TABLE I – DISCHARGE POINT INFORMATION & DISCHARGE QUANTITY

Discharge Point	LOCATION	Latitude	Longitude	Class	C (weighted)	I (in/hr)	A (Acres)	Q (cfs)
1	Kaneohe Bay	21.41280^	157.77208^	AA	0.93	3.96	5.14	18.85
2	Kawainui Marsh	21.40418^	157.76485^	1	0.77	3.96	0.36	1.10
3	Kawainui Marsh	21.40480^	157.76300^	1	0.33	3.96	1.86	2.42
4	Kawainui Marsh	21.40499^	157.76195^	1	0.92	3.96	2.97	10.77
5	Kawainui Marsh	21.40514^	157.76104^	1	0.95	3.96	1.36	5.10
6	Kawainui Marsh	21.40542^	157.76027^	1	0.95	3.96	0.36	1.34
7	Kawainui Marsh	21.40562^	157.75975^	1	0.90	3.96	1.25	4.45
8	Kawainui Marsh	21.40591^	157.75902^	1	0.95	3.96	0.31	1.16
9	Kawainui Marsh	21.40579^ to 21.40634^	157.75929^ to 157.75790	1	0.95	3.96	0.17	0.63
10	Kawainui Marsh	21.40622^	157.75818^	1	0.95	3.96	0.26	0.99
11	Kawainui Marsh	21.40634^ to 21.40641^	157.75790^ to 157.75765^	1	0.95	3.96	0.01	0.04
12	Kawainui Marsh	21.40647^	157.75749^	1	0.87	3.96	0.53	1.84
13	Kawainui Canal	21.40666^ to 21.40825^	157.75683^ to 157.75497^	2	0.50	3.96	0.48	0.95
14	Kawainui Canal	21.40801^	157.75517^	2	0.89	3.96	3.02	10.66
15	Kawainui Canal	21.40921^	157.75424^	2	0.95	3.96	0.61	2.30
16	Kawainui Canal	21.40949^	157.75402^	2	0.89	3.96	0.45	1.57

RUNOFF CALCULATIONS

Given:

Area Disturbed 1-1 = 0.03 Acres
Area Disturbed 1-2 = 0.41 Acres
Area Disturbed 1-3 = 0.03 Acres
Area Disturbed 1-4 = 0.91 Acres
Area Disturbed 1-5 = 0.30 Acres
Area Disturbed 1-6 = 0.25 Acres
Area Disturbed 1-7 = 0.11 Acres
Area Disturbed 1-8 = 0.23 Acres
Area Disturbed 1-9 = 0.26 Acres
Area Disturbed 1-10 = 0.23 Acres
Area Disturbed 1-11 = 0.25 Acres
Area Disturbed 1-12 = 0.51 Acres
Area Disturbed 1-13 = 0.23 Acres
Area Disturbed 1-14 = 0.47 Acres
Area Disturbed 1-15 = 0.39 Acres
Area Disturbed 1-16 = 0.34 Acres
Area Disturbed 1-4A = 0.07 Acres
Area Disturbed 1-8A = 0.13 Acres

Area Disturbed 2-1 = 0.12 Acres
Area Disturbed 2-2 = 0.10 Acres
Area Disturbed 2-3 = 0.04 Acres
Area Disturbed 2-1A = 0.10 Acres

Area Disturbed 3-1 = 0.08 Acres
Area Disturbed 3-1A = 1.78 Acres

Area Disturbed 4-1 = 0.72 Acres
Area Disturbed 4-2 = 1.29 Acres
Area Disturbed 4-3 = 0.41 Acres
Area Disturbed 4-4 = 0.39 Acres
Area Disturbed 4-1A = 0.15 Acres

Area Disturbed 5-1 = 0.62 Acres
Area Disturbed 5-2 = 0.74 Acres

Area Disturbed 6-1 = 0.36 Acres

Area Disturbed 7-1 = 0.72 Acres
Area Disturbed 7-2 = 0.43 Acres
Area Disturbed 7-1A = 0.10 Acres

Area Disturbed 8-1 = 0.31 Acres

Area Disturbed 9-1 = 0.17 Acres

Area Disturbed 10-1 = 0.26 Acres

Area Disturbed 11-1 = 0.01 Acres

Area Disturbed 12-1 = 0.42 Acres
Area Disturbed 12-2 = 0.02 Acres
Area Disturbed 12-3 = 0.03 Acres
Area Disturbed 12-1A = 0.07 Acres

Area Disturbed 13-1B = 0.48 Acres

Area Disturbed 14-1 = 0.47 Acres
Area Disturbed 14-2 = 0.21 Acres
Area Disturbed 14-3 = 0.57 Acres
Area Disturbed 14-4 = 0.82 Acres
Area Disturbed 14-5 = 0.67 Acres
Area Disturbed 14-2A = 0.06 Acres
Area Disturbed 14-4A = 0.17 Acres
Area Disturbed 14-5A = 0.05 Acres

Area Disturbed 15-1 = 0.48 Acres
Area Disturbed 15-2 = 0.13 Acres

Area Disturbed 16-1 = 0.28 Acres
Area Disturbed 16-2 = 0.13 Acres
Area Disturbed 16-1A = 0.04 Acres

C = 0.95 (AC Pavement/Concrete Sidewalk/Concrete Driveways)
C=0.3 (Grassed/Pervious areas)
C=0.5 (Dirt areas)

i = (2-yr, 1-hr event) = 1.76 in/hr

$tc_{(All\ Areas)}$ = 10 min. (minimum)

$Cf_{(All\ Areas)}$ = 2.25

I = i X Cf
I=1.76 in/hr x 2.25 = 3.96 in/hr

Since project area is less than 100 acres, the Rational Formula will be used to calculate potential runoff.

