

APPENDIX 2

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Table 2.1				
Curve Number Calculations				
South Broadway Drainage Master Plan				
Basin Name	Basin Area (acres)	Basin Description	Curve Number	Percent Impervious (%)
CA1	19.4	Commerical, 1/8 acre residential & roads	92	90%
CA2	0.8	Commerical, 1/8 acre residential & roads	92	90%
CA3	3.3	Road	98	98%
CA4	1.7	Road ROW with side slopes	92	75%
CBPS1	18.8	1/8 acre residential lots and industrial	90	65%
CBPS2	12.8	1/8 acre residential lots, commerical and open space	89	65%
CBPS3	17.7	1/8 acre residential lots, commerical and open space	90	65%
KP1	31.0	1/8 acre residential lots	90	65%
KP10	0.2	Road	98	98%
KP11	2.5	Road	98	98%
KP12	23.0	1/8 acre residential lots and open space	88	60%
KP13	5.9	1/8 acre residential lots and road	90	65%
KP14	2.8	Road ROW with side slopes	86	0%
KP15	2.4	Road ROW with side slopes	86	0%
KP16	4.3	Road ROW with side slopes, commercial & vacant open space	88	50%
KP17	2.5	Road	98	98%
KP18	6.8	Commerical, 1/8 acre residential & roads	89	70%
KP19	33.8	Commerical, 1/8 acre residential & roads	92	70%
KP2	3.0	Pond with 1/8 acre residential	83	20%
KP20	17.1	Open space with road ROW	80	15%
KP21	1.7	Road	98	98%
KP22	11.3	1/8 acre residential lots and road	90	65%
KP23	4.7	Commerical, 1/8 acre residential & roads with ROW	88	50%
KP24	2.0	Road	98	98%
KP25	1.8	Road	98	98%
KP26	4.7	Road ROW with side slopes	92	75%
KP27	11.0	1/8 acre residential lots and road	90	65%
KP3	7.8	Commercial/Industrial	94	85%
KP4	0.4	Road	98	98%
KP5	0.4	Road	98	98%
KP6	5.8	Commerical, 1/8 acre residential & roads with ROW	90	80%
KP7	22.9	Commerical, 1/8 acre residential & roads with ROW	90	60%
KP8	5.0	Commercial/Industrial	94	85%
KP9	0.7	Road	98	98%
MP1	1.2	Open Space with commercial	88	50%
MP10	2.9	Road	98	98%
MP11	3.7	Commercial and road ROW	92	55%
MP12	14.8	Commerical/Industrial, open space, road ROW and 1/8 acre lots	90	70%
MP13	2.3	Commerical, 1/8 acre residential & roads	89	40%
MP14	9.8	Commercial/Industrial open space	92	85%
MP15	1.6	Commercial/Industrial	90	25%
MP16	22.2	Commercial/Industrial open space	94	85%
MP17	13.6	Commercial/Industrial school	90	55%
MP18	6.7	Commercial/Industrial	94	85%
MP19	7.4	Pond open space	94	85%
MP2	1.5	Commercial/Industrial	82	20%
MP20	1.6	Commerical, 1/8 acre residential & roads	94	85%
MP21	7.6	Commerical, 1/8 acre residential & roads	93	72%
MP22	21.5	Commerical, 1/8 acre residential & roads	90	60%
MP23	11.4	Road	90	65%
MP24	0.5	Road	98	98%
MP25	0.7	Road	98	98%
MP26	1.1	Road	98	98%
MP27	1.0	Commerical/Industrial, road ROW and 1/8 acre lots	98	98%
MP28	13.9	1/8 acre residential lots and road	91	70%
MP29	3.7	Commerical, 1/8 acre residential & roads	90	65%

Table 2.1				
Curve Number Calculations				
South Broadway Drainage Master Plan				
Basin Name	Basin Area (acres)	Basin Description	Curve Number	Percent Impervious (%)
MP3	3.0	Commercial/Industrial	90	70%
MP30	2.3	1/8 acre residential lots and road	88	70%
MP31	1.1	Road ROW with side slopes	90	65%
MP32	8.6	Road	89	25%
MP33	0.7	Road ROW with side slopes	98	98%
MP34	6.0	Road	89	35%
MP4	1.0	Industrial	98	98%
MP5	5.7	Industrial	91	72%
MP6	2.9	Road ROW with side slopes	91	72%
MP7	1.6	Road	89	50%
MP8	3.6	Industrial	96	98%
MP9	3.8	Industrial	91	50%
SBP1	1.7	Commerical, 1/8 acre residential & roads	91	72%
SBP10	17.6	1/8 acre residential lots, road and open space	92	75%
SBP11	28.3	Commerical, 1/8 acre residential & roads	90	65%
SBP12	23.5	Road	88	60%
SBP13	3.1	Commerical, 1/8 acre residential & roads	98	98%
SBP14	20.3	Road ROW with side slopes	90	65%
SBP15	2.3	Commerical, 1/8 acre residential & roads	92	40%
SBP16	18.3	1/8 acre residential lots and road	92	75%
SBP17	8.6	Commerical, 1/8 acre residential & roads	90	65%
SBP18	14.3	Commerical, 1/8 acre residential & roads	92	70%
SBP19	26.1	Pond with 1/8 acre residential and commerical	92	70%
SBP2	7.6	1/8 acre residential lots and road	86	35%
SBP20	6.6	Road	90	65%
SBP21	1.3	Road	98	98%
SBP22	1.6	Road	98	98%
SBP23	1.6	Commerical and road	98	98%
SBP24	7.6	Commerical, 1/8 acre residential & roads	95	95%
SBP25	14.3	1/8 acre residential lots and road	90	65%
SBP26	1.0	Commerical, 1/8 acre residential & roads	90	60%
SBP27	20.2	Commerical road with ROW	90	65%
SBP28	9.3	Commercial	93	80%
SBP29	14.1	1/8 acre residential lots and road	94	85%
SBP3	2.1	Commerical with open space	90	65%
SBP30	11.4	1/8 acre or less	88	50%
SBP31	3.0	Road	92	80%
SBP32	2.5	Road	98	98%
SBP33	1.2	1/8 acre or less with commerical	98	98%
SBP34	23.5	Road	92	70%
SBP35	3.5	1/8 acre or less	98	98%
SBP36	5.7	Commerical, 1/8 acre residential & roads	89	60%
SBP37	30.5	Road ROW with side slopes	94	80%
SBP38	20.3	Road ROW with side slopes	92	75%
SBP39	3.0	Commerical, 1/8 acre residential & roads	92	75%
SBP4	5.0	Commercial	94	80%
SBP40	17.6	Commercial	94	80%
SBP41	11.6	Open space/park with roads	94	85%

Table 2.1				
Curve Number Calculations				
South Broadway Drainage Master Plan				
Basin Name	Basin Area (acres)	Basin Description	Curve Number	Percent Impervious (%)
SBP42	1.8	Commerical, 1/8 acre residential & roads	89	75%
SBP43	0.6	Road	98	98%
SBP44	10.0	Commercial	91	75%
SBP5	7.3	Commercial	94	85%
SBP6	19.4	Commercial	94	85%
SBP7	16.5	Commerical road with ROW	94	85%
SBP8	11.8	1/8 acre residential lots, road and open space	90	65%
SBP9	9.5	1/8 acre residential lots, road and open space	90	65%
SJ1	23.6	Industrial	96	90%
SJ10	3.8	1/8 acre residential lots and road	90	60%
SJ11	5.8	Industrial	85	45%
SJ12	2.1	Industrial	93	85%
SJ13	3.0	Industrial	93	85%
SJ14	10.1	Industrial	93	80%
SJ15	4.3	Industrial	91	75%
SJ16	3.5	Commercial	94	85%
SJ17	14.0	Industrial	91	72%
SJ18	16.1	Industrial	88	60%
SJ19	6.0	1/8 acre residential lots and road	90	55%
SJ2	14.1	Industrial	94	80%
SJ20	13.7	Commerical, 1/8 acre residential & roads	88	70%
SJ21	4.4	Open space channel	90	75%
SJ22	3.7	Commerical, 1/8 acre residential & roads	92	75%
SJ23	7.6	1/4 acre residential with roads	86	45%
SJ24	16.1	1/8 acre residential lots, roads, open space park and commerical/industrial	86	50%
SJ25	15.0	1/8 acre residential lots and road	90	65%
SJ26	8.9	1/8 acre residential lots and road	90	65%
SJ27	11.3	Commerical, 1/8 acre residential & roads	92	70%
SJ28	22.7	1/4 acre residential with roads, open space and industrial	86	45%
SJ29	7.1	1/8 acre residential lots and road	88	60%
SJ3	9.6	Industrial	94	75%
SJ30	10.9	Commerical, 1/8 acre residential, roads & open space	86	35%
SJ31	4.0	Road ROW with side slopes	89	50%
SJ32	3.6	Road ROW with side slopes	89	45%
SJ33	1.7	Open space ROW	80	5%
SJ34	6.0	Commercial	88	80%
SJ35	4.4	Commercial	88	70%
SJ36	7.3	Commerical, 1/8 acre residential & roads	87	50%
SJ37	6.3	1/8 acre residential lots and road	88	60%
SJ38	8.6	1/8 acre residential lots and road	90	60%
SJ39	10.5	1/8 acre residential lots and road	90	55%
SJ4	32.5	Industrial with open space	87	45%
SJ40	11.0	1/8 acre residential lots and road	90	65%
SJ41	14.2	Commercial/Industrial	94	85%
SJ42	18.3	Commercial/Industrial	94	85%
SJ43	15.3	Commerical, 1/8 acre residential, roads & open space	88	60%
SJ5	24.2	Industrial with 1/2 acre lots	88	55%
SJ6	16.0	Open space	80	0%
SJ7	17.6	Commercial/Industrial	93	85%
SJ8	2.0	Open space with road ROW	85	15%
SJ9	8.6	Industrial	91	75%
SP1	42.2	Sunport Drainage Report Amendment Approximation	90	60%
SP2	11.2	Sunport Drainage Report Amendment Approximation	86	25%
SP3	3.5	Sunport Drainage Report Amendment Approximation	98	98%
Footnotes:				

