



Memorandum

Date: April 2, 2012

From: John McCain

Phone: 612-916-4400

To: Al Frechette, Kate Sedlacek

Company: Scott County

Re: Jordan Aggregates Mine Inundation Spillway

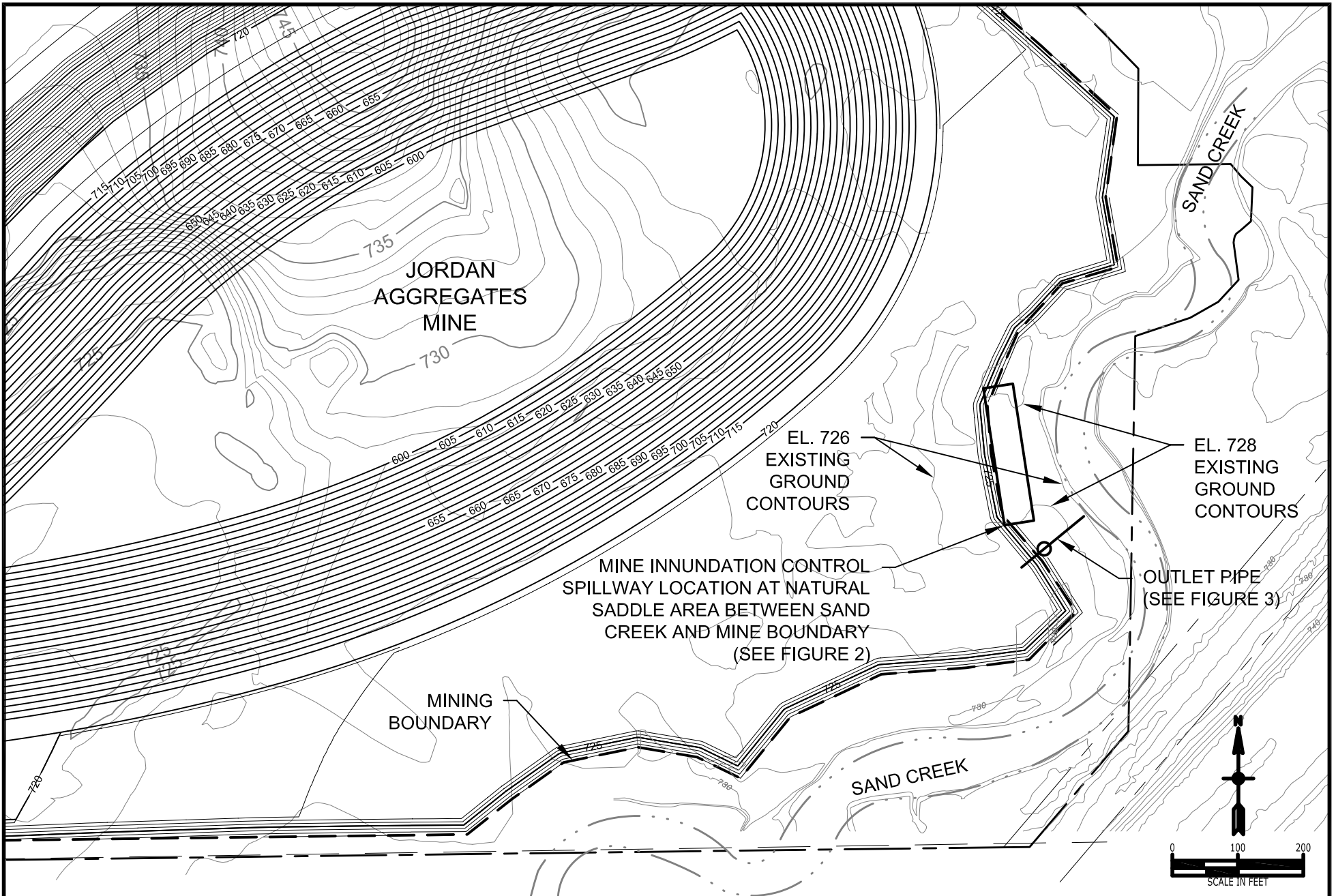
This memorandum provides design information for a spillway and outlet pipe between Sand Creek and the Jordan Aggregates mine to provide for controlled flow of flood waters into and out of the mine during the rise and recession of Sand Creek flood waters. Providing controlled movement of flood waters between Sand Creek and the mine will mitigate the potential for rechannelization of Sand Creek through the mine. The location of the spillway and outlet pipe are shown on attached Figure 1.

A spillway is proposed to be located on the mining boundary at a natural saddle location between the mine and Sand Creek as shown on Figure 1. The spillway crest will be placed at Elev. 726.0, bounded by natural ground at or above Elev. 728.0. The spillway length is approximately 200 feet. The spillway drops into the mine on a 5H:1V sloped surface that terminates in a two-foot deep stilling basin. The vertical drop from the spillway crest to the mine floor is approximately four feet. Design information is shown on attached Figure 2.

A spreadsheet analysis of the mine inundation process is provided as an attachment. The spreadsheet calculates floodwater movement into the mine through the spillway for a flood scenario where the water surface elevation is rising at a rate of 5 ft/day during the flood. The calculations demonstrate that the water elevation in the mine equilibrates with the flood elevation outside the mine while the flood water is still contained within the spillway (i.e. flood elevation below 728.0). Once the water levels are equal, the erosive force on the 100-foot wide buffer ground between Sand Creek and mine will be insignificant, thus mitigating the potential for rechannelization of Sand Creek into the mine area.

An 18-inch diameter concrete pipe outlet is proposed for draining floodwater from the mine back to Sand Creek (once the water level in the mine has receded below the spillway crest elevation). The pipe will be equipped with a one-way valve to prevent creek water from entering the mine through the pipe. Design information is shown on attached Figure 3. The spreadsheet also calculates water flow through the mine outlet pipe for a flood water recession rate of 1 foot/day. The calculations indicate a maximum discharge rate of 12 cubic feet per second and a discharge velocity of 6.8 ft/s.

The entire spillway crest, face, and stilling basin, and also the discharge end of the outlet pipe, will be armored with a vegetated 3-dimensional turf mat. Flow velocities will be less than seven ft/s across the spillway crest with a corresponding shear stress of 0.6 lbs/SF. Flow will accelerate to a velocity of 8 to 12 ft/s on the spillway face (depending upon the water surface elevation in the mine) with a corresponding shear stress of 4.4 to 6.6 lbs/SF. The proposed turf mat is rated for a maximum shear stress of 12 lbs/SF with mature vegetation, and thus has a minimum safety factor of 1.8 for this application.

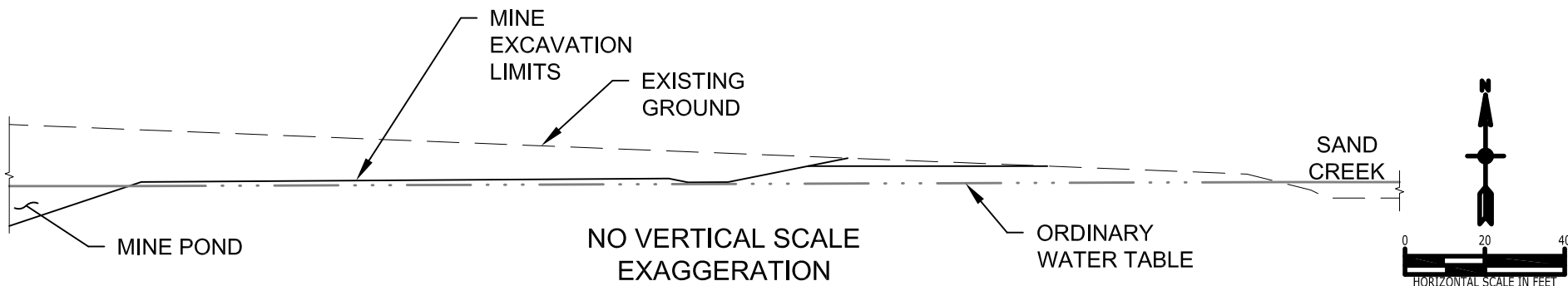
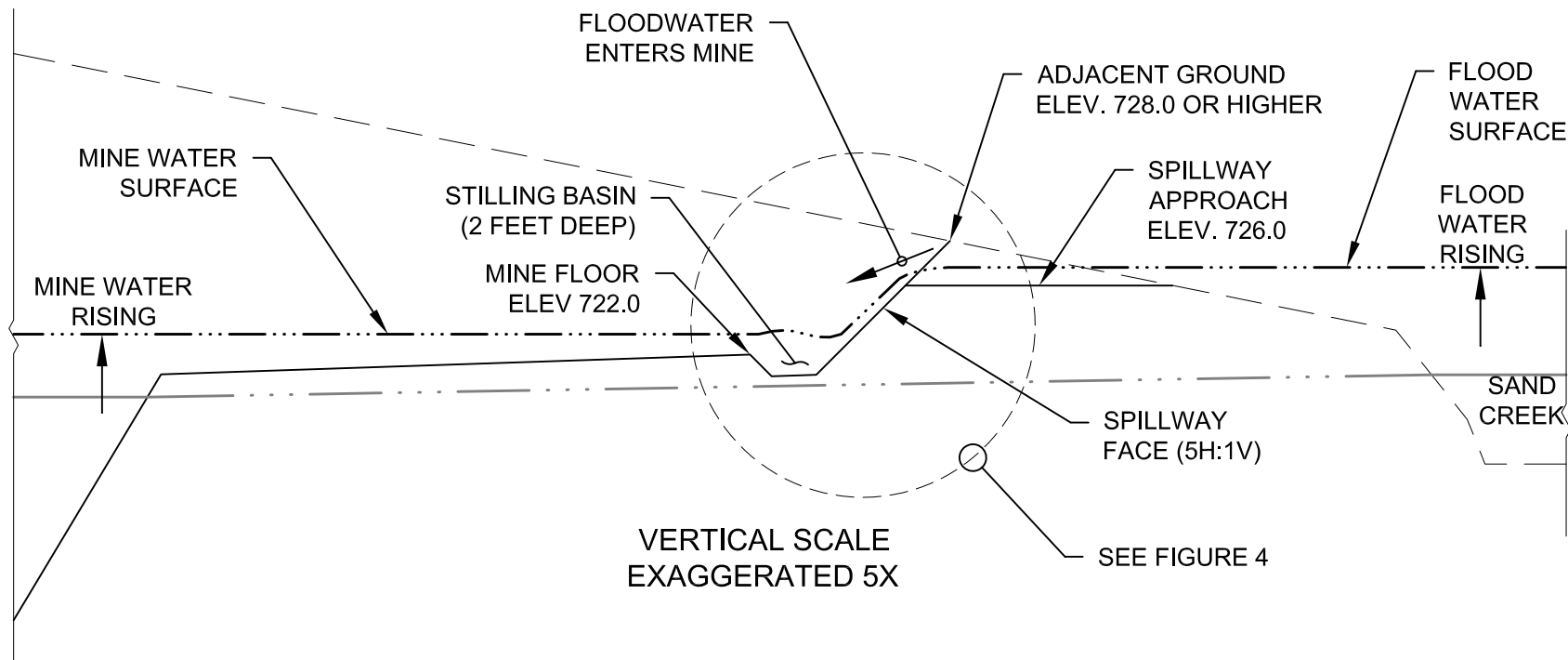


