NORSK INSTITUTT FOR VANNFORSKNING

V E D L E G G 2

APPENDIX C

O- 66/72

UTSLIPP AV AVLØPSVANN FRA SKOGHALLSVERKEN

- Dimensjonering av utløpsledning og diffusor.
- Avløpsvannets primærfortynning.

Rapporten avsluttet: 2.10.1972

Saksbehandler: Paul Liseth,
siv.ing. Ph.D.

A P P E N D I X C

EDB-BEREGNINGER AV UTLØPSLEDNINGENS OG DIFFUSORENS HYDRAULIKK, ALTERNATIVENE 1-5

BOTTOM PROFILE

DISTANCE M	DEPTH M
.00	.00
25.00	.00
35.00	1.00
40.00	2.00
50.00	3.50
62.00	5.00
75.00	6.50
90.00	8.50
100.00	9.00
120.00	9.00
125.00	9.00
150.00	9.50
175.00	10.00
200.00	11.00
210.00	11.50
225.00	12.00
250.00	12.50
275.00	13.00
300.00	13.50
325.00	13.60
350.00	14.00
375.00	14.00
400.00	14.00
450.00	14.00
510.00	14.00

MANIFOLD 1
TRACE A

LIST OF SYMBOLS

N = NO OF PORT
DEPTH(N) = DEPTH AT PORT N
DIST(N) = DISTANCE FROM SHORE
DIA(N) = DIAMETER OF MANIFOLD BETWEEN PORT N AND N-1
DL(N) = LENGTH BETWEEN PORT N AND N-1
D(N) = DIAMETER OF PORT N
V(N) = VELOCITY IN MANIFOLD BETWEEN PORT N AND N-1
U(N) = DISCHARGEVELOCITY OF PORT N
FR(N) = DENSIMETRIC FROUDE NO OF JET AT PORT N
E(N) = TOTAL HEAD AT PORT N
SQ(N) = TOTAL DISCHARGE UP TO PORT N
Q(N) = DISCHARGE OF PORT N
QL(N) = DISCHARGE LOAD PR LENGTH OF MANIFOLD
QDES = DESIGN DISCHARGE FLOW
VMIN = MINIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
VMAX = MAXIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
DENS = (SPEC.GRAV. SEAW.-SPEC.GRAV. WASTEW.)/(SPEC.GRAV. WASTEW.)
FRM = DARCY FRICTION FACTOR IN MANIFOLD
FRP = DARCY FRICTION FACTOR IN OUTFALL PIPELINE
VPIPE = UPPER LIMIT FOR VELOCITY IN OUTFALL PIPELINE AT DESIGN FLOW

INITIAL VALUES FOR THE CALCULATION OF THE MANIFOLD

QUES = 4.000 CUM/SEC
VMAX = 2.00 M/SEC
VMIN = .30 M/SEC
DIST(1) = 500.00 M
U(1) = 3.00 M/SEC
DIA(2) = .928 M
DL(2) = 15.00 M
D(2) = .30 M
DL(3) = 15.00 M
DENS = .001
VPIPE = 1.20 M/SEC
FR1 = .100
FRP = .100
PORT NO K1 = 10
DIA(K1) = 2.000 M
DL(K1) = 15.00 M
D(K1) = .30 M

PORT NO K2 = 0
DIA(K2) = .000 M
DL(K2) = .00 M
D(K2) = .00 M

PORT NO K3 = 0
DIA(K3) = .000 M
DL(K3) = .00 M
D(K3) = .00 M

THE LENGTH BETWEEN THE PORTS DL(N) AND THE DIAMETER OF THE PORTS
D(N) ARE KEPT CONSTANT ALONG THE MANIFOLD AND SET EQUAL TO
RESPECTIVELY DL(3) AND D(2).
IF WANTED THE DIA(N),DL(N) AND D(N) CAN BE CHANGED FOR PORT NO
N = K TO DIA(K),DL(K) AND D(K).

1

FLOW CHARACTERISTICS FOR U(1) = 3.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	14.00	500.00			.37		3.00	55.91	.46		202.81	
2	14.00	485.00	.928	15.00	.30	.30	3.02	62.71	.47	.20	133.05	13.52
3	14.00	470.00	.928	15.00	.30	.50	3.09	64.31	.49	.34	133.90	8.87
4	14.00	455.00	.928	15.00	.30	.69	3.21	67.22	.53	.47	136.52	8.93
5	14.00	440.00	.928	15.00	.30	.90	3.41	71.72	.59	.61	141.74	9.10
6	14.00	425.00	.928	15.00	.30	1.11	3.69	77.98	.69	.75	150.19	9.45
7	14.00	410.00	.928	15.00	.30	1.33	4.06	86.15	.84	.90	162.33	10.01
8	14.00	395.00	.928	15.00	.30	1.57	4.52	96.32	1.04	1.06	178.45	10.82
9	14.00	380.00	.928	15.00	.30	1.83	5.09	108.63	1.32	1.24	198.80	11.90
10	14.00	365.00	2.000	15.00	.30	.46	5.10	105.74	1.33	1.44	224.80	13.25
11	14.00	350.00	2.000	15.00	.30	.53	5.12	106.23	1.34	1.66	225.16	14.99
12	14.00	335.00	2.000	15.00	.30	.60	5.15	106.85	1.35	1.89	225.70	15.01
13	13.76	320.00	2.000	15.00	.30	.67	5.18	107.63	1.37	2.11	226.48	15.05
14	13.70	305.00	2.000	15.00	.30	.75	5.22	108.55	1.39	2.34	227.49	15.10
15	13.64	290.00	2.000	15.00	.30	.82	5.27	109.64	1.42	2.57	228.77	15.17
16	13.34	275.01	2.000	15.00	.30	.89	5.33	110.92	1.45	2.80	230.39	15.25
17	13.04	260.01	2.000	15.00	.30	.96	5.39	112.39	1.48	3.03	232.34	15.36
18	12.74	245.01	2.000	15.00	.30	1.04	5.47	114.07	1.52	3.26	234.66	15.49
19	12.44	230.01	2.000	15.00	.30	1.11	5.55	115.95	1.57	3.49	237.36	15.64
20	12.14	215.02	2.000	15.00	.30	1.19	5.65	118.05	1.63	3.73	240.48	15.82
21	11.64	200.03	2.000	15.00	.30	1.26	5.75	120.39	1.69	3.97	244.05	16.03

OUTFALL PIPELINE

TOTAL DISCHARGE = 4.22 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.34 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 2.62 M

1 FLOW CHARACTERISTICS FOR U(1) = 1.0$_0$ M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M-SEC
1	14.00	500.00			.37		1.00	18.64	.05		67.60	
2	14.00	485.00	.928	15.00	.30	.10	1.01	20.90	.05	.07	44.35	4.51
3	14.00	470.00	.928	15.00	.30	.17	1.03	21.44	.05	.11	44.63	2.96
4	14.00	455.00	.928	15.00	.30	.23	1.07	22.41	.06	.16	45.51	2.98
5	14.00	440.00	.928	15.00	.30	.30	1.14	23.91	.07	.20	47.25	3.03
6	14.00	425.00	.928	15.00	.30	.37	1.23	25.99	.08	.25	50.06	3.15
7	14.00	410.00	.928	15.00	.30	.44	1.35	28.72	.09	.30	54.11	3.34
8	14.00	395.00	.928	15.00	.30	.52	1.51	32.11	.12	.35	59.48	3.61
9	14.00	380.00	.928	15.00	.30	.61	1.70	36.21	.15	.41	66.27	3.97
10	14.00	365.00	2.000	15.00	.30	.15	1.70	35.25	.15	.48	74.93	4.42
11	14.00	350.00	2.000	15.00	.30	.18	1.71	35.41	.15	.55	75.05	5.00
12	14.00	335.00	2.000	15.00	.30	.20	1.72	35.62	.15	.63	75.23	5.00
13	13.76	320.00	2.000	15.00	.30	.22	1.73	35.90	.15	.70	75.55	5.02
14	13.70	305.00	2.000	15.00	.30	.25	1.74	36.21	.15	.78	75.90	5.04
15	13.64	290.00	2.000	15.00	.30	.27	1.76	36.58	.16	.86	76.34	5.06
16	13.34	275.01	2.000	15.00	.30	.30	1.78	37.04	.16	.93	76.94	5.09
17	13.04	260.01	2.000	15.00	.30	.32	1.80	37.56	.17	1.01	77.66	5.13
18	12.74	245.01	2.000	15.00	.30	.35	1.83	38.15	.17	1.09	78.50	5.18
19	12.44	230.01	2.000	15.00	.30	.37	1.86	38.80	.18	1.17	79.46	5.23
20	12.14	215.02	2.000	15.00	.30	.40	1.89	39.53	.18	1.24	80.56	5.30
21	11.64	200.03	2.000	15.00	.30	.42	1.93	40.35	.19	1.33	81.85	5.37

OUTFALL PIPELINE

TOTAL DISCHARGE = 1.41 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .45 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = .30 M

1 FLOW CHARACTERISTICS FOR U(1) = 2.0₀ M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	14.00	500.00			.37		2.00	37.28	.20		135.21	
2	14.00	485.00	.928	15.00	.30	.20	2.02	41.81	.21	.14	88.70	9.01
3	14.00	470.00	.928	15.00	.30	.33	2.06	42.87	.22	.22	89.27	5.91
4	14.00	455.00	.928	15.00	.30	.46	2.14	44.81	.23	.31	91.01	5.95
5	14.00	440.00	.928	15.00	.30	.60	2.27	47.81	.26	.40	94.49	6.07
6	14.00	425.00	.928	15.00	.30	.74	2.46	51.99	.31	.50	100.13	6.30
7	14.00	410.00	.928	15.00	.30	.89	2.70	57.43	.37	.60	108.22	6.68
8	14.00	395.00	.928	15.00	.30	1.05	3.01	64.21	.46	.71	118.97	7.21
9	14.00	380.00	.928	15.00	.30	1.22	3.39	72.42	.59	.83	132.53	7.93
10	14.00	365.00	2.000	15.00	.30	.31	3.40	70.49	.59	.96	149.87	8.84
11	14.00	350.00	2.000	15.00	.30	.35	3.41	70.82	.59	1.11	150.11	9.99
12	14.00	335.00	2.000	15.00	.30	.40	3.43	71.24	.60	1.26	150.47	10.01
13	13.76	320.00	2.000	15.00	.30	.45	3.45	71.76	.61	1.41	151.00	10.03
14	13.70	305.00	2.000	15.00	.30	.50	3.48	72.38	.62	1.56	151.68	10.07
15	13.64	290.00	2.000	15.00	.30	.55	3.51	73.11	.63	1.71	152.54	10.11
16	13.34	275.01	2.000	15.00	.30	.59	3.55	73.97	.64	1.86	153.64	10.17
17	13.04	260.01	2.000	15.00	.30	.64	3.60	74.96	.66	2.02	154.96	10.24
18	12.74	245.01	2.000	15.00	.30	.69	3.65	76.08	.68	2.17	156.53	10.33
19	12.44	230.01	2.000	15.00	.30	.74	3.70	77.35	.70	2.33	158.35	10.44
20	12.14	215.02	2.000	15.00	.30	.79	3.77	78.76	.72	2.49	160.44	10.56
21	11.64	200.03	2.000	15.00	.30	.84	3.84	80.33	.75	2.65	162.85	10.70

OUTFALL PIPELINE

TOTAL DISCHARGE = 2.61 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .90 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 1.17 M

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FLOW CHARACTERISTICS FOR U(1) = 4.0₀ M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	14.00	500.00			.37		4.00	74.55	.82		270.41	
2	14.00	485.00	.928	15.00	.30	.40	4.03	83.62	.83	.27	177.40	18.03
3	14.00	470.00	.928	15.00	.30	.66	4.12	85.74	.86	.45	178.53	11.83
4	14.00	455.00	.928	15.00	.30	.93	4.28	89.63	.94	.63	182.03	11.90
5	14.00	440.00	.928	15.00	.30	1.20	4.55	95.62	1.05	.81	188.98	12.14
6	14.00	425.00	.928	15.00	.30	1.48	4.92	103.98	1.23	1.00	200.25	12.60
7	14.00	410.00	.928	15.00	.30	1.77	5.41	114.86	1.49	1.20	216.44	13.35
8	14.00	395.00	.928	15.00	.30	2.09	6.03	128.43	1.85	1.41	237.94	14.43
9	14.00	380.00	.928	15.00	.30	2.44	6.78	144.84	2.34	1.65	265.07	15.86
10	14.00	365.00	2.000	15.00	.30	.61	6.80	140.99	2.36	1.92	299.74	17.67
11	14.00	350.00	2.000	15.00	.30	.71	6.83	141.64	2.38	2.22	300.21	19.98
12	14.00	335.00	2.000	15.00	.30	.80	6.86	142.47	2.40	2.52	300.93	20.01
13	13.76	320.00	2.000	15.00	.30	.90	6.91	143.50	2.43	2.82	301.96	20.06
14	13.70	305.00	2.000	15.00	.30	.99	6.96	144.73	2.47	3.12	303.30	20.13
15	13.64	290.00	2.000	15.00	.30	1.09	7.03	146.18	2.52	3.42	305.01	20.22
16	13.34	275.01	2.000	15.00	.30	1.19	7.10	147.88	2.57	3.73	307.15	20.33
17	13.04	260.01	2.000	15.00	.30	1.29	7.19	149.84	2.63	4.04	309.74	20.48
18	12.74	245.01	2.000	15.00	.30	1.38	7.29	152.06	2.71	4.35	312.82	20.65
19	12.44	230.01	2.000	15.00	.30	1.48	7.40	154.57	2.79	4.66	316.41	20.85
20	12.14	215.02	2.000	15.00	.30	1.58	7.53	157.36	2.89	4.97	320.55	21.09
21	11.84	200.03	2.000	15.00	.30	1.69	7.67	160.47	3.00	5.29	325.28	21.37

OUTFALL PIPELINE

TOTAL DISCHARGE = 5.62 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.79 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 4.65 M

1 FLOW CHARACTERISTICS FOR U(1) = 5.0₀ M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	14.00	500.00			.37		5.00	93.19	1.27		338.01	
2	14.00	485.00	.928	15.00	.30	.50	5.04	104.52	1.29	.34	221.75	22.53
3	14.00	470.00	.928	15.00	.30	.83	5.15	107.18	1.35	.56	223.17	14.78
4	14.00	455.00	.928	15.00	.30	1.16	5.36	112.03	1.46	.78	227.53	14.88
5	14.00	440.00	.928	15.00	.30	1.49	5.68	119.53	1.65	1.01	230.23	15.17
6	14.00	425.00	.928	15.00	.30	1.84	6.15	129.97	1.93	1.25	250.32	15.75
7	14.00	410.00	.928	15.00	.30	2.21	6.76	143.58	2.33	1.50	270.55	16.69
8	14.00	395.00	.928	15.00	.30	2.61	7.53	160.53	2.89	1.77	297.42	18.04
9	14.00	380.00	.928	15.00	.30	3.05	8.48	181.05	3.66	2.06	331.34	19.83
10	14.00	365.00	2.000	15.00	.30	.76	8.50	176.24	3.68	2.40	374.67	22.09
11	14.00	350.00	2.000	15.00	.30	.88	8.54	177.06	3.71	2.77	375.27	24.98
12	14.00	335.00	2.000	15.00	.30	1.00	8.58	176.09	3.75	3.15	376.17	25.02
13	13.76	320.00	2.000	15.00	.30	1.12	8.64	179.37	3.80	3.52	377.44	25.08
14	13.70	305.00	2.000	15.00	.30	1.24	8.70	180.90	3.86	3.90	379.11	25.16
15	13.64	290.00	2.000	15.00	.30	1.36	8.78	182.72	3.93	4.28	381.26	25.27
16	13.34	275.01	2.000	15.00	.30	1.48	8.88	184.84	4.02	4.66	383.92	25.42
17	13.04	260.01	2.000	15.00	.30	1.61	8.98	187.29	4.11	5.04	387.15	25.59
18	12.74	245.01	2.000	15.00	.30	1.73	9.11	190.06	4.23	5.43	390.99	25.81
19	12.44	230.01	2.000	15.00	.30	1.85	9.25	193.19	4.36	5.82	395.47	26.07
20	12.14	215.02	2.000	15.00	.30	1.98	9.41	196.68	4.51	6.22	400.64	26.36
21	11.64	200.03	2.000	15.00	.30	2.11	9.58	200.56	4.68	6.62	406.54	26.71

OUTFALL PIPELINE

TOTAL DISCHARGE = 7.02 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.24 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 7.25 M

1 FLOW CHARACTERISTICS FOR U(1) = 6.0n M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	14.00	500.00			.37		6.00	111.83	1.83		405.62	
2	14.00	485.00	.928	15.00	.30	.60	6.05	125.43	1.86	.41	266.10	27.04
3	14.00	470.00	.928	15.00	.30	.99	6.18	126.61	1.95	.67	267.80	17.74
4	14.00	455.00	.928	15.00	.30	1.39	6.43	134.44	2.10	.94	273.04	17.85
5	14.00	440.00	.928	15.00	.30	1.79	6.82	143.43	2.37	1.21	283.47	18.20
6	14.00	425.00	.928	15.00	.30	2.21	7.38	155.96	2.77	1.50	300.38	18.90
7	14.00	410.00	.928	15.00	.30	2.66	8.11	172.29	3.36	1.80	324.65	20.03
8	14.00	395.00	.928	15.00	.30	3.14	9.04	192.64	4.17	2.12	356.90	21.64
9	14.00	380.00	.928	15.00	.30	3.67	10.17	217.26	5.27	2.48	397.60	23.79
10	14.00	365.00	2.000	15.00	.30	.92	10.20	211.48	5.31	2.88	449.61	26.51
11	14.00	350.00	2.000	15.00	.30	1.06	10.24	212.47	5.35	3.33	450.32	29.97
12	14.00	335.00	2.000	15.00	.30	1.20	10.30	213.71	5.40	3.78	451.40	30.02
13	13.76	320.00	2.000	15.00	.30	1.35	10.36	215.24	5.47	4.23	452.92	30.09
14	13.70	305.00	2.000	15.00	.30	1.49	10.44	217.08	5.56	4.68	454.93	30.19
15	13.64	290.00	2.000	15.00	.30	1.64	10.54	219.26	5.66	5.13	457.50	30.33
16	13.34	275.01	2.000	15.00	.30	1.78	10.65	221.81	5.78	5.59	460.70	30.50
17	13.04	260.01	2.000	15.00	.30	1.93	10.78	224.73	5.92	6.05	464.57	30.71
18	12.74	245.01	2.000	15.00	.30	2.08	10.93	228.06	6.09	6.52	469.16	30.97
19	12.44	230.01	2.000	15.00	.30	2.23	11.10	231.81	6.28	6.99	474.54	31.28
20	12.14	215.02	2.000	15.00	.30	2.38	11.29	236.00	6.49	7.46	480.74	31.64
21	11.84	200.03	2.000	15.00	.30	2.53	11.50	240.65	6.74	7.94	487.81	32.05

OUTFALL PIPELINE

TOTAL DISCHARGE = 8.43 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.68 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 10.44 M

1 FLOW CHARACTERISTICS FOR U(1) = 7.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	14.00	500.00			.37		7.00	130.46	2.50		473.22	
2	14.00	485.00	.928	15.00	.30	.70	7.06	146.33	2.54	.47	310.45	31.55
3	14.00	470.00	.928	15.00	.30	1.16	7.21	150.05	2.65	.78	312.43	20.70
4	14.00	455.00	.928	15.00	.30	1.62	7.50	156.84	2.87	1.10	318.55	20.83
5	14.00	440.00	.928	15.00	.30	2.09	7.96	167.34	3.23	1.41	330.72	21.24
6	14.00	425.00	.928	15.00	.30	2.58	8.61	181.96	3.78	1.75	350.44	22.05
7	14.00	410.00	.928	15.00	.30	3.10	9.47	201.01	4.57	2.10	378.76	23.36
8	14.00	395.00	.928	15.00	.30	3.66	10.55	224.75	5.67	2.47	416.39	25.25
9	14.00	380.00	.928	15.00	.30	4.28	11.87	253.47	7.18	2.89	463.87	27.76
10	14.00	365.00	2.000	15.00	.30	1.07	11.90	246.73	7.22	3.35	524.54	30.92
11	14.00	350.00	2.000	15.00	.30	1.24	11.95	247.88	7.28	3.88	525.37	34.97
12	14.00	335.00	2.000	15.00	.30	1.40	12.01	249.33	7.35	4.40	526.63	35.02
13	13.76	320.00	2.000	15.00	.30	1.57	12.09	251.11	7.45	4.93	528.40	35.11
14	13.70	305.00	2.000	15.00	.30	1.74	12.18	253.26	7.56	5.46	530.75	35.23
15	13.64	290.00	2.000	15.00	.30	1.91	12.29	255.80	7.70	5.99	533.75	35.38
16	13.34	275.01	2.000	15.00	.30	2.08	12.43	258.77	7.87	6.52	537.47	35.58
17	13.04	260.01	2.000	15.00	.30	2.25	12.58	262.18	8.06	7.06	541.98	35.83
18	12.74	245.01	2.000	15.00	.30	2.42	12.75	266.07	8.29	7.60	547.34	36.13
19	12.44	230.01	2.000	15.00	.30	2.60	12.95	270.44	8.55	8.15	553.61	36.49
20	12.14	215.02	2.000	15.00	.30	2.77	13.17	275.33	8.84	8.70	560.84	36.91
21	11.64	200.03	2.000	15.00	.30	2.95	13.42	280.75	9.17	9.27	569.08	37.39

OUTFALL PIPELINE

TOTAL DISCHARGE = 9.83 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 3.13 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 14.20 M

1 FLOW CHARACTERISTICS FOR U(1) = 8.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	14.00	500.00			.67		8.00	149.10	3.26		540.82	
2	14.00	485.00	.928	15.00	.30	.80	8.06	167.24	3.31	.54	354.80	36.05
3	14.00	470.00	.928	15.00	.30	1.32	8.24	171.49	3.46	.90	357.07	23.65
4	14.00	455.00	.928	15.00	.30	1.85	8.57	179.25	3.74	1.25	364.06	23.80
5	14.00	440.00	.928	15.00	.30	2.39	9.09	191.24	4.21	1.62	377.96	24.27
6	14.00	425.00	.928	15.00	.30	2.95	9.84	207.95	4.93	1.99	400.50	25.20
7	14.00	410.00	.928	15.00	.30	3.54	10.82	229.72	5.96	2.40	432.87	26.70
8	14.00	395.00	.928	15.00	.30	4.18	12.05	256.85	7.41	2.93	475.87	28.86
9	14.00	380.00	.928	15.00	.30	4.89	13.56	289.68	9.37	3.30	530.14	31.72
10	14.00	365.00	2.000	15.00	.30	1.22	13.60	281.98	9.43	3.83	599.48	35.34
11	14.00	350.00	2.000	15.00	.30	1.41	13.66	283.29	9.51	4.43	680.43	39.97
12	14.00	335.00	2.000	15.00	.30	1.60	13.73	284.94	9.61	5.03	681.86	40.03
13	13.76	320.00	2.000	15.00	.30	1.79	13.82	286.98	9.73	5.64	683.89	40.12
14	13.70	305.00	2.000	15.00	.30	1.99	13.92	289.44	9.88	6.24	686.57	40.26
15	13.64	290.00	2.000	15.00	.30	2.18	14.05	292.35	10.06	6.85	689.99	40.44
16	13.34	275.01	2.000	15.00	.30	2.37	14.20	295.74	10.28	7.46	694.25	40.67
17	13.04	260.01	2.000	15.00	.30	2.57	14.37	299.63	10.53	8.07	699.40	40.95
18	12.74	245.01	2.000	15.00	.30	2.77	14.57	304.07	10.82	8.69	705.52	41.29
19	12.44	230.01	2.000	15.00	.30	2.97	14.80	309.07	11.16	9.32	712.68	41.70
20	12.14	215.02	2.000	15.00	.30	3.17	15.05	314.65	11.54	9.95	720.94	42.18
21	11.64	200.03	2.000	15.00	.30	3.37	15.33	320.84	11.98	10.59	730.36	42.73

OUTFALL PIPELINE

TOTAL DISCHARGE = 11.24 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 3.58 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 16.54 M

MANIFOLD 1
TRACE B

BOTTOM PROFILE

DISTANCE M	DEPTH M
.00	.00
25.00	.00
40.00	1.00
50.00	3.00
60.00	4.50
65.00	5.00
75.00	6.50
90.00	7.00
100.00	8.50
125.00	9.00
150.00	9.10
175.00	9.50
200.00	9.80
225.00	10.20
250.00	10.50
275.00	10.50
300.00	10.50
325.00	10.50
350.00	10.80
375.00	10.80
400.00	11.00
425.00	11.00
450.00	11.00
475.00	11.50
510.00	11.60

LIST OF SYMBOLS

N = NO OF PORT
DEPTH(N) = DEPTH AT PORT N
DIST(N) = DISTANCE FROM SHORE
DIA(N) = DIAMETER OF MANIFOLD BETWEEN PORT N AND N-1
DL(N) = LENGTH BETWEEN PORT N AND N-1
D(N) = DIAMETER OF PORT N
V(N) = VELOCITY IN MANIFOLD BETWEEN PORT N AND N-1
U(N) = DISCHARGEVELOCITY OF PORT N
FN(N) = DENSIMETRIC FROUDE NO OF JET AT PORT N
E(N) = TOTAL HEAD AT PORT N
SQ(N) = TOTAL DISCHARGE UP TO PORT N
Q(N) = DISCHARGE OF PORT N
QL(N) = DISCHARGE LOAD PR LENGTH OF MANIFOLD
QDES = DESIGN DISCHARGE FLOW
VMIN = MINIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
VMAX = MAXIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
DENS = (SPEC.GRAV. SEAW.-SPEC.GRAV. WASTEW.)/(SPEC.GRAV. WASTEW.)
FRM = DARCY FRICTION FACTOR IN MANIFOLD
FRP = DARCY FRICTION FACTOR IN OUTFALL PIPELINE
VPIPE = UPPER LIMIT FOR VELOCITY IN OUTFALL PIPELINE AT DESIGN FLOW

INITIAL VALUES FOR THE CALCULATION OF THE MANIFOLD

QUES = 4.000 CUM/SEC
VMAX = 2.00 M/SEC
VMIN = .30 M/SEC
DIST(1) = 500.00 M
U(1) = 3.00 M/SEC
DIA(2) = .928 M
DL(2) = 15.00 M
D(2) = .30 M
DL(3) = 15.00 M
DENS = .001
VPIPE = 1.20 M/SEC
FKM = .100
FKP = .100
PORT NO K1 = 10
DIA(K1) = 2.000 M
DL(K1) = 15.00 M
D(K1) = .30 M

PORT NO K2 = 0
DIA(K2) = .000 M
DL(K2) = .00 M
D(K2) = .00 M

PORT NO K3 = 0
DIA(K3) = .000 M
DL(K3) = .00 M
D(K3) = .00 M

THE LENGTH BETWEEN THE PORTS DL(N) AND THE DIAMETER OF THE PORTS
D(N) ARE KEPT CONSTANT ALONG THE MANIFOLD AND SET EQUAL TO
RESPECTIVELY DL(3) AND D(2).
IF WANTED THE DIA(N),DL(N) AND D(N) CAN BE CHANGED FOR PORT NO
N = K TO DIA(K),DL(K) AND D(K).

1 FLOW CHARACTERISTICS FOR U(1) = 3.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.37		3.00	55.91	.46		202.81	
2	11.53	485.00	.928	15.00	.30	.30	3.02	62.72	.47	.20	133.06	13.52
3	11.49	470.00	.928	15.00	.30	.50	3.09	64.31	.49	.34	133.91	8.87
4	11.19	455.00	.928	15.00	.30	.69	3.21	67.24	.53	.47	136.58	8.93
5	10.89	440.01	.928	15.00	.30	.90	3.41	71.76	.59	.61	141.83	9.11
6	10.89	425.01	.928	15.00	.30	1.11	3.69	78.02	.69	.75	150.28	9.46
7	10.89	410.01	.928	15.00	.30	1.33	4.06	86.19	.84	.90	162.42	10.02
8	10.89	395.01	.928	15.00	.30	1.57	4.52	96.36	1.04	1.06	178.54	10.83
9	10.77	380.01	.928	15.00	.30	1.83	5.09	108.68	1.32	1.24	198.91	11.90
10	10.65	365.01	2.000	15.00	.30	.46	5.10	105.80	1.33	1.44	224.92	13.26
11	10.65	350.01	2.000	15.00	.30	.53	5.12	106.29	1.34	1.66	225.28	14.99
12	10.65	335.01	2.000	15.00	.30	.60	5.15	106.91	1.35	1.89	225.82	15.02
13	10.47	320.01	2.000	15.00	.30	.67	5.18	107.68	1.37	2.11	226.59	15.05
14	10.47	305.01	2.000	15.00	.30	.75	5.22	108.60	1.39	2.34	227.59	15.11
15	10.47	290.01	2.000	15.00	.30	.82	5.27	109.69	1. 2	2.57	228.88	15.17
16	10.47	275.01	2.000	15.00	.30	.89	5.33	110.96	1. 5	2.80	230.47	15.26
17	10.47	260.01	2.000	15.00	.30	.96	5.39	112.42	1.48	3.03	232.40	15.36
18	10.47	245.01	2.000	15.00	.30	1.04	5.47	114.09	1.52	3.26	234.69	15.49
19	10.29	230.01	2.000	15.00	.30	1.11	5.55	115.97	1.57	3.49	237.39	15.65
20	10.11	215.01	2.000	15.00	.30	1.19	5.65	116.07	1.63	3.73	240.50	15.83
21	9.87	200.01	2.000	15.00	.30	1.27	5.75	120.39	1.69	3.97	244.05	16.03

OUTFALL PIPELINE

TOTAL DISCHARGE = 4.22 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.34 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 2.62 M

1 FLOW CHARACTERISTICS FOR U(1) = 1.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	11.57	500.00			.37		1.00	18.64	.05		67.60	
2	11.53	485.00	.928	15.00	.30	.10	1.01	20.91	.05	.07	44.37	4.51
3	11.49	470.00	.928	15.00	.30	.17	1.03	21.45	.05	.11	44.67	2.96
4	11.19	455.00	.928	15.00	.30	.23	1.07	22.48	.06	.16	45.67	2.98
5	10.89	440.01	.928	15.00	.30	.30	1.14	24.03	.07	.20	47.53	3.04
6	10.89	425.01	.928	15.00	.30	.37	1.24	26.12	.08	.25	50.33	3.17
7	10.89	410.01	.928	15.00	.30	.44	1.36	28.84	.09	.30	54.37	3.36
8	10.89	395.01	.928	15.00	.30	.52	1.51	32.24	.12	.35	59.75	3.62
9	10.77	380.01	.928	15.00	.30	.61	1.70	36.36	.15	.41	66.58	3.98
10	10.65	365.01	2.000	15.00	.30	.15	1.71	35.41	.15	.48	75.29	4.44
11	10.65	350.01	2.000	15.00	.30	.18	1.72	35.58	.15	.56	75.41	5.02
12	10.65	335.01	2.000	15.00	.30	.20	1.72	35.79	.15	.63	75.59	5.03
13	10.47	320.01	2.000	15.00	.30	.23	1.74	36.06	.15	.71	75.89	5.04
14	10.47	305.01	2.000	15.00	.30	.25	1.75	36.37	.16	.78	76.22	5.06
15	10.47	290.01	2.000	15.00	.30	.27	1.77	36.73	.16	.86	76.65	5.08
16	10.47	275.01	2.000	15.00	.30	.30	1.78	37.16	.16	.94	77.19	5.11
17	10.47	260.01	2.000	15.00	.30	.32	1.81	37.65	.17	1.01	77.83	5.15
18	10.47	245.01	2.000	15.00	.30	.35	1.83	38.20	.17	1.09	78.60	5.19
19	10.29	230.01	2.000	15.00	.30	.37	1.86	38.85	.18	1.17	79.54	5.24
20	10.11	215.01	2.000	15.00	.30	.40	1.89	39.57	.18	1.25	80.61	5.30
21	9.87	200.01	2.000	15.00	.30	.42	1.93	40.37	.19	1.33	81.85	5.37

OUTFALL PIPELINE

TOTAL DISCHARGE = 1.41 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .45 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = .30 M

1 FLOW CHARACTERISTICS FOR U(1) = 2.0₀ M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.37		2.00	37.28	.20		135.21	
2	11.53	485.00	.928	15.00	.30	.20	2.02	41.81	.21	.14	88.71	9.01
3	11.49	470.00	.928	15.00	.30	.33	2.06	42.88	.22	.22	89.28	5.91
4	11.19	455.00	.928	15.00	.30	.46	2.14	44.85	.23	.31	91.10	5.95
5	10.89	440.01	.928	15.00	.30	.60	2.28	47.87	.26	.40	94.63	6.07
6	10.89	425.01	.928	15.00	.30	.74	2.46	52.05	.31	.50	100.26	6.31
7	10.89	410.01	.928	15.00	.30	.89	2.71	57.49	.37	.60	108.35	6.68
8	10.89	395.01	.928	15.00	.30	1.05	3.02	64.28	.46	.71	119.10	7.22
9	10.77	380.01	.928	15.00	.30	1.22	3.39	72.50	.59	.83	132.69	7.94
10	10.65	365.01	2.000	15.00	.30	.31	3.40	70.58	.59	.96	150.05	8.85
11	10.65	350.01	2.000	15.00	.30	.35	3.42	70.91	.60	1.11	150.29	10.00
12	10.65	335.01	2.000	15.00	.30	.40	3.44	71.32	.60	1.26	150.65	10.02
13	10.47	320.01	2.000	15.00	.30	.45	3.46	71.84	.61	1.41	151.17	10.04
14	10.47	305.01	2.000	15.00	.30	.50	3.49	72.45	.62	1.56	151.84	10.08
15	10.47	290.01	2.000	15.00	.30	.55	3.52	73.18	.63	1.71	152.70	10.12
16	10.47	275.01	2.000	15.00	.30	.59	3.55	74.03	.64	1.87	153.76	10.18
17	10.47	260.01	2.000	15.00	.30	.64	3.60	75.00	.66	2.02	155.05	10.25
18	10.47	245.01	2.000	15.00	.30	.69	3.65	76.11	.68	2.17	156.58	10.34
19	10.29	230.01	2.000	15.00	.30	.74	3.70	77.37	.70	2.33	158.39	10.44
20	10.11	215.01	2.000	15.00	.30	.79	3.77	78.78	.72	2.49	160.47	10.56
21	9.87	200.01	2.000	15.00	.30	.84	3.84	80.34	.75	2.65	162.85	10.70

OUTFALL PIPELINE

TOTAL DISCHARGE = 2.81 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .90 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 1.17 M

1 FLOW CHARACTERISTICS FOR U(1) = 4.0₀ M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	11.57	500.00			.37		4.00	74.55	.82		270.41	
2	11.53	485.00	.928	15.00	.30	.40	4.03	85.62	.83	.27	177.41	18.03
3	11.49	470.00	.928	15.00	.30	.66	4.12	85.75	.86	.45	178.54	11.83
4	11.19	455.00	.928	15.00	.30	.93	4.29	89.64	.94	.63	182.07	11.90
5	10.89	440.01	.928	15.00	.30	1.20	4.55	95.65	1.05	.81	189.05	12.14
6	10.89	425.01	.928	15.00	.30	1.48	4.92	104.01	1.23	1.00	200.32	12.60
7	10.89	410.01	.928	15.00	.30	1.77	5.41	114.89	1.49	1.20	216.50	13.35
8	10.89	395.01	.928	15.00	.30	2.09	6.03	128.46	1.85	1.41	238.00	14.43
9	10.77	380.01	.928	15.00	.30	2.44	6.78	144.88	2.34	1.65	265.15	15.87
10	10.65	365.01	2.000	15.00	.30	.61	6.80	141.03	2.36	1.92	299.83	17.68
11	10.65	350.01	2.000	15.00	.30	.71	6.83	141.69	2.38	2.22	300.30	19.99
12	10.65	335.01	2.000	15.00	.30	.80	6.87	142.51	2.40	2.52	301.02	20.02
13	10.47	320.01	2.000	15.00	.30	.90	6.91	143.54	2.43	2.82	302.04	20.07
14	10.47	305.01	2.000	15.00	.30	.99	6.96	144.77	2.47	3.12	303.38	20.14
15	10.47	290.01	2.000	15.00	.30	1.09	7.03	146.22	2.52	3.42	305.09	20.23
16	10.47	275.01	2.000	15.00	.30	1.19	7.10	147.91	2.57	3.73	307.22	20.34
17	10.47	260.01	2.000	15.00	.30	1.29	7.19	149.86	2.63	4.04	309.79	20.48
18	10.47	245.01	2.000	15.00	.30	1.38	7.29	152.08	2.71	4.35	312.84	20.65
19	10.29	230.01	2.000	15.00	.30	1.48	7.40	154.58	2.79	4.66	316.43	20.86
20	10.11	215.01	2.000	15.00	.30	1.58	7.53	157.37	2.89	4.98	320.57	21.10
21	9.87	200.01	2.000	15.00	.30	1.69	7.67	160.47	3.00	5.30	325.29	21.37

