THOMPSON Engineering Consultants, Inc.

February 11, 2014

Mr. Curtis Cherne, P.E.
Principal Engineer, Planning Department
Development and Building Services
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: ADDITIONAL HYDROLOGIC ANALYSIS FOR THE AMENDMENT TO THE TRAILS DRAINAGE MASTER PLAN

Dear Mr. Cherne:

At our last meeting on the review of the Trails DMP, you requested that we analyze developed conditions hydrology with no orifice plates downstream of Ponds D, F, and G to determine the affect on the Pond K detention volume. We have completed this AHYMO model and have included the AHYMO summary table with this letter.

The table below gives the results of the AHYMO model in the November 2013 DMP compared to the February 2014 AHYMO model removing the orifice plates downstream of Ponds D, F, and G. Please note that the interim capacity of Pond K is 14.84 ac-ft with the current configuration of the original Pond K and the temporary berm to the north. As Unit 4 develops Pond K will be revised to reduce the footprint to maximize the developable area in Unit 4.

POND	CAPACITY (ac-ft)	NOV 13 VOLUME (ac-ft)	FEB 14 VOLUME (ac-ft)
D	6.24	5.079	2.348
F	11.76	11.001	6.320
G	7.21	2.955	7.858
K	14.84 (INTERIM)	8.203	16.526

In comparing the results of the two AHYMO models the February 2014 model increases the volume in Ponds G and K significantly and reduces the volume in Ponds D and F. The February 2014 model shows that Ponds G and K capacities are exceeded and therefore discharge over the emergency spillway, while only about 50% of the capacity of Ponds D and F is being used.

Another consequence of the February 2014 model is that the capacity of the storm drains downstream of Ponds D and F are exceeded surcharging the storm drain system. The HGL is higher than the manhole rim elevation resulting in storm water spilling into the streets. Downstream of Pond F the HGL is as much as 3.75 feet higher than the manhole rim elevation, and downstream of Pond D the HGL is as much as 25.6 feet higher than the manhole rim elevation (see attached HGL spreadsheets). Therefore, orifice plates are required in the storm drains downstream of Ponds D and F to limit the peak flow discharging from these ponds to the downstream storm drains.

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In conclusion, removing the orifice plates results in surcharging the downstream storm drains and the capacity of Ponds G and K being exceeded. Orifice plates are required to limit the amount of flow discharging from the upstream ponds to the downstream storm drains so that their capacity is not exceeded. Also, orifice plates control the peak flow discharging from Ponds D, F, and G, which results in maximizing the detention volume in these ponds. This follows the previous DMP, which includes an intricate system of storm drains and surge ponds with orifice plates that was analyzed and designed by Wilson and Company in 2004 and constructed in 2006. Therefore, this update of the Trails DMP should use the November 2013 model maximizing the available volume in Ponds D, F, and G while limiting the volume in Pond K.

If you should have any questions about this additional analysis, please call.

Sincerely,

David B. Thompson, P.E.

AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) - - VERSION: 1997.02c RUN DATE (MON/DAY/YR) =02/10/2014
INPUT FILE = C:\Projects\LONGFO~1\REVISE~3\TR3699~1.TXT USER NO.= AHYMO-I-9702a01000K21-AH