Table 2.2 Initial Abstraction Calculations South Broadway Drainage Master Plan				
Basin Name	Curve Number	100yr- 24hr Rainfall (in)	IA (in)	Additional Pervious Depression Storage (in)*
CBPS1	90	2.6	0.22	0.78
CBPS3	90	2.6	0.22	0.78
KP11	98	2.6	0.04	0.96
KP3	94	2.6	0.13	0.87
KP8	94	2.6	0.13	0.87
MP23	98	2.6	0.04	0.96
MP24	98	2.6	0.04	0.96
MP25	98	2.6	0.04	0.96
MP26	98	2.6	0.04	0.96
MP32	98	2.6	0.04	0.96
MP34	98	2.6	0.04	0.96
SBP22	98	2.6	0.04	0.96
SBP23	95	2.6	0.11	0.89
SBP31	98	2.6	0.04	0.96
SJ1	96	2.6	0.08	0.92
SJ10	90	2.6	0.22	0.78
SJ11	85	2.6	0.35	0.65
SJ12	93	2.6	0.15	0.85
SJ13	93	2.6	0.15	0.85
SJ14	93	2.6	0.15	0.85
SJ15	91	2.6	0.20	0.80
SJ16	94	2.6	0.13	0.87
SJ17	91	2.6	0.20	0.80
SJ18	88	2.6	0.27	0.73
SJ19	90	2.6	0.22	0.78
SJ2	94	2.6	0.13	0.87
SJ20	88	2.6	0.27	0.73
SJ21	90	2.6	0.22	0.78
SJ26	90	2.6	0.22	0.78
SJ27	92	2.6	0.17	0.83
SJ29	88	2.6	0.27	0.73
SJ3	94	2.6	0.13	0.87
SJ36	87	2.6	0.30	0.70
SJ37	88	2.6	0.27	0.73
SJ39	90	2.6	0.22	0.78
SJ40	90	2.6	0.22	0.78
SJ42	94	2.6	0.13	0.87
SJ43	88	2.6	0.27	0.73
SP3	98	2.6	0.04	0.96
(a) National Engineering Handbook- Table 10-1 used as a reference * Values below 1 inch will add difference from 1 inch for "additional initial abstraction." This will be added to pervious depression storage in PCSWMM Valley basins.				

Table 2.3.1 Bell Commercial Pump Station - Elevation Storage Pump Discharge South Broadway Drainage Master Plan													
Contour Elevation NGVD 29	Coverision Factor	Contour Elevation NAD 1983	Depth	Contour Area	Incremental Volume	Incremental Volume	Cumulative Volume	Pump # 1 Curve	Pump # 2 Curve	Pump # 3 Curve	Pump # 4 Curve (Sump)	Pump # 5 Curve (Sump)	Comment
				Principal Spillway Orifice Diameter (inches) Number of Orifices									
		(ft)		(sq ft)	(cu ft)	(ac-ft)	(ac-ft)	cfs	cfs	cfs	cfs	cfs	
		(a)		(a)				(b)					
4922.00	2.67	4924.67	0	1020	0	0.0000	0.00	22.28	32.5	32.5	4.5	4.5	Invert of Wet well
4923.00	2.67	4925.67	1.0	1020	1020	0.0234	0.02	22.28	32.5	32.5	4.5	4.5	
4924.00	2.67	4926.67	2.0	1020	1020	0.0234	0.05	22.28	32.5	32.5	4.5	4.5	
4925.00	2.67	4927.67	3.0	1020	1020	0.0234	0.07	22.28	32.5	32.5	4.5	4.5	
4926.00	2.67	4928.67	4.0	1020	1020	0.0234	0.09	22.28	32.5	32.5	4.5	4.5	
4927.00	2.67	4929.67	5.0	1020	1020	0.0234	0.12	22.28	32.5	32.5	4.5	4.5	
4928.00	2.67	4930.67	6.0	1020	1020	0.0234	0.14	22.28	32.5	32.5	4.5	4.5	
4929.00	2.67	4931.67	7.0	1020	1020	0.0234	0.16	22.28	32.5	32.5	4.5	4.5	
4930.00	2.67	4932.67	8.0	1020	1020	0.0234	0.19	22.28	32.5	32.5	4.5	4.5	
4931.00	2.67	4933.67	9.0	1020	1020	0.0234	0.21	22.28	32.5	32.5	4.5	4.5	
4932.00	2.67	4934.67	10.0	1020	1020	0.0234	0.23	22.28	32.5	32.5	4.5	4.5	
4933.00	2.67	4935.67	11.0	1020	1020	0.0234	0.26	22.28	32.5	32.5	4.5	4.5	
4934.00	2.67	4936.67	12.0	1020	1020	0.0234	0.28	22.28	32.5	32.5	4.5	4.5	
4935.00	2.67	4937.67	13.0	1020	1020	0.0234	0.30	22.28	32.5	32.5	4.5	4.5	
4936.00	2.67	4938.67	14.0	1020	1020	0.0234	0.33	22.28	32.5	32.5	4.5	4.5	
4937.00	2.67	4939.67	15.0	1020	1020	0.0234	0.35	22.28	32.5	32.5	4.5	4.5	
4938.00	2.67	4940.67	16.0	1020	1020	0.0234	0.37	22.28	32.5	32.5	4.5	4.5	
4939.00	2.67	4941.67	17.0	1020	1020	0.0234	0.40	22.28	32.5	32.5	4.5	4.5	
4940.00	2.67	4942.67	18.0	1020	1020	0.0234	0.42	22.28	32.5	32.5	4.5	4.5	
4941.00	2.67	4943.67	19.0	1020	1020	0.0234	0.44	22.28	32.5	32.5	4.5	4.5	
4942.00	2.67	4944.67	20.0	1020	1020	0.0234	0.47	22.28	32.5	32.5	4.5	4.5	
4943.00	2.67	4945.67	21.0	1020	1020	0.0234	0.49	22.28	32.5	32.5	4.5	4.5	
4944.00	2.67	4946.67	22.0	1020	1020	0.0234	0.52	22.28	32.5	32.5	4.5	4.5	
4945.00	2.67	4947.67	23.0	1020	1020	0.0234	0.54	22.28	32.5	32.5	4.5	4.5	
4946.00	2.67	4948.67	24.0	1020	1020	0.0234	0.56	22.28	32.5	32.5	4.5	4.5	
4947.00	2.67	4949.67	25.0	1020	1020	0.0234	0.59	22.28	32.5	32.5	4.5	4.5	
(a) Data Source : Bell Commercial Operations Manual completed by Molzen Corbin 2015 grey box means must input data													

Table 2.3.2 Business Industrial South Retention Pond - Elevation Storage Discharge South Broadway Drainage Master Plan						
Contour Elevation NAVD 1988	Depth	Contour Area	Incremental Volume	Incremental Volume	Cumulative Volume	Comment
		Principal Spillway Orifice Diameter (inches) Number of Orifices				
(ft)		(sq ft)	(cu ft)	(ac-ft)	(ac-ft)	
(a)						
4973.00	0	327	0	0.0000	0.00	Pond bottom
4974.00	1.0	8202	4265	0.0979	0.10	
4975.00	2.0	11745	9974	0.2290	0.33	
4976.00	3.0	13997	12871	0.2955	0.62	
4977.00	4.0	15650	14824	0.3403	0.96	
4978.00	5.0	17120	16385	0.3761	1.34	
4979.00	6.0	18460	17790	0.4084	1.75	
4980.00	7.0	19808	19134	0.4393	2.19	
4981.00	8.0	21215	20512	0.4709	2.66	
4982.00	9.0	22669	21942	0.5037	3.16	
4983.00	10.0	24409	23539	0.5404	3.70	
4984.00	11.0	26619	25514	0.5857	4.29	
4985.00	12.0	27000	26810	0.6155	4.90	Top of Pond/Emergency spillway - Artificial Area
(a) Data Source : City of Albuquerque/Bernalillo County as-builts. Lidar provided by MRCOG - 2018 DEM, contours were extracted.						
grey box means must input data						
(e) Weir equation and "C" coefficients were obtained from Equation 5-10 and Table 5-3 from "Handbook of Hydraulics" Sixth Edition, by Brater & King, 1976.						
Emergency Spillway flows were computed based on the following data used in the weir equation						
Q = CLH^ 1.5 C = discharge coefficient, L = spillway length perp. to flow (ft), H = head (ft)						
Emergency Spillway C =		2.60	L =	42	Emer. Spill. Elev.= 4985.00	
(f) Length assumed along top of pond embankment and elevations extended above emergency spillway to allow for rating curve to function if flow spills over top						