OUTFALL PIPELINE

TOTAL DISCHARGE = 5.62 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.79 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 4.65 M

1 FLOW CHARACTERISTICS FOR U(1) = 5.0$_0$ M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.37		5.00	93.19	1.27		338.01	
2	11.53	485.00	.928	15.00	.30	.50	5.04	104.52	1.29	.34	221.76	22.53
3	11.49	470.00	.928	15.00	.30	.83	5.15	107.18	1.35	.56	223.17	14.78
4	11.19	455.00	.928	15.00	.30	1.16	5.36	112.05	1.46	.78	227.57	14.88
5	10.89	440.01	.928	15.00	.30	1.49	5.68	119.55	1.65	1.01	236.28	15.17
6	10.89	425.01	.928	15.00	.30	1.84	6.15	129.99	1.93	1.25	250.37	15.75
7	10.89	410.01	.928	15.00	.30	2.21	6.76	143.60	2.33	1.50	270.60	16.69
8	10.89	395.01	.928	15.00	.30	2.61	7.54	160.56	2.89	1.77	297.47	18.04
9	10.77	380.01	.928	15.00	.30	3.05	8.48	181.08	3.66	2.07	331.40	19.83
10	10.65	365.01	2.000	15.00	.30	.76	8.50	176.27	3.69	2.40	374.74	22.09
11	10.65	350.01	2.000	15.00	.30	.88	8.54	177.09	3.72	2.77	375.34	24.98
12	10.65	335.01	2.000	15.00	.30	1.00	8.58	178.12	3.75	3.15	376.24	25.02
13	10.47	320.01	2.000	15.00	.30	1.12	8.64	179.40	3.80	3.52	377.51	25.08
14	10.47	305.01	2.000	15.00	.30	1.24	8.70	180.94	3.86	3.90	379.18	25.17
15	10.47	290.01	2.000	15.00	.30	1.36	8.78	182.75	3.93	4.28	381.32	25.28
16	10.47	275.01	2.000	15.00	.30	1.48	8.88	184.87	4.02	4.66	383.97	25.42
17	10.47	260.01	2.000	15.00	.30	1.61	8.99	187.30	4.11	5.04	387.19	25.60
18	10.47	245.01	2.000	15.00	.30	1.73	9.11	190.07	4.23	5.43	391.01	25.81
19	10.29	230.01	2.000	15.00	.30	1.85	9.25	193.20	4.36	5.82	395.49	26.07
20	10.11	215.01	2.000	15.00	.30	1.98	9.41	196.69	4.51	6.22	400.65	26.37
21	9.87	200.01	2.000	15.00	.30	2.11	9.58	200.56	4.68	6.62	406.54	26.71

OUTFALL PIPELINE

TOTAL DISCHARGE = 7.03 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.24 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 7.25 M

1 FLOW CHARACTERISTICS FOR U(1) = 6.0$_0$ M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.37		6.00	111.83	1.83		405.62	
2	11.53	485.00	.928	15.00	.30	.60	6.05	125.43	1.86	.41	266.11	27.04
3	11.49	470.00	.928	15.00	.30	.99	6.18	128.62	1.95	.67	267.80	17.74
4	11.19	455.00	.928	15.00	.30	1.39	6.43	134.45	2.11	.94	273.07	17.85
5	10.89	440.01	.928	15.00	.30	1.79	6.82	143.45	2.37	1.21	283.52	18.20
6	10.89	425.01	.928	15.00	.30	2.21	7.38	155.98	2.77	1.50	300.42	18.90
7	10.89	410.01	.928	15.00	.30	2.66	8.11	172.31	3.36	1.80	324.70	20.03
8	10.89	395.01	.928	15.00	.30	3.14	9.04	192.66	4.17	2.12	356.95	21.65
9	10.77	380.01	.928	15.00	.30	3.67	10.17	217.28	5.27	2.48	397.66	23.80
10	10.65	365.01	2.000	15.00	.30	.92	10.20	211.51	5.31	2.88	449.67	26.51
11	10.65	350.01	2.000	15.00	.30	1.06	10.24	212.49	5.35	3.33	450.38	29.98
12	10.65	335.01	2.000	15.00	.30	1.20	10.30	213.74	5.40	3.78	451.46	30.03
13	10.47	320.01	2.000	15.00	.30	1.35	10.36	215.27	5.47	4.23	452.98	30.10
14	10.47	305.01	2.000	15.00	.30	1.49	10.44	217.11	5.56	4.68	454.99	30.20
15	10.47	290.01	2.000	15.00	.30	1.64	10.54	219.29	5.66	5.14	457.55	30.33
16	10.47	275.01	2.000	15.00	.30	1.78	10.65	221.83	5.78	5.59	460.74	30.50
17	10.47	260.01	2.000	15.00	.30	1.93	10.78	224.75	5.92	6.05	464.60	30.72
18	10.47	245.01	2.000	15.00	.30	2.08	10.93	228.07	6.09	6.52	469.18	30.97
19	10.29	230.01	2.000	15.00	.30	2.23	11.10	231.82	6.28	6.99	474.55	31.28
20	10.11	215.01	2.000	15.00	.30	2.38	11.29	236.01	6.49	7.46	480.75	31.64
21	9.87	200.01	2.000	15.00	.30	2.53	11.50	240.65	6.74	7.94	487.81	32.05

OUTFALL PIPELINE

TOTAL DISCHARGE = 8.43 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.68 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 10.44 M

1 FLOW CHARACTERISTICS FOR U(1) = 8.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.37		8.00	149.10	3.26		540.82	
2	11.53	485.00	.928	15.00	.30	.80	8.06	167.24	3.31	.54	354.81	36.05
3	11.49	470.00	.928	15.00	.30	1.32	8.24	171.49	3.46	.90	357.07	23.65
4	11.19	455.00	.928	15.00	.30	1.85	8.57	179.26	3.74	1.25	364.08	23.80
5	10.89	440.01	.928	15.00	.30	2.39	9.09	191.26	4.21	1.62	378.00	24.27
6	10.89	425.01	.928	15.00	.30	2.95	9.84	207.97	4.93	1.99	400.54	25.20
7	10.89	410.01	.928	15.00	.30	3.54	10.82	229.74	5.97	2.40	432.91	26.70
8	10.89	395.01	.928	15.00	.30	4.18	12.06	256.87	7.41	2.83	475.91	28.86
9	10.77	380.01	.928	15.00	.30	4.89	13.56	289.70	9.38	3.30	530.18	31.73
10	10.65	365.01	2.000	15.00	.30	1.22	13.60	282.00	9.43	3.83	599.52	35.35
11	10.65	350.01	2.000	15.00	.30	1.41	13.66	285.31	9.51	4.43	600.47	39.97
12	10.65	335.01	2.000	15.00	.30	1.60	13.73	284.96	9.61	5.03	601.91	40.03
13	10.47	320.01	2.000	15.00	.30	1.79	13.82	287.01	9.73	5.64	603.93	40.13
14	10.47	305.01	2.000	15.00	.30	1.99	13.92	289.46	9.88	6.24	606.61	40.26
15	10.47	290.01	2.000	15.00	.30	2.18	14.05	292.36	10.06	6.85	610.03	40.44
16	10.47	275.01	2.000	15.00	.30	2.37	14.20	295.75	10.28	7.46	614.28	40.67
17	10.47	260.01	2.000	15.00	.30	2.57	14.37	299.65	10.53	8.07	619.42	40.95
18	10.47	245.01	2.000	15.00	.30	2.77	14.57	304.08	10.82	8.69	625.54	41.29
19	10.29	230.01	2.000	15.00	.30	2.97	14.80	309.08	11.16	9.32	632.69	41.70
20	10.11	215.01	2.000	15.00	.30	3.17	15.05	314.66	11.54	9.95	640.95	42.18
21	9.87	200.01	2.000	15.00	.30	3.37	15.33	320.84	11.98	10.59	650.36	42.73

OUTFALL PIPELINE

TOTAL DISCHARGE = 11.24 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 3.58 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 18.54 M

1 FLOW CHARACTERISTICS FOR U(1) = 7.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	11.57	500.00			.37		7.00	130.46	2.50		473.22	
2	11.53	485.00	.928	15.00	.30	.70	7.06	146.33	2.54	.47	310.46	31.55
3	11.49	470.00	.928	15.00	.30	1.16	7.21	150.05	2.65	.78	312.44	20.70
4	11.19	455.00	.928	15.00	.30	1.62	7.50	156.85	2.87	1.10	318.57	20.83
5	10.89	440.01	.928	15.00	.30	2.09	7.96	167.35	3.23	1.41	330.76	21.24
6	10.89	425.01	.928	15.00	.30	2.58	8.61	181.97	3.78	1.75	350.48	22.05
7	10.89	410.01	.928	15.00	.30	3.10	9.47	201.03	4.57	2.10	378.80	23.37
8	10.89	395.01	.928	15.00	.30	3.66	10.55	224.77	5.67	2.47	416.43	25.25
9	10.77	380.01	.928	15.00	.30	4.28	11.87	253.49	7.18	2.89	463.92	27.76
10	10.65	365.01	2.000	15.00	.30	1.07	11.90	246.76	7.22	3.36	524.59	30.93
11	10.65	350.01	2.000	15.00	.30	1.24	11.95	247.90	7.28	3.88	525.42	34.97
12	10.65	335.01	2.000	15.00	.30	1.40	12.01	249.35	7.36	4.41	526.68	35.03
13	10.47	320.01	2.000	15.00	.30	1.57	12.09	251.14	7.45	4.93	528.45	35.11
14	10.47	305.01	2.000	15.00	.30	1.74	12.18	253.28	7.57	5.46	530.80	35.23
15	10.47	290.01	2.000	15.00	.30	1.91	12.30	255.83	7.71	5.99	533.79	35.39
16	10.47	275.01	2.000	15.00	.30	2.08	12.43	258.79	7.87	6.52	537.51	35.59
17	10.47	260.01	2.000	15.00	.30	2.25	12.58	262.20	8.06	7.06	542.01	35.83
18	10.47	245.01	2.000	15.00	.30	2.42	12.75	266.08	8.29	7.60	547.36	36.13
19	10.29	230.01	2.000	15.00	.30	2.60	12.95	270.45	8.55	8.15	553.62	36.49
20	10.11	215.01	2.000	15.00	.30	2.77	13.17	275.33	8.84	8.71	560.84	36.91
21	9.87	200.01	2.000	15.00	.30	2.95	13.42	280.75	9.17	9.27	569.08	37.39

OUTFALL PIPELINE

TOTAL DISCHARGE = 9.84 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 3.13 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 14.20 M

MANIFOLD 1
TRACE C

BOTTOM PROFILE

DISTANCE M	DEPTH M
.00	.00
25.00	.00
35.00	.50
40.00	1.50
50.00	3.00
60.00	4.00
70.00	6.00
90.00	8.00
100.00	9.00
125.00	9.20
150.00	9.30
175.00	9.50
200.00	9.80
225.00	9.80
250.00	9.80
275.00	9.90
300.00	10.00
325.00	10.00
350.00	10.50
375.00	10.50
400.00	11.00
425.00	11.00
450.00	11.00
475.00	11.10
510.00	11.30

LIST OF SYMBOLS

N = NO OF PORT
DEPTH(N) = DEPTH AT PORT N
DIST(N) = DISTANCE FROM SHORE
DIA(N) = DIAMETER OF MANIFOLD BETWEEN PORT N AND N-1
DL(N) = LENGTH BETWEEN PORT N AND N-1
D(N) = DIAMETER OF PORT N
V(N) = VELOCITY IN MANIFOLD BETWEEN PORT N AND N-1
U(N) = DISCHARGEVELOCITY OF PORT N
FN(N) = DENSIMETRIC FROUDE NO OF JET AT PORT N
E(N) = TOTAL HEAD AT PORT N
SQ(N) = TOTAL DISCHARGE UP TO PORT N
Q(N) = DISCHARGE OF PORT N
QL(N) = DISCHARGE LOAD PR LENGTH OF MANIFOLD
QDES = DESIGN DISCHARGE FLOW
VMIN = MINIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
VMAX = MAXIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
DENS = (SPEC.GRAV. SEAW.-SPEC.GRAV. WASTEW.)/(SPEC.GRAV. WAS-EW.)
FRM = DARCY FRICTION FACTOR IN MANIFOLD
FRP = DARCY FRICTION FACTOR IN OUTFALL PIPELINE
VPIPE = UPPER LIMIT FOR VELOCITY IN OUTFALL PIPELINE AT DESIGN FLOW

INITIAL VALUES FOR THE CALCULATION OF THE MANIFOLD

QDES = 4.000 CUM/SEC
VMAX = 2.00 M/SEC
VMIN = .30 M/SEC
DIST(1) = 500.00 M
D(1) = 3.00 M/SEC
DIA(2) = .928 M
DL(2) = 15.00 M
D(2) = .30 M
DL(3) = 15.00 M
[illegible] = .001
VPIPE = 1.20 M/SEC
FRM = .100
FRP = .100
PORT NO K1 = 10
DIA(K1) = 2.000 M
DL(K1) = 15.00 M
D(K1) = .30 M

PORT NO K2 = 0
DIA(K2) = .000 M
DL(K2) = .00 M
D(K2) = .00 M

PORT NO K3 = 0
DIA(K3) = .000 M
DL(K3) = .00 M
D(K3) = .00 M

THE LENGTH BETWEEN THE PORTS DL(N) AND THE DIAMETER OF THE PORTS
D(N) ARE KEPT CONSTANT ALONG THE MANIFOLD AND SET EQUAL TO
RESPECTIVELY DL(3) AND D(2).
IF WANTED THE DIA(N),DL(N) AND D(N) CAN BE CHANGED FOR PORT NO
N = K TO DIA(K),DL(K) AND D(K).

1 FLOW CHARACTERISTICS FOR U(1) = 3.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SO(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.24	500.00			.37		3.00	55.91	.46		202.81	
2	11.16	485.00	.928	15.00	.30	.30	3.02	62.72	.47	.20	133.06	13.52
3	11.07	470.00	.928	15.00	.30	.50	3.09	64.32	.49	.34	133.92	8.87
4	11.01	455.00	.928	15.00	.30	.69	3.21	67.23	.53	.47	136.55	8.93
5	10.95	440.00	.928	15.00	.30	.90	3.41	71.73	.59	.61	141.78	9.10
6	10.95	425.00	.928	15.00	.30	1.11	3.69	78.00	.69	.75	150.23	9.45
7	10.95	410.00	.928	15.00	.30	1.33	4.06	86.17	.84	.90	162.37	10.02
8	10.95	395.00	.928	15.00	.30	1.57	4.52	96.34	1.04	1.06	178.49	10.82
9	10.85	380.00	.928	15.00	.30	1.83	5.09	108.66	1.32	1.24	198.88	11.90
10	10.35	365.01	2.000	15.00	.30	.46	5.10	105.79	1.33	1.44	224.90	13.26
11	10.35	350.01	2.000	15.00	.30	.53	5.12	106.28	1.34	1.66	225.26	14.99
12	10.35	335.01	2.000	15.00	.30	.60	5.15	106.90	1.35	1.89	225.80	15.02
13	10.05	320.01	2.000	15.00	.30	.67	5.18	107.68	1.37	2.11	226.58	15.05
14	10.05	305.01	2.000	15.00	.30	.75	5.22	108.60	1.39	2.34	227.59	15.11
15	10.05	290.01	2.000	15.00	.30	.82	5.27	109.69	1.42	2.57	228.87	15.17
16	9.99	275.01	2.000	15.00	.30	.89	5.33	110.96	1.45	2.80	230.47	15.26
17	9.93	260.01	2.000	15.00	.30	.96	5.39	112.42	1.48	3.03	232.40	15.36
18	9.87	245.01	2.000	15.00	.30	1.04	5.47	114.09	1.52	3.26	234.70	15.49
19	9.87	230.01	2.000	15.00	.30	1.11	5.55	115.96	1.57	3.49	237.38	15.65
20	9.87	215.01	2.000	15.00	.30	1.19	5.65	118.05	1.63	3.73	240.47	15.83
21	9.87	200.01	2.000	15.00	.30	1.27	5.75	120.37	1.69	3.97	244.00	16.03

OUTFALL PIPELINE

TOTAL DISCHARGE = 4.22 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.34 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 2.62 M

1 FLOW CHARACTERISTICS FOR U(1) = 4.0₀ M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	11.24	500.00			.37		4.00	74.55	.82		270.41	
2	11.16	485.00	.928	15.00	.30	.40	4.03	85.62	.83	.27	177.41	18.03
3	11.07	470.00	.928	15.00	.30	.66	4.12	85.75	.86	.45	178.55	11.83
4	11.01	455.00	.928	15.00	.30	.93	4.28	89.64	.94	.63	182.05	11.90
5	10.95	440.00	.928	15.00	.30	1.20	4.55	95.63	1.05	.81	189.01	12.14
6	10.95	425.00	.928	15.00	.30	1.48	4.92	105.99	1.23	1.00	200.28	12.60
7	10.95	410.00	.928	15.00	.30	1.77	5.41	114.88	1.49	1.20	216.47	13.35
8	10.95	395.00	.928	15.00	.30	2.09	6.03	126.44	1.85	1.41	237.97	14.43
9	10.65	380.00	.928	15.00	.30	2.44	6.78	144.87	2.34	1.65	265.12	15.86
10	10.35	365.01	2.000	15.00	.30	.61	6.80	141.02	2.36	1.92	299.81	17.67
11	10.35	350.01	2.000	15.00	.30	.71	6.83	141.68	2.38	2.22	300.29	19.99
12	10.35	335.01	2.000	15.00	.30	.80	6.87	142.51	2.40	2.52	301.01	20.02
13	10.05	320.01	2.000	15.00	.30	.90	6.91	143.53	2.43	2.82	302.03	20.07
14	10.05	305.01	2.000	15.00	.30	.99	6.96	144.76	2.47	3.12	303.37	20.14
15	10.05	290.01	2.000	15.00	.30	1.09	7.03	146.21	2.52	3.42	305.08	20.22
16	9.99	275.01	2.000	15.00	.30	1.19	7.10	147.91	2.57	3.73	307.21	20.34
17	9.93	260.01	2.000	15.00	.30	1.29	7.19	149.86	2.63	4.04	309.79	20.48
18	9.87	245.01	2.000	15.00	.30	1.38	7.29	152.08	2.71	4.35	312.85	20.65
19	9.87	230.01	2.000	15.00	.30	1.48	7.40	154.57	2.79	4.66	316.42	20.86
20	9.87	215.01	2.000	15.00	.30	1.58	7.53	157.36	2.89	4.98	320.55	21.09
21	9.87	200.01	2.000	15.00	.30	1.69	7.67	160.46	3.00	5.30	325.25	21.37

OUTFALL PIPELINE

TOTAL DISCHARGE = 5.62 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.79 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 4.64 M

1 FLOW CHARACTERISTICS FOR U(1) = 5.0₀ M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SO(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	11.24	500.00			.37		5.00	93.19	1.27		338.01	
2	11.16	485.00	.928	15.00	.30	.50	5.04	104.53	1.29	.34	221.76	22.53
3	11.07	470.00	.928	15.00	.30	.83	5.15	107.19	1.35	.56	223.18	14.78
4	11.01	455.00	.928	15.00	.30	1.16	5.36	112.04	1.46	.78	227.55	14.88
5	10.95	440.00	.928	15.00	.30	1.49	5.68	119.54	1.65	1.01	236.25	15.17
6	10.95	425.00	.928	15.00	.30	1.84	6.15	129.08	1.93	1.25	250.34	15.75
7	10.95	410.00	.928	15.00	.30	2.21	6.76	143.59	2.33	1.50	270.57	16.69
8	10.95	395.00	.928	15.00	.30	2.61	7.53	160.55	2.89	1.77	297.45	18.64
9	10.65	380.00	.928	15.00	.30	3.05	8.48	181.07	3.66	2.07	331.38	19.83
10	10.35	365.01	2.000	15.00	.30	.76	8.50	176.26	3.69	2.40	374.73	22.09
11	10.35	350.01	2.000	15.00	.30	.88	8.54	177.08	3.72	2.77	375.33	24.98
12	10.35	335.01	2.000	15.00	.30	1.00	8.58	176.12	3.75	3.15	376.23	25.02
13	10.05	320.01	2.000	15.00	.30	1.12	8.64	179.40	3.80	3.52	377.50	25.08
14	10.05	305.01	2.000	15.00	.30	1.24	8.70	180.93	3.86	3.90	379.17	25.17
15	10.05	290.01	2.000	15.00	.30	1.36	8.78	182.75	3.93	4.28	381.31	25.28
16	9.99	275.01	2.000	15.00	.30	1.48	8.88	184.87	4.02	4.66	383.97	25.42
17	9.93	260.01	2.000	15.00	.30	1.61	8.99	187.30	4.11	5.04	387.19	25.60
18	9.87	245.01	2.000	15.00	.30	1.73	9.11	190.07	4.23	5.43	391.01	25.81
19	9.87	230.01	2.000	15.00	.30	1.85	9.25	193.20	4.36	5.82	395.48	26.07
20	9.87	215.01	2.000	15.00	.30	1.98	9.41	196.68	4.51	6.22	400.64	26.37
21	9.87	200.01	2.000	15.00	.30	2.11	9.58	200.55	4.68	6.62	406.52	26.71

OUTFALL PIPELINE

TOTAL DISCHARGE = 7.03 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.24 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 7.25 M

1 FLOW CHARACTERISTICS FOR U(1) = 6.0 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M/SEC
1	11.24	500.00			.37		6.00	111.83	1.83		405.62	
2	11.16	485.00	.928	15.00	.30	.60	6.05	120.43	1.86	.41	266.11	27.04
3	11.07	470.00	.928	15.00	.30	.99	6.18	126.62	1.95	.67	267.81	17.74
4	11.01	455.00	.928	15.00	.30	1.39	6.43	134.45	2.11	.94	273.06	17.85
5	10.95	440.00	.928	15.00	.30	1.79	6.82	145.44	2.37	1.21	283.49	18.20
6	10.95	425.00	.928	15.00	.30	2.21	7.38	155.97	2.77	1.50	300.40	18.90
7	10.96	410.00	.928	15.00	.30	2.66	8.11	172.30	3.36	1.80	324.68	20.03
8	10.95	395.00	.928	15.00	.30	3.14	9.04	192.65	4.17	2.12	356.93	21.65
9	10.85	380.00	.928	15.00	.30	3.67	10.17	217.28	5.27	2.48	397.64	23.80
10	10.35	365.01	2.000	15.00	.30	.92	10.20	211.51	5.31	2.88	449.66	26.51
11	10.35	350.01	2.000	15.00	.30	1.06	10.24	212.49	5.35	3.33	450.37	29.98
12	10.35	335.01	2.000	15.00	.30	1.20	10.30	213.73	5.40	3.78	451.45	30.02
13	10.35	320.01	2.000	15.00	.30	1.35	10.36	215.27	5.47	4.23	452.97	30.10
14	10.35	305.01	2.000	15.00	.30	1.49	10.44	217.11	5.56	4.68	454.98	30.20
15	10.35	290.01	2.000	15.00	.30	1.64	10.54	219.28	5.66	5.14	457.55	30.33
16	9.99	275.01	2.000	15.00	.30	1.78	10.65	221.83	5.78	5.59	460.74	30.50
17	9.93	260.01	2.000	15.00	.30	1.93	10.78	224.75	5.92	6.05	464.60	30.72
18	9.87	245.01	2.000	15.00	.30	2.08	10.93	228.07	6.09	6.52	469.18	30.97
19	9.87	230.01	2.000	15.00	.30	2.23	11.10	231.82	6.28	6.99	474.55	31.28
20	9.87	215.01	2.000	15.00	.30	2.38	11.29	236.00	6.49	7.46	480.73	31.64
21	9.87	200.01	2.000	15.00	.30	2.53	11.50	240.64	6.74	7.94	487.79	32.65

OUTFALL PIPELINE

TOTAL DISCHARGE = 3.43 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.68 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 10.43 M

1 FLOW CHARACTERISTICS FOR U(1) = 7.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
											473.22	
1	12.24	500.00			.37		7.00	130.46	2.50		473.22	
2	12.16	485.00	.928	15.00	.30	.70	7.06	146.33	2.54	.47	310.46	31.55
3	12.07	470.00	.928	15.00	.30	1.16	7.21	150.06	2.65	.78	312.44	20.70
4	12.01	455.00	.928	15.00	.30	1.62	7.50	156.85	2.87	1.10	318.56	20.83
5	10.95	440.00	.928	15.00	.30	2.09	7.96	167.34	3.23	1.41	330.74	21.24
6	10.95	425.00	.928	15.00	.30	2.58	8.61	181.97	3.78	1.75	350.46	22.05
7	10.95	410.00	.928	15.00	.30	3.10	9.47	201.02	4.57	2.10	378.78	23.36
8	10.95	395.00	.928	15.00	.30	3.66	10.55	224.76	5.67	2.47	416.41	25.25
9	10.65	380.00	.928	15.00	.30	4.26	11.87	253.48	7.18	2.89	465.90	27.76
10	10.35	365.01	2.000	15.00	.30	1.07	11.90	246.75	7.22	3.35	524.59	30.93
11	10.35	350.01	2.000	15.00	.30	1.24	11.95	247.90	7.28	3.88	525.42	34.97
12	10.35	335.01	2.000	15.00	.30	1.40	12.01	249.35	7.36	4.40	526.67	35.03
13	10.05	320.01	2.000	15.00	.30	1.57	12.09	251.13	7.45	4.93	528.45	35.11
14	10.05	305.01	2.000	15.00	.30	1.74	12.18	253.28	7.57	5.46	530.79	35.23
15	10.05	290.01	2.000	15.00	.30	1.91	12.30	255.92	7.71	5.99	533.79	35.39
16	9.99	275.01	2.000	15.00	.30	2.08	12.43	258.79	7.87	6.52	537.50	35.59
17	9.93	260.01	2.000	15.00	.30	2.25	12.58	262.20	8.06	7.06	542.01	35.83
18	9.87	245.01	2.000	15.00	.30	2.42	12.75	266.08	8.29	7.60	547.36	36.13
19	9.87	230.01	2.000	15.00	.30	2.60	12.95	270.45	8.55	8.15	553.61	36.49
20	9.87	215.01	2.000	15.00	.30	2.77	13.17	275.33	8.84	8.71	560.83	36.91
21	9.87	200.01	2.000	15.00	.30	2.95	13.41	280.74	9.17	9.27	569.06	37.39

OUTFALL PIPELINE

TOTAL DISCHARGE = 9.64 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 3.13 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 14.20 M

1 FLOW CHARACTERISTICS FOR U(1) = 8.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	11.24	500.00			.37		8.00	149.10	3.26		540.82	
2	11.16	485.00	.928	15.00	.30	.80	8.06	167.24	3.31	.54	354.81	36.05
3	11.07	470.00	.928	15.00	.30	1.32	8.24	171.49	3.46	.90	357.07	23.65
4	11.01	455.00	.928	15.00	.30	1.85	8.57	179.26	3.74	1.25	364.07	23.80
5	10.95	440.00	.928	15.00	.30	2.39	9.09	191.25	4.21	1.62	377.98	24.27
6	10.95	425.00	.928	15.00	.30	2.95	9.84	207.96	4.93	1.99	400.52	25.20
7	10.95	410.00	.928	15.00	.30	3.54	10.82	229.73	5.97	2.40	432.89	26.70
8	10.95	395.00	.928	15.00	.30	4.18	12.06	256.86	7.41	2.83	475.89	28.86
9	10.85	380.00	.928	15.00	.30	4.89	13.56	289.69	9.38	3.30	530.17	31.73
10	10.35	365.01	2.000	15.00	.30	1.22	13.60	282.00	9.43	3.83	599.51	35.34
11	10.35	350.01	2.000	15.00	.30	1.41	13.66	285.31	9.51	4.43	680.46	39.97
12	10.35	335.01	2.000	15.00	.30	1.60	13.73	284.96	9.61	5.03	681.90	40.03
13	10.05	320.01	2.000	15.00	.30	1.79	13.82	287.00	9.73	5.64	683.93	40.13
14	10.05	305.01	2.000	15.00	.30	1.99	13.92	289.46	9.88	6.24	686.61	40.26
15	10.05	290.01	2.000	15.00	.30	2.18	14.05	292.36	10.06	6.85	690.03	40.44
16	9.99	275.01	2.000	15.00	.30	2.37	14.20	295.75	10.28	7.46	694.28	40.67
17	9.93	260.01	2.000	15.00	.30	2.57	14.37	299.65	10.53	8.07	699.42	40.95
18	9.87	245.01	2.000	15.00	.30	2.77	14.57	304.08	10.82	8.69	705.54	41.29
19	9.87	230.01	2.000	15.00	.30	2.97	14.80	309.07	11.16	9.32	712.69	41.70
20	9.87	215.01	2.000	15.00	.30	3.17	15.05	314.65	11.54	9.95	720.94	42.18
21	9.87	200.01	2.000	15.00	.30	3.37	15.33	320.84	11.98	10.59	730.34	42.73

OUTFALL PIPELINE

TOTAL DISCHARGE = 11.24 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 3.58 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 10.54 M

DISTANCE M	DEPTH M
.00	.00
25.00	.00
35.00	1.00
40.00	2.00
50.00	3.50
62.00	5.00
75.00	6.50
90.00	8.50
100.00	9.00
120.00	9.00
125.00	9.00
150.00	9.50
175.00	10.00
200.00	11.00
210.00	11.50
225.00	12.00
250.00	12.50
275.00	13.00
300.00	13.50
325.00	13.60
350.00	14.00
375.00	14.00
400.00	14.00
450.00	14.00
510.00	14.00

MANIFOLD 2

TRACE A

LIST OF SYMBOLS

N = NO OF PORT
DEPTH(N) = DEPTH AT PORT N
DIST(N) = DISTANCE FROM SHORE
DIA(N) = DIAMETER OF MANIFOLD BETWEEN PORT N AND N-1
DL(N) = LENGTH BETWEEN PORT N AND N-1
D(N) = DIAMETER OF PORT N
V(N) = VELOCITY IN MANIFOLD BETWEEN PORT N AND N-1
U(N) = DISCHARGEVELOCITY OF PORT N
FN(N) = DENSIMETRIC FROUDE NO OF JET AT PORT N
E(N) = TOTAL HEAD AT PORT N
SQ(N) = TOTAL DISCHARGE UP TO PORT N
Q(N) = DISCHARGE OF PORT N
QL(N) = DISCHARGE LOAD PR LENGTH OF MANIFOLD
QDES = DESIGN DISCHARGE FLOW
VMIN = MINIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
VMAX = MAXIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
DENS = (SPEC.GRAV. SEAW.-SPEC.GRAV. WASTEW.)/(SPEC.GRAV. WASTEW.)
FRM = DARCY FRICTION FACTOR IN MANIFOLD
FRP = DARCY FRICTION FACTOR IN OUTFALL PIPELINE
VPIPE = UPPER LIMIT FOR VELOCITY IN OUTFALL PIPELINE AT DESIGN FLOW

INITIAL VALUES FOR THE CALCULATION OF THE MANIFOLD

QDES = 4.000 CUM/SEC
VMAX = 2.00 M/SEC
VMIN = .40 M/SEC
DIST(1) = 500.00 M
U(1) = 4.00 M/SEC
DIA(2) = .928 M
DL(2) = 15.00 M
D(2) = .27 M
DL(3) = 15.00 M
DENS = .001
VPIPE = 1.20 M/SEC
FRM = .100
FRP = .100
PORT NO K1 = 9
DIA(K1) = 2.000 M
DL(K1) = 15.00 M
D(K1) = .27 M

PORT NO K2 = 0
DIA(K2) = .000 M
DL(K2) = .00 M
D(K2) = .00 M

PORT NO K3 = 0
DIA(K3) = .000 M
DL(K3) = .00 M
D(K3) = .00 M

THE LENGTH BETWEEN THE PORTS DL(N) AND THE DIAMETER OF THE PORTS D(N) ARE KEPT CONSTANT ALONG THE MANIFOLD AND SET EQUAL TO RESPECTIVELY DL(3) AND D(2).
IF WANTED THE DIA(N),DL(N) AND D(N) CAN BE CHANGED FOR PORT NO N = K TO DIA(K),DL(K) AND D(K).