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION	
START										TIME=	.00
RAINFALL TYPE= 2										RAIN24=	2.660
SEDIMENT BULK										PK BF =	1.00
*S**********											
*S**********	COMPUTE ONSITE BASINS FROM THE TRAILS										
*S**********											
COMPUTE NM HYD	OFFSITE1	-	50	.19980	37.00	4.426	.41534	2.000	.289	PER IMP=	.00
ROUTE RESERVOIR	OFF.POND.1	50	53	.19980	9.25	4.426	.41533	3.200	.072	AC-FT=	2.302
ROUTE MCUNGE	RTE.OFF.POND	53	54	.19980	9.26	4.426	.41537	3.200	.072	CCODE =	.2
COMPUTE NM HYD	BASIN.A1	-	21	.02422	51.68	2.610	2.02069	1.500	3.334	PER IMP=	75.00
COMPUTE NM HYD	BASIN.A2	-	22	.01331	23.43	.960	1.35259	1.500	2.750	PER IMP=	34.00
COMPUTE NM HYD	BASIN.A3	-	23	.00502	11.41	.606	2.26512	1.500	3.550	PER IMP=	90.00
COMPUTE NM HYD	BASIN.A4	-	24	.01186	26.39	1.381	2.18365	1.500	3.477	PER IMP=	85.00
COMPUTE NM HYD	BASIN.A5	-	25	.01830	37.55	1.829	1.87404	1.500	3.206	PER IMP=	66.00
COMPUTE NM HYD	BASIN.A6	-	26	.02652	53.44	2.558	1.80886	1.500	3.149	PER IMP=	62.00
COMPUTE NM HYD	BASIN.A7	-	27	.01055	22.52	1.137	2.02070	1.500	3.335	PER IMP=	75.00
ADD HYD	O1.A2	54&22	55	.21311	25.89	5.386	.47390	1.500	.190		
ADD HYD	O1A2.A1	55&21	56	.23733	77.57	7.996	.63175	1.500	.511		
ADD HYD	O1A2A1.A3	56&23	57	.24235	88.97	8.603	.66558	1.500	.574		
ROUTE MCUNGE	RTE.O1A2A1.A	57	58	.24235	80.93	8.569	.66299	1.500	.522	CCODE =	.1
ADD HYD	A1TOA5	58&25	59	.26065	118.48	10.398	.74801	1.500	.710		
DIVIDE HYD	BYPASS.A5	59	61	.14169	8.26	5.653	.74801	1.300	.091		
	SURGE.A5	and	62	.11896	110.22	4.746	.74801	1.500	1.448		
ROUTE RESERVOIR	POND.A5	62	60	.11896	6.12	4.746	.74801	2.400	.080	AC-FT=	3.774
ADD HYD	TOTALA5	61&60	59	.26065	14.38	10.398	.74800	2.400	.086		
ROUTE MCUNGE	RTE.A4	24	61	.01186	24.62	1.372	2.16943	1.500	3.243	CCODE =	.1
ADD HYD	RTE.A4.A6	61&26	62	.03838	78.06	3.931	1.92024	1.500	3.178		
ADD HYD	RTEA4A6.POND	62&59	63	.29903	90.13	14.329	.89846	1.500	.471		
DIVIDE HYD	BYPASS.A6	63	61	.16754	8.26	8.028	.89846	1.300	.077		
	SURGE.A6	and	62	.13149	81.87	6.301	.89846	1.500	.973		
ROUTE RESERVOIR	POND.A6	62	64	.13149	6.27	6.301	.89846	4.400	.075	AC-FT=	3.108
ADD HYD	TOTALA6	61&64	66	.29903	14.53	14.329	.89845	4.400	.076		
ADD HYD	PONDA6.A7	66&27	65	.30958	34.71	15.466	.93669	1.500	.175		
ROUTE MCUNGE	RTE.A6.A7	65	66	.30958	34.71	15.466	.93669	1.500	.175	CCODE =	.0
COMPUTE NM HYD	BASIN.D1	-	25	.01816	36.60	1.752	1.80886	1.500	3.149	PER IMP=	62.00
ADD HYD	A6.A7.D1	66&25	67	.32774	71.31	17.218	.98502	1.500	.340		
DIVIDE HYD	BYPASS.AD1	67	61	.24177	11.07	12.701	.98502	1.200	.072		
	SURGE.D1	and	62	.08597	60.24	4.517	.98502	1.500	1.095		
ROUTE RESERVOIR	POND.D1	62	68	.08597	4.50	4.518	.98529	2.700	.082	AC-FT=	2.135
ADD HYD	TOTALD1	61&68	67	.32774	15.57	17.218	.98506	2.700	.074		
ROUTE MCUNGE	RTE.D1	67	69	.32774	15.57	17.221	.98519	2.800	.074	CCODE =	.2
COMPUTE NM HYD	BASIN.D2	-	25	.03456	63.65	2.763	1.49925	1.500	2.878	PER IMP=	43.00
ADD HYD	PONDD1.D2	69&25	70	.36230	76.93	19.984	1.03422	1.500	.332		
COMPUTE NM HYD	BASIN.D3	-	26	.00580	13.18	.701	2.26512	1.500	3.550	PER IMP=	90.00
ADD HYD	D1.D2.D3	70&26	71	.36810	90.11	20.685	1.05362	1.500	.383		
ROUTE MCUNGE	RTE.D1	71	72	.36810	90.11	20.685	1.05362	1.500	.383	CCODE =	.0
COMPUTE NM HYD	BASIN.D4	-	27	.01961	36.12	1.568	1.49925	1.500	2.878	PER IMP=	43.00
ADD HYD	D1D2D3.D4	72&27	73	.38771	126.23	22.253	1.07615	1.500	.509		
COMPUTE NM HYD	BASIN.D5	-	28	.01367	26.55	1.224	1.67850	1.500	3.035	PER IMP=	54.00