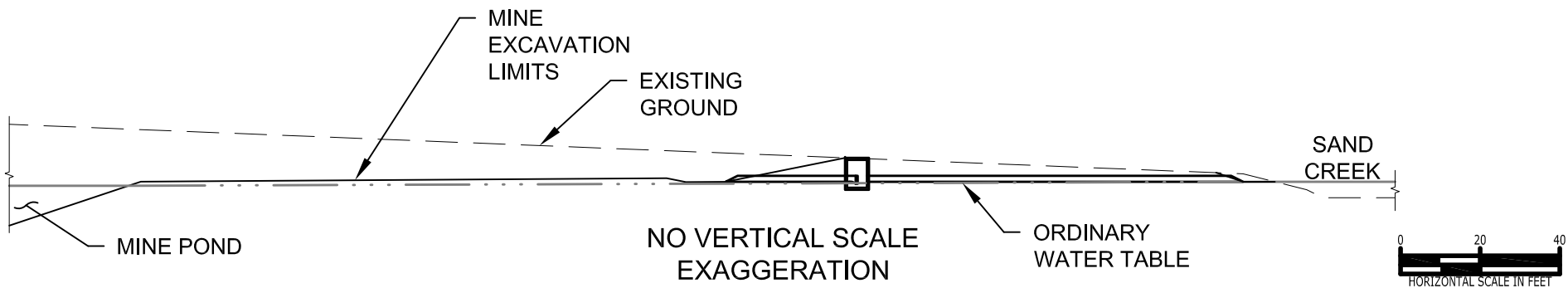
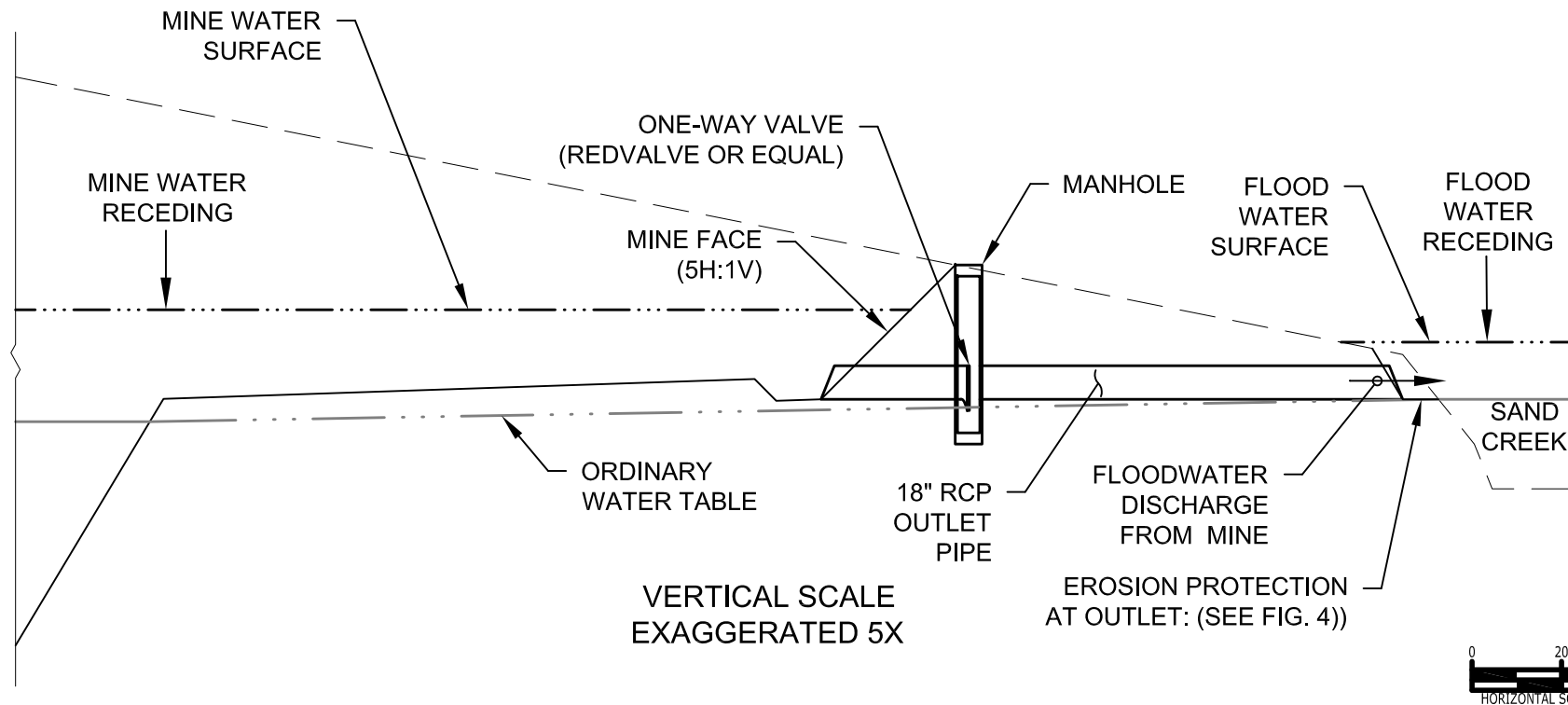
P:\Projects\HENHEN0901_Keefe\EIS\Mine Inundation x-section.dwg, Figure 1, 4/12/2012 4:36:06 PM



JORDAN AGGREGATES
 Sand Creek Township
 Scott County, MN

FIGURE 1
Spillway Location





ARMOR SPILLWAY CREST, FACE, AND STILLING BASIN WITH VEGETATED 3-DIMENSIONAL TURF MAT (NORTH AMERICAN GREEN C350 OR EQUAL)

5.0

10.0

SPILLWAY EROSION PROTECTION



MINE OUTLET PIPE

ARMOR CULVERT OUTLET WITH VEGETATED 3-DIMENSIONAL TURF MAT (NORTH AMERICAN GREEN C350 OR EQUAL)

MINE OUTLET EROSION PROTECTION



JORDAN AGGREGATES
Sand Creek Township
Scott County, MN

FIGURE 4
Erosion Protection

Jordan Aggregates Mine Inundation Analysis

spillway L 200 ft
 discharge C 3
 crest El 726 ft MSL
 weir height 2 ft
 Creek flood rise rate 5 ft/day