1

FLOW CHARACTERISTICS FOR U(1) = 4.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	14.00	500.00			.37		4.00	74.55	.82		270.41	
2	14.00	485.00	.928	15.00	.27	.40	4.03	88.14	.83	.27	143.70	18.03
3	14.00	470.00	.928	15.00	.27	.61	4.11	90.03	.86	.41	144.66	9.58
4	14.00	455.00	.928	15.00	.27	.83	4.24	93.28	.92	.56	147.11	9.64
5	14.00	440.00	.928	15.00	.27	1.04	4.44	98.15	1.01	.71	151.62	9.81
6	14.00	425.00	.928	15.00	.27	1.27	4.73	104.85	1.14	.86	158.68	10.11
7	14.00	410.00	.928	15.00	.27	1.50	5.10	113.52	1.32	1.02	168.64	10.58
8	14.00	395.00	.928	15.00	.27	1.75	5.56	124.27	1.58	1.18	181.79	11.24
9	14.00	380.00	2.000	15.00	.27	.44	5.58	121.78	1.58	1.37	199.40	12.12
10	14.00	365.00	2.000	15.00	.27	.50	5.59	122.20	1.59	1.57	199.66	13.29
11	14.00	350.00	2.000	15.00	.27	.56	5.61	122.72	1.61	1.77	200.03	13.31
12	14.00	335.00	2.000	15.00	.27	.63	5.64	123.36	1.62	1.97	200.53	13.34
13	13.76	320.00	2.000	15.00	.27	.69	5.67	124.13	1.64	2.17	201.20	13.37
14	13.70	305.00	2.000	15.00	.27	.75	5.71	125.03	1.66	2.37	202.03	13.41
15	13.64	290.00	2.000	15.00	.27	.82	5.75	126.07	1.69	2.57	203.06	13.47
16	13.34	275.01	2.000	15.00	.27	.88	5.80	127.28	1.72	2.77	204.30	13.54
17	13.04	260.01	2.000	15.00	.27	.95	5.86	128.65	1.75	2.98	205.77	13.62
18	12.74	245.01	2.000	15.00	.27	1.01	5.93	130.19	1.79	3.18	207.47	13.72
19	12.44	230.01	2.000	15.00	.27	1.08	6.00	131.90	1.84	3.39	209.43	13.83
20	12.14	215.02	2.000	15.00	.27	1.15	6.08	133.81	1.89	3.60	211.66	13.96
21	11.64	200.03	2.000	15.00	.27	1.21	6.18	135.91	1.94	3.81	214.18	14.11

OUTFALL PIPELINE

TOTAL DISCHARGE = 4.03 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.28 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 2.80 M

1

FLOW CHARACTERISTICS FOR U(1) = 1.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	14.00	500.00			.37		1.00	18.64	.05		67.60	
2	14.00	485.00	.928	15.00	.27	.10	1.01	22.04	.05	.07	35.92	4.51
3	14.00	470.00	.928	15.00	.27	.15	1.03	22.51	.05	.10	36.17	2.39
4	14.00	455.00	.928	15.00	.27	.21	1.06	23.32	.06	.14	36.78	2.41
5	14.00	440.00	.928	15.00	.27	.26	1.11	24.54	.06	.18	37.91	2.45
6	14.00	425.00	.928	15.00	.27	.32	1.18	26.21	.07	.21	39.67	2.53
7	14.00	410.00	.928	15.00	.27	.38	1.27	28.38	.08	.25	42.16	2.64
8	14.00	395.00	.928	15.00	.27	.44	1.39	31.07	.10	.30	45.45	2.81
9	14.00	380.00	2.000	15.00	.27	.11	1.39	30.45	.10	.34	49.85	3.03
10	14.00	365.00	2.000	15.00	.27	.12	1.40	30.55	.10	.39	49.91	3.32
11	14.00	350.00	2.000	15.00	.27	.14	1.40	30.68	.10	.44	50.01	3.33
12	14.00	335.00	2.000	15.00	.27	.16	1.41	30.84	.10	.49	50.13	3.33
13	13.76	320.00	2.000	15.00	.27	.17	1.42	31.07	.10	.54	50.36	3.34
14	13.70	305.00	2.000	15.00	.27	.19	1.43	31.30	.10	.59	50.58	3.36
15	13.64	290.00	2.000	15.00	.27	.20	1.44	31.57	.11	.64	50.85	3.37
16	13.34	275.01	2.000	15.00	.27	.22	1.46	31.91	.11	.69	51.23	3.39
17	13.04	260.01	2.000	15.00	.27	.24	1.47	32.29	.11	.74	51.66	3.42
18	12.74	245.01	2.000	15.00	.27	.25	1.49	32.72	.11	.80	52.16	3.44
19	12.44	230.01	2.000	15.00	.27	.27	1.51	33.18	.12	.85	52.71	3.48
20	12.14	215.02	2.000	15.00	.27	.29	1.53	33.70	.12	.90	53.33	3.51
21	11.64	200.03	2.000	15.00	.27	.30	1.56	34.28	.12	.95	54.07	3.56

OUTFALL PIPELINE

TOTAL DISCHARGE = 1.01 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .32 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = .19 M

1

FLOW CHARACTERISTICS FOR U(1) = 2.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	14.00	500.00			.37		2.00	37.28	.20		135.21	
2	14.00	485.00	.928	15.00	.27	.20	2.02	44.07	.21	.14	71.85	9.01
3	14.00	470.00	.928	15.00	.27	.31	2.05	45.02	.21	.21	72.33	4.79
4	14.00	455.00	.928	15.00	.27	.41	2.12	46.64	.23	.28	73.56	4.82
5	14.00	440.00	.928	15.00	.27	.52	2.22	49.08	.25	.35	75.81	4.90
6	14.00	425.00	.928	15.00	.27	.63	2.36	52.42	.28	.43	79.34	5.05
7	14.00	410.00	.928	15.00	.27	.75	2.55	56.76	.33	.51	84.32	5.29
8	14.00	395.00	.928	15.00	.27	.88	2.78	62.14	.39	.59	90.89	5.62
9	14.00	380.00	2.000	15.00	.27	.22	2.79	60.89	.40	.68	99.70	6.06
10	14.00	365.00	2.000	15.00	.27	.25	2.80	61.10	.40	.78	99.83	6.65
11	14.00	350.00	2.000	15.00	.27	.28	2.81	61.36	.40	.88	100.01	6.66
12	14.00	335.00	2.000	15.00	.27	.31	2.82	61.68	.41	.98	100.26	6.67
13	13.76	320.00	2.000	15.00	.27	.34	2.84	62.08	.41	1.08	100.62	6.68
14	13.70	305.00	2.000	15.00	.27	.38	2.86	62.53	.42	1.18	101.04	6.71
15	13.64	290.00	2.000	15.00	.27	.41	2.88	63.06	.42	1.28	101.56	6.74
16	13.34	275.01	2.000	15.00	.27	.44	2.90	63.68	.43	1.39	102.21	6.77
17	13.04	260.01	2.000	15.00	.27	.47	2.93	64.38	.44	1.49	102.97	6.81
18	12.74	245.01	2.000	15.00	.27	.51	2.97	65.16	.45	1.59	103.85	6.86
19	12.44	230.01	2.000	15.00	.27	.54	3.01	66.04	.46	1.70	104.86	6.92
20	12.14	215.02	2.000	15.00	.27	.57	3.05	67.00	.47	1.80	106.00	6.99
21	11.64	200.03	2.000	15.00	.27	.61	3.09	68.08	.49	1.91	107.30	7.07

OUTFALL PIPELINE

TOTAL DISCHARGE = 2.01 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .64 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = .71 M

1

FLOW CHARACTERISTICS FOR U(1) = 3.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	14.00	500.00			.37		3.00	55.91	.46		202.81	
2	14.00	485.00	.928	15.00	.27	.30	3.02	66.11	.47	.20	107.77	13.52
3	14.00	470.00	.928	15.00	.27	.46	3.08	67.52	.48	.31	108.50	7.18
4	14.00	455.00	.928	15.00	.27	.62	3.18	69.96	.52	.42	110.33	7.23
5	14.00	440.00	.928	15.00	.27	.78	3.33	73.61	.57	.53	113.72	7.36
6	14.00	425.00	.928	15.00	.27	.95	3.54	78.64	.64	.64	119.01	7.58
7	14.00	410.00	.928	15.00	.27	1.13	3.82	85.14	.74	.76	126.48	7.93
8	14.00	395.00	.928	15.00	.27	1.31	4.17	93.21	.89	.89	136.34	8.43
9	14.00	380.00	2.000	15.00	.27	.33	4.18	91.34	.89	1.02	149.55	9.09
10	14.00	365.00	2.000	15.00	.27	.37	4.19	91.65	.90	1.17	149.74	9.97
11	14.00	350.00	2.000	15.00	.27	.42	4.21	92.04	.90	1.32	150.02	9.98
12	14.00	335.00	2.000	15.00	.27	.47	4.23	92.52	.91	1.47	150.40	10.00
13	13.76	320.00	2.000	15.00	.27	.52	4.25	93.10	.92	1.62	150.91	10.03
14	13.70	305.00	2.000	15.00	.27	.57	4.28	93.78	.93	1.78	151.54	10.06
15	13.64	290.00	2.000	15.00	.27	.61	4.32	94.56	.95	1.93	152.30	10.10
16	13.34	275.01	2.000	15.00	.27	.66	4.35	95.47	.97	2.08	153.25	10.15
17	13.04	260.01	2.000	15.00	.27	.71	4.40	96.51	.99	2.23	154.36	10.22
18	12.74	245.01	2.000	15.00	.27	.76	4.45	97.67	1.01	2.39	155.65	10.29
19	12.44	230.01	2.000	15.00	.27	.81	4.50	98.96	1.03	2.54	157.13	10.38
20	12.14	215.02	2.000	15.00	.27	.86	4.57	100.39	1.06	2.70	158.81	10.48
21	11.64	200.03	2.000	15.00	.27	.91	4.63	101.98	1.09	2.86	160.72	10.59

OUTFALL PIPELINE

TOTAL DISCHARGE = 3.02 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .96 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 1.58 M

1 FLOW CHARACTERISTICS FOR U(1) = 5.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	14.00	500.00			.37		5.00	93.19	1.27		338.01	
2	14.00	485.00	.928	15.00	.27	.50	5.04	110.18	1.29	.34	179.62	22.53
3	14.00	470.00	.928	15.00	.27	.77	5.13	112.54	1.34	.52	180.83	11.97
4	14.00	455.00	.928	15.00	.27	1.03	5.30	116.60	1.43	.70	183.89	12.06
5	14.00	440.00	.928	15.00	.27	1.31	5.55	122.69	1.57	.88	189.53	12.26
6	14.00	425.00	.928	15.00	.27	1.59	5.91	131.06	1.78	1.07	198.35	12.64
7	14.00	410.00	.928	15.00	.27	1.88	6.37	141.90	2.07	1.27	210.81	13.22
8	14.00	395.00	.928	15.00	.27	2.19	6.95	155.34	2.46	1.48	227.24	14.05
9	14.00	380.00	2.000	15.00	.27	.54	6.97	152.23	2.48	1.71	249.25	15.15
10	14.00	365.00	2.000	15.00	.27	.62	6.99	152.75	2.49	1.96	249.57	16.62
11	14.00	350.00	2.000	15.00	.27	.70	7.02	153.40	2.51	2.21	250.03	16.64
12	14.00	335.00	2.000	15.00	.27	.78	7.05	154.20	2.53	2.46	250.66	16.67
13	13.76	320.00	2.000	15.00	.27	.86	7.09	155.16	2.56	2.71	251.49	16.71
14	13.70	305.00	2.000	15.00	.27	.94	7.14	156.28	2.60	2.96	252.53	16.77
15	13.64	290.00	2.000	15.00	.27	1.02	7.19	157.58	2.64	3.21	253.81	16.84
16	13.34	275.01	2.000	15.00	.27	1.10	7.26	159.09	2.68	3.47	255.36	16.92
17	13.04	260.01	2.000	15.00	.27	1.19	7.33	160.79	2.74	3.72	257.18	17.02
18	12.74	245.01	2.000	15.00	.27	1.27	7.41	162.71	2.80	3.98	259.31	17.15
19	12.44	230.01	2.000	15.00	.27	1.35	7.50	164.85	2.87	4.24	261.75	17.29
20	12.14	215.02	2.000	15.00	.27	1.43	7.60	167.23	2.95	4.50	264.53	17.45
21	11.64	200.03	2.000	15.00	.27	1.52	7.72	169.85	3.04	4.76	267.67	17.64

OUTFALL PIPELINE

TOTAL DISCHARGE = 5.03 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.60 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 4.36 M

1

FLOW CHARACTERISTICS FOR U(1) = 6.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	14.00	500.00			.37		6.00	111.83	1.83		405.62	
2	14.00	485.00	.928	15.00	.27	.60	6.05	132.21	1.86	.41	215.54	27.04
3	14.00	470.00	.928	15.00	.27	.92	6.16	135.05	1.93	.62	217.00	14.37
4	14.00	455.00	.928	15.00	.27	1.24	6.36	139.92	2.06	.84	220.67	14.47
5	14.00	440.00	.928	15.00	.27	1.57	6.66	147.23	2.26	1.06	227.43	14.71
6	14.00	425.00	.928	15.00	.27	1.90	7.09	157.27	2.56	1.29	238.02	15.16
7	14.00	410.00	.928	15.00	.27	2.25	7.65	170.28	2.98	1.52	252.97	15.87
8	14.00	395.00	.928	15.00	.27	2.63	8.34	186.41	3.55	1.78	272.68	16.86
9	14.00	380.00	2.000	15.00	.27	.65	8.36	182.67	3.57	2.05	299.11	18.18
10	14.00	365.00	2.000	15.00	.27	.75	8.39	183.30	3.59	2.35	299.48	19.94
11	14.00	350.00	2.000	15.00	.27	.84	8.42	184.08	3.61	2.65	300.04	19.97
12	14.00	335.00	2.000	15.00	.27	.94	8.46	185.04	3.65	2.95	300.79	20.00
13	13.76	320.00	2.000	15.00	.27	1.03	8.51	186.18	3.69	3.25	301.79	20.05
14	13.70	305.00	2.000	15.00	.27	1.13	8.56	187.53	3.74	3.55	303.03	20.12
15	13.64	290.00	2.000	15.00	.27	1.23	8.63	189.10	3.80	3.85	304.56	20.20
16	13.34	275.01	2.000	15.00	.27	1.32	8.71	190.90	3.86	4.16	306.42	20.30
17	13.04	260.01	2.000	15.00	.27	1.42	8.79	192.94	3.94	4.47	308.60	20.43
18	12.74	245.01	2.000	15.00	.27	1.52	8.89	195.24	4.03	4.77	311.15	20.57
19	12.44	230.01	2.000	15.00	.27	1.62	9.00	197.81	4.13	5.08	314.07	20.74
20	12.14	215.02	2.000	15.00	.27	1.72	9.12	200.65	4.24	5.40	317.40	20.94
21	11.64	200.03	2.000	15.00	.27	1.82	9.26	203.79	4.37	5.72	321.16	21.16

OUTFALL PIPELINE

TOTAL DISCHARGE = 6.04 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.92 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 6.27 M

1 FLOW CHARACTERISTICS FOR U(1) = 7.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	14.00	500.00			.37		7.00	130.46	2.50		473.22	
2	14.00	485.00	.928	15.00	.27	.70	7.06	154.25	2.54	.47	251.47	31.55
3	14.00	470.00	.928	15.00	.27	1.07	7.19	157.55	2.63	.72	253.16	16.76
4	14.00	455.00	.928	15.00	.27	1.45	7.42	163.24	2.80	.98	257.45	16.88
5	14.00	440.00	.928	15.00	.27	1.83	7.77	171.77	3.08	1.24	265.34	17.16
6	14.00	425.00	.928	15.00	.27	2.22	8.27	183.49	3.49	1.50	277.69	17.69
7	14.00	410.00	.928	15.00	.27	2.63	8.92	198.66	4.06	1.78	295.13	18.51
8	14.00	395.00	.928	15.00	.27	3.07	9.74	217.48	4.83	2.07	318.13	19.68
9	14.00	380.00	2.000	15.00	.27	.76	9.76	213.12	4.85	2.39	348.96	21.21
10	14.00	365.00	2.000	15.00	.27	.87	9.79	213.85	4.88	2.74	349.40	23.26
11	14.00	350.00	2.000	15.00	.27	.98	9.82	214.76	4.92	3.09	350.04	23.29
12	14.00	335.00	2.000	15.00	.27	1.10	9.87	215.87	4.97	3.44	350.92	23.34
13	13.76	320.00	2.000	15.00	.27	1.21	9.93	217.21	5.02	3.79	352.08	23.39
14	13.70	305.00	2.000	15.00	.27	1.32	9.99	218.78	5.09	4.14	353.54	23.47
15	13.64	290.00	2.000	15.00	.27	1.43	10.07	220.61	5.17	4.50	355.32	23.57
16	13.34	275.01	2.000	15.00	.27	1.55	10.16	222.71	5.26	4.85	357.48	23.69
17	13.04	260.01	2.000	15.00	.27	1.66	10.26	225.09	5.36	5.21	360.02	23.83
18	12.74	245.01	2.000	15.00	.27	1.77	10.37	227.77	5.48	5.57	362.99	24.00
19	12.44	230.01	2.000	15.00	.27	1.89	10.50	230.77	5.62	5.93	366.40	24.20
20	12.14	215.02	2.000	15.00	.27	2.01	10.64	234.08	5.77	6.30	370.28	24.43
21	11.64	200.03	2.000	15.00	.27	2.12	10.80	237.74	5.95	6.67	374.66	24.69

OUTFALL PIPELINE

TOTAL DISCHARGE = 7.04 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.24 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 8.53 M

1 FLOW CHARACTERISTICS FOR U(1) = 8.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	14.00	500.00			.37		8.00	149.10	3.26		540.82	
2	14.00	485.00	.928	15.00	.27	.80	8.06	176.28	3.31	.54	287.39	36.05
3	14.00	470.00	.928	15.00	.27	1.23	8.21	180.06	3.44	.83	289.33	19.16
4	14.00	455.00	.928	15.00	.27	1.65	8.48	186.56	3.66	1.12	294.22	19.29
5	14.00	440.00	.928	15.00	.27	2.09	8.88	196.30	4.02	1.41	303.24	19.61
6	14.00	425.00	.928	15.00	.27	2.54	9.45	209.70	4.55	1.72	317.35	20.22
7	14.00	410.00	.928	15.00	.27	3.01	10.20	227.04	5.30	2.03	337.29	21.16
8	14.00	395.00	.928	15.00	.27	3.51	11.13	248.55	6.31	2.37	363.58	22.49
9	14.00	380.00	2.000	15.00	.27	.87	11.15	243.56	6.34	2.73	398.81	24.24
10	14.00	365.00	2.000	15.00	.27	1.00	11.19	244.40	6.38	3.13	399.31	26.59
11	14.00	350.00	2.000	15.00	.27	1.12	11.23	245.44	6.43	3.53	400.05	26.62
12	14.00	335.00	2.000	15.00	.27	1.25	11.28	246.71	6.49	3.93	401.06	26.67
13	13.76	320.00	2.000	15.00	.27	1.38	11.34	248.24	6.56	4.33	402.38	26.74
14	13.70	305.00	2.000	15.00	.27	1.51	11.42	250.04	6.65	4.73	404.04	26.83
15	13.64	290.00	2.000	15.00	.27	1.64	11.51	252.12	6.75	5.14	406.08	26.94
16	13.34	275.01	2.000	15.00	.27	1.77	11.61	254.52	6.87	5.54	408.54	27.07
17	13.04	260.01	2.000	15.00	.27	1.90	11.72	257.24	7.00	5.95	411.45	27.24
18	12.74	245.01	2.000	15.00	.27	2.03	11.85	260.30	7.16	6.36	414.83	27.43
19	12.44	230.01	2.000	15.00	.27	2.16	12.00	263.72	7.34	6.78	418.73	27.66
20	12.14	215.02	2.000	15.00	.27	2.29	12.16	267.51	7.54	7.20	423.16	27.92
21	11.64	200.03	2.000	15.00	.27	2.43	12.35	271.69	7.77	7.62	428.16	28.21

OUTFALL PIPELINE

TOTAL DISCHARGE = 8.05 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.56 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 11.14 M

BOTTOM PROFILE

DISTANCE M	DEPTH M
.00	.00
25.00	.00
40.00	1.00
50.00	3.00
60.00	4.50
65.00	5.00
75.00	6.50
90.00	7.00
100.00	8.50
125.00	9.00
150.00	9.10
175.00	9.50
200.00	9.80
225.00	10.20
250.00	10.50
275.00	10.50
300.00	10.50
325.00	10.50
350.00	10.80
375.00	10.80
400.00	11.00
425.00	11.00
450.00	11.00
475.00	11.50
510.00	11.60

MANIFOLD 2
TRACE B

LIST OF SYMBOLS

N = NO OF PORT
DEPTH(N) = DEPTH AT PORT N
DIST(N) = DISTANCE FROM SHORE
DIA(N) = DIAMETER OF MANIFOLD BETWEEN PORT N AND N-1
DL(N) = LENGTH BETWEEN PORT N AND N-1
D(N) = DIAMETER OF PORT N
V(N) = VELOCITY IN MANIFOLD BETWEEN PORT N AND N-1
U(N) = DISCHARGEVELOCITY OF PORT N
FN(N) = DENSIMETRIC FROUDE NO OF JET AT PORT N
E(N) = TOTAL HEAD AT PORT N
SQ(N) = TOTAL DISCHARGE UP TO PORT N
Q(N) = DISCHARGE OF PORT N
QL(N) = DISCHARGE LOAD PR LENGTH OF MANIFOLD
QDES = DESIGN DISCHARGE FLOW
VMIN = MINIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
VMAX = MAXIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
DENS = (SPEC.GRAV. SEAW.-SPEC.GRAV. WASTEW.)/(SPEC.GRAV. WASTEW.)
FRM = DARCY FRICTION FACTOR IN MANIFOLD
FRP = DARCY FRICTION FACTOR IN OUTFALL PIPELINE
VPIPE = UPPER LIMIT FOR VELOCITY IN OUTFALL PIPELINE AT DESIGN FLOW

INITIAL VALUES FOR THE CALCULATION OF THE MANIFOLD

QDES = 4.000 CUM/SEC
VMAX = 2.00 M/SEC
VMIN = .40 M/SEC
DIST(1) = 500.00 M
U(1) = 4.00 M/SEC
DIA(2) = .928 M
DL(2) = 15.00 M
D(2) = .27 M
DL(3) = 15.00 M
DENS = .001
VPIPE = 1.20 M/SEC
FRM = .100
FRP = .100
PORT NO K1 = 9
DIA(K1) = 2.000 M
DL(K1) = 15.00 M
D(K1) = .27 M

PORT NO K2 = 0
DIA(K2) = .000 M
DL(K2) = .00 M
D(K2) = .00 M

PORT NO K3 = 0
DIA(K3) = .000 M
DL(K3) = .00 M
D(K3) = .00 M

THE LENGTH BETWEEN THE PORTS DL(N) AND THE DIAMETER OF THE PORTS
D(N) ARE KEPT CONSTANT ALONG THE MANIFOLD AND SET EQUAL TO
RESPECTIVELY DL(3) AND D(2).
IF WANTED THE DIA(N),DL(N) AND D(N) CAN BE CHANGED FOR PORT NO
N = K TO DIA(K),DL(K) AND D(K).

1 FLOW CHARACTERISTICS FOR U(1) = 4.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.37		4.00	74.55	.82		270.41	
2	11.53	485.00	.928	15.00	.27	.40	4.03	88.14	.83	.27	143.70	18.03
3	11.49	470.00	.928	15.00	.27	.61	4.11	90.04	.86	.41	144.67	9.58
4	11.19	455.00	.928	15.00	.27	.83	4.24	93.30	.92	.56	147.14	9.64
5	10.89	440.01	.928	15.00	.27	1.04	4.44	98.19	1.01	.71	151.68	9.81
6	10.89	425.01	.928	15.00	.27	1.27	4.73	104.88	1.14	.86	158.73	10.11
7	10.89	410.01	.928	15.00	.27	1.50	5.10	113.55	1.33	1.02	168.70	10.58
8	10.89	395.01	.928	15.00	.27	1.75	5.56	124.31	1.58	1.19	181.84	11.25
9	10.77	380.01	2.000	15.00	.27	.44	5.58	121.82	1.59	1.37	199.47	12.12
10	10.65	365.01	2.000	15.00	.27	.50	5.59	122.24	1.60	1.57	199.73	13.30
11	10.65	350.01	2.000	15.00	.27	.56	5.62	122.76	1.61	1.77	200.10	13.32
12	10.65	335.01	2.000	15.00	.27	.63	5.64	123.40	1.62	1.97	200.60	13.34
13	10.47	320.01	2.000	15.00	.27	.69	5.67	124.17	1.64	2.17	201.27	13.37
14	10.47	305.01	2.000	15.00	.27	.75	5.71	125.07	1.66	2.37	202.10	13.42
15	10.47	290.01	2.000	15.00	.27	.82	5.76	126.11	1.69	2.57	203.12	13.47
16	10.47	275.01	2.000	15.00	.27	.88	5.81	127.30	1.72	2.77	204.34	13.54
17	10.47	260.01	2.000	15.00	.27	.95	5.86	128.66	1.75	2.98	205.79	13.62
18	10.47	245.01	2.000	15.00	.27	1.01	5.93	130.19	1.79	3.18	207.48	13.72
19	10.29	230.01	2.000	15.00	.27	1.08	6.00	131.91	1.84	3.39	209.43	13.83
20	10.11	215.01	2.000	15.00	.27	1.15	6.08	133.80	1.89	3.60	211.66	13.96
21	9.87	200.01	2.000	15.00	.27	1.21	6.17	135.90	1.94	3.81	214.16	14.11

OUTFALL PIPELINE

TOTAL DISCHARGE = 4.03 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.28 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 2.79 M

1

FLOW CHARACTERISTICS FOR U(1) = 1.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.37		1.00	18.64	.05		67.60	
2	11.53	485.00	.928	15.00	.27	.10	1.01	22.04	.05	.07	35.94	4.51
3	11.49	470.00	.928	15.00	.27	.15	1.03	22.53	.05	.10	36.20	2.40
4	11.19	455.00	.928	15.00	.27	.21	1.06	23.40	.06	.14	36.91	2.41
5	10.89	440.01	.928	15.00	.27	.26	1.12	24.67	.06	.18	38.13	2.46
6	10.89	425.01	.928	15.00	.27	.32	1.19	26.34	.07	.21	39.89	2.54
7	10.89	410.01	.928	15.00	.27	.38	1.28	28.51	.08	.25	42.38	2.66
8	10.89	395.01	.928	15.00	.27	.44	1.40	31.20	.10	.30	45.66	2.83
9	10.77	380.01	2.000	15.00	.27	.11	1.40	30.60	.10	.34	50.10	3.04
10	10.65	365.01	2.000	15.00	.27	.13	1.41	30.72	.10	.39	50.20	3.34
11	10.65	350.01	2.000	15.00	.27	.14	1.41	30.85	.10	.44	50.29	3.35
12	10.65	335.01	2.000	15.00	.27	.16	1.42	31.01	.10	.49	50.42	3.35
13	10.47	320.01	2.000	15.00	.27	.17	1.43	31.23	.10	.54	50.62	3.36
14	10.47	305.01	2.000	15.00	.27	.19	1.44	31.45	.11	.59	50.83	3.37
15	10.47	290.01	2.000	15.00	.27	.21	1.45	31.72	.11	.65	51.09	3.39
16	10.47	275.01	2.000	15.00	.27	.22	1.46	32.02	.11	.70	51.39	3.41
17	10.47	260.01	2.000	15.00	.27	.24	1.47	32.36	.11	.75	51.76	3.43
18	10.47	245.01	2.000	15.00	.27	.25	1.49	32.74	.11	.80	52.18	3.45
19	10.29	230.01	2.000	15.00	.27	.27	1.51	33.19	.12	.85	52.71	3.48
20	10.11	215.01	2.000	15.00	.27	.29	1.53	33.69	.12	.90	53.31	3.51
21	9.87	200.01	2.000	15.00	.27	.30	1.56	34.25	.12	.96	53.99	3.55

OUTFALL PIPELINE

TOTAL DISCHARGE = 1.01 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .32 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = .19 M

1

FLOW CHARACTERISTICS FOR U(1) = 2.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.37		2.00	37.28	.20		135.21	
2	11.53	485.00	.928	15.00	.27	.20	2.02	44.08	.21	.14	71.86	9.01
3	11.49	470.00	.928	15.00	.27	.31	2.05	45.02	.21	.21	72.35	4.79
4	11.19	455.00	.928	15.00	.27	.41	2.12	46.68	.23	.28	73.62	4.82
5	10.89	440.01	.928	15.00	.27	.52	2.22	49.14	.25	.35	75.93	4.91
6	10.89	425.01	.928	15.00	.27	.63	2.37	52.49	.29	.43	79.45	5.06
7	10.89	410.01	.928	15.00	.27	.75	2.55	56.83	.33	.51	84.43	5.30
8	10.89	395.01	.928	15.00	.27	.88	2.78	62.20	.40	.59	91.00	5.63
9	10.77	380.01	2.000	15.00	.27	.22	2.79	60.97	.40	.68	99.83	6.07
10	10.65	365.01	2.000	15.00	.27	.25	2.80	61.19	.40	.78	99.97	6.66
11	10.65	350.01	2.000	15.00	.27	.28	2.81	61.45	.40	.88	100.15	6.66
12	10.65	335.01	2.000	15.00	.27	.31	2.82	61.76	.41	.98	100.41	6.68
13	10.47	320.01	2.000	15.00	.27	.35	2.84	62.16	.41	1.08	100.76	6.69
14	10.47	305.01	2.000	15.00	.27	.38	2.86	62.61	.42	1.18	101.17	6.72
15	10.47	290.01	2.000	15.00	.27	.41	2.88	63.13	.42	1.29	101.68	6.74
16	10.47	275.01	2.000	15.00	.27	.44	2.91	63.73	.43	1.39	102.29	6.79
17	10.47	260.01	2.000	15.00	.27	.47	2.94	64.41	.44	1.49	103.02	6.82
18	10.47	245.01	2.000	15.00	.27	.51	2.97	65.17	.45	1.59	103.86	6.87
19	10.29	230.01	2.000	15.00	.27	.54	3.01	66.04	.46	1.70	104.86	6.92
20	10.11	215.01	2.000	15.00	.27	.57	3.05	67.00	.47	1.80	105.99	6.99
21	9.87	200.01	2.000	15.00	.27	.61	3.09	68.06	.49	1.91	107.26	7.07

OUTFALL PIPELINE

TOTAL DISCHARGE = 2.02 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .64 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = .71 M

1

FLOW CHARACTERISTICS FOR U(1) = 3.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.37		3.00	55.91	.46		202.81	
2	11.53	485.00	.928	15.00	.27	.30	3.02	66.11	.47	.20	107.78	13.52
3	11.49	470.00	.928	15.00	.27	.46	3.08	67.53	.48	.31	108.51	7.19
4	11.19	455.00	.928	15.00	.27	.62	3.18	69.99	.52	.42	110.38	7.23
5	10.89	440.01	.928	15.00	.27	.78	3.33	73.66	.57	.53	113.79	7.36
6	10.89	425.01	.928	15.00	.27	.95	3.55	78.68	.64	.64	119.08	7.59
7	10.89	410.01	.928	15.00	.27	1.13	3.83	85.18	.75	.76	126.56	7.94
8	10.89	395.01	.928	15.00	.27	1.31	4.17	93.25	.89	.89	136.41	8.44
9	10.77	380.01	2.000	15.00	.27	.33	4.18	91.39	.89	1.03	149.64	9.09
10	10.65	365.01	2.000	15.00	.27	.37	4.20	91.71	.90	1.17	149.84	9.98
11	10.65	350.01	2.000	15.00	.27	.42	4.21	92.10	.90	1.32	150.11	9.99
12	10.65	335.01	2.000	15.00	.27	.47	4.23	92.58	.91	1.47	150.49	10.01
13	10.47	320.01	2.000	15.00	.27	.52	4.26	93.16	.92	1.63	151.00	10.03
14	10.47	305.01	2.000	15.00	.27	.57	4.28	93.83	.94	1.78	151.62	10.07
15	10.47	290.01	2.000	15.00	.27	.61	4.32	94.61	.95	1.93	152.38	10.11
16	10.47	275.01	2.000	15.00	.27	.66	4.36	95.51	.97	2.08	153.30	10.16
17	10.47	260.01	2.000	15.00	.27	.71	4.40	96.53	.99	2.23	154.39	10.22
18	10.47	245.01	2.000	15.00	.27	.76	4.45	97.67	1.01	2.39	155.66	10.29
19	10.29	230.01	2.000	15.00	.27	.81	4.50	98.96	1.03	2.54	157.13	10.38
20	10.11	215.01	2.000	15.00	.27	.86	4.56	100.39	1.06	2.70	158.80	10.48
21	9.87	200.01	2.000	15.00	.27	.91	4.63	101.97	1.09	2.86	160.69	10.59

OUTFALL PIPELINE

TOTAL DISCHARGE = 3.02 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .96 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 1.58 M

1

FLOW CHARACTERISTICS FOR U(1) = 5.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	11.57	500.00			.37		5.00	93.19	1.27		338.01	
2	11.53	485.00	.928	15.00	.27	.50	5.04	110.18	1.29	.34	179.62	22.53
3	11.49	470.00	.928	15.00	.27	.77	5.13	112.54	1.34	.52	180.84	11.97
4	11.19	455.00	.928	15.00	.27	1.03	5.30	116.61	1.43	.70	183.92	12.06
5	10.89	440.01	.928	15.00	.27	1.31	5.55	122.72	1.57	.88	189.57	12.26
6	10.89	425.01	.928	15.00	.27	1.59	5.91	131.09	1.78	1.07	198.30	12.64
7	10.89	410.01	.928	15.00	.27	1.88	6.37	141.92	2.07	1.27	210.85	13.23
8	10.89	395.01	.928	15.00	.27	2.19	6.96	155.37	2.47	1.48	227.28	14.06
9	10.77	380.01	2.000	15.00	.27	.54	6.97	152.26	2.48	1.71	249.30	15.15
10	10.65	365.01	2.000	15.00	.27	.62	6.99	152.78	2.49	1.96	249.63	16.62
11	10.65	350.01	2.000	15.00	.27	.70	7.02	153.44	2.51	2.21	250.09	16.64
12	10.65	335.01	2.000	15.00	.27	.78	7.05	154.23	2.53	2.46	250.72	16.67
13	10.47	320.01	2.000	15.00	.27	.86	7.09	155.19	2.56	2.71	251.55	16.71
14	10.47	305.01	2.000	15.00	.27	.94	7.14	156.31	2.60	2.96	252.58	16.77
15	10.47	290.01	2.000	15.00	.27	1.02	7.19	157.61	2.64	3.21	253.86	16.84
16	10.47	275.01	2.000	15.00	.27	1.10	7.26	159.11	2.68	3.47	255.39	16.92
17	10.47	260.01	2.000	15.00	.27	1.19	7.33	160.81	2.74	3.72	257.20	17.03
18	10.47	245.01	2.000	15.00	.27	1.27	7.41	162.72	2.80	3.98	259.31	17.15
19	10.29	230.01	2.000	15.00	.27	1.35	7.50	164.86	2.87	4.24	261.75	17.29
20	10.11	215.01	2.000	15.00	.27	1.43	7.60	167.23	2.95	4.50	264.52	17.45
21	9.87	200.01	2.000	15.00	.27	1.52	7.72	169.84	3.04	4.76	267.65	17.63

OUTFALL PIPELINE

TOTAL DISCHARGE = 5.03 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.60 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 4.36 M

1

FLOW CHARACTERISTICS FOR U(1) = 6.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.37		6.00	111.83	1.83		405.62	
2	11.53	485.00	.928	15.00	.27	.60	6.05	132.21	1.86	.41	215.55	27.04
3	11.49	470.00	.928	15.00	.27	.92	6.16	135.05	1.93	.62	217.00	14.37
4	11.19	455.00	.928	15.00	.27	1.24	6.36	139.93	2.06	.84	220.69	14.47
5	10.89	440.01	.928	15.00	.27	1.57	6.66	147.25	2.26	1.06	227.47	14.71
6	10.89	425.01	.928	15.00	.27	1.90	7.09	157.30	2.56	1.29	238.05	15.16
7	10.89	410.01	.928	15.00	.27	2.25	7.65	170.30	2.98	1.52	253.00	15.87
8	10.89	395.01	.928	15.00	.27	2.63	8.35	186.43	3.55	1.78	272.72	16.87
9	10.77	380.01	2.000	15.00	.27	.65	8.37	182.70	3.57	2.05	290.15	18.18
10	10.65	365.01	2.000	15.00	.27	.75	8.39	183.33	3.59	2.35	299.53	19.94
11	10.65	350.01	2.000	15.00	.27	.84	8.42	184.11	3.62	2.65	300.08	19.97
12	10.65	335.01	2.000	15.00	.27	.94	8.46	185.06	3.65	2.95	300.84	20.01
13	10.47	320.01	2.000	15.00	.27	1.03	8.51	186.21	3.69	3.25	301.83	20.06
14	10.47	305.01	2.000	15.00	.27	1.13	8.57	187.56	3.74	3.55	303.08	20.12
15	10.47	290.01	2.000	15.00	.27	1.23	8.63	189.12	3.80	3.85	304.60	20.21
16	10.47	275.01	2.000	15.00	.27	1.32	8.71	190.91	3.86	4.16	306.44	20.31
17	10.47	260.01	2.000	15.00	.27	1.42	8.79	192.95	3.94	4.47	308.62	20.43
18	10.47	245.01	2.000	15.00	.27	1.52	8.89	195.25	4.03	4.77	311.15	20.57
19	10.29	230.01	2.000	15.00	.27	1.62	9.00	197.81	4.13	5.09	314.07	20.74
20	10.11	215.01	2.000	15.00	.27	1.72	9.12	200.65	4.24	5.40	317.40	20.94
21	9.87	200.01	2.000	15.00	.27	1.82	9.26	203.79	4.37	5.72	321.15	21.16

OUTFALL PIPELINE

TOTAL DISCHARGE = 6.04 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.92 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 6.27 M