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION	
ADD HYD	D1234.D5	73&28	74	.40138	152.79	23.476	1.09667	1.500	.595		
COMPUTE NM HYD	BASIN.D6	-	25	.00781	15.89	.767	1.84145	1.500	3.178	PER IMP=	64.00
ADD HYD	D12345.D6	74&25	75	.40919	168.67	24.243	1.11088	1.500	.644		
DIVIDE HYD	BYPASS.D	75	31	.35747	45.77	21.179	1.11088	1.300	.200		
	SURGE.D	and	32	.05172	122.90	3.064	1.11088	1.500	3.713		
ROUTE RESERVOIR	POND.D	32	50	.05172	18.70	3.069	1.11269	1.800	.565	AC-FT=	2.348
ROUTE MCUNGE	RTE.D	50	51	.05172	18.30	3.043	1.10303	2.100	.553	CCODE =	.1
ADD HYD	BYPASS.RTE.D	51&31	75	.40919	63.00	24.221	1.10988	2.000	.241		
COMPUTE NM HYD	BASIN.C	-	20	.01278	24.36	1.100	1.61332	1.500	2.978	PER IMP=	50.00
ROUTE MCUNGE	RTE.C	20	76	.01278	23.74	1.096	1.60827	1.600	2.902	CCODE =	.1
COMPUTE NM HYD	BASIN.F1	-	20	.02208	43.39	2.025	1.71939	1.500	3.071	PER IMP=	56.50
ADD HYD	C.F1	76&20	77	.03486	64.42	3.121	1.67860	1.500	2.888		
COMPUTE NM HYD	BASIN.F2	-	21	.00573	13.02	.692	2.26512	1.500	3.550	PER IMP=	90.00
ADD HYD	CF1.F2	77&21	78	.04059	77.44	3.813	1.76139	1.500	2.981		
ROUTE MCUNGE	RTE.CF1F2	78	79	.04059	76.94	3.816	1.76280	1.500	2.962	CCODE =	.2
COMPUTE NM HYD	BASIN.F3	-	22	.03563	70.02	3.267	1.71938	1.500	3.070	PER IMP=	56.50
ADD HYD	CF1F2.F3	79&22	70	.07622	146.95	7.083	1.74248	1.500	3.012		
COMPUTE NM HYD	BASIN.F4	-	23	.03892	74.16	3.349	1.61331	1.500	2.977	PER IMP=	50.00
ADD HYD	CF1F2F3.F4	70&23	71	.11514	221.12	10.432	1.69882	1.500	3.001		
ADD HYD	CF1F2F3F4.D	71&75	70	.52433	268.64	34.654	1.23921	1.500	.801		
COMPUTE NM HYD	BASIN.F5	-	24	.01852	39.52	1.996	2.02070	1.500	3.334	PER IMP=	75.00
COMPUTE NM HYD	BASIN.J10	-	25	.00628	14.27	.759	2.26512	1.500	3.550	PER IMP=	90.00
COMPUTE NM HYD	BASIN.J11	-	26	.00733	16.65	.886	2.26512	1.500	3.549	PER IMP=	90.00
ADD HYD	J10.J11	25&26	23	.01361	30.92	1.644	2.26508	1.500	3.550		
ROUTE MCUNGE	RTE.J10J11	23	10	.01361	29.01	1.634	2.25104	1.500	3.330	CCODE =	.1
COMPUTE NM HYD	BASIN.F7	-	26	.01097	24.42	1.278	2.18365	1.500	3.478	PER IMP=	85.00
