

Gorge 2nd Tunnel

Appendix L: System Curves

Contents:

Head Loss Graphs for Various G2T Diameters with Link 3 Connection (6 pages)

Head Loss Results Summary (28 pages)

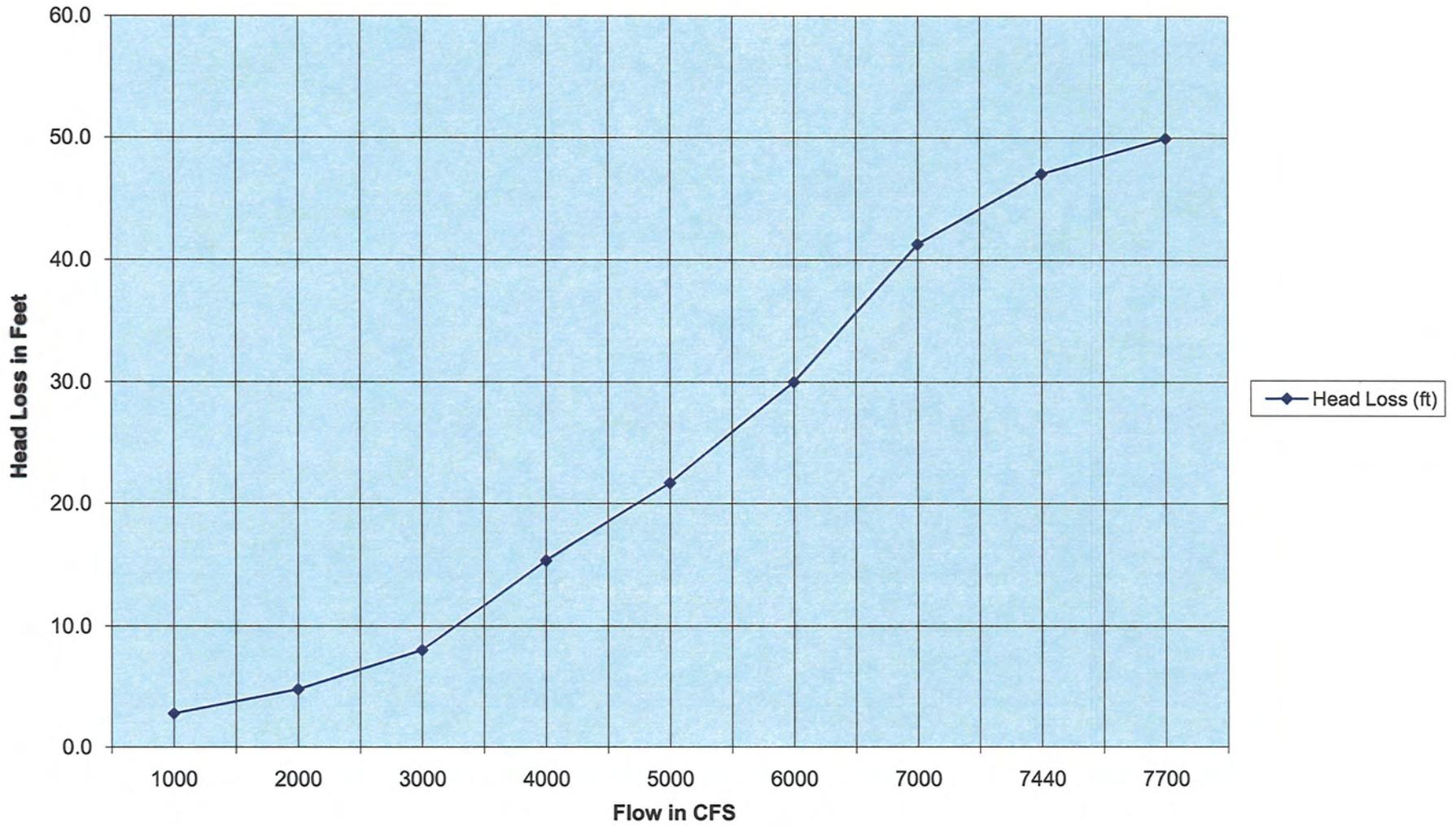
Graph Depicting Estimated Plant Capacity with Link 3 Arrangement (1 page)

Prepared by:

