Appendix C

MV-5 Data

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Table C−1. MV-5 Chronology

Date	Time	Depth (ft bgs)	Activity
05/09/09 through 05/10/09	NA	NA	Move rig and equipment from MV-4 pad to MV-5 pad and prepare to drill MV-5.
05/10/09	12:10	0	Rig inspection and drill pad walk through inspection, continue with preparations for drilling.
05/10/09	14:00	0	Begin drilling 31-inch diameter conductor casing borehole.
05/11/09	01:00	100	Advanced 31-inch borehole to completion depth.
05/11/09	12:00	100	Completed tripping out of hole, setting, and cementing 24-inch diameter CS surface casing with 210 ft^3 cement.
05/11/09	19:10	100	Begin drilling 12.25-inch borehole using conventional mud rotary method, switch to flooded reverse circulation method at about 265 ft.
05/12/09	11:45	265	Drillers helper received a minor cut to the forehead when his wrench slipped off a nut he was tightening—an incident report was prepared.
05/12/09	13:55	270	Sampling of drill fluid for tritium and bromide begins.
05/15/09	00:36	1,840	Deviation tool lost down hole during survey at 1,800 ft.
05/15/09	15:46	1,840	Resume drilling advance after tripping drill string out of hole to retrieve deviation tool and tripping drill string back in hole.
05/16/09	16:50	2,298.5	Tritium in drill fluid sample measured at 22,521 pCi/L caused drilling to be shut down. Reanalysis of sample yielded normal BG levels of tritium.
05/16/09	18:55	2,298.5	Resume drilling.
05/16/09	22:48	2,400	TD of borehole reached.
05/17/09	07:55	NA	Circulate fluids in borehole and tripped out drill string.
05/17/09	12:25	NA	COLOG arrives and begins first phase of logging.
05/18/09	14:10	NA	COLOG completes first phase of logging and leaves MV-5 pad.
05/18/09	20:45	NA	Finish tripping in NQ tremie pipe and piezometer to 1,100 ft.
05/19/09	08:37	NA	Finish tripping in 5.5-inch well casing and complete pipe tally—2,206.14 ft is landed.
05/19/09	14:38	NA	Finish mixing and placing cement through NQ tremie pipe and tagged depth at 2,232 ft.
05/20/09	11:45	NA	Washed out obstruction by circulating through AQ and NQ tremie pipe so that COLOG could get NAIL tool down to 2,232-ft.
05/20/09	23:05	NA	Completed placing 1/8 to 1/4 inch gravel to depth of 1,778 ft.
05/21/09	01:29	NA	Completed placing No. 6 sand to depth of 1,753 ft and 3/8 inch bentonite chips to depth of 1,749 ft.
05/21/09	10:03	NA	Completed placing cement between well and piezometer, tagged top of cement at 1,120 ft.
05/21/09	20:20	NA	Completed installation of gravel, sand, and bentonite for piezometer, COLOG completes final logging run and leaves site.
05/22/09	07:40	NA	Completed cementing well and piezometer casing to surface.
05/22/09	21:30	NA	Completed tripping in HQ eductor and AQ airline and start air lift development of well.
05/24/09	09:30	NA	Completed air lift development of well and started tripping out HQ eductor and AQ airline.
05/24/09	20:00	NA	Trip in airline to piezometer and start air lift development of piezometer.

Table C−1 (continued). MV-5 Chronology

Date	Time	Depth (ft bgs)	Activity
05/25/09	08:50	NA	Completed air lift development of piezometer and tripped out airline.
06/04/09	06:00	NA	Pump crew begins installing Grundfos® 10S50-58DS stainless-steel pump in MV-5.
06/05/09	14:30	NA	Pump crew completes Grundfos® pump installation, intake set at 1,801 ft.
06/05/09	18:37	NA	Began final development of MV-5 well and sampling from pump - Started falling head test.
06/06/09	13:37	NA	Completed final development of MV-5 for the day - ended falling head test.
06/06/09	14:37	NA	Start rising head test (monitored recovery of water levels).
06/07/09	07:40	NA	End rising head test.
06/07/09	10:20	NA	Begin pumping and sampling, final development.
06/07/09	22:20	NA	End pumping and sampling.
06/08/09	06:30	NA	Begin pumping and sampling, final development.
06/09/09	09:30	NA	End pumping and sampling, final development of MV-5 well completed.

NA = Not applicable

Table C−2. CNTA MV-5 Well Construction Materials

Construction	Material	Type	Interval (ft)	Stemming Material	Volume (ft^3)	Interval (ft)
Surface Casing	24-in. CS Casing	Blank	0.0 – 100.0	Cement Seal	210	0.0 – 100.0
Piezometer Casing	2.375-in. CS Flush Joint Tubing	Blank	+0.6 – 1,017.70	3/8-in. Bentonite Chips	6.2	960.0 – 970.0
		Screen	1,017.70 – 1,077.70	No. 6 Sand Pack	16.9	970.0 – 997.0
		Blank w/end cap	1,077.70 – 1,097.35	1/8-1/4-in. Gravel Pack	77.3	997.0 – 1,120.0
Bottom Seal	NA			Cement Seal	411.1	1,120.0 – 1,749.0
Monitor Well Casing	5.5-in. CS Casing (Internal Ceramic Coated)	Blank	+ 1.1 – 1,838.57	Cement Seal	859.6	0.0 – 960.0
				3/8-in. Bentonite Chips	2.6	1,749.0 – 1,753.0
		Screen	1,838.57 – 2,163.00	No. 6 Sand Pack	16.33	1,753.0 – 1,778.0
		Blank w/end cap	2,163.00 – 2,203.44	1/8-1/4-in. Gravel Pack	301.4	1,778.0 – 2,232.0
Bottom Seal	NA			Cement Seal	136.8	2,232.0 – 2,399.17
Submersible pump	Grundfos® 10S50-58DS Pump	Top	1,796.0	NA		
		Intake	1,801.0	NA		
		Bottom	1,803.0	NA		
Pump Riser Pipe	1.0-in. CS EUE	Blank	+1.4 – 1,796.0	NA		
Water Access Tubing	1.25-in. Flush Joint Schedule 80 PVC	Blank	+1.4 – 1,754.0	NA		
		Screen w/end cap	1,754.0 – 1,794.0	NA		

CS = Carbon steel
ft = Feet
ft^3 = Cubic feet
in. = Inch
NA = Not applicable
PVC = Polyvinyl chloride
EUE = External upset ends