ROUTE MCUNGE	RTE.F7	26	74	.01097	23.37	1.269	2.16910	1.500	3.328	CCODE =	.1
ADD HYD	F7.F5	74&24	75	.02949	62.89	3.265	2.07585	1.500	3.332		
ROUTE RESERVOIR	POND.F5	75	51	.02949	19.84	3.265	2.07584	1.900	1.051	AC-FT=	1.386
COMPUTE NM HYD	BASIN.F8	-	27	.00781	15.89	.767	1.84145	1.500	3.178	PER IMP=	64.00
ADD HYD	PONDF5.F8	51&27	78	.03730	27.40	4.032	2.02672	1.500	1.148		
ROUTE MCUNGE	RTE.PONDF5	78	77	.03730	27.34	4.033	2.02709	1.600	1.145	CCODE =	.2
ADD HYD	F1TOF8	77&70	78	.56163	295.55	38.686	1.29153	1.500	.822		
ROUTE RESERVOIR	POND.F	78	52	.56163	125.81	38.670	1.29100	2.100	.350	AC-FT=	6.320
ROUTE MCUNGE	RTE.PONDF	52	77	.56163	117.04	38.504	1.28545	2.400	.326	CCODE =	.2
COMPUTE NM HYD	BASIN.G1	-	20	.02531	48.23	2.178	1.61331	1.500	2.978	PER IMP=	50.00
ROUTE MCUNGE	RTE.G1	20	78	.02531	48.23	2.178	1.61330	1.500	2.978	CCODE =	.0
COMPUTE NM HYD	BASIN.G2	-	21	.02530	48.22	2.177	1.61331	1.500	2.978	PER IMP=	50.00
ADD HYD	G1.G2	78&21	30	.05061	96.45	4.355	1.61330	1.500	2.978		
ADD HYD	G1G2.PONDF	30&77	31	.61224	147.19	42.858	1.31254	1.500	.376		
DIVIDE HYD	BYPASS.G	31	32	.38299	29.91	26.810	1.31254	1.300	.122		
	SURGE.G	and	33	.22925	117.28	16.048	1.31254	1.500	.799		
ROUTE RESERVOIR	POND.G	33	34	.22925	78.17	15.868	1.29776	2.700	.533	AC-FT=	7.858
ROUTE MCUNGE	RTE.PONDG	34	78	.22925	78.17	15.868	1.29776	2.700	.533	CCODE =	.0
ADD HYD	BYPASS.RTE.G	78&32	79	.61224	108.08	42.677	1.30701	2.700	.276		
COMPUTE NM HYD	OFFSITE2	-	55	.08050	13.87	1.783	.41534	2.000	.269	PER IMP=	.00
ROUTE RESERVOIR	OFFPOND2	55	50	.08050	4.43	1.783	.41534	3.100	.086	AC-FT=	.813
ROUTE MCUNGE	RTE.OFFPOND2	50	70	.08050	4.43	1.783	.41538	3.200	.086	CCODE =	.2
COMPUTE NM HYD	BASIN.B	-	30	.01998	34.80	1.407	1.32000	1.500	2.721	PER IMP=	32.00
ROUTE RESERVOIR	POND.B	30	51	.01998	3.36	1.407	1.31999	2.100	.263	AC-FT=	.930
ROUTE MCUNGE	RTE.PONDB	51	71	.01998	3.36	1.407	1.32010	2.100	.263	CCODE =	.2
ADD HYD	OFF.B	71&70	72	.10048	7.62	3.190	.59525	2.900	.118		