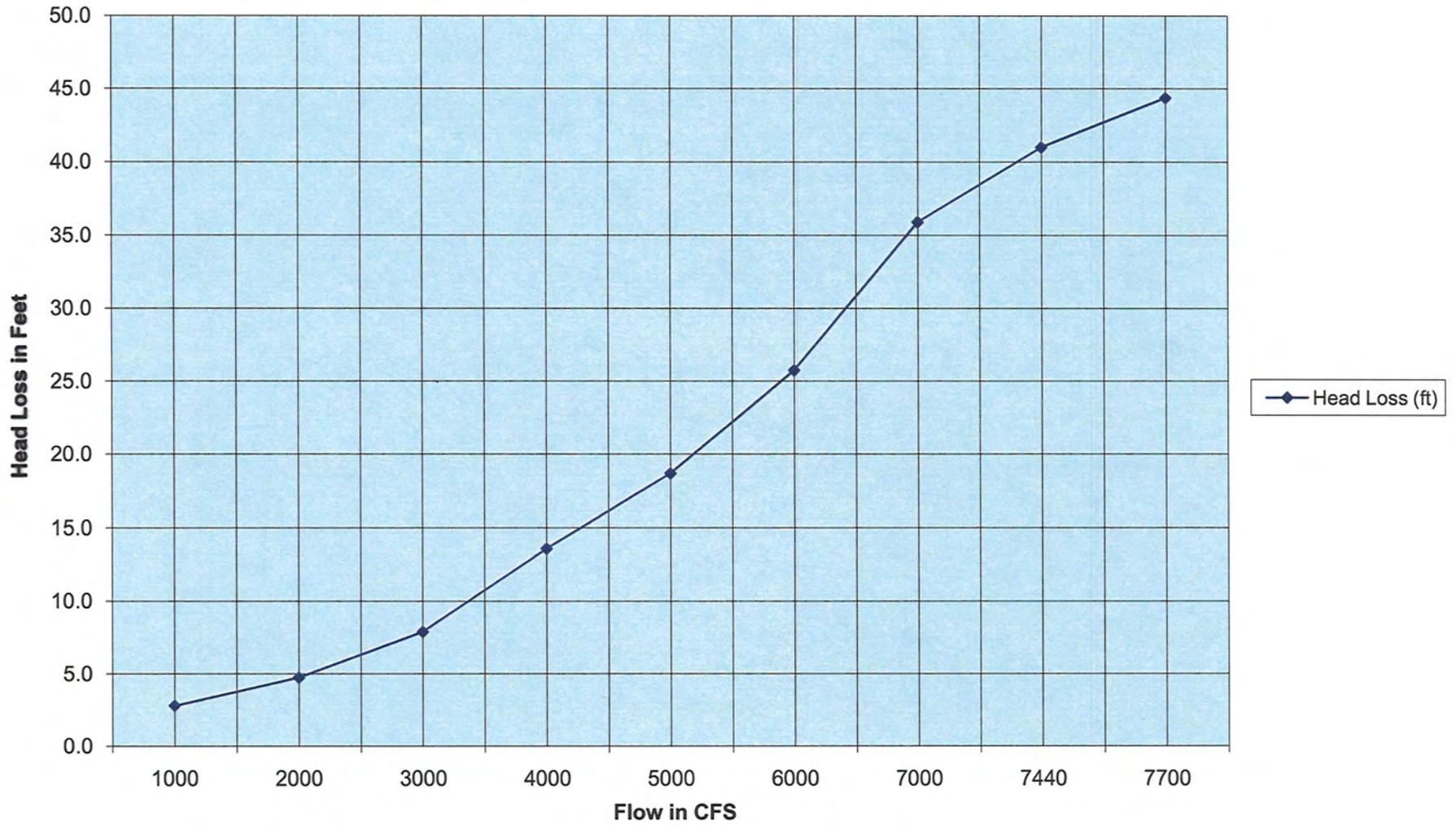


Jacobs Associates
1109 First Avenue, Suite 501
Seattle, WA 98101

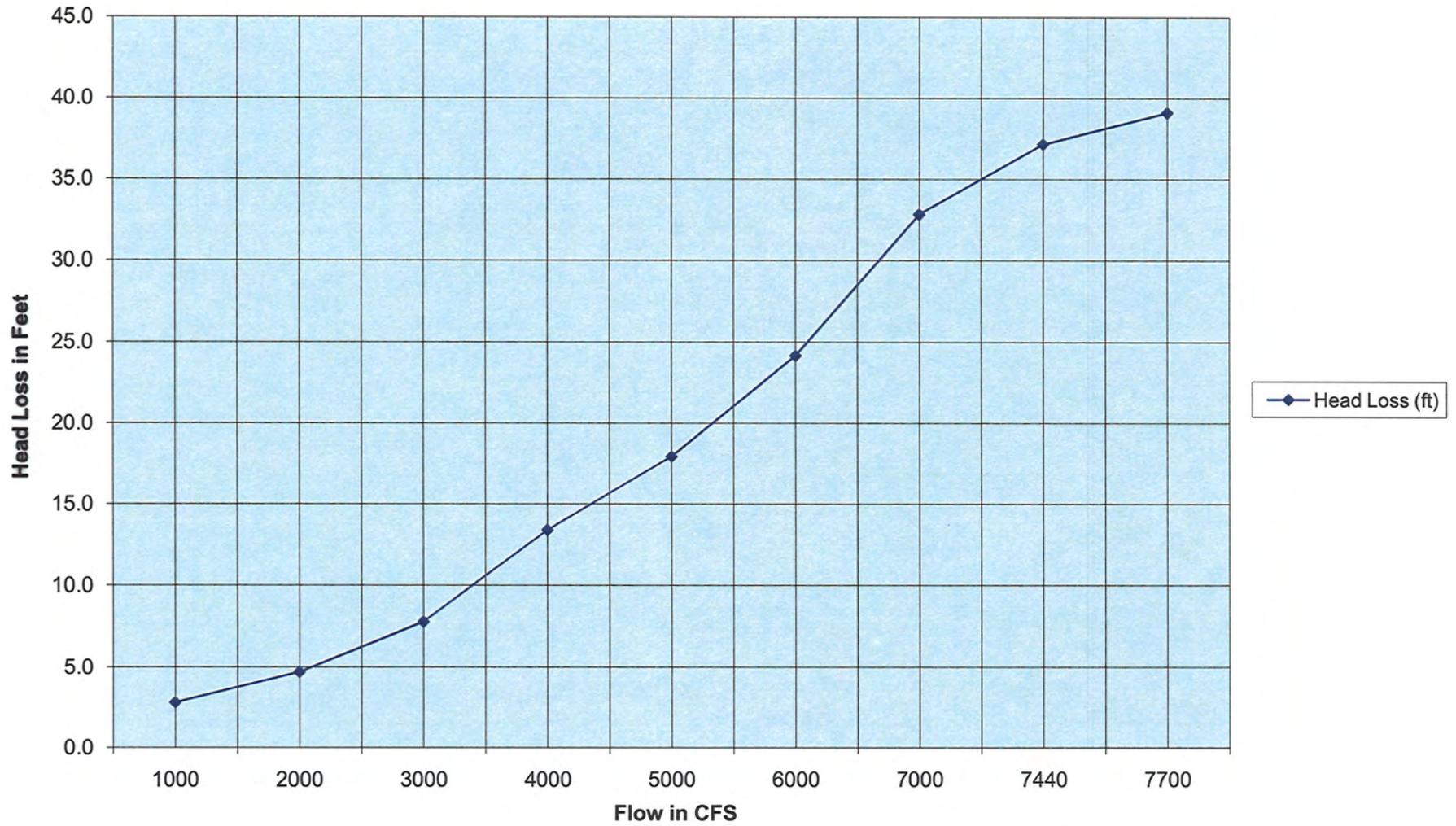
Graph 1
Gorge T2 Alternative Link 3 - 14' Diameter
Head Loss



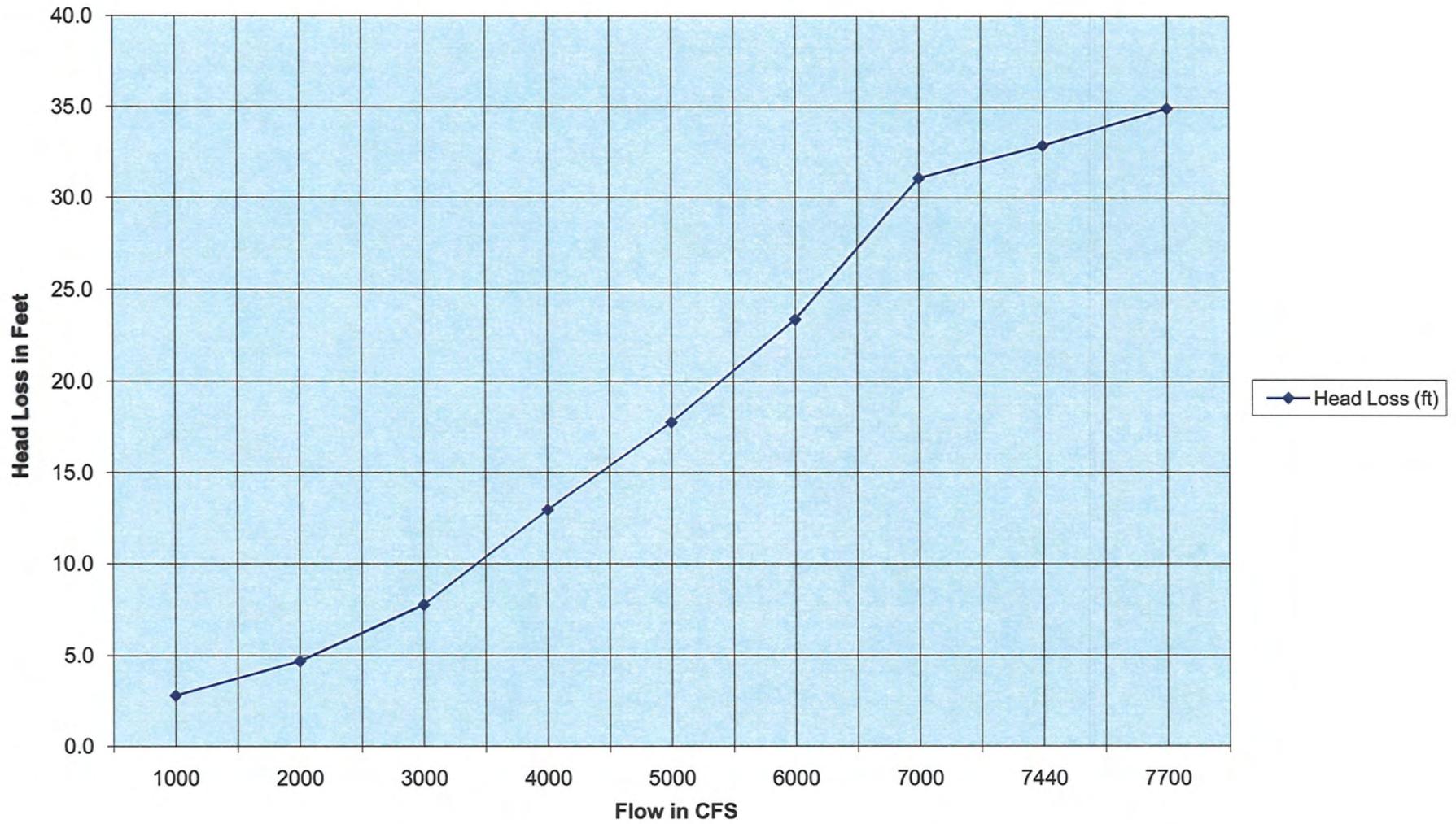
Graph 2
Gorge T2 Alternative Link 3 - 16' Diameter
Head Loss



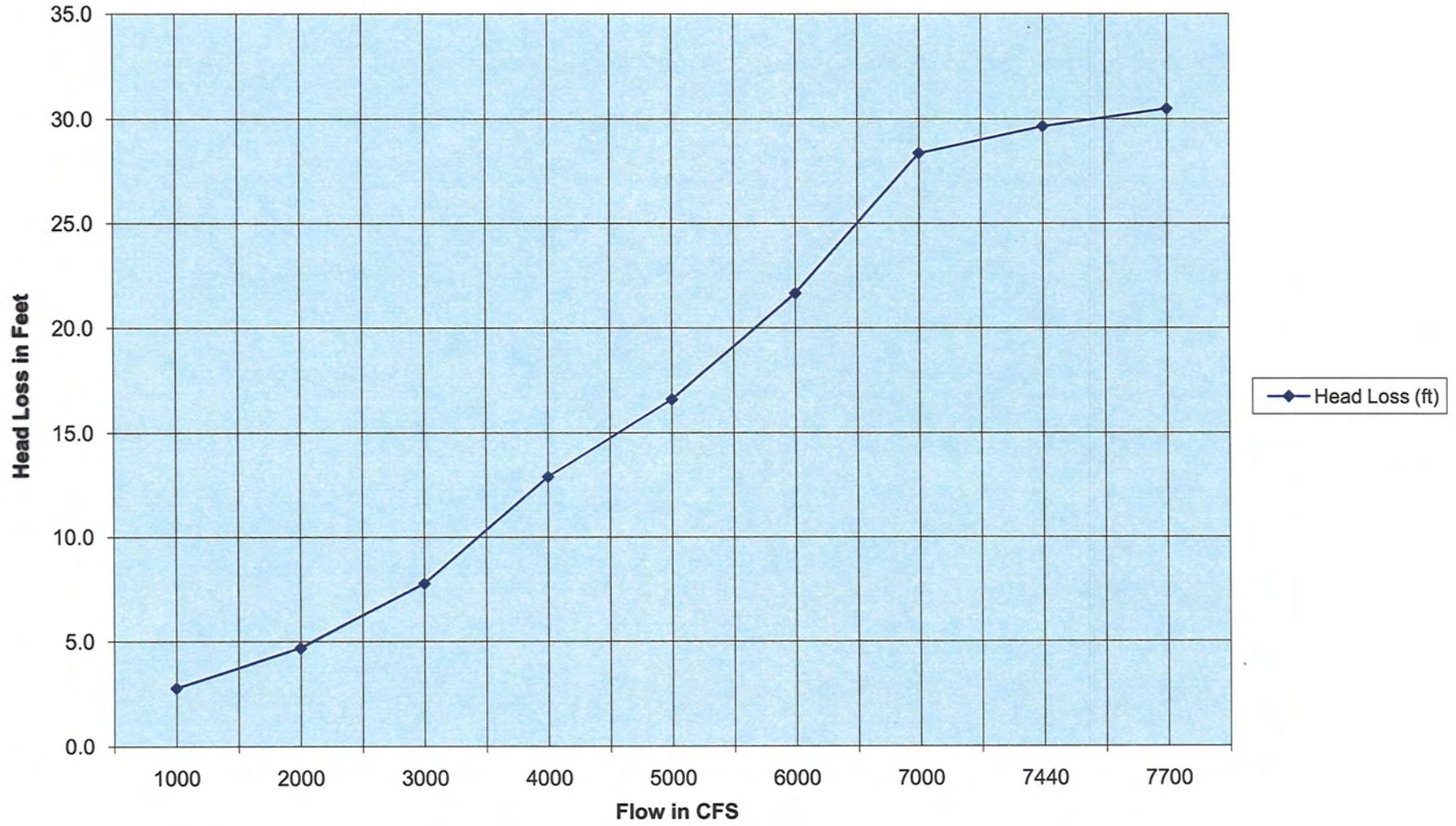
Graph 3
Gorge T2 Alternative Link 3 - 18' Diameter
Head Loss



