	%	%		%
Sample ID	Client Sample ID	Depth	Results	Results	Results	Results	Results
C08100869-121	175	17-33	53	15	32	SCL	6
C08100869-122	175	33-41	69	11	20	SL - SCL	3
C08100869-123	175	41-48	51	15	34	SCL	11
C08100869-124	177	0-2	47	23	30	SCL	8
C08100869-125	177	2-15	41	25	34	CL	6
C08100869-126	178	0-2	69	19	12	SL	3
C08100869-127	178	2-12	71	11	18	SL	3
C08100869-128	178	12-18	63	19	18	SL	4
C08100869-129	178	18-29	73	3	24	SCL	2
C08100869-130	178	29-35	81	4	15	SL	2
C08100869-131	178	35-60	78	6	16	SL	3
C08100869-132	180	0-2	21	33	46	C	9
C08100869-133	180	2-12	37	23	40	C - CL	5
C08100869-134	180	12-19	33	29	38	CL	3
C08100869-135	180	19-37	41	23	36	CL	3
C08100869-136	181	0-2	63	13	24	SCL	1
C08100869-137	181	2-9	71	11	18	SL	3
C08100869-138	181	9-21	73	7	20	SL - SCL	3
C08100869-139	182	0-2	79	7	14	SL	< 1
C08100869-140	182	2-15	82	2	16	SL	< 1
C08100869-141	182	15-30	80	8	12	SL	< 1
C08100869-142	182	30-44	74	12	14	SL	< 1
C08100869-143	183	0-8	38	32	30	CL	3
C08100869-144	183	8-22	26	50	24	SIL - L	5
C08100869-145	184	0-8	54	26	20	SL - SCL	4
C08100869-146	184	8-17	42	28	30	CL	4
C08100869-147	185	0-2	62	24	14	SL	2
C08100869-148	185	2-19	61	17	22	SCL	2
C08100869-149	185	19-31	60	14	26	SCL	3
C08100869-150	185	31-48	70	10	20	SL - SCL	2
C08100869-151	186	0-8	28	42	30	CL	3
C08100869-152	186	8-18	48	20	32	SCL	5
C08100869-153	186	18-31	34	34	32	CL	5
C08100869-154	186	31-43	52	22	26	SCL	3
C08100869-155	186	43-60	50	20	30	SCL	3
C08100869-156	187	0-8	24	26	50	C	6
C08100869-157	187	8-17	18	30	52	C	6
C08100869-158	187	17-22	12	38	50	C	20
C08100869-159	188	0-9	62	18	20	SL - SCL	3
C08100869-160	188	9-21	72	8	20	SL - SCL	4

LABORATORY ANALYTICAL REPORT

Client: Uranium One Americas
Project: 539A Ludeman Uranium
Workorder: C08100869

Report Date: 12/17/08
Date Received: 10/17/08

		Analysis	Sand	Silt	Clay	Texture	Coarse Frags
		Units	%	%	%		%
Sample ID	Client Sample ID	Depth	Results	Results	Results	Results	Results
C08100869-161	189	21-30	61	9	30	SCL	3
C08100869-162	189	30-48	65	7	28	SCL	5
C08100869-163	189	0-8	49	13	39	SC	5
C08100869-164	189	8-18	51	19	30	SCL	4
C08100869-165	189	18-24	33	33	34	CL	7
C08100869-166	190	0-3	69	19	12	SL	3
C08100869-167	190	3-14	61	11	28	SCL	3
C08100869-168	190	14-38	69	9	22	SCL	5
C08100869-169	190	38-48	61	17	22	SCL	2
C08100869-170	191	0-3	69	11	20	SL - SCL	1
C08100869-171	191	3-11	77	7	16	SL	3
C08100869-172	191	11-18	71	13	16	SL	1
C08100869-173	191	18-34	73	7	20	SL - SCL	6
C08100869-174	192	0-1	43	25	32	CL	6
C08100869-175	192	1-8	19	35	46	C	12
C08100869-176	193	0-3	45	25	30	CL	3
C08100869-177	193	3-10	25	31	44	C	6
C08100869-178	193	10-18	31	39	30	CL	4
C08100869-179	193	18-36	29	39	32	CL	5
C08100869-180	193	36-60	29	21	50	C	6
C08100869-181	194	0-8	38	22	40	C - CL	7
C08100869-182	194	8-17	24	42	34	CL	5
C08100869-183	194	17-32	26	38	36	CL	9
C08100869-184	194	32-44	30	30	40	C - CL	7
C08100869-185	195	0-9	74	16	10	SL	3
C08100869-186	195	9-18	72	12	16	SL	5
C08100869-187	195	18-37	74	14	12	SL	4
C08100869-188	195	37-48	73	13	14	SL	5
C08100869-189	197	0-4	64	22	14	SL	4
C08100869-190	197	4-10	70	6	24	SCL	9
C08100869-191	197	10-19	74	10	16	SL	3
C08100869-192	197	19-36	90	< 1	10	LS	2
C08100869-193	197	36-48	92	2	6	S	2
C08100869-194	198	0-6	66	20	14	SL	3
C08100869-195	198	6-22	54	26	20	SL - SCL	2
C08100869-196	199	0-3	52	26	22	SCL	4
C08100869-197	199	3-14	58	26	16	SL	4
C08100869-198	199	14-26	54	18	28	SCL	3
C08100869-199	199	26-43	56	14	30	SCL	2
C08100869-200	199	43-60	52	26	22	SCL	3