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION	
COMPUTE NM HYD	BASIN.E1	-	30	.03341	58.79	2.410	1.35259	1.500	2.749	PER IMP=	34.00
ADD HYD	OFFB.E1	72&30	73	.13389	61.76	5.600	.78423	1.500	.721		
COMPUTE NM HYD	BASIN.E2	-	32	.01348	27.42	1.324	1.84145	1.500	3.178	PER IMP=	64.00
ROUTE MCUNGE	RTE.E2	32	76	.01348	25.29	1.314	1.82775	1.600	2.932	CCODE =	.1
COMPUTE NM HYD	BASIN.E3	-	33	.01197	22.82	1.030	1.61331	1.500	2.978	PER IMP=	50.00
COMPUTE NM HYD	BASIN.E4	-	34	.00577	13.11	.697	2.26513	1.500	3.550	PER IMP=	90.00
ADD HYD	E3.E4	33&34	74	.01774	35.93	1.727	1.82529	1.500	3.164		
ADD HYD	E3E4.E1BOFF	74&73	75	.15163	97.69	7.327	.90603	1.500	1.007		
ROUTE MCUNGE	RTE.E1E4	75	77	.15163	97.69	7.327	.90603	1.500	1.007	CCODE =	.0
ADD HYD	E1E4.E2	77&76	78	.16511	122.58	8.641	.98127	1.500	1.160		
COMPUTE NM HYD	BASIN.E5	-	35	.04402	80.67	3.482	1.48295	1.500	2.863	PER IMP=	42.00
ADD HYD	E1E4.E5	78&35	80	.20913	203.25	12.123	1.08687	1.500	1.519		
COMPUTE NM HYD	BASIN.E6	-	36	.00488	11.09	.590	2.26512	1.500	3.550	PER IMP=	90.00
ADD HYD	E1E6	80&36	40	.21401	214.33	12.712	1.11374	1.500	1.565		
DIVIDE HYD	BYPASS.E	40	61	.10345	15.50	6.145	1.11374	1.300	.234		
	SURGE.E	and	62	.11056	198.83	6.567	1.11374	1.500	2.810		
ROUTE RESERVOIR	POND.E	62	37	.11056	6.83	6.574	1.11484	2.400	.097	AC-FT=	6.058
ADD HYD	TOTALE	61&37	40	.21401	22.33	12.718	1.11427	2.400	.163		
ROUTE MCUNGE	RTE.PONDE	40	38	.21401	22.34	12.720	1.11446	2.100	.163	CCODE =	.2
COMPUTE NM HYD	BASIN.P	-	32	.00845	10.08	.327	.72623	1.500	1.865	PER IMP=	7.00
COMPUTE NM HYD	BASIN.H1	-	33	.01825	37.78	1.856	1.90663	1.500	3.234	PER IMP=	68.00
ADD HYD	PONDE.H1	38&33	43	.23226	57.68	14.576	1.17670	1.500	.388		
COMPUTE NM HYD	BASIN.H2	-	34	.00836	19.16	1.018	2.28220	1.500	3.582	PER IMP=	90.00
ADD HYD	P.H2	32&34	44	.01681	29.25	1.345	1.50001	1.500	2.718		
ADD HYD	PH2.H1	44&43	45	.24907	86.93	15.921	1.19852	1.500	.545		
COMPUTE NM HYD	BASIN.H3	-	35	.01191	23.79	1.128	1.77627	1.500	3.121	PER IMP=	60.00