Table C−3. MV-5 Tritium Results

Sample Identification	Date	Time	Depth (ft)	MDA (dpm)	Tritium (pCi/L)	MDC (pCi/L)
Well Drilling						
MV-5; 270 ft	05/12/09	1355	270	38.56	630	3474
MV-5; 330 ft	05/12/09	1500	330	36.14	-360	3256
MV-5; 340 ft	05/12/09	1615	340	38.74	540	3490
MV-5; 380 ft	05/12/09	1713	380	37.14	-90	3346
MV-5; 420 ft	05/12/09	1800	420	36.31	-1981	3271
MV-5; 450 ft	05/12/09	1910	450	36.72	-1531	3308
MV-5; 490 ft	05/12/09	2000	490	36.10	-1531	3253
MV-5; 540 ft	05/12/09	2100	540	37.16	-1261	3348
MV-5; 590 ft	05/12/09	2200	590	38.06	-900	3429
MV-5; 650 ft	05/12/09	2320	650	39.04	-90	3518
MV-5; 690 ft	05/13/09	0045	690	37.90	-1891	3414
MV-5; 725 ft	05/13/09	0145	725	38.33	-810	3453
MV-5; 765 ft	05/13/09	0245	765	38.18	-1711	3440
MV-5; 805 ft	05/13/09	0345	805	38.06	-990	3428
MV-5; 835 ft	05/13/09	0440	835	36.71	-2072	3307
MV-5; 870 ft	05/13/09	0540	870	36.48	-1261	3286
MV-5; 905 ft	05/13/09	0645	905	37.53	-2522	3381
MV-5; 945 ft	05/13/09	0745	945	37.14	-1981	3346
MV-5; 975 ft	05/13/09	0915	975	36.47	-2612	3285
MV-5; 1005 ft	05/13/09	1040	1005	37.93	-2072	3417
MV-5; 1040 ft	05/13/09	1135	1040	39.59	-180	3539
MV-5; 1070 ft	05/13/09	1305	1070	38.27	-4414	3448
MV-5; 1110 ft	05/13/09	1415	1110	38.07	-5315	3430
MV-5; 1150 ft	05/13/09	1520	1150	37.47	-1171	3375
MV-5; 1180 ft	05/13/09	1615	1180	39.19	-2072	3530
MV-5; 1210 ft	05/13/09	1718	1210	38.93	-810	3508
MV-5; 1250 ft	05/13/09	1921	1250	36.99	-2252	3333
MV-5; 1290 ft	05/13/09	2037	1290	38.21	-2072	3442
MV-5; 1320 ft	05/13/09	2135	1320	37.37	-1621	3367
MV-5; 1350 ft	05/13/09	2248	1350	38.06	-2162	3429
MV-5; 1390 ft	05/14/09	0030	1390	38.29	-2522	3450
MV-5; 1415 ft	05/14/09	0140	1415	38.40	-5045	3459
MV-5; 1440 ft	05/14/09	0255	1440	38.75	-2432	3491
MV-5; 1465 ft	05/14/09	0415	1465	37.11	-4234	3343
MV-5; 1495 ft	05/14/09	0520	1495	36.31	-3963	3271
MV-5; 1520 ft	05/14/09	0635	1520	38.05	-4054	3428
MV-5; 1545 ft	05/14/09	0840	1545	35.96	-3063	3240
MV-5; 1575 ft	05/14/09	0950	1575	37.94	-3333	3418
MV-5; 1605 ft	05/14/09	1135	1605	38.86	-2162	3501
MV-5; 1630 ft	05/14/09	1325	1630	39.01	-1261	3514

Table C−3 (continued). MV-5 Tritium Results

Sample Identification	Date	Time	Depth (ft)	MDA (dpm)	Tritium (pCi/L)	MDC (pCi/L)
MV-5; 1660 ft	05/14/09	1430	1660	37.06	-720	3338
MV-5; 1690 ft	05/14/09	1611	1690	35.45	-2162	3194
MV-5; 1720 ft	05/14/09	1750	1720	37.57	-180	3385
MV-5; 1750 ft	05/14/09	1915	1750	37.65	-720	3392
MV-5; 1780 ft	05/14/09	2035	1780	37.79	-630	3404
MV-5; 1810 ft	05/14/09	2215	1810	36.71	-1531	3307
MV-5; 1850 ft	05/15/09	1555	1850	35.94	90	3238
MV-5; 1880 ft	05/15/09	1708	1880	36.97	0	3330
MV-5; 1910 ft	05/15/09	1840	1910	36.77	-720	3312
MV-5; 1940 ft	05/15/09	1955	1940	35.94	0	3238
MV-5; 1970 ft	05/15/09	2058	1970	35.69	-1810	3215
MV-5; 2000 ft	05/15/09	2215	2000	35.67	-1621	3214
MV-5; 2040 ft	05/16/09	0020	2040	37.86	-3603	3411
MV-5; 2065 ft	05/16/09	0220	2065	36.12	-5225	3254
MV-5; 2095 ft	05/16/09	0340	2095	37.37	-3513	3367
MV-5; 2125 ft	05/16/09	0525	2125	38.18	-2612	3440
MV-5; 2150 ft	05/16/09	0725	2150	36.75	-3513	3311
MV-5; 2180 ft	05/16/09	0925	2180	39.14	-1801	3527
MV-5; 2210 ft	05/16/09	1125	2210	37.98	-3333	3421
MV-5; 2240 ft	05/16/09	1315	2240	36.07	450	3249
MV-5; 2260 ft	05/16/09	1430	2260	35.20	270	3172
MV-5; 2290 ft	05/16/09	1600	2290	35.11	-180	3163
MV-5; 2298 ft	05/16/09	1812	2298	36.34	630	3274
MV-5; 2310 ft	05/16/09	1915	2310	36.95	-1621	3329
MV-5; 2330 ft	05/16/09	2025	2330	34.93	90	3147
MV-5; 2350 ft	05/16/09	2145	2350	34.97	-270	3150
MV-5; 2380 ft	05/16/09	2307	2380	36.67	-1801	3303
Well Development - Air						
MV-5 Well Dev.	05/22/09	1230	WD	35.65	-1711	3212
MV-5 Well Dev.	05/23/09	0030	WD	35.83	-1171	3228
MV-5 Well Dev.	05/23/09	0153	WD	38.33	720	3454
MV-5 Well Dev.	05/23/09	0328	WD	36.11	-1171	3253
MV-5 Well Dev.	05/23/09	0459	WD	36.46	-360	3285
MV-5 Well Dev.	05/23/09	0623	WD	36.69	180	3305
MV-5 Well Dev.	05/23/09	0755	WD	36.90	-450	3324
MV-5 Well Dev.	05/23/09	0930	WD	37.78	540	3403
MV-5 Well Dev.	05/23/09	1330	WD	37.60	-630	3388
MV-5 Well Dev.	05/23/09	1500	WD	34.36	-1441	3096
MV-5 Well Dev.	05/23/09	1730	WD	37.48	90	3376
MV-5 Well Dev.	05/23/09	1900	WD	37.58	360	3386
MV-5 Well Dev.	05/23/09	2030	WD	37.33	990	3363
MV-5 Well Dev.	05/23/09	2200	WD	36.72	-810	3308
MV-5 Well Dev.	05/23/09	2300	WD	36.17	180	3258