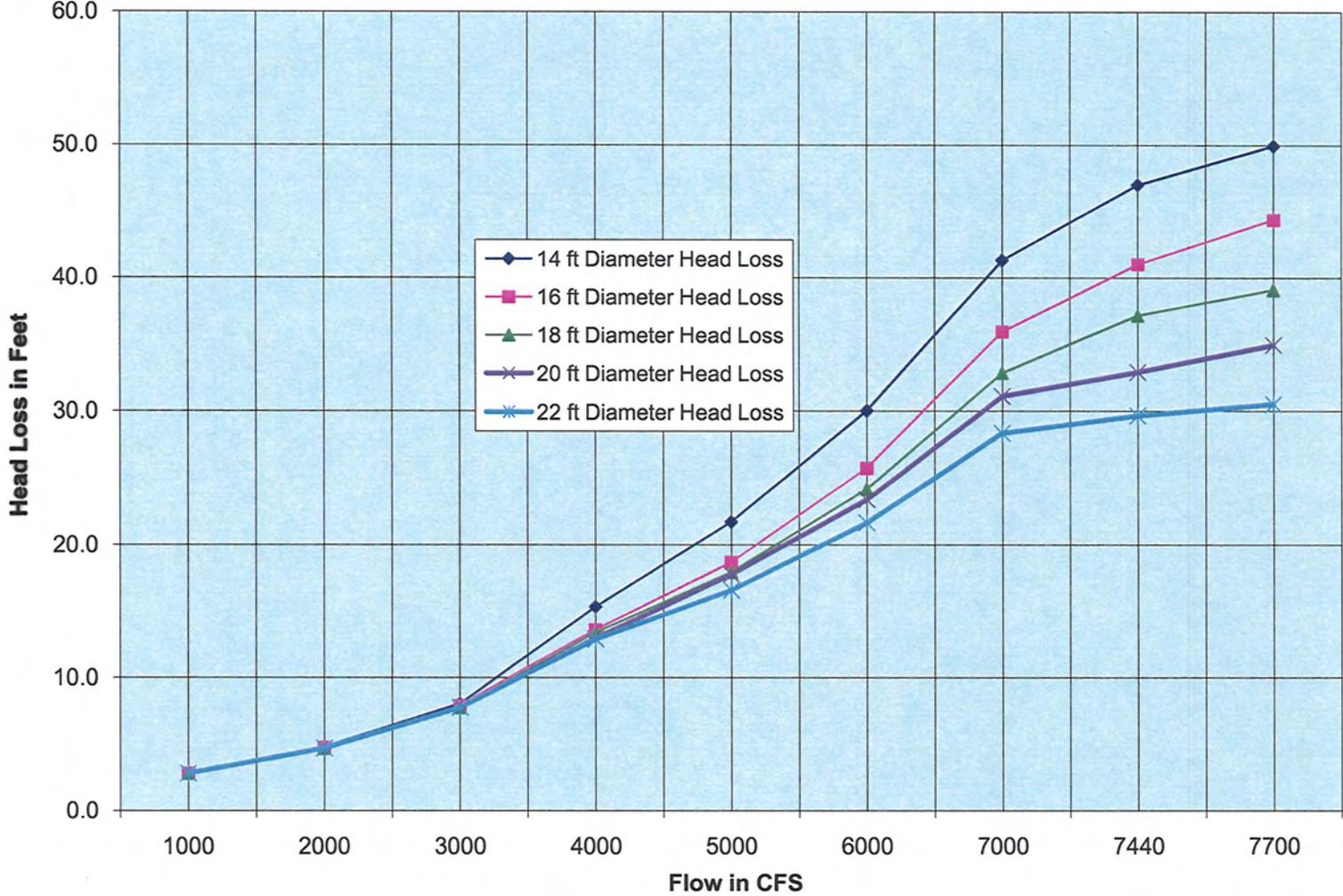
Graph 4
Gorge T2 Alternative Link 3 - 20' Diameter
Head Loss



Graph 5
Gorge T2 Alternative Link 3 - 22' Diameter
Head Loss



Graph 6
Gorge T2 Alternative Link 3 - Comparison of Diameter
Head Loss



G7440A4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1372	1372	1275	3440	7459	
Steady State HGL at Scroll Case (PTURB Output)	830.3	830.2	830.9	829.9		
Velocity (PTURB Output)	17.47	17.47	16.23	28.04		
Velocity Head (Spreadsheet Calculation)	4.7	4.7	4.1	12.2		
Head Loss in ft (Spreadsheet Calculation)	44.7	44.8	44.1	45.1	44.7	average (calculated)

G7700A4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1401	1401	1346	3564	7712	
Steady State HGL at Scroll Case (PTURB Output)	825	824.9	825.3	825		
Velocity (PTURB Output)	17.84	17.84	17.13	29.04		
Velocity Head (Spreadsheet Calculation)	4.9	4.9	4.6	13.1		
Head Loss in ft (Spreadsheet Calculation)	50.0	50.1	49.7	50.0	50.0	average (calculated)

Gorge 2nd Tunnel - Preliminary Transient Results Summary

16' Diameter Second Tunnel - Link 1 Configuration

G1000A6						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	0	1000	0	0	1000	
Steady State HGL at Scroll Case (PTURB Output)	874.2	872	874.1	874.2		
Velocity (PTURB Output)	0.00	12.74	0	0		
Velocity Head (Spreadsheet Calculation)	0.0	2.5	0.0	0.0		
Head Loss in ft (Spreadsheet Calculation)		3.0			3.0	average (calculated)

G2000A6						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	950	1054	0	0	2005	
Steady State HGL at Scroll Case (PTURB Output)	870.3	870	872.3	872.7		
Velocity (PTURB Output)	12.10	13.40	0	0		
Velocity Head (Spreadsheet Calculation)	2.3	2.8	0.0	0.0		
Head Loss in ft (Spreadsheet Calculation)	4.7	5.0			4.9	average (calculated)

G3000A6						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	927	1001	1079	0	3007	
Steady State HGL at Scroll Case (PTURB Output)	867.2	866.9	866.6	870		
Velocity (PTURB Output)	11.80	12.75	13.73	0		
Velocity Head (Spreadsheet Calculation)	2.2	2.5	2.9	0.0		
Head Loss in ft (Spreadsheet Calculation)	7.8	8.1	8.4		8.1	average (calculated)

G4000A6						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	0	1162	0	2853	4015	
Steady State HGL at Scroll Case (PTURB Output)	865.7	862.8	865.6	862		
Velocity (PTURB Output)	0.00	14.80	0	23.25		
Velocity Head (Spreadsheet Calculation)	0.0	3.4	0.0	8.4		
Head Loss in ft (Spreadsheet Calculation)		12.2		13.0	12.6	average (calculated)

G5000A6						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1012	1140	0	2876	5028	
Steady State HGL at Scroll Case (PTURB Output)	857.9	857.5	860.2	857.3		
Velocity (PTURB Output)	12.89	14.51	0	23.4		
Velocity Head (Spreadsheet Calculation)	2.6	3.3	0.0	8.5		
Head Loss in ft (Spreadsheet Calculation)	17.1	17.5		17.7	17.4	average (calculated)

G6000A6						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1015	1113	1113	2785	6026	
Steady State HGL at Scroll Case (PTURB Output)	850.2	849.7	849.7	850.1		
Velocity (PTURB Output)	12.93	14.17	14.17	22.7		
Velocity Head (Spreadsheet Calculation)	2.6	3.1	3.1	8.0		
Head Loss in ft (Spreadsheet Calculation)	24.8	25.3	25.3	24.9	25.1	average (calculated)