LABORATORY ANALYTICAL REPORT

Client: Uranium One Americas
Project: 539A Ludeman Uranium
Workorder: C08100869

Report Date: 12/17/08
Date Received: 10/17/08

		Analysis	Sand	Silt	Clay	Texture	Coarse Frags
		Units	%	%	%		%
Sample ID	Client Sample ID	Depth	Results	Results	Results	Results	Results
C08100869-201	201	0-2	60	20	20	SL - SCL	6
C08100869-202	201	2-10	62	< 1	38	SC	8
C08100869-203	201	10-31	40	26	34	CL	4
C08100869-204	201	31-42	44	26	30	CL	4
C08100869-205	201	42-48	46	22	32	SCL	4
C08100869-206	202	0-4	20	36	44	C	1
C08100869-207	202	4-17	14	42	44	SiC	12
C08100869-208	202	17-27	46	30	24	L	6
C08100869-209	202	27-36	48	26	26	SCL	9
C08100869-210	202	36-48	62	18	20	SL - SCL	3
C08100869-211	203	0-2	40	22	38	CL	4
C08100869-212	203	2-8	46	18	36	SC	6
C08100869-213	203	8-21	30	26	44	C	4
C08100869-214	203	21-40	28	46	26	L	9
C08100869-215	204	0-9	54	24	22	SCL	5
C08100869-216	204	9-22	60	20	20	SL - SCL	10
C08100869-217	204	22-29	62	14	24	SCL	3
C08100869-218	204	29-48	88	< 1	12	LS	< 1

ADDENDUM 3.3-F

PRIME FARMLAND DESIGNATION

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
1954 E, Richards, #10
Douglas, Wyoming 82633

November 24, 2008

Adam Beilke
BKS Environmental Associates Inc.
P.O. Box 3467
Gillette, WY 82717

Adam,

No prime farmland exists on the previously identified legal descriptions you provided for the proposed uranium mine area north of Glenrock. The enclosed maps and descriptions are that verification.

Tim

Tim Schroeder
District Conservationist
Douglas NRCS

Helping People Help the Land

An Equal Opportunity Provider and Employer

Farmland Classification

Aggregation Method: No Aggregation Necessary
Tie-break Rule: Lower

Converse County, Wyoming, Southern Part
Survey Area Version and Date: 6 - 09/15/2008