Table C−3 (continued). MV-5 Tritium Results

Sample Identification	Date	Time	Depth (ft)	MDA (dpm)	Tritium (pCi/L)	MDC (pCi/L)
MV-5 Well Dev.	05/24/09	0030	WD	37.71	-1441	3398
MV-5 Well Dev.	05/24/09	0200	WD	36.61	-270	3298
MV-5 Well Dev.	05/24/09	0322	WD	38.12	-180	3434
MV-5 Well Dev.	05/24/09	0503	WD	36.38	-2522	3277
MV-5 Well Dev.	05/24/09	0628	WD	37.82	-1171	3408
MV-5 Well Dev.	05/24/09	0753	WD	37.25	-1171	3356
MV-5 Well Dev.	05/24/09	0929	WD	37.69	-1261	3396
Piezometer Development - Air						
MV-5 Well Dev.	05/24/09	2100	WD	35.77	-180	3223
MV-5 Well Dev.	05/24/09	2230	WD	34.55	-1171	3112
MV-5 Well Dev.	05/25/09	0030	WD	37.51	-1351	3379
MV-5 Well Dev.	05/25/09	0242	WD	38.70	450	3486
MV-5 Well Dev.	05/25/09	0409	WD	37.78	-1171	3404
MV-5 Well Dev.	05/25/09	0526	WD	37.36	-270	3366
MV-5 Well Dev.	05/25/09	0645	WD	37.16	180	3348
MV-5 Well Dev.	05/25/09	0800	WD	38.36	-990	3456
Well Development - Pump						
MV-5 Well Dev.	06/05/09	1850	WD	35.92	-1171	3236
MV-5 Well Dev.	06/05/09	2050	WD	37.00	-2162	3334
MV-5 Well Dev.	06/05/09	2240	WD	36.19	-990	3260
MV-5 Well Dev.	06/06/09	0137	WD	36.58	90	3295
MV-5 Well Dev.	06/06/09	0337	WD	35.10	180	3162
MV-5 Well Dev.	06/06/09	0537	WD	36.33	-270	3273
MV-5 Well Dev.	06/06/09	0737	WD	37.24	540	3355
MV-5 Well Dev.	06/06/09	0937	WD	36.53	630	3291
MV-5 Well Dev.	06/06/09	1137	WD	36.62	360	3299
MV-5 Well Dev.	06/06/09	1337	WD	36.53	-90	3291
MV-5 Well Dev.	06/07/09	1020	WD	37.76	720	3402
MV-5 Well Dev.	06/07/09	1220	WD	34.60	-1441	3117
MV-5 Well Dev.	06/07/09	1420	WD	35.45	-3963	3194
MV-5 Well Dev.	06/07/09	1520	WD	37.37	990	3367
MV-5 Well Dev.	06/07/09	1620	WD	35.13	-2702	3165
MV-5 Well Dev.	06/07/09	1720	WD	37.80	720	3406
MV-5 Well Dev.	06/07/09	1820	WD	37.23	-90	3354
MV-5 Well Dev.	06/07/09	1920	WD	36.42	-1621	3281
MV-5 Well Dev.	06/07/09	2020	WD	36.57	-1711	3294
MV-5 Well Dev.	06/07/09	2120	WD	36.77	540	3313
MV-5 Well Dev.	06/07/09	2340	WD	37.07	-1171	3340
MV-5 Well Dev.	06/08/09	0630	WD	36.80	-810	3315
MV-5 Well Dev.	06/08/09	0730	WD	36.78	-2342	3313
MV-5 Well Dev.	06/08/09	0830	WD	35.12	-3603	3164
MV-5 Well Dev.	06/08/09	0930	WD	37.00	90	3333
MV-5 Well Dev.	06/08/09	1030	WD	37.73	-360	3399

Table C−3 (continued). MV-5 Tritium Results

Sample Identification	Date	Time	Depth (ft)	MDA (dpm)	Tritium (pCi/L)	MDC (pCi/L)
MV-5 Well Dev.	06/08/09	1130	WD	35.79	-180	3224
MV-5 Well Dev.	06/08/09	1330	WD	36.27	540	3268
MV-5 Well Dev.	06/08/09	1530	WD	34.49	-1441	3107
MV-5 Well Dev.	06/08/09	1730	WD	36.51	900	3289
MV-5 Well Dev.	06/08/09	1930	WD	36.57	360	3294
MV-5 Well Dev.	06/08/09	2130	WD	34.71	360	3127
MV-5 Well Dev.	06/08/09	2330	WD	35.48	360	3197
MV-5 Well Dev.	06/09/09	0130	WD	35.77	-1801	3222
MV-5 Well Dev.	06/09/09	0330	WD	37.41	-1441	3370
MV-5 Well Dev.	06/09/09	0530	WD	37.19	-630	3350
MV-5 Well Dev.	06/09/09	0730	WD	37.04	-540	3337
MV-5 Well Dev.	06/09/09	0930	WD	37.77	-810	3403

ft = Feet
dpm = Disintegrations per minute
MDA = Minimum detectable activity
pCi/L = Picocuries per liter
MDC = Minimum detectable concentration
WD = Well development

Note: The sample collected during drilling at a depth of 2,290 ft on May 16, 2009 had an initial result of 22,972 pCi/L, the sample was reanalyzed and result provided in table.

Table C−4. MV-5 Water Quality Parameter Results

Date	Time	Depth (ft)	pH (SU)	Temperature (°C)	Conductivity (µS/cm)	Br^- (mg/L)	Turbidity (NTU)
Well Drilling							
05/12/09	1355	270	8.5	27.99	1977	44	NA
05/12/09	1500	330	8.7	27.28	1917	39	NA
05/12/09	1615	340	8.44	27.31	1678	45	NA
05/12/09	1713	380	8.73	27	1775	39	NA
05/12/09	1800	420	8.71	26.51	1766	41	NA
05/12/09	1910	450	8.64	25.55	1687	41	NA
05/12/09	2000	490	8.63	23.6	1651	39	NA
05/12/09	2100	540	8.63	23.62	1654	33	NA
05/12/09	2200	590	8.49	22.74	1617	40	NA
05/12/09	2320	650	8.61	21.73	1545	39	NA
05/13/09	0045	690	8.53	21.3	1515	43	NA
05/13/09	0145	725	8.6	20.03	1564	38	NA
05/13/09	0245	765	8.49	19.8	1527	41	NA
05/13/09	0345	805	8.64	19.12	1518	40	NA
05/13/09	0440	835	8.62	18.56	1476	44	NA
05/13/09	0540	870	8.59	17.81	1477	54	NA
05/13/09	0645	905	8.51	17.34	1493	45	NA
05/13/09	0745	945	8.74	17.52	1488	43	NA
05/13/09	0915	975	8.48	17.58	1502	44	NA
05/13/09	1040	1005	8.73	18.17	1518	40	NA
05/13/09	1135	1040	8.51	18.7	1461	40	NA
05/13/09	1305	1070	8.81	19.34	1501	49	NA
05/13/09	1415	1110	8.57	19.46	1533	43	NA
05/13/09	1520	1110	8.48	20.12	1514	41	NA
05/13/09	1615	1180	8.63	20.44	1567	37	NA
05/13/09	1718	1210	8.5	20.89	1527	33	NA
05/13/09	1921	1250	8.42	20.84	1545	33	NA
05/13/09	2037	1290	8.5	20.42	1520	33	NA
05/13/09	2135	1320	8.58	19.95	1513	33	NA
05/13/09	2248	1350	8.62	19.79	1544	36	NA
05/14/09	0030	1390	8.6	20.16	1510	34	NA
05/14/09	0140	1415	8.57	19.8	1484	37	NA
05/14/09	0255	1440	8.54	19.37	1514	37	NA
05/14/09	0415	1465	8.55	18.97	1537	37	NA
05/14/09	0520	1495	8.57	18.89	1506	41	NA
05/14/09	0635	1520	8.57	18.53	1505	41	NA
05/14/09	0840	1545	8.48	19.99	1516	37	NA
05/14/09	0950	1575	8.45	20.38	1538	36	NA
05/14/09	1135	1605	8.62	21	1497	36	NA
05/14/09	1325	1630	8.52	21.65	1576	41	NA
05/14/09	1430	1660	8.58	22.02	1615	36	NA
05/14/09	1611	1690	8.49	22.71	1620	28	NA
05/14/09	1750	1720	8.48	23.2	1623	36	NA
05/14/09	1915	1750	8.48	22.78	1639	31	NA
05/14/09	2035	1780	8.65	22.44	1689	27	NA
05/14/09	2215	1810	8.66	21.93	1771	30	NA