G7000A6						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1229	1301	1201	3324	7056	
Steady State HGL at Scroll Case (PTURB Output)	840.6	840.2	840.8	840.5		
Velocity (PTURB Output)	15.65	16.57	15.3	27.09		
Velocity Head (Spreadsheet Calculation)	3.8	4.3	3.6	11.4		
Head Loss in ft (Spreadsheet Calculation)	34.4	34.8	34.2	34.5	34.5	average (calculated)

G7440A6						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1355	1338	1254	3546	7492	
Steady State HGL at Scroll Case (PTURB Output)	836.1	836.2	836.7	835.8		
Velocity (PTURB Output)	17.24	17.03	15.96	28.89		
Velocity Head (Spreadsheet Calculation)	4.6	4.5	4.0	13.0		
Head Loss in ft (Spreadsheet Calculation)	38.9	38.8	38.3	39.2	38.8	average (calculated)

G7700A6						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1411	1400	1313	3601	7725	
Steady State HGL at Scroll Case (PTURB Output)	830.9	831	831.5	831.3		
Velocity (PTURB Output)	17.96	17.83	16.71	29.35		
Velocity Head (Spreadsheet Calculation)	5.0	4.9	4.3	13.4		
Head Loss in ft (Spreadsheet Calculation)	44.1	44.0	43.5	43.7	43.8	average (calculated)

7000
7440
8000

Gorge 2nd Tunnel - Preliminary Transient Results Summary

18' Diameter Second Tunnel - Link 1 Configuration

G1000A8						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	0	1000	0	0	1000	
Steady State HGL at Scroll Case (PTURB Output)	874.2	872	874.1	874.2		
Velocity (PTURB Output)	0.00	12.73	0	0		
Velocity Head (Spreadsheet Calculation)	0.0	2.5	0.0	0.0		
Head Loss in ft (Spreadsheet Calculation)		3.0			3.0	average (calculated)

G2000A8						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	953	1051	0	0	2004	
Steady State HGL at Scroll Case (PTURB Output)	870.3	870.1	872.4	872.7		
Velocity (PTURB Output)	12.13	13.39	0	0		
Velocity Head (Spreadsheet Calculation)	2.3	2.8	0.0	0.0		
Head Loss in ft (Spreadsheet Calculation)	4.7	4.9			4.8	average (calculated)

G3000A8						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	925	1000	1075	0	3000	
Steady State HGL at Scroll Case (PTURB Output)	867.3	866.9	866.6	870		
Velocity (PTURB Output)	11.78	12.73	13.69	0		
Velocity Head (Spreadsheet Calculation)	2.2	2.5	2.9	0.0		
Head Loss in ft (Spreadsheet Calculation)	7.7	8.1	8.4		8.1	average (calculated)

G4000A8						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	0	1180	0	2842	4022	
Steady State HGL at Scroll Case (PTURB Output)	866.1	863.2	866	862.6		
Velocity (PTURB Output)	0.00	15.00	0	23.16		
Velocity Head (Spreadsheet Calculation)	0.0	3.5	0.0	8.3		
Head Loss in ft (Spreadsheet Calculation)		11.8		12.4	12.1	average (calculated)

G5000A8						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1012	1137	0	2870	5019	
Steady State HGL at Scroll Case (PTURB Output)	858.4	858	860.7	857.8		
Velocity (PTURB Output)	12.89	14.48	0	23.38		
Velocity Head (Spreadsheet Calculation)	2.6	3.3	0.0	8.5		
Head Loss in ft (Spreadsheet Calculation)	16.6	17.0		17.2	16.9	average (calculated)

G6000A8						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	996	1097	1097	2842	6032	
Steady State HGL at Scroll Case (PTURB Output)	851.9	851.4	851.4	851.6		
Velocity (PTURB Output)	12.69	13.96	13.97	23.16		
Velocity Head (Spreadsheet Calculation)	2.5	3.0	3.0	8.3		
Head Loss in ft (Spreadsheet Calculation)	23.1	23.6	23.6	23.4	23.4	average (calculated)

G7000A8						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	

Flow in CFS (PTURB Output)	1227	1293	1203	3333	7055	
Steady State HGL at Scroll Case (PTURB Output)	843.1	842.7	843.2	843.1		
Velocity (PTURB Output)	15.62	16.46	15.32	27.16		
Velocity Head (Spreadsheet Calculation)	3.8	4.2	3.6	11.5		
Head Loss in ft (Spreadsheet Calculation)	31.9	32.3	31.8	31.9	32.0	average (calculated)

G7440A8						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1349	1332	1255	3535	7471	
Steady State HGL at Scroll Case (PTURB Output)	839.5	839.6	840.1	839.4		
Velocity (PTURB Output)	17.17	16.96	15.98	28.81		
Velocity Head (Spreadsheet Calculation)	4.6	4.5	4.0	12.9		
Head Loss in ft (Spreadsheet Calculation)	35.5	35.4	34.9	35.6	35.4	average (calculated)

G7700A8						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1401	1392	1304	3612	7709	
Steady State HGL at Scroll Case (PTURB Output)	836.3	836.4	836.9	836.8		
Velocity (PTURB Output)	17.84	17.71	16.6	29.44		
Velocity Head (Spreadsheet Calculation)	4.9	4.9	4.3	13.5		
Head Loss in ft (Spreadsheet Calculation)	38.7	38.6	38.1	38.2	38.4	average (calculated)

Gorge 2nd Tunnel - Preliminary Transient Results Summary

14' Diameter Second Tunnel - Link 2 Configuration

G1000B4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	0	1000	0	0	1000	
Steady State HGL at Scroll Case (PTURB Output)	874.1	872	874.1	874.2		
Velocity (PTURB Output)	0.00	12.73	0	0		
Velocity Head (Spreadsheet Calculation)	0.0	2.5	0.0	0.0		
Head Loss in ft (Spreadsheet Calculation)		3.0			3.0	average (calculated)

G2000B4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	951	1051	0	0	2002	
Steady State HGL at Scroll Case (PTURB Output)	870	869.8	872.1	872.4		
Velocity (PTURB Output)	12.11	13.38	0	0		
Velocity Head (Spreadsheet Calculation)	2.3	2.8	0.0	0.0		
Head Loss in ft (Spreadsheet Calculation)	5.0	5.2			5.1	average (calculated)

G3000B4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	928	1001	1083	0	3013	
Steady State HGL at Scroll Case (PTURB Output)	866.9	866.5	866.2	869.6		
Velocity (PTURB Output)	11.82	12.75	13.79	0		
Velocity Head (Spreadsheet Calculation)	2.2	2.5	3.0	0.0		
Head Loss in ft (Spreadsheet Calculation)	8.1	8.5	8.8		8.5	average (calculated)

G4000B4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	0	1184	0	2852	4036	
Steady State HGL at Scroll Case (PTURB Output)	864.7	861.7	864.6	859.6		
Velocity (PTURB Output)	0.00	15.08	0	23.24		
Velocity Head (Spreadsheet Calculation)	0.0	3.5	0.0	8.4		
Head Loss in ft (Spreadsheet Calculation)		13.3		15.4	14.4	average (calculated)

G5000B4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1019	1142	0	2881	5041	
Steady State HGL at Scroll Case (PTURB Output)	855.4	855	857.7	854.4		
Velocity (PTURB Output)	12.97	14.54	0	23.47		
Velocity Head (Spreadsheet Calculation)	2.6	3.3	0.0	8.6		
Head Loss in ft (Spreadsheet Calculation)	19.6	20.0		20.6	20.1	average (calculated)

G6000B4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1016	1114	1114	2794	6037	
Steady State HGL at Scroll Case (PTURB Output)	846.7	846.2	846.2	846.3		
Velocity (PTURB Output)	12.93	14.18	14.18	22.77		
Velocity Head (Spreadsheet Calculation)	2.6	3.1	3.1	8.1		
Head Loss in ft (Spreadsheet Calculation)	28.3	28.8	28.8	28.7	28.7	average (calculated)

G7000B4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1225	1297	1198	3315	7035	
Steady State HGL at Scroll Case (PTURB Output)	835.6	835.2	835.7	835		
Velocity (PTURB Output)	15.59	16.51	15.26	27		
Velocity Head (Spreadsheet Calculation)	3.8	4.2	3.6	11.3		
Head Loss in ft (Spreadsheet Calculation)	39.4	39.8	39.3	40.0	39.6	average (calculated)

G7440B4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1355	1338	1260	3543	7495	
Steady State HGL at Scroll Case (PTURB Output)	830.7	830.8	831.3	828.8		
Velocity (PTURB Output)	17.25	17.03	16.04	28.87		
Velocity Head (Spreadsheet Calculation)	4.6	4.5	4.0	12.9		
Head Loss in ft (Spreadsheet Calculation)	44.3	44.2	43.7	46.2	44.6	average (calculated)