Time (min)	Sand Creek WSE (ft MSL)	Q in through spillway (CFS)	Volume in through spillway (CF)	Cumulative Volume in (CF)	Mine WSE (ft MSL)	Mine Filled to Weir Crest	Mine WSE = Creek WSE
0	726	0.00			720.00	NO	NO
5	726.02	1.70	509.1	509.1	720.00	NO	NO
10	726.04	4.80	1,440.0	1,949.1	720.00	NO	NO
15	726.06	8.82	2,645.4	4,594.6	720.00	NO	NO
20	726.08	13.58	4,072.9	8,667.5	720.01	NO	NO
25	726.1	18.97	5,692.1	14,359.6	720.01	NO	NO
30	726.12	24.94	7,482.5	21,842.1	720.01	NO	NO
35	726.14	31.43	9,429.0	31,271.0	720.02	NO	NO
40	726.16	38.40	11,520.0	42,791.0	720.02	NO	NO
45	726.18	45.82	13,746.2	56,537.2	720.03	NO	NO
50	726.2	53.67	16,099.7	72,636.9	720.04	NO	NO
55	726.22	61.91	18,574.0	91,210.9	720.05	NO	NO
60	726.24	70.55	21,163.6	112,374.5	720.07	NO	NO
65	726.26	79.54	23,863.4	136,237.9	720.08	NO	NO
70	726.28	88.90	26,669.2	162,907.1	720.09	NO	NO
75	726.3	98.59	29,577.0	192,484.1	720.11	NO	NO
80	726.32	108.61	32,583.5	225,067.6	720.13	NO	NO
85	726.34	118.95	35,685.4	260,753.0	720.15	NO	NO
90	726.36	129.60	38,880.0	299,633.0	720.17	NO	NO
95	726.38	140.55	42,164.6	341,797.6	720.20	NO	NO
100	726.4	151.79	45,536.8	387,334.4	720.22	NO	NO
105	726.42	163.31	48,994.4	436,328.8	720.25	NO	NO
110	726.44	175.12	52,535.3	488,864.2	720.28	NO	NO
115	726.46	187.19	56,157.7	545,021.8	720.32	NO	NO
120	726.48	199.53	59,859.7	604,881.5	720.35	NO	NO
125	726.5	212.13	63,639.6	668,521.1	720.39	NO	NO
130	726.52	224.99	67,495.9	736,017.1	720.43	NO	NO
135	726.54	238.09	71,427.1	807,444.2	720.47	NO	NO
140	726.56	251.44	75,431.8	882,876.0	720.51	NO	NO
145	726.58	265.03	79,508.7	962,384.7	720.56	NO	NO
150	726.6	278.85	83,656.4	1,046,041.1	720.61	NO	NO
155	726.62	292.91	87,873.9	1,133,915.0	720.66	NO	NO
160	726.64	307.20	92,160.0	1,226,075.0	720.71	NO	NO
165	726.66	321.71	96,513.6	1,322,588.6	720.77	NO	NO
170	726.68	336.45	100,933.6	1,423,522.2	720.82	NO	NO
175	726.7	351.40	105,419.2	1,528,941.4	720.88	NO	NO
180	726.72	366.56	109,969.2	1,638,910.6	720.95	NO	NO
185	726.74	381.94	114,583.0	1,753,493.6	721.01	NO	NO
190	726.76	397.53	119,259.5	1,872,753.1	721.08	NO	NO
195	726.78	413.33	123,997.9	1,996,751.0	721.14	NO	NO
200	726.8	429.33	128,797.5	2,125,548.5	721.21	NO	NO
205	726.82	445.52	133,657.5	2,259,206.0	721.29	NO	NO
210	726.84	461.92	138,577.1	2,397,783.1	721.36	NO	NO

Time (min)	Sand Creek WSE (ft MSL)	Q in through spillway (CFS)	Volume in through spillway (CF)	Cumulative Volume in (CF)	Mine WSE (ft MSL)	Mine Filled to Weir Crest	Mine WSE = Creek WSE
215	726.86	478.52	143,555.6	2,541,338.7	721.44	NO	NO
220	726.88	495.31	148,592.4	2,689,931.1	721.52	NO	NO
225	726.9	512.29	153,686.7	2,843,617.8	721.60	NO	NO
230	726.92	529.46	158,837.9	3,002,455.7	721.69	NO	NO
235	726.94	546.82	164,045.5	3,166,501.2	721.78	NO	NO
240	726.96	564.36	169,308.7	3,335,809.9	721.87	NO	NO
245	726.98	582.09	174,627.1	3,510,437.0	721.96	NO	NO
250	727	600.00	180,000.0	3,690,437.0	722.05	NO	NO
255	727.02	618.09	185,426.9	3,875,863.9	722.14	NO	NO
260	727.04	636.36	190,907.3	4,066,771.2	722.23	NO	NO
265	727.06	654.80	196,440.6	4,263,211.9	722.32	NO	NO
270	727.08	673.42	202,026.4	4,465,238.3	722.41	NO	NO
275	727.1	692.21	207,664.2	4,672,902.4	722.51	NO	NO
280	727.12	711.18	213,353.4	4,886,255.8	722.60	NO	NO
285	727.14	730.31	219,093.6	5,105,349.4	722.71	NO	NO
290	727.16	749.61	224,884.5	5,330,233.9	722.81	NO	NO
295	727.18	769.08	230,725.5	5,560,959.4	722.92	NO	NO
300	727.2	788.72	236,616.1	5,797,575.5	723.02	NO	NO
305	727.22	808.52	242,556.1	6,040,131.7	723.12	NO	NO
310	727.24	828.48	248,545.0	6,288,676.7	723.22	NO	NO
315	727.26	848.61	254,582.4	6,543,259.0	723.33	NO	NO
320	727.28	868.89	260,667.8	6,803,926.9	723.44	NO	NO
325	727.3	889.34	266,801.0	7,070,727.9	723.55	NO	NO
330	727.32	909.94	272,981.6	7,343,709.5	723.66	NO	NO
335	727.34	930.70	279,209.2	7,622,918.7	723.77	NO	NO
340	727.36	951.61	285,483.4	7,908,402.1	723.89	NO	NO
345	727.38	972.68	291,803.9	8,200,206.1	724.01	NO	NO
350	727.4	993.90	298,170.4	8,498,376.5	724.13	NO	NO
355	727.42	1,015.28	304,582.6	8,802,959.0	724.26	NO	NO
360	727.44	1,036.80	311,040.0	9,113,999.0	724.38	NO	NO
365	727.46	1,058.47	317,542.4	9,431,541.5	724.51	NO	NO
370	727.48	1,080.30	324,089.6	9,755,631.1	724.65	NO	NO
375	727.5	1,102.27	330,681.1	10,086,312.2	724.78	NO	NO
380	727.52	1,124.39	337,316.7	10,423,628.9	724.92	NO	NO
385	727.54	1,146.65	343,996.2	10,767,625.1	725.06	NO	NO
390	727.56	1,169.06	350,719.1	11,118,344.2	725.20	NO	NO
395	727.58	1,191.62	357,485.3	11,475,829.4	725.34	NO	NO
400	727.6	1,214.31	364,294.4	11,840,123.8	725.49	NO	NO
405	727.62	1,237.15	371,146.2	12,211,270.0	725.64	NO	NO
410	727.64	1,260.13	378,040.5	12,589,310.5	725.79	NO	NO
415	727.66	1,283.26	384,976.9	12,974,287.3	725.94	NO	NO
420	727.68	1,306.52	391,955.2	13,366,242.5	726.10	YES	NO
425	727.7	1,300.14	390,043.2	13,756,285.7	726.25	YES	NO
430	727.72	1,273.19	381,956.0	14,138,241.7	726.40	YES	NO
435	727.74	1,243.66	373,097.1	14,511,338.8	726.55	YES	NO
440	727.76	1,211.40	363,419.6	14,874,758.5	726.70	YES	NO
445	727.78	1,176.24	352,871.1	15,227,629.5	726.84	YES	NO
450	727.8	1,137.97	341,391.9	15,569,021.4	726.98	YES	NO
455	727.82	1,096.38	328,914.0	15,897,935.5	727.10	YES	NO
460	727.84	1,052.93	315,880.4	16,213,815.9	727.23	YES	NO
465	727.86	1,006.21	301,863.5	16,515,679.4	727.34	YES	NO
470	727.88	955.49	286,648.0	16,802,327.4	727.45	YES	NO
475	727.9	900.40	270,118.6	17,072,446.0	727.56	YES	NO
480	727.92	840.45	252,135.4	17,324,581.4	727.65	YES	NO
485	727.94	775.09	232,525.9	17,557,107.3	727.74	YES	NO

Time (min)	Sand Creek WSE (ft MSL)	Q in through spillway (CFS)	Volume in through spillway (CF)	Cumulative Volume in (CF)	Mine WSE (ft MSL)	Mine Filled to Weir Crest	Mine WSE = Creek WSE
490	727.96	703.58	211,073.3	17,768,180.6	727.83	YES	NO
495	727.98	625.00	187,499.4	17,955,680.0	727.90	YES	YES
500	728	0.00	0.0	17,955,680.0	728.00	YES	YES

Jordan Aggregates Mine Outlet Pipe

Creek Drop
 Rate 1 ft/day
 Culvert Dia 18 inch
 Culvert L 250 ft
 Culvert n 0.012