Table C−4 (continued). MV-5 Water Quality Parameter Results

Date	Time	Depth (ft)	pH (SU)	Temperature (°C)	Conductivity (µS/cm)	Br^- (mg/L)	Turbidity (NTU)
05/15/09	1555	1850	8.57	23.45	1748	40	NA
05/15/09	1708	1880	8.95	22.89	1890	31	NA
05/15/09	1810	1910	8.85	22.9	1866	33	NA
05/15/09	1955	1940	8.75	22.78	1854	28	NA
05/15/09	2058	1970	8.99	22.4	1934	27	NA
05/15/09	2215	2000	8.75	22.28	1892	27	NA
05/16/09	0020	2040	8.88	21.93	1926	34	NA
05/16/09	0220	2065	8.75	21.84	1936	32	NA
05/16/09	0340	2095	8.67	21.53	1919	34	NA
05/16/09	0525	2125	8.76	21.52	1910	43	NA
05/16/09	0725	2150	8.61	21.48	1917	33	NA
05/16/09	0925	2180	8.7	22.33	1915	40	NA
05/16/09	1125	2210	8.73	23.21	1941	41	NA
05/16/09	1315	2240	8.97	23.91	2065	36	NA
05/16/09	1430	2260	8.71	25.56	1976	31	NA
05/16/09	1600	2290	8.66	25.93	2027	36	NA
05/16/09	1915	2310	8.59	24.63	2027	29	NA
05/16/09	2025	2330	8.68	24.14	2051	29	NA
05/16/09	2145	2350	8.65	23.95	2017	27	NA
05/16/09	2307	2380	8.61	23.71	2019	34	NA
Well Development - Air							
05/22/09	1740	WD	NA	NA	NA	34	NA
05/22/09	2130	WD	NA	NA	NA	NA	NA
05/22/09	2230	WD	NA	NA	NA	NA	NA
05/22/09	2300	WD	NA	NA	NA	NA	NA
05/22/09	2330	WD	NA	NA	NA	NA	NA
05/23/09	0001	WD	NA	NA	NA	NA	NA
05/23/09	0021	WD	8.48	20.11	839	11	NA
05/23/09	0152	WD	8.54	20.14	762	8.6	NA
05/23/09	0325	WD	8.47	19.5	823	7.5	NA
05/23/09	0455	WD	8.42	19.06	738	4.1	NA
05/23/09	0625	WD	8.41	19.01	707	6.2	NA
05/23/09	0757	WD	8.48	19.8	702	5.3	NA
05/23/09	0931	WD	8.44	19.72	695	4.7	NA
05/23/09	1330	WD	8.46	21.31	762	5.4	NA
05/23/09	1500	WD	8.41	NA	685	3.9	NA
05/23/09	1730	WD	8.41	17.72	664	3.9	NA
05/23/09	1900	WD	8.43	16.91	623	3.5	NA
05/23/09	2030	WD	8.48	16.16	593	2.9	688
05/23/09	2200	WD	8.34	16.07	5573	2.8	571
05/23/09	2300	WD	8.42	15.96	589	3	700
05/24/09	0030	WD	8.8	15.14	578	3	940
05/24/09	0159	WD	8.45	15.67	584	2.9	>1000
05/24/09	0338	WD	8.4	15.41	570	2.8	995
05/24/09	0503	WD	8.4	15.36	575	2.7	942
05/24/09	0628	WD	8.4	15.65	565	2.9	>1000
05/24/09	0755	WD	8.44	16.86	570	3.2	>1000
05/24/09	0927	WD	8.43	17.66	552	2.6	>1000

Table C−4 (continued). MV-5 Water Quality Parameter Results

Date	Time	Depth (ft)	pH (SU)	Temperature (°C)	Conductivity (µS/cm)	Br^- (mg/L)	Turbidity (NTU)
Piezometer Development - Air							
05/24/09	2100	WD	10.15	21.6	408	7.8	841
05/24/09	2230	WD	9.61	21.19	309	3.5	677
05/25/09	0030	WD	9.08	20.74	257	2.3	638
05/25/09	0242	WD	8.45	20.43	242	0.97	107
05/25/09	0409	WD	8.37	20.02	236	0.75	103
05/25/09	0525	WD	8.37	20.09	231	0.65	114
05/25/09	0640	WD	8.35	20.33	228	0.82	86.8
05/25/09	0800	WD	8.35	20.77	228	0.97	70.9
Well Development - Pump							
06/05/09	1850	WD	9.97	18.58	557	11	179
06/05/09	2050	WD	11.01	24.2	893	5.6	139
06/05/09	2237	WD	10.5	25.53	689	3.8	61.7
06/06/09	0137	WD	4.84	26.08	643	2.7	27.6
06/06/09	0337	WD	4.24	25.78	613	2.3	28.2
06/06/09	0537	WD	4.08	26.8	603	2	19.5
06/06/09	0737	WD	9.45	26.29	626	1.8	16.9
06/06/09	0937	WD	9.91	26.07	587	4.4	16.1
06/06/09	1137	WD	9.85	28.15	579	5.4	14.3
06/06/09	1337	WD	9.9	27	569	1.6	11.7
06/07/09	1020	WD	9.88	17.88	505	2.9	56.5
06/07/09	1220	WD	10.02	25.17	567	2.7	18.2
06/07/09	1320	WD	10.02	27.33	563	1.9	15.9
06/07/09	1420	WD	9.95	27.42	546	1.7	15
06/07/09	1520	WD	9.91	27.96	543	1.9	14.8
06/07/09	1620	WD	9.89	27.73	537	1.2	13.4
06/07/09	1720	WD	9.87	27.42	530	1.2	12.3
06/07/09	1820	WD	9.87	25.54	521	1.6	11.7
06/07/09	1920	WD	9.85	27.62	520	1.3	13
06/07/09	2020	WD	9.84	27.33	516	1.1	10.4
06/07/09	2120	WD	9.82	27.19	514	1.5	10.6
06/07/09	2220	WD	9.69	27.76	509	1.5	21.5
06/08/09	0630	WD	9.7	18.4	500	1.8	33.1
06/08/09	0730	WD	9.8	25.45	497	1.5	16.8
06/08/09	0830	WD	9.94	26.95	524	1.5	23.2
06/08/09	0930	WD	9.87	26.7	514	1.6	18.5
06/08/09	1030	WD	9.84	27.85	509	1.1	15
06/08/09	1130	WD	9.78	27.87	504	1	15.2
06/08/09	1330	WD	9.81	27.31	501	1.3	12.9
06/08/09	1530	WD	9.79	28.62	495	1.2	12.7
06/08/09	1730	WD	9.78	27.72	487	1.2	10.6
06/08/09	1930	WD	9.78	27.77	484	1.1	10.5
06/08/09	2130	WD	9.74	26.8	479	2.5	11.4
06/08/09	2330	WD	9.75	27.2	476	2.3	9.71
06/09/09	0130	WD	9.75	27.3	476	2.4	10.7
06/09/09	0330	WD	9.75	27.07	468	2.7	8.74
06/09/09	0530	WD	9.74	27.06	463	2.2	8.33
06/09/09	0730	WD	9.74	26.92	472	1.2	10.1