G7700B4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1402	1402	1346	3563	7712	
Steady State HGL at Scroll Case (PTURB Output)	825.1	825.2	825.6	825		
Velocity (PTURB Output)	17.84	17.84	17.14	29.4		
Velocity Head (Spreadsheet Calculation)	4.9	4.9	4.6	13.4		
Head Loss in ft (Spreadsheet Calculation)	49.9	49.8	49.4	50.0	49.8	average (calculated)

Gorge 2nd Tunnel - Preliminary Transient Results Summary

16' Diameter Second Tunnel - Link 2 Configuration

G1000B6					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	0	1023	0	0	1023
Steady State HGL at Scroll Case (PTURB Output)	874.1	871.9	874	874.2	
Velocity (PTURB Output)	0.00	13.00	0	0	
Velocity Head (Spreadsheet Calculation)	0.0	2.6	0.0	0.0	
Head Loss in ft (Spreadsheet Calculation)		3.1			3.1 average (calculated)

G2000B6					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	952	1052	0	0	2004
Steady State HGL at Scroll Case (PTURB Output)	870	869.8	872.1	872.4	
Velocity (PTURB Output)	12.12	13.39	0	0	
Velocity Head (Spreadsheet Calculation)	2.3	2.8	0.0	0.0	
Head Loss in ft (Spreadsheet Calculation)	5.0	5.2			5.1 average (calculated)

G3000B6					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	929	1002	1085	0	3016
Steady State HGL at Scroll Case (PTURB Output)	867	866.6	866.3	869.7	
Velocity (PTURB Output)	11.83	12.76	13.81	0	
Velocity Head (Spreadsheet Calculation)	2.2	2.5	3.0	0.0	
Head Loss in ft (Spreadsheet Calculation)	8.0	8.4	8.7		8.4 average (calculated)

G4000B6					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	0	1180	0	2845	4025
Steady State HGL at Scroll Case (PTURB Output)	866	863.1	865.9	861.6	
Velocity (PTURB Output)	0.00	15.02	0	23.18	
Velocity Head (Spreadsheet Calculation)	0.0	3.5	0.0	8.3	
Head Loss in ft (Spreadsheet Calculation)		11.9		13.4	12.7 average (calculated)

G5000B6					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	1016	1140	0	2876	5032
Steady State HGL at Scroll Case (PTURB Output)	857.9	857.6	860.3	857.2	
Velocity (PTURB Output)	12.94	14.52	0	23.43	
Velocity Head (Spreadsheet Calculation)	2.6	3.3	0.0	8.5	
Head Loss in ft (Spreadsheet Calculation)	17.1	17.4		17.8	17.4 average (calculated)

G6000B6					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	1008	1007	1107	2780	5902
Steady State HGL at Scroll Case (PTURB Output)	850.3	849.8	849.9	850.1	
Velocity (PTURB Output)	12.83	14.10	14.1	22.66	
Velocity Head (Spreadsheet Calculation)	2.6	3.1	3.1	8.0	
Head Loss in ft (Spreadsheet Calculation)	24.7	25.2	25.1	24.9	25.0 average (calculated)

G7000B6					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	1224	1298	1200	3332	7053
Steady State HGL at Scroll Case (PTURB Output)	840.9	840.4	841	840.6	
Velocity (PTURB Output)	15.59	16.52	15.28	27.15	
Velocity Head (Spreadsheet Calculation)	3.8	4.2	3.6	11.4	
Head Loss in ft (Spreadsheet Calculation)	34.1	34.6	34.0	34.4	34.3 average (calculated)

G7440B6						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1353	1335	1256	3548	7493	
Steady State HGL at Scroll Case (PTURB Output)	836.5	836.5	837	835.5		
Velocity (PTURB Output)	17.23	17.00	15.99	28.92		
Velocity Head (Spreadsheet Calculation)	4.6	4.5	4.0	13.0		
Head Loss in ft (Spreadsheet Calculation)	38.5	38.5	38.0	39.5	38.6	average (calculated)

G7700B6						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1411	1401	1313	3600	7725	
Steady State HGL at Scroll Case (PTURB Output)	831.4	831.4	832	831.5		
Velocity (PTURB Output)	19.96	17.83	16.72	29.38		
Velocity Head (Spreadsheet Calculation)	6.2	4.9	4.3	13.4		
Head Loss in ft (Spreadsheet Calculation)	43.6	43.6	43.0	43.5	43.4	average (calculated)

Gorge 2nd Tunnel - Preliminary Transient Results Summary

18' Diameter Second Tunnel - Link 2 Configuration

G1000B8						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	0	1005	0	0	1005	
Steady State HGL at Scroll Case (PTURB Output)	874.1	872	874.1	874.2		
Velocity (PTURB Output)	0.00	12.80	0	0		
Velocity Head (Spreadsheet Calculation)	0.0	2.5	0.0	0.0		
Head Loss in ft (Spreadsheet Calculation)		3.0			3.0	average (calculated)

G2000B8						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	953	1052	0	0	2005	
Steady State HGL at Scroll Case (PTURB Output)	870	869.8	872.1	872.4		
Velocity (PTURB Output)	12.13	13.39	0	0		
Velocity Head (Spreadsheet Calculation)	2.3	2.8	0.0	0.0		
Head Loss in ft (Spreadsheet Calculation)	5.0	5.2			5.1	average (calculated)

G3000B8						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	925	1000	1075	0	3000	
Steady State HGL at Scroll Case (PTURB Output)	867.1	866.7	866.5	869.8		
Velocity (PTURB Output)	11.78	12.73	13.69	0		
Velocity Head (Spreadsheet Calculation)	2.2	2.5	2.9	0.0		
Head Loss in ft (Spreadsheet Calculation)	7.9	6.3	8.5		8.2	average (calculated)

G4000B8						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	0	1139	0	2867	4006	
Steady State HGL at Scroll Case (PTURB Output)	866.3	863.5	866.2	861.8		
Velocity (PTURB Output)	0.00	14.50	0	23.36		
Velocity Head (Spreadsheet Calculation)	0.0	3.3	0.0	8.5		
Head Loss in ft (Spreadsheet Calculation)		11.5		13.2	12.4	average (calculated)

G5000B8						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1012	1137	0	2868	5017	
Steady State HGL at Scroll Case (PTURB Output)	858.5	858.1	860.8	857.8		
Velocity (PTURB Output)	12.89	14.47	0	23.37		
Velocity Head (Spreadsheet Calculation)	2.6	3.3	0.0	8.5		
Head Loss in ft (Spreadsheet Calculation)	16.5	16.9		17.2	16.9	average (calculated)

G6000B8						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1002	1105	1105	2823	6035	
Steady State HGL at Scroll Case (PTURB Output)	851.7	851.2	851.2	851.4		
Velocity (PTURB Output)	12.76	14.07	14.07	23		
Velocity Head (Spreadsheet Calculation)	2.5	3.1	3.1	8.2		
Head Loss in ft (Spreadsheet Calculation)	23.3	23.8	23.8	23.6	23.6	average (calculated)

G7000B8						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1223	1292	1202	3320	7037	
Steady State HGL at Scroll Case (PTURB Output)	843.1	842.7	843.3	842.9		
Velocity (PTURB Output)	15.57	16.45	15.3	27.06		
Velocity Head (Spreadsheet Calculation)	3.8	4.2	3.6	11.4		
Head Loss in ft (Spreadsheet Calculation)	31.9	32.3	31.7	32.1	32.0	average (calculated)

G7440B8						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1349	1333	1255	3534	7471	
Steady State HGL at Scroll Case (PTURB Output)	839.5	839.6	840.1	839		
Velocity (PTURB Output)	17.18	16.97	15.98	28.8		
Velocity Head (Spreadsheet Calculation)	4.6	4.5	4.0	12.9		
Head Loss in ft (Spreadsheet Calculation)	35.5	35.4	34.9	36.0	35.5	average (calculated)

G7700B8						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1402	1393	1305	3610	7710	
Steady State HGL at Scroll Case (PTURB Output)	836.5	836.5	837.1	836.7		
Velocity (PTURB Output)	17.85	17.73	16.6	29.42		
Velocity Head (Spreadsheet Calculation)	4.9	4.9	4.3	13.4		
Head Loss in ft (Spreadsheet Calculation)	38.5	38.5	37.9	38.3	38.3	average (calculated)

Gorge 2nd Tunnel - Preliminary Transient Results Summary

14' Diameter Second Tunnel - Link 3 Configuration

G1000C4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	0	1004	0	0	1004	
Steady State HGL at Scroll Case (PTURB Output)	874.3	872.2	874.2	874.4		
Velocity (PTURB Output)	0.00	12.79	0	0		
Velocity Head (Spreadsheet Calculation)	0.0	2.5	0.0	0.0		
Head Loss in ft (Spreadsheet Calculation)					2.8	average (calculated)

G2000C4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	956	1053	0	0	2010	
Steady State HGL at Scroll Case (PTURB Output)	870.3	870.1	872.3	872.7		
Velocity (PTURB Output)	12.18	13.41	0	0		
Velocity Head (Spreadsheet Calculation)	2.3	2.8	0.0	0.0		
Head Loss in ft (Spreadsheet Calculation)	4.7	4.9			4.8	average (calculated)