Table 2.3.3 Karsten Pond - Elevation Storage Discharge South Broadway Drainage Master Plan													
Contour Elevation NAVD 1988	Depth	Contour Area	Incremental Volume	Incremental Volume	Cumulative Volume	1st Row of Reverse Incline Ports Discharge	2nd Row of Reverse Incline Ports Discharge	Principal Spillway Grate Discharge	Principal Spillway Outfall Pipe Discharge	Total Principal Spillway / Outfall Pipe Discharge	Emergency Spillway Discharge	Total Discharge Rating Curve	Comment
		Principal Spillway Orifice Diameter (inches)				23	0		48				
		Number of Orifices				1	0		1				
(ft)		(sq ft)	(cu ft)	(ac-ft)	(ac-ft)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	
(a)						(d)	(d)	(e)	(d)		(e,f)		
4985.00	0	280	0	0.0000	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0.00	Pond bottom
4986.00	1.0	5305	2793	0.0641	0.06	0.0	0.0	0.0	11.6	0.0	0.01	0.01	
4987.00	2.0	11940	8623	0.1979	0.26	0.0	0.0	0.0	42.1	0.0	0.02	0.02	
4988.00	3.0	19093	15517	0.3562	0.62	0.0	0.0	0.0	82.9	0.0	0.03	0.03	
4989.00	4.0	24095	21594	0.4957	1.11	0.0	0.0	0.0	119.0	0.0	0.04	0.04	
4989.20	4.2	24844	4894	0.1123	1.23	0.0	0.0	0.0	121.9	0.0	0.05	0.05	
4990.00	5.0	27840	21074	0.4838	1.71	11.8	0.0	0.0	133.0	11.8	0.0	11.8	
4991.00	6.0	31242	29541	0.6782	2.39	17.7	0.0	0.0	145.7	17.7	0.0	17.7	
4992.00	7.0	34469	32856	0.7543	3.14	22.1	0.0	0.0	157.4	22.1	0.0	22.1	
4993.00	8.0	37684	36077	0.8282	3.97	25.7	0.0	0.0	168.3	25.7	0.0	25.7	
4994.00	9.0	41137	39411	0.9047	4.88	28.9	0.0	0.0	178.5	28.9	0.0	28.9	
4994.40	9.4	42659	16759	0.3847	5.26	30.1	0.0	0.0	182.4	30.1	0.0	30.1	
4995.00	10.0	44941	26280	0.6033	5.86	31.8	0.0	17.5	188.2	49.3	0.0	49.3	Emergency Spillway
4996.00	11.0	52282	48612	1.1160	6.98	34.4	0.0	76.3	197.3	110.7	174.2	284.9	Top of Pond
(a) Data Source : City of Albuquerque/Bernalillo County as-builts. Lidar provided by MRCOG - 2018 DEM, contours were extracted.													
grey box means must input data													
(b) conversion factor calculated on average 2.67 feet, details provided from https://geodesy.noaa.gov/VERTCON3/index.shtml													
(d)													
Orifice equation and coefficient were obtained from Equation 4-10 and Table 4-3 from "Handbook of Hydraulics" Sixth Edition, by Brater & King, 1976.													
$Q = Ca\sqrt{2gh}$ C = 0.590 g=32.2 ft/sec^2, a=area (sq ft) h=head (ft)													
$a = \pi D^2 / 4$ (full area formula)													
$a = \frac{1}{2}r^2 \left\{ \left[2 \cos^{-1} \left(\frac{r-d}{r} \right) \right] \frac{\pi}{180} - \sin \left[\left[2 \cos^{-1} \left(\frac{r-d}{r} \right) \right] \frac{\pi}{180} \right] \right\}$ (partial area formula)													
Principal Spill. Pipe radius r in feet = 2.00													
d = depth of water in the pipe in feet													
(e) Weir equation and "C" coefficients were obtained from Equation 5-10 and Table 5-3 from "Handbook of Hydraulics" Sixth Edition, by Brater & King, 1976.													
Emergency Spillway flows were computed based on the following data used in the weir equation													
Q = CLH^ 1.5 C = discharge coefficient, L = spillway length perp. to flow (ft), H = head (ft)													
Emergency Spillway C =		2.60	L =	67	Emer. Spill. Elev.=		4995.00	NAVD88					
Grate / Weir C =		3.00	L =	12.6	48" diameter CMP Riser		4994.40	NAVD88					
(f) Length assumed along top of pond embankment and elevations extended above emergency spillway to allow for rating curve to function if flow spills over top													

Table 2.3.4 Business Industrial Unit 3 Pond - Elevation Storage Discharge South Broadway Drianage Master Plan										
Contour Elevation NAVD 88	Depth	Contour Area	Incremental Volume	Incremental Volume	Cumulative Volume	Principal Spillway Outfall Pipe Discharge	Total Principal Spillway / Outfall Pipe Discharge	Emergency Spillway Discharge	Total Discharge Rating Curve	Comment
		Principal Spillway Orifice Diameter (inches)				24				
		Number of Orifices				1				
(ft)		(sq ft)	(cu ft)	(ac-ft)	(ac-ft)	(cfs)	(cfs)	(cfs)	(cfs)	
(a)						(d)		(e,f)		
4998.00	0	341	0	0.0000	0.00	0.0	0.0	0.0	0.0	Pond bottom
4999.00	1.0	1224	783	0.0180	0.02	7.4	7.4	0.0	7.4	
5000.00	2.0	1844	1534	0.0352	0.05	21.0	21.0	0.0	21.0	
5001.00	3.0	2395	2120	0.0487	0.10	25.8	25.8	0.0	25.8	
5002.00	4.0	2938	2667	0.0612	0.16	29.7	29.7	0.0	29.7	
5003.00	5.0	3511	3225	0.0740	0.24	33.3	33.3	0.0	33.3	
5004.00	6.0	4126	3819	0.0877	0.32	36.4	36.4	0.0	36.4	
5005.00	7.0	4818	4472	0.1027	0.43	39.4	39.4	0.0	39.4	
5006.00	8.0	5956	5387	0.1237	0.55	42.1	42.1	0.0	42.1	
5007.00	9.0	7636	6796	0.1560	0.71	44.6	44.6	0.0	44.6	Top of pond/Emergency Spillway-Artificial Area

(a) Data Source : City of Albuquerque/Bernalillo County as-builts. Lidar provided by MRCOG - 2018 DEM, contours were extracted.

grey box means must input data

(d)

Orifice equation and coefficient were obtained from Equation 4-10 and Table 4-3 from "Handbook of Hydraulics" Sixth Edition, by Brater & King, 1976.

$$Q = Ca\sqrt{2gh}$$

C = 0.590 g=32.2 ft/sec^2, a=area (sq ft) h=head (ft)

$$a = \frac{\pi D^2}{4}$$

(full area formula)

$$a = \frac{1}{2}r^2 \left\{ \left[2\cos^{-1}\left(\frac{r-d}{r}\right) \right] \frac{\pi}{180} - \sin \left[\left[2\cos^{-1}\left(\frac{r-d}{r}\right) \right] \frac{\pi}{180} \right] \right\}$$

(partial area formula)

Principal Spill. Pipe radius r in feet = 1.00

d = depth of water in the pipe in feet

(e) Weir equation and "C" coefficients were obtained from Equation 5-10 and Table 5-3 from "Handbook of Hydraulics" Sixth Edition, by Brater & King, 1976.

Emergency Spillway flows were computed based on the following data used in the weir equation

Q = CLH^1.5 C = discharge coefficient, L = spillway length perp. to flow (ft), H = head (ft)

Emergency Spillway C =	2.60	L =	66	Emer. Spill. Elev. =	5007.00 NAVD 88
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(f) Length assumed along top of pond embankment and elevations extended above emergency spillway to allow for rating curve to function if flow spills over top

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Table 2.3.5 Kathryn Detention Pond - Elevation Storage Discharge South Broadway Drainage Master Plan																
Contour Elevation NAVD 1988	Depth	Contour Area	Incremental Volume	Incremental Volume	Cumulative Volume	1st Row of Reverse Incline Ports Discharge	2nd Row of Reverse Incline Ports Discharge	3rd Row of Reverse Incline Ports Discharge	4th Row of Reverse Incline Ports Discharge	Principal Spillway Grate Discharge	Principal Spillway Outfall Pipe Discharge	Total Principal Spillway / Outfall Pipe Discharge	Emergency Spillway Discharge	Total Discharge Rating Curve	Comment	
		Principal Spillway Orifice Diameter (inches)				3	3	3	3		18					
		Number of Orifices				1	3	4	4		1					
(ft)		(sq ft)	(cu ft)	(ac-ft)	(ac-ft)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)		
(a)						(d)	(d)	(d)	(d)	(e)	(d)		(e, f)			
4940.79	0	0	0	0.0000	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pond Bottom/3" dia. opening	
4941.00	0.2	667	70	0.0016	0.00	0.1	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.1		
4941.27	0.5	3886	615	0.0141	0.02	0.2	0.0	0.0	0.0	0.0	1.6	0.2	0.0	0.2	2nd row of ports,	
4942.00	1.2	12589	6013	0.1380	0.15	0.3	0.6	0.0	0.0	0.0	8.0	0.9	0.0	0.9		
4942.44	1.6	28013	8932	0.2051	0.36	0.3	0.8	0.0	0.0	0.0	10.7	1.1	0.0	1.1	3rd row of ports	
4943.00	2.2	47643	21184	0.4863	0.85	0.3	0.9	0.7	0.0	0.0	12.4	2.0	0.0	2.0		
4943.02	2.2	47837	955	0.0219	0.87	0.3	0.9	0.7	0.0	0.0	12.5	2.0	0.0	2.0	4th row of ports	
4944.00	3.2	57326	51530	1.1830	2.05	0.4	1.2	1.2	0.9	0.0	15.0	3.6	0.0	3.6	Top of RCP Riser	
4945.00	4.2	62303	59815	1.3732	3.42	0.5	1.3	1.5	1.3	14.1	17.2	17.2	0.0	17.2		
4946.00	5.2	68425	65364	1.5006	4.92	0.5	1.5	1.8	1.6	40.0	19.1	19.1	0.0	19.1	Emergency Spillway/Top of Pond	
(a) Data Source : City of Albuquerque/Bernalillo County as-buils. Lidar provided by MRCOG - 2018 DEM, contours were extracted.																
		grey box means must input data														
(d)		Orifice equation and coefficient were obtained from Equation 4-10 and Table 4-3 from "Handbook of Hydraulics" Sixth Edition, by Brater & King, 1976.														
		$Q = Ca\sqrt{2gh}$ C = 0.590g=32.2 ft/sec^2, a=area (sq ft) h=head (ft)														
		$a = \pi D^2 / 4$ (full area formula)														
		$a = \frac{1}{2}r^2 \left\{ \left[2\cos^{-1}\left(\frac{r-d}{r}\right) \right] \frac{\pi}{180} - \sin \left[\left[2\cos^{-1}\left(\frac{r-d}{r}\right) \right] \frac{\pi}{180} \right] \right\}$ (partial area formula)														
		Principal Spill. Pipe radius r in feet = 0.75														
		d = depth of water in the pipe in feet														
(e) Weir equation and "C" coefficients were obtained from Equation 5-10 and Table 5-3 from "Handbook of Hydraulics" Sixth Edition, by Brater & King, 1976.																
Emergency Spillway flows were computed based on the following data used in the weir equation																
Q = CLH^ 1.5 C = discharge coefficient, L = spillway length perp. to flow (ft), H = head (ft)																
Emergency Spillway C =		2.60	L =	207	Emer. Spill. Elev.=		4946.00	NAVD 88								
Grate / Weir C =		3.00	L =	4.7	El.18" Dia Grate=		4944.00	NAVD 88								
(f) Length assumed along top of pond embankment and elevations extended above emergency spillway to allow for rating curve to function if flow spills over top																