Map symbol	Map unit name	Rating
122	Clarkelen fine sandy loam, overflow, 0 to 3 percent slopes	Not prime farmland
123	Clarkelen fine sandy loam, wet, 0 to 3 percent slopes	Not prime farmland
125	Clarkelen, wet-Haverdad, wet-Bigwinder complex, 0 to 3 percent slopes	Not prime farmland
127	Clarkelen-Draknab complex, wet, 0 to 3 percent slopes	Not prime farmland
128	Clarkelen-Dwyer-Orpha association, 0 to 10 percent slopes	Not prime farmland
129	Clarkelen-Haverdad-Bigwinder complex, 0 to 3 percent slopes	Not prime farmland
138	Draknab loamy fine sand, wet, 0 to 3 percent slopes	Not prime farmland
140	Dune land-Orpha complex, 10 to 30 percent slopes	Not prime farmland
141	Dwyer-Orpha loamy sands, 3 to 15 percent slopes	Not prime farmland
152	Forkwood-Cambria loams, 0 to 6 percent slopes	Not prime farmland
154	Forkwood-Cambria-Cushman loams, 6 to 15 percent slopes	Not prime farmland
155	Forkwood-Ulm complex, 0 to 6 percent slopes	Not prime farmland
158	Gravel pits and quarries	Not prime farmland
164	Haverdad loam, wet, 0 to 3 percent slopes	Not prime farmland
165	Haverdad-Clarkelen complex, lowlands, 0 to 3 percent slopes, rarely flooded	Not prime farmland
167	Haverdad-Clarkelen complex, wet, 0 to 3 percent slopes	Not prime farmland
171	Hiland-Bowbac sandy loams, 0 to 6 percent slopes	Not prime farmland
172	Hiland-Bowbac fine sandy loams, 0 to 6 percent slopes	Not prime farmland
173	Hiland-Bowbac fine sandy loams, 6 to 15 percent slopes	Not prime farmland
175	Hiland-Bowbac complex, 6 to 15 percent slopes	Not prime farmland
179	Keeline fine sandy loam, 0 to 6 percent slopes	Not prime farmland
182	Keeline-Kishona complex, 0 to 6 percent slopes	Not prime farmland
183	Keeline-Kishona-Theedle complex, 6 to 30 percent slopes	Not prime farmland
184	Keeline-Turnercrest fine sandy loams, 3 to 10 percent slopes	Not prime farmland
186	Keyner-Absted-Slickspots complex, 0 to 6 percent slopes	Not prime farmland
187	Kishona-Cambria loams, 0 to 6 percent slopes	Not prime farmland
189	Kishona-Cambria-Theedle loams, 3 to 20 percent slopes	Not prime farmland
225	Samday-Shingle-Worf complex, 3 to 15 percent slopes	Not prime farmland
226	Samday-Shingle-Worf, loamy complex, 3 to 15 percent slopes	Not prime farmland
230	Shingle-Badland-Samday complex, 10 to 30 percent slopes	Not prime farmland
233	Shingle-Taluce-Badland complex, 10 to 40 percent slopes	Not prime farmland
237	Sunup-Threetop-Rock outcrop complex, 10 to 40 percent slopes	Not prime farmland
238	Taluce-Badland-Turnercrest complex, 6 to 50 percent slopes	Not prime farmland
239	Taluce-Shingle complex, 6 to 30 percent slopes	Not prime farmland
243	Taluce-Tullock-Vonalee association, 6 to 30 percent slopes	Not prime farmland
244	Taluce-Turnercrest-Keeline fine sandy loams, 3 to 20 percent slopes	Not prime farmland
245	Tassel-Shingle complex, 2 to 30 percent slopes	Not prime farmland
248	Tassel-Tullock-Vonalee association, 6 to 30 percent slopes	Not prime farmland
250	Theedle-Kishona loams, 6 to 15 percent slopes	Not prime farmland
251	Theedle-Kishona-Shingle loams, 3 to 30 percent slopes	Not prime farmland
255	Ulm loam, 0 to 6 percent slopes	Not prime farmland
257	Ulm-Bidman complex, 0 to 6 percent slopes	Not prime farmland
258	Ulm-Forkwood loams, 0 to 6 percent slopes	Not prime farmland
259	Ulm-Renohill clay loams, 0 to 6 percent slopes	Not prime farmland
260	Ulm-Renohill clay loams, 6 to 15 percent slopes	Not prime farmland
263	Ustic Torriorthents, gullied, 3 to 45 percent slopes	Not prime farmland
264	Vonalee fine sandy loam, 0 to 6 percent slopes	Not prime farmland

USDA Natural Resources Conservation Service

Application Version: 5.0.002.0008

11/14/2008

Page 1 of 3

Farmland Classification

Aggregation Method: No Aggregation Necessary
Tie-break Rule: Lower

Converse County, Wyoming, Southern Part
Survey Area Version and Date: 6 - 09/15/2008

Map symbol	Map unit name	Rating
265	Vonalee-Terro fine sandy loams, 0 to 6 percent slopes	Not prime farmland
266	Vonalee-Terro fine sandy loams, 6 to 15 percent slopes	Not prime farmland
267	Water	Not prime farmland
269	Worf-Shingle-Taluce complex, 3 to 30 percent slopes	Not prime farmland
270	Worf-Shingle-Tassel complex, 3 to 30 percent slopes	Not prime farmland

Farmland Classification

Rating Options

Attribute Name: Farmland Classification

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Aggregation Method: No Aggregation Necessary

Aggregation is the process by which a set of component attribute values is reduced to a single value to represent the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. The components in the map unit name represent the major soils within a map unit delineation. Minor components make up the balance of the map unit. Great differences in soil properties can occur between map unit components and within short distances. Minor components may be very different from the major components. Such differences could significantly affect use and management of the map unit. Minor components may or may not be documented in the database. The results of aggregation do not reflect the presence or absence of limitations of the components which are not listed in the database. An on-site investigation is required to identify the location of individual map unit components.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