Table C−4 (continued). MV-5 Water Quality Parameter Results

Date	Time	Depth (ft)	pH (SU)	Temperature (°C)	Conductivity (µS/cm)	Br^- (mg/L)	Turbidity (NTU)
06/09/09	0930	WD	9.73	27.73	467	1.2	11.8

Br– = Bromide
°C = Degrees Celsius
ft = Feet
mg/L = Milligrams per liter
NA = Not analyzed
NTU = Nephelometric turbidity unit
SU = Standard unit
WD = Well development
µS/cm = Microsiemens per centimeter

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MONITORING WELL COMPLETION LOG CNT01-MV-5

PROJECT	Offsites	WELL NUMBER	CNT01-MV-5	DATE DRILLED	5/10/2009 to 5/25/2009	WATER LEVEL DATE	
LOCATION	Nevada	NORTH COORD. (FT)	1413229.86	SURFACE ELEV. (FT NGVD)	6040.63	DRILLER	Jacobo, L.
SITE	Central Nevada Test Area	EAST COORD. (FT)	629586.52	TOP OF CASING (FT)	6041.69	LOGGED BY	Dickerson, B., Goodknight, C., Hill, R.
DRILLING METHOD	Reverse Circulation	HOLE DEPTH (FT)	2400.00	MEAS. PT. ELEV. (FT)	6041.69	SAMPLING METHOD	PUMP
DRILL COMPANY	Boart Longyear	WELL DEPTH (FT)	2203.44	SLOT SIZE (IN)	0.078	DATE DEVELOPED	5/25/2009
RIG TYPE	LM 300E Tophead Rotary	WATER LEVEL (FT BGS)		BIT SIZE(S) (IN)	31.0 / 12.25		

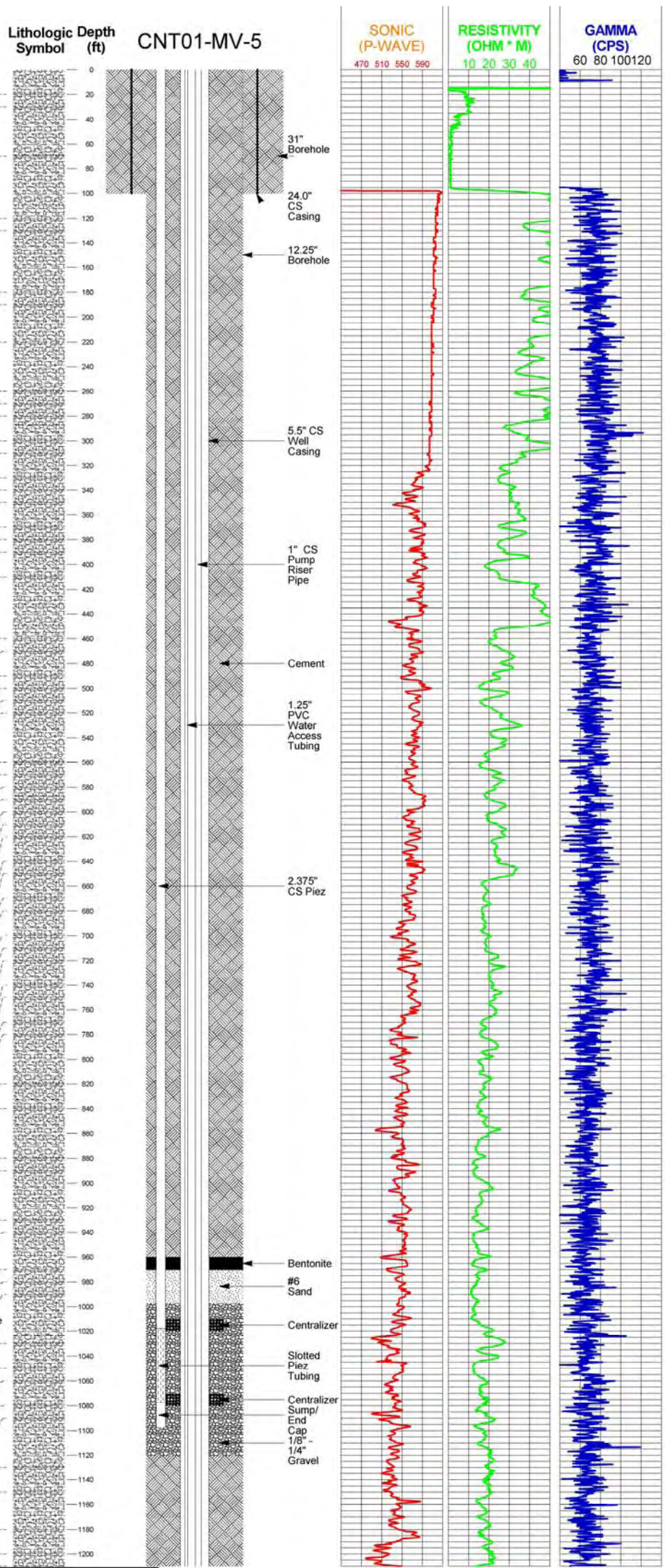
	WELL INSTALLATION	INTERVAL (FT)		
BLANK CASING:	5.5 in. Carbon Steel (CS)	-1.06	to	1838.57
WELL SCREEN:	5.5 in. Slotted CS	1838.57	to	2163.0
SUMP/END CAP:	5.5 in. C S	2163.0	to	2203.44
SEAL:	Bentonite	1749.0	to	1753.0
UPPER PACK:	#6 Sand	1753.0	to	1778.0
WELL PACK	1/8" - 1/4" Gravel	1778.0	to	2232.0

	PIEZOMETER INSTALLATION	INTERVAL (FT)		
BLANK CASING:	2.375 in. Carbon Steel (CS)	-0.6	to	1017.7
WELL SCREEN:	2.375 in. Slotted CS	1017.7	to	1077.7
SUMP/END CAP:	2.375 in. C S	1077.7	to	1097.35
SEAL:	Bentonite	960.0	to	970.0
UPPER PACK:	#6 Sand	970.0	to	997.0
WELL PACK	1/8" - 1/4" Gravel	997.0	to	1120.0