1

FLOW CHARACTERISTICS FOR U(1) = 7.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.37		7.00	130.46	2.50		473.22	
2	11.53	485.00	.928	15.00	.27	.70	7.06	154.25	2.54	.47	251.47	31.55
3	11.49	470.00	.928	15.00	.27	1.07	7.19	157.56	2.63	.72	253.17	16.76
4	11.19	455.00	.928	15.00	.27	1.45	7.42	163.25	2.81	.98	257.46	16.88
5	10.89	440.01	.928	15.00	.27	1.83	7.77	171.79	3.08	1.24	265.37	17.16
6	10.89	425.01	.928	15.00	.27	2.22	8.27	183.51	3.49	1.50	277.72	17.69
7	10.89	410.01	.928	15.00	.27	2.63	8.92	198.68	4.06	1.78	295.16	18.51
8	10.89	395.01	.928	15.00	.27	3.07	9.74	217.50	4.83	2.07	319.16	19.68
9	10.77	380.01	2.000	15.00	.27	.76	9.76	213.14	4.85	2.39	348.99	21.21
10	10.65	365.01	2.000	15.00	.27	.87	9.79	213.87	4.88	2.74	349.44	23.27
11	10.65	350.01	2.000	15.00	.27	.98	9.83	214.79	4.92	3.09	350.08	23.30
12	10.65	335.01	2.000	15.00	.27	1.10	9.87	215.90	4.97	3.44	350.97	23.34
13	10.47	320.01	2.000	15.00	.27	1.21	9.93	217.24	5.02	3.79	352.12	23.40
14	10.47	305.01	2.000	15.00	.27	1.32	9.99	218.81	5.09	4.14	353.57	23.47
15	10.47	290.01	2.000	15.00	.27	1.43	10.07	220.63	5.17	4.50	355.36	23.57
16	10.47	275.01	2.000	15.00	.27	1.55	10.16	222.72	5.26	4.85	357.50	23.69
17	10.47	260.01	2.000	15.00	.27	1.66	10.26	225.10	5.36	5.21	360.04	23.83
18	10.47	245.01	2.000	15.00	.27	1.77	10.37	227.78	5.48	5.57	362.99	24.00
19	10.29	230.01	2.000	15.00	.27	1.89	10.50	230.77	5.62	5.93	366.40	24.20
20	10.11	215.01	2.000	15.00	.27	2.01	10.64	234.08	5.77	6.30	370.27	24.43
21	9.87	200.01	2.000	15.00	.27	2.12	10.80	237.73	5.95	6.67	374.65	24.68

OUTFALL PIPELINE

TOTAL DISCHARGE = 7.04 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.24 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 8.53 M

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FLOW CHARACTERISTICS FOR U(1) = 8.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.37		8.00	149.10	3.26		540.82	
2	11.53	485.00	.928	15.00	.27	.80	8.06	176.28	3.31	.54	287.39	36.05
3	11.49	470.00	.928	15.00	.27	1.23	8.21	180.06	3.44	.83	289.33	19.16
4	11.19	455.00	.928	15.00	.27	1.65	8.48	186.57	3.66	1.12	294.24	19.29
5	10.89	440.01	.928	15.00	.27	2.09	8.88	196.32	4.02	1.41	303.27	19.62
6	10.89	425.01	.928	15.00	.27	2.54	9.45	209.72	4.55	1.72	317.38	20.22
7	10.89	410.01	.928	15.00	.27	3.01	10.20	227.05	5.30	2.03	337.32	21.16
8	10.89	395.01	.928	15.00	.27	3.51	11.13	248.56	6.31	2.37	363.60	22.49
9	10.77	380.01	2.000	15.00	.27	.87	11.15	243.58	6.34	2.73	398.84	24.24
10	10.65	365.01	2.000	15.00	.27	1.00	11.19	244.42	6.38	3.13	399.35	26.59
11	10.65	350.01	2.000	15.00	.27	1.12	11.23	245.46	6.43	3.53	400.09	26.62
12	10.65	335.01	2.000	15.00	.27	1.25	11.28	246.74	6.49	3.93	401.09	26.67
13	10.47	320.01	2.000	15.00	.27	1.38	11.34	248.26	6.56	4.33	402.41	26.74
14	10.47	305.01	2.000	15.00	.27	1.51	11.42	250.06	6.65	4.74	404.07	26.83
15	10.47	290.01	2.000	15.00	.27	1.64	11.51	252.14	6.75	5.14	406.11	26.94
16	10.47	275.01	2.000	15.00	.27	1.77	11.61	254.53	6.87	5.55	408.56	27.07
17	10.47	260.01	2.000	15.00	.27	1.90	11.72	257.25	7.01	5.95	411.46	27.24
18	10.47	245.01	2.000	15.00	.27	2.03	11.85	260.31	7.16	6.37	414.83	27.43
19	10.29	230.01	2.000	15.00	.27	2.16	12.00	263.72	7.34	6.78	418.73	27.66
20	10.11	215.01	2.000	15.00	.27	2.29	12.16	267.51	7.54	7.20	423.15	27.92
21	9.87	200.01	2.000	15.00	.27	2.43	12.34	271.69	7.77	7.62	428.15	28.21

OUTFALL PIPELINE

TOTAL DISCHARGE = 8.05 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.56 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 11.14 M

BOTTOM PROFILE

DISTANCE M	DEPTH M
.00	.00
25.00	.00
35.00	.50
40.00	1.50
50.00	3.00
60.00	4.00
70.00	6.00
90.00	8.00
100.00	9.00
125.00	9.20
150.00	9.30
175.00	9.50
200.00	9.80
225.00	9.80
250.00	9.80
275.00	9.90
300.00	10.00
325.00	10.00
350.00	10.50
375.00	10.50
400.00	11.00
425.00	11.00
450.00	11.00
475.00	11.10
510.00	11.30

MANIFOLD 2

TRACE C

LIST OF SYMBOLS

N = NO OF PORT
DEPTH(N) = DEPTH AT PORT N
DIST(N) = DISTANCE FROM SHORE
DIA(N) = DIAMETER OF MANIFOLD BETWEEN PORT N AND N-1
DL(N) = LENGTH BETWEEN PORT N AND N-1
D(N) = DIAMETER OF PORT N
V(N) = VELOCITY IN MANIFOLD BETWEEN PORT N AND N-1
U(N) = DISCHARGEVELOCITY OF PORT N
FN(N) = DENSIMETRIC FROUDE NO OF JET AT PORT N
E(N) = TOTAL HEAD AT PORT N
SQ(N) = TOTAL DISCHARGE UP TO PORT N
Q(N) = DISCHARGE OF PORT N
QL(N) = DISCHARGE LOAD PR LENGTH OF MANIFOLD
QDES = DESIGN DISCHARGE FLOW
VMIN = MINIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
VMAX = MAXIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
DENS = (SPEC.GRAV. SEAW.-SPEC.GRAV. WASTEW.)/(SPEC.GRAV. WASTEW.)
FRM = DARCY FRICTION FACTOR IN MANIFOLD
FRP = DARCY FRICTION FACTOR IN OUTFALL PIPELINE
VPIPE = UPPER LIMIT FOR VELOCITY IN OUTFALL PIPELINE AT DESIGN FLOW

INITIAL VALUES FOR THE CALCULATION OF THE MANIFOLD

QDES = 4.000 CUM/SEC
VMAX = 2.00 M/SEC
VMIN = .40 M/SEC
DIST(1) = 500.00 M
U(1) = 4.00 M/SEC
DIA(2) = .928 M
DL(2) = 15.00 M
D(2) = .27 M
DL(3) = 15.00 M
DENS = .001
VPIPE = 1.20 M/SEC
FRM = .100
FRP = .100
PORT NO K1 = 9
DIA(K1) = 2.000 M
DL(K1) = 15.00 M
D(K1) = .27 M

PORT NO K2 = 0
DIA(K2) = .000 M
DL(K2) = .00 M
D(K2) = .00 M

PORT NO K3 = 0
DIA(K3) = .000 M
DL(K3) = .00 M
D(K3) = .00 M

THE LENGTH BETWEEN THE PORTS DL(N) AND THE DIAMETER OF THE PORTS
D(N) ARE KEPT CONSTANT ALONG THE MANIFOLD AND SET EQUAL TO
RESPECTIVELY DL(3) AND D(2).
IF WANTED THE DIA(N),DL(N) AND D(N) CAN BE CHANGED FOR PORT NO .
N = K TO DIA(K),DL(K) AND D(K).

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FLOW CHARACTERISTICS FOR U(1) = 4.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.24	500.00			.37		4.00	74.55	.82		270.41	
2	11.16	485.00	.928	15.00	.27	.40	4.03	88.15	.83	.27	143.70	18.03
3	11.07	470.00	.928	15.00	.27	.61	4.11	90.04	.86	.41	144.68	9.58
4	11.01	455.00	.928	15.00	.27	.83	4.24	93.29	.92	.56	147.13	9.65
5	10.95	440.00	.928	15.00	.27	1.04	4.44	98.17	1.01	.71	151.65	9.91
6	10.95	425.00	.928	15.00	.27	1.27	4.73	104.86	1.14	.86	158.70	10.11
7	10.95	410.00	.928	15.00	.27	1.50	5.10	113.53	1.32	1.02	168.67	10.58
8	10.95	395.00	.928	15.00	.27	1.75	5.56	124.29	1.58	1.18	181.91	11.24
9	10.65	380.00	2.000	15.00	.27	.44	5.58	121.81	1.59	1.37	199.45	12.12
10	10.35	365.01	2.000	15.00	.27	.50	5.59	122.24	1.60	1.57	199.72	13.30
11	10.35	350.01	2.000	15.00	.27	.56	5.62	122.76	1.61	1.77	200.09	13.31
12	10.35	335.01	2.000	15.00	.27	.63	5.64	123.40	1.62	1.97	200.59	13.34
13	10.05	320.01	2.000	15.00	.27	.69	5.67	124.17	1.64	2.17	201.27	13.37
14	10.05	305.01	2.000	15.00	.27	.75	5.71	125.07	1.66	2.37	202.10	13.42
15	10.05	290.01	2.000	15.00	.27	.82	5.76	126.11	1.69	2.57	203.12	13.47
16	9.99	275.01	2.000	15.00	.27	.88	5.81	127.31	1.72	2.77	204.35	13.54
17	9.93	260.01	2.000	15.00	.27	.95	5.86	128.67	1.75	2.98	205.80	13.62
18	9.87	245.01	2.000	15.00	.27	1.01	5.93	130.20	1.79	3.18	207.49	13.72
19	9.87	230.01	2.000	15.00	.27	1.08	6.00	131.91	1.84	3.39	209.43	13.83
20	9.87	215.01	2.000	15.00	.27	1.15	6.08	133.80	1.89	3.60	211.64	13.96
21	9.87	200.01	2.000	15.00	.27	1.21	6.17	135.88	1.94	3.81	214.14	14.11

OUTFALL PIPELINE

TOTAL DISCHARGE = 4.03 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.28 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 2.79 M

1

FLOW CHARACTERISTICS FOR U(1) = 1.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.24	500.00			.37		1.00	18.64	.05		67.60	
2	11.16	485.00	.928	15.00	.27	.10	1.01	22.05	.05	.07	35.95	4.51
3	11.07	470.00	.928	15.00	.27	.15	1.03	22.54	.05	.10	36.23	2.40
4	11.01	455.00	.928	15.00	.27	.21	1.06	23.37	.06	.14	36.86	2.42
5	10.95	440.00	.928	15.00	.27	.26	1.11	24.60	.06	.18	38.00	2.46
6	10.95	425.00	.928	15.00	.27	.32	1.18	26.27	.07	.21	39.77	2.53
7	10.95	410.00	.928	15.00	.27	.38	1.28	28.44	.08	.25	42.26	2.65
8	10.95	395.00	.928	15.00	.27	.44	1.39	31.13	.10	.30	45.55	2.82
9	10.65	380.00	2.000	15.00	.27	.11	1.40	30.55	.10	.34	50.03	3.04
10	10.35	365.01	2.000	15.00	.27	.12	1.41	30.70	.10	.39	50.17	3.34
11	10.35	350.01	2.000	15.00	.27	.14	1.41	30.84	.10	.44	50.26	3.34
12	10.35	335.01	2.000	15.00	.27	.16	1.42	30.99	.10	.49	50.39	3.35
13	10.05	320.01	2.000	15.00	.27	.17	1.43	31.23	.10	.54	50.63	3.36
14	10.05	305.01	2.000	15.00	.27	.19	1.44	31.45	.11	.59	50.83	3.38
15	10.05	290.01	2.000	15.00	.27	.21	1.45	31.71	.11	.64	51.09	3.39
16	9.99	275.01	2.000	15.00	.27	.22	1.46	32.02	.11	.70	51.41	3.41
17	9.93	260.01	2.000	15.00	.27	.24	1.48	32.37	.11	.75	51.79	3.43
18	9.87	245.01	2.000	15.00	.27	.25	1.49	32.76	.11	.80	52.22	3.45
19	9.87	230.01	2.000	15.00	.27	.27	1.51	33.19	.12	.85	52.71	3.48
20	9.87	215.01	2.000	15.00	.27	.29	1.53	33.66	.12	.90	53.26	3.51
21	9.87	200.01	2.000	15.00	.27	.30	1.55	34.19	.12	.96	53.89	3.55

OUTFALL PIPELINE

TOTAL DISCHARGE = 1.01 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .32 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = .19 M

1 FLOW CHARACTERISTICS FOR U(1) = 2.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.24	500.00			.37		2.00	37.28	.20		135.21	
2	11.16	485.00	.928	15.00	.27	.20	2.02	44.08	.21	.14	71.86	9.01
3	11.07	470.00	.928	15.00	.27	.31	2.05	45.03	.22	.21	72.36	4.79
4	11.01	455.00	.928	15.00	.27	.41	2.12	46.66	.23	.28	73.60	4.82
5	10.95	440.00	.928	15.00	.27	.52	2.22	49.11	.25	.35	75.86	4.91
6	10.95	425.00	.928	15.00	.27	.63	2.36	52.45	.28	.43	79.39	5.06
7	10.95	410.00	.928	15.00	.27	.75	2.55	56.79	.33	.51	84.37	5.29
8	10.95	395.00	.928	15.00	.27	.88	2.78	62.17	.39	.59	90.94	5.62
9	10.65	380.00	2.000	15.00	.27	.22	2.79	60.95	.40	.68	99.79	6.06
10	10.35	365.01	2.000	15.00	.27	.25	2.80	61.18	.40	.78	99.96	6.65
11	10.35	350.01	2.000	15.00	.27	.28	2.81	61.44	.40	.88	100.14	6.66
12	10.35	335.01	2.000	15.00	.27	.31	2.82	61.76	.41	.98	100.39	6.68
13	10.05	320.01	2.000	15.00	.27	.35	2.84	62.16	.41	1.08	100.76	6.69
14	10.05	305.01	2.000	15.00	.27	.38	2.86	62.61	.42	1.18	101.17	6.72
15	10.05	290.01	2.000	15.00	.27	.41	2.88	63.13	.42	1.29	101.68	6.74
16	9.99	275.01	2.000	15.00	.27	.44	2.91	63.73	.43	1.39	102.30	6.78
17	9.93	260.01	2.000	15.00	.27	.47	2.94	64.42	.44	1.49	103.03	6.82
18	9.87	245.01	2.000	15.00	.27	.51	2.97	65.18	.45	1.59	103.89	6.87
19	9.87	230.01	2.000	15.00	.27	.54	3.01	66.04	.46	1.70	104.86	6.93
20	9.87	215.01	2.000	15.00	.27	.57	3.05	66.98	.47	1.80	105.96	6.99
21	9.87	200.01	2.000	15.00	.27	.61	3.09	68.03	.49	1.91	107.21	7.06

OUTFALL PIPELINE

TOTAL DISCHARGE = 2.01 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .64 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = .71 M

1 FLOW CHARACTERISTICS FOR U(1) = 3.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.24	500.00			.37		3.00	55.91	.46		202.81	
2	11.16	485.00	.928	15.00	.27	.30	3.02	66.11	.47	.20	107.78	13.52
3	11.07	470.00	.928	15.00	.27	.46	3.08	67.53	.48	.31	108.52	7.19
4	11.01	455.00	.928	15.00	.27	.62	3.18	69.98	.52	.42	110.36	7.23
5	10.95	440.00	.928	15.00	.27	.78	3.33	73.63	.57	.53	113.75	7.36
6	10.95	425.00	.928	15.00	.27	.95	3.55	78.66	.64	.64	119.04	7.58
7	10.95	410.00	.928	15.00	.27	1.13	3.82	85.16	.75	.76	126.52	7.94
8	10.95	395.00	.928	15.00	.27	1.31	4.17	93.23	.89	.89	136.37	8.43
9	10.65	380.00	2.000	15.00	.27	.33	4.18	91.37	.89	1.03	149.61	9.09
10	10.35	365.01	2.000	15.00	.27	.37	4.20	91.70	.90	1.17	149.83	9.97
11	10.35	350.01	2.000	15.00	.27	.42	4.21	92.09	.90	1.32	150.10	9.99
12	10.35	335.01	2.000	15.00	.27	.47	4.23	92.57	.91	1.47	150.48	10.01
13	10.05	320.01	2.000	15.00	.27	.52	4.26	93.16	.92	1.63	151.00	10.03
14	10.05	305.01	2.000	15.00	.27	.57	4.28	93.83	.94	1.78	151.62	10.07
15	10.05	290.01	2.000	15.00	.27	.61	4.32	94.61	.95	1.93	152.39	10.11
16	9.99	275.01	2.000	15.00	.27	.66	4.36	95.51	.97	2.08	153.31	10.16
17	9.93	260.01	2.000	15.00	.27	.71	4.40	96.53	.99	2.23	154.40	10.22
18	9.87	245.01	2.000	15.00	.27	.76	4.45	97.68	1.01	2.39	155.67	10.29
19	9.87	230.01	2.000	15.00	.27	.81	4.50	98.96	1.03	2.54	157.13	10.38
20	9.87	215.01	2.000	15.00	.27	.86	4.56	100.38	1.06	2.70	158.79	10.48
21	9.87	200.01	2.000	15.00	.27	.91	4.63	101.95	1.09	2.86	160.66	10.59

OUTFALL PIPELINE

TOTAL DISCHARGE = 3.02 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .96 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 1.58 M

1 FLOW CHARACTERISTICS FOR U(1) = 5.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	11.24	500.00			.37		5.00	93.19	1.27		338.01	
2	11.16	485.00	.928	15.00	.27	.50	5.04	110.18	1.29	.34	179.63	22.53
3	11.07	470.00	.928	15.00	.27	.77	5.13	112.55	1.34	.52	180.84	11.98
4	11.01	455.00	.928	15.00	.27	1.03	5.30	116.61	1.43	.70	183.91	12.06
5	10.95	440.00	.928	15.00	.27	1.31	5.55	122.70	1.57	.88	189.55	12.26
6	10.95	425.00	.928	15.00	.27	1.59	5.91	131.07	1.78	1.07	198.37	12.64
7	10.95	410.00	.928	15.00	.27	1.88	6.37	141.91	2.07	1.27	210.83	13.22
8	10.95	395.00	.928	15.00	.27	2.19	6.95	155.35	2.47	1.48	227.26	14.06
9	10.65	380.00	2.000	15.00	.27	.54	6.97	152.25	2.48	1.71	249.29	15.15
10	10.35	365.01	2.000	15.00	.27	.62	6.99	152.78	2.49	1.96	249.62	16.62
11	10.35	350.01	2.000	15.00	.27	.70	7.02	153.43	2.51	2.21	250.08	16.64
12	10.35	335.01	2.000	15.00	.27	.78	7.05	154.23	2.53	2.46	250.71	16.67
13	10.05	320.01	2.000	15.00	.27	.86	7.09	155.19	2.56	2.71	251.55	16.71
14	10.05	305.01	2.000	15.00	.27	.94	7.14	156.31	2.60	2.96	252.58	16.77
15	10.05	290.01	2.000	15.00	.27	1.02	7.19	157.61	2.64	3.21	253.86	16.84
16	9.99	275.01	2.000	15.00	.27	1.10	7.26	159.11	2.68	3.47	255.39	16.92
17	9.93	260.01	2.000	15.00	.27	1.19	7.33	160.81	2.74	3.72	257.21	17.03
18	9.87	245.01	2.000	15.00	.27	1.27	7.41	162.72	2.80	3.98	259.32	17.15
19	9.87	230.01	2.000	15.00	.27	1.35	7.50	164.86	2.87	4.24	261.75	17.29
20	9.87	215.01	2.000	15.00	.27	1.43	7.60	167.22	2.95	4.50	264.51	17.45
21	9.87	200.01	2.000	15.00	.27	1.52	7.72	169.83	3.03	4.76	267.63	17.63

OUTFALL PIPELINE

TOTAL DISCHARGE = 5.03 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.60 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 4.36 M

1 FLOW CHARACTERISTICS FOR U(1) = 6.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	11.24	500.00			.37		6.00	111.83	1.83		405.62	
2	11.16	485.00	.928	15.00	.27	.60	6.05	132.21	1.86	.41	215.55	27.04
3	11.07	470.00	.928	15.00	.27	.92	6.16	135.05	1.93	.62	217.01	14.37
4	11.01	455.00	.928	15.00	.27	1.24	6.36	139.93	2.06	.84	220.68	14.47
5	10.95	440.00	.928	15.00	.27	1.57	6.66	147.24	2.26	1.06	227.45	14.71
6	10.95	425.00	.928	15.00	.27	1.90	7.09	157.28	2.56	1.29	238.03	15.16
7	10.95	410.00	.928	15.00	.27	2.25	7.65	170.29	2.98	1.52	252.98	15.87
8	10.95	395.00	.928	15.00	.27	2.63	8.35	186.42	3.55	1.78	272.70	16.87
9	10.65	380.00	2.000	15.00	.27	.65	8.36	182.69	3.57	2.05	299.14	18.18
10	10.35	365.01	2.000	15.00	.27	.75	8.39	183.32	3.59	2.35	299.53	19.04
11	10.35	350.01	2.000	15.00	.27	.84	8.42	184.11	3.62	2.65	300.08	19.97
12	10.35	335.01	2.000	15.00	.27	.94	8.46	185.06	3.65	2.95	300.84	20.01
13	10.05	320.01	2.000	15.00	.27	1.03	8.51	186.21	3.69	3.25	301.83	20.06
14	10.05	305.01	2.000	15.00	.27	1.13	8.57	187.56	3.74	3.55	303.08	20.12
15	10.05	290.01	2.000	15.00	.27	1.23	8.63	189.12	3.80	3.85	304.60	20.21
16	9.99	275.01	2.000	15.00	.27	1.32	8.71	190.92	3.86	4.16	306.45	20.31
17	9.93	260.01	2.000	15.00	.27	1.42	8.79	192.95	3.94	4.47	308.62	20.43
18	9.87	245.01	2.000	15.00	.27	1.52	8.89	195.25	4.03	4.77	311.16	20.57
19	9.87	230.01	2.000	15.00	.27	1.62	9.00	197.81	4.13	5.09	314.07	20.74
20	9.87	215.01	2.000	15.00	.27	1.72	9.12	200.65	4.24	5.40	317.39	20.94
21	9.87	200.01	2.000	15.00	.27	1.82	9.26	203.78	4.37	5.72	321.13	21.16

OUTFALL PIPELINE

TOTAL DISCHARGE = 6.04 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.92 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 6.27 M

1 FLOW CHARACTERISTICS FOR U(1) = 7.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.24	500.00			.37		7.00	130.46	2.50		473.22	
2	11.16	485.00	.928	15.00	.27	.70	7.06	154.25	2.54	.47	251.47	31.55
3	11.07	470.00	.928	15.00	.27	1.07	7.19	157.56	2.63	.72	253.17	16.76
4	11.01	455.00	.928	15.00	.27	1.45	7.42	163.25	2.81	.98	257.46	16.88
5	10.95	440.00	.928	15.00	.27	1.83	7.77	171.77	3.08	1.24	265.35	17.16
6	10.95	425.00	.928	15.00	.27	2.22	8.27	183.50	3.49	1.50	277.70	17.69
7	10.95	410.00	.928	15.00	.27	2.63	8.92	198.67	4.06	1.78	295.14	18.51
8	10.95	395.00	.928	15.00	.27	3.07	9.74	217.49	4.83	2.07	318.14	19.68
9	10.65	380.00	2.000	15.00	.27	.76	9.76	213.13	4.85	2.39	348.98	21.21
10	10.35	365.01	2.000	15.00	.27	.87	9.79	213.87	4.88	2.74	349.44	23.27
11	10.35	350.01	2.000	15.00	.27	.98	9.83	214.78	4.92	3.09	350.08	23.30
12	10.35	335.01	2.000	15.00	.27	1.10	9.87	215.90	4.97	3.44	350.96	23.38
13	10.05	320.01	2.000	15.00	.27	1.21	9.93	217.24	5.02	3.79	352.12	23.40
14	10.05	305.01	2.000	15.00	.27	1.32	9.99	218.81	5.09	4.14	353.57	23.47
15	10.05	290.01	2.000	15.00	.27	1.43	10.07	220.63	5.17	4.50	355.36	23.57
16	9.99	275.01	2.000	15.00	.27	1.55	10.16	222.72	5.26	4.85	357.50	23.69
17	9.93	260.01	2.000	15.00	.27	1.66	10.26	225.10	5.36	5.21	360.04	23.83
18	9.87	245.01	2.000	15.00	.27	1.77	10.37	227.78	5.48	5.57	363.00	24.00
19	9.87	230.01	2.000	15.00	.27	1.89	10.50	230.77	5.62	5.93	366.40	24.20
20	9.87	215.01	2.000	15.00	.27	2.01	10.64	234.09	5.77	6.30	370.27	24.43
21	9.87	200.01	2.000	15.00	.27	2.12	10.80	237.73	5.95	6.67	374.63	24.68

OUTFALL PIPELINE

TOTAL DISCHARGE = 7.04 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.24 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 8.53 M

1 FLOW CHARACTERISTICS FOR U(1) = 8.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.24	500.00			.37		8.00	149.10	3.26		540.82	
2	11.16	485.00	.928	15.00	.27	.80	8.06	176.28	3.31	.54	287.39	36.05
3	11.07	470.00	.928	15.00	.27	1.23	8.21	180.07	3.44	.83	289.34	19.16
4	11.01	455.00	.928	15.00	.27	1.65	8.48	186.56	3.66	1.12	294.23	19.29
5	10.95	440.00	.928	15.00	.27	2.09	8.88	196.31	4.02	1.41	303.26	19.62
6	10.95	425.00	.928	15.00	.27	2.54	9.45	209.71	4.55	1.72	317.37	20.22
7	10.95	410.00	.928	15.00	.27	3.01	10.20	227.04	5.30	2.03	337.30	21.16
8	10.95	395.00	.928	15.00	.27	3.51	11.13	248.56	6.31	2.37	363.59	22.49
9	10.65	380.00	2.000	15.00	.27	.87	11.15	243.58	6.34	2.73	398.93	24.24
10	10.35	365.01	2.000	15.00	.27	1.00	11.19	244.42	6.38	3.13	399.34	26.59
11	10.35	350.01	2.000	15.00	.27	1.12	11.23	245.46	6.43	3.53	400.08	26.62
12	10.35	335.01	2.000	15.00	.27	1.25	11.28	246.73	6.49	3.93	401.09	26.67
13	10.05	320.01	2.000	15.00	.27	1.38	11.34	248.26	6.56	4.33	402.41	26.74
14	10.05	305.01	2.000	15.00	.27	1.51	11.42	250.06	6.65	4.74	404.07	26.83
15	10.05	290.01	2.000	15.00	.27	1.64	11.51	252.14	6.75	5.14	406.11	26.94
16	9.99	275.01	2.000	15.00	.27	1.77	11.61	254.53	6.87	5.55	408.56	27.07
17	9.93	260.01	2.000	15.00	.27	1.90	11.72	257.25	7.01	5.95	411.46	27.24
18	9.87	245.01	2.000	15.00	.27	2.03	11.85	260.31	7.16	6.37	414.84	27.43
19	9.87	230.01	2.000	15.00	.27	2.16	12.00	263.72	7.34	6.78	418.73	27.66
20	9.87	215.01	2.000	15.00	.27	2.29	12.16	267.51	7.54	7.20	423.15	27.92
21	9.87	200.01	2.000	15.00	.27	2.43	12.34	271.68	7.77	7.62	428.14	28.21

OUTFALL PIPELINE

TOTAL DISCHARGE = 8.05 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.56 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 11.14 M

BOTTOM PROFILE

DISTANCE M	DEPTH M
.00	.00
25.00	.00
35.00	1.00
40.00	2.00
50.00	3.50
62.00	5.00
75.00	6.50
90.00	8.50
100.00	9.00
120.00	9.00
125.00	9.00
150.00	9.50
175.00	10.00
200.00	11.00
210.00	11.50
225.00	12.00
250.00	12.50
275.00	13.00
300.00	13.50
325.00	13.60
350.00	14.00
375.00	14.00
400.00	14.00
450.00	14.00
510.00	14.00

MANIFOLD 3

TRACE A

LIST OF SYMBOLS

N = NO OF PORT
DEPTH(N) = DEPTH AT PORT N
DIST(N) = DISTANCE FROM SHORE
DIA(N) = DIAMETER OF MANIFOLD BETWEEN PORT N AND N-1
DL(N) = LENGTH BETWEEN PORT N AND N-1
D(N) = DIAMETER OF PORT N
V(N) = VELOCITY IN MANIFOLD BETWEEN PORT N AND N-1
U(N) = DISCHARGEVELOCITY OF PORT N
FN(N) = DENSIMETRIC FROUDE NO OF JET AT PORT N
E(N) = TOTAL HEAD AT PORT N
SQ(N) = TOTAL DISCHARGE UP TO PORT N
Q(N) = DISCHARGE OF PORT N
QL(N) = DISCHARGE LOAD PR LENGTH OF MANIFOLD
QDES = DESIGN DISCHARGE FLOW
VMIN = MINIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
VMAX = MAXIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
DENS = (SPEC.GRAV. SEAW.-SPEC.GRAV. WASTEW.)/(SPEC.GRAV. WASTEW.)
FRM = DARCY FRICTION FACTOR IN MANIFOLD
FRP = DARCY FRICTION FACTOR IN OUTFALL PIPELINE
VPIPE = UPPER LIMIT FOR VELOCITY IN OUTFALL PIPELINE AT DESIGN FLOW

INITIAL VALUES FOR THE CALCULATION OF THE MANIFOLD

QDES = 4.000 CUM/SEC
VMAX = 2.00 M/SEC
VMIN = .40 M/SEC
DIST(1) = 500.00 M
U(1) = 4.00 M/SEC
DIA(2) = .928 M
DL(2) = 10.00 M
D(2) = .25 M
DL(3) = 10.00 M
DENS = .001
VPIPE = 1.20 M/SEC
FRM = .100
FRP = .100
PORT NO K1 = 11
DIA(K1) = 2.000 M
DL(K1) = 10.00 M
D(K1) = .21 M

PORT NO K2 = 0
DIA(K2) = .000 M
DL(K2) = .00 M
D(K2) = .00 M

PORT NO K3 = 0
DIA(K3) = .000 M
DL(K3) = .00 M
D(K3) = .00 M

THE LENGTH BETWEEN THE PORTS DL(N) AND THE DIAMETER OF THE PORTS
D(N) ARE KEPT CONSTANT ALONG THE MANIFOLD AND SET EQUAL TO
RESPECTIVELY DL(3) AND D(2).
IF WANTED THE DIA(N),DL(N) AND D(N) CAN BE CHANGED FOR PORT NO
N = K TO DIA(K),DL(K) AND D(K).