G3000C4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	929	1003	1075	0	3007	
Steady State HGL at Scroll Case (PTURB Output)	867.3	866.9	866.7	869.7		
Velocity (PTURB Output)	11.83	12.78	13.686	0		
Velocity Head (Spreadsheet Calculation)	2.5	2.5	2.9	0.0		
Head Loss in ft (Spreadsheet Calculation)	7.7	8.1	8.3		8.0	average (calculated)

G4000C4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	0	1175	0	2857	4032	
Steady State HGL at Scroll Case (PTURB Output)	864.6	860.9	864.5	858.4		
Velocity (PTURB Output)	0.00	14.98	0	23.28		
Velocity Head (Spreadsheet Calculation)	0.0	3.5	0.0	8.4		
Head Loss in ft (Spreadsheet Calculation)		14.1		16.6	15.4	average (calculated)

G5000C4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1022	1143	0	2876	5041	
Steady State HGL at Scroll Case (PTURB Output)	854.4	854	858.1	851.5		
Velocity (PTURB Output)	13.01	14.56	0	23.44		
Velocity Head (Spreadsheet Calculation)	2.6	3.3	0.0	8.5		
Head Loss in ft (Spreadsheet Calculation)	20.6	21.0		23.5	21.7	average (calculated)

G6000C4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1012	1112	1113	2776	6013	
Steady State HGL at Scroll Case (PTURB Output)	845.8	845.3	845.4	843.5		
Velocity (PTURB Output)	12.89	14.26	14.17	22.62		
Velocity Head (Spreadsheet Calculation)	2.6	3.2	3.1	7.9		
Head Loss in ft (Spreadsheet Calculation)	29.2	29.7	29.6	31.5	30.0	average (calculated)

G7000C4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1224	1298	1202	3299	7023	
Steady State HGL at Scroll Case (PTURB Output)	834.5	834.5	834.6	831.2		
Velocity (PTURB Output)	15.59	16.53	15.3	26.88		
Velocity Head (Spreadsheet Calculation)	3.8	4.2	3.6	11.2		
Head Loss in ft (Spreadsheet Calculation)	40.5	40.5	40.4	43.8	41.3	average (calculated)

G7440C4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1351	1336	1255	3534	7476	
Steady State HGL at Scroll Case (PTURB Output)	828.7	828.8	829.3	825.1		
Velocity (PTURB Output)	17.20	17.00	15.98	28.8		
Velocity Head (Spreadsheet Calculation)	4.6	4.5	4.0	12.9		
Head Loss in ft (Spreadsheet Calculation)	46.3	46.2	45.7	49.9	47.0	average (calculated)

G7700C4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1401	1401	1346	3564	7712	
Steady State HGL at Scroll Case (PTURB Output)	825	824.9	825.3	825		
Velocity (PTURB Output)	17.84	17.84	17.1	29.04		
Velocity Head (Spreadsheet Calculation)	4.9	4.9	4.5	13.1		
Head Loss in ft (Spreadsheet Calculation)	50.0	50.1	49.7	50.0	50.0	average (calculated)

Gorge 2nd Tunnel - Preliminary Transient Results Summary

16' Diameter Second Tunnel - Link 3 Configuration

G1000C6						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	0	1004	0	0	1004	
Steady State HGL at Scroll Case (PTURB Output)	874.3	872.2	874.2	874.4		
Velocity (PTURB Output)	0.00	12.79	0	0		
Velocity Head (Spreadsheet Calculation)	0.0	2.5	0.0	0.0		
Head Loss in ft (Spreadsheet Calculation)		2.8			2.8	average (calculated)

G2000C6						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	957	1054	0	0	2011	
Steady State HGL at Scroll Case (PTURB Output)	870.4	870.1	872.4	872.7		
Velocity (PTURB Output)	12.18	13.42	0	0		
Velocity Head (Spreadsheet Calculation)	2.3	2.8	0.0	0.0		
Head Loss in ft (Spreadsheet Calculation)	4.6	4.9			4.8	average (calculated)

G3000C6						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	930	1005	1075	0	3010	
Steady State HGL at Scroll Case (PTURB Output)	867.4	867.1	866.8	870		
Velocity (PTURB Output)	11.85	12.79	13.7	0		
Velocity Head (Spreadsheet Calculation)	2.2	2.5	2.9	0.0		
Head Loss in ft (Spreadsheet Calculation)	7.6	7.9	8.2		7.9	average (calculated)

G4000C6						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	0	1192	0	2840	4032	
Steady State HGL at Scroll Case (PTURB Output)	866	862.6	865.9	860.2		
Velocity (PTURB Output)	0.00	15.05	0	23.14		
Velocity Head (Spreadsheet Calculation)	0.0	3.5	0.0	8.3		
Head Loss in ft (Spreadsheet Calculation)		12.4		14.8	13.6	average (calculated)

G5000C6						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1015	1139	0	2869	5023	
Steady State HGL at Scroll Case (PTURB Output)	857.4	857.1	860.6	854.5		
Velocity (PTURB Output)	12.94	14.50	0	23.37		
Velocity Head (Spreadsheet Calculation)	2.6	3.3	0.0	8.5		
Head Loss in ft (Spreadsheet Calculation)	17.6	17.9		20.5	18.7	average (calculated)

G6000C6						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1012	1120	1114	2782	6029	
Steady State HGL at Scroll Case (PTURB Output)	850.1	849.6	849.7	847.7		
Velocity (PTURB Output)	12.89	14.26	14.18	22.67		
Velocity Head (Spreadsheet Calculation)	2.6	3.2	3.1	8.0		
Head Loss in ft (Spreadsheet Calculation)	24.9	25.4	25.3	27.3	25.7	average (calculated)

G7000C6						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1226	1300	1202	3320	7049	
Steady State HGL at Scroll Case (PTURB Output)	840	839.6	840.1	836.6		
Velocity (PTURB Output)	15.62	16.59	15.3	27.05		
Velocity Head (Spreadsheet Calculation)	3.8	4.3	3.6	11.4		
Head Loss in ft (Spreadsheet Calculation)	35.0	35.4	34.9	38.4	35.9	average (calculated)

G7440C6						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1353	1337	1256	3542	7488	
Steady State HGL at Scroll Case (PTURB Output)	834.7	834.8	835.4	831.1		
Velocity (PTURB Output)	17.24	17.02	16.96	28.86		
Velocity Head (Spreadsheet Calculation)	4.6	4.5	4.0	12.9		
Head Loss in ft (Spreadsheet Calculation)	40.3	40.2	39.6	43.9	41.0	average (calculated)

G7700C6						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1410	1421	1312	3579	7722	
Steady State HGL at Scroll Case (PTURB Output)	831.3	831.2	831.9	828.1		
Velocity (PTURB Output)	17.96	18.10	16.71	29.16		
Velocity Head (Spreadsheet Calculation)	5.0	5.1	4.3	13.2		
Head Loss in ft (Spreadsheet Calculation)	43.7	43.8	43.1	46.9	44.4	average (calculated)

Gorge 2nd Tunnel - Preliminary Transient Results Summary
18' Diameter Second Tunnel - Link 3 Configuration

G1000C8					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	0	1002	0	0	1002
Steady State HGL at Scroll Case (PTURB Output)	874.3	872.2	874.2	874.4	
Velocity (PTURB Output)	0.00	12.76	0	0	
Velocity Head (Spreadsheet Calculation)	0.0	2.5	0.0	0.0	
Head Loss in ft (Spreadsheet Calculation)		2.8			2.8
					average (calculated)

G2000C8					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	951	1052	0	0	2003
Steady State HGL at Scroll Case (PTURB Output)	870.4	870.2	872.3	872.7	
Velocity (PTURB Output)	12.11	13.40	0	0	
Velocity Head (Spreadsheet Calculation)	2.3	2.8	0.0	0.0	
Head Loss in ft (Spreadsheet Calculation)	4.6	4.8			4.7
					average (calculated)

G3000C8					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	926	1000	1076	0	3002
Steady State HGL at Scroll Case (PTURB Output)	867.6	867.2	866.9	870	
Velocity (PTURB Output)	11.78	12.73	13.7	0	
Velocity Head (Spreadsheet Calculation)	2.2	2.5	2.9	0.0	
Head Loss in ft (Spreadsheet Calculation)	7.4	7.8	8.1		7.8
					average (calculated)

G4000C8					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	0	1179	0	2838	4017
Steady State HGL at Scroll Case (PTURB Output)	865.8	862.8	865.9	860.4	
Velocity (PTURB Output)	0.00	15.00	0	23.13	
Velocity Head (Spreadsheet Calculation)	0.0	3.5	0.0	8.3	
Head Loss in ft (Spreadsheet Calculation)		12.2		14.6	13.4
					average (calculated)

G5000C8					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	1012	1136	0	2868	5016
Steady State HGL at Scroll Case (PTURB Output)	858.2	857.8	860.7	855.2	
Velocity (PTURB Output)	12.86	14.51	0	23.37	
Velocity Head (Spreadsheet Calculation)	2.6	3.3	0.0	8.5	
Head Loss in ft (Spreadsheet Calculation)	16.8	17.2		19.8	17.9
					average (calculated)