REMARKS

Lithological Description

0 - 20 Alluvium, dark gray (5YR 4/1) to dark reddish gray (5YR 4/2), medium to coarse sand, some gravel.
20 - 30 Alluvium, reddish brown (5YR 5/3), coarse sand and gravel.
30 - 70 Alluvium, reddish brown (5YR 5/3), medium to coarse sand, some gravel.
70 - 120 Alluvium, reddish brown (5YR 5/3), medium to coarse sand, minor gravel.
120 - 130 Alluvium, reddish brown (5YR 5/3), coarse sand and gravel.
130 - 180 Alluvium, reddish brown (5YR 5/3), medium to coarse sand, some gravel.
180 - 190 Alluvium, reddish brown (5YR 5/3), gravel, some coarse sand.
190 - 220 Alluvium, reddish brown (5YR 5/3), medium to coarse sand, minor gravel.
220 - 260 Alluvium, reddish brown (5YR 5/3), medium to coarse sand.
260 - 270 Alluvium, reddish brown (5YR 5/3), coarse sand and gravel.
270 - 280 Alluvium, very pale brown (10 YR 8/4), silt and clay, fine to coarse sand, some gravel.
280 - 300 Alluvium, very pale brown (10 YR 8/4), silt and clay, fine to coarse sand.
300 - 310 Alluvium, light gray (10YR 7/2), medium to coarse sand, minor gravel.
310 - 330 Alluvium, light gray (10YR 7/2), silt and clay, fine to coarse sand.
330 - 340 Alluvium, light gray (10YR 7/2), fine to coarse sand, some silt and clay, minor gravel.
340 - 350 Alluvium, light gray (10YR 7/2), medium to coarse sand, some gravel, minor silt and clay.
350 - 370 Alluvium, light gray (10YR 7/2), fine to coarse sand, some silt and clay, minor gravel.
370 - 380 Alluvium, light gray (10YR 7/2), fine to coarse sand, silt and clay, minor gravel.
380 - 390 Alluvium, very pale brown (10YR 8/4), silt and clay, fine to coarse sand, minor gravel.
390 - 410 Alluvium, very pale brown (10YR 8/4), fine to coarse sand, some silt and clay.
410 - 460 Alluvium, light gray (10YR 7/2) to very pale brown (10 YR 7/3), medium to coarse sand, minor silt and clay, minor gravel.
460 - 470 Alluvium, light gray (10YR 7/2) to very pale brown (10 YR 7/3), silt and clay, fine to coarse sand, minor fine gravel.
470 - 490 Alluvium, light gray (10YR 7/2) to very pale brown (10 YR 7/3), fine to coarse sand, silt and clay.
490 - 500 Alluvium, light gray (10YR 7/2) to very pale brown (10 YR 7/3), silt and clay, fine to coarse sand.
500 - 510 Alluvium, light gray (10YR 7/2) to very pale brown (10 YR 7/3), fine to coarse sand, some gravel, minor silt and clay.
510 - 520 Alluvium, light gray (10YR 7/2) to very pale brown (10 YR 7/3), silt and clay, fine to coarse sand.
520 - 560 Alluvium, light gray (10YR 7/2) to very pale brown (10 YR 7/3), silt and clay, some fine to coarse sand.
560 - 570 Alluvium, light gray (10YR 7/2) to very pale brown (10 YR 7/3), silt and clay, minor fine to coarse sand.
570 - 580 Alluvium, light gray (10YR 7/2) to very pale brown (10 YR 7/3), fine to coarse sand, some silt and clay, minor gravel.
580 - 590 Alluvium, light gray (10YR 7/2) to very pale brown (10 YR 7/3), silt and clay, some fine to coarse sand.
590 - 600 Alluvium, light gray (10YR 7/2) to very pale brown (10 YR 7/3), fine to coarse sand, silt and clay, minor gravel.
600 - 610 Alluvium, light gray (10YR 7/2) to very pale brown (10 YR 7/3), silt and clay, some fine to coarse sand, minor gravel.
610 - 620 Alluvium, light gray (10YR 7/2) to very pale brown (10 YR 7/3), fine to coarse sand, some silt and clay, minor gravel.
620 - 640 Alluvium, light gray (10YR 7/2) to very pale brown (10 YR 7/3), silt and clay, some fine to coarse sand and gravel.
640 - 650 Alluvium, light gray (10YR 7/2) to very pale brown (10 YR 7/3), fine to coarse sand, some silt and clay.
650 - 670 Alluvium, light gray (10YR 7/2) to very pale brown (10 YR 7/3), silt and clay, fine to coarse sand.
670 - 680 Alluvium, light gray (10YR 7/2) to very pale brown (10 YR 7/3), silt and clay, minor fine to coarse sand.
680 - 700 Alluvium, light gray (10YR 7/2) to very pale brown (10 YR 7/3), silt and clay, some fine to coarse sand and gravel.
700 - 710 Alluvium, light gray (10YR 7/2) to very pale brown (10 YR 7/3), silt and clay, fine to coarse sand, minor gravel.
710 - 720 Alluvium, light gray (10YR 7/2) to very pale brown (10 YR 7/3), fine to coarse sand, some gravel, minor silt and clay.
720 - 740 Alluvium, light gray (10YR 7/2) to very pale brown (10 YR 7/3), silt and clay, fine to coarse sand, minor gravel.
740 - 750 Alluvium, very pale brown (10YR 8/3), silt and clay, some fine to coarse sand and gravel.
750 - 770 Alluvium, very pale brown (10YR 8/3), fine to coarse sand, some silt and clay.
770 - 780 Alluvium, very pale brown (10YR 8/3), silt and clay, some fine to coarse sand and gravel.
780 - 820 Alluvium, very pale brown (10YR 8/3), silt and clay, fine to coarse sand, minor gravel.
820 - 840 Alluvium, light gray (10YR 7/2), silt and clay, minor fine to coarse sand.
840 - 880 Alluvium, light gray (10YR 7/2), silt and clay, some fine to coarse sand and gravel.
880 - 890 Alluvium, very pale brown (10YR 8/3), silt and clay, minor fine to coarse sand.
890 - 930 Alluvium, light gray (10YR 7/2) to very pale brown (10YR 8/3), silt and clay, some fine to coarse sand, minor gravel.
930 - 940 Alluvium, light gray (10YR 7/2) to very pale brown (10YR 8/3), fine to coarse sand, silt and clay, some gravel.
940 - 970 Alluvium, light gray (10YR 7/2) to very pale brown (10YR 8/3), silt and clay, minor fine to coarse sand and gravel.
970 - 980 Alluvium, light gray (10YR 7/2) to very pale brown (10YR 8/3), silt and clay, fine to coarse sand, minor gravel.
980 - 990 Alluvium, light gray (10YR 7/2) to very pale brown (10YR 8/3), silt and clay, minor fine to coarse sand and gravel.
990 - 1030 Alluvium light gray (10YR 7/2) to very pale brown (10YR 8/3), silt and clay, gravel, some fine to coarse sand.
1030 - 1050 Alluvium, light gray (10YR 7/2) to very pale brown (10YR 8/3), fine to coarse sand and gravel, some silt and clay.
1050 - 1060 Alluvium, light gray (10YR 7/2) to very pale brown (10YR 8/3), silt and clay, coarse sand and gravel, some fine to medium sand.
1060 - 1080 Alluvium, light gray (10YR 7/2) to very pale brown (10YR 8/3), fine to coarse sand, some silt and clay, some gravel.
1080 - 1090 Alluvium, light gray (10YR 7/2) to very pale brown (10YR 8/3), silt and clay, some gravel, minor fine to coarse sand.
1090 - 1130 Alluvium, light gray (10YR 7/2) to very pale brown (10YR 8/3), fine to coarse sand, some silt and clay, some gravel.
1130 - 1150 Alluvium, light gray (10YR 7/2) to very pale brown (10YR 8/3), gravel, medium to coarse sand.
1150 - 1180 Alluvium, light gray (10YR 7/2) to very pale brown (10YR 8/3), fine to coarse sand, silt and clay, minor gravel.
1180 - 1200 Alluvium, light gray (10YR 7/2) to very pale brown (10YR 8/3), silt and clay, some fine to coarse sand.
1200 - 1210 Alluvium, gray (10YR 6/1), gravel, medium to coarse sand, some silt and clay.



