

DETENTION CALCULATIONS - NORTH TRIBUTARY POND ULTIMATE DESIGN

ALLOWABLE RELEASE RATE CALCULATIONS

2-YEAR STORM
South Tributary
Undeveloped Runoff Calculations

Area #	Area (ac)	Area (ac)	Existing Runoff (cfs)	Tc - Existing (min)	Rainfall Intensity (in/hr)	Q - Undeveloped (cfs)	
3	2951648	67.76	0.35	20	3.9	92.5	
4 (offsite)	892204	20.48	0.35	20	3.9	28.0	
Total							120.5

Post-Development Runoff Calculations

Area #	Area (ac)	Area (ac)	Proposed Runoff (cfs)	Tc - Proposed (min)	Rainfall Intensity (in/hr)	Post-Development (cfs)	
3	2951648	67.76	0.35	10	5.3	259.3	
4 (offsite)	892204	20.48	0.35	10	5.3	87.3	
Total							346.6

Difference between Pre and Post Development Conditions: 126.1

DETENTION POND RELEASE RATE CALCULATIONS

Elevation Calculations Based on Actual Release Rate

Event	Maximum Actual Release Rate	Storage Requirement	Occurs at Elevation
2-year	37.3	247604	499.74
10-year	75.5	329416	500.54
25-year	93.6	364056	500.87
50-year	112.0	397507	501.17
100-year	128.1	424869	501.42

Release Rate Calculations Based on Above Table

Stage	Lower	Higher	Discharge	Allowable Discharge	Above (Below)
499.74	0.00	2.00	0.0	0.0	0.0
499.80	1.00	2.00	5.3	0.0	5.3
499.90	2.00	2.00	14.9	0.0	14.9
499.94	2.74	2.00	23.9	0.74	13.4
500.00	3.00	2.00	27.3	1.00	11.4
500.04	3.44	2.00	35.1	1.44	8.6
500.07	3.67	2.00	40.0	1.67	6.9
500.17	4.17	2.00	44.8	2.17	6.0
501.00	4.00	2.00	42.1	2.00	6.0
501.42	4.42	2.00	48.9	2.42	6.0
502.00	5.00	2.00	58.8	3.00	6.0

ALLOWABLE RELEASE RATE CALCULATIONS

South Tributary Upstream Pond
2-Year Storm
Undeveloped Runoff Calculations

Area #	Area (ac)	Area (ac)	Existing Runoff (cfs)	Tc - Existing (min)	Rainfall Intensity (in/hr)	Q - Undeveloped (cfs)	
3	2951648	67.76	0.35	20	3.9	92.5	
4 (offsite)	892204	20.48	0.35	20	3.9	28.0	
Total							120.5

Post-Development Runoff Calculations

Area #	Area (ac)	Area (ac)	Proposed Runoff (cfs)	Tc - Proposed (min)	Rainfall Intensity (in/hr)	Post-Development (cfs)	
3	2951648	67.76	0.35	10	5.3	259.3	
4 (offsite)	892204	20.48	0.35	10	5.3	87.3	
Total							346.6

Difference between Pre and Post Development Conditions: 226.1

10-Year Storm
Undeveloped Runoff Calculations

Area #	Area (ac)	Area (ac)	Existing Runoff (cfs)	Tc - Existing (min)	Rainfall Intensity (in/hr)	Q - Undeveloped (cfs)	
3	2951648	67.76	0.35	20	5.9	139.9	
4 (offsite)	892204	20.48	0.35	20	5.9	42.3	
Total							182.2

Post-Development Runoff Calculations

Area #	Area (ac)	Area (ac)	Proposed Runoff (cfs)	Tc - Proposed (min)	Rainfall Intensity (in/hr)	Post-Development (cfs)	
3	2951648	67.76	0.35	10	7.1	423.3	
4 (offsite)	892204	20.48	0.35	10	7.1	169.4	
Total							592.7

Difference between Pre and Post Development Conditions: 410.5

25-Year Storm
Undeveloped Runoff Calculations

Area #	Area (ac)	Area (ac)	Existing Runoff (cfs)	Tc - Existing (min)	Rainfall Intensity (in/hr)	Q - Undeveloped (cfs)	
3	2951648	67.76	0.35	20	6.6	156.5	
4 (offsite)	892204	20.48	0.35	20	6.6	47.3	
Total							203.8