ADD HYD	PH1H3	45&35	46	.26098	110.72	17.049	1.22489	1.500	.663		
DIVIDE HYD	BYPASS.H	46	47	.21051	21.60	13.752	1.22489	1.300	.160		
	SURGE.H	and	48	.05047	89.12	3.297	1.22489	1.500	2.759		
ROUTE RESERVOIR	POND.H	48	30	.05047	5.20	3.297	1.22489	2.300	.161	AC-FT=	2.871
ROUTE MCUNGE	RTE.PONDH	30	49	.05047	5.20	3.298	1.22499	2.400	.161	CCODE =	.2
ADD HYD	BYPASS.RTE.H	49&47	31	.26098	26.80	17.049	1.22490	2.400	.160		
COMPUTE NM HYD	BASIN.K1	-	20	.02673	50.54	2.579	1.80886	1.500	2.954	PER IMP=	62.00
ADD HYD	PONDH.K1	31&20	32	.28771	73.46	19.628	1.27915	1.500	.399		
ROUTE MCUNGE	RTE.K1	32	33	.28771	73.46	19.628	1.27915	1.500	.399	CCODE =	.0
COMPUTE NM HYD	BASIN.K2	-	21	.01486	29.39	1.537	1.93922	1.500	3.090	PER IMP=	70.00
ADD HYD	K1.K2	33&21	34	.30257	102.85	21.165	1.31157	1.500	.531		
COMPUTE NM HYD	BASIN.K3	-	22	.00648	14.72	.783	2.26512	1.500	3.550	PER IMP=	90.00
ADD HYD	PONDG.K3	79&22	24	.61872	108.40	43.460	1.31704	2.700	.274		
COMPUTE NM HYD	BASIN.K4	-	23	.01340	18.28	.527	.73726	1.500	2.132	PER IMP=	.00
ADD HYD	K3.K4	24&23	25	.63212	108.63	43.987	1.30475	2.700	.269		
COMPUTE NM HYD	BASIN.J1	-	81	.00517	11.04	.557	2.02069	1.500	3.336	PER IMP=	75.00
COMPUTE NM HYD	BASIN.J2	-	82	.01706	36.40	1.839	2.02069	1.500	3.334	PER IMP=	75.00
COMPUTE NM HYD	BASIN.J3	-	83	.00580	11.70	.560	1.80886	1.500	3.151	PER IMP=	62.00
COMPUTE NM HYD	BASIN.J4	-	84	.01006	21.47	1.084	2.02069	1.500	3.335	PER IMP=	75.00
COMPUTE NM HYD	BASIN.J5	-	85	.00134	3.05	.162	2.26513	1.500	3.561	PER IMP=	90.00
COMPUTE NM HYD	BASIN.J6	-	86	.00422	9.59	.510	2.26512	1.500	3.551	PER IMP=	90.00
COMPUTE NM HYD	BASIN.J7	-	87	.00444	10.09	.536	2.26512	1.500	3.551	PER IMP=	90.00
COMPUTE NM HYD	BASIN.J8	-	88	.00903	12.31	.355	.73726	1.500	2.130	PER IMP=	.00
COMPUTE NM HYD	BASIN.J9	-	89	.00548	12.20	.638	2.18365	1.500	3.479	PER IMP=	85.00
COMPUTE NM HYD	BASIN.J12	-	12	.01419	10.65	.314	.41534	1.500	1.173	PER IMP=	.00
ADD HYD	J10J11.J6	86&10	11	.01783	38.60	2.144	2.25428	1.500	3.383		