Table 2.3.6 Mechem Detention Pond - Elevation Storage Discharge Project (DMP, Client, etc.)																	
Contour Elevation NGVD29	Conversion Factor (ft)	Contour Elevation NAVD 1988	Depth	Contour Area	Incremental Volume	Incremental Volume	Cumulative Volume	1st Row of Reverse Incline Ports Discharge	2nd Row of Reverse Incline Ports Discharge	3rd Row of Reverse Incline Ports Discharge	4th Row of Reverse Incline Ports Discharge	Principal Spillway Grate Discharge	Principal Spillway Outfall Pipe Discharge	Total Principal Spillway / Outfall Pipe Discharge	Emergency Spillway Discharge	Total Discharge Rating Curve	Comment
				Principal Spillway Orifice Diameter (inches)				6	6	6	6		24				
				Number of Orifices				10	10	10	10		1				
(ft)	(ft)	(ft)		(sq ft)	(cu ft)	(ac-ft)	(ac-ft)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	
(a)	(b)	(a)						(d)	(d)	(d)	(d)	(e)	(d)		(e.f)		
4934.50	2.67	4937.17	0	0	0	0.0000	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pond bottom and 1st row of ports
4935.33	2.67	4938.00	0.8	1559	647	0.0149	0.01	8.5	0.0	0.0	0.0	0.0	5.3	5.3	0.0	5.3	
4935.42	2.67	4938.09	0.9	2538	184	0.0042	0.02	8.9	0.0	0.0	0.0	0.0	6.4	6.4	0.0	6.4	2nd row of ports
4936.33	2.67	4939.00	1.8	12440	6815	0.1565	0.18	12.6	8.9	0.0	0.0	0.0	19.3	19.3	0.0	19.3	
4936.63	2.67	4939.30	2.1	16674	4367	0.1003	0.28	13.6	10.2	0.0	0.0	0.0	21.7	21.7	0.0	21.7	3rd row of ports
4937.33	2.67	4940.00	2.8	26554	15130	0.3473	0.62	15.6	12.8	7.8	0.0	0.0	25.0	25.0	0.0	25.0	
4937.88	2.67	4940.55	3.4	29683	15465	0.3550	0.98	17.1	14.6	10.4	0.0	0.0	27.3	27.3	0.0	27.3	4th row of ports
4938.33	2.67	4941.00	3.8	32243	13933	0.3199	1.30	18.2	15.9	12.1	6.2	0.0	29.1	29.1	0.0	29.1	
4939.33	2.67	4942.00	4.8	36251	34247	0.7862	2.08	20.4	18.4	15.3	11.2	0.0	32.7	32.7	0.0	32.7	
4940.33	2.67	4943.00	5.8	39890	38071	0.8740	2.96	22.4	20.6	17.9	14.6	0.0	35.9	35.9	0.0	35.9	
4941.00	2.67	4943.67	6.5	42224	27508	0.6315	3.59	23.7	22.0	19.4	16.4	0.0	37.9	37.9	0.0	37.9	Top of principal spillway riser
4941.33	2.67	4944.00	6.8	43374	14124	0.3242	3.91	24.3	22.6	20.2	17.3	9.0	38.9	38.9	0.0	38.9	
4942.33	2.67	4945.00	7.8	46977	45176	1.0371	4.95	26.0	24.4	22.2	19.6	72.9	41.6	41.6	0.0	41.6	
4943.33	2.67	4946.00	8.8	51876	49427	1.1347	6.09	27.6	26.1	24.1	21.7	168.9	44.2	44.2	0.0	44.2	Artificial Area
4943.70	2.67	4946.37	9.2	52000	19217	0.4412	6.53	28.2	26.8	24.7	22.4	210.7	45.1	45.1	0.0	45.1	Emergency Spillway/Top of Pond-Artificial Area
(a) Data Source : City of Albuquerque/Bernalillo County as-built. Lidar provided by MRCOG - 2018 DEM, contours were extracted.																	
grey box means must input data																	
(b) conversion factor calculated on average 2.67 feet, details provided from https://geodesy.noaa.gov/VERTCON3/index.shtml																	
(d)																	
Orifice equation and coefficient were obtained from Equation 4-10 and Table 4-3 from "Handbook of Hydraulics" Sixth Edition, by Brater & King, 1976.																	
$Q = Ca\sqrt{2gh}$ C = 0.590 g=32.2 ft/sec^2, a=area (sq ft) h=head (ft)																	
$a = \pi D^2 / 4$ (full area formula)																	
$a = \frac{1}{2} r^2 \left\{ \left[2 \cos^{-1} \left(\frac{r - d}{r} \right) \right] \frac{\pi}{180} - \sin \left[\left[2 \cos^{-1} \left(\frac{r - d}{r} \right) \right] \frac{\pi}{180} \right] \right\}$ (partial area formula)																	
Principal Spill. Pipe radius r in feet = 1.00																	
d = depth of water in the pipe in feet																	
(e) Weir equation and "C" coefficients were obtained from Equation 5-10 and Table 5-3 from "Handbook of Hydraulics" Sixth Edition, by Brater & King, 1976.																	
Emergency Spillway flows were computed based on the following data used in the weir equation																	
Q = CLH^ 1.5 C = discharge coefficient, L = spillway length perp. to flow (ft), H = head (ft)																	
Emergency Spillway C =				2.60	L =	42	Emer. Spill. Elev.=		4946.37	NAVD88							
Grate / Weir C =				3.00	L =	15.8	El.26" x 35" (5 grates) Grate=		4943.67	NAVD88							
(f) Length assumed along top of pond embankment and elevations extended above emergency spillway to allow for rating curve to function if flow spills over top																	

Table 2.3.7 South Broadway Detention Pond - Elevation Storage Discharge South Broadway Drainage Master Plan																			
Contour Elevation NGVD 1929 From As- Built	Conversion Factor (ft)	Contour Elevation NAVD 1988	Depth	Contour Area	Incremental Volume	Incremental Volume	Cumulative Volume	1st Row of Reverse Incline Ports Discharge	2nd Row of Reverse Incline Ports Discharge	Rectangular Reverse Incline Port Discharge	3rd Row of Reverse Incline Ports Discharge	Principal Spillway Grate Discharge	Principal Spillway Outfall Pipe Discharge	Total Principal Spillway / Outfall Pipe Discharge	Emergency Spillway Discharge	Total Discharge Rating Curve	Comment		
				Principal Spillway Orifice Diameter (inches)				9	6	30	6		30						
				Number of Orifices				12	12	1	12		1						
		(ft)		(sq ft)	(cu ft)	(ac-ft)	(ac-ft)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)			
(a)	(b)	(a)						(d)	(d)	(d)	(d)	(e)	(d)		(e,f)				
4935.68	2.67	4938.35	0	0	0	0.0000	0.00	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	Pond Bottom/1st row of 8" x 8" ports and 30" outfall		
4936.33	2.67	4939.00	0.6	480	156	0.0036	0.00	20.6	0.0	0.0	0.0	0	3.9	3.9	0.0	3.9			
4936.35	2.67	4939.02	0.7	557	10	0.0002	0.00	20.9	0.0	0.0	0.0	0	4.1	4.1	0.0	4.1	30" dia. Rectangular Reverse inclined port		
4936.76	2.67	4939.43	1.1	2129	551	0.0126	0.02	26.5	0.0	14.6	0.0	0	10.0	10.0	0.0	10.0	2nd row of 6" dia. Reversed inclined ports		
4937.33	2.67	4940.00	1.6	4315	1837	0.0422	0.06	32.8	8.4	22.6	0.0	0	20.9	20.9	0.0	20.9			
4938.01	2.67	4940.68	2.3	36375	13835	0.3176	0.38	38.9	12.5	29.5	0.0	0	34.4	34.4	0.0	34.4	3rd row of 6" dia. Reversed inclined ports		
4938.33	2.67	4941.00	2.6	51462	14054	0.3226	0.70	41.5	14.0	32.2	6.3	0	37.8	37.8	0.0	37.8			
4939.33	2.67	4942.00	3.6	73084	62273	1.4296	2.13	48.7	17.9	39.5	12.8	0	44.4	44.4	0.0	44.4			
4940.33	2.67	4943.00	4.6	79926	76505	1.7563	3.88	55.0	21.1	45.6	17.0	0	50.1	50.1	0.0	50.1			
4940.51	2.67	4943.18	4.8	80877	14472	0.3322	4.22	56.1	21.6	46.6	17.6	0.0	51.1	51.1	0.0	51.1	Top of grate/Principle Spillway		
4941.33	2.67	4944.00	5.6	85209	68095	1.5632	5.78	60.6	23.8	51.0	20.3	42.7	55.2	55.2	0.0	55.2			
4942.33	2.67	4945.00	6.6	90169	87689	2.0131	7.79	65.8	26.3	55.9	23.2	141.2	59.9	59.9	0.0	59.9			
4943.33	2.67	4946.00	7.6	95055	92612	2.1261	9.92	70.5	28.6	60.4	25.7	272.3	64.3	64.3	0.0	64.3			
4944.33	2.67	4947.00	8.6	99860	97457	2.2373	12.16	75.0	30.7	64.6	28.0	429.3	68.4	68.4	0.0	68.4			
4945.33	2.67	4948.00	9.6	104666	102263	2.3476	14.50	79.2	32.7	68.5	30.2	608.5	72.2	72.2	0.0	72.2			
4946.33	2.67	4949.00	10.6	109445	107055	2.4576	16.96	83.2	34.5	72.2	32.2	807.3	75.8	75.8	0.0	75.8			
4947.33	2.67	4950.00	11.6	114579	112012	2.5714	19.53	87.1	36.3	75.8	34.1	1024.1	79.3	79.3	0.0	79.3			
4948.33	2.67	4951.00	12.6	121198	117888	2.7063	22.24	90.7	37.9	79.2	35.8	1257.4	82.7	82.7	0.0	82.7			
4948.80	2.67	4951.47	13.1	127188	58371	1.3400	23.58	92.4	38.7	80.7	36.6	1372.5	84.2	84.2	0.0	84.2	Emergency Spillway (concrete weir), located sw corner EL 4951.47		
4949.33	2.67	4952.00	13.6	133943	69200	1.5886	25.17	94.2	39.6	82.4	37.5	1506.2	85.9	85.9	95.3	181.2	Top of Pond-Artificial		
(a) Data Source : City of Albuquerque/Bernalillo County as-built. Lidar provided by MRCOG - 2018 DEM, contours were extracted.																			
				grey box means must input data															
(b) conversion factor calculated on average 2.67 feet, details provided from https://geodesy.noaa.gov/VERTCON3/index.shtml																			
(d)				Orifice equation and coefficient were obtained from Equation 4-10 and Table 4-3 from "Handbook of Hydraulics" Sixth Edition, by Brater & King, 1976.															
				$Q = Ca\sqrt{2gh}$ C = 0.590 g=32.2 ft/sec^2, a=area (sq ft) h=head (ft)															
				$a = \pi D^2 / 4$ (full area formula)															
				$a = \frac{1}{2} r^2 \left\{ \left[2 \cos^{-1} \left(\frac{r - d}{r} \right) \right] \frac{\pi}{180} - \sin \left[\left[2 \cos^{-1} \left(\frac{r - d}{r} \right) \right] \frac{\pi}{180} \right] \right\}$ (partial area formula)															
				Principal Spill. Pipe radius r in feet = 1.25															
				d = depth of water in the pipe in feet															
(e) Weir equation and "C" coefficients were obtained from Equation 5-10 and Table 5-3 from "Handbook of Hydraulics" Sixth Edition, by Brater & King, 1976.																			
Emergency Spillway flows were computed based on the following data used in the weir equation																			
Q = CLH^ 1.5 C = discharge coefficient, L = spillway length perp. to flow (ft), H = head (ft)																			
Emergency Spillway C =				2.60	L =	95	Emer. Spill. Elev.	4951.47											
Grate / Weir C =				3.00	L =	19	El. grate	4943.18											
(f) Length assumed along top of pond embankment and elevations extended above emergency spillway to allow for rating curve to function if flow spills over top																			