Time (min)	Sand Creek WSE (ft MSL)	Qout (CFS)	Volume out (CF)	Cumulative Volume (CF)	Mine WSE (ft MSL)	Head Diff	Day
0	726	0	0	13,122,635	726.00	0.00	0.0
15	725.99	0.74	663	13,121,972	726.00	0.01	0.0
30	725.98	1.03	931	13,121,041	726.00	0.02	0.0
45	725.97	1.26	1,136	13,119,905	726.00	0.03	0.0
60	725.96	1.45	1,308	13,118,597	726.00	0.04	0.0
75	725.95	1.62	1,459	13,117,138	726.00	0.05	0.1
90	725.94	1.77	1,594	13,115,544	726.00	0.06	0.1
105	725.93	1.91	1,719	13,113,825	726.00	0.07	0.1
120	725.92	2.04	1,834	13,111,991	726.00	0.08	0.1
135	725.91	2.16	1,942	13,110,048	725.99	0.09	0.1
150	725.90	2.27	2,044	13,108,004	725.99	0.10	0.1
165	725.89	2.38	2,141	13,105,863	725.99	0.11	0.1
180	725.88	2.48	2,233	13,103,629	725.99	0.12	0.1
195	725.86	2.58	2,321	13,101,308	725.99	0.13	0.1
210	725.85	2.67	2,406	13,098,902	725.99	0.14	0.1
225	725.84	2.76	2,488	13,096,414	725.99	0.15	0.2
240	725.83	2.85	2,566	13,093,848	725.99	0.16	0.2
255	725.82	2.94	2,642	13,091,206	725.99	0.16	0.2
270	725.81	3.02	2,716	13,088,490	725.99	0.17	0.2
285	725.80	3.10	2,787	13,085,702	725.99	0.18	0.2
300	725.79	3.17	2,857	13,082,845	725.98	0.19	0.2
315	725.78	3.25	2,925	13,079,921	725.98	0.20	0.2
330	725.77	3.32	2,990	13,076,930	725.98	0.21	0.2
345	725.76	3.39	3,055	13,073,875	725.98	0.22	0.2
360	725.75	3.46	3,118	13,070,758	725.98	0.23	0.3
375	725.74	3.53	3,179	13,067,579	725.98	0.24	0.3
390	725.73	3.60	3,239	13,064,340	725.98	0.25	0.3
405	725.72	3.66	3,298	13,061,042	725.98	0.26	0.3
420	725.71	3.73	3,356	13,057,686	725.97	0.27	0.3
435	725.70	3.79	3,412	13,054,274	725.97	0.27	0.3
450	725.69	3.85	3,468	13,050,806	725.97	0.28	0.3
465	725.68	3.91	3,522	13,047,284	725.97	0.29	0.3
480	725.67	3.97	3,576	13,043,708	725.97	0.30	0.3
495	725.66	4.03	3,628	13,040,080	725.97	0.31	0.3
510	725.65	4.09	3,680	13,036,400	725.97	0.32	0.4
525	725.64	4.15	3,731	13,032,669	725.96	0.33	0.4
540	725.63	4.20	3,781	13,028,887	725.96	0.34	0.4
555	725.61	4.26	3,830	13,025,057	725.96	0.35	0.4
570	725.60	4.31	3,879	13,021,178	725.96	0.36	0.4
585	725.59	4.36	3,927	13,017,251	725.96	0.36	0.4

	Sand Creek			Cumulative			
Time (min)	WSE (ft MSL)	Qout (CFS)	Volume out (CF)	Volume (CF)	Mine WSE (ft MSL)	Head Diff	Day
600	725.58	4.42	3,974	13,013,277	725.96	0.37	0.4
615	725.57	4.47	4,021	13,009,256	725.95	0.38	0.4
630	725.56	4.52	4,067	13,005,189	725.95	0.39	0.4
645	725.55	4.57	4,112	13,001,077	725.95	0.40	0.4
660	725.54	4.62	4,157	12,996,920	725.95	0.41	0.5
675	725.53	4.67	4,201	12,992,719	725.95	0.42	0.5
690	725.52	4.72	4,245	12,988,475	725.95	0.43	0.5
705	725.51	4.76	4,288	12,984,187	725.94	0.43	0.5
720	725.50	4.81	4,330	12,979,857	725.94	0.44	0.5
735	725.49	4.86	4,372	12,975,484	725.94	0.45	0.5
750	725.48	4.90	4,414	12,971,070	725.94	0.46	0.5
765	725.47	4.95	4,455	12,966,615	725.94	0.47	0.5
780	725.46	5.00	4,496	12,962,119	725.94	0.48	0.5
795	725.45	5.04	4,536	12,957,583	725.93	0.49	0.6
810	725.44	5.08	4,576	12,953,007	725.93	0.49	0.6
825	725.43	5.13	4,615	12,948,391	725.93	0.50	0.6
840	725.42	5.17	4,654	12,943,737	725.93	0.51	0.6
855	725.41	5.21	4,693	12,939,044	725.93	0.52	0.6
870	725.40	5.26	4,731	12,934,313	725.92	0.53	0.6
885	725.39	5.30	4,769	12,929,544	725.92	0.54	0.6
900	725.38	5.34	4,807	12,924,737	725.92	0.55	0.6
915	725.36	5.38	4,844	12,919,893	725.92	0.55	0.6
930	725.35	5.42	4,881	12,915,013	725.92	0.56	0.6
945	725.34	5.46	4,917	12,910,096	725.92	0.57	0.7
960	725.33	5.50	4,953	12,905,143	725.91	0.58	0.7
975	725.32	5.54	4,989	12,900,154	725.91	0.59	0.7
990	725.31	5.58	5,024	12,895,130	725.91	0.60	0.7
1005	725.30	5.62	5,060	12,890,070	725.91	0.61	0.7
1020	725.29	5.66	5,094	12,884,976	725.91	0.61	0.7
1035	725.28	5.70	5,129	12,879,847	725.90	0.62	0.7
1050	725.27	5.74	5,163	12,874,683	725.90	0.63	0.7
1065	725.26	5.77	5,197	12,869,486	725.90	0.64	0.7
1080	725.25	5.81	5,231	12,864,255	725.90	0.65	0.8
1095	725.24	5.85	5,264	12,858,991	725.89	0.66	0.8
1110	725.23	5.89	5,298	12,853,693	725.89	0.66	0.8
1125	725.22	5.92	5,331	12,848,362	725.89	0.67	0.8
1140	725.21	5.96	5,363	12,842,999	725.89	0.68	0.8
1155	725.20	6.00	5,396	12,837,603	725.89	0.69	0.8
1170	725.19	6.03	5,428	12,832,175	725.88	0.70	0.8
1185	725.18	6.07	5,460	12,826,715	725.88	0.70	0.8
1200	725.17	6.10	5,492	12,821,224	725.88	0.71	0.8
1215	725.16	6.14	5,523	12,815,701	725.88	0.72	0.8
1230	725.15	6.17	5,554	12,810,146	725.88	0.73	0.9
1245	725.14	6.21	5,585	12,804,561	725.87	0.74	0.9
1260	725.13	6.24	5,616	12,798,945	725.87	0.75	0.9
1275	725.11	6.27	5,647	12,793,298	725.87	0.75	0.9
1290	725.10	6.31	5,677	12,787,621	725.87	0.76	0.9
1305	725.09	6.34	5,707	12,781,913	725.86	0.77	0.9
1320	725.08	6.37	5,737	12,776,176	725.86	0.78	0.9
1335	725.07	6.41	5,767	12,770,408	725.86	0.79	0.9

	Sand Creek			Cumulative				
Time (min)	WSE (ft MSL)	Qout (CFS)	Volume out (CF)	Volume (CF)	Mine WSE (ft MSL)	Head Diff	Day	
1350	725.06	6.44	5,797	12,764,612	725.86	0.79	0.9	
1365	725.05	6.47	5,826	12,758,785	725.85	0.80	0.9	
1380	725.04	6.51	5,855	12,752,930	725.85	0.81	1.0	
1395	725.03	6.54	5,884	12,747,045	725.85	0.82	1.0	
1410	725.02	6.57	5,913	12,741,132	725.85	0.83	1.0	
1425	725.01	6.60	5,942	12,735,190	725.85	0.84	1.0	
1440	725.00	6.63	5,970	12,729,220	725.84	0.84	1.0	
1455	724.99	6.67	5,999	12,723,221	725.84	0.85	1.0	
1470	724.98	6.70	6,027	12,717,194	725.84	0.86	1.0	
1485	724.97	6.73	6,055	12,711,139	725.84	0.87	1.0	
1500	724.96	6.76	6,083	12,705,057	725.83	0.88	1.0	
1515	724.95	6.79	6,110	12,698,946	725.83	0.88	1.1	
1530	724.94	6.82	6,138	12,692,809	725.83	0.89	1.1	
1545	724.93	6.85	6,165	12,686,644	725.83	0.90	1.1	
1560	724.92	6.88	6,192	12,680,451	725.82	0.91	1.1	
1575	724.91	6.91	6,219	12,674,232	725.82	0.92	1.1	
1590	724.90	6.94	6,246	12,667,986	725.82	0.92	1.1	
1605	724.89	6.97	6,273	12,661,713	725.82	0.93	1.1	
1620	724.88	7.00	6,299	12,655,414	725.81	0.94	1.1	
1635	724.86	7.03	6,326	12,649,088	725.81	0.95	1.1	
1650	724.85	7.06	6,352	12,642,736	725.81	0.95	1.1	
1665	724.84	7.09	6,378	12,636,358	725.81	0.96	1.2	
1680	724.83	7.12	6,404	12,629,954	725.80	0.97	1.2	
1695	724.82	7.14	6,430	12,623,524	725.80	0.98	1.2	
1710	724.81	7.17	6,456	12,617,069	725.80	0.99	1.2	
1725	724.80	7.20	6,481	12,610,588	725.80	0.99	1.2	
1740	724.79	7.23	6,507	12,604,081	725.79	1.00	1.2	
1755	724.78	7.26	6,532	12,597,549	725.79	1.01	1.2	
1770	724.77	7.29	6,557	12,590,992	725.79	1.02	1.2	
1785	724.76	7.31	6,582	12,584,410	725.79	1.03	1.2	
1800	724.75	7.34	6,607	12,577,803	725.78	1.03	1.3	
1815	724.74	7.37	6,632	12,571,172	725.78	1.04	1.3	
1830	724.73	7.40	6,656	12,564,515	725.78	1.05	1.3	
1845	724.72	7.42	6,681	12,557,834	725.77	1.06	1.3	
1860	724.71	7.45	6,705	12,551,129	725.77	1.06	1.3	
1875	724.70	7.48	6,730	12,544,399	725.77	1.07	1.3	
1890	724.69	7.50	6,754	12,537,645	725.77	1.08	1.3	
1905	724.68	7.53	6,778	12,530,868	725.76	1.09	1.3	
1920	724.67	7.56	6,802	12,524,066	725.76	1.09	1.3	
1935	724.66	7.58	6,826	12,517,240	725.76	1.10	1.3	
1950	724.65	7.61	6,849	12,510,391	725.76	1.11	1.4	
1965	724.64	7.64	6,873	12,503,518	725.75	1.12	1.4	
1980	724.63	7.66	6,897	12,496,621	725.75	1.13	1.4	
1995	724.61	7.69	6,920	12,489,701	725.75	1.13	1.4	
2010	724.60	7.71	6,943	12,482,758	725.74	1.14	1.4	
2025	724.59	7.74	6,966	12,475,792	725.74	1.15	1.4	
2040	724.58	7.77	6,989	12,468,802	725.74	1.16	1.4	
2055	724.57	7.79	7,012	12,461,790	725.74	1.16	1.4	
2070	724.56	7.82	7,035	12,454,754	725.73	1.17	1.4	
2085	724.55	7.84	7,058	12,447,696	725.73	1.18	1.4	