Find: Runoff for a 2-yr 1-hr rainfall event (Q).

Solution: Q = C x I x A

Q_{1-1} = (0.95) x (3.96 in/hr) x (0.03 Acs)
Q_{1-1} = 0.11 cfs

Q_{1-2} = (0.95) x (3.96 in/hr) x (0.41 Acs)
Q_{1-2} = 1.54 cfs

Q_{1-3} = (0.95) x (3.96 in/hr) x (0.03 Acs)
Q_{1-3} = 0.12 cfs

Q_{1-4} = (0.95) x (3.96 in/hr) x (0.91 Acs)
Q_{1-4} = 3.41 cfs

Q_{1-5} = (0.95) x (3.96 in/hr) x (0.30 Acs)
Q_{1-5} = 1.12 cfs

Q_{1-6} = (0.95) x (3.96 in/hr) x (0.25 Acs)
Q_{1-6} = 0.94 cfs

Q_{1-7} = (0.95) x (3.96 in/hr) x (0.11 Acs)
Q_{1-7} = 0.42 cfs

Q_{1-8} = (0.95) x (3.96 in/hr) x (0.23 Acs)
Q_{1-8} = 0.87 cfs

Q_{1-9} = (0.95) x (3.96 in/hr) x (0.26 Acs)
Q_{1-9} = 0.99 cfs

$Q_{1\text{-}10}$ = (0.95) x (3.96 in/hr) x (0.23 Acs)
$Q_{1\text{-}10}$ = 0.87 cfs

$Q_{1\text{-}11}$ = (0.95) x (3.96 in/hr) x (0.25 Acs)
$Q_{1\text{-}11}$ = 0.93 cfs

$Q_{1\text{-}12}$ = (0.95) x (3.96 in/hr) x (0.51 Acs)
$Q_{1\text{-}12}$ = 1.92 cfs

$Q_{1\text{-}13}$ = (0.95) x (3.96 in/hr) x (0.23 Acs)
$Q_{1\text{-}13}$ = 0.85 cfs

$Q_{1\text{-}14}$ = (0.95) x (3.96 in/hr) x (0.47 Acs)
$Q_{1\text{-}14}$ = 1.78 cfs

$Q_{1\text{-}15}$ = (0.95) x (3.96 in/hr) x (0.39 Acs)
$Q_{1\text{-}15}$ = 1.48 cfs

$Q_{1\text{-}16}$ = (0.95) x (3.96 in/hr) x (0.34 Acs)
$Q_{1\text{-}16}$ = 1.28 cfs

$Q_{1\text{-}4A}$ = (0.30) x (3.96 in/hr) x (0.07 Acs)
$Q_{1\text{-}4A}$ = 0.08 cfs

$Q_{1\text{-}8A}$ = (0.30) x (3.96 in/hr) x (0.13 Acs)
$Q_{1\text{-}8A}$ = 0.15 cfs

$Q_{2\text{-}1}$ = (0.95) x (3.96 in/hr) x (0.12 Acs)
$Q_{2\text{-}1}$ = 0.46 cfs

$Q_{2\text{-}2}$ = (0.95) x (3.96 in/hr) x (0.10 Acs)
$Q_{2\text{-}2}$ = 0.38 cfs

$Q_{2\text{-}3}$ = (0.95) x (3.96 in/hr) x (0.04 Acs)
$Q_{2\text{-}3}$ = 0.15 cfs

$Q_{2\text{-}1A}$ = (0.30) x (3.96 in/hr) x (0.10 Acs)
$Q_{2\text{-}1A}$ = 0.12 cfs

$Q_{3\text{-}1}$ = (0.95) x (3.96 in/hr) x (0.08 Acs)
$Q_{3\text{-}1}$ = 0.30 cfs

$Q_{3\text{-}1A}$ = (0.30) x (3.96 in/hr) x (1.78 Acs)
$Q_{3\text{-}1A}$ = 2.12 cfs

$Q_{4\text{-}1}$ = (0.95) x (3.96 in/hr) x (0.72 Acs)
$Q_{4\text{-}1}$ = 2.73 cfs

$Q_{4\text{-}2}$ = (0.95) x (3.96 in/hr) x (1.29 Acs)
$Q_{4\text{-}2}$ = 4.86 cfs

$Q_{4\text{-}3}$ = (0.95) x (3.96 in/hr) x (0.41 Acs)
$Q_{4\text{-}3}$ = 1.56 cfs