Table 2.3.8 Sunport Pond System - Elevation Storage Discharge South Broadway Drainage Master Plan																	
Contour Elevation NAVD 1988	Depth	Contour Area	Incremental Volume	Incremental Volume	Cumulative Volume	1st Row of Reverse Incline Ports Discharge	2nd Row of Reverse Incline Ports Discharge	3rd Row of Reverse Incline Ports Discharge	4th Row of Reverse Incline Ports Discharge	Principal Spillway Grate Discharge	Principal Spillway Outfall Pipe Discharge	Total Principal Spillway / Outfall Pipe Discharge	Emergency Spillway Discharge	Total Discharge Rating Curve	Comment		
		Principal Spillway Orifice Diameter (inches)				2	2	2	2		18						
		Number of Orifices				12	12	12	12		1						
(ft)		(sq ft)	(cu ft)	(ac-ft)	(ac-ft)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)			
(a)						(d)	(d)	(d)	(d)	(e)	(d)		(e,f)				
4934.28	0	33900	0	0.0000	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pond Bottom, First row of orifices		
4935.00	0.7		36180	25229	0.5792	0.58	1.1	0.0	0.0	0.0		0.0	3.4	1.1	0.0	1.1	
4935.03	0.8		36259	1087	0.0249	0.60	1.1	0.0	0.0	0.0		0.0	3.6	1.1	0.0	1.1	Second row of orifices
4935.78	1.5		38247	27940	0.6414	1.25	1.5	1.1	0.0	0.0		0.0	10.2	2.6	0.0	2.6	Third row of orifices
4936.00	1.7		38830	8478	0.1946	1.44	1.6	1.2	0.6	0.0	0.0	11.0	3.4	0.0	3.4		
4936.53	2.3		40225	20950	0.4809	1.92	1.9	1.5	1.1	0.0	0.0		12.6	4.5	0.0	4.5	Fourth row of orifices
4937.00	2.7		41462	19196	0.4407	2.36	2.0	1.7	1.4	0.8	0.0		13.8	6.0	0.0	6.0	
4938.00	3.7		44061	42762	0.9817	3.34	2.4	2.1	1.8	1.5	0.0	16.1	7.9	0.0	7.9	Top of grate	
4939.00	4.7		46679	45370	1.0416	4.39	2.7	2.5	2.2	1.9		18.2	18.2	0.0	18.2		
4940.00	5.7		49282	47981	1.1015	5.49	3.0	2.8	2.5	2.3		63.6	20.0	20.0	0.0	20.0	
4941.00	6.7	51870	50576	1.1611	6.65	3.2	3.0	2.8	2.6	116.9		21.7	21.7	0.0	21.7	Emergency Spillway	
4941.50	7.2	53000	26218	0.6019	7.25	3.3	3.2	3.0	2.8	147.3	22.5	22.5	137.9	160.4	Top of Pond		
(a) Data Source : City of Albuquerque/Bernalillo County as-built. Lidar provided by MRCOG - 2018 DEM, contours were extracted.																	
		grey box means must input data															
(d)		Orifice equation and coefficient were obtained from Equation 4-10 and Table 4-3 from "Handbook of Hydraulics" Sixth Edition, by Brater & King, 1976.															
		$Q = Ca\sqrt{2gh}$ C = 0.590g=32.2 ft/sec^2, a=area (sq ft) h=head (ft)															
		$a = \pi D^2 / 4$ (full area formula)															
		$a = \frac{1}{2}r^2 \left\{ \left[2\cos^{-1}\left(\frac{r-d}{r}\right) \right] \frac{\pi}{180} - \sin \left[\left[2\cos^{-1}\left(\frac{r-d}{r}\right) \right] \frac{\pi}{180} \right] \right\}$ (partial area formula)															
		Principal Spill. Pipe radius r in feet = 0.75															
		d = depth of water in the pipe in feet															
(e) Weir equation and "C" coefficients were obtained from Equation 5-10 and Table 5-3 from "Handbook of Hydraulics" Sixth Edition, by Brater & King, 1976.																	
Emergency Spillway flows were computed based on the following data used in the weir equation																	
Q = CLH^ 1.5 C = discharge coefficient, L = spillway length perp. to flow (ft), H = head (ft)																	
Emergency Spillway C =			2.60	L =	150	Emer. Spill. Elev.=		4941.00									
Grate / Weir C =			3.00	L =	8	El.25x40. Grate=		4938.00									
(f) Length assumed along top of pond embankment and elevations extended above emergency spillway to allow for rating curve to function if flow spills over top																	

Table 2.4.1 John Street Pond-Option 1 Alternative 1 - Elevation Storage Discharge South Broadway Drainage Master Plan															
Contour Elevation NAVD 1988	Depth	Contour Area	Incremental Volume	Incremental Volume	Cumulative Volume	1st Row of Reverse Incline Ports Discharge	2nd Row of Reverse Incline Ports Discharge	Rectangular Reverse Incline Port Discharge	3rd Row of Reverse Incline Ports Discharge	Principal Spillway Grate Discharge	Principal Spillway Outfall Pipe Discharge	Total Principal Spillway / Outfall Pipe Discharge	Emergency Spillway Discharge	Total Discharge Rating Curve	Comment
		Principal Spillway Orifice Diameter (inches)				0	0	0	0		30				
		Number of Orifices				12	12	1	12		1				
(ft)		(sq ft)	(cu ft)	(ac-ft)	(ac-ft)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	
(d)						(a)	(a)	(a)	(a)	(b)	(a)	(e)	(b)		
4941.00	0	71077	0	0.0000	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4942.00	1.0	73049	72063	1.6543	1.65	0.0	0.0	0.0	0.0	0.0	8.7	0.0	0.0	0.0	
4943.00	2.0	75044	74047	1.6999	3.35	0.0	0.0	0.0	0.0	0.0	28.2	0.0	0.0	0.0	
4944.00	3.0	77061	76053	1.7459	5.10	0.0	0.0	0.0	0.0	0.0	40.3	0.0	0.0	0.0	
4945.00	4.0	79100	78081	1.7925	6.89	0.0	0.0	0.0	0.0	0.0	46.5	0.0	0.0	0.0	
4946.00	5.0	81161	80131	1.8395	8.73	0.0	0.0	0.0	0.0	0.0	52.0	0.0	0.0	0.0	
4947.00	6.0	83244	82203	1.8871	10.62	0.0	0.0	0.0	0.0	0.0	56.9	0.0	0.0	0.0	
4948.00	7.0	85350	84297	1.9352	12.55	0.0	0.0	0.0	0.0	0.0	61.5	0.0	0.0	0.0	
4949.00	8.0	87478	86414	1.9838	14.54	0.0	0.0	0.0	0.0	0.0	65.7	0.0	0.0	0.0	
4950.00	9.0	89629	88554	2.0329	16.57	0.0	0.0	0.0	0.0	0.0	69.7	0.0	0.0	0.0	
4951.00	10.0	91799	90714	2.0825	18.65	0.0	0.0	0.0	0.0	0.0	73.5	0.0	0.0	0.0	

Table 2.4.2 John Street Pond-Option 1 Alternative 2 - Elevation Storage Discharge South Broadway Drainage Master Plan															
Contour Elevation NAVD 1988	Depth	Contour Area	Incremental Volume	Incremental Volume	Cumulative Volume	1st Row of Reverse Incline Ports Discharge	2nd Row of Reverse Incline Ports Discharge	Rectangular Reverse Incline Port Discharge	3rd Row of Reverse Incline Ports Discharge	Principal Spillway Grate Discharge	Principal Spillway Outfall Pipe Discharge	Total Principal Spillway / Outfall Pipe Discharge	Emergency Spillway Discharge	Total Discharge Rating Curve	Comment
		Principal Spillway Orifice Diameter (inches)				0	0	0	0		30				
		Number of Orifices				12	12	1	12		1				
(ft)		(sq ft)	(cu ft)	(ac-ft)	(ac-ft)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	
(d)						(a)	(a)	(a)	(a)	(b)	(a)	(e)	(b)		
4941.00	0	71146	0	0.0000	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4942.00	1.0	73116	72131	1.6559	1.66	0.0	0.0	0.0	0.0	0.0	8.7	0.0	0.0	0.0	
4943.00	2.0	75108	74112	1.7014	3.36	0.0	0.0	0.0	0.0	0.0	28.2	0.0	0.0	0.0	
4944.00	3.0	77122	76115	1.7474	5.10	0.0	0.0	0.0	0.0	0.0	40.3	0.0	0.0	0.0	
4945.00	4.0	79159	78141	1.7939	6.90	0.0	0.0	0.0	0.0	0.0	46.5	0.0	0.0	0.0	
4946.00	5.0	81217	80188	1.8409	8.74	0.0	0.0	0.0	0.0	0.0	52.0	0.0	0.0	0.0	
4947.00	6.0	83298	82258	1.8884	10.63	0.0	0.0	0.0	0.0	0.0	56.9	0.0	0.0	0.0	
4948.00	7.0	85401	84350	1.9364	12.56	0.0	0.0	0.0	0.0	0.0	61.5	0.0	0.0	0.0	
4949.00	8.0	87527	86464	1.9849	14.55	0.0	0.0	0.0	0.0	0.0	65.7	0.0	0.0	0.0	
4950.00	9.0	89675	88601	2.0340	16.58	0.0	0.0	0.0	0.0	0.0	69.7	0.0	0.0	0.0	
4951.00	10.0	94845	92260	2.1180	18.70	0.0	0.0	0.0	0.0	0.0	73.5	0.0	0.0	0.0	
4952.00	11.0	94039	94442	2.1681	20.87	0.0	0.0	0.0	0.0	0.0	77.1	0.0	0.0	0.0	
4953.00	12.0	96251	95145	2.1842	23.05	0.0	0.0	0.0	0.0	0.0	80.5	0.0	0.0	0.0	
4954.00	13.0	98489	97370	2.2353	25.29	0.0	0.0	0.0	0.0	0.0	83.8	0.0	0.0	0.0	
4955.00	14.0	100748	99619	2.2869	27.58	0.0	0.0	0.0	0.0	0.0	87.0	0.0	0.0	0.0	