Post-Development Runoff Calculations

Area #	Area (ac)	Area (ac)	Proposed Runoff (cfs)	Tc - Proposed (min)	Rainfall Intensity (in/hr)	Post-Development (cfs)	
3	2951648	67.76	0.35	10	7.5	473.3	
4 (offsite)	892204	20.48	0.35	10	7.5	221.4	
Total							694.7

Difference between Pre and Post Development Conditions: 490.9

50-Year Storm
Undeveloped Runoff Calculations

Area #	Area (ac)	Area (ac)	Existing Runoff (cfs)	Tc - Existing (min)	Rainfall Intensity (in/hr)	Q - Undeveloped (cfs)	
3	2951648	67.76	0.35	20	7.5	177.9	
4 (offsite)	892204	20.48	0.35	20	7.5	53.8	
Total							231.7

Post-Development Runoff Calculations

Area #	Area (ac)	Area (ac)	Proposed Runoff (cfs)	Tc - Proposed (min)	Rainfall Intensity (in/hr)	Post-Development (cfs)	
3	2951648	67.76	0.35	10	9.0	533.8	
4 (offsite)	892204	20.48	0.35	10	9.0	240.1	
Total							773.9

Difference between Pre and Post Development Conditions: 542.2

100-Year Storm
Undeveloped Runoff Calculations

Area #	Area (ac)	Area (ac)	Existing Runoff (cfs)	Tc - Existing (min)	Rainfall Intensity (in/hr)	Q - Undeveloped (cfs)	
3	2951648	67.76	0.35	20	8.3	191.6	
4 (offsite)	892204	20.48	0.35	20	8.3	59.5	
Total							251.1

Post-Development Runoff Calculations

Area #	Area (ac)	Area (ac)	Proposed Runoff (cfs)	Tc - Proposed (min)	Rainfall Intensity (in/hr)	Post-Development (cfs)	
3	2951648	67.76	0.35	10	9.6	561.4	
4 (offsite)	892204	20.48	0.35	10	9.6	261.4	
Total							822.8

Difference between Pre and Post Development Conditions: 571.7

DETENTION STORAGE REQUIREMENTS

DETENTION CALCULATIONS - 2 Year

Storm Duration	Inflow Duration	Area (AC)	Future "C"	Future "KF"	Future "CA"	Rainfall Intensity	Inflow (cfs)	Volume (cubic ft.)	Volume (cubic ft.)	Volume (cubic ft.)	Volume (acre-ft.)	Outflow (cfs)	
10	20	82.34	0.50	1.00	41.17	5.30	218.2	130921	3384	5.30	106570	2.49	37.3
20	30	82.34	0.50	1.00	41.17	3.90	169.6	132676	3325	3.90	108570	2.49	37.3
30	40	82.34	0.50	1.00	41.17	3.30	135.9	244560	44700	199580	4.59	37.3	
40	50	82.34	0.50	1.00	41.17	2.60	107.0	256901	56875	204026	4.61	37.3	
50	60	82.34	0.50	1.00	41.17	2.30	94.7	284073	67090	217023	4.98	37.3	
60	70	82.34	0.50	1.00	41.17	1.80	78.2	281603	78226	203377	4.67	37.3	
70	80	82.34	0.50	1.00	41.17	1.60	74.1	311245	89401	221845	5.09	37.3	
80	90	82.34	0.50	1.00	41.17	1.70	70.0	335047	5400	235372	5.40	37.3	
90	100	82.34	0.50	1.00	41.17	1.60	65.9	395706	111751	243958	5.60	37.3	
100	110	82.34	0.50	1.00	41.17	1.50	61.8	370330	122926	247604	5.68	37.3	