$Q_{4\text{-}4}$ = (0.95) x (3.96 in/hr) x (0.39 Acs)
$Q_{4\text{-}4}$ = 1.45 cfs

$Q_{4\text{-}1A}$ = (0.30) x (3.96 in/hr) x (0.15 Acs)
$Q_{4\text{-}1A}$ = 0.18 cfs

$Q_{5\text{-}1}$ = (0.95) x (3.96 in/hr) x (0.62 Acs)
$Q_{5\text{-}1}$ = 2.32 cfs

$Q_{5\text{-}2}$ = (0.95) x (3.96 in/hr) x (0.74 Acs)
$Q_{5\text{-}2}$ = 2.78 cfs

$Q_{6\text{-}1}$ = (0.95) x (3.96 in/hr) x (0.36 Acs)
$Q_{6\text{-}1}$ = 1.34 cfs

$Q_{7\text{-}1}$ = (0.95) x (3.96 in/hr) x (0.72 Acs)
$Q_{7\text{-}1}$ = 2.70 cfs

$Q_{7\text{-}2}$ = (0.95) x (3.96 in/hr) x (0.43 Acs)
$Q_{7\text{-}2}$ = 1.63 cfs

$Q_{7\text{-}1A}$ = (0.30) x (3.96 in/hr) x (0.10 Acs)
$Q_{7\text{-}1A}$ = 0.11 cfs

$Q_{8\text{-}1}$ = (0.95) x (3.96 in/hr) x (0.31 Acs)
$Q_{8\text{-}1}$ = 1.16 cfs

$Q_{9\text{-}1}$ = (0.95) x (3.96 in/hr) x (0.17 Acs)
$Q_{9\text{-}1}$ = 0.63 cfs

$Q_{10\text{-}1}$ = (0.95) x (3.96 in/hr) x (0.26 Acs)
$Q_{10\text{-}1}$ = 0.99 cfs

$Q_{11\text{-}1}$ = (0.95) x (3.96 in/hr) x (0.01 Acs)
$Q_{11\text{-}1}$ = 0.04 cfs

$Q_{12\text{-}1}$ = (0.95) x (3.96 in/hr) x (0.42 Acs)
$Q_{12\text{-}1}$ = 1.59 cfs

$Q_{12\text{-}2}$ = (0.95) x (3.96 in/hr) x (0.02 Acs)
$Q_{12\text{-}2}$ = 0.07 cfs

$Q_{12\text{-}3}$ = (0.95) x (3.96 in/hr) x (0.03 Acs)
$Q_{12\text{-}3}$ = 0.10 cfs

$Q_{12\text{-}1A}$ = (0.30) x (3.96 in/hr) x (0.07 Acs)
$Q_{12\text{-}1A}$ = 0.08 cfs

$Q_{13\text{-}1B}$ = (0.50) x (3.96 in/hr) x (0.48 Acs)
$Q_{13\text{-}1B}$ = 0.95 cfs

$Q_{14\text{-}1}$ = (0.95) x (3.96 in/hr) x (0.47 Acs)
$Q_{14\text{-}1}$ = 1.77 cfs

$Q_{14\text{-}2}$ = (0.95) x (3.96 in/hr) x (0.21 Acs)
$Q_{14\text{-}2}$ = 0.79 cfs

$Q_{14\text{-}3}$ = (0.95) x (3.96 in/hr) x (0.57 Acs)
$Q_{14\text{-}3}$ = 2.15 cfs

$Q_{14\text{-}4}$ = (0.95) x (3.96 in/hr) x (0.82 Acs)
$Q_{14\text{-}4}$ = 3.09 cfs

$Q_{14\text{-}5}$ = (0.95) x (3.96 in/hr) x (0.67 Acs)
$Q_{14\text{-}5}$ = 2.54 cfs

$Q_{14\text{-}2A}$ = (0.30) x (3.96 in/hr) x (0.06 Acs)
$Q_{14\text{-}2A}$ = 0.07 cfs

$Q_{14\text{-}4A}$ = (0.30) x (3.96 in/hr) x (0.17 Acs)
$Q_{14\text{-}4A}$ = 0.20 cfs

$Q_{14\text{-}5A}$ = (0.30) x (3.96 in/hr) x (0.05 Acs)
$Q_{14\text{-}5A}$ = 0.06 cfs

$Q_{15\text{-}1}$ = (0.95) x (3.96 in/hr) x (0.48 Acs)
$Q_{15\text{-}1}$ = 1.82 cfs

$Q_{15\text{-}2}$ = (0.95) x (3.96 in/hr) x (0.13 Acs)
$Q_{15\text{-}2}$ = 0.48 cfs

$Q_{16\text{-}1}$ = (0.95) x (3.96 in/hr) x (0.28 Acs)
$Q_{16\text{-}1}$ = 1.05 cfs

$Q_{16\text{-}2}$ = (0.95) x (3.96 in/hr) x (0.13 Acs)
$Q_{16\text{-}2}$ = 0.48 cfs

$Q_{16\text{-}1A}$ = (0.30) x (3.96 in/hr) x (0.04 Acs)
$Q_{16\text{-}1A}$ = 0.05 cfs