Table 2.4.3 John Street Pond-Option 2 Alternative 1 - Elevation Storage Discharge South Broadway Drainage Master Plan															
Contour Elevation NAVD 1988	Depth	Contour Area	Incremental Volume	Incremental Volume	Cumulative Volume	1st Row of Reverse Incline Ports Discharge	2nd Row of Reverse Incline Ports Discharge	Rectangular Reverse Incline Port Discharge	3rd Row of Reverse Incline Ports Discharge	Principal Spillway Grate Discharge	Principal Spillway Outfall Pipe Discharge	Total Principal Spillway / Outfall Pipe Discharge	Emergency Spillway Discharge	Total Discharge Rating Curve	Comment
		Principal Spillway Orifice Diameter (inches)				0	0	0	0		60				
		Number of Orifices				12	12	1	12		1				
(ft)		(sq ft)	(cu ft)	(ac-ft)	(ac-ft)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	
(d)						(a)	(a)	(a)	(a)	(b)	(a)	(e)	(b)		
4931.00	0	1500	0	0.0000	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4932.00	1.0	36263	18882	0.4335	0.43	0.0	0.0	0.0	0.0	0.0	13.2	13.2	0.0	13.2	
4933.00	2.0	38489	37376	0.8580	1.29	0.0	0.0	0.0	0.0	0.0	49.1	49.1	0.0	49.1	
4934.00	3.0	40760	39624	0.9097	2.20	0.0	0.0	0.0	0.0	0.0	100.9	100.9	0.0	100.9	
4935.00	4.0	43074	41917	0.9623	3.16	0.0	0.0	0.0	0.0	0.0	159.5	159.5	0.0	159.5	
4936.00	5.0	45439	44256	1.0160	4.18	0.0	0.0	0.0	0.0	0.0	207.9	207.9	0.0	207.9	
4937.00	6.0	47838	46638	1.0707	5.25	0.0	0.0	0.0	0.0	0.0	227.7	227.7	0.0	227.7	
4938.00	7.0	50287	49062	1.1263	6.38	0.0	0.0	0.0	0.0	0.0	246.0	246.0	0.0	246.0	
4939.00	8.0	52778	51532	1.1830	7.56	0.0	0.0	0.0	0.0	0.0	262.9	262.9	0.0	262.9	
4940.00	9.0	55312	54045	1.2407	8.80	0.0	0.0	0.0	0.0	0.0	278.9	278.9	0.0	278.9	
4941.00	10.0	57887	56600	1.2994	10.10	0.0	0.0	0.0	0.0	0.0	294.0	294.0	0.0	294.0	
4942.00	11.0	60504	59195	1.3589	11.46	0.0	0.0	0.0	0.0	0.0	308.3	308.3	0.0	308.3	
4943.00	12.0	63161	61832	1.4195	12.88	0.0	0.0	0.0	0.0	0.0	322.0	322.0	0.0	322.0	
4944.00	13.0	65860	64511	1.4810	14.36	0.0	0.0	0.0	0.0	0.0	335.2	335.2	0.0	335.2	
4945.00	14.0	68600	67230	1.5434	15.90	0.0	0.0	0.0	0.0	0.0	347.8	347.8	0.0	347.8	
4946.00	15.0	71382	69991	1.6068	17.51	0.0	0.0	0.0	0.0	0.0	360.1	360.1	0.0	360.1	
4947.00	16.0	74204	72793	1.6711	19.18	0.0	0.0	0.0	0.0	0.0	371.9	371.9	0.0	371.9	
4948.00	17.0	77067	75635	1.7364	20.92	0.0	0.0	0.0	0.0	0.0	383.3	383.3	0.0	383.3	
4949.00	18.0	79971	78519	1.8025	22.72	0.0	0.0	0.0	0.0	0.0	394.4	394.4	0.0	394.4	
4950.00	19.0	82916	81444	1.8697	24.59	0.0	0.0	0.0	0.0	0.0	405.2	405.2	0.0	405.2	
4951.00	20.0	85907	84411	1.9378	26.53	0.0	0.0	0.0	0.0	0.0	415.8	415.8	0.0	415.8	

Table 2.4.4 John Street Pond-Option 2 Alternative 2 - Elevation Storage Discharge South Broadway Drainage Master Plan															
Contour Elevation NAVD 1988	Depth	Contour Area	Incremental Volume	Incremental Volume	Cumulative Volume	1st Row of Reverse Incline Ports Discharge	2nd Row of Reverse Incline Ports Discharge	Rectangular Reverse Incline Port Discharge	3rd Row of Reverse Incline Ports Discharge	Principal Spillway Grate Discharge	Principal Spillway Outfall Pipe Discharge	Total Principal Spillway / Outfall Pipe Discharge	Emergency Spillway Discharge	Total Discharge Rating Curve	Comment
		Principal Spillway Orifice Diameter (inches)				0	0	0	0		60				
		Number of Orifices				12	12	1	12		1				
(ft)		(sq ft)	(cu ft)	(ac-ft)	(ac-ft)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	
(d)						(a)	(a)	(a)	(a)	(b)	(a)	(e)	(b)		
4931.00	0	1500	0	0.0000	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4932.00	1.0	1500	1500	0.0344	0.03	0.0	0.0	0.0	0.0	0.0	13.2	0.0	0.0	0.0	
4933.00	2.0	30500	16000	0.3673	0.40	0.0	0.0	0.0	0.0	0.0	49.1	0.0	0.0	0.0	
4934.00	3.0	32725	31613	0.7257	1.13	0.0	0.0	0.0	0.0	0.0	100.9	0.0	0.0	0.0	
4935.00	4.0	34942	33834	0.7767	1.90	0.0	0.0	0.0	0.0	0.0	159.5	0.0	0.0	0.0	
4936.00	5.0	37214	36078	0.8282	2.73	0.0	0.0	0.0	0.0	0.0	207.9	0.0	0.0	0.0	
4937.00	6.0	39540	38377	0.8810	3.61	0.0	0.0	0.0	0.0	0.0	227.7	0.0	0.0	0.0	
4938.00	7.0	41921	40730	0.9350	4.55	0.0	0.0	0.0	0.0	0.0	246.0	0.0	0.0	0.0	
4939.00	8.0	44359	43140	0.9903	5.54	0.0	0.0	0.0	0.0	0.0	262.9	0.0	0.0	0.0	
4940.00	9.0	46852	45605	1.0470	6.59	0.0	0.0	0.0	0.0	0.0	278.9	0.0	0.0	0.0	
4941.00	10.0	49406	48129	1.1049	7.69	0.0	0.0	0.0	0.0	0.0	294.0	0.0	0.0	0.0	
4942.00	11.0	52031	50719	1.1643	8.86	0.0	0.0	0.0	0.0	0.0	308.3	0.0	0.0	0.0	
4943.00	12.0	54708	53370	1.2252	10.08	0.0	0.0	0.0	0.0	0.0	322.0	0.0	0.0	0.0	
4944.00	13.0	57427	56067	1.2871	11.37	0.0	0.0	0.0	0.0	0.0	335.2	0.0	0.0	0.0	
4945.00	14.0	60187	58807	1.3500	12.72	0.0	0.0	0.0	0.0	0.0	347.8	0.0	0.0	0.0	
4946.00	15.0	62990	61589	1.4139	14.13	0.0	0.0	0.0	0.0	0.0	360.1	0.0	0.0	0.0	
4947.00	16.0	65836	64413	1.4787	15.61	0.0	0.0	0.0	0.0	0.0	371.9	0.0	0.0	0.0	
4948.00	17.0	68721	67278	1.5445	17.15	0.0	0.0	0.0	0.0	0.0	383.3	0.0	0.0	0.0	
4949.00	18.0	71646	70183	1.6112	18.77	0.0	0.0	0.0	0.0	0.0	394.4	0.0	0.0	0.0	
4950.00	19.0	74609	73128	1.6788	20.44	0.0	0.0	0.0	0.0	0.0	405.2	0.0	0.0	0.0	
4951.00	20.0	77612	76111	1.7473	22.19	0.0	0.0	0.0	0.0	0.0	415.8	0.0	1.0	1.0	
4952.00	21.0	80654	79133	1.8166	24.01	0.0	0.0	0.0	0.0	0.0	426.0	0.0	2.0	2.0	
4953.00	22.0	83735	82195	1.8869	25.90	0.0	0.0	0.0	0.0	0.0	436.0	0.0	3.0	3.0	
4954.00	23.0	86856	85296	1.9581	27.85	0.0	0.0	0.0	0.0	0.0	445.8	0.0	4.0	4.0	
4955.00	24.0	90019	88437	2.0302	29.88	0.0	0.0	0.0	0.0	0.0	455.4	0.0	5.0	5.0	
4956.00	25.0	93233	91626	2.1034	31.99	0.0	0.0	0.0	0.0	0.0	464.8	0.0	6.0	6.0	