DETENTION CALCULATIONS - 10 Year

Storm Duration	Inflow Duration	Area (AC)	Future "C"	Future "KF"	Future "CA"	Rainfall Intensity	Inflow (cfs)	Volume (cubic ft.)	Volume (cubic ft.)	Volume (cubic ft.)	Volume (acre-ft.)	Outflow (cfs)
10	20	89.76	0.38	1.00	33.84	7.10	240.3	144166	100667	43498	1.00	167.8
20	30	89.76	0.38	1.00	33.84	5.90	199.7	238600	151001	88598	2.03	167.8
30	40	89.76	0.38	1.00	33.84	4.80	162.4	292393	201335	91069	2.09	167.8
40	50	89.76	0.38	1.00	33.84	4.00	135.4	324881	251693	73212	1.80	167.8
50	60	89.76	0.38	1.00	33.84	3.50	118.4	355338	302002	53326	1.22	167.8
60	70	89.76	0.38	1.00	33.84	3.00	101.5	365491	352338	13155	0.30	167.8
70	80	89.76	0.38	1.00	33.84	2.80	94.8	397979	402670	-4691	-0.11	167.8
80	90	89.76	0.38	1.00	33.84	2.60	88.0	422345	453004	-30658	-0.70	167.8
90	100	89.76	0.38	1.00	33.84	2.60	84.6	456864	603337	-46474	-1.07	167.8
100	110	89.76	0.38	1.00	33.84	2.30	77.8	467016	535671	-88658	-1.99	167.8

DETENTION CALCULATIONS - 25 Year

Storm Duration	Inflow Duration	Area (AC)	Future "C"	Future "KF"	Future "CA"	Rainfall Intensity	Inflow (cfs)	Volume (cubic ft.)	Volume (cubic ft.)	Volume (cubic ft.)	Volume (acre-ft.)	Outflow (cfs)
10	20	89.76	0.38	1.00	33.84	8.30	280.9	168532	117003	50629	1.16	166.5
20	30	89.76	0.38	1.00	33.84	6.60	223.4	268027	176855	91172	2.09	166.5
30	40	89.76	0.38	1.00	33.84	5.50	185.1	336033	228805	99227	2.28	166.5
40	50	89.76	0.38	1.00	33.84	4.60	155.7	373613	294758	78855	1.81	166.5
50	60	89.76	0.38	1.00	33.84	4.00	135.4	406101	353709	52392	1.20	166.5
60	70	89.76	0.38	1.00	33.84	3.50	118.4	426406	412661	13745	0.32	166.5
70	80	89.76	0.38	1.00	33.84	3.30	111.7	469947	471612	-2566	-0.08	166.5
80	90	89.76	0.38	1.00	33.84	3.10	104.9	503365	530564	-28399	-0.82	166.5
90	100	89.76	0.38	1.00	33.84	2.90	98.1	529852	585616	-59554	-1.37	166.5
100	110	89.76	0.38	1.00	33.84	2.70	91.4	548236	648467	-100231	-2.30	166.5

DETENTION CALCULATIONS - 50 Year

Storm Duration	Inflow Duration	Area (AC)	Future "C"	Future "KF"	Future "CA"	Rainfall Intensity	Inflow (cfs)	Volume (cubic ft.)	Volume (cubic ft.)	Volume (cubic ft.)	Volume (acre-ft.)	Outflow (cfs)
10	20	89.76	0.38	1.00	33.84	9.00	304.6	182745	125312	57434	1.32	208.9
20	30	89.76	0.38	1.00	33.84	7.60	253.8	304576	187967	116866	2.68	208.9
30	40	89.76	0.38	1.00	33.84	6.10	205.4	371582	256523	120959	2.78	208.9
40	50	89.76	0.38	1.00	33.84	5.20	178.0	422345	313278	101065	2.50	208.9
50	60	89.76	0.38	1.00	33.84	4.50	152.3	456864	375635	80923	1.86	208.9
60	70	89.76	0.38	1.00	33.84	3.90	132.0	475138	438591	36548	0.84	208.9
70	80	89.76	0.38	1.00	33.84	3.70	125.2	525901	501245	24654	0.57	208.9
80	90	89.76	0.38	1.00	33.84	3.50	118.4	568641	633902	4639	0.11	208.9
90	100	89.76	0.38	1.00	33.84	3.30	111.7	603060	620558	-23499	-0.54	208.9
100	110	89.76	0.38	1.00	33.84	3.00	101.5	609152	689214	-80662	-1.84	208.9

DETENTION CALCULATIONS - 100 Year

Storm Duration	Inflow Duration	Area (AC)	Future "C"	Future "KF"	Future "CA"	Rainfall Intensity	Inflow (cfs)	Volume (cubic ft.)	Volume (cubic ft.)	Volume (cubic ft.)	Volume (acre-ft.)	Outflow (cfs)
10	20	89.76	0.38	1.00	33.84	9.00	301.6	198990				