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
ADD HYD	J10J11J6.J9	11&89	95	.02331	50.80	2.782	2.23766	1.500	3.405	
ADD HYD	J10J11J6J9.J	85&95	90	.02465	53.86	2.944	2.23914	1.500	3.414	
ROUTE MCUNGE	RTE.J5J6	90	91	.02465	53.86	2.944	2.23914	1.500	3.414	CCODE = .0
ADD HYD	J1.J4	81&84	93	.01523	32.51	1.641	2.02065	1.500	3.335	
ADD HYD	J1J4.J5J6J9	91&93	94	.03988	86.37	4.585	2.15570	1.500	3.384	
ROUTE MCUNGE	RTE.J14569	94	92	.03988	86.37	4.585	2.15570	1.500	3.384	CCODE = .0
ADD HYD	J2.J3	82&83	95	.02286	48.10	2.398	1.96692	1.500	3.288	
ADD HYD	J2J3.J7	95&87	94	.02730	58.19	2.934	2.01541	1.500	3.330	
ADD HYD	J145679.J237	94&92	96	.06718	144.56	7.519	2.09869	1.500	3.362	
ADD HYD	J1J7.J8	96&88	97	.07621	156.87	7.875	1.93737	1.500	3.216	
ADD HYD	J1J8.J12	97&12	98	.09040	167.52	8.189	1.69846	1.500	2.895	
DIVIDE HYD	BYPASSJ	98	83	.04558	26.34	4.129	1.69846	1.300	.903	
	SURGEJ	and	84	.04482	141.18	4.060	1.69846	1.500	4.922	
ROUTE RESERVOIR	POND.J	84	90	.04482	6.05	4.059	1.69831	2.100	.211	AC-FT= 3.771
ADD HYD	BYPASS.SURGE	90&83	97	.09040	32.39	8.188	1.69835	2.000	.560	
ROUTE MCUNGE	RTE.J5J6	97	91	.09040	32.34	8.180	1.69667	2.100	.559	CCODE = .1
COMPUTE NM HYD	BASIN.K5	-	30	.02364	47.63	2.281	1.80886	1.500	3.148	PER IMP= 62.00
COMPUTE NM HYD	BASIN.K6	-	31	.00220	5.01	.266	2.26512	1.500	3.555	PER IMP= 90.00
ADD HYD	K5.K6	30&31	41	.02584	52.64	2.546	1.84768	1.500	3.183	
ADD HYD	K5K6.PONDJ	41&91	43	.11624	80.50	10.726	1.73022	1.500	1.082	
ADD HYD	K5K6PONDJ.K3	43&25	44	.74836	152.43	54.714	1.37084	1.500	.318	
ADD HYD	PONDJK13.K1K	34&44	96	1.05093	255.27	75.878	1.35377	1.500	.380	
DIVIDE HYD	BYPASS.K	96	97	.67318	42.18	48.605	1.35377	1.300	.098	
	SURGE.K	and	98	.37775	213.09	27.274	1.35377	1.500	.881	
ROUTE RESERVOIR	POND.K	98	70	.37775	39.60	27.273	1.35374	3.900	.164	AC-FT= 16.526
ADD HYD	BYPASS.ROUTE	70&97	99	1.05093	81.78	75.878	1.35376	3.900	.122	
ROUTE MCUNGE	RTE.PONDK	99	1	1.05093	80.03	75.641	1.34953	4.500	.119	CCODE = .2
COMPUTE NM HYD	UNIVROWNORTH	-	2	.00727	16.51	.878	2.26512	1.500	3.550	PER IMP= 90.00
ADD HYD	UNIVN.PONDK	1& 2	3	1.05820	80.16	76.518	1.35582	4.500	.118	
ROUTE MCUNGE	RTE.UNIVN	3	4	1.05820	79.15	76.408	1.35387	4.900	.117	CCODE = .2
COMPUTE NM HYD	UNIVROWSOUTH	-	5	.00727	16.51	.878	2.26512	1.500	3.550	PER IMP= 90.00
ADD HYD	UNIVNS.PONDK	4& 5	6	1.06546	79.28	77.286	1.36008	4.900	.116	