G6000C8					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	1010	1118	1113	2778	6019
Steady State HGL at Scroll Case (PTURB Output)	851.7	851.1	851.2	849.3	
Velocity (PTURB Output)	12.86	14.24	14.17	22.64	
Velocity Head (Spreadsheet Calculation)	2.6	3.1	3.1	8.0	
Head Loss in ft (Spreadsheet Calculation)	23.3	23.9	23.8	25.7	24.2
					average (calculated)

G7000C8					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total

Flow in CFS (PTURB Output)	1220	1295	1195	3309	7019	
Steady State HGL at Scroll Case (PTURB Output)	843.1	842.7	843.2	839.7		
Velocity (PTURB Output)	15.53	16.49	15.22	26.97		
Velocity Head (Spreadsheet Calculation)	3.7	4.2	3.6	11.3		
Head Loss in ft (Spreadsheet Calculation)	31.9	32.3	31.8	35.3	32.8	average (calculated)

G7440C8						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1347	1331	1249	3534	7461	
Steady State HGL at Scroll Case (PTURB Output)	838.6	838.7	839.2	834.9		
Velocity (PTURB Output)	17.15	16.95	15.9	28.79		
Velocity Head (Spreadsheet Calculation)	4.6	4.5	3.9	12.9		
Head Loss in ft (Spreadsheet Calculation)	36.4	36.3	35.8	40.1	37.2	average (calculated)

G7700C8						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1402	1413	1304	3589	7708	
Steady State HGL at Scroll Case (PTURB Output)	836.6	836.5	837.2	833.3		
Velocity (PTURB Output)	17.85	17.99	16.6	29.24		
Velocity Head (Spreadsheet Calculation)	4.9	5.0	4.3	13.3		
Head Loss in ft (Spreadsheet Calculation)	38.4	38.5	37.8	41.7	39.1	average (calculated)

Gorge 2nd Tunnel - Preliminary Transient Results Summary
22' Diameter Second Tunnel - Link 3 Configuration

G1000C2						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	0	1002	0	0	1002	
Steady State HGL at Scroll Case (PTURB Output)	874.3	872.2	874.2	874.4		
Velocity (PTURB Output)	0.00	12.76	0	0		
Velocity Head (Spreadsheet Calculation)	0.0	2.5	0.0	0.0		
Head Loss in ft (Spreadsheet Calculation)		2.8			2.8	average (calculated)

G2000C2						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	952	1053	0	0	2004	
Steady State HGL at Scroll Case (PTURB Output)	870.4	870.2	872.3	872.7		
Velocity (PTURB Output)	12.11	13.40	0	0		
Velocity Head (Spreadsheet Calculation)	2.3	2.8	0.0	0.0		
Head Loss in ft (Spreadsheet Calculation)	4.6	4.8			4.7	average (calculated)

G3000C2						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	926	1001	1077	0	3004	
Steady State HGL at Scroll Case (PTURB Output)	867.6	867.2	866.9	870		
Velocity (PTURB Output)	11.79	12.75	13.7	0		
Velocity Head (Spreadsheet Calculation)	2.2	2.5	2.9	0.0		
Head Loss in ft (Spreadsheet Calculation)	7.4	7.8	8.1		7.8	average (calculated)

G4000C2						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	0	1184	0	2823	4007	
Steady State HGL at Scroll Case (PTURB Output)	865.8	863.2	865.9	861		
Velocity (PTURB Output)	0.00	15.08	0	23		
Velocity Head (Spreadsheet Calculation)	0.0	3.5	0.0	8.2		
Head Loss in ft (Spreadsheet Calculation)		11.8		14.0	12.9	average (calculated)

G5000C2						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1014	1140	0	2866	5021	
Steady State HGL at Scroll Case (PTURB Output)	859.5	859.1	860.7	856.6		
Velocity (PTURB Output)	12.95	14.50	0	23.36		
Velocity Head (Spreadsheet Calculation)	2.6	3.3	0.0	8.5		
Head Loss in ft (Spreadsheet Calculation)	15.5	15.9		18.4	16.6	average (calculated)

G6000C2						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1018	1118	1117	2761	6014	
Steady State HGL at Scroll Case (PTURB Output)	854.2	853.6	853.7	851.9		
Velocity (PTURB Output)	12.99	14.24	14.31	22.51		
Velocity Head (Spreadsheet Calculation)	2.6	3.1	3.2	7.9		
Head Loss in ft (Spreadsheet Calculation)	20.8	21.4	21.3	23.1	21.7	average (calculated)

G7000C2						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	

Flow in CFS (PTURB Output)	1226	1302	1201	3297	7025	
Steady State HGL at Scroll Case (PTURB Output)	847.5	847.1	847.6	844.4		
Velocity (PTURB Output)	15.60	16.58	15.29	26.87		
Velocity Head (Spreadsheet Calculation)	3.8	4.3	3.6	11.2		
Head Loss in ft (Spreadsheet Calculation)	27.5	27.9	27.4	30.6	28.4	average (calculated)

G7440C2						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1351	1333	1250	3528	7463	
Steady State HGL at Scroll Case (PTURB Output)	843.5	846.9	847.5	843.5		
Velocity (PTURB Output)	17.20	18.98	15.92	28.75		
Velocity Head (Spreadsheet Calculation)	4.6	4.5	3.9	12.8		
Head Loss in ft (Spreadsheet Calculation)	31.5	28.1	27.5	31.5	29.7	average (calculated)

G7700C2						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1396	1417	1300	3587	7700	
Steady State HGL at Scroll Case (PTURB Output)	845.2	845.1	845.8	841.9		
Velocity (PTURB Output)	17.78	18.05	16.55	29.23		
Velocity Head (Spreadsheet Calculation)	4.9	5.1	4.3	13.3		
Head Loss in ft (Spreadsheet Calculation)	29.8	29.9	29.2	33.1	30.5	average (calculated)

Gorge 2nd Tunnel - Preliminary Transient Results Summary

14' Diameter Second Tunnel - Link 4 Configuration

G1000D4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	0	1004	0	0	1004	
Steady State HGL at Scroll Case (PTURB Output)	874.3	872.2	874.3	874.4		
Velocity (PTURB Output)	0.00	12.79	0	0		
Velocity Head (Spreadsheet Calculation)	0.0	2.5	0.0	0.0		
Head Loss in ft (Spreadsheet Calculation)		2.8			2.8	average (calculated)

G2000D4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	954	1054	0	0	2009	
Steady State HGL at Scroll Case (PTURB Output)	870.3	870.1	872.4	872.6		
Velocity (PTURB Output)	12.15	13.42	0	0		
Velocity Head (Spreadsheet Calculation)	2.3	2.8	0.0	0.0		
Head Loss in ft (Spreadsheet Calculation)	4.7	4.9			4.8	average (calculated)

G3000D4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	916	1031	1057	0	3004	
Steady State HGL at Scroll Case (PTURB Output)	866.9	866.3	866.3	869.2		
Velocity (PTURB Output)	11.66	13.13	13.46	0		
Velocity Head (Spreadsheet Calculation)	2.7	2.7	2.8	0.0		
Head Loss in ft (Spreadsheet Calculation)	8.1	8.7	8.7		8.7	average (calculated)

G4000D4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	0	1177	0	2881	4058	
Steady State HGL at Scroll Case (PTURB Output)	863.3	860.3	863.2	857.9		
Velocity (PTURB Output)	0.00	14.99	0	23.48		
Velocity Head (Spreadsheet Calculation)	0.0	3.5	0.0	8.6		
Head Loss in ft (Spreadsheet Calculation)		14.7		17.1	15.9	average (calculated)

G5000D4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1017	1139	0	2895	5051	
Steady State HGL at Scroll Case (PTURB Output)	853.9	853.5	856.2	850.9		
Velocity (PTURB Output)	12.94	14.50	0	23.59		
Velocity Head (Spreadsheet Calculation)	2.6	3.3	0.0	8.6		
Head Loss in ft (Spreadsheet Calculation)	21.1	21.5		24.1	22.2	average (calculated)

G6000D4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1022	1119	1117	2794	6051	
Steady State HGL at Scroll Case (PTURB Output)	845	844.4	844.5	842.6		
Velocity (PTURB Output)	13.01	14.25	14.22	22.77		
Velocity Head (Spreadsheet Calculation)	2.6	3.2	3.1	8.1		
Head Loss in ft (Spreadsheet Calculation)	30.0	30.6	30.5	32.4	30.9	average (calculated)

G7000D4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1224	1296	1199	3337	7055	
Steady State HGL at Scroll Case (PTURB Output)	832.9	832.4	833	829.5		
Velocity (PTURB Output)	15.58	16.51	15.26	28.19		
Velocity Head (Spreadsheet Calculation)	3.8	4.2	3.6	12.3		
Head Loss in ft (Spreadsheet Calculation)	42.1	42.6	42.0	45.5	43.1	average (calculated)