1 FLOW CHARACTERISTICS FOR U(1) = 4.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	14.00	500.00			.37		4.00	74.55	.82		270.41	
2	14.00	490.00	.928	10.00	.25	.40	4.02	91.36	.82	.27	122.86	27.04
3	14.00	480.00	.928	10.00	.25	.58	4.07	92.61	.84	.39	123.02	12.29
4	14.00	470.00	.928	10.00	.25	.76	4.14	94.65	.87	.52	123.75	12.30
5	14.00	460.00	.928	10.00	.25	.95	4.26	97.64	.92	.64	125.31	12.37
6	14.00	450.00	.928	10.00	.25	1.13	4.42	101.69	.99	.77	127.96	12.53
7	14.00	440.00	.928	10.00	.25	1.32	4.63	106.90	1.09	.89	131.90	12.80
8	14.00	430.00	.928	10.00	.25	1.52	4.89	113.34	1.22	1.03	137.28	13.19
9	14.00	420.00	.928	10.00	.25	1.72	5.20	121.07	1.38	1.16	144.25	13.73
10	14.00	410.00	.928	10.00	.25	1.93	5.58	130.13	1.58	1.31	152.88	14.42
11	14.00	400.00	2.000	10.00	.21	.46	5.59	158.34	1.59	1.46	120.73	15.29
12	14.00	390.00	2.000	10.00	.21	.50	5.60	138.66	1.60	1.58	120.84	12.07
13	14.00	380.00	2.000	10.00	.21	.54	5.61	139.02	1.60	1.70	120.99	12.08
14	14.00	370.00	2.000	10.00	.21	.58	5.62	139.44	1.61	1.82	121.16	12.10
15	14.00	360.00	2.000	10.00	.21	.62	5.64	139.90	1.62	1.94	121.37	12.12
16	14.00	350.00	2.000	10.00	.21	.66	5.66	140.42	1.63	2.06	121.62	12.14
17	14.00	340.00	2.000	10.00	.21	.70	5.68	141.00	1.65	2.19	121.90	12.16
18	13.84	330.00	2.000	10.00	.21	.74	5.71	141.65	1.66	2.31	122.24	12.19
19	13.68	320.00	2.000	10.00	.21	.77	5.73	142.36	1.67	2.43	122.62	12.22
20	13.64	310.00	2.000	10.00	.21	.81	5.76	143.14	1.69	2.55	123.04	12.26
21	13.60	300.00	2.000	10.00	.21	.85	5.79	143.98	1.71	2.68	123.51	12.30
22	13.56	290.00	2.000	10.00	.21	.89	5.83	144.89	1.73	2.80	124.04	12.35
23	13.36	280.00	2.000	10.00	.21	.93	5.86	145.88	1.75	2.92	124.62	12.40
24	13.16	270.01	2.000	10.00	.21	.97	5.90	146.95	1.78	3.05	125.26	12.46
25	12.96	260.01	2.000	10.00	.21	1.01	5.95	148.09	1.80	3.17	125.97	12.53
26	12.76	250.01	2.000	10.00	.21	1.05	5.99	149.32	1.83	3.30	126.73	12.60
27	12.56	240.01	2.000	10.00	.21	1.09	6.04	150.62	1.86	3.43	127.56	12.67
28	12.36	230.01	2.000	10.00	.21	1.13	6.10	152.01	1.90	3.55	128.45	12.76
29	12.16	220.02	2.000	10.00	.21	1.17	6.15	153.49	1.93	3.68	129.41	12.84
30	11.83	210.02	2.000	10.00	.21	1.21	6.21	155.06	1.97	3.81	130.44	12.94
31	11.49	200.03	2.000	10.00	.21	1.26	6.28	156.71	2.01	3.94	131.55	13.04

OUTFALL PIPELINE

TOTAL DISCHARGE = 4.07 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.30 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 2.88 M

1

FLOW CHARACTERISTICS FOR U(1) = 1.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	14.00	500.00			.37		1.00	18.64	.05		67.60	
2	14.00	490.00	.928	10.00	.25	.10	1.01	22.84	.05	.07	30.72	6.76
3	14.00	480.00	.928	10.00	.25	.15	1.02	23.15	.05	.10	30.75	3.07
4	14.00	470.00	.928	10.00	.25	.19	1.04	23.66	.05	.13	30.94	3.08
5	14.00	460.00	.928	10.00	.25	.24	1.06	24.41	.06	.16	31.33	3.09
6	14.00	450.00	.928	10.00	.25	.28	1.10	25.42	.06	.19	31.99	3.13
7	14.00	440.00	.928	10.00	.25	.33	1.16	26.73	.07	.22	32.97	3.20
8	14.00	430.00	.928	10.00	.25	.38	1.22	28.34	.08	.26	34.32	3.30
9	14.00	420.00	.928	10.00	.25	.43	1.30	30.27	.09	.29	36.06	3.43
10	14.00	410.00	.928	10.00	.25	.48	1.39	32.53	.10	.33	38.22	3.61
11	14.00	400.00	2.000	10.00	.21	.12	1.40	34.58	.10	.36	30.18	3.82
12	14.00	390.00	2.000	10.00	.21	.13	1.40	34.66	.10	.40	30.21	3.02
13	14.00	380.00	2.000	10.00	.21	.14	1.40	34.76	.10	.43	30.25	3.02
14	14.00	370.00	2.000	10.00	.21	.15	1.41	34.86	.10	.46	30.29	3.02
15	14.00	360.00	2.000	10.00	.21	.15	1.41	34.98	.10	.49	30.34	3.03
16	14.00	350.00	2.000	10.00	.21	.16	1.42	35.11	.10	.52	30.40	3.03
17	14.00	340.00	2.000	10.00	.21	.17	1.42	35.25	.10	.55	30.48	3.04
18	13.84	330.00	2.000	10.00	.21	.18	1.43	35.44	.10	.58	30.58	3.05
19	13.68	320.00	2.000	10.00	.21	.19	1.44	35.64	.10	.61	30.70	3.06
20	13.64	310.00	2.000	10.00	.21	.20	1.44	35.84	.11	.64	30.81	3.07
21	13.60	300.00	2.000	10.00	.21	.21	1.45	36.06	.11	.67	30.93	3.08
22	13.56	290.00	2.000	10.00	.21	.22	1.46	36.29	.11	.70	31.07	3.09
23	13.36	280.00	2.000	10.00	.21	.23	1.47	36.57	.11	.73	31.24	3.11
24	13.16	270.01	2.000	10.00	.21	.24	1.48	36.87	.11	.76	31.43	3.12
25	12.96	260.01	2.000	10.00	.21	.25	1.49	37.18	.11	.79	31.63	3.14
26	12.76	250.01	2.000	10.00	.21	.26	1.51	37.52	.12	.83	31.85	3.16
27	12.56	240.01	2.000	10.00	.21	.27	1.52	37.87	.12	.86	32.08	3.19
28	12.36	230.01	2.000	10.00	.21	.28	1.53	38.25	.12	.89	32.33	3.21
29	12.16	220.02	2.000	10.00	.21	.29	1.55	38.65	.12	.92	32.60	3.23
30	11.83	210.02	2.000	10.00	.21	.30	1.57	39.08	.13	.95	32.90	3.26
31	11.49	200.03	2.000	10.00	.21	.31	1.58	39.54	.13	.99	33.22	3.29

OUTFALL PIPELINE

TOTAL DISCHARGE = 1.02 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .32 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = .19 M

1 FLOW CHARACTERISTICS FOR U(1) = 2.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	14.00	500.00			.37		2.00	37.28	.20		135.21	
2	14.00	490.00	.928	10.00	.25	.20	2.01	45.68	.21	.14	61.43	13.52
3	14.00	480.00	.928	10.00	.25	.29	2.03	46.30	.21	.20	61.51	6.14
4	14.00	470.00	.928	10.00	.25	.38	2.07	47.33	.22	.26	61.87	6.15
5	14.00	460.00	.928	10.00	.25	.47	2.13	48.82	.23	.32	62.66	6.19
6	14.00	450.00	.928	10.00	.25	.57	2.21	50.85	.25	.38	63.98	6.27
7	14.00	440.00	.928	10.00	.25	.66	2.31	53.45	.27	.45	65.95	6.40
8	14.00	430.00	.928	10.00	.25	.76	2.44	56.67	.30	.51	68.64	6.59
9	14.00	420.00	.928	10.00	.25	.86	2.60	60.53	.34	.58	72.12	6.86
10	14.00	410.00	.928	10.00	.25	.97	2.79	65.06	.40	.65	76.44	7.21
11	14.00	400.00	2.000	10.00	.21	.23	2.79	69.17	.40	.73	60.37	7.64
12	14.00	390.00	2.000	10.00	.21	.25	2.80	69.33	.40	.79	60.42	6.04
13	14.00	380.00	2.000	10.00	.21	.27	2.80	69.51	.40	.85	60.49	6.04
14	14.00	370.00	2.000	10.00	.21	.29	2.81	69.72	.40	.91	60.58	6.05
15	14.00	360.00	2.000	10.00	.21	.31	2.82	69.95	.41	.97	60.69	6.06
16	14.00	350.00	2.000	10.00	.21	.33	2.83	70.21	.41	1.03	60.81	6.07
17	14.00	340.00	2.000	10.00	.21	.35	2.84	70.50	.41	1.09	60.95	6.08
18	13.84	330.00	2.000	10.00	.21	.37	2.85	70.84	.41	1.15	61.13	6.10
19	13.68	320.00	2.000	10.00	.21	.39	2.87	71.20	.42	1.22	61.33	6.11
20	13.64	310.00	2.000	10.00	.21	.41	2.88	71.59	.42	1.28	61.54	6.13
21	13.60	300.00	2.000	10.00	.21	.43	2.90	72.01	.43	1.34	61.78	6.15
22	13.56	290.00	2.000	10.00	.21	.45	2.91	72.47	.43	1.40	62.04	6.18
23	13.36	280.00	2.000	10.00	.21	.47	2.93	72.98	.44	1.46	62.35	6.20
24	13.16	270.01	2.000	10.00	.21	.49	2.95	73.53	.44	1.52	62.68	6.23
25	12.96	260.01	2.000	10.00	.21	.51	2.98	74.11	.45	1.59	63.04	6.27
26	12.76	250.01	2.000	10.00	.21	.53	3.00	74.73	.46	1.65	63.43	6.30
27	12.56	240.01	2.000	10.00	.21	.55	3.03	75.40	.47	1.71	63.86	6.34
28	12.36	230.01	2.000	10.00	.21	.57	3.05	76.11	.48	1.78	64.31	6.39
29	12.16	220.02	2.000	10.00	.21	.59	3.08	76.85	.48	1.84	64.80	6.43
30	11.83	210.02	2.000	10.00	.21	.61	3.11	77.66	.49	1.91	65.34	6.48
31	11.49	200.03	2.000	10.00	.21	.63	3.14	78.50	.50	1.97	65.91	6.53

OUTFALL PIPELINE

TOTAL DISCHARGE = 2.04 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .65 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = .73 M

1 FLOW CHARACTERISTICS FOR U(1) = 3.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	14.00	500.00			.37		3.00	55.91	.46		202.81	
2	14.00	490.00	.928	10.00	.25	.30	3.02	68.52	.46	.20	92.15	20.28
3	14.00	480.00	.928	10.00	.25	.44	3.05	69.46	.47	.29	92.26	9.21
4	14.00	470.00	.928	10.00	.25	.57	3.11	70.99	.49	.39	92.81	9.23
5	14.00	460.00	.928	10.00	.25	.71	3.19	73.23	.52	.48	93.98	9.28
6	14.00	450.00	.928	10.00	.25	.85	3.31	76.27	.56	.57	95.97	9.40
7	14.00	440.00	.928	10.00	.25	.99	3.47	80.18	.61	.67	98.92	9.60
8	14.00	430.00	.928	10.00	.25	1.14	3.66	85.01	.68	.77	102.96	9.89
9	14.00	420.00	.928	10.00	.25	1.29	3.90	90.80	.78	.87	108.19	10.30
10	14.00	410.00	.928	10.00	.25	1.45	4.18	97.60	.89	.98	114.66	10.82
11	14.00	400.00	2.000	10.00	.21	.35	4.19	103.75	.89	1.09	90.55	11.47
12	14.00	390.00	2.000	10.00	.21	.38	4.20	103.99	.90	1.19	90.63	9.05
13	14.00	380.00	2.000	10.00	.21	.41	4.21	104.27	.90	1.28	90.74	9.06
14	14.00	370.00	2.000	10.00	.21	.44	4.22	104.58	.91	1.37	90.87	9.07
15	14.00	360.00	2.000	10.00	.21	.46	4.23	104.93	.91	1.46	91.03	9.09
16	14.00	350.00	2.000	10.00	.21	.49	4.25	105.32	.92	1.55	91.21	9.10
17	14.00	340.00	2.000	10.00	.21	.52	4.26	105.75	.93	1.64	91.43	9.12
18	13.84	330.00	2.000	10.00	.21	.55	4.28	106.24	.93	1.73	91.68	9.14
19	13.68	320.00	2.000	10.00	.21	.58	4.30	106.78	.94	1.82	91.97	9.17
20	13.64	310.00	2.000	10.00	.21	.61	4.32	107.36	.95	1.91	92.29	9.20
21	13.60	300.00	2.000	10.00	.21	.64	4.34	107.99	.96	2.01	92.64	9.23
22	13.56	290.00	2.000	10.00	.21	.67	4.37	108.68	.97	2.10	93.04	9.26
23	13.36	280.00	2.000	10.00	.21	.70	4.40	109.43	.99	2.19	93.48	9.30
24	13.16	270.01	2.000	10.00	.21	.73	4.43	110.23	1.00	2.29	93.97	9.35
25	12.96	260.01	2.000	10.00	.21	.76	4.46	111.10	1.01	2.38	94.50	9.40
26	12.76	250.01	2.000	10.00	.21	.79	4.50	112.02	1.03	2.47	95.07	9.45
27	12.56	240.01	2.000	10.00	.21	.82	4.53	113.00	1.05	2.57	95.70	9.51
28	12.36	230.01	2.000	10.00	.21	.85	4.57	114.05	1.07	2.67	96.37	9.57
29	12.16	220.02	2.000	10.00	.21	.88	4.62	115.16	1.09	2.76	97.10	9.64
30	11.83	210.02	2.000	10.00	.21	.91	4.66	116.34	1.11	2.86	97.88	9.71
31	11.49	200.03	2.000	10.00	.21	.94	4.71	117.59	1.13	2.96	98.71	9.79

OUTFALL PIPELINE

TOTAL DISCHARGE = 3.06 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .97 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 1.63 M

1 FLOW CHARACTERISTICS FOR U(1) = 5.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	14.00	500.00			.37		5.00	93.19	1.27		338.01	
2	14.00	490.00	.928	10.00	.25	.50	5.03	114.20	1.29	.34	153.58	33.80
3	14.00	480.00	.928	10.00	.25	.73	5.08	115.76	1.32	.49	153.77	15.36
4	14.00	470.00	.928	10.00	.25	.95	5.18	118.32	1.37	.65	154.68	15.38
5	14.00	460.00	.928	10.00	.25	1.18	5.32	122.05	1.44	.80	156.64	15.47
6	14.00	450.00	.928	10.00	.25	1.42	5.52	127.12	1.55	.96	159.95	15.66
7	14.00	440.00	.928	10.00	.25	1.65	5.78	133.63	1.70	1.12	164.87	15.99
8	14.00	430.00	.928	10.00	.25	1.90	6.11	141.68	1.90	1.28	171.61	16.49
9	14.00	420.00	.928	10.00	.25	2.15	6.50	151.33	2.15	1.45	180.31	17.16
10	14.00	410.00	.928	10.00	.25	2.42	6.97	162.66	2.48	1.63	191.10	18.03
11	14.00	400.00	2.000	10.00	.21	.58	6.98	172.92	2.48	1.82	150.91	19.11
12	14.00	390.00	2.000	10.00	.21	.63	7.00	173.32	2.49	1.98	151.06	15.09
13	14.00	380.00	2.000	10.00	.21	.68	7.01	173.78	2.51	2.13	151.24	15.11
14	14.00	370.00	2.000	10.00	.21	.73	7.03	174.29	2.52	2.28	151.45	15.12
15	14.00	360.00	2.000	10.00	.21	.77	7.05	174.88	2.53	2.43	151.72	15.15
16	14.00	350.00	2.000	10.00	.21	.82	7.08	175.53	2.55	2.58	152.02	15.17
17	14.00	340.00	2.000	10.00	.21	.87	7.10	176.26	2.57	2.73	152.38	15.20
18	13.84	330.00	2.000	10.00	.21	.92	7.13	177.06	2.59	2.89	152.80	15.24
19	13.68	320.00	2.000	10.00	.21	.97	7.17	177.95	2.62	3.04	153.27	15.28
20	13.64	310.00	2.000	10.00	.21	1.02	7.20	178.91	2.64	3.19	153.79	15.33
21	13.60	300.00	2.000	10.00	.21	1.07	7.24	179.96	2.67	3.35	154.38	15.38
22	13.56	290.00	2.000	10.00	.21	1.11	7.28	181.10	2.70	3.50	155.04	15.44
23	13.36	280.00	2.000	10.00	.21	1.16	7.33	182.34	2.74	3.65	155.77	15.50
24	13.16	270.01	2.000	10.00	.21	1.21	7.38	183.67	2.78	3.81	156.57	15.58
25	12.96	260.01	2.000	10.00	.21	1.26	7.43	185.10	2.82	3.97	157.44	15.66
26	12.76	250.01	2.000	10.00	.21	1.31	7.49	186.63	2.86	4.12	158.39	15.74
27	12.56	240.01	2.000	10.00	.21	1.36	7.55	188.25	2.91	4.28	159.42	15.84
28	12.36	230.01	2.000	10.00	.21	1.41	7.62	189.99	2.96	4.44	160.53	15.94
29	12.16	220.02	2.000	10.00	.21	1.47	7.69	191.83	3.02	4.60	161.73	16.05
30	11.83	210.02	2.000	10.00	.21	1.52	7.77	193.78	3.07	4.76	163.02	16.17
31	11.49	200.03	2.000	10.00	.21	1.57	7.85	195.85	3.14	4.93	164.39	16.30

OUTFALL PIPELINE

TOTAL DISCHARGE = 5.09 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.62 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 4.49 M

1 FLOW CHARACTERISTICS FOR U(1) = 6.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	14.00	500.00			.37		6.00	111.83	1.83		405.62	
2	14.00	490.00	.928	10.00	.25	.60	6.03	137.04	1.85	.41	184.29	40.56
3	14.00	480.00	.928	10.00	.25	.87	6.10	138.91	1.90	.59	184.53	18.43
4	14.00	470.00	.928	10.00	.25	1.15	6.21	141.98	1.97	.77	185.62	18.45
5	14.00	460.00	.928	10.00	.25	1.42	6.39	146.46	2.08	.96	187.97	18.56
6	14.00	450.00	.928	10.00	.25	1.70	6.63	152.54	2.24	1.15	191.94	18.80
7	14.00	440.00	.928	10.00	.25	1.98	6.94	160.35	2.45	1.34	197.84	19.19
8	14.00	430.00	.928	10.00	.25	2.27	7.33	170.01	2.74	1.54	205.93	19.78
9	14.00	420.00	.928	10.00	.25	2.58	7.80	181.60	3.10	1.74	216.37	20.59
10	14.00	410.00	.928	10.00	.25	2.90	8.36	195.19	3.56	1.96	229.32	21.64
11	14.00	400.00	2.000	10.00	.21	.70	8.38	207.51	3.58	2.19	181.10	22.93
12	14.00	390.00	2.000	10.00	.21	.75	8.39	207.99	3.59	2.37	181.27	18.11
13	14.00	380.00	2.000	10.00	.21	.81	8.41	208.53	3.61	2.55	181.48	18.13
14	14.00	370.00	2.000	10.00	.21	.87	8.44	209.15	3.63	2.73	181.74	18.15
15	14.00	360.00	2.000	10.00	.21	.93	8.46	209.85	3.65	2.92	182.06	18.17
16	14.00	350.00	2.000	10.00	.21	.99	8.49	210.64	3.67	3.10	182.43	18.21
17	14.00	340.00	2.000	10.00	.21	1.04	8.52	211.51	3.70	3.28	182.86	18.24
18	13.84	330.00	2.000	10.00	.21	1.10	8.56	212.47	3.73	3.46	183.35	18.29
19	13.68	320.00	2.000	10.00	.21	1.16	8.60	213.53	3.77	3.65	183.92	18.34
20	13.64	310.00	2.000	10.00	.21	1.22	8.64	214.69	3.81	3.83	184.55	18.39
21	13.60	300.00	2.000	10.00	.21	1.28	8.69	215.95	3.85	4.01	185.26	18.45
22	13.56	290.00	2.000	10.00	.21	1.34	8.74	217.32	3.89	4.20	186.04	18.53
23	13.36	280.00	2.000	10.00	.21	1.40	8.80	218.80	3.94	4.39	186.91	18.60
24	13.16	270.01	2.000	10.00	.21	1.46	8.86	220.39	4.00	4.57	187.87	18.69
25	12.96	260.01	2.000	10.00	.21	1.52	8.92	222.11	4.06	4.76	188.92	18.79
26	12.76	250.01	2.000	10.00	.21	1.58	8.99	223.94	4.12	4.95	190.06	18.89
27	12.56	240.01	2.000	10.00	.21	1.64	9.06	225.89	4.19	5.14	191.29	19.01
28	12.36	230.01	2.000	10.00	.21	1.70	9.14	227.97	4.26	5.33	192.62	19.13
29	12.16	220.02	2.000	10.00	.21	1.76	9.23	230.17	4.34	5.52	194.06	19.26
30	11.83	210.02	2.000	10.00	.21	1.82	9.32	232.51	4.43	5.72	195.60	19.41
31	11.49	200.03	2.000	10.00	.21	1.88	9.41	234.99	4.52	5.91	197.25	19.56

OUTFALL PIPELINE

TOTAL DISCHARGE = 6.11 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.95 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 6.46 M

1 FLOW CHARACTERISTICS FOR U(1) = 7.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
					.37		7.00	130.46	2.50		473.22	
1	14.00	500.00			.25	.70	7.04	159.87	2.52	.47	215.01	47.32
2	14.00	490.00	.928	10.00	.25	1.02	7.12	162.07	2.58	.69	215.28	21.50
3	14.00	480.00	.928	10.00	.25	1.34	7.25	165.65	2.68	.90	216.56	21.53
4	14.00	470.00	.928	10.00	.25	1.66	7.45	170.87	2.83	1.12	219.30	21.66
5	14.00	460.00	.928	10.00	.25	1.98	7.73	177.96	3.05	1.34	223.93	21.93
6	14.00	450.00	.928	10.00	.25	2.31	8.09	187.08	3.34	1.56	230.82	22.39
7	14.00	440.00	.928	10.00	.25	2.65	8.55	198.35	3.73	1.79	240.25	23.08
8	14.00	430.00	.928	10.00	.25	3.01	9.10	211.87	4.22	2.03	252.43	24.02
9	14.00	420.00	.928	10.00	.25	3.38	9.76	227.72	4.85	2.29	267.54	25.24
10	14.00	410.00	.928	10.00	.21	.81	9.77	242.09	4.87	2.55	211.28	26.75
11	14.00	400.00	2.000	10.00	.21	.88	9.79	242.65	4.89	2.77	211.48	21.13
12	14.00	390.00	2.000	10.00	.21	.95	9.82	243.29	4.91	2.98	211.73	21.15
13	14.00	380.00	2.000	10.00	.21	1.02	9.84	244.01	4.94	3.19	212.04	21.17
14	14.00	370.00	2.000	10.00	.21	1.08	9.87	244.83	4.97	3.40	212.40	21.20
15	14.00	360.00	2.000	10.00	.21	1.15	9.91	245.74	5.00	3.61	212.83	21.24
16	14.00	350.00	2.000	10.00	.21	1.22	9.94	246.76	5.04	3.83	213.33	21.28
17	14.00	340.00	2.000	10.00	.21	1.29	9.99	247.88	5.08	4.04	213.91	21.33
18	13.84	330.00	2.000	10.00	.21	1.35	10.03	249.12	5.13	4.25	214.57	21.39
19	13.68	320.00	2.000	10.00	.21	1.42	10.08	250.47	5.18	4.47	215.30	21.46
20	13.64	310.00	2.000	10.00	.21	1.49	10.14	251.94	5.24	4.68	216.13	21.53
21	13.60	300.00	2.000	10.00	.21	1.56	10.20	253.53	5.30	4.90	217.05	21.61
22	13.56	290.00	2.000	10.00	.21	1.63	10.26	255.26	5.37	5.12	218.06	21.70
23	13.36	280.00	2.000	10.00	.21	1.70	10.33	257.12	5.44	5.33	219.18	21.81
24	13.16	270.01	2.000	10.00	.21	1.77	10.41	259.11	5.52	5.55	220.40	21.92
25	12.96	260.01	2.000	10.00	.21	1.84	10.49	261.25	5.61	5.77	221.72	22.04
26	12.76	250.01	2.000	10.00	.21	1.91	10.58	263.52	5.70	6.00	22 .16	22.17
27	12.56	240.01	2.000	10.00	.21	1.98	10.67	265.95	5.80	6.22	224.72	22.32
28	12.36	230.01	2.000	10.00	.21	2.05	10.77	268.52	5.91	6.44	226.39	22.47
29	12.16	220.02	2.000	10.00	.21	2.12	10.87	271.25	6.02	6.67	228.18	22.64
30	11.83	210.02	2.000	10.00	.21	2.20	10.98	274.13	6.15	6.90	230.10	22.82
31	11.49	200.03	2.000	10.00								

OUTFALL PIPELINE

TOTAL DISCHARGE = 7.13 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.27 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 8.79 M

1 FLOW CHARACTERISTICS FOR U(1) = 8.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	14.00	500.00			.37		8.00	149.10	3.26		540.82	
2	14.00	490.00	.928	10.00	.25	.80	8.04	182.71	3.30	.54	245.73	54.08
3	14.00	480.00	.928	10.00	.25	1.16	8.13	185.22	3.37	.79	246.04	24.57
4	14.00	470.00	.928	10.00	.25	1.53	8.29	189.31	3.50	1.03	247.49	24.60
5	14.00	460.00	.928	10.00	.25	1.89	8.52	195.28	3.70	1.28	250.62	24.75
6	14.00	450.00	.928	10.00	.25	2.26	8.83	203.39	3.98	1.53	255.92	25.06
7	14.00	440.00	.928	10.00	.25	2.64	9.25	213.81	4.36	1.79	263.79	25.59
8	14.00	430.00	.928	10.00	.25	3.03	9.77	226.69	4.87	2.05	274.57	26.38
9	14.00	420.00	.928	10.00	.25	3.44	10.40	242.14	5.52	2.32	288.50	27.46
10	14.00	410.00	.928	10.00	.25	3.87	11.15	260.26	6.34	2.61	305.76	28.85
11	14.00	400.00	2.000	10.00	.21	.93	11.17	276.68	6.36	2.92	241.46	30.58
12	14.00	390.00	2.000	10.00	.21	1.01	11.19	277.31	6.39	3.16	241.69	24.15
13	14.00	380.00	2.000	10.00	.21	1.08	11.22	278.04	6.42	3.40	241.98	24.17
14	14.00	370.00	2.000	10.00	.21	1.16	11.25	278.87	6.45	3.64	242.33	24.20
15	14.00	360.00	2.000	10.00	.21	1.24	11.28	279.80	6.49	3.89	242.74	24.23
16	14.00	350.00	2.000	10.00	.21	1.32	11.32	280.85	6.53	4.13	243.24	24.27
17	14.00	340.00	2.000	10.00	.21	1.39	11.36	282.01	6.58	4.37	243.81	24.32
18	13.84	330.00	2.000	10.00	.21	1.47	11.41	283.29	6.64	4.62	244.47	24.38
19	13.68	320.00	2.000	10.00	.21	1.55	11.46	284.71	6.70	4.86	245.22	24.45
20	13.64	310.00	2.000	10.00	.21	1.63	11.52	286.25	6.77	5.11	246.06	24.52
21	13.60	300.00	2.000	10.00	.21	1.70	11.58	287.93	6.84	5.35	247.00	24.61
22	13.56	290.00	2.000	10.00	.21	1.78	11.65	289.75	6.92	5.60	248.05	24.70
23	13.36	280.00	2.000	10.00	.21	1.86	11.73	291.72	7.01	5.85	249.21	24.80
24	13.16	270.01	2.000	10.00	.21	1.94	11.81	293.85	7.11	6.10	250.48	24.92
25	12.96	260.01	2.000	10.00	.21	2.02	11.89	296.12	7.21	6.35	251.88	25.05
26	12.76	250.01	2.000	10.00	.21	2.10	11.99	298.56	7.32	6.60	253.39	25.19
27	12.56	240.01	2.000	10.00	.21	2.18	12.09	301.16	7.44	6.85	255.04	25.34
28	12.36	230.01	2.000	10.00	.21	2.26	12.19	303.93	7.58	7.11	256.81	25.50
29	12.16	220.02	2.000	10.00	.21	2.35	12.30	306.87	7.72	7.36	258.72	25.68
30	11.83	210.02	2.000	10.00	.21	2.43	12.42	309.98	7.87	7.62	260.77	25.87
31	11.49	200.03	2.000	10.00	.21	2.51	12.55	313.28	8.03	7.88	262.96	26.08

OUTFALL PIPELINE

TOTAL DISCHARGE = 8.15 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.59 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 11.48 M

MANIFOLD 3
TRACE B

BOTTOM PROFILE

DISTANCE M	DEPTH M
.00	.00
25.00	.00
40.00	1.00
50.00	3.00
60.00	4.50
65.00	5.00
75.00	6.50
90.00	7.00
100.00	8.50
125.00	9.00
150.00	9.10
175.00	9.50
200.00	9.80
225.00	10.20
250.00	10.50
275.00	10.50
300.00	10.50
325.00	10.50
350.00	10.80
375.00	10.80
400.00	11.00
425.00	11.00
450.00	11.00
475.00	11.50
510.00	11.60

LIST OF SYMBOLS

N = NO OF PORT
DEPTH(N) = DEPTH AT PORT N
DIST(N) = DISTANCE FROM SHORE
DIA(N) = DIAMETER OF MANIFOLD BETWEEN PORT N AND N-1
DL(N) = LENGTH BETWEEN PORT N AND N-1
D(N) = DIAMETER OF PORT N
V(N) = VELOCITY IN MANIFOLD BETWEEN PORT N AND N-1
U(N) = DISCHARGEVELOCITY OF PORT N
FN(N) = DENSIMETRIC FROUDE NO OF JET AT PORT N
E(N) = TOTAL HEAD AT PORT N
SQ(N) = TOTAL DISCHARGE UP TO PORT N
Q(N) = DISCHARGE OF PORT N
QL(N) = DISCHARGE LOAD PR LENGTH OF MANIFOLD
QDES = DESIGN DISCHARGE FLOW
VMIN = MINIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
VMAX = MAXIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
DENS = (SPEC.GRAV. SEAW.-SPEC.GRAV. WASTEW.)/(SPEC.GRAV. WASTEW.)
FRM = DARCY FRICTION FACTOR IN MANIFOLD
FRP = DARCY FRICTION FACTOR IN OUTFALL PIPELINE
VPIPE = UPPER LIMIT FOR VELOCITY IN OUTFALL PIPELINE AT DESIGN FLOW

INITIAL VALUES FOR THE CALCULATION OF THE MANIFOLD

QDES = 4.000 CUM/SEC
VMAX = 2.00 M/SEC
VMIN = .40 M/SEC
DIST(1) = 500.00 M
U(1) = 4.00 M/SEC
DIA(2) = .928 M
DL(2) = 10.00 M
D(2) = .25 M
DL(3) = 10.00 M
DENS = .001
VPIPE = 1.20 M/SEC
FRM = .100
FRP = .100
PORT NO K1 = 11
DIA(K1) = 2.000 M
DL(K1) = 10.00 M
D(K1) = .21 M

PORT NO K2 = 0
DIA(K2) = .000 M
DL(K2) = .00 M
D(K2) = .00 M

PORT NO K3 = 0
DIA(K3) = .000 M
DL(K3) = .00 M
D(K3) = .00 M

THE LENGTH BETWEEN THE PORTS DL(N) AND THE DIAMETER OF THE PORTS D(N) ARE KEPT CONSTANT ALONG THE MANIFOLD AND SET EQUAL TO RESPECTIVELY DL(3) AND D(2).
IF WANTED THE DIA(N),DL(N) AND D(N) CAN BE CHANGED FOR PORT NO N = K TO DIA(K),DL(K) AND D(K).

1

FLOW CHARACTERISTICS FOR U(1) = 4.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.37		4.00	74.55	.82		270.41	
2	11.54	490.00	.928	10.00	.25	.40	4.02	91.36	.82	.27	122.86	27.04
3	11.51	480.00	.928	10.00	.25	.58	4.07	92.61	.84	.39	123.02	12.29
4	11.49	470.00	.928	10.00	.25	.76	4.14	94.66	.87	.52	123.75	12.30
5	11.29	460.00	.928	10.00	.25	.95	4.26	97.66	.92	.64	125.33	12.38
6	11.09	450.00	.928	10.00	.25	1.13	4.42	101.72	1.00	.77	127.99	12.53
7	10.89	440.01	.928	10.00	.25	1.32	4.63	106.94	1.09	.89	131.94	12.80
8	10.89	430.01	.928	10.00	.25	1.52	4.89	113.38	1.22	1.03	137.33	13.19
9	10.89	420.01	.928	10.00	.25	1.72	5.20	121.10	1.38	1.16	144.29	13.73
10	10.89	410.01	.928	10.00	.25	1.93	5.58	130.16	1.59	1.31	152.93	14.43
11	10.89	400.01	2.000	10.00	.21	.46	5.59	138.38	1.59	1.46	120.76	15.29
12	10.89	390.01	2.000	10.00	.21	.50	5.60	138.69	1.60	1.58	120.88	12.08
13	10.81	380.01	2.000	10.00	.21	.54	5.61	139.06	1.60	1.70	121.02	12.09
14	10.73	370.01	2.000	10.00	.21	.58	5.63	139.48	1.61	1.82	121.20	12.10
15	10.73	360.01	2.000	10.00	.21	.62	5.64	139.95	1.62	1.94	121.41	12.12
16	10.73	350.01	2.000	10.00	.21	.66	5.66	140.47	1.63	2.07	121.66	12.14
17	10.73	340.01	2.000	10.00	.21	.70	5.68	141.05	1.65	2.19	121.94	12.17
18	10.61	330.01	2.000	10.00	.21	.74	5.71	141.70	1.66	2.31	122.28	12.19
19	10.49	320.01	2.000	10.00	.21	.77	5.73	142.41	1.68	2.43	122.65	12.23
20	10.49	310.01	2.000	10.00	.21	.81	5.76	143.18	1.69	2.55	123.07	12.27
21	10.49	300.01	2.000	10.00	.21	.85	5.79	144.02	1.71	2.68	123.55	12.31
22	10.49	290.01	2.000	10.00	.21	.89	5.83	144.93	1.73	2.80	124.07	12.35
23	10.49	280.01	2.000	10.00	.21	.93	5.87	145.91	1.75	2.92	124.65	12.41
24	10.49	270.01	2.000	10.00	.21	.97	5.91	146.97	1.78	3.05	125.28	12.46
25	10.49	260.01	2.000	10.00	.21	1.01	5.95	148.11	1.80	3.17	125.98	12.53
26	10.49	250.01	2.000	10.00	.21	1.05	6.00	149.32	1.83	3.30	126.73	12.60
27	10.49	240.01	2.000	10.00	.21	1.09	6.04	150.62	1.86	3.43	127.55	12.67
28	10.37	230.01	2.000	10.00	.21	1.13	6.10	152.01	1.89	3.55	128.44	12.76
29	10.25	220.01	2.000	10.00	.21	1.17	6.15	153.48	1.93	3.68	129.40	12.84
30	10.09	210.01	2.000	10.00	.21	1.21	6.21	155.04	1.97	3.81	130.43	12.94
31	9.93	200.01	2.000	10.00	.21	1.26	6.28	156.69	2.01	3.94	131.53	13.04

OUTFALL PIPELINE

TOTAL DISCHARGE = 4.07 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.30 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 2.88 M

FLOW CHARACTERISTICS FOR U(1) = 1.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.37		1.00	18.64	.05		67.60	
2	11.54	490.00	.928	10.00	.25	.10	1.01	22.85	.05	.07	30.72	6.76
3	11.51	480.00	.928	10.00	.25	.15	1.02	23.16	.05	.10	30.77	3.07
4	11.49	470.00	.928	10.00	.25	.19	1.04	23.68	.05	.13	30.96	3.08
5	11.29	460.00	.928	10.00	.25	.24	1.07	24.47	.06	.16	31.41	3.10
6	11.09	450.00	.928	10.00	.25	.28	1.11	25.52	.06	.19	32.13	3.14
7	10.89	440.01	.928	10.00	.25	.33	1.16	26.86	.07	.22	33.17	3.21
8	10.89	430.01	.928	10.00	.25	.38	1.23	28.47	.08	.26	34.51	3.32
9	10.89	420.01	.928	10.00	.25	.43	1.31	30.40	.09	.29	36.24	3.45
10	10.89	410.01	.928	10.00	.25	.48	1.40	32.67	.10	.33	38.40	3.62
11	10.89	400.01	2.000	10.00	.21	.12	1.40	34.73	.10	.37	30.31	3.84
12	10.89	390.01	2.000	10.00	.21	.13	1.41	34.81	.10	.40	30.34	3.03
13	10.81	380.01	2.000	10.00	.21	.14	1.41	34.92	.10	.43	30.39	3.03
14	10.73	370.01	2.000	10.00	.21	.15	1.41	35.03	.10	.46	30.45	3.04
15	10.73	360.01	2.000	10.00	.21	.16	1.42	35.15	.10	.49	30.50	3.04
16	10.73	350.01	2.000	10.00	.21	.16	1.42	35.28	.10	.52	30.56	3.05
17	10.73	340.01	2.000	10.00	.21	.17	1.43	35.43	.10	.55	30.63	3.06
18	10.61	330.01	2.000	10.00	.21	.18	1.43	35.61	.10	.58	30.73	3.06
19	10.49	320.01	2.000	10.00	.21	.19	1.44	35.81	.11	.61	30.84	3.07
20	10.49	310.01	2.000	10.00	.21	.20	1.45	36.00	.11	.64	30.95	3.08
21	10.49	300.01	2.000	10.00	.21	.21	1.46	36.21	.11	.67	31.06	3.09
22	10.49	290.01	2.000	10.00	.21	.22	1.47	36.44	.11	.70	31.20	3.11
23	10.49	280.01	2.000	10.00	.21	.23	1.47	36.68	.11	.73	31.34	3.12
24	10.49	270.01	2.000	10.00	.21	.24	1.48	36.95	.11	.77	31.50	3.13
25	10.49	260.01	2.000	10.00	.21	.25	1.50	37.23	.11	.80	31.67	3.15
26	10.49	250.01	2.000	10.00	.21	.26	1.51	37.54	.12	.83	31.86	3.17
27	10.49	240.01	2.000	10.00	.21	.27	1.52	37.86	.12	.86	32.07	3.19
28	10.37	230.01	2.000	10.00	.21	.28	1.53	38.23	.12	.89	32.31	3.21
29	10.25	220.01	2.000	10.00	.21	.29	1.55	38.62	.12	.92	32.56	3.23
30	10.09	210.01	2.000	10.00	.21	.30	1.56	39.03	.12	.96	32.84	3.26
31	9.93	200.01	2.000	10.00	.21	.32	1.58	39.47	.13	.99	33.14	3.28

OUTFALL PIPELINE

TOTAL DISCHARGE = 1.02 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .33 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = .19 M