Stoller

U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION, COLORADO

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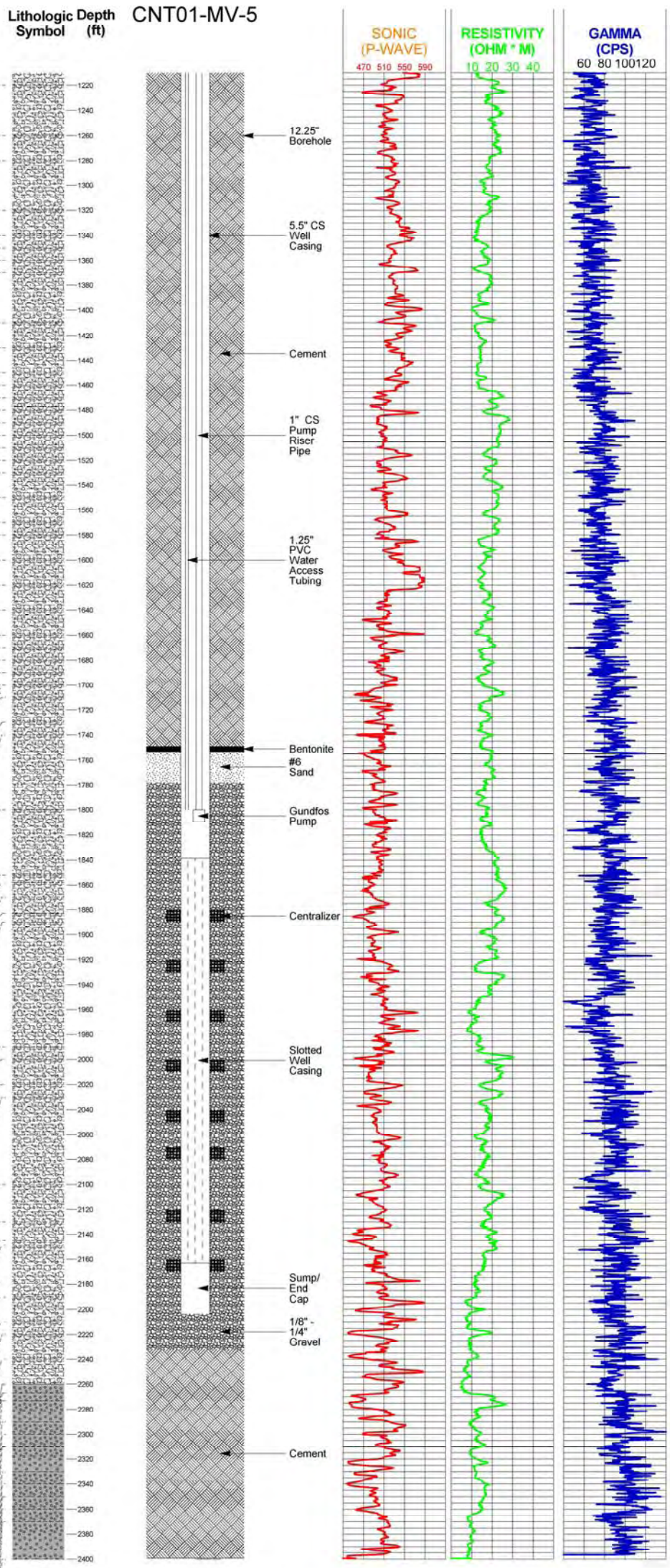
MONITORING WELL COMPLETION LOG CNT01-MV-5