G7440D4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1356	1338	1258	3568	7520	
Steady State HGL at Scroll Case (PTURB Output)	826.5	826.6	827.1	823		
Velocity (PTURB Output)	17.27	17.03	16.01	29.08		
Velocity Head (Spreadsheet Calculation)	4.6	4.5	4.0	13.1		
Head Loss in ft (Spreadsheet Calculation)	48.5	48.4	47.9	52.0	49.2	average (calculated)

G7700D4						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1400	1421	1350	3540	7712	
Steady State HGL at Scroll Case (PTURB Output)	822.5	822.3	822.8	819.4		
Velocity (PTURB Output)	17.83	18.10	17.19	28.84		
Velocity Head (Spreadsheet Calculation)	4.9	5.1	4.6	12.9		
Head Loss in ft (Spreadsheet Calculation)	52.5	52.7	52.2	55.6	53.3	average (calculated)

Gorge 2nd Tunnel - Preliminary Transient Results Summary

16' Diameter Second Tunnel - Link 4 Configuration

G1000D6					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	0	1005	0	0	1005
Steady State HGL at Scroll Case (PTURB Output)	874.3	872.2	874.3	874.4	
Velocity (PTURB Output)	0.00	12.79	0	0	
Velocity Head (Spreadsheet Calculation)	0.0	2.5	0.0	0.0	
Head Loss in ft (Spreadsheet Calculation)		2.8			2.8
					average (calculated)

G2000D6					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	955	1055	0	0	2011
Steady State HGL at Scroll Case (PTURB Output)	870.3	870.1	872.4	872.6	
Velocity (PTURB Output)	12.17	13.44	0	0	
Velocity Head (Spreadsheet Calculation)	2.3	2.8	0.0	0.0	
Head Loss in ft (Spreadsheet Calculation)	4.7	4.9			4.8
					average (calculated)

G3000D6					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	923	999	1075	0	2997
Steady State HGL at Scroll Case (PTURB Output)	867.4	867	866.8	869.8	
Velocity (PTURB Output)	11.76	12.72	13.68	0	
Velocity Head (Spreadsheet Calculation)	2.1	2.5	2.9	0.0	
Head Loss in ft (Spreadsheet Calculation)	7.6	8.0	8.2		7.9
					average (calculated)

G4000D6					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	0	1174	0	2885	4058
Steady State HGL at Scroll Case (PTURB Output)	863.7	860.7	863.6	858.2	
Velocity (PTURB Output)	0.00	14.94	0	23.51	
Velocity Head (Spreadsheet Calculation)	0.0	3.5	0.0	8.6	
Head Loss in ft (Spreadsheet Calculation)		14.3		16.8	15.6
					average (calculated)

G5000D6					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	1016	1138	0	2895	5049
Steady State HGL at Scroll Case (PTURB Output)	856.4	856.1	858.7	853.5	
Velocity (PTURB Output)	12.93	14.50	0	23.59	
Velocity Head (Spreadsheet Calculation)	2.6	3.3	0.0	8.6	
Head Loss in ft (Spreadsheet Calculation)	18.6	18.9		21.5	19.7
					average (calculated)

G6000D6					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	1011	1109	1110	2805	6035
Steady State HGL at Scroll Case (PTURB Output)	849	848.5	848.6	846.6	
Velocity (PTURB Output)	12.88	14.12	14.13	22.9	
Velocity Head (Spreadsheet Calculation)	2.6	3.1	3.1	8.1	
Head Loss in ft (Spreadsheet Calculation)	26.0	26.5	26.4	28.4	26.8
					average (calculated)

G7000D6					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	1221	1295	1196	3335	7047
Steady State HGL at Scroll Case (PTURB Output)	837.9	837.4	838	834.5	
Velocity (PTURB Output)	15.55	16.50	15.23	17.18	
Velocity Head (Spreadsheet Calculation)	3.8	4.2	3.6	4.6	
Head Loss in ft (Spreadsheet Calculation)	37.1	37.6	37.0	40.5	38.1
					average (calculated)

G7440D6						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1350	1332	1253	3585	7519	
Steady State HGL at Scroll Case (PTURB Output)	832.7	832.8	833.3	829.1		
Velocity (PTURB Output)	17.19	16.96	16.95	29.2		
Velocity Head (Spreadsheet Calculation)	4.6	4.5	4.0	13.2		
Head Loss in ft (Spreadsheet Calculation)	42.3	42.2	41.7	45.9	43.0	average (calculated)

G7700D6						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1405	1426	1317	3564	7711	
Steady State HGL at Scroll Case (PTURB Output)	828.5	828.4	829.1	825.4		
Velocity (PTURB Output)	17.84	18.15	16.77	29.04		
Velocity Head (Spreadsheet Calculation)	4.9	5.1	4.4	13.1		
Head Loss in ft (Spreadsheet Calculation)	46.5	46.6	45.9	49.6	47.2	average (calculated)

Gorge 2nd Tunnel - Preliminary Transient Results Summary

18' Diameter Second Tunnel - Link 4 Configuration

G1000D8					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	0	1002	0	0	1002
Steady State HGL at Scroll Case (PTURB Output)	874.3	872.2	874.3	874.4	
Velocity (PTURB Output)	0.00	12.76	0	0	
Velocity Head (Spreadsheet Calculation)	0.0	2.5	0.0	0.0	
Head Loss in ft (Spreadsheet Calculation)		2.8			2.8 average (calculated)

G2000D8					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	950	1051	0	0	2001
Steady State HGL at Scroll Case (PTURB Output)	870.4	870.1	872.4	872.6	
Velocity (PTURB Output)	12.09	13.38	0	0	
Velocity Head (Spreadsheet Calculation)	2.3	2.8	0.0	0.0	
Head Loss in ft (Spreadsheet Calculation)	4.6	4.9			4.8 average (calculated)

G3000D8					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	925	1007	1081	0	3013
Steady State HGL at Scroll Case (PTURB Output)	867.4	867	866.7	869.7	
Velocity (PTURB Output)	11.78	12.82	13.77	0	
Velocity Head (Spreadsheet Calculation)	2.2	2.6	2.9	0.0	
Head Loss in ft (Spreadsheet Calculation)	7.6	8.0	8.3		8.0 average (calculated)

G4000D8					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	0	1173	0	2883	4056
Steady State HGL at Scroll Case (PTURB Output)	865.4	862.5	865.3	860	
Velocity (PTURB Output)	0.00	14.93	0	23.49	
Velocity Head (Spreadsheet Calculation)	0.0	3.5	0.0	8.6	
Head Loss in ft (Spreadsheet Calculation)		12.5		15.0	13.8 average (calculated)

G5000D8					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	1017	1140	0	2899	5055
Steady State HGL at Scroll Case (PTURB Output)	856.8	856.5	859.1	853.9	
Velocity (PTURB Output)	12.94	14.51	0	23.62	
Velocity Head (Spreadsheet Calculation)	2.6	3.3	0.0	8.7	
Head Loss in ft (Spreadsheet Calculation)	18.2	18.5		21.1	19.3 average (calculated)

G6000D8					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total
Flow in CFS (PTURB Output)	1014	1118	1113	2807	6052
Steady State HGL at Scroll Case (PTURB Output)	851.2	850.6	850.7	848.8	
Velocity (PTURB Output)	12.91	14.23	14.18	22.87	
Velocity Head (Spreadsheet Calculation)	2.6	3.1	3.1	8.1	
Head Loss in ft (Spreadsheet Calculation)	23.8	24.4	24.3	26.2	24.7 average (calculated)

G7000D8					
Intake Water Level	875	ft	Full Pond		
Tailrace Water level	494.5	ft	Assumed		
Gross Head	380.5	ft			
	Unit 21	Unit 22	Unit 23	Unit 24	Total

Flow in CFS (PTURB Output)	1217	1292	1191	3340	7039	
Steady State HGL at Scroll Case (PTURB Output)	842.2	841.8	842.4	838.8		
Velocity (PTURB Output)	15.49	16.44	15.16	27.22		
Velocity Head (Spreadsheet Calculation)	3.7	4.2	3.6	11.5		
Head Loss in ft (Spreadsheet Calculation)	32.8	33.2	32.6	36.2	33.7	average (calculated)

G7440D8						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1345	1326	1246	3575	7492	
Steady State HGL at Scroll Case (PTURB Output)	837.4	837.5	838	833.8		
Velocity (PTURB Output)	17.13	16.88	15.9	29.13		
Velocity Head (Spreadsheet Calculation)	4.6	4.4	3.9	13.2		
Head Loss in ft (Spreadsheet Calculation)	37.6	37.5	37.0	41.2	38.3	average (calculated)

G7700D8						
Intake Water Level	875	ft	Full Pond			
Tailrace Water level	494.5	ft	Assumed			
Gross Head	380.5	ft				
	Unit 21	Unit 22	Unit 23	Unit 24	Total	
Flow in CFS (PTURB Output)	1401	1422	1312	3581	7715	
Steady State HGL at Scroll Case (PTURB Output)	833.4	833.2	833.9	830.1		
Velocity (PTURB Output)	17.83	18.10	16.71	29.18		
Velocity Head (Spreadsheet Calculation)	4.9	5.1	4.3	13.2		
Head Loss in ft (Spreadsheet Calculation)	41.6	41.8	41.1	44.9	42.4	average (calculated)