	Sand Creek			Cumulative				
Time (min)	WSE (ft MSL)	Qout (CFS)	Volume out (CF)	Volume (CF)	Mine WSE (ft MSL)	Head Diff	Day	
2100	724.54	7.87	7,081	12,440,615	725.73	1.19	1.5	
2115	724.53	7.89	7,103	12,433,512	725.73	1.19	1.5	
2130	724.52	7.92	7,126	12,426,386	725.72	1.20	1.5	
2145	724.51	7.94	7,148	12,419,238	725.72	1.21	1.5	
2160	724.50	7.97	7,170	12,412,068	725.72	1.22	1.5	
2175	724.49	7.99	7,193	12,404,875	725.71	1.22	1.5	
2190	724.48	8.02	7,215	12,397,660	725.71	1.23	1.5	
2205	724.47	8.04	7,237	12,390,424	725.71	1.24	1.5	
2220	724.46	8.07	7,259	12,383,165	725.71	1.25	1.5	
2235	724.45	8.09	7,280	12,375,884	725.70	1.25	1.6	
2250	724.44	8.11	7,302	12,368,582	725.70	1.26	1.6	
2265	724.43	8.14	7,324	12,361,258	725.70	1.27	1.6	
2280	724.42	8.16	7,345	12,353,913	725.69	1.28	1.6	
2295	724.41	8.19	7,367	12,346,546	725.69	1.28	1.6	
2310	724.40	8.21	7,388	12,339,158	725.69	1.29	1.6	
2325	724.39	8.23	7,409	12,331,749	725.68	1.30	1.6	
2340	724.38	8.26	7,431	12,324,318	725.68	1.31	1.6	
2355	724.36	8.28	7,452	12,316,866	725.68	1.31	1.6	
2370	724.35	8.30	7,473	12,309,393	725.68	1.32	1.6	
2385	724.34	8.33	7,494	12,301,899	725.67	1.33	1.7	
2400	724.33	8.35	7,515	12,294,385	725.67	1.34	1.7	
2415	724.32	8.37	7,535	12,286,849	725.67	1.34	1.7	
2430	724.31	8.40	7,556	12,279,293	725.66	1.35	1.7	
2445	724.30	8.42	7,577	12,271,716	725.66	1.36	1.7	
2460	724.29	8.44	7,597	12,264,119	725.66	1.37	1.7	
2475	724.28	8.46	7,618	12,256,501	725.65	1.37	1.7	
2490	724.27	8.49	7,638	12,248,863	725.65	1.38	1.7	
2505	724.26	8.51	7,659	12,241,205	725.65	1.39	1.7	
2520	724.25	8.53	7,679	12,233,526	725.65	1.40	1.8	
2535	724.24	8.55	7,699	12,225,827	725.64	1.40	1.8	
2550	724.23	8.58	7,719	12,218,108	725.64	1.41	1.8	
2565	724.22	8.60	7,739	12,210,369	725.64	1.42	1.8	
2580	724.21	8.62	7,759	12,202,610	725.63	1.42	1.8	
2595	724.20	8.64	7,779	12,194,831	725.63	1.43	1.8	
2610	724.19	8.67	7,799	12,187,032	725.63	1.44	1.8	
2625	724.18	8.69	7,818	12,179,214	725.62	1.45	1.8	
2640	724.17	8.71	7,838	12,171,376	725.62	1.45	1.8	
2655	724.16	8.73	7,858	12,163,518	725.62	1.46	1.8	
2670	724.15	8.75	7,877	12,155,641	725.61	1.47	1.9	
2685	724.14	8.77	7,897	12,147,745	725.61	1.48	1.9	
2700	724.13	8.80	7,916	12,139,829	725.61	1.48	1.9	
2715	724.11	8.82	7,935	12,131,893	725.61	1.49	1.9	
2730	724.10	8.84	7,955	12,123,939	725.60	1.50	1.9	
2745	724.09	8.86	7,974	12,115,965	725.60	1.51	1.9	
2760	724.08	8.88	7,993	12,107,972	725.60	1.51	1.9	
2775	724.07	8.90	8,012	12,099,961	725.59	1.52	1.9	
2790	724.06	8.92	8,031	12,091,930	725.59	1.53	1.9	
2805	724.05	8.94	8,050	12,083,880	725.59	1.53	1.9	
2820	724.04	8.97	8,069	12,075,811	725.58	1.54	2.0	
2835	724.03	8.99	8,087	12,067,724	725.58	1.55	2.0	

	Sand Creek			Cumulative				
Time (min)	WSE (ft MSL)	Qout (CFS)	Volume out (CF)	Volume (CF)	Mine WSE (ft MSL)	Head Diff	Day	
2850	724.02	9.01	8,106	12,059,618	725.58	1.56	2.0	
2865	724.01	9.03	8,125	12,051,493	725.57	1.56	2.0	
2880	724.00	9.05	8,143	12,043,350	725.57	1.57	2.0	
2895	723.99	9.07	8,162	12,035,188	725.57	1.58	2.0	
2910	723.98	9.09	8,180	12,027,007	725.56	1.58	2.0	
2925	723.97	9.11	8,199	12,018,809	725.56	1.59	2.0	
2940	723.96	9.13	8,217	12,010,591	725.56	1.60	2.0	
2955	723.95	9.15	8,235	12,002,356	725.55	1.61	2.1	
2970	723.94	9.17	8,254	11,994,102	725.55	1.61	2.1	
2985	723.93	9.19	8,272	11,985,830	725.55	1.62	2.1	
3000	723.92	9.21	8,290	11,977,540	725.54	1.63	2.1	
3015	723.91	9.23	8,308	11,969,232	725.54	1.63	2.1	
3030	723.90	9.25	8,326	11,960,906	725.54	1.64	2.1	
3045	723.89	9.27	8,344	11,952,562	725.53	1.65	2.1	
3060	723.88	9.29	8,362	11,944,200	725.53	1.66	2.1	
3075	723.86	9.31	8,380	11,935,820	725.53	1.66	2.1	
3090	723.85	9.33	8,398	11,927,423	725.52	1.67	2.1	
3105	723.84	9.35	8,415	11,919,007	725.52	1.68	2.2	
3120	723.83	9.37	8,433	11,910,574	725.52	1.68	2.2	
3135	723.82	9.39	8,451	11,902,124	725.51	1.69	2.2	
3150	723.81	9.41	8,468	11,893,656	725.51	1.70	2.2	
3165	723.80	9.43	8,486	11,885,170	725.51	1.70	2.2	
3180	723.79	9.45	8,503	11,876,667	725.50	1.71	2.2	
3195	723.78	9.47	8,521	11,868,147	725.50	1.72	2.2	
3210	723.77	9.49	8,538	11,859,609	725.50	1.73	2.2	
3225	723.76	9.51	8,555	11,851,054	725.49	1.73	2.2	
3240	723.75	9.52	8,572	11,842,481	725.49	1.74	2.3	
3255	723.74	9.54	8,590	11,833,892	725.49	1.75	2.3	
3270	723.73	9.56	8,607	11,825,285	725.48	1.75	2.3	
3285	723.72	9.58	8,624	11,816,661	725.48	1.76	2.3	
3300	723.71	9.60	8,641	11,808,020	725.48	1.77	2.3	
3315	723.70	9.62	8,658	11,799,362	725.47	1.77	2.3	
3330	723.69	9.64	8,675	11,790,687	725.47	1.78	2.3	
3345	723.68	9.66	8,692	11,781,996	725.47	1.79	2.3	
3360	723.67	9.68	8,709	11,773,287	725.46	1.80	2.3	
3375	723.66	9.69	8,725	11,764,562	725.46	1.80	2.3	
3390	723.65	9.71	8,742	11,755,820	725.46	1.81	2.4	
3405	723.64	9.73	8,759	11,747,061	725.45	1.82	2.4	
3420	723.63	9.75	8,775	11,738,286	725.45	1.82	2.4	
3435	723.61	9.77	8,792	11,729,494	725.44	1.83	2.4	
3450	723.60	9.79	8,809	11,720,685	725.44	1.84	2.4	
3465	723.59	9.81	8,825	11,711,860	725.44	1.84	2.4	
3480	723.58	9.82	8,842	11,703,018	725.43	1.85	2.4	
3495	723.57	9.84	8,858	11,694,160	725.43	1.86	2.4	
3510	723.56	9.86	8,874	11,685,286	725.43	1.86	2.4	
3525	723.55	9.88	8,891	11,676,395	725.42	1.87	2.4	
3540	723.54	9.90	8,907	11,667,488	725.42	1.88	2.5	
3555	723.53	9.91	8,923	11,658,565	725.42	1.89	2.5	
3570	723.52	9.93	8,939	11,649,626	725.41	1.89	2.5	
3585	723.51	9.95	8,956	11,640,670	725.41	1.90	2.5	