1 FLOW CHARACTERISTICS FOR U(1) = 2.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.37		2.00	37.28	.20		135.21	
2	11.54	490.00	.928	10.00	.25	.20	2.01	45.68	.21	.14	61.44	13.52
3	11.51	480.00	.928	10.00	.25	.29	2.03	46.31	.21	.20	61.52	6.14
4	11.49	470.00	.928	10.00	.25	.38	2.07	47.34	.22	.26	61.89	6.15
5	11.29	460.00	.928	10.00	.25	.47	2.13	48.85	.23	.32	62.70	6.19
6	11.09	450.00	.928	10.00	.25	.57	2.21	50.90	.25	.38	64.05	6.27
7	10.89	440.01	.928	10.00	.25	.66	2.32	53.52	.27	.45	66.04	6.41
8	10.89	430.01	.928	10.00	.25	.76	2.45	56.74	.30	.51	68.74	6.60
9	10.89	420.01	.928	10.00	.25	.86	2.60	60.60	.35	.58	72.22	6.87
10	10.89	410.01	.928	10.00	.25	.97	2.79	65.13	.40	.65	76.53	7.22
11	10.89	400.01	2.000	10.00	.21	.23	2.80	69.24	.40	.73	60.43	7.65
12	10.89	390.01	2.000	10.00	.21	.25	2.80	69.40	.40	.79	60.49	6.04
13	10.81	380.01	2.000	10.00	.21	.27	2.81	69.59	.40	.85	60.57	6.05
14	10.73	370.01	2.000	10.00	.21	.29	2.82	69.81	.40	.91	60.66	6.06
15	10.73	360.01	2.000	10.00	.21	.31	2.82	70.04	.41	.97	60.76	6.07
16	10.73	350.01	2.000	10.00	.21	.33	2.83	70.30	.41	1.03	60.89	6.08
17	10.73	340.01	2.000	10.00	.21	.35	2.84	70.59	.41	1.09	61.03	6.09
18	10.61	330.01	2.000	10.00	.21	.37	2.86	70.92	.42	1.16	61.20	6.10
19	10.49	320.01	2.000	10.00	.21	.39	2.87	71.28	.42	1.22	61.40	6.12
20	10.49	310.01	2.000	10.00	.21	.41	2.88	71.67	.42	1.28	61.61	6.14
21	10.49	300.01	2.000	10.00	.21	.43	2.90	72.09	.43	1.34	61.84	6.16
22	10.49	290.01	2.000	10.00	.21	.45	2.92	72.55	.43	1.40	62.11	6.18
23	10.49	280.01	2.000	10.00	.21	.47	2.94	73.04	.44	1.46	62.40	6.21
24	10.49	270.01	2.000	10.00	.21	.49	2.96	73.57	.45	1.53	62.71	6.24
25	10.49	260.01	2.000	10.00	.21	.51	2.98	74.14	.45	1.59	63.06	6.27
26	10.49	250.01	2.000	10.00	.21	.53	3.00	74.75	.46	1.65	63.44	6.31
27	10.49	240.01	2.000	10.00	.21	.55	3.03	75.39	.47	1.71	63.85	6.34
28	10.37	230.01	2.000	10.00	.21	.57	3.05	76.10	.47	1.78	64.30	6.38
29	10.25	220.01	2.000	10.00	.21	.59	3.08	76.84	.48	1.84	64.79	6.43
30	10.09	210.01	2.000	10.00	.21	.61	3.11	77.63	.49	1.91	65.31	6.48
31	9.93	200.01	2.000	10.00	.21	.63	3.14	78.46	.50	1.97	65.87	6.53

OUTFALL PIPELINE

TOTAL DISCHARGE = 2.04 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .65 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = .73 M

1 FLOW CHARACTERISTICS FOR U(1) = 3.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.37		3.00	55.91	.46		202.81	
2	11.54	490.00	.928	10.00	.25	.30	3.02	68.52	.46	.20	92.15	20.28
3	11.51	480.00	.928	10.00	.25	.44	3.05	69.46	.47	.29	92.27	9.21
4	11.49	470.00	.928	10.00	.25	.57	3.11	71.00	.49	.39	92.82	9.23
5	11.29	460.00	.928	10.00	.25	.71	3.19	73.25	.52	.48	94.01	9.28
6	11.09	450.00	.928	10.00	.25	.85	3.31	76.30	.56	.57	96.02	9.40
7	10.89	440.01	.928	10.00	.25	.99	3.47	80.22	.61	.67	98.99	9.60
8	10.89	430.01	.928	10.00	.25	1.14	3.67	85.05	.69	.77	103.03	9.90
9	10.89	420.01	.928	10.00	.25	1.29	3.90	90.85	.78	.87	108.25	10.30
10	10.89	410.01	.928	10.00	.25	1.45	4.18	97.64	.89	.98	114.72	10.82
11	10.89	400.01	2.000	10.00	.21	.35	4.19	103.80	.90	1.10	90.59	11.47
12	10.89	390.01	2.000	10.00	.21	.38	4.20	104.04	.90	1.19	90.68	9.06
13	10.81	380.01	2.000	10.00	.21	.41	4.21	104.32	.90	1.28	90.79	9.07
14	10.73	370.01	2.000	10.00	.21	.44	4.22	104.64	.91	1.37	90.92	9.08
15	10.73	360.01	2.000	10.00	.21	.46	4.23	104.99	.91	1.46	91.08	9.09
16	10.73	350.01	2.000	10.00	.21	.49	4.25	105.38	.92	1.55	91.27	9.11
17	10.73	340.01	2.000	10.00	.21	.52	4.26	105.81	.93	1.64	91.48	9.13
18	10.61	330.01	2.000	10.00	.21	.55	4.28	106.30	.93	1.73	91.73	9.15
19	10.49	320.01	2.000	10.00	.21	.58	4.30	106.84	.94	1.82	92.02	9.17
20	10.49	310.01	2.000	10.00	.21	.61	4.32	107.41	.95	1.92	92.33	9.20
21	10.49	300.01	2.000	10.00	.21	.64	4.35	108.04	.96	2.01	92.69	9.23
22	10.49	290.01	2.000	10.00	.21	.67	4.37	108.73	.97	2.10	93.08	9.27
23	10.49	280.01	2.000	10.00	.21	.70	4.40	109.46	.99	2.19	93.51	9.31
24	10.49	270.01	2.000	10.00	.21	.73	4.43	110.26	1.00	2.29	93.99	9.35
25	10.49	260.01	2.000	10.00	.21	.76	4.46	111.11	1.02	2.38	94.51	9.40
26	10.49	250.01	2.000	10.00	.21	.79	4.50	112.03	1.03	2.48	95.08	9.45
27	10.49	240.01	2.000	10.00	.21	.82	4.53	113.00	1.05	2.57	95.69	9.51
28	10.37	230.01	2.000	10.00	.21	.85	4.57	114.04	1.07	2.67	96.36	9.57
29	10.25	220.01	2.000	10.00	.21	.88	4.62	115.15	1.09	2.76	97.08	9.64
30	10.09	210.01	2.000	10.00	.21	.91	4.66	116.32	1.11	2.86	97.86	9.71
31	9.93	200.01	2.000	10.00	.21	.94	4.71	117.57	1.13	2.96	98.69	9.79

OUTFALL PIPELINE

TOTAL DISCHARGE = 3.06 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .97 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 1.62 M

1 FLOW CHARACTERISTICS FOR U(1) = 5.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	11.57	500.00			.37		5.00	93.19	1.27		338.01	
2	11.54	490.00	.928	10.00	.25	.50	5.03	114.20	1.29	.34	153.58	33.80
3	11.51	480.00	.928	10.00	.25	.73	5.08	115.76	1.32	.49	153.78	15.36
4	11.49	470.00	.928	10.00	.25	.95	5.18	118.32	1.37	.65	154.69	15.38
5	11.29	460.00	.928	10.00	.25	1.18	5.32	122.06	1.44	.80	156.66	15.47
6	11.09	450.00	.928	10.00	.25	1.42	5.52	127.14	1.55	.96	159.98	15.67
7	10.89	440.01	.928	10.00	.25	1.65	5.78	133.66	1.70	1.12	164.91	16.00
8	10.89	430.01	.928	10.00	.25	1.90	6.11	141.70	1.90	1.28	171.64	16.49
9	10.89	420.01	.928	10.00	.25	2.15	6.50	151.36	2.16	1.45	180.35	17.16
10	10.89	410.01	.928	10.00	.25	2.42	6.97	162.69	2.48	1.63	191.14	18.03
11	10.89	400.01	2.000	10.00	.21	.58	6.98	172.95	2.49	1.82	150.94	19.11
12	10.89	390.01	2.000	10.00	.21	.63	7.00	173.35	2.50	1.98	151.08	15.09
13	10.81	380.01	2.000	10.00	.21	.68	7.01	173.81	2.51	2.13	151.26	15.11
14	10.73	370.01	2.000	10.00	.21	.73	7.03	174.33	2.52	2.28	151.49	15.13
15	10.73	360.01	2.000	10.00	.21	.77	7.05	174.91	2.54	2.43	151.75	15.15
16	10.73	350.01	2.000	10.00	.21	.82	7.08	175.57	2.55	2.58	152.05	15.17
17	10.73	340.01	2.000	10.00	.21	.87	7.10	176.29	2.57	2.73	152.41	15.21
18	10.61	330.01	2.000	10.00	.21	.92	7.13	177.10	2.59	2.89	152.83	15.24
19	10.49	320.01	2.000	10.00	.21	.97	7.17	177.98	2.62	3.04	153.30	15.28
20	10.49	310.01	2.000	10.00	.21	1.02	7.20	178.95	2.64	3.19	153.82	15.33
21	10.49	300.01	2.000	10.00	.21	1.07	7.24	179.99	2.67	3.35	154.41	15.38
22	10.49	290.01	2.000	10.00	.21	1.11	7.28	181.13	2.70	3.50	155.06	15.44
23	10.49	280.01	2.000	10.00	.21	1.16	7.33	182.36	2.74	3.66	155.79	15.51
24	10.49	270.01	2.000	10.00	.21	1.21	7.38	183.69	2.78	3.81	156.58	15.58
25	10.49	260.01	2.000	10.00	.21	1.26	7.43	185.11	2.82	3.97	157.45	15.66
26	10.49	250.01	2.000	10.00	.21	1.31	7.49	186.63	2.86	4.12	158.39	15.74
27	10.49	240.01	2.000	10.00	.21	1.36	7.55	188.25	2.91	4.28	159.42	15.84
28	10.37	230.01	2.000	10.00	.21	1.41	7.62	189.98	2.96	4.44	160.53	15.94
29	10.25	220.01	2.000	10.00	.21	1.47	7.69	191.82	3.01	4.60	161.72	16.05
30	10.09	210.01	2.000	10.00	.21	1.52	7.77	193.77	3.07	4.77	163.01	16.17
31	9.93	200.01	2.000	10.00	.21	1.57	7.84	195.83	3.14	4.93	164.38	16.30

OUTFALL PIPELINE

TOTAL DISCHARGE = 5.09 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.62 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 4.49 M

1 FLOW CHARACTERISTICS FOR U(1) = 6.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.37		6.00	111.83	1.83		405.62	
2	11.54	490.00	.928	10.00	.25	.60	6.03	137.04	1.85	.41	184.30	40.56
3	11.51	480.00	.928	10.00	.25	.87	6.10	138.92	1.90	.59	184.53	18.43
4	11.49	470.00	.928	10.00	.25	1.15	6.21	141.98	1.97	.77	185.62	18.45
5	11.29	460.00	.928	10.00	.25	1.42	6.39	146.47	2.08	.96	187.98	18.56
6	11.09	450.00	.928	10.00	.25	1.70	6.63	152.56	2.24	1.15	191.96	18.80
7	10.89	440.01	.928	10.00	.25	1.98	6.94	160.38	2.45	1.34	197.88	19.20
8	10.89	430.01	.928	10.00	.25	2.27	7.33	170.04	2.74	1.54	205.96	19.79
9	10.89	420.01	.928	10.00	.25	2.58	7.80	181.62	3.10	1.74	216.40	20.60
10	10.89	410.01	.928	10.00	.25	2.90	8.36	195.21	3.57	1.96	229.35	21.64
11	10.89	400.01	2.000	10.00	.21	.70	8.38	207.53	3.58	2.19	181.12	22.94
12	10.89	390.01	2.000	10.00	.21	.76	8.40	208.01	3.59	2.37	181.29	18.11
13	10.81	380.01	2.000	10.00	.21	.81	8.42	208.56	3.61	2.55	181.51	18.13
14	10.73	370.01	2.000	10.00	.21	.87	8.44	209.18	3.63	2.73	181.77	18.15
15	10.73	360.01	2.000	10.00	.21	.93	8.46	209.88	3.65	2.92	182.08	18.18
16	10.73	350.01	2.000	10.00	.21	.99	8.49	210.67	3.68	3.10	182.45	18.21
17	10.73	340.01	2.000	10.00	.21	1.04	8.52	211.54	3.70	3.28	182.88	18.25
18	10.61	330.01	2.000	10.00	.21	1.10	8.56	212.50	3.73	3.46	183.38	18.29
19	10.49	320.01	2.000	10.00	.21	1.16	8.60	213.56	3.77	3.65	183.94	18.34
20	10.49	310.01	2.000	10.00	.21	1.22	8.64	214.72	3.81	3.83	184.57	18.39
21	10.49	300.01	2.000	10.00	.21	1.28	8.69	215.98	3.85	4.01	185.28	18.46
22	10.49	290.01	2.000	10.00	.21	1.34	8.74	217.34	3.89	4.20	186.06	18.53
23	10.49	280.01	2.000	10.00	.21	1.40	8.80	218.82	3.94	4.39	186.93	18.61
24	10.49	270.01	2.000	10.00	.21	1.46	8.86	220.41	4.00	4.57	187.88	18.69
25	10.49	260.01	2.000	10.00	.21	1.52	8.92	222.11	4.06	4.76	188.92	18.79
26	10.49	250.01	2.000	10.00	.21	1.58	8.99	223.94	4.12	4.95	190.06	18.89
27	10.49	240.01	2.000	10.00	.21	1.64	9.06	225.89	4.19	5.14	191.29	19.01
28	10.37	230.01	2.000	10.00	.21	1.70	9.14	227.96	4.26	5.33	192.62	19.13
29	10.25	220.01	2.000	10.00	.21	1.76	9.23	230.17	4.34	5.52	194.05	19.26
30	10.09	210.01	2.000	10.00	.21	1.82	9.32	232.50	4.43	5.72	195.59	19.41
31	9.93	200.01	2.000	10.00	.21	1.88	9.41	234.97	4.52	5.91	197.23	19.56

OUTFALL PIPELINE

TOTAL DISCHARGE = 6.11 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.95 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 6.46 M

1 FLOW CHARACTERISTICS FOR U(1) = 7.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	11.57	500.00			.37		7.00	130.46	2.50		473.22	
2	11.54	490.00	.928	10.00	.25	.70	7.04	159.88	2.52	.47	215.01	47.32
3	11.51	480.00	.928	10.00	.25	1.02	7.12	162.07	2.58	.69	215.29	21.50
4	11.49	470.00	.928	10.00	.25	1.34	7.25	165.65	2.68	.90	216.56	21.53
5	11.29	460.00	.928	10.00	.25	1.66	7.45	170.88	2.83	1.12	219.31	21.66
6	11.09	450.00	.928	10.00	.25	1.98	7.73	177.98	3.05	1.34	223.95	21.93
7	10.89	440.01	.928	10.00	.25	2.31	8.10	187.10	3.34	1.56	230.85	22.39
8	10.89	430.01	.928	10.00	.25	2.65	8.55	198.37	3.73	1.79	240.27	23.08
9	10.89	420.01	.928	10.00	.25	3.01	9.10	211.89	4.22	2.03	252.46	24.03
10	10.89	410.01	.928	10.00	.25	3.38	9.76	227.74	4.85	2.29	267.57	25.25
11	10.89	400.01	2.000	10.00	.21	.81	9.77	242.11	4.87	2.55	211.30	26.76
12	10.89	390.01	2.000	10.00	.21	.88	9.79	242.67	4.89	2.77	211.50	21.13
13	10.81	380.01	2.000	10.00	.21	.95	9.82	243.31	4.91	2.98	211.75	21.15
14	10.73	370.01	2.000	10.00	.21	1.02	9.84	244.04	4.94	3.19	212.06	21.18
15	10.73	360.01	2.000	10.00	.21	1.08	9.87	244.85	4.97	3.40	212.42	21.21
16	10.73	350.01	2.000	10.00	.21	1.15	9.91	245.77	5.00	3.61	212.85	21.24
17	10.73	340.01	2.000	10.00	.21	1.22	9.94	246.78	5.04	3.83	213.35	21.29
18	10.61	330.01	2.000	10.00	.21	1.29	9.99	247.91	5.08	4.04	213.93	21.34
19	10.49	320.01	2.000	10.00	.21	1.35	10.03	249.14	5.13	4.25	214.59	21.39
20	10.49	310.01	2.000	10.00	.21	1.42	10.08	250.49	5.18	4.47	215.32	21.46
21	10.49	300.01	2.000	10.00	.21	1.49	10.14	251.96	5.24	4.68	216.15	21.53
22	10.49	290.01	2.000	10.00	.21	1.56	10.20	253.56	5.30	4.90	217.06	21.61
23	10.49	280.01	2.000	10.00	.21	1.63	10.26	255.28	5.37	5.12	218.08	21.71
24	10.49	270.01	2.000	10.00	.21	1.70	10.33	257.13	5.44	5.33	219.19	21.81
25	10.49	260.01	2.000	10.00	.21	1.77	10.41	259.12	5.52	5.55	220.40	21.92
26	10.49	250.01	2.000	10.00	.21	1.84	10.49	261.25	5.61	5.77	221.73	22.04
27	10.49	240.01	2.000	10.00	.21	1.91	10.58	263.52	5.70	6.00	223.16	22.17
28	10.37	230.01	2.000	10.00	.21	1.98	10.67	265.95	5.80	6.22	224.71	22.32
29	10.25	220.01	2.000	10.00	.21	2.05	10.77	268.52	5.91	6.44	226.38	22.47
30	10.09	210.01	2.000	10.00	.21	2.12	10.87	271.24	6.02	6.67	228.17	22.64
31	9.93	200.01	2.000	10.00	.21	2.20	10.98	274.12	6.15	6.90	230.09	22.82

OUTFALL PIPELINE

TOTAL DISCHARGE = 7.13 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.27 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 8.79 M

1 FLOW CHARACTERISTICS FOR U(1) = 8.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.37		8.00	149.10	3.26		540.82	
2	11.54	490.00	.928	10.00	.25	.80	8.04	182.71	3.30	.54	245.73	54.08
3	11.51	480.00	.928	10.00	.25	1.16	8.13	185.22	3.37	.79	246.04	24.57
4	11.49	470.00	.928	10.00	.25	1.53	8.29	189.31	3.50	1.03	247.50	24.60
5	11.29	460.00	.928	10.00	.25	1.89	8.52	195.29	3.70	1.28	250.63	24.75
6	11.09	450.00	.928	10.00	.25	2.26	8.84	203.40	3.98	1.53	255.94	25.06
7	10.89	440.01	.928	10.00	.25	2.64	9.25	213.82	4.36	1.79	263.82	25.59
8	10.89	430.01	.928	10.00	.25	3.03	9.77	226.70	4.87	2.05	274.59	26.38
9	10.89	420.01	.928	10.00	.25	3.44	10.40	242.15	5.52	2.33	288.52	27.46
10	10.89	410.01	.928	10.00	.25	3.87	11.15	260.27	6.34	2.61	305.78	28.85
11	10.89	400.01	2.000	10.00	.21	.93	11.17	276.70	6.36	2.92	241.48	30.58
12	10.89	390.01	2.000	10.00	.21	1.01	11.19	277.33	6.39	3.16	241.71	24.15
13	10.81	380.01	2.000	10.00	.21	1.08	11.22	278.06	6.42	3.40	241.99	24.17
14	10.73	370.01	2.000	10.00	.21	1.16	11.25	278.89	6.45	3.64	242.35	24.20
15	10.73	360.01	2.000	10.00	.21	1.24	11.28	279.83	6.49	3.89	242.76	24.23
16	10.73	350.01	2.000	10.00	.21	1.32	11.32	280.87	6.53	4.13	243.26	24.28
17	10.73	340.01	2.000	10.00	.21	1.39	11.36	282.03	6.58	4.37	243.83	24.33
18	10.61	330.01	2.000	10.00	.21	1.47	11.41	283.32	6.64	4.62	244.49	24.38
19	10.49	320.01	2.000	10.00	.21	1.55	11.46	284.73	6.70	4.86	245.24	24.45
20	10.49	310.01	2.000	10.00	.21	1.63	11.52	286.27	6.77	5.11	246.08	24.52
21	10.49	300.01	2.000	10.00	.21	1.70	11.59	287.95	6.84	5.35	247.02	24.61
22	10.49	290.01	2.000	10.00	.21	1.78	11.65	289.77	6.92	5.60	248.07	24.70
23	10.49	280.01	2.000	10.00	.21	1.86	11.73	291.74	7.01	5.85	249.22	24.81
24	10.49	270.01	2.000	10.00	.21	1.94	11.81	293.86	7.11	6.10	250.49	24.92
25	10.49	260.01	2.000	10.00	.21	2.02	11.89	296.13	7.21	6.35	251.88	25.05
26	10.49	250.01	2.000	10.00	.21	2.10	11.99	298.56	7.32	6.60	253.39	25.19
27	10.49	240.01	2.000	10.00	.21	2.18	12.09	301.16	7.44	6.85	255.03	25.34
28	10.37	230.01	2.000	10.00	.21	2.26	12.19	303.93	7.58	7.11	256.81	25.50
29	10.25	220.01	2.000	10.00	.21	2.35	12.30	306.87	7.72	7.36	258.71	25.68
30	10.09	210.01	2.000	10.00	.21	2.43	12.42	309.98	7.87	7.62	260.76	25.87
31	9.93	200.01	2.000	10.00	.21	2.51	12.55	313.27	8.03	7.88	262.95	26.08

OUTFALL PIPELINE

TOTAL DISCHARGE = 8.15 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.59 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 11.48 M

BOTTOM PROFILE

DISTANCE M	DEPTH M
.00	.00
25.00	.00
35.00	.50
40.00	1.50
50.00	3.00
60.00	4.00
70.00	6.00
90.00	8.00
100.00	9.00
125.00	9.20
150.00	9.30
175.00	9.50
200.00	9.80
225.00	9.80
250.00	9.80
275.00	9.90
300.00	10.00
325.00	10.00
350.00	10.50
375.00	10.50
400.00	11.00
425.00	11.00
450.00	11.00
475.00	11.10
510.00	11.30

MANIFOLD 3
TRACE C

LIST OF SYMBOLS

N = NO OF PORT
DEPTH(N) = DEPTH AT PORT N
DIST(N) = DISTANCE FROM SHORE
DIA(N) = DIAMETER OF MANIFOLD BETWEEN PORT N AND N-1
DL(N) = LENGTH BETWEEN PORT N AND N-1
D(N) = DIAMETER OF PORT N
V(N) = VELOCITY IN MANIFOLD BETWEEN PORT N AND N-1
U(N) = DISCHARGEVELOCITY OF PORT N
FN(N) = DENSIMETRIC FROUDE NO OF JET AT PORT N
E(N) = TOTAL HEAD AT PORT N
SQ(N) = TOTAL DISCHARGE UP TO PORT N
Q(N) = DISCHARGE OF PORT N
QL(N) = DISCHARGE LOAD PR LENGTH OF MANIFOLD
QDES = DESIGN DISCHARGE FLOW
VMIN = MINIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
VMAX = MAXIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
DENS = (SPEC.GRAV. SEAW.-SPEC.GRAV. WASTEW.)/(SPEC.GRAV. WASTEW.)
FRM = DARCY FRICTION FACTOR IN MANIFOLD
FRP = DARCY FRICTION FACTOR IN OUTFALL PIPELINE
VPIPE = UPPER LIMIT FOR VELOCITY IN OUTFALL PIPELINE AT DESIGN FLOW

INITIAL VALUES FOR THE CALCULATION OF THE MANIFOLD

QDES = 4.000 CUM/SEC
VMAX = 2.00 M/SEC
VMIN = .40 M/SEC
DIST(1) = 500.00 M
U(1) = 4.00 M/SEC
DIA(2) = .928 M
DL(2) = 10.00 M
D(2) = .25 M
DL(3) = 10.00 M
DENS = .001
VPIPE = 1.20 M/SEC
FRM = .100
FRP = .100
PORT NO K1 = 11
DIA(K1) = 2.000 M
DL(K1) = 10.00 M
D(K1) = .21 M

PORT NO K2 = 0
DIA(K2) = .000 M
DL(K2) = .00 M
D(K2) = .00 M

PORT NO K3 = 0
DIA(K3) = .000 M
DL(K3) = .00 M
D(K3) = .00 M

THE LENGTH BETWEEN THE PORTS DL(N) AND THE DIAMETER OF THE PORTS
D(N) ARE KEPT CONSTANT ALONG THE MANIFOLD AND SET EQUAL TO
RESPECTIVELY DL(3) AND D(2).
IF WANTED THE DIA(N),DL(N) AND D(N) CAN BE CHANGED FOR PORT NO
N = K TO DIA(K),DL(K) AND D(K).

1 FLOW CHARACTERISTICS FOR U(1) = 4.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.24	500.00			.37		4.00	74.55	.82		270.41	
2	11.19	490.00	.928	10.00	.25	.40	4.02	91.36	.82	.27	122.87	27.04
3	11.13	480.00	.928	10.00	.25	.58	4.07	92.62	.84	.39	123.03	12.29
4	11.07	470.00	.928	10.00	.25	.76	4.14	94.66	.88	.52	123.76	12.30
5	11.03	460.00	.928	10.00	.25	.95	4.26	97.65	.92	.64	125.33	12.38
6	10.99	450.00	.928	10.00	.25	1.13	4.42	101.71	.99	.77	127.98	12.53
7	10.95	440.00	.928	10.00	.25	1.32	4.63	106.92	1.09	.89	131.92	12.80
8	10.95	430.00	.928	10.00	.25	1.52	4.89	113.36	1.22	1.03	137.30	13.19
9	10.95	420.00	.928	10.00	.25	1.72	5.20	121.08	1.38	1.16	144.27	13.73
10	10.95	410.00	.928	10.00	.25	1.93	5.58	130.14	1.58	1.31	152.90	14.43
11	10.95	400.00	2.000	10.00	.21	.46	5.59	138.36	1.59	1.46	120.75	15.29
12	10.95	390.00	2.000	10.00	.21	.50	5.60	138.67	1.60	1.58	120.86	12.07
13	10.75	380.00	2.000	10.00	.21	.54	5.61	139.05	1.60	1.70	121.01	12.09
14	10.55	370.00	2.000	10.00	.21	.58	5.63	139.47	1.61	1.82	121.19	12.10
15	10.55	360.00	2.000	10.00	.21	.62	5.64	139.94	1.62	1.94	121.40	12.12
16	10.55	350.00	2.000	10.00	.21	.66	5.66	140.46	1.65	2.06	121.65	12.14
17	10.55	340.00	2.000	10.00	.21	.70	5.68	141.04	1.65	2.19	121.94	12.16
18	10.35	330.01	2.000	10.00	.21	.74	5.71	141.69	1.66	2.31	122.27	12.19
19	10.15	320.01	2.000	10.00	.21	.77	5.73	142.40	1.68	2.43	122.65	12.23
20	10.15	310.01	2.000	10.00	.21	.81	5.76	143.17	1.69	2.55	123.07	12.27
21	10.15	300.01	2.000	10.00	.21	.85	5.79	144.01	1.71	2.68	123.54	12.31
22	10.15	290.01	2.000	10.00	.21	.89	5.83	144.92	1.73	2.80	124.07	12.35
23	10.11	280.01	2.000	10.00	.21	.93	5.87	145.91	1.75	2.92	124.65	12.41
24	10.07	270.01	2.000	10.00	.21	.97	5.91	146.97	1.78	3.05	125.28	12.46
25	10.03	260.01	2.000	10.00	.21	1.01	5.95	148.11	1.80	3.17	125.98	12.53
26	9.99	250.01	2.000	10.00	.21	1.05	6.00	149.33	1.83	3.30	126.74	12.60
27	9.95	240.01	2.000	10.00	.21	1.09	6.04	150.63	1.86	3.43	127.56	12.67
28	9.95	230.01	2.000	10.00	.21	1.13	6.10	152.01	1.89	3.55	128.44	12.76
29	9.95	220.01	2.000	10.00	.21	1.17	6.15	153.48	1.93	3.68	129.40	12.84
30	9.95	210.01	2.000	10.00	.21	1.21	6.21	155.03	1.97	3.81	130.42	12.94
31	9.95	200.01	2.000	10.00	.21	1.26	6.28	156.68	2.01	3.94	131.51	13.04

OUTFALL PIPELINE

TOTAL DISCHARGE = 4.07 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.30 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 2.88 M

1 FLOW CHARACTERISTICS FOR U(1) = 1.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.24	500.00			.37		1.00	18.64	.05		67.60	
2	11.19	490.00	.928	10.00	.25	.10	1.01	22.85	.05	.07	30.73	6.76
3	11.13	480.00	.928	10.00	.25	.15	1.02	23.18	.05	.10	30.79	3.07
4	11.07	470.00	.928	10.00	.25	.19	1.04	23.70	.05	.13	30.99	3.08
5	11.03	460.00	.928	10.00	.25	.24	1.07	24.46	.06	.16	31.39	3.10
6	10.99	450.00	.928	10.00	.25	.28	1.11	25.48	.06	.19	32.06	3.14
7	10.95	440.00	.928	10.00	.25	.33	1.16	26.79	.07	.22	33.06	3.21
8	10.95	430.00	.928	10.00	.25	.38	1.22	28.40	.08	.26	34.40	3.31
9	10.95	420.00	.928	10.00	.25	.43	1.30	30.33	.09	.29	36.14	3.44
10	10.95	410.00	.928	10.00	.25	.48	1.40	32.60	.10	.33	38.30	3.61
11	10.95	400.00	2.000	10.00	.21	.12	1.40	34.66	.10	.37	30.24	3.83
12	10.95	390.00	2.000	10.00	.21	.13	1.40	34.73	.10	.40	30.27	3.02
13	10.75	380.00	2.000	10.00	.21	.14	1.41	34.86	.10	.43	30.34	3.03
14	10.55	370.00	2.000	10.00	.21	.15	1.41	35.00	.10	.46	30.41	3.03
15	10.55	360.00	2.000	10.00	.21	.16	1.42	35.12	.10	.49	30.47	3.04
16	10.55	350.00	2.000	10.00	.21	.16	1.42	35.25	.10	.52	30.53	3.05
17	10.55	340.00	2.000	10.00	.21	.17	1.43	35.39	.10	.55	30.60	3.05
18	10.35	330.01	2.000	10.00	.21	.18	1.43	35.58	.10	.58	30.71	3.06
19	10.15	320.01	2.000	10.00	.21	.19	1.44	35.79	.11	.61	30.83	3.07
20	10.15	310.01	2.000	10.00	.21	.20	1.45	35.99	.11	.64	30.94	3.08
21	10.15	300.01	2.000	10.00	.21	.21	1.46	36.20	.11	.67	31.06	3.09
22	10.15	290.01	2.000	10.00	.21	.22	1.46	36.42	.11	.70	31.19	3.11
23	10.11	280.01	2.000	10.00	.21	.23	1.47	36.68	.11	.73	31.34	3.12
24	10.07	270.01	2.000	10.00	.21	.24	1.48	36.95	.11	.76	31.50	3.13
25	10.03	260.01	2.000	10.00	.21	.25	1.50	37.24	.11	.80	31.68	3.15
26	9.99	250.01	2.000	10.00	.21	.26	1.51	37.55	.12	.83	31.88	3.17
27	9.95	240.01	2.000	10.00	.21	.27	1.52	37.88	.12	.86	32.09	3.19
28	9.95	230.01	2.000	10.00	.21	.28	1.53	38.23	.12	.89	32.31	3.21
29	9.95	220.01	2.000	10.00	.21	.29	1.55	38.59	.12	.92	32.55	3.23
30	9.95	210.01	2.000	10.00	.21	.30	1.56	38.98	.12	.96	32.80	3.25
31	9.95	200.01	2.000	10.00	.21	.32	1.58	39.40	.13	.99	33.08	3.28

OUTFALL PIPELINE

TOTAL DISCHARGE = 1.02 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .33 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = .19 M

1 FLOW CHARACTERISTICS FOR U(1) = 2.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	11.24	500.00			.37		2.00	37.28	.20		135.21	
2	11.19	490.00	.928	10.00	.25	.20	2.01	45.68	.21	.14	61.44	13.52
3	11.13	480.00	.928	10.00	.25	.29	2.03	46.32	.21	.20	61.53	6.14
4	11.07	470.00	.928	10.00	.25	.38	2.07	47.35	.22	.26	61.90	6.15
5	11.03	460.00	.928	10.00	.25	.47	2.13	48.84	.23	.32	62.69	6.19
6	10.99	450.00	.928	10.00	.25	.57	2.21	50.87	.25	.38	64.02	6.27
7	10.95	440.00	.928	10.00	.25	.66	2.31	53.48	.27	.45	65.99	6.40
8	10.95	430.00	.928	10.00	.25	.76	2.44	56.70	.30	.51	68.68	6.60
9	10.95	420.00	.928	10.00	.25	.86	2.60	60.57	.35	.58	72.17	6.87
10	10.95	410.00	.928	10.00	.25	.97	2.79	65.10	.40	.65	76.48	7.22
11	10.95	400.00	2.000	10.00	.21	.23	2.79	69.20	.40	.73	60.40	7.65
12	10.95	390.00	2.000	10.00	.21	.25	2.80	69.36	.40	.79	60.45	6.04
13	10.75	380.00	2.000	10.00	.21	.27	2.81	69.56	.40	.85	60.54	6.05
14	10.55	370.00	2.000	10.00	.21	.29	2.82	69.79	.40	.91	60.64	6.05
15	10.55	360.00	2.000	10.00	.21	.31	2.82	70.02	.41	.97	60.75	6.06
16	10.55	350.00	2.000	10.00	.21	.33	2.83	70.28	.41	1.03	60.87	6.07
17	10.55	340.00	2.000	10.00	.21	.35	2.84	70.57	.41	1.09	61.01	6.09
18	10.35	330.01	2.000	10.00	.21	.37	2.86	70.91	.42	1.15	61.19	6.10
19	10.15	320.01	2.000	10.00	.21	.39	2.87	71.28	.42	1.22	61.39	6.12
20	10.15	310.01	2.000	10.00	.21	.41	2.88	71.66	.42	1.28	61.60	6.14
21	10.15	300.01	2.000	10.00	.21	.43	2.90	72.08	.43	1.34	61.84	6.16
22	10.15	290.01	2.000	10.00	.21	.45	2.92	72.54	.43	1.40	62.10	6.18
23	10.11	280.01	2.000	10.00	.21	.47	2.94	73.03	.44	1.46	62.39	6.21
24	10.07	270.01	2.000	10.00	.21	.49	2.96	73.57	.45	1.53	62.71	6.24
25	10.03	260.01	2.000	10.00	.21	.51	2.98	74.14	.45	1.59	63.06	6.27
26	9.99	250.01	2.000	10.00	.21	.53	3.00	74.75	.46	1.65	63.45	6.31
27	9.95	240.01	2.000	10.00	.21	.55	3.03	75.40	.47	1.71	63.86	6.34
28	9.95	230.01	2.000	10.00	.21	.57	3.05	76.09	.47	1.78	64.30	6.39
29	9.95	220.01	2.000	10.00	.21	.59	3.08	76.83	.48	1.84	64.78	6.43
30	9.95	210.01	2.000	10.00	.21	.61	3.11	77.61	.49	1.91	65.29	6.48
31	9.95	200.01	2.000	10.00	.21	.63	3.14	78.43	.50	1.97	65.83	6.53

OUTFALL PIPELINE

TOTAL DISCHARGE = 2.04 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .65 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = .73 M