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*S**************************************************************
*S******END OF TRAILS DRAINAGE ANALYSIS
FINISH
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SUMMARY OF HYDRAULIC CALCULATIONS
CLOSED CONDUIT

BY: DBT
DATE: 2/10/14
SHEET: 1 of 1

PROJECT: TRAILS DMP LINE: POND G TO POND F
100 year

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Comment
										JUNCTION		LOSSES										
STATION	STRUCT	D	Q	A	V	K	Sf	L	DELTA	D	ANGLE	hf	hb	hj	hmh	ht	hmisc	SUM	E.G.	hv	H.G.	GROUND ELEV.
																					5422.86	
	POND G												0.00				0.00	0.00	5423.50	0.64	5422.86	
		60	126	19.64	6.41	2606	0.0023	158				0.37						0.37	5423.87	0.64	5423.23	
	MH								90				0.19	0.00	0.05	0.07		0.31	5424.18	0.97	5423.20	5422.92
		54	126	15.90	7.92	1968	0.0041	374				1.53						1.53	5425.71	0.97	5424.74	
	MH								90				0.31	0.00	0.08	0.12		0.51	5426.22	1.56	5424.66	5424.36
		48	126	12.57	10.03	1437	0.0077	238				1.83						1.83	5428.05	1.56	5426.49	
	MH								90				0.31	0.00	0.08	0.00		0.39	5428.44	1.56	5426.88	5423.18
		48	126	12.57	10.03	1437	0.0077	267				2.05						2.05	5430.49	1.56	5428.93	
	MH												0.00	0.00	0.00	0.00		0.00	5430.49	0.00	5430.49	
		48	0	12.57	0.00	1437	0.0000	88				0.00						0.00	5430.49	0.00	5430.49	
	MH												0.00	0.00	0.00	0.00		0.00	5430.49	0.00	5430.49	
		12	0	0.79	0.00	35.63	0.0000	600				0.00						0.00	5430.49	0.00	5430.49	

REMARKS: Manning's n: 0.013

SUMMARY OF HYDRAULIC CALCULATIONS
CLOSED CONDUIT

BY: DBT
DATE: 2/10/14
SHEET: 1 of 1

PROJECT: TRAILS DMP LINE: POND F TO POND D
100 year

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Comment
										JUNCTION		LOSSES										
STATION	STRUCT	D	Q	A	V	K	Sf	L	DELTA	D	ANGLE	hf	hb	hj	hmh	ht	hmisc	SUM	E.G.	hv	H.G.	GROUND ELEV.
																					5421.15	
	POND F												0.00				0.00	0.00	5423.83	2.68	5421.15	
		30	64.5	4.91	13.14	410.3	0.0247	280				6.92						6.92	5430.75	2.68	5428.07	
	MH								90				0.54	0.00	0.13	0.00		0.67	5431.42	2.68	5428.74	5426.89
		30	64.5	4.91	13.14	410.3	0.0247	55				1.36						1.36	5432.78	2.68	5430.10	
	MH								90				0.54	0.00	0.13	0.00		0.67	5433.45	2.68	5430.77	5425.80
		30	64.5	4.91	13.14	410.3	0.0247	903				22.31						22.31	5455.76	2.68	5453.08	
	MH												0.00	0.00	0.00	0.00		0.00	5455.76	0.00	5455.76	5430.14
		30	0	4.91	0.00	410.3	0.0000	320				0.00						0.00	5455.76	0.00	5455.76	
	MH												0.00	0.00	0.00	0.00		0.00	5455.76	0.00	5455.76	
		30	0	4.91	0.00	410.3	0.0000	235				0.00						0.00	5455.76	0.00	5455.76	
	MH												0.00	0.00	0.00	0.00		0.00	5455.76	0.00	5455.76	
		12	0	0.79	0.00	35.63	0.0000	600				0.00						0.00	5455.76	0.00	5455.76	

REMARKS: Manning's n: 0.013