	Sand Creek			Cumulative			
Time	WSE	Qout	Volume out	Volume	Mine WSE	Head Diff	Day
(min)	(ft MSL)	(CFS)	(CF)	(CF)	(ft MSL)		
3600	723.50	9.97	8,972	11,631,699	725.41	1.91	2.5
3615	723.49	9.99	8,988	11,622,711	725.40	1.91	2.5
3630	723.48	10.00	9,004	11,613,707	725.40	1.92	2.5
3645	723.47	10.02	9,020	11,604,688	725.39	1.93	2.5
3660	723.46	10.04	9,036	11,595,652	725.39	1.93	2.5
3675	723.45	10.06	9,051	11,586,601	725.39	1.94	2.6
3690	723.44	10.07	9,067	11,577,533	725.38	1.95	2.6
3705	723.43	10.09	9,083	11,568,450	725.38	1.95	2.6
3720	723.42	10.11	9,099	11,559,351	725.38	1.96	2.6
3735	723.41	10.13	9,115	11,550,237	725.37	1.97	2.6
3750	723.40	10.14	9,130	11,541,106	725.37	1.97	2.6
3765	723.39	10.16	9,146	11,531,960	725.37	1.98	2.6
3780	723.38	10.18	9,161	11,522,799	725.36	1.99	2.6
3795	723.36	10.20	9,177	11,513,622	725.36	1.99	2.6
3810	723.35	10.21	9,193	11,504,429	725.36	2.00	2.6
3825	723.34	10.23	9,208	11,495,221	725.35	2.01	2.7
3840	723.33	10.25	9,223	11,485,998	725.35	2.01	2.7
3855	723.32	10.27	9,239	11,476,759	725.34	2.02	2.7
3870	723.31	10.28	9,254	11,467,505	725.34	2.03	2.7
3885	723.30	10.30	9,270	11,458,235	725.34	2.03	2.7
3900	723.29	10.32	9,285	11,448,950	725.33	2.04	2.7
3915	723.28	10.33	9,300	11,439,650	725.33	2.05	2.7
3930	723.27	10.35	9,315	11,430,335	725.33	2.05	2.7
3945	723.26	10.37	9,330	11,421,005	725.32	2.06	2.7
3960	723.25	10.38	9,345	11,411,659	725.32	2.07	2.8
3975	723.24	10.40	9,361	11,402,299	725.31	2.07	2.8
3990	723.23	10.42	9,376	11,392,923	725.31	2.08	2.8
4005	723.22	10.43	9,391	11,383,532	725.31	2.09	2.8
4020	723.21	10.45	9,406	11,374,127	725.30	2.09	2.8
4035	723.20	10.47	9,421	11,364,706	725.30	2.10	2.8
4050	723.19	10.48	9,435	11,355,271	725.30	2.11	2.8
4065	723.18	10.50	9,450	11,345,821	725.29	2.11	2.8
4080	723.17	10.52	9,465	11,336,356	725.29	2.12	2.8
4095	723.16	10.53	9,480	11,326,876	725.28	2.13	2.8
4110	723.15	10.55	9,495	11,317,381	725.28	2.13	2.9
4125	723.14	10.57	9,509	11,307,872	725.28	2.14	2.9
4140	723.13	10.58	9,524	11,298,348	725.27	2.15	2.9
4155	723.11	10.60	9,539	11,288,809	725.27	2.15	2.9
4170	723.10	10.61	9,553	11,279,256	725.27	2.16	2.9
4185	723.09	10.63	9,568	11,269,688	725.26	2.17	2.9
4200	723.08	10.65	9,582	11,260,106	725.26	2.17	2.9
4215	723.07	10.66	9,597	11,250,509	725.25	2.18	2.9
4230	723.06	10.68	9,611	11,240,897	725.25	2.19	2.9
4245	723.05	10.70	9,626	11,231,272	725.25	2.19	2.9
4260	723.04	10.71	9,640	11,221,631	725.24	2.20	3.0
4275	723.03	10.73	9,655	11,211,977	725.24	2.21	3.0
4290	723.02	10.74	9,669	11,202,308	725.23	2.21	3.0
4305	723.01	10.76	9,683	11,192,625	725.23	2.22	3.0
4320	723.00	10.77	9,697	11,182,927	725.23	2.23	3.0
4335	722.99	10.79	9,712	11,173,216	725.22	2.23	3.0

	Sand Creek			Cumulative				
Time (min)	WSE (ft MSL)	Qout (CFS)	Volume out (CF)	Volume (CF)	Mine WSE (ft MSL)	Head Diff	Day	
4350	722.98	10.81	9,726	11,163,490	725.22	2.24	3.0	
4365	722.97	10.82	9,740	11,153,750	725.22	2.25	3.0	
4380	722.96	10.84	9,754	11,143,996	725.21	2.25	3.0	
4395	722.95	10.85	9,768	11,134,228	725.21	2.26	3.1	
4410	722.94	10.87	9,782	11,124,445	725.20	2.27	3.1	
4425	722.93	10.88	9,796	11,114,649	725.20	2.27	3.1	
4440	722.92	10.90	9,810	11,104,839	725.20	2.28	3.1	
4455	722.91	10.92	9,824	11,095,014	725.19	2.29	3.1	
4470	722.90	10.93	9,838	11,085,176	725.19	2.29	3.1	
4485	722.89	10.95	9,852	11,075,324	725.18	2.30	3.1	
4500	722.88	10.96	9,866	11,065,458	725.18	2.31	3.1	
4515	722.86	10.98	9,880	11,055,578	725.18	2.31	3.1	
4530	722.85	10.99	9,894	11,045,684	725.17	2.32	3.1	
4545	722.84	11.01	9,907	11,035,777	725.17	2.32	3.2	
4560	722.83	11.02	9,921	11,025,855	725.16	2.33	3.2	
4575	722.82	11.04	9,935	11,015,921	725.16	2.34	3.2	
4590	722.81	11.05	9,949	11,005,972	725.16	2.34	3.2	
4605	722.80	11.07	9,962	10,996,010	725.15	2.35	3.2	
4620	722.79	11.08	9,976	10,986,034	725.15	2.36	3.2	
4635	722.78	11.10	9,990	10,976,044	725.14	2.36	3.2	
4650	722.77	11.11	10,003	10,966,041	725.14	2.37	3.2	
4665	722.76	11.13	10,017	10,956,024	725.14	2.38	3.2	
4680	722.75	11.14	10,030	10,945,994	725.13	2.38	3.3	
4695	722.74	11.16	10,044	10,935,951	725.13	2.39	3.3	
4710	722.73	11.17	10,057	10,925,894	725.12	2.40	3.3	
4725	722.72	11.19	10,070	10,915,823	725.12	2.40	3.3	
4740	722.71	11.20	10,084	10,905,739	725.12	2.41	3.3	
4755	722.70	11.22	10,097	10,895,642	725.11	2.41	3.3	
4770	722.69	11.23	10,111	10,885,531	725.11	2.42	3.3	
4785	722.68	11.25	10,124	10,875,407	725.10	2.43	3.3	
4800	722.67	11.26	10,137	10,865,270	725.10	2.43	3.3	
4815	722.66	11.28	10,150	10,855,120	725.10	2.44	3.3	
4830	722.65	11.29	10,164	10,844,956	725.09	2.45	3.4	
4845	722.64	11.31	10,177	10,834,779	725.09	2.45	3.4	
4860	722.63	11.32	10,190	10,824,589	725.08	2.46	3.4	
4875	722.61	11.34	10,203	10,814,386	725.08	2.47	3.4	
4890	722.60	11.35	10,216	10,804,170	725.08	2.47	3.4	
4905	722.59	11.37	10,229	10,793,941	725.07	2.48	3.4	
4920	722.58	11.38	10,242	10,783,698	725.07	2.48	3.4	
4935	722.57	11.39	10,255	10,773,443	725.06	2.49	3.4	
4950	722.56	11.41	10,268	10,763,175	725.06	2.50	3.4	
4965	722.55	11.42	10,281	10,752,893	725.06	2.50	3.4	
4980	722.54	11.44	10,294	10,742,599	725.05	2.51	3.5	
4995	722.53	11.45	10,307	10,732,292	725.05	2.52	3.5	
5010	722.52	11.47	10,320	10,721,971	725.04	2.52	3.5	
5025	722.51	11.48	10,333	10,711,638	725.04	2.53	3.5	
5040	722.50	11.50	10,346	10,701,293	725.03	2.53	3.5	
5055	722.49	11.51	10,359	10,690,934	725.03	2.54	3.5	
5070	722.48	11.52	10,371	10,680,562	725.03	2.55	3.5	
5085	722.47	11.54	10,384	10,670,178	725.02	2.55	3.5	