Lithological Description

1210 - 1220 Alluvium, light gray (10YR 7/2), silt and clay, fine to coarse sand, some gravel.
1220 - 1260 Alluvium, light gray (10YR 7/2), silt and clay, fine to coarse sand, some gravel.
1260 - 1280 Alluvium, gray (10YR 6/1), fine to coarse sand, silt and clay, some gravel.
1280 - 1320 Alluvium, very pale brown (10YR 8/2 - 8/3), silt and clay, some fine to coarse sand, minor gravel.
1320 - 1340 Alluvium, very pale brown (10YR 8/2 - 8/3), silt and clay, fine to coarse sand, minor gravel.
1340 - 1350 Alluvium, very pale brown (10YR 8/2 - 8/3), silt and clay, some gravel, some fine to coarse sand.
1350 - 1360 Alluvium, very pale brown (10YR 8/2 - 8/3), silt and clay, some gravel, minor fine to coarse sand.
1360 - 1370 Alluvium, very pale brown (10YR 8/2 - 8/3), silt and clay, some fine to coarse sand, minor gravel.
1370 - 1410 Alluvium, very pale brown (10YR 8/2 - 8/3), silt and clay, some fine to coarse sand and gravel.
1410 - 1430 Alluvium, very pale brown (10YR 8/2 - 8/3), silt and clay, some fine to coarse sand.
1430 - 1450 Alluvium, very pale brown (10YR 8/2 - 8/3), silt and clay, some fine to coarse sand, minor gravel.
1450 - 1460 Alluvium, very pale brown (10YR 8/2 - 8/3), silt and clay, minor fine to coarse sand, minor gravel.
1460 - 1470 Alluvium, gray (10YR 6/1), silt and clay, fine to coarse sand, some gravel.
1470 - 1480 Alluvium, very pale brown (10YR 8/2 - 8/3), silt and clay, fine to coarse sand, minor gravel.
1480 - 1490 Alluvium, very pale brown (10YR 8/2 - 8/3), fine to coarse sand, silt and clay, some gravel.
1490 - 1500 Alluvium, very pale brown (10YR 8/2 - 8/3), silt and clay, fine to coarse sand, some gravel.
1500 - 1510 Alluvium, very pale brown (10YR 8/2 - 8/3), silt and clay, some fine to coarse sand, minor gravel.
1510 - 1520 Alluvium, very pale brown (10YR 8/2 - 8/3), silt and clay, minor gravel, minor coarse sand.
1520 - 1530 Alluvium, very pale brown (10YR 8/2 - 8/3), silt and clay, some fine to coarse sand, minor gravel.
1530 - 1550 Alluvium, very pale brown (10YR 8/2 - 8/3), silt and clay, minor coarse sand and gravel.
1550 - 1570 Alluvium, very pale brown (10YR 8/2 - 8/3), silt and clay, some coarse sand and gravel.
1570 - 1580 Alluvium, gray (10YR 6/1), gravel, medium to coarse sand.
1580 - 1600 Alluvium, very pale brown (10YR 8/2 - 8/3), silt and clay, fine to coarse sand.
1600 - 1620 Alluvium, very pale brown (10YR 8/2 - 8/3), silt and clay, some fine to coarse sand.
1620 - 1640 Alluvium, very pale brown (10YR 8/2), fine to coarse sand, some silt and clay, minor gravel.
1640 - 1660 Alluvium, very pale brown (10YR 8/2), silt and clay, some fine to coarse sand, minor gravel.
1660 - 1670 Alluvium, very pale brown (10YR 8/2), silt and clay, fine to coarse sand, minor gravel.
1670 - 1680 Alluvium, very pale brown (10YR 7/4), silt and clay, minor fine to coarse sand.
1680 - 1690 Alluvium, very pale brown (10YR 7/4), silt and clay, fine to coarse sand, minor gravel.
1690 - 1700 Nonwelded tuff, very pale brown (10YR 8/3), argillically altered.
1700 - 1710 Volcaniclastic sediment, very pale brown (10YR 8/3), composed of angular, gravel-size clasts of light gray (N8) welded tuff, reddish gray (10R 6/1) welded tuff, and pale yellow (2.5Y 8/2) welded tuff in a clayey matrix.
1710 - 1730 Volcaniclastic sediment, very pale brown (10YR 8/3), abundant ash argillically altered to clay containing sand to gravel-size clasts of light gray (N8) welded tuff, reddish gray (10R 6/1) welded tuff, pale yellow (2.5Y 8/2) welded tuff, and pink (5YR 8/3) welded tuff
1730 - 1740 Nonwelded tuff, very pale brown (10YR 7/3), argillically altered to clay, with minor sand-size clasts of welded tuff.
1740 - 1800 Volcaniclastic sediments, light gray (10YR 7/1 - 7/2), predominantly argillically altered ash with coarse sand to gravel-size clasts of welded tuff and well indurated yellow mudstone.
1800 - 1852 Nonwelded tuff interbedded with volcaniclastic sediments, light gray (10YR 7/1 - 7/2), argillically altered, with preserved pyroclastic texture, phenocrysts of quartz, biotite, and altered pseudomorphs of alkali feldspar and pumice clasts; also contains coarse sand to gravel-size clasts of various types of welded tuff.
1852 - 1858 Welded tuff, light greenish gray (10G 8/1) to light gray (N7), devitrified, 30-35 percent phenocrysts of quartz, alkali feldspar, and biotite; extent of welded tuff determined by drilling break.
1858 - 1870 Nonwelded tuff interbedded with volcaniclastic sediments, very pale brown (10YR 8/2 - 8/3), ashy matrix argillically altered, with angular clasts of dark gray (N4) welded tuff and yellow (10YR 7/6) welded tuff.
1870 - 1883 Nonwelded tuff, very pale brown (10YR 8/2 - 8/3), argillically altered.
1883 - 1890 Welded tuff, grayish brown (10YR 5/2), devitrified, 12-15 percent phenocrysts of alkali feldspar and quartz, no pumice or lithic fragments.
1890 - 1990 Volcaniclastic sediments, very pale brown (10YR 8/2), ash-rich, argillically altered, with angular clasts of several different welded tuffs, plus gray chert.
1990 - 2000 Nonwelded tuff, white (10YR 8/1), argillically altered, preserved pyroclastic texture, 20-25 percent phenocrysts of quartz and alkali feldspar, with some white, argillically altered pumice clasts.
2000 - 2020 Volcaniclastic sediment, very pale brown (10YR 8/2 - 8/3), argillically altered ashy matrix with angular clasts of several different types of welded tuff.
2020 - 2030 Volcaniclastic sediment, possibly interbedded with a thin welded tuff, very pale brown (10YR 8/2 8/3); half of this sample is composed of clasts of dark gray (10YR 4/1) welded tuff with approximately 25 percent phenocrysts of quartz, alkali feldspar, and minor biotite.
2030 - 2100 Volcaniclastic sediment, very pale brown (10YR 8/2 - 8/3), ash-rich, argillically altered, with minor amount of coarse sand and gravel-size clasts of various different welded tuffs.
2100 - 2130 Volcaniclastic sediment, very pale brown (10YR 8/2 - 8/3), composed predominantly of argillically altered ash, with subordinate coarse sand to gravel-size angular clasts of welded tuff.
2130 - 2145 Volcaniclastic sediment, gray (2.5YR 5/1), composed predominantly of argillically altered ash, with subordinate coarse sand to gravel-size angular clasts of welded tuff.
2145 - 2149 Welded tuff, light gray (5Y 7/1), devitrified, with 25 percent phenocrysts of quartz, alkali feldspar, and minor pumice, no pumice or lithic fragments within the welded tuff. Thickness determined by drilling break.
2149 - 2190 Volcaniclastic sediment, very pale brown (10YR 8/2 - 8/3), ash-rich, argillically altered, contains xenocrysts of euhedral to subhedral quartz and coarse sand-size clasts of various welded tuff, and some clasts of yellow well indurated mudstone.
2190 - 2210 Nonwelded tuff, very pale brown (10YR 8/2 - 8/3), argillically altered but preserved pyroclastic texture, approximately 10-15 percent phenocrysts of quartz and other altered minerals (likely alkali feldspar), abundant lithic clasts, and minor white, altered pumice clasts.
2210 - 2220 Nonwelded to welded tuff, pink (5YR 7/4), nonwelded tuff is argillically altered with preserved pyroclastic texture identical to the welded tuff; welded tuff contains approximately 18 percent phenocrysts of quartz, alkali feldspar, and sparse biotite; no observable pumice fragments or lithic fragments.
2220 - 2240 Volcaniclastic sediment, very pale brown (10YR 8/2), argillically altered ashy matrix, with some subangular, coarse sand-sized clasts of various types of welded tuff.
2240 - 2260 Nonwelded tuff, very pale brown (10YR 8/2), argillically altered, with preserved pyroclastic texture, 35 percent phenocrysts of quartz, alkali feldspar, and biotite, with argillically altered white pumice clasts, and some lithic clasts.
2260 - 2267 Nonwelded tuff, pinkish white (7.5YR 8/2), argillically altered, but with well preserved pyroclastic texture similar to welded tuff below; with 40-45 percent phenocrysts of quartz, alkali feldspar, and abundant biotite. This interval comprises the upper nonwelded portion of the welded tuff described below.
2267 - 2273 Welded tuff, olive brown (2.5Y 4/4), with 40-45 percent phenocrysts of quartz, alkali feldspar, and abundant biotite. Drill-cutting chip size suggests this welded tuff is pervasively fractured. Welded tuff interval based in part on drilling break.
2273 - 2290 Nonwelded tuff, very pale brown (10YR 8/2), argillically altered, but with well preserved pyroclastic texture similar to tuff above; with 40-45 percent phenocrysts of quartz, alkali feldspar, and abundant biotite. This interval comprises the lower nonwelded portion of the welded tuff described above.
2290 - 2300 Volcaniclastic sediments, very pale brown (10YR 8/2), with argillically altered ashy matrix and coarse sand to gravel composed of several different types of welded tuff plus clasts of pale yellow mudstone.
2300 - 2310 Volcaniclastic sediments, very pale brown (10YR 8/2), dominantly composed of argillically altered ash with subordinate amounts of gravel clasts .
2310 - 2330 Nonwelded to welded tuff, light brownish gray (10YR 6/2), nonwelded tuff is argillically altered to clay, welded tuff is unaltered and contains approximately 45 percent phenocrysts of alkali feldspar, quartz, and minor biotite.
2330 - 2340 Volcaniclastic sediments, pinkish white (7.5YR 8/2), with sand and gravel clasts composed of several different types of welded tuff within a matrix of argillically altered ash.
2340 - 2350 Volcaniclastic sediments, pale yellow (2.5 Y 8/2), with sand and gravel clasts composed of several different types of welded tuff.
2350 - 2360 Nonwelded to welded tuff, pale yellow (2.5 Y 8/2), nonwelded tuff is argillically altered to clay but preserves the texture of the original pyroclastic rock; the welded tuff contains 25-30 percent phenocrysts of alkali feldspar, quartz, and biotite
2360 - 2370 Nonwelded to welded tuff, very pale brown (10YR 8/3), nonwelded tuff is argillically altered to clay but preserves the texture of the original pyroclastic rock; the welded tuff contains 35-40 percent phenocrysts of quartz, alkali feldspar, and sparse biotite.
2370 - 2400 Volcaniclastic sediments, white (2.5 Y 8/1 to pale yellow (2.5 Y 8/3), angular to subangular, coarse sand to fine gravel clasts .



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