Table 2.4.5 John Street Pond-Option 3 Alternative 1 - Elevation Storage Discharge South Broadway Drainage Master Plan															
Contour Elevation NAVD 1988	Depth	Contour Area	Incremental Volume	Incremental Volume	Cumulative Volume	1st Row of Reverse Incline Ports Discharge	2nd Row of Reverse Incline Ports Discharge	Rectangular Reverse Incline Port Discharge	3rd Row of Reverse Incline Ports Discharge	Principal Spillway Grate Discharge	Principal Spillway Outfall Pipe Discharge	Total Principal Spillway / Outfall Pipe Discharge	Emergency Spillway Discharge	Total Discharge Rating Curve	Comment
		Principal Spillway Orifice Diameter (inches)				0	0	0	0		60				
		Number of Orifices				12	12	1	12		1				
(ft)		(sq ft)	(cu ft)	(ac-ft)	(ac-ft)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	
(d)						(a)	(a)	(a)	(a)	(b)	(a)	(e)	(b)		
4932.25	0	1500	0	0.0000	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4933.25	1.0	1500	1500	0.0344	0.03	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4934.00	1.8	5360	2573	0.0591	0.09	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4935.00	2.8	7338	6349	0.1458	0.24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4936.00	3.8	9700	8519	0.1956	0.43	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4937.00	4.8	12459	11080	0.2544	0.69	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4938.00	5.8	15589	14024	0.3219	1.01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4939.00	6.8	19111	17350	0.3983	1.41	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4940.00	7.8	23331	21221	0.4872	1.90	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4941.00	8.8	64905	44118	1.0128	2.91	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4942.00	9.8	71363	68134	1.5641	4.47	0.0	0.0	0.0	0.0	0.0	93.0	0.0	0.0	0.0	
4943.00	10.8	74181	72772	1.6706	6.14	0.0	0.0	0.0	0.0	0.0	131.5	0.0	0.0	0.0	
4944.00	11.8	77040	75611	1.7358	7.88	0.0	0.0	0.0	0.0	0.0	161.0	0.0	0.0	0.0	
4945.00	12.8	79940	78490	1.8019	9.68	0.0	0.0	0.0	0.0	0.0	185.9	0.0	0.0	0.0	
4946.00	13.8	82881	81411	1.8689	11.55	0.0	0.0	0.0	0.0	0.0	207.9	0.0	0.0	0.0	
4947.00	14.8	85863	84372	1.9369	13.49	0.0	0.0	0.0	0.0	0.0	227.7	0.0	0.0	0.0	
4948.00	15.8	88886	87375	2.0058	15.49	0.0	0.0	0.0	0.0	0.0	246.0	0.0	0.0	0.0	
4949.00	16.8	91950	90418	2.0757	17.57	0.0	0.0	0.0	0.0	0.0	262.9	0.0	0.0	0.0	
4950.00	17.8	95055	93503	2.1465	19.72	0.0	0.0	0.0	0.0	0.0	278.9	0.0	0.0	0.0	
4951.00	18.8	98195	96625	2.2182	21.93	0.0	0.0	0.0	0.0	0.0	294.0	0.0	0.0	0.0	

Table 2.4.6 John Street Pond-Option 3 Alternative 2 - Elevation Storage Discharge South Broadway Drainage Master Plan															
Contour Elevation NAVD 1988	Depth	Contour Area	Incremental Volume	Incremental Volume	Cumulative Volume	1st Row of Reverse Incline Ports Discharge	2nd Row of Reverse Incline Ports Discharge	Rectangular Reverse Incline Port Discharge	3rd Row of Reverse Incline Ports Discharge	Principal Spillway Grate Discharge	Principal Spillway Outfall Pipe Discharge	Total Principal Spillway / Outfall Pipe Discharge	Emergency Spillway Discharge	Total Discharge Rating Curve	Comment
		Principal Spillway Orifice Diameter (inches)				0	0	0	0		60				
		Number of Orifices				12	12	1	12		1				
(ft)		(sq ft)	(cu ft)	(ac-ft)	(ac-ft)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	
(d)						(a)	(a)	(a)	(a)	(b)	(a)	(e)	(b)		
4931.00	0	1500	0	0.0000	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4932.00	1.0	3416	2458	0.0564	0.06	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4933.00	2.0	4004	3710	0.0852	0.14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4934.00	3.0	4661	4333	0.0995	0.24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4935.00	4.0	5385	5023	0.1153	0.36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4936.00	5.0	6178	5782	0.1327	0.49	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4937.00	6.0	7041	6610	0.1517	0.64	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4938.00	7.0	7974	7508	0.1723	0.81	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4939.00	8.0	8972	8473	0.1945	1.01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4940.00	9.0	10040	9506	0.2182	1.23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4941.00	10.0	11438	10739	0.2465	1.47	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4942.00	11.0	45188	28313	0.6500	2.12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4943.00	12.0	48133	46661	1.0712	3.19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4944.00	13.0	51148	49641	1.1396	4.33	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4945.00	14.0	54233	52691	1.2096	5.54	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4946.00	15.0	57387	55810	1.2812	6.82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4947.00	16.0	60611	58999	1.3544	8.18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4948.00	17.0	63903	62257	1.4292	9.61	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4949.00	18.0	67264	65584	1.5056	11.11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4950.00	19.0	70693	68979	1.5835	12.70	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4951.00	20.0	74191	72442	1.6630	14.36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4952.00	21.0	77758	75975	1.7441	16.10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4953.00	22.0	81394	79576	1.8268	17.93	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4954.00	23.0	85099	83247	1.9111	19.84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4955.00	24.0	88872	86986	1.9969	21.84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4956.00	25.0	92816	90844	2.0855	23.92	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Table 2.4.7 John Street Pond-Option 4 Main Pond - Elevation Storage Discharge South Broadway Drainage Master Plan															
Contour Elevation NAVD 1988	Depth	Contour Area	Incremental Volume	Incremental Volume	Cumulative Volume	1st Row of Reverse Incline Ports Discharge	2nd Row of Reverse Incline Ports Discharge	Rectangular Reverse Incline Port Discharge	3rd Row of Reverse Incline Ports Discharge	Principal Spillway Grate Discharge	Principal Spillway Outfall Pipe Discharge	Total Principal Spillway / Outfall Pipe Discharge	Emergency Spillway Discharge	Total Discharge Rating Curve	Comment
		Principal Spillway Orifice Diameter (inches)				0	6	0	0		30				
		Number of Orifices				12	12	1	12		1				
(ft)		(sq ft)	(cu ft)	(ac-ft)	(ac-ft)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	
(d)						(a)	(a)	(a)	(a)	(b)	(a)	(e)	(b)		
4941.00	0.0	18685	0	0.0000	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4942.00	1.0	21270	19978	0.4586	0.46	0.0	0.0	0.0	0.0	0.0	23.2	0.0	0.0	0.0	
4943.00	2.0	23926	22598	0.5188	0.98	0.0	0.0	0.0	0.0	0.0	32.9	0.0	0.0	0.0	
4944.00	3.0	26656	25291	0.5806	1.56	0.0	0.0	0.0	0.0	0.0	40.3	0.0	0.0	0.0	
4945.00	4.0	29460	28058	0.6441	2.20	0.0	11.2	0.0	0.0	0.0	46.5	11.2	0.0	11.2	
4946.00	5.0	32334	30897	0.7093	2.91	0.0	15.8	0.0	0.0	0.0	52.0	15.8	0.0	15.8	
4947.00	6.0	35283	33809	0.7761	3.69	0.0	19.3	0.0	0.0	0.0	56.9	19.3	0.0	19.3	
4948.00	7.0	38302	36793	0.8446	4.53	0.0	22.3	0.0	0.0	0.0	61.5	22.3	0.0	22.3	
4949.00	8.0	41380	39841	0.9146	5.45	0.0	24.9	0.0	0.0	0.0	65.7	24.9	0.0	24.9	
4950.00	9.0	44549	42965	0.9863	6.43	0.0	27.3	0.0	0.0	0.0	69.7	27.3	0.0	27.3	
4951.00	10.0	47782	46166	1.0598	7.49	0.0	29.5	0.0	0.0	0.0	73.5	29.5	0.0	29.5	
4952.00	11.0	51087	49435	1.1349	8.63	0.0	31.6	0.0	0.0	0.0	77.1	31.6	0.0	31.6	
4953.00	12.0	54466	52777	1.2116	9.84	0.0	33.5	0.0	0.0	0.0	80.5	33.5	0.0	33.5	
4954.00	13.0	57921	56194	1.2900	11.13	0.0	35.3	0.0	0.0	0.0	83.8	35.3	0.0	35.3	
4955.00	14.0	61434	59678	1.3700	12.50	0.0	37.0	0.0	0.0	0.0	87.0	37.0	0.0	37.0	