1 FLOW CHARACTERISTICS FOR U(1) = 3.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.24	500.00			.37		3.00	55.91	.46		202.81	
2	11.19	490.00	.928	10.00	.25	.30	3.02	68.52	.46	.20	92.15	20.28
3	11.13	480.00	.928	10.00	.25	.44	3.05	69.47	.47	.29	92.28	9.22
4	11.07	470.00	.928	10.00	.25	.57	3.11	71.00	.49	.39	92.83	9.23
5	11.03	460.00	.928	10.00	.25	.71	3.19	73.25	.52	.48	94.00	9.28
6	10.99	450.00	.928	10.00	.25	.85	3.31	76.29	.56	.57	95.99	9.40
7	10.95	440.00	.928	10.00	.25	.99	3.47	80.20	.61	.67	98.95	9.60
8	10.95	430.00	.928	10.00	.25	1.14	3.67	85.03	.68	.77	102.99	9.89
9	10.95	420.00	.928	10.00	.25	1.29	3.90	90.82	.78	.87	108.21	10.30
10	10.95	410.00	.928	10.00	.25	1.45	4.18	97.62	.89	.98	114.69	10.82
11	10.95	400.00	2.000	10.00	.21	.35	4.19	103.78	.89	1.09	90.57	11.47
12	10.95	390.00	2.000	10.00	.21	.38	4.20	104.02	.90	1.19	90.65	9.06
13	10.75	380.00	2.000	10.00	.21	.41	4.21	104.30	.90	1.28	90.77	9.07
14	10.55	370.00	2.000	10.00	.21	.44	4.22	104.62	.91	1.37	90.91	9.08
15	10.55	360.00	2.000	10.00	.21	.46	4.23	104.97	.91	1.46	91.07	9.09
16	10.55	350.00	2.000	10.00	.21	.49	4.25	105.36	.92	1.55	91.25	9.11
17	10.55	340.00	2.000	10.00	.21	.52	4.26	105.80	.93	1.64	91.47	9.13
18	10.35	330.01	2.000	10.00	.21	.55	4.28	106.29	.93	1.73	91.73	9.15
19	10.15	320.01	2.000	10.00	.21	.58	4.30	106.83	.94	1.82	92.02	9.17
20	10.15	310.01	2.000	10.00	.21	.61	4.32	107.41	.95	1.92	92.33	9.20
21	10.15	300.01	2.000	10.00	.21	.64	4.35	108.04	.96	2.01	92.68	9.23
22	10.15	290.01	2.000	10.00	.21	.67	4.37	108.72	.97	2.10	93.08	9.27
23	10.11	280.01	2.000	10.00	.21	.70	4.40	109.46	.99	2.19	93.51	9.31
24	10.07	270.01	2.000	10.00	.21	.73	4.43	110.26	1.00	2.29	93.99	9.35
25	10.03	260.01	2.000	10.00	.21	.76	4.46	111.11	1.02	2.38	94.51	9.40
26	9.99	250.01	2.000	10.00	.21	.79	4.50	112.03	1.03	2.48	95.08	9.45
27	9.95	240.01	2.000	10.00	.21	.82	4.53	113.01	1.05	2.57	95.70	9.51
28	9.95	230.01	2.000	10.00	.21	.85	4.57	114.04	1.07	2.67	96.36	9.57
29	9.95	220.01	2.000	10.00	.21	.88	4.62	115.14	1.09	2.76	97.08	9.64
30	9.95	210.01	2.000	10.00	.21	.91	4.66	116.31	1.11	2.86	97.84	9.71
31	9.95	200.01	2.000	10.00	.21	.94	4.71	117.54	1.13	2.96	98.66	9.78

OUTFALL PIPELINE

TOTAL DISCHARGE = 3.06 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .97 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 1.62 M

1

FLOW CHARACTERISTICS FOR U(1) = 5.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	11.24	500.00			.37		5.00	93.19	1.27		338.01	
2	11.19	490.00	.928	10.00	.25	.50	5.03	114.20	1.29	.34	153.58	33.80
3	11.13	480.00	.928	10.00	.25	.73	5.08	115.77	1.32	.49	153.78	15.36
4	11.07	470.00	.928	10.00	.25	.95	5.18	118.33	1.37	.65	154.69	15.38
5	11.03	460.00	.928	10.00	.25	1.18	5.32	122.06	1.44	.80	156.65	15.47
6	10.99	450.00	.928	10.00	.25	1.42	5.52	127.13	1.55	.96	159.96	15.67
7	10.95	440.00	.928	10.00	.25	1.65	5.78	133.64	1.70	1.12	164.89	16.00
8	10.95	430.00	.928	10.00	.25	1.90	6.11	141.69	1.90	1.28	171.62	16.49
9	10.95	420.00	.928	10.00	.25	2.15	6.50	151.35	2.16	1.45	180.33	17.16
10	10.95	410.00	.928	10.00	.25	2.42	6.97	162.67	2.48	1.63	191.12	18.03
11	10.95	400.00	2.000	10.00	.21	.58	6.98	172.94	2.48	1.82	150.93	19.11
12	10.95	390.00	2.000	10.00	.21	.63	7.00	173.34	2.49	1.98	151.07	15.09
13	10.75	380.00	2.000	10.00	.21	.68	7.01	173.80	2.51	2.13	151.25	15.11
14	10.55	370.00	2.000	10.00	.21	.73	7.03	174.32	2.52	2.28	151.48	15.13
15	10.55	360.00	2.000	10.00	.21	.77	7.05	174.91	2.54	2.43	151.74	15.15
16	10.55	350.00	2.000	10.00	.21	.82	7.08	175.56	2.55	2.58	152.05	15.17
17	10.55	340.00	2.000	10.00	.21	.87	7.10	176.28	2.57	2.73	152.41	15.20
18	10.35	330.01	2.000	10.00	.21	.92	7.13	177.09	2.59	2.89	152.82	15.24
19	10.15	320.01	2.000	10.00	.21	.97	7.17	177.98	2.62	3.04	153.29	15.28
20	10.15	310.01	2.000	10.00	.21	1.02	7.20	178.94	2.64	3.19	153.82	15.33
21	10.15	300.01	2.000	10.00	.21	1.07	7.24	179.99	2.67	3.35	154.41	15.38
22	10.15	290.01	2.000	10.00	.21	1.11	7.28	181.13	2.70	3.50	155.06	15.44
23	10.11	280.01	2.000	10.00	.21	1.16	7.33	182.36	2.74	3.65	155.79	15.51
24	10.07	270.01	2.000	10.00	.21	1.21	7.38	183.69	2.78	3.81	156.58	15.58
25	10.03	260.01	2.000	10.00	.21	1.26	7.44	185.11	2.82	3.97	157.45	15.66
26	9.99	250.01	2.000	10.00	.21	1.31	7.49	186.63	2.86	4.12	158.40	15.75
27	9.95	240.01	2.000	10.00	.21	1.36	7.55	188.26	2.91	4.28	159.42	15.84
28	9.95	230.01	2.000	10.00	.21	1.41	7.62	189.98	2.96	4.44	160.53	15.94
29	9.95	220.01	2.000	10.00	.21	1.47	7.69	191.82	3.01	4.60	161.72	16.05
30	9.95	210.01	2.000	10.00	.21	1.52	7.77	193.76	3.07	4.76	163.00	16.17
31	9.95	200.01	2.000	10.00	.21	1.57	7.84	195.82	3.14	4.93	164.37	16.30

OUTFALL PIPELINE

TOTAL DISCHARGE = 5.09 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.62 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 4.49 M

1 FLOW CHARACTERISTICS FOR U(1) = 6.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.24	500.00			.37		6.00	111.83	1.83		405.62	
2	11.19	490.00	.928	10.00	.25	.60	6.03	137.04	1.85	.41	184.30	40.56
3	11.13	480.00	.928	10.00	.25	.87	6.10	138.92	1.90	.59	184.54	18.43
4	11.07	470.00	.928	10.00	.25	1.15	6.21	141.99	1.97	.77	185.63	18.45
5	11.03	460.00	.928	10.00	.25	1.42	6.39	146.47	2.08	.96	187.98	18.56
6	10.99	450.00	.928	10.00	.25	1.70	6.63	152.55	2.24	1.15	191.95	18.80
7	10.95	440.00	.928	10.00	.25	1.98	6.94	160.36	2.45	1.34	197.86	19.20
8	10.95	430.00	.928	10.00	.25	2.27	7.33	170.02	2.74	1.54	205.94	19.79
9	10.95	420.00	.928	10.00	.25	2.58	7.80	181.61	3.10	1.74	216.39	20.59
10	10.95	410.00	.928	10.00	.25	2.90	8.36	195.20	3.57	1.96	229.33	21.64
11	10.95	400.00	2.000	10.00	.21	.70	8.38	207.52	3.58	2.19	181.11	22.93
12	10.95	390.00	2.000	10.00	.21	.75	8.40	208.00	3.59	2.37	181.28	18.11
13	10.75	380.00	2.000	10.00	.21	.81	8.41	208.55	3.61	2.55	181.50	18.13
14	10.55	370.00	2.000	10.00	.21	.87	8.44	209.18	3.63	2.73	181.77	18.15
15	10.55	360.00	2.000	10.00	.21	.93	8.46	209.88	3.65	2.92	182.08	18.18
16	10.55	350.00	2.000	10.00	.21	.99	8.49	210.66	3.68	3.10	182.45	18.21
17	10.55	340.00	2.000	10.00	.21	1.04	8.52	211.53	3.70	3.28	182.88	18.24
18	10.35	330.01	2.000	10.00	.21	1.10	8.56	212.50	3.73	3.46	183.37	18.29
19	10.15	320.01	2.000	10.00	.21	1.16	8.60	213.56	3.77	3.65	183.94	18.34
20	10.15	310.01	2.000	10.00	.21	1.22	8.64	214.72	3.81	3.83	184.57	18.39
21	10.15	300.01	2.000	10.00	.21	1.28	8.69	215.98	3.85	4.01	185.28	18.46
22	10.15	290.01	2.000	10.00	.21	1.34	8.74	217.34	3.89	4.20	186.06	18.53
23	10.11	280.01	2.000	10.00	.21	1.40	8.80	218.82	3.94	4.39	186.93	18.61
24	10.07	270.01	2.000	10.00	.21	1.46	8.86	220.41	4.00	4.57	187.88	18.69
25	10.03	260.01	2.000	10.00	.21	1.52	8.92	222.11	4.06	4.76	188.93	18.79
26	9.99	250.01	2.000	10.00	.21	1.58	8.99	223.94	4.12	4.95	190.06	18.89
27	9.95	240.01	2.000	10.00	.21	1.64	9.06	225.89	4.19	5.14	191.29	19.01
28	9.95	230.01	2.000	10.00	.21	1.70	9.14	227.96	4.26	5.33	192.62	19.13
29	9.95	220.01	2.000	10.00	.21	1.76	9.23	230.16	4.34	5.52	194.05	19.26
30	9.95	210.01	2.000	10.00	.21	1.82	9.32	232.50	4.43	5.72	195.58	19.40
31	9.95	200.01	2.000	10.00	.21	1.88	9.41	234.96	4.52	5.91	197.22	19.56

OUTFALL PIPELINE

TOTAL DISCHARGE = 6.11 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.95 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 6.46 M

1 FLOW CHARACTERISTICS FOR U(1) = 7.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.24	500.00			.37		7.00	130.46	2.50		473.22	
2	11.19	490.00	.928	10.00	.25	.70	7.04	159.88	2.52	.47	215.01	47.32
3	11.13	480.00	.928	10.00	.25	1.02	7.12	162.07	2.58	.69	215.29	21.50
4	11.07	470.00	.928	10.00	.25	1.34	7.25	165.65	2.68	.90	216.56	21.53
5	11.03	460.00	.928	10.00	.25	1.66	7.45	170.88	2.83	1.12	219.31	21.66
6	10.99	450.00	.928	10.00	.25	1.98	7.73	177.97	3.05	1.34	223.94	21.93
7	10.95	440.00	.928	10.00	.25	2.31	8.09	187.09	3.34	1.56	230.83	22.39
8	10.95	430.00	.928	10.00	.25	2.65	8.55	198.36	3.73	1.79	240.26	23.08
9	10.95	420.00	.928	10.00	.25	3.01	9.10	211.88	4.22	2.03	252.45	24.03
10	10.95	410.00	.928	10.00	.25	3.38	9.76	227.73	4.85	2.29	267.55	25.24
11	10.95	400.00	2.000	10.00	.21	.81	9.77	242.10	4.87	2.55	211.29	26.76
12	10.95	390.00	2.000	10.00	.21	.88	9.79	242.66	4.89	2.77	211.49	21.13
13	10.75	380.00	2.000	10.00	.21	.95	9.82	243.30	4.91	2.98	211.74	21.15
14	10.55	370.00	2.000	10.00	.21	1.02	9.84	244.03	4.94	3.19	212.05	21.17
15	10.55	360.00	2.000	10.00	.21	1.08	9.87	244.85	4.97	3.40	212.42	21.21
16	10.55	350.00	2.000	10.00	.21	1.15	9.91	245.76	5.00	3.61	212.85	21.24
17	10.55	340.00	2.000	10.00	.21	1.22	9.94	246.78	5.04	3.83	213.35	21.29
18	10.35	330.01	2.000	10.00	.21	1.29	9.99	247.90	5.08	4.04	213.93	21.34
19	10.15	320.01	2.000	10.00	.21	1.35	10.03	249.14	5.13	4.25	214.59	21.39
20	10.15	310.01	2.000	10.00	.21	1.42	10.08	250.49	5.18	4.47	215.32	21.46
21	10.15	300.01	2.000	10.00	.21	1.49	10.14	251.96	5.24	4.68	216.15	21.53
22	10.15	290.01	2.000	10.00	.21	1.56	10.20	253.55	5.30	4.90	217.06	21.61
23	10.11	280.01	2.000	10.00	.21	1.63	10.26	255.28	5.37	5.12	218.07	21.71
24	10.07	270.01	2.000	10.00	.21	1.70	10.33	257.13	5.44	5.33	219.19	21.81
25	10.03	260.01	2.000	10.00	.21	1.77	10.41	259.12	5.52	5.55	220.40	21.92
26	9.99	250.01	2.000	10.00	.21	1.84	10.49	261.25	5.61	5.77	221.73	22.04
27	9.95	240.01	2.000	10.00	.21	1.91	10.58	263.53	5.70	6.00	223.16	22.17
28	9.95	230.01	2.000	10.00	.21	1.98	10.67	265.94	5.80	6.22	224.71	22.32
29	9.95	220.01	2.000	10.00	.21	2.05	10.77	268.51	5.91	6.44	226.38	22.47
30	9.95	210.01	2.000	10.00	.21	2.12	10.87	271.23	6.02	6.67	228.17	22.64
31	9.95	200.01	2.000	10.00	.21	2.20	10.98	274.11	6.15	6.90	230.08	22.82

OUTFALL PIPELINE

TOTAL DISCHARGE = 7.13 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.27 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 8.79 M

1 FLOW CHARACTERISTICS FOR U(1) = 8.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.24	500.00			.37		8.00	149.10	3.26		540.82	
2	11.19	490.00	.928	10.00	.25	.80	8.04	182.72	3.30	.54	245.73	54.08
3	11.13	480.00	.928	10.00	.25	1.16	8.13	185.22	3.37	.79	246.04	24.57
4	11.07	470.00	.928	10.00	.25	1.53	8.29	189.31	3.50	1.03	247.50	24.60
5	11.03	460.00	.928	10.00	.25	1.89	8.52	195.29	3.70	1.28	250.63	24.75
6	10.99	450.00	.928	10.00	.25	2.26	8.83	203.39	3.98	1.53	255.93	25.06
7	10.95	440.00	.928	10.00	.25	2.64	9.25	213.81	4.36	1.79	263.80	25.59
8	10.95	430.00	.928	10.00	.25	3.03	9.77	226.69	4.87	2.05	274.58	26.38
9	10.95	420.00	.928	10.00	.25	3.44	10.40	242.14	5.52	2.33	288.51	27.46
10	10.95	410.00	.928	10.00	.25	3.87	11.15	260.26	6.34	2.61	305.77	28.85
11	10.95	400.00	2.000	10.00	.21	.93	11.17	276.69	6.36	2.92	241.47	30.58
12	10.95	390.00	2.000	10.00	.21	1.01	11.19	277.32	6.39	3.16	241.70	24.15
13	10.75	380.00	2.000	10.00	.21	1.08	11.22	278.06	6.42	3.40	241.99	24.17
14	10.55	370.00	2.000	10.00	.21	1.16	11.25	278.89	6.45	3.64	242.34	24.20
15	10.55	360.00	2.000	10.00	.21	1.24	11.28	279.82	6.49	3.89	242.76	24.23
16	10.55	350.00	2.000	10.00	.21	1.32	11.32	280.87	6.53	4.13	243.25	24.28
17	10.55	340.00	2.000	10.00	.21	1.39	11.36	282.03	6.58	4.37	243.82	24.33
18	10.35	330.01	2.000	10.00	.21	1.47	11.41	283.31	6.64	4.62	244.48	24.38
19	10.15	320.01	2.000	10.00	.21	1.55	11.46	284.73	6.70	4.86	245.23	24.45
20	10.15	310.01	2.000	10.00	.21	1.63	11.52	286.27	6.77	5.11	246.08	24.52
21	10.15	300.01	2.000	10.00	.21	1.70	11.59	287.95	6.84	5.35	247.02	24.61
22	10.15	290.01	2.000	10.00	.21	1.78	11.65	289.77	6.92	5.60	248.06	24.70
23	10.11	280.01	2.000	10.00	.21	1.86	11.73	291.74	7.01	5.85	249.22	24.81
24	10.07	270.01	2.000	10.00	.21	1.94	11.81	293.86	7.11	6.10	250.49	24.92
25	10.03	260.01	2.000	10.00	.21	2.02	11.89	296.13	7.21	6.35	251.88	25.05
26	9.99	250.01	2.000	10.00	.21	2.10	11.99	298.57	7.32	6.60	253.40	25.19
27	9.95	240.01	2.000	10.00	.21	2.18	12.09	301.16	7.44	6.85	255.04	25.34
28	9.95	230.01	2.000	10.00	.21	2.26	12.19	303.93	7.58	7.11	256.81	25.50
29	9.95	220.01	2.000	10.00	.21	2.35	12.30	306.86	7.72	7.36	258.71	25.68
30	9.95	210.01	2.000	10.00	.21	2.43	12.42	309.97	7.87	7.62	260.76	25.87
31	9.95	200.01	2.000	10.00	.21	2.51	12.55	313.26	8.03	7.88	262.94	26.08

OUTFALL PIPELINE

TOTAL DISCHARGE = 8.15 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.59 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 11.48 M

BOTTOM PROFILE

DISTANCE M	DEPTH M
.00	.00
25.00	.00
35.00	1.00
40.00	2.00
50.00	3.50
62.00	5.00
75.00	6.50
90.00	8.50
100.00	9.00
120.00	9.00
125.00	9.00
150.00	9.50
175.00	10.00
200.00	11.00
210.00	11.50
225.00	12.00
250.00	12.50
275.00	13.00
300.00	13.50
325.00	13.60
350.00	14.00
375.00	14.00
400.00	14.00
450.00	14.00
510.00	14.00

MANIFOLD 4
TRACE A

LIST OF SYMBOLS

N = NO OF PORT
DEPTH(N) = DEPTH AT PORT N
DIST(N) = DISTANCE FROM SHORE
DIA(N) = DIAMETER OF MANIFOLD BETWEEN PORT N AND N-1
DL(N) = LENGTH BETWEEN PORT N AND N-1
D(N) = DIAMETER OF PORT N
V(N) = VELOCITY IN MANIFOLD BETWEEN PORT N AND N-1
U(N) = DISCHARGEVELOCITY OF PORT N
FN(N) = DENSIMETRIC FROUDE NO OF JET AT PORT N
E(N) = TOTAL HEAD AT PORT N
SQ(N) = TOTAL DISCHARGE UP TO PORT N
Q(N) = DISCHARGE OF PORT N
QL(N) = DISCHARGE LOAD PR LENGTH OF MANIFOLD
QDES = DESIGN DISCHARGE FLOW
VMIN = MINIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
VMAX = MAXIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
DENS = (SPEC.GRAV. SEAW.-SPEC.GRAV. WASTEW.)/(SPEC.GRAV. WASTEW.)
FRM = DARCY FRICTION FACTOR IN MANIFOLD
FRP = DARCY FRICTION FACTOR IN OUTFALL PIPELINE
VPIPE = UPPER LIMIT FOR VELOCITY IN OUTFALL PIPELINE AT DESIGN FLOW

INITIAL VALUES FOR THE CALCULATION OF THE MANIFOLD

QDES = 4.100 CUM/SEC
VMAX = 2.00 M/SEC
VMIN = .50 M/SEC
DIST(1) = 500.00 M
U(1) = 4.00 M/SEC
DIA(2) = .794 M
DL(2) = 10.00 M
D(2) = .22 M
DL(3) = 10.00 M
DENS = .001
VPIPE = 1.20 M/SEC
FRM = .100
FRP = .100
PORT NO K1 = 20
DIA(K1) = 2.000 M
DL(K1) = 10.00 M
D(K1) = .22 M

PORT NO K2 = 0
DIA(K2) = .000 M
DL(K2) = .00 M
D(K2) = .00 M

PORT NO K3 = 0
DIA(K3) = .000 M
DL(K3) = .00 M
D(K3) = .00 M

THE LENGTH BETWEEN THE PORTS DL(N) AND THE DIAMETER OF THE PORTS D(N) ARE KEPT CONSTANT ALONG THE MANIFOLD AND SET EQUAL TO RESPECTIVELY DL(3) AND D(2).
IF WANTED THE DIA(N),DL(N) AND D(N) CAN BE CHANGED FOR PORT NO N = K TO DIA(K),DL(K) AND D(K).

1 FLOW CHARACTERISTICS FOR U(1) = 4.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	14.00	500.00			.35		4.00	76.22	.82		247.45	
2	14.00	490.00	.794	10.00	.22	.50	4.04	97.94	.83	.25	95.08	24.74
3	14.00	480.00	.794	10.00	.22	.69	4.11	100.04	.86	.34	95.65	9.51
4	14.00	470.00	.794	10.00	.22	.89	4.23	103.29	.91	.44	96.96	9.56
5	14.00	460.00	.794	10.00	.22	1.08	4.40	107.89	.99	.54	99.27	9.70
6	14.00	450.00	.794	10.00	.22	1.28	4.63	113.96	1.09	.63	102.78	9.93
7	14.00	440.00	.794	10.00	.22	1.49	4.92	121.61	1.24	.74	107.65	10.28
8	14.00	430.00	.794	10.00	.22	1.71	5.28	130.92	1.42	.84	114.02	10.77
9	14.00	420.00	.794	10.00	.22	1.94	5.71	141.95	1.66	.96	121.97	11.40
10	14.00	410.00	1.598	10.00	.22	.54	5.73	138.71	1.67	1.08	135.67	12.20
11	14.00	400.00	1.598	10.00	.22	.61	5.75	139.27	1.68	1.22	135.86	13.57
12	14.00	390.00	1.598	10.00	.22	.67	5.77	139.95	1.70	1.35	136.13	13.59
13	14.00	380.00	1.598	10.00	.22	.74	5.80	140.76	1.72	1.49	136.48	13.61
14	14.00	370.00	1.598	10.00	.22	.81	5.84	141.71	1.74	1.62	136.94	13.65
15	14.00	360.00	1.598	10.00	.22	.88	5.88	142.81	1.76	1.76	137.51	13.69
16	14.00	350.00	1.598	10.00	.22	.95	5.93	144.08	1.79	1.90	138.21	13.75
17	14.00	340.00	1.598	10.00	.22	1.02	5.98	145.51	1.82	2.04	139.04	13.82
18	13.84	330.00	1.598	10.00	.22	1.09	6.04	147.13	1.86	2.18	140.01	13.90
19	13.68	320.00	1.598	10.00	.22	1.16	6.11	148.93	1.90	2.32	141.15	14.00
20	13.64	310.00	2.000	10.00	.22	.78	6.14	148.86	1.92	2.46	144.36	14.11
21	13.60	300.00	2.000	10.00	.22	.83	6.17	149.60	1.94	2.60	144.77	14.44
22	13.56	290.00	2.000	10.00	.22	.87	6.20	150.42	1.96	2.75	145.24	14.48
23	13.36	280.00	2.000	10.00	.22	.92	6.23	151.32	1.98	2.89	145.79	14.52
24	13.16	270.01	2.000	10.00	.22	.97	6.27	152.31	2.00	3.04	146.40	14.58
25	12.96	260.01	2.000	10.00	.22	1.01	6.31	153.38	2.03	3.18	147.08	14.64
26	12.76	250.01	2.000	10.00	.22	1.06	6.35	154.54	2.06	3.33	147.84	14.71
27	12.56	240.01	2.000	10.00	.22	1.11	6.40	155.80	2.09	3.48	148.68	14.78
28	12.36	230.01	2.000	10.00	.22	1.16	6.46	157.15	2.12	3.63	149.59	14.87
29	12.16	220.02	2.000	10.00	.22	1.20	6.51	158.59	2.16	3.78	150.59	14.96
30	11.83	210.02	2.000	10.00	.22	1.25	6.57	160.14	2.20	3.93	151.68	15.06
31	11.49	200.03	2.000	10.00	.22	1.30	6.64	161.79	2.24	4.08	152.86	15.17

OUTFALL PIPELINE

TOTAL DISCHARGE = 4.23 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.35 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 3.19 M

1 FLOW CHARACTERISTICS FOR U(1) = 1.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	14.00	500.00			.35		1.00	19.06	.05		61.86	
2	14.00	490.00	.794	10.00	.22	.13	1.01	24.48	.05	.06	23.77	6.19
3	14.00	480.00	.794	10.00	.22	.17	1.03	25.01	.05	.09	23.91	2.38
4	14.00	470.00	.794	10.00	.22	.22	1.06	25.82	.06	.11	24.24	2.39
5	14.00	460.00	.794	10.00	.22	.27	1.10	26.97	.06	.13	24.82	2.42
6	14.00	450.00	.794	10.00	.22	.32	1.16	28.49	.07	.16	25.69	2.48
7	14.00	440.00	.794	10.00	.22	.37	1.23	30.40	.08	.18	26.91	2.57
8	14.00	430.00	.794	10.00	.22	.43	1.32	32.73	.09	.21	28.51	2.69
9	14.00	420.00	.794	10.00	.22	.48	1.43	35.49	.10	.24	30.49	2.85
10	14.00	410.00	1.598	10.00	.22	.13	1.43	34.68	.10	.27	33.92	3.05
11	14.00	400.00	1.598	10.00	.22	.15	1.44	34.82	.11	.30	33.97	3.39
12	14.00	390.00	1.598	10.00	.22	.17	1.44	34.99	.11	.34	34.03	3.40
13	14.00	380.00	1.598	10.00	.22	.19	1.45	35.19	.11	.37	34.12	3.40
14	14.00	370.00	1.598	10.00	.22	.20	1.46	35.43	.11	.41	34.24	3.41
15	14.00	360.00	1.598	10.00	.22	.22	1.47	35.70	.11	.44	34.38	3.42
16	14.00	350.00	1.598	10.00	.22	.24	1.48	36.02	.11	.47	34.55	3.44
17	14.00	340.00	1.598	10.00	.22	.25	1.50	36.38	.11	.51	34.76	3.46
18	13.84	330.00	1.598	10.00	.22	.27	1.51	36.81	.12	.54	35.03	3.48
19	13.68	320.00	1.598	10.00	.22	.29	1.53	37.28	.12	.58	35.33	3.50
20	13.64	310.00	2.000	10.00	.22	.20	1.54	37.27	.12	.61	36.14	3.53
21	13.60	300.00	2.000	10.00	.22	.21	1.54	37.46	.12	.65	36.25	3.61
22	13.56	290.00	2.000	10.00	.22	.22	1.55	37.67	.12	.69	36.37	3.63
23	13.36	280.00	2.000	10.00	.22	.23	1.56	37.92	.12	.72	36.54	3.64
24	13.16	270.01	2.000	10.00	.22	.24	1.57	38.20	.13	.76	36.72	3.65
25	12.96	260.01	2.000	10.00	.22	.25	1.58	38.49	.13	.80	36.92	3.67
26	12.76	250.01	2.000	10.00	.22	.27	1.60	38.81	.13	.83	37.14	3.69
27	12.56	240.01	2.000	10.00	.22	.28	1.61	39.15	.13	.87	37.37	3.71
28	12.36	230.01	2.000	10.00	.22	.29	1.62	39.51	.13	.91	37.63	3.74
29	12.16	220.02	2.000	10.00	.22	.30	1.64	39.90	.14	.95	37.90	3.76
30	11.83	210.02	2.000	10.00	.22	.31	1.66	40.33	.14	.98	38.22	3.79
31	11.49	200.03	2.000	10.00	.22	.33	1.67	40.79	.14	1.02	38.56	3.82

OUTFALL PIPELINE

TOTAL DISCHARGE = 1.06 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .34 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = .21 M

1

FLOW CHARACTERISTICS FOR U(1) = 2.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	14.00	500.00			.35		2.00	38.11	.20		123.72	
2	14.00	490.00	.794	10.00	.22	.25	2.02	48.97	.21	.12	47.54	12.37
3	14.00	480.00	.794	10.00	.22	.35	2.06	50.02	.22	.17	47.82	4.75
4	14.00	470.00	.794	10.00	.22	.44	2.12	51.65	.23	.22	48.48	4.78
5	14.00	460.00	.794	10.00	.22	.54	2.20	53.94	.25	.27	49.63	4.85
6	14.00	450.00	.794	10.00	.22	.64	2.32	56.98	.27	.32	51.39	4.96
7	14.00	440.00	.794	10.00	.22	.74	2.46	60.80	.31	.37	53.83	5.14
8	14.00	430.00	.794	10.00	.22	.85	2.64	65.46	.36	.42	57.01	5.38
9	14.00	420.00	.794	10.00	.22	.97	2.86	70.98	.42	.48	60.98	5.70
10	14.00	410.00	1.598	10.00	.22	.27	2.86	69.35	.42	.54	67.84	6.10
11	14.00	400.00	1.598	10.00	.22	.30	2.87	69.63	.42	.61	67.93	6.78
12	14.00	390.00	1.598	10.00	.22	.34	2.89	69.97	.42	.68	68.06	6.79
13	14.00	380.00	1.598	10.00	.22	.37	2.90	70.38	.43	.74	68.24	6.81
14	14.00	370.00	1.598	10.00	.22	.41	2.92	70.85	.43	.81	68.47	6.82
15	14.00	360.00	1.598	10.00	.22	.44	2.94	71.41	.44	.88	68.76	6.85
16	14.00	350.00	1.598	10.00	.22	.47	2.96	72.04	.45	.95	69.10	6.88
17	14.00	340.00	1.598	10.00	.22	.51	2.99	72.76	.46	1.02	69.52	6.91
18	13.84	330.00	1.598	10.00	.22	.54	3.02	73.57	.47	1.09	70.02	6.95
19	13.68	320.00	1.598	10.00	.22	.58	3.06	74.48	.48	1.16	70.59	7.00
20	13.64	310.00	2.000	10.00	.22	.39	3.07	74.45	.48	1.23	72.20	7.06
21	13.60	300.00	2.000	10.00	.22	.41	3.08	74.82	.48	1.30	72.41	7.22
22	13.56	290.00	2.000	10.00	.22	.44	3.10	75.23	.49	1.37	72.65	7.24
23	13.36	280.00	2.000	10.00	.22	.46	3.12	75.70	.50	1.45	72.93	7.26
24	13.16	270.01	2.000	10.00	.22	.48	3.14	76.20	.50	1.52	73.25	7.29
25	12.96	260.01	2.000	10.00	.22	.51	3.16	76.75	.51	1.59	73.60	7.32
26	12.76	250.01	2.000	10.00	.22	.53	3.18	77.34	.52	1.67	73.99	7.36
27	12.56	240.01	2.000	10.00	.22	.55	3.21	77.98	.52	1.74	74.42	7.40
28	12.36	230.01	2.000	10.00	.22	.58	3.23	78.66	.53	1.81	74.89	7.44
29	12.16	220.02	2.000	10.00	.22	.60	3.26	79.40	.54	1.89	75.40	7.49
30	11.83	210.02	2.000	10.00	.22	.63	3.29	80.19	.55	1.96	75.96	7.54
31	11.49	200.03	2.000	10.00	.22	.65	3.32	81.03	.56	2.04	76.57	7.60

OUTFALL PIPELINE

TOTAL DISCHARGE = 2.12 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .67 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = .81 M

1 FLOW CHARACTERISTICS FOR U(1) = 3.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	14.00	500.00			.35		3.00	57.17	.46		185.58	
2	14.00	490.00	.794	10.00	.22	.37	3.03	73.45	.47	.19	71.31	18.56
3	14.00	480.00	.794	10.00	.22	.52	3.08	75.03	.49	.26	71.74	7.13
4	14.00	470.00	.794	10.00	.22	.66	3.17	77.47	.51	.33	72.72	7.17
5	14.00	460.00	.794	10.00	.22	.81	3.30	80.92	.56	.40	74.45	7.27
6	14.00	450.00	.794	10.00	.22	.96	3.47	85.47	.61	.48	77.08	7.45
7	14.00	440.00	.794	10.00	.22	1.12	3.69	91.21	.70	.55	80.74	7.71
8	14.00	430.00	.794	10.00	.22	1.28	3.96	98.19	.80	.63	85.52	8.07
9	14.00	420.00	.794	10.00	.22	1.45	4.28	106.47	.94	.72	91.48	8.55
10	14.00	410.00	1.598	10.00	.22	.40	4.30	104.03	.94	.81	101.76	9.15
11	14.00	400.00	1.598	10.00	.22	.46	4.31	104.45	.95	.91	101.90	10.18
12	14.00	390.00	1.598	10.00	.22	.51	4.33	104.96	.96	1.01	102.10	10.19
13	14.00	380.00	1.598	10.00	.22	.56	4.35	105.57	.97	1.12	102.36	10.21
14	14.00	370.00	1.598	10.00	.22	.61	4.38	106.28	.98	1.22	102.71	10.24
15	14.00	360.00	1.598	10.00	.22	.66	4.41	107.11	.99	1.32	103.13	10.27
16	14.00	350.00	1.598	10.00	.22	.71	4.45	108.06	1.01	1.42	103.65	10.31
17	14.00	340.00	1.598	10.00	.22	.76	4.49	109.13	1.03	1.53	104.28	10.37
18	13.84	330.00	1.598	10.00	.22	.81	4.53	110.35	1.05	1.63	105.01	10.43
19	13.68	320.00	1.598	10.00	.22	.87	4.58	111.71	1.07	1.74	105.87	10.50
20	13.64	310.00	2.000	10.00	.22	.59	4.60	111.65	1.08	1.84	108.27	10.59
21	13.60	300.00	2.000	10.00	.22	.62	4.62	112.21	1.09	1.95	108.59	10.83
22	13.56	290.00	2.000	10.00	.22	.66	4.65	112.82	1.10	2.06	108.94	10.86
23	13.36	280.00	2.000	10.00	.22	.69	4.67	113.51	1.11	2.17	109.36	10.89
24	13.16	270.01	2.000	10.00	.22	.73	4.70	114.25	1.13	2.28	109.82	10.94
25	12.96	260.01	2.000	10.00	.22	.76	4.73	115.06	1.14	2.39	110.34	10.98
26	12.76	250.01	2.000	10.00	.22	.80	4.77	115.94	1.16	2.50	110.91	11.03
27	12.56	240.01	2.000	10.00	.22	.83	4.80	116.88	1.18	2.61	111.54	11.09
28	12.36	230.01	2.000	10.00	.22	.87	4.84	117.90	1.20	2.72	112.23	11.15
29	12.16	220.02	2.000	10.00	.22	.90	4.89	118.98	1.22	2.83	112.98	11.22
30	11.83	210.02	2.000	10.00	.22	.94	4.93	120.15	1.24	2.95	113.81	11.30
31	11.49	200.03	2.000	10.00	.22	.97	4.98	121.40	1.26	3.06	114.70	11.38

OUTFALL PIPELINE

TOTAL DISCHARGE = 3.17 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.01 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 1.80 M