	Sand Creek			Cumulative				
Time (min)	WSE (ft MSL)	Qout (CFS)	Volume out (CF)	Volume (CF)	Mine WSE (ft MSL)	Head Diff	Day	
5100	722.46	11.55	10,397	10,659,781	725.02	2.56	3.5	
5115	722.45	11.57	10,410	10,649,372	725.01	2.57	3.6	
5130	722.44	11.58	10,422	10,638,949	725.01	2.57	3.6	
5145	722.43	11.59	10,435	10,628,514	725.01	2.58	3.6	
5160	722.42	11.61	10,448	10,618,067	725.00	2.59	3.6	
5175	722.41	11.62	10,460	10,607,606	725.00	2.59	3.6	
5190	722.40	11.64	10,473	10,597,134	724.99	2.60	3.6	
5205	722.39	11.65	10,485	10,586,649	724.99	2.60	3.6	
5220	722.38	11.66	10,497	10,576,152	724.98	2.61	3.6	
5235	722.36	11.68	10,510	10,565,642	724.98	2.62	3.6	
5250	722.35	11.69	10,522	10,555,120	724.98	2.62	3.6	
5265	722.34	11.70	10,534	10,544,586	724.97	2.63	3.7	
5280	722.33	11.72	10,546	10,534,040	724.97	2.63	3.7	
5295	722.32	11.73	10,558	10,523,482	724.96	2.64	3.7	
5310	722.31	11.74	10,570	10,512,911	724.96	2.65	3.7	
5325	722.30	11.76	10,583	10,502,329	724.95	2.65	3.7	
5340	722.29	11.77	10,595	10,491,734	724.95	2.66	3.7	
5355	722.28	11.79	10,607	10,481,127	724.95	2.66	3.7	
5370	722.27	11.80	10,619	10,470,509	724.94	2.67	3.7	
5385	722.26	11.81	10,631	10,459,878	724.94	2.68	3.7	
5400	722.25	11.83	10,643	10,449,235	724.93	2.68	3.8	
5415	722.24	11.84	10,655	10,438,580	724.93	2.69	3.8	
5430	722.23	11.85	10,667	10,427,914	724.92	2.69	3.8	
5445	722.22	11.87	10,679	10,417,235	724.92	2.70	3.8	
5460	722.21	11.88	10,691	10,406,545	724.92	2.71	3.8	
5475	722.20	11.89	10,702	10,395,842	724.91	2.71	3.8	
5490	722.19	11.90	10,714	10,385,128	724.91	2.72	3.8	
5505	722.18	11.92	10,726	10,374,402	724.90	2.72	3.8	
5520	722.17	11.93	10,738	10,363,664	724.90	2.73	3.8	
5535	722.16	11.94	10,750	10,352,914	724.89	2.74	3.8	
5550	722.15	11.96	10,761	10,342,153	724.89	2.74	3.9	
5565	722.14	11.97	10,773	10,331,379	724.88	2.75	3.9	
5580	722.13	11.98	10,785	10,320,595	724.88	2.75	3.9	
5595	722.11	12.00	10,797	10,309,798	724.88	2.76	3.9	
5610	722.10	12.01	10,808	10,298,990	724.87	2.77	3.9	
5625	722.09	12.02	10,820	10,288,170	724.87	2.77	3.9	
5640	722.08	12.04	10,832	10,277,338	724.86	2.78	3.9	
5655	722.07	12.05	10,843	10,266,495	724.86	2.78	3.9	
5670	722.06	12.06	10,855	10,255,640	724.85	2.79	3.9	
5685	722.05	12.07	10,866	10,244,773	724.85	2.80	3.9	
5700	722.04	12.09	10,878	10,233,896	724.84	2.80	4.0	
5715	722.03	12.10	10,889	10,223,006	724.84	2.81	4.0	
5730	722.02	12.11	10,901	10,212,105	724.84	2.81	4.0	
5745	722.01	12.12	10,912	10,201,193	724.83	2.82	4.0	
5760	722.00	12.14	10,924	10,190,269	724.83	2.83	4.0	
5775	722.00	12.13	10,915	10,179,353	724.82	2.82	4.0	
5790	722.00	12.12	10,907	10,168,447	724.82	2.82	4.0	
5805	722.00	12.11	10,898	10,157,549	724.81	2.81	4.0	
5820	722.00	12.10	10,889	10,146,660	724.81	2.81	4.0	
5835	722.00	12.09	10,881	10,135,779	724.80	2.80	4.1	

	Sand Creek			Cumulative				
Time (min)	WSE (ft MSL)	Qout (CFS)	Volume out (CF)	Volume (CF)	Mine WSE (ft MSL)	Head Diff	Day	
5850	722.00	12.08	10,872	10,124,907	724.80	2.80	4.1	
5865	722.00	12.07	10,863	10,114,044	724.79	2.79	4.1	
5880	722.00	12.06	10,855	10,103,189	724.79	2.79	4.1	
5895	722.00	12.05	10,846	10,092,343	724.79	2.79	4.1	
5910	722.00	12.04	10,837	10,081,505	724.78	2.78	4.1	
5925	722.00	12.03	10,829	10,070,677	724.78	2.78	4.1	
5940	722.00	12.02	10,820	10,059,857	724.77	2.77	4.1	
5955	722.00	12.01	10,811	10,049,045	724.77	2.77	4.1	
5970	722.00	12.00	10,803	10,038,242	724.76	2.76	4.1	
5985	722.00	11.99	10,794	10,027,448	724.76	2.76	4.2	
6000	722.00	11.98	10,785	10,016,663	724.75	2.75	4.2	
6015	722.00	11.97	10,777	10,005,886	724.75	2.75	4.2	
6030	722.00	11.96	10,768	9,995,118	724.75	2.75	4.2	
6045	722.00	11.95	10,759	9,984,358	724.74	2.74	4.2	
6060	722.00	11.95	10,751	9,973,608	724.74	2.74	4.2	
6075	722.00	11.94	10,742	9,962,865	724.73	2.73	4.2	
6090	722.00	11.93	10,734	9,952,132	724.73	2.73	4.2	
6105	722.00	11.92	10,725	9,941,407	724.72	2.72	4.2	
6120	722.00	11.91	10,716	9,930,691	724.72	2.72	4.3	
6135	722.00	11.90	10,708	9,919,983	724.72	2.72	4.3	
6150	722.00	11.89	10,699	9,909,284	724.71	2.71	4.3	
6165	722.00	11.88	10,690	9,898,594	724.71	2.71	4.3	
6180	722.00	11.87	10,682	9,887,912	724.70	2.70	4.3	
6195	722.00	11.86	10,673	9,877,239	724.70	2.70	4.3	
6210	722.00	11.85	10,664	9,866,575	724.69	2.69	4.3	
6225	722.00	11.84	10,656	9,855,919	724.69	2.69	4.3	
6240	722.00	11.83	10,647	9,845,272	724.68	2.68	4.3	
6255	722.00	11.82	10,638	9,834,634	724.68	2.68	4.3	
6270	722.00	11.81	10,630	9,824,004	724.68	2.68	4.4	
6285	722.00	11.80	10,621	9,813,383	724.67	2.67	4.4	
6300	722.00	11.79	10,612	9,802,771	724.67	2.67	4.4	
6315	722.00	11.78	10,604	9,792,167	724.66	2.66	4.4	
6330	722.00	11.77	10,595	9,781,572	724.66	2.66	4.4	
6345	722.00	11.76	10,586	9,770,986	724.65	2.65	4.4	
6360	722.00	11.75	10,578	9,760,408	724.65	2.65	4.4	
6375	722.00	11.74	10,569	9,749,839	724.65	2.65	4.4	
6390	722.00	11.73	10,560	9,739,278	724.64	2.64	4.4	
6405	722.00	11.72	10,552	9,728,727	724.64	2.64	4.4	
6420	722.00	11.71	10,543	9,718,184	724.63	2.63	4.5	
6435	722.00	11.70	10,534	9,707,649	724.63	2.63	4.5	
6450	722.00	11.70	10,526	9,697,123	724.62	2.62	4.5	
6465	722.00	11.69	10,517	9,686,606	724.62	2.62	4.5	
6480	722.00	11.68	10,509	9,676,097	724.62	2.62	4.5	
6495	722.00	11.67	10,500	9,665,598	724.61	2.61	4.5	
6510	722.00	11.66	10,491	9,655,106	724.61	2.61	4.5	
6525	722.00	11.65	10,483	9,644,624	724.60	2.60	4.5	
6540	722.00	11.64	10,474	9,634,150	724.60	2.60	4.5	
6555	722.00	11.63	10,465	9,623,685	724.59	2.59	4.6	
6570	722.00	11.62	10,457	9,613,228	724.59	2.59	4.6	
6585	722.00	11.61	10,448	9,602,780	724.59	2.59	4.6	