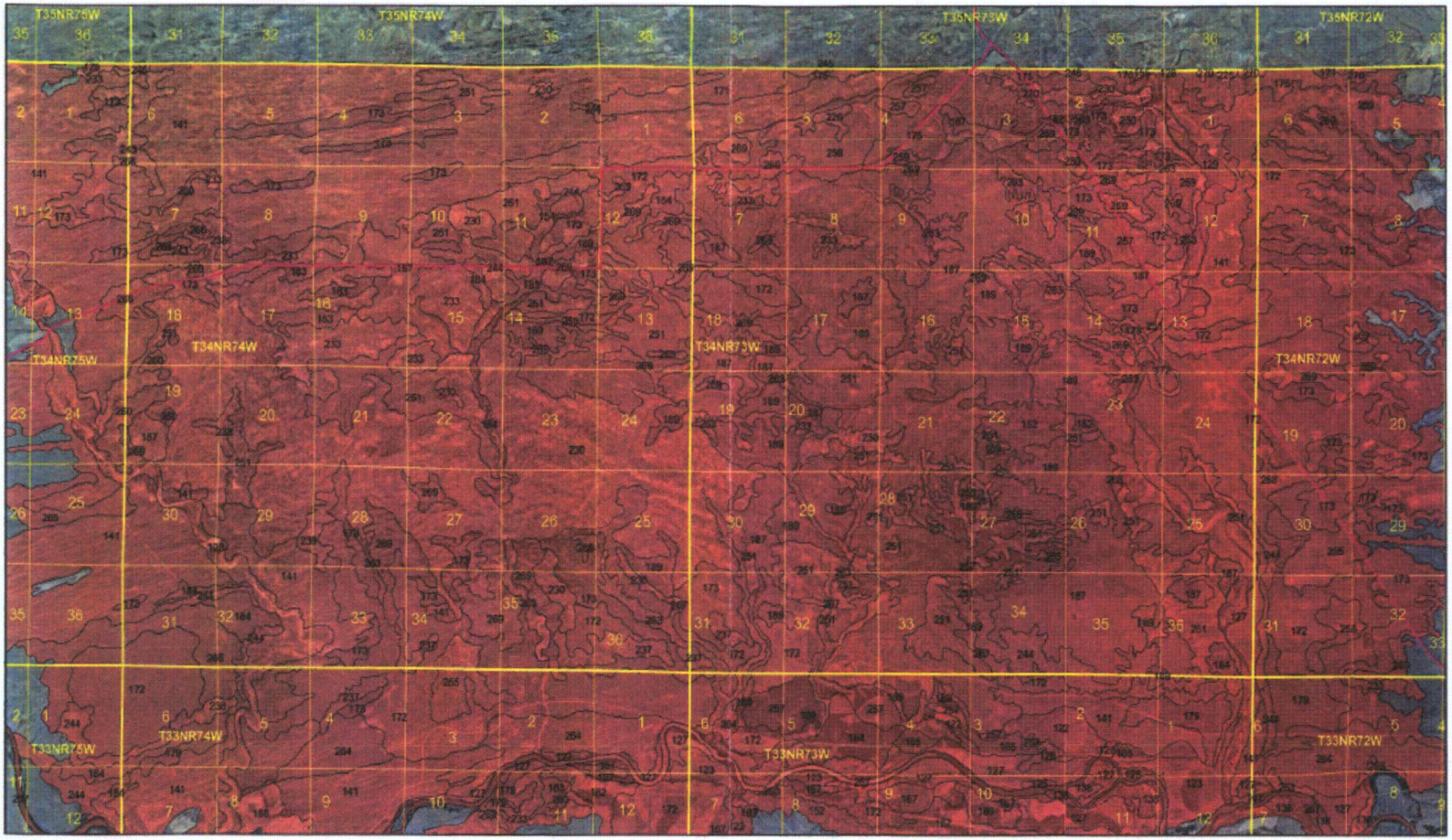
For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be generated. Aggregation must be done because, on any soil map, map units are delineated but components are not. The majority of soil attributes are associated with a component of a map unit, and such an attribute has to be aggregated to the map unit level before a thematic map can be rendered. Map units, however, also have their own attributes. An attribute of a map unit does not have to be aggregated in order to render a corresponding thematic map. Therefore, the "aggregation method" for any attribute of a map unit is referred to as "No Aggregation Necessary".

Tie-break Rule: Lower

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Glenrock, WY Uranium Project Area

November 14, 2008



South Converse County, Wyoming Soil Survey Area

Red Polygons - Not prime farmland

1:60,000

ADDENDUM 3.3-G

SOILS MAP

The 1 Drawing specifically referenced in the Table of Contents has been processed into ADAMS

This drawing can be accessed by the NRC staff within the ADAMS package or by performing a search on the Document/Report Number

D-01

ADDENDUM 3.3-H

PROFESSIONAL CERTIFICATIONS

ARCPACS

A Federation of Certifying Boards in Agriculture, Biology, Earth and Environmental Sciences

Certifies that

Brenda K. Schladweiler, BS

Subscribes to the Code of Ethics and has met the requirements established for the certification of

as a

Certified Professional Soil Scientist

Certification effective from:
1/1/2009 to 12/31/2010
Number: 15269

SSSA President

Soils Certifying Board Chair

ARCPACS is a membership service of the American Society of Agronomy