Table 2.4.8 John Street Pond-Option 4 Wet Well Pond - Elevation Storage Discharge South Broadway Drainage Master Plan															
Contour Elevation NAVD 1988	Depth	Contour Area	Incremental Volume	Incremental Volume	Cumulative Volume	1st Row of Reverse Incline Ports Discharge	2nd Row of Reverse Incline Ports Discharge	Rectangular Reverse Incline Port Discharge	3rd Row of Reverse Incline Ports Discharge	Principal Spillway Grate Discharge	Principal Spillway Outfall Pipe Discharge	Total Principal Spillway / Outfall Pipe Discharge	Emergency Spillway Discharge	Total Discharge Rating Curve	Comment
		Principal Spillway Orifice Diameter (inches)				0	0	0	0		60				
		Number of Orifices				12	12	1	12		1				
(ft)		(sq ft)	(cu ft)	(ac-ft)	(ac-ft)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	
(d)						(a)	(a)	(a)	(a)	(b)	(a)	(e)	(b)		
4931.00	0	1500	0	0.0000	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4932.00	1.0	5364	3432	0.0788	0.08	0.0	0.0	0.0	0.0	0.0	93.0	0.0	0.0	0.0	
4933.00	2.0	5837	5601	0.1286	0.21	0.0	0.0	0.0	0.0	0.0	131.5	0.0	0.0	0.0	
4934.00	3.0	6502	6170	0.1416	0.35	0.0	0.0	0.0	0.0	0.0	161.0	0.0	0.0	0.0	
4935.00	4.0	7203	6853	0.1573	0.51	0.0	0.0	0.0	0.0	0.0	185.9	0.0	0.0	0.0	
4936.00	5.0	7937	7570	0.1738	0.68	0.0	0.0	0.0	0.0	0.0	207.9	0.0	0.0	0.0	
4937.00	6.0	8701	8319	0.1910	0.87	0.0	0.0	0.0	0.0	0.0	227.7	0.0	0.0	0.0	
4938.00	7.0	9498	9100	0.2089	1.08	0.0	0.0	0.0	0.0	0.0	246.0	0.0	0.0	0.0	
4939.00	8.0	10328	9913	0.2276	1.31	0.0	0.0	0.0	0.0	0.0	262.9	0.0	0.0	0.0	
4940.00	9.0	11193	10761	0.2470	1.55	0.0	0.0	0.0	0.0	0.0	278.9	0.0	0.0	0.0	
4941.00	10.0	12091	11642	0.2673	1.82	0.0	0.0	0.0	0.0	0.0	294.0	0.0	0.0	0.0	
4942.00	11.0	13022	12557	0.2883	2.11	0.0	0.0	0.0	0.0	0.0	308.3	0.0	0.0	0.0	
4943.00	12.0	13988	13505	0.3100	2.42	0.0	0.0	0.0	0.0	0.0	322.0	0.0	0.0	0.0	
4944.00	13.0	14986	14487	0.3326	2.75	0.0	0.0	0.0	0.0	0.0	335.2	0.0	0.0	0.0	
4945.00	14.0	16018	15502	0.3559	3.11	0.0	0.0	0.0	0.0	0.0	347.8	0.0	0.0	0.0	
4946.00	15.0	17084	16551	0.3800	3.49	0.0	0.0	0.0	0.0	0.0	360.1	0.0	0.0	0.0	Top of Wet Well

Table 2.4.9 Kathryn Detention Pond Updated - Elevation Storage Discharge South Broadway Drainage Master Plan															
Contour Elevation NAVD 1988	Depth	Contour Area	Incremental Volume	Incremental Volume	Cumulative Volume	1st Row of Reverse Incline Ports Discharge	2nd Row of Reverse Incline Ports Discharge	3rd Row of Reverse Incline Ports Discharge	4th Row of Reverse Incline Ports Discharge	Principal Spillway Grate Discharge	Principal Spillway Outfall Pipe Discharge	Total Principal Spillway / Outfall Pipe Discharge	Emergency Spillway Discharge	Total Discharge Rating Curve	Comment
		Principal Spillway Orifice Diameter (inches)				3	3	3	3		18				
		Number of Orifices				1	3	4	4		1				
(ft)		(sq ft)	(cu ft)	(ac-ft)	(ac-ft)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	
(a)						(d)	(d)	(d)	(d)	(e)	(d)		(e, f)		
4940.79	0	0	0	0.0000	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pond Bottom/3" dia. opening
4941.00	0.2	60117	6312	0.1449	0.14	0.1	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.1	
4941.27	0.5	60555	16291	0.3740	0.52	0.2	0.0	0.0	0.0	0.0	1.6	0.2	0.0	0.2	2nd row of ports,
4942.00	1.2	61739	44637	1.0247	1.54	0.3	0.6	0.0	0.0	0.0	8.0	0.9	0.0	0.9	
4942.44	1.6	62460	27324	0.6273	2.17	0.3	0.8	0.0	0.0	0.0	10.7	1.1	0.0	1.1	3rd row of ports
4943.00	2.2	63377	35234	0.8089	2.98	0.3	0.9	0.7	0.0	0.0	12.4	2.0	0.0	2.0	
4943.02	2.2	63410	1268	0.0291	3.01	0.3	0.9	0.7	0.0	0.0	12.5	2.0	0.0	2.0	4th row of ports
4944.00	3.2	65034	62938	1.4448	4.45	0.4	1.2	1.2	0.9	0.0	15.0	3.6	0.0	3.6	Top of RCP Riser
4945.00	4.2	66717	65876	1.5123	5.97	0.5	1.3	1.5	1.3	14.1	17.2	17.2	0.0	17.2	
4946.00	5.2	68425	67571	1.5512	7.52	0.5	1.5	1.8	1.6	40.0	19.1	19.1	0.0	19.1	Emergency Spillway/Top of Pond
(a) Data Source : City of Albuquerque/Bernalillo County as-builts. Lidar provided by MRCOG - 2018 DEM, contours were extracted.															
grey box means must input data															
(d)															
Orifice equation and coefficient were obtained from Equation 4-10 and Table 4-3 from "Handbook of Hydraulics" Sixth Edition, by Brater & King, 1976.															
$Q = Ca\sqrt{2gh}$ C = 0.590g=32.2 ft/sec^2, a=area (sq ft) h=head (ft)															
$a = \pi D^2 / 4$ (full area formula)															
$a = \frac{1}{2}r^2 \left\{ \left[2\cos^{-1}\left(\frac{r-d}{r}\right) \right] \frac{\pi}{180} - \sin \left[\left[2\cos^{-1}\left(\frac{r-d}{r}\right) \right] \frac{\pi}{180} \right] \right\}$ (partial area formula)															
Principal Spill. Pipe radius r in feet = 0.75															
d = depth of water in the pipe in feet															
(e) Weir equation and "C" coefficients were obtained from Equation 5-10 and Table 5-3 from "Handbook of Hydraulics" Sixth Edition, by Brater & King, 1976.															
Emergency Spillway flows were computed based on the following data used in the weir equation															
Q = CLH^ 1.5 C = discharge coefficient, L = spillway length perp. to flow (ft), H = head (ft)															
Emergency Spillway C =		2.60	L =	207	Emer. Spill. Elev.=		4946.00	NAVD 88							
Grate / Weir C =		3.00	L =	4.7	El.18" Dia Grate=		4944.00	NAVD 88							
(f) Length assumed along top of pond embankment and elevations extended above emergency spillway to allow for rating curve to function if flow spills over top															

Table 2.4.10 South Broadway Detention Pond Updated - Elevation Storage Discharge South Broadway Drainage Master Plan															
Contour Elevation NAVD 1988	Depth	Contour Area	Incremental Volume	Incremental Volume	Cumulative Volume	1st Row of Reverse Incline Ports Discharge	2nd Row of Reverse Incline Ports Discharge	Rectangular Reverse Incline Port Discharge	3rd Row of Reverse Incline Ports Discharge	Principal Spillway Grate Discharge	Principal Spillway Outfall Pipe Discharge	Total Principal Spillway / Outfall Pipe Discharge	Emergency Spillway Discharge	Total Discharge Rating Curve	Comment
		Principal Spillway Orifice Diameter (inches)				9	6	30	6		30				
		Number of Orifices				12	12	1	12		1				
(ft)		(sq ft)	(cu ft)	(ac-ft)	(ac-ft)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	
(a)						(d)	(d)	(d)	(d)	(e)	(d)		(e, f)		
4938.35	0	0	0	0.0000	0.00	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	Pond Bottom/1st row of 8" x 8" ports and 30" outfall
4939.00	0.6	95815	31140	0.7149	0.71	20.6	0.0	0.0	0.0	0	3.9	3.9	0.0	3.9	
4939.02	0.7	95855	1917	0.0440	0.76	20.9	0.0	0.0	0.0	0	4.1	4.1	0.0	4.1	30" dia. Rectangular Reverse inclined port
4939.43	1.1	96671	39468	0.9061	1.66	26.5	0.0	14.6	0.0	0	10.0	10.0	0.0	10.0	2nd row of 6" dia. Reversed inclined ports
4940.00	1.6	97806	55426	1.2724	2.94	32.8	8.4	22.6	0.0	0	20.9	20.9	0.0	20.9	
4940.68	2.3	99169	66972	1.5375	4.47	38.9	12.5	29.5	0.0	0	34.4	34.4	0.0	34.4	3rd row of 6" dia. Reversed inclined ports
4941.00	2.6	99811	31837	0.7309	5.21	41.5	14.0	32.2	6.3	0	37.8	37.8	0.0	37.8	
4942.00	3.6	101832	100822	2.3145	7.52	48.7	17.9	39.5	12.8	0	44.4	44.4	0.0	44.4	
4943.00	4.6	103867	102850	2.3611	9.88	55.0	21.1	45.6	17.0	0	50.1	50.1	0.0	50.1	
4943.18	4.8	104236	18729	0.4300	10.31	56.1	21.6	46.6	17.6	0.0	51.1	51.1	0.0	51.1	Top of grate/Principle Spillway
4944.00	5.6	105918	86163	1.9780	12.29	60.6	23.8	51.0	20.3	42.7	55.2	55.2	0.0	55.2	
4945.00	6.6	107984	106951	2.4553	14.74	65.8	26.3	55.9	23.2	141.2	59.9	59.9	0.0	59.9	
4946.00	7.6	110064	109024	2.5028	17.25	70.5	28.6	60.4	25.7	272.3	64.3	64.3	0.0	64.3	
4947.00	8.6	112158	111111	2.5508	19.80	75.0	30.7	64.6	28.0	429.3	68.4	68.4	0.0	68.4	
4948.00	9.6	114267	113213	2.5990	22.40	79.2	32.7	68.5	30.2	608.5	72.2	72.2	0.0	72.2	
4949.00	10.6	116392	115330	2.6476	25.04	83.2	34.5	72.2	32.2	807.3	75.8	75.8	0.0	75.8	
4950.00	11.6	118531	117462	2.6965	27.74	87.1	36.3	75.8	34.1	1024.1	79.3	79.3	0.0	79.3	
4951.00	12.6	120684	119608	2.7458	30.49	90.7	37.9	79.2	35.8	1257.4	82.7	82.7	0.0	82.7	
4951.47	13.1	126916	58186	1.3358	31.82	92.4	38.7	80.7	36.6	1372.5	84.2	84.2	0.0	84.2	Emergency Spillway (concrete weir), located sw corner EL 4951.47
4952.00	13.6	133943	69128	1.5869	33.41	94.2	39.6	82.4	37.5	1506.2	85.9	85.9	95.3	181.2	Top of Pond-Artificial