	Sand Creek			Cumulative				
Time (min)	WSE (ft MSL)	Qout (CFS)	Volume out (CF)	Volume (CF)	Mine WSE (ft MSL)	Head Diff	Day	
6600	722.00	11.60	10,439	9,592,341	724.58	2.58	4.6	
6615	722.00	11.59	10,431	9,581,910	724.58	2.58	4.6	
6630	722.00	11.58	10,422	9,571,488	724.57	2.57	4.6	
6645	722.00	11.57	10,413	9,561,075	724.57	2.57	4.6	
6660	722.00	11.56	10,405	9,550,670	724.56	2.56	4.6	
6675	722.00	11.55	10,396	9,540,274	724.56	2.56	4.6	
6690	722.00	11.54	10,387	9,529,887	724.56	2.56	4.6	
6705	722.00	11.53	10,379	9,519,508	724.55	2.55	4.7	
6720	722.00	11.52	10,370	9,509,138	724.55	2.55	4.7	
6735	722.00	11.51	10,361	9,498,777	724.54	2.54	4.7	
6750	722.00	11.50	10,353	9,488,424	724.54	2.54	4.7	
6765	722.00	11.49	10,344	9,478,080	724.53	2.53	4.7	
6780	722.00	11.48	10,335	9,467,744	724.53	2.53	4.7	
6795	722.00	11.47	10,327	9,457,417	724.53	2.53	4.7	
6810	722.00	11.46	10,318	9,447,099	724.52	2.52	4.7	
6825	722.00	11.45	10,309	9,436,790	724.52	2.52	4.7	
6840	722.00	11.45	10,301	9,426,489	724.51	2.51	4.8	
6855	722.00	11.44	10,292	9,416,197	724.51	2.51	4.8	
6870	722.00	11.43	10,284	9,405,913	724.50	2.50	4.8	
6885	722.00	11.42	10,275	9,395,638	724.50	2.50	4.8	
6900	722.00	11.41	10,266	9,385,372	724.50	2.50	4.8	
6915	722.00	11.40	10,258	9,375,115	724.49	2.49	4.8	
6930	722.00	11.39	10,249	9,364,866	724.49	2.49	4.8	
6945	722.00	11.38	10,240	9,354,626	724.48	2.48	4.8	
6960	722.00	11.37	10,232	9,344,394	724.48	2.48	4.8	
6975	722.00	11.36	10,223	9,334,171	724.47	2.47	4.8	
6990	722.00	11.35	10,214	9,323,957	724.47	2.47	4.9	
7005	722.00	11.34	10,206	9,313,751	724.47	2.47	4.9	
7020	722.00	11.33	10,197	9,303,554	724.46	2.46	4.9	
7035	722.00	11.32	10,188	9,293,366	724.46	2.46	4.9	
7050	722.00	11.31	10,180	9,283,186	724.45	2.45	4.9	
7065	722.00	11.30	10,171	9,273,015	724.45	2.45	4.9	
7080	722.00	11.29	10,162	9,262,853	724.45	2.45	4.9	
7095	722.00	11.28	10,154	9,252,699	724.44	2.44	4.9	
7110	722.00	11.27	10,145	9,242,554	724.44	2.44	4.9	
7125	722.00	11.26	10,136	9,232,418	724.43	2.43	4.9	
7140	722.00	11.25	10,128	9,222,290	724.43	2.43	5.0	
7155	722.00	11.24	10,119	9,212,171	724.42	2.42	5.0	
7170	722.00	11.23	10,110	9,202,060	724.42	2.42	5.0	
7185	722.00	11.22	10,102	9,191,959	724.42	2.42	5.0	
7200	722.00	11.21	10,093	9,181,865	724.41	2.41	5.0	
7215	722.00	11.20	10,084	9,171,781	724.41	2.41	5.0	
7230	722.00	11.20	10,076	9,161,705	724.40	2.40	5.0	
7245	722.00	11.19	10,067	9,151,638	724.40	2.40	5.0	
7260	722.00	11.18	10,059	9,141,579	724.40	2.40	5.0	
7275	722.00	11.17	10,050	9,131,530	724.39	2.39	5.1	
7290	722.00	11.16	10,041	9,121,488	724.39	2.39	5.1	
7305	722.00	11.15	10,033	9,111,456	724.38	2.38	5.1	
7320	722.00	11.14	10,024	9,101,432	724.38	2.38	5.1	
7335	722.00	11.13	10,015	9,091,417	724.38	2.38	5.1	

	Sand Creek			Cumulative				
Time (min)	WSE (ft MSL)	Qout (CFS)	Volume out (CF)	Volume (CF)	Mine WSE (ft MSL)	Head Diff	Day	
7350	722.00	11.12	10,007	9,081,410	724.37	2.37	5.1	
7365	722.00	11.11	9,998	9,071,412	724.37	2.37	5.1	
7380	722.00	11.10	9,989	9,061,423	724.36	2.36	5.1	
7395	722.00	11.09	9,981	9,051,442	724.36	2.36	5.1	
7410	722.00	11.08	9,972	9,041,470	724.35	2.35	5.1	
7425	722.00	11.07	9,963	9,031,507	724.35	2.35	5.2	
7440	722.00	11.06	9,955	9,021,552	724.35	2.35	5.2	
7455	722.00	11.05	9,946	9,011,606	724.34	2.34	5.2	
7470	722.00	11.04	9,937	9,001,669	724.34	2.34	5.2	
7485	722.00	11.03	9,929	8,991,740	724.33	2.33	5.2	
7500	722.00	11.02	9,920	8,981,820	724.33	2.33	5.2	
7515	722.00	11.01	9,911	8,971,909	724.33	2.33	5.2	
7530	722.00	11.00	9,903	8,962,006	724.32	2.32	5.2	
7545	722.00	10.99	9,894	8,952,112	724.32	2.32	5.2	
7560	722.00	10.98	9,885	8,942,227	724.31	2.31	5.3	
7575	722.00	10.97	9,877	8,932,350	724.31	2.31	5.3	
7590	722.00	10.96	9,868	8,922,482	724.31	2.31	5.3	
7605	722.00	10.95	9,859	8,912,622	724.30	2.30	5.3	
7620	722.00	10.95	9,851	8,902,772	724.30	2.30	5.3	
7635	722.00	10.94	9,842	8,892,929	724.29	2.29	5.3	
7650	722.00	10.93	9,833	8,883,096	724.29	2.29	5.3	
7665	722.00	10.92	9,825	8,873,271	724.29	2.29	5.3	
7680	722.00	10.91	9,816	8,863,455	724.28	2.28	5.3	
7695	722.00	10.90	9,808	8,853,647	724.28	2.28	5.3	
7710	722.00	10.89	9,799	8,843,848	724.27	2.27	5.4	
7725	722.00	10.88	9,790	8,834,058	724.27	2.27	5.4	
7740	722.00	10.87	9,782	8,824,277	724.27	2.27	5.4	
7755	722.00	10.86	9,773	8,814,504	724.26	2.26	5.4	
7770	722.00	10.85	9,764	8,804,740	724.26	2.26	5.4	
7785	722.00	10.84	9,756	8,794,984	724.25	2.25	5.4	
7800	722.00	10.83	9,747	8,785,237	724.25	2.25	5.4	
7815	722.00	10.82	9,738	8,775,499	724.25	2.25	5.4	
7830	722.00	10.81	9,730	8,765,769	724.24	2.24	5.4	
7845	722.00	10.80	9,721	8,756,048	724.24	2.24	5.4	
7860	722.00	10.79	9,712	8,746,336	724.23	2.23	5.5	
7875	722.00	10.78	9,704	8,736,632	724.23	2.23	5.5	
7890	722.00	10.77	9,695	8,726,937	724.23	2.23	5.5	
7905	722.00	10.76	9,686	8,717,251	724.22	2.22	5.5	
7920	722.00	10.75	9,678	8,707,573	724.22	2.22	5.5	
7935	722.00	10.74	9,669	8,697,904	724.21	2.21	5.5	
7950	722.00	10.73	9,660	8,688,243	724.21	2.21	5.5	
7965	722.00	10.72	9,652	8,678,592	724.21	2.21	5.5	
7980	722.00	10.71	9,643	8,668,949	724.20	2.20	5.5	
7995	722.00	10.70	9,634	8,659,314	724.20	2.20	5.6	
8010	722.00	10.70	9,626	8,649,688	724.19	2.19	5.6	
8025	722.00	10.69	9,617	8,640,071	724.19	2.19	5.6	
8040	722.00	10.68	9,608	8,630,463	724.19	2.19	5.6	
8055	722.00	10.67	9,600	8,620,863	724.18	2.18	5.6	
8070	722.00	10.66	9,591	8,611,272	724.18	2.18	5.6	
8085	722.00	10.65	9,583	8,601,689	724.17	2.17	5.6	