1 FLOW CHARACTERISTICS FOR U(1) = 5.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	14.00	500.00			.35		5.00	95.28	1.27		309.31	
2	14.00	490.00	.794	10.00	.22	.62	5.05	122.42	1.30	.31	118.85	30.93
3	14.00	480.00	.794	10.00	.22	.87	5.14	125.05	1.35	.43	119.56	11.89
4	14.00	470.00	.794	10.00	.22	1.11	5.29	129.12	1.43	.55	121.20	11.96
5	14.00	460.00	.794	10.00	.22	1.35	5.50	134.86	1.54	.67	124.09	12.12
6	14.00	450.00	.794	10.00	.22	1.60	5.79	142.45	1.71	.79	128.47	12.41
7	14.00	440.00	.794	10.00	.22	1.86	6.15	152.01	1.93	.92	134.57	12.85
8	14.00	430.00	.794	10.00	.22	2.13	6.60	163.64	2.22	1.06	142.53	13.46
9	14.00	420.00	.794	10.00	.22	2.42	7.14	177.44	2.60	1.20	152.46	14.25
10	14.00	410.00	1.598	10.00	.22	.67	7.16	173.38	2.61	1.35	160.59	15.25
11	14.00	400.00	1.598	10.00	.22	.76	7.19	174.08	2.63	1.52	160.83	16.96
12	14.00	390.00	1.598	10.00	.22	.84	7.22	174.93	2.65	1.69	170.16	16.98
13	14.00	380.00	1.598	10.00	.22	.93	7.25	175.95	2.68	1.86	170.60	17.02
14	14.00	370.00	1.598	10.00	.22	1.01	7.30	177.14	2.72	2.03	171.19	17.06
15	14.00	360.00	1.598	10.00	.22	1.10	7.35	178.52	2.75	2.20	171.89	17.12
16	14.00	350.00	1.598	10.00	.22	1.18	7.41	180.10	2.80	2.37	172.76	17.19
17	14.00	340.00	1.598	10.00	.22	1.27	7.48	181.89	2.85	2.55	173.79	17.28
18	13.84	330.00	1.598	10.00	.22	1.36	7.55	183.91	2.91	2.72	175.02	17.38
19	13.68	320.00	1.598	10.00	.22	1.44	7.64	186.16	2.98	2.90	176.43	17.50
20	13.64	310.00	2.000	10.00	.22	.98	7.67	186.07	3.00	3.07	180.44	17.64
21	13.60	300.00	2.000	10.00	.22	1.04	7.71	186.99	3.03	3.25	180.95	18.04
22	13.56	290.00	2.000	10.00	.22	1.09	7.75	188.01	3.06	3.43	181.55	18.10
23	13.36	280.00	2.000	10.00	.22	1.15	7.79	189.14	3.09	3.62	182.22	18.15
24	13.16	270.01	2.000	10.00	.22	1.21	7.84	190.37	3.13	3.80	182.99	18.22
25	12.96	260.01	2.000	10.00	.22	1.27	7.89	191.71	3.17	3.98	183.84	18.30
26	12.76	250.01	2.000	10.00	.22	1.33	7.94	193.16	3.22	4.16	184.78	18.38
27	12.56	240.01	2.000	10.00	.22	1.39	8.00	194.72	3.26	4.35	185.82	18.48
28	12.36	230.01	2.000	10.00	.22	1.44	8.07	196.41	3.32	4.53	186.96	18.58
29	12.16	220.02	2.000	10.00	.22	1.50	8.14	198.21	3.38	4.72	188.21	18.70
30	11.83	210.02	2.000	10.00	.22	1.56	8.21	200.14	3.44	4.91	189.57	18.82
31	11.49	200.03	2.000	10.00	.22	1.62	8.29	202.20	3.51	5.10	191.04	18.96

OUTFALL PIPELINE

TOTAL DISCHARGE = 5.29 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.68 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 4.97 M

1

FLOW CHARACTERISTICS FOR U(1) = 6.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	14.00	500.00			.35		6.00	114.33	1.83		371.17	
2	14.00	490.00	.794	10.00	.22	.75	6.06	146.91	1.87	.37	142.62	37.12
3	14.00	480.00	.794	10.00	.22	1.04	6.17	150.06	1.94	.51	143.47	14.26
4	14.00	470.00	.794	10.00	.22	1.33	6.35	154.94	2.05	.66	145.44	14.35
5	14.00	460.00	.794	10.00	.22	1.62	6.60	161.83	2.22	.80	148.90	14.54
6	14.00	450.00	.794	10.00	.22	1.92	6.95	170.94	2.46	.95	154.16	14.89
7	14.00	440.00	.794	10.00	.22	2.23	7.39	182.41	2.78	1.11	161.48	15.42
8	14.00	430.00	.794	10.00	.22	2.56	7.92	196.37	3.20	1.27	171.03	16.15
9	14.00	420.00	.794	10.00	.22	2.91	8.57	212.93	3.74	1.44	182.95	17.10
10	14.00	410.00	1.598	10.00	.22	.81	8.59	208.06	3.76	1.62	203.51	18.30
11	14.00	400.00	1.598	10.00	.22	.91	8.62	208.90	3.79	1.82	203.79	20.35
12	14.00	390.00	1.598	10.00	.22	1.01	8.66	209.92	3.82	2.03	204.19	20.38
13	14.00	380.00	1.598	10.00	.22	1.11	8.71	211.14	3.86	2.23	204.72	20.42
14	14.00	370.00	1.598	10.00	.22	1.22	8.76	212.56	3.91	2.44	205.41	20.47
15	14.00	360.00	1.598	10.00	.22	1.32	8.82	214.22	3.97	2.64	206.27	20.54
16	14.00	350.00	1.598	10.00	.22	1.42	8.89	216.12	4.03	2.85	207.31	20.63
17	14.00	340.00	1.598	10.00	.22	1.52	8.97	218.27	4.10	3.06	208.55	20.73
18	13.84	330.00	1.598	10.00	.22	1.63	9.07	220.69	4.19	3.26	210.02	20.86
19	13.68	320.00	1.598	10.00	.22	1.73	9.17	223.39	4.28	3.48	211.71	21.00
20	13.64	310.00	2.000	10.00	.22	1.17	9.21	223.27	4.32	3.69	216.52	21.17
21	13.60	300.00	2.000	10.00	.22	1.24	9.25	224.39	4.36	3.90	217.14	21.65
22	13.56	290.00	2.000	10.00	.22	1.31	9.29	225.61	4.40	4.12	217.85	21.71
23	13.36	280.00	2.000	10.00	.22	1.38	9.35	226.96	4.45	4.34	218.66	21.79
24	13.16	270.01	2.000	10.00	.22	1.45	9.40	228.44	4.51	4.56	219.57	21.87
25	12.96	260.01	2.000	10.00	.22	1.52	9.46	230.04	4.57	4.78	220.59	21.96
26	12.76	250.01	2.000	10.00	.22	1.59	9.53	231.78	4.63	5.00	221.72	22.06
27	12.56	240.01	2.000	10.00	.22	1.66	9.60	233.65	4.70	5.22	222.97	22.17
28	12.36	230.01	2.000	10.00	.22	1.73	9.68	235.67	4.78	5.44	224.34	22.30
29	12.16	220.02	2.000	10.00	.22	1.80	9.77	237.83	4.86	5.67	225.83	22.43
30	11.83	210.02	2.000	10.00	.22	1.88	9.86	240.14	4.95	5.89	227.46	22.58
31	11.49	200.03	2.000	10.00	.22	1.95	9.95	242.61	5.05	6.12	229.22	22.75

OUTFALL PIPELINE

TOTAL DISCHARGE = 6.35 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.02 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 7.15 M

1 FLOW CHARACTERISTICS FOR U(1) = 7.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	14.00	500.00			.35		7.00	133.39	2.50		433.03	
2	14.00	490.00	.794	10.00	.22	.87	7.07	171.39	2.55	.43	166.39	43.30
3	14.00	480.00	.794	10.00	.22	1.21	7.20	175.07	2.64	.60	167.38	16.64
4	14.00	470.00	.794	10.00	.22	1.55	7.41	180.77	2.79	.77	169.68	16.74
5	14.00	460.00	.794	10.00	.22	1.89	7.70	188.81	3.02	.94	173.72	16.97
6	14.00	450.00	.794	10.00	.22	2.24	8.10	199.43	3.35	1.11	179.86	17.37
7	14.00	440.00	.794	10.00	.22	2.61	8.62	212.81	3.78	1.29	188.39	17.99
8	14.00	430.00	.794	10.00	.22	2.99	9.25	229.10	4.36	1.48	199.54	18.84
9	14.00	420.00	.794	10.00	.22	3.39	10.00	248.42	5.09	1.68	213.44	19.95
10	14.00	410.00	1.598	10.00	.22	.94	10.03	242.73	5.12	1.89	237.43	21.34
11	14.00	400.00	1.598	10.00	.22	1.06	10.06	243.71	5.16	2.13	237.76	23.74
12	14.00	390.00	1.598	10.00	.22	1.18	10.10	244.90	5.20	2.37	238.22	23.78
13	14.00	380.00	1.598	10.00	.22	1.30	10.16	246.32	5.26	2.60	238.85	23.82
14	14.00	370.00	1.598	10.00	.22	1.42	10.22	247.99	5.32	2.84	239.65	23.88
15	14.00	360.00	1.598	10.00	.22	1.54	10.29	249.92	5.40	3.08	240.65	23.96
16	14.00	350.00	1.598	10.00	.22	1.66	10.37	252.14	5.48	3.32	241.86	24.06
17	14.00	340.00	1.598	10.00	.22	1.78	10.47	254.65	5.59	3.57	243.31	24.19
18	13.84	330.00	1.598	10.00	.22	1.90	10.58	257.47	5.70	3.81	245.02	24.33
19	13.68	320.00	1.598	10.00	.22	2.02	10.70	260.62	5.83	4.05	246.99	24.50
20	13.64	310.00	2.000	10.00	.22	1.37	10.74	260.48	5.88	4.30	252.61	24.70
21	13.60	300.00	2.000	10.00	.22	1.45	10.79	261.78	5.93	4.55	253.33	25.26
22	13.56	290.00	2.000	10.00	.22	1.53	10.84	263.21	5.99	4.81	254.16	25.33
23	13.36	280.00	2.000	10.00	.22	1.61	10.90	264.78	6.06	5.06	255.10	25.42
24	13.16	270.01	2.000	10.00	.22	1.69	10.97	266.50	6.13	5.32	256.16	25.51
25	12.96	260.01	2.000	10.00	.22	1.77	11.04	268.37	6.21	5.57	257.35	25.62
26	12.76	250.01	2.000	10.00	.22	1.86	11.12	270.40	6.30	5.83	258.67	25.73
27	12.56	240.01	2.000	10.00	.22	1.94	11.20	272.58	6.40	6.09	260.12	25.87
28	12.36	230.01	2.000	10.00	.22	2.02	11.29	274.93	6.50	6.35	261.71	26.01
29	12.16	220.02	2.000	10.00	.22	2.11	11.39	277.46	6.61	6.61	263.45	26.17
30	11.83	210.02	2.000	10.00	.22	2.19	11.50	280.15	6.74	6.87	265.35	26.35
31	11.49	200.03	2.000	10.00	.22	2.27	11.61	283.03	6.87	7.14	267.40	26.53

OUTFALL PIPELINE

TOTAL DISCHARGE = 7.41 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.36 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 9.73 M

1

FLOW CHARACTERISTICS FOR U(1) = 8.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	14.00	500.00			.35		8.00	152.45	3.26		494.89	
2	14.00	490.00	.794	10.00	.22	1.00	8.08	195.88	3.33	.49	190.16	49.49
3	14.00	480.00	.794	10.00	.22	1.38	8.23	200.08	3.45	.69	191.30	19.02
4	14.00	470.00	.794	10.00	.22	1.77	8.46	206.59	3.65	.88	193.92	19.13
5	14.00	460.00	.794	10.00	.22	2.16	8.80	215.78	3.95	1.07	198.53	19.39
6	14.00	450.00	.794	10.00	.22	2.56	9.26	227.92	4.37	1.27	205.55	19.85
7	14.00	440.00	.794	10.00	.22	2.98	9.85	243.22	4.94	1.47	215.31	20.56
8	14.00	430.00	.794	10.00	.22	3.41	10.57	261.83	5.69	1.69	228.04	21.53
9	14.00	420.00	.794	10.00	.22	3.87	11.43	283.91	6.65	1.92	243.93	22.80
10	14.00	410.00	1.598	10.00	.22	1.08	11.46	277.41	6.69	2.16	271.35	24.39
11	14.00	400.00	1.598	10.00	.22	1.21	11.50	278.53	6.74	2.43	271.72	27.13
12	14.00	390.00	1.598	10.00	.22	1.35	11.55	279.89	6.80	2.70	272.25	27.17
13	14.00	380.00	1.598	10.00	.22	1.49	11.61	281.51	6.87	2.98	272.97	27.23
14	14.00	370.00	1.598	10.00	.22	1.62	11.68	283.42	6.95	3.25	273.88	27.30
15	14.00	360.00	1.598	10.00	.22	1.76	11.76	285.63	7.05	3.52	275.02	27.39
16	14.00	350.00	1.598	10.00	.22	1.90	11.86	288.16	7.16	3.80	276.41	27.50
17	14.00	340.00	1.598	10.00	.22	2.03	11.96	291.02	7.30	4.08	278.07	27.64
18	13.84	330.00	1.598	10.00	.22	2.17	12.09	294.25	7.45	4.35	280.02	27.81
19	13.68	320.00	1.598	10.00	.22	2.31	12.22	297.85	7.62	4.63	282.28	28.00
20	13.64	310.00	2.000	10.00	.22	1.57	12.27	297.69	7.68	4.92	288.69	28.23
21	13.60	300.00	2.000	10.00	.22	1.66	12.33	299.17	7.75	5.20	289.52	28.97
22	13.56	290.00	2.000	10.00	.22	1.75	12.39	300.81	7.83	5.49	290.46	28.95
23	13.36	280.00	2.000	10.00	.22	1.84	12.46	302.61	7.91	5.78	291.54	29.05
24	13.16	270.01	2.000	10.00	.22	1.93	12.54	304.57	8.01	6.08	292.75	29.15
25	12.96	260.01	2.000	10.00	.22	2.03	12.62	306.71	8.11	6.37	294.11	29.28
26	12.76	250.01	2.000	10.00	.22	2.12	12.71	309.02	8.23	6.66	295.61	29.41
27	12.56	240.01	2.000	10.00	.22	2.22	12.80	311.52	8.36	6.96	297.27	29.56
28	12.36	230.01	2.000	10.00	.22	2.31	12.91	314.20	8.49	7.26	299.09	29.73
29	12.16	220.02	2.000	10.00	.22	2.41	13.02	317.08	8.64	7.55	301.08	29.91
30	11.83	210.02	2.000	10.00	.22	2.50	13.14	320.16	8.80	7.86	303.24	30.11
31	11.49	200.03	2.000	10.00	.22	2.60	13.27	323.44	8.97	8.16	305.59	30.32

OUTFALL PIPELINE

TOTAL DISCHARGE = 8.46 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.70 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 12.70 M

BOTTOM PROFILE

DISTANCE M	DEPTH M
.00	.00
25.00	.00
40.00	1.00
50.00	3.00
60.00	4.50
65.00	5.00
75.00	6.50
90.00	7.00
100.00	8.50
125.00	9.00
150.00	9.10
175.00	9.50
200.00	9.80
225.00	10.20
250.00	10.50
275.00	10.50
300.00	10.50
325.00	10.50
350.00	10.80
375.00	10.80
400.00	11.00
425.00	11.00
450.00	11.00
475.00	11.50
510.00	11.60

MANIFOLD 4

TRACE B

LIST OF SYMBOLS

N = NO OF PORT
DEPTH(N) = DEPTH AT PORT N
DIST(N) = DISTANCE FROM SHORE
DIA(N) = DIAMETER OF MANIFOLD BETWEEN PORT N AND N-1
DL(N) = LENGTH BETWEEN PORT N AND N-1
D(N) = DIAMETER OF PORT N
V(N) = VELOCITY IN MANIFOLD BETWEEN PORT N AND N-1
U(N) = DISCHARGEVELOCITY OF PORT N
FN(N) = DENSIMETRIC FROUDE NO OF JET AT PORT N
E(N) = TOTAL HEAD AT PORT N
SQ(N) = TOTAL DISCHARGE UP TO PORT N
Q(N) = DISCHARGE OF PORT N
QL(N) = DISCHARGE LOAD PR LENGTH OF MANIFOLD
QDES = DESIGN DISCHARGE FLOW
VMIN = MINIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
VMAX = MAXIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
DENS = (SPEC.GRAV. SEAW.-SPEC.GRAV. WASTEW.)/(SPEC.GRAV. WASTEW.)
FRM = DARCY FRICTION FACTOR IN MANIFOLD
FRP = DARCY FRICTION FACTOR IN OUTFALL PIPELINE
VPIPE = UPPER LIMIT FOR VELOCITY IN OUTFALL PIPELINE AT DESIGN FLOW

INITIAL VALUES FOR THE CALCULATION OF THE MANIFOLD *

QDES = 4.100 CUM/SEC
VMAX = 2.00 M/SEC
VMIN = .50 M/SEC
DIST(1) = 500.00 M
U(1) = 4.00 M/SEC
DIA(2) = .794 M
DL(2) = 10.00 M
D(2) = .22 M
DL(3) = 10.00 M
DENS = .001
VPIPE = 1.20 M/SEC
FRM = .100
FRP = .100
PORT NO K1 = 20
DIA(K1) = 2.000 M
DL(K1) = 10.00 M
D(K1) = .22 M

PORT NO K2 = 0
DIA(K2) = .000 M
DL(K2) = .00 M
D(K2) = .00 M

PORT NO K3 = 0
DIA(K3) = .000 M
DL(K3) = .00 M
D(K3) = .00 M

THE LENGTH BETWEEN THE PORTS DL(N) AND THE DIAMETER OF THE PORTS
D(N) ARE KEPT CONSTANT ALONG THE MANIFOLD AND SET EQUAL TO
RESPECTIVELY DL(3) AND D(2).
IF WANTED THE DIA(N),DL(N) AND D(N) CAN BE CHANGED FOR PORT NO
N = K TO DIA(K),DL(K) AND D(K).

1

FLOW CHARACTERISTICS FOR U(1) = 4.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	11.57	500.00			.35		4.00	76.22	.82		247.45	
2	11.54	490.00	.794	10.00	.22	.50	4.04	97.94	.83	.25	95.08	24.74
3	11.51	480.00	.794	10.00	.22	.69	4.11	100.04	.86	.34	95.65	9.51
4	11.49	470.00	.794	10.00	.22	.89	4.23	103.30	.91	.44	96.97	9.57
5	11.29	460.00	.794	10.00	.22	1.08	4.40	107.91	.99	.54	98.28	9.70
6	11.09	450.00	.794	10.00	.22	1.28	4.63	113.98	1.09	.63	102.80	9.93
7	10.89	440.01	.794	10.00	.22	1.49	4.93	121.64	1.24	.74	107.69	10.28
8	10.89	430.01	.794	10.00	.22	1.71	5.28	130.95	1.42	.84	114.05	10.77
9	10.89	420.01	.794	10.00	.22	1.94	5.71	141.99	1.66	.96	122.00	11.41
10	10.89	410.01	1.598	10.00	.22	.54	5.73	138.74	1.67	1.08	135.71	12.20
11	10.89	400.01	1.598	10.00	.22	.61	5.75	139.30	1.69	1.22	135.90	13.57
12	10.89	390.01	1.598	10.00	.22	.67	5.78	139.98	1.70	1.35	136.16	13.59
13	10.81	380.01	1.598	10.00	.22	.74	5.81	140.79	1.72	1.49	136.52	13.62
14	10.73	370.01	1.598	10.00	.22	.81	5.84	141.75	1.74	1.63	136.98	13.65
15	10.73	360.01	1.598	10.00	.22	.88	5.88	142.85	1.76	1.76	137.55	13.70
16	10.73	350.01	1.598	10.00	.22	.95	5.93	144.12	1.79	1.90	138.25	13.76
17	10.73	340.01	1.598	10.00	.22	1.02	5.98	145.55	1.82	2.04	139.08	13.82
18	10.61	330.01	1.598	10.00	.22	1.09	6.05	147.17	1.86	2.18	140.05	13.91
19	10.49	320.01	1.598	10.00	.22	1.16	6.11	148.97	1.91	2.32	141.19	14.01
20	10.49	310.01	2.000	10.00	.22	.78	6.14	148.89	1.92	2.46	144.39	14.12
21	10.49	300.01	2.000	10.00	.22	.83	6.17	149.63	1.94	2.60	144.80	14.44
22	10.49	290.01	2.000	10.00	.22	.88	6.20	150.45	1.96	2.75	145.28	14.48
23	10.49	280.01	2.000	10.00	.22	.92	6.23	151.35	1.98	2.89	145.81	14.53
24	10.49	270.01	2.000	10.00	.22	.97	6.27	152.33	2.00	3.04	146.42	14.58
25	10.49	260.01	2.000	10.00	.22	1.01	6.31	153.39	2.03	3.19	147.09	14.64
26	10.49	250.01	2.000	10.00	.22	1.06	6.36	154.55	2.06	3.33	147.84	14.71
27	10.49	240.01	2.000	10.00	.22	1.11	6.40	155.80	2.09	3.48	148.67	14.78
28	10.37	230.01	2.000	10.00	.22	1.16	6.46	157.14	2.12	3.63	149.59	14.87
29	10.25	220.01	2.000	10.00	.22	1.20	6.51	158.59	2.16	3.78	150.58	14.96
30	10.09	210.01	2.000	10.00	.22	1.25	6.57	160.13	2.20	3.93	151.67	15.06
31	9.93	200.01	2.000	10.00	.22	1.30	6.64	161.77	2.24	4.08	152.84	15.17

OUTFALL PIPELINE

TOTAL DISCHARGE = 4.23 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M.
VELOCITY IN OUTFALL PIPELINE = 1.35 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 3.18 M

1 FLOW CHARACTERISTICS FOR U(1) = 1.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.35		1.00	19.06	.05		61.86	
2	11.54	490.00	.794	10.00	.22	.13	1.01	24.49	.05	.06	23.78	6.19
3	11.51	480.00	.794	10.00	.22	.17	1.03	25.02	.05	.09	23.93	2.38
4	11.49	470.00	.794	10.00	.22	.22	1.06	25.84	.06	.11	24.26	2.39
5	11.29	460.00	.794	10.00	.22	.27	1.10	27.03	.06	.13	24.88	2.43
6	11.09	450.00	.794	10.00	.22	.32	1.16	28.59	.07	.16	25.80	2.49
7	10.89	440.01	.794	10.00	.22	.37	1.24	30.54	.08	.18	27.06	2.58
8	10.89	430.01	.794	10.00	.22	.43	1.33	32.86	.09	.21	28.64	2.71
9	10.89	420.01	.794	10.00	.22	.49	1.43	35.62	.10	.24	30.63	2.86
10	10.89	410.01	1.598	10.00	.22	.14	1.44	34.81	.11	.27	34.05	3.06
11	10.89	400.01	1.598	10.00	.22	.15	1.44	34.95	.11	.30	34.10	3.41
12	10.89	390.01	1.598	10.00	.22	.17	1.45	35.12	.11	.34	34.17	3.41
13	10.81	380.01	1.598	10.00	.22	.19	1.46	35.34	.11	.37	34.27	3.42
14	10.73	370.01	1.598	10.00	.22	.20	1.47	35.59	.11	.41	34.40	3.43
15	10.73	360.01	1.598	10.00	.22	.22	1.48	35.87	.11	.44	34.54	3.44
16	10.73	350.01	1.598	10.00	.22	.24	1.49	36.18	.11	.48	34.71	3.45
17	10.73	340.01	1.598	10.00	.22	.25	1.50	36.54	.12	.51	34.92	3.47
18	10.61	330.01	1.598	10.00	.22	.27	1.52	36.96	.12	.55	35.18	3.49
19	10.49	320.01	1.598	10.00	.22	.29	1.54	37.43	.12	.58	35.48	3.52
20	10.49	310.01	2.000	10.00	.22	.20	1.54	37.41	.12	.62	36.29	3.55
21	10.49	300.01	2.000	10.00	.22	.21	1.55	37.60	.12	.65	36.39	3.63
22	10.49	290.01	2.000	10.00	.22	.22	1.56	37.80	.12	.69	36.51	3.64
23	10.49	280.01	2.000	10.00	.22	.23	1.57	38.03	.12	.73	36.64	3.65
24	10.49	270.01	2.000	10.00	.22	.24	1.58	38.27	.13	.76	36.79	3.66
25	10.49	260.01	2.000	10.00	.22	.25	1.59	38.54	.13	.80	36.96	3.68
26	10.49	250.01	2.000	10.00	.22	.27	1.60	38.83	.13	.84	37.15	3.70
27	10.49	240.01	2.000	10.00	.22	.28	1.61	39.14	.13	.87	37.36	3.71
28	10.37	230.01	2.000	10.00	.22	.29	1.62	39.50	.13	.91	37.60	3.74
29	10.25	220.01	2.000	10.00	.22	.30	1.64	39.88	.14	.95	37.87	3.76
30	10.09	210.01	2.000	10.00	.22	.31	1.65	40.28	.14	.99	38.16	3.79
31	9.93	200.01	2.000	10.00	.22	.33	1.67	40.72	.14	1.02	38.48	3.82

OUTFALL PIPELINE

TOTAL DISCHARGE = 1.06 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .34 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = .21 M

1

FLOW CHARACTERISTICS FOR U(1) = 2.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.35		2.00	38.11	.20		123.72	
2	11.54	490.00	.794	10.00	.22	.25	2.02	48.97	.21	.12	47.54	12.37
3	11.51	480.00	.794	10.00	.22	.35	2.06	50.03	.22	.17	47.83	4.75
4	11.49	470.00	.794	10.00	.22	.44	2.12	51.66	.23	.22	48.49	4.78
5	11.29	460.00	.794	10.00	.22	.54	2.20	53.98	.25	.27	49.67	4.85
6	11.09	450.00	.794	10.00	.22	.64	2.32	57.03	.27	.32	51.44	4.97
7	10.89	440.01	.794	10.00	.22	.74	2.46	60.87	.31	.37	53.90	5.14
8	10.89	430.01	.794	10.00	.22	.85	2.64	65.53	.36	.42	57.08	5.39
9	10.89	420.01	.794	10.00	.22	.97	2.86	71.04	.42	.48	61.05	5.71
10	10.89	410.01	1.598	10.00	.22	.27	2.87	69.42	.42	.54	67.90	6.11
11	10.89	400.01	1.598	10.00	.22	.30	2.88	69.70	.42	.61	68.00	6.70
12	10.89	390.01	1.598	10.00	.22	.34	2.89	70.04	.43	.68	68.13	6.80
13	10.81	380.01	1.598	10.00	.22	.37	2.90	70.45	.43	.74	68.32	6.81
14	10.73	370.01	1.598	10.00	.22	.41	2.92	70.94	.44	.81	68.55	6.83
15	10.73	360.01	1.598	10.00	.22	.44	2.94	71.49	.44	.88	68.84	6.86
16	10.73	350.01	1.598	10.00	.22	.47	2.97	72.12	.45	.95	69.18	6.88
17	10.73	340.01	1.598	10.00	.22	.51	2.99	72.84	.46	1.02	69.60	6.92
18	10.61	330.01	1.598	10.00	.22	.54	3.03	73.65	.47	1.09	70.09	6.96
19	10.49	320.01	1.598	10.00	.22	.58	3.06	74.56	.48	1.16	70.67	7.01
20	10.49	310.01	2.000	10.00	.22	.39	3.07	74.52	.48	1.23	72.27	7.07
21	10.49	300.01	2.000	10.00	.22	.41	3.09	74.89	.49	1.30	72.48	7.23
22	10.49	290.01	2.000	10.00	.22	.44	3.10	75.30	.49	1.37	72.71	7.25
23	10.49	280.01	2.000	10.00	.22	.46	3.12	75.75	.50	1.45	72.98	7.27
24	10.49	270.01	2.000	10.00	.22	.48	3.14	76.24	.50	1.52	73.28	7.30
25	10.49	260.01	2.000	10.00	.22	.51	3.16	76.77	.51	1.59	73.62	7.33
26	10.49	250.01	2.000	10.00	.22	.53	3.18	77.35	.52	1.67	74.00	7.36
27	10.49	240.01	2.000	10.00	.22	.55	3.20	77.98	.52	1.74	74.41	7.40
28	10.37	230.01	2.000	10.00	.22	.58	3.23	78.66	.53	1.82	74.88	7.44
29	10.25	220.01	2.000	10.00	.22	.60	3.26	79.38	.54	1.89	75.38	7.49
30	10.09	210.01	2.000	10.00	.22	.63	3.29	80.17	.55	1.97	75.93	7.54
31	9.93	200.01	2.000	10.00	.22	.65	3.32	81.00	.56	2.04	76.53	7.59

OUTFALL PIPELINE

TOTAL DISCHARGE = 2.12 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .67 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = .81 M

1 FLOW CHARACTERISTICS FOR U(1) = 3.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.35		3.00	57.17	.46		185.58	
2	11.54	490.00	.794	10.00	.22	.37	3.03	73.46	.47	.19	71.31	18.56
3	11.51	480.00	.794	10.00	.22	.52	3.09	75.03	.49	.26	71.74	7.13
4	11.49	470.00	.794	10.00	.22	.66	3.17	77.48	.51	.33	72.73	7.17
5	11.29	460.00	.794	10.00	.22	.81	3.30	80.94	.56	.40	74.47	7.27
6	11.09	450.00	.794	10.00	.22	.96	3.47	85.50	.62	.48	77.12	7.45
7	10.89	440.01	.794	10.00	.22	1.12	3.69	91.25	.70	.55	80.79	7.71
8	10.89	430.01	.794	10.00	.22	1.28	3.96	98.23	.80	.63	85.56	8.08
9	10.89	420.01	.794	10.00	.22	1.45	4.29	106.51	.94	.72	91.52	8.56
10	10.89	410.01	1.598	10.00	.22	.40	4.30	104.07	.94	.81	101.80	9.15
11	10.89	400.01	1.598	10.00	.22	.46	4.31	104.49	.95	.91	101.94	10.18
12	10.89	390.01	1.598	10.00	.22	.51	4.33	105.00	.96	1.01	102.14	10.19
13	10.81	380.01	1.598	10.00	.22	.56	4.35	105.62	.97	1.12	102.41	10.21
14	10.73	370.01	1.598	10.00	.22	.61	4.38	106.34	.98	1.22	102.76	10.24
15	10.73	360.01	1.598	10.00	.22	.66	4.41	107.16	.99	1.32	103.19	10.28
16	10.73	350.01	1.598	10.00	.22	.71	4.45	108.11	1.01	1.43	103.71	10.32
17	10.73	340.01	1.598	10.00	.22	.76	4.49	109.19	1.03	1.53	104.33	10.37
18	10.61	330.01	1.598	10.00	.22	.81	4.54	110.40	1.05	1.63	105.07	10.43
19	10.49	320.01	1.598	10.00	.22	.87	4.59	111.76	1.07	1.74	105.92	10.51
20	10.49	310.01	2.000	10.00	.22	.59	4.61	111.70	1.08	1.84	108.32	10.59
21	10.49	300.01	2.000	10.00	.22	.62	4.63	112.26	1.09	1.95	108.63	10.83
22	10.49	290.01	2.000	10.00	.22	.66	4.65	112.87	1.10	2.06	108.99	10.86
23	10.49	280.01	2.000	10.00	.22	.69	4.68	113.54	1.11	2.17	109.39	10.90
24	10.49	270.01	2.000	10.00	.22	.73	4.70	114.28	1.13	2.28	109.84	10.94
25	10.49	260.01	2.000	10.00	.22	.76	4.73	115.08	1.14	2.39	110.35	10.98
26	10.49	250.01	2.000	10.00	.22	.80	4.77	115.94	1.16	2.50	110.91	11.03
27	10.49	240.01	2.000	10.00	.22	.83	4.80	116.88	1.18	2.61	111.53	11.09
28	10.37	230.01	2.000	10.00	.22	.87	4.84	117.89	1.20	2.72	112.22	11.15
29	10.25	220.01	2.000	10.00	.22	.90	4.89	118.97	1.22	2.83	112.97	11.22
30	10.09	210.01	2.000	10.00	.22	.94	4.93	120.14	1.24	2.95	113.79	11.30
31	9.93	200.01	2.000	10.00	.22	.97	4.98	121.37	1.26	3.06	114.67	11.38

OUTFALL PIPELINE

TOTAL DISCHARGE = 3.18 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.01 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 1.80 M

1

FLOW CHARACTERISTICS FOR U(1) = 5.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.35		5.00	95.28	1.27		309.31	
2	11.54	490.00	.794	10.00	.22	.62	5.05	122.42	1.30	.31	118.85	30.93
3	11.51	480.00	.794	10.00	.22	.87	5.14	125.05	1.35	.43	119.56	11.89
4	11.49	470.00	.794	10.00	.22	1.11	5.29	129.12	1.43	.55	121.21	11.96
5	11.29	460.00	.794	10.00	.22	1.35	5.50	134.87	1.54	.67	124.10	12.12
6	11.09	450.00	.794	10.00	.22	1.60	5.79	142.47	1.71	.79	128.49	12.41
7	10.89	440.01	.794	10.00	.22	1.86	6.16	152.04	1.93	.92	134.60	12.85
8	10.89	430.01	.794	10.00	.22	2.13	6.61	163.67	2.22	1.06	142.55	13.46
9	10.89	420.01	.794	10.00	.22	2.42	7.14	177.47	2.60	1.20	152.49	14.26
10	10.89	410.01	1.598	10.00	.22	.67	7.16	173.41	2.61	1.35	169.62	15.25
11	10.89	400.01	1.598	10.00	.22	.76	7.19	174.11	2.63	1.52	169.85	16.96
12	10.89	390.01	1.598	10.00	.22	.84	7.22	174.96	2.66	1.69	170.19	16.99
13	10.81	380.01	1.598	10.00	.22	.93	7.26	175.98	2.68	1.86	170.63	17.02
14	10.73	370.01	1.598	10.00	.22	1.01	7.30	177.17	2.72	2.03	171.21	17.06
15	10.73	360.01	1.598	10.00	.22	1.10	7.35	178.55	2.75	2.20	171.92	17.12
16	10.73	350.01	1.598	10.00	.22	1.18	7.41	180.13	2.80	2.37	172.79	17.19
17	10.73	340.01	1.598	10.00	.22	1.27	7.48	181.92	2.85	2.55	173.83	17.28
18	10.61	330.01	1.598	10.00	.22	1.36	7.56	183.94	2.91	2.72	175.05	17.38
19	10.49	320.01	1.598	10.00	.22	1.44	7.64	186.19	2.98	2.90	176.46	17.50
20	10.49	310.01	2.000	10.00	.22	.98	7.67	186.10	3.00	3.07	180.47	17.65
21	10.49	300.01	2.000	10.00	.22	1.04	7.71	187.02	3.03	3.25	180.98	18.05
22	10.49	290.01	2.000	10.00	.22	1.09	7.75	188.04	3.06	3.43	181.57	18.10
23	10.49	280.01	2.000	10.00	.22	1.15	7.79	189.16	3.09	3.62	182.24	18.16
24	10.49	270.01	2.000	10.00	.22	1.21	7.84	190.39	3.13	3.80	183.00	18.22
25	10.49	260.01	2.000	10.00	.22	1.27	7.89	191.72	3.17	3.98	183.84	18.30
26	10.49	250.01	2.000	10.00	.22	1.33	7.94	193.16	3.22	4.16	184.78	18.38
27	10.49	240.01	2.000	10.00	.22	1.39	8.00	194.72	3.26	4.35	185.82	18.48
28	10.37	230.01	2.000	10.00	.22	1.44	8.07	196.40	3.32	4.54	186.96	18.58
29	10.25	220.01	2.000	10.00	.22	1.50	8.14	198.20	3.38	4.72	188.20	18.70
30	10.09	210.01	2.000	10.00	.22	1.56	8.21	200.13	3.44	4.91	189.55	18.82
31	9.93	200.01	2.000	10.00	.22	1.62	8.29	202.18	3.51	5.10	191.02	18.96

OUTFALL PIPELINE

TOTAL DISCHARGE = 5.29 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.69 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 4.97 M

1 FLOW CHARACTERISTICS FOR U(1) = 6.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	11.57	500.00			.35		6.00	114.33	1.83		371.17	
2	11.54	490.00	.794	10.00	.22	.75	6.06	146.91	1.87	.37	142.62	37.12
3	11.51	480.00	.794	10.00	.22	1.04	6.17	150.06	1.94	.51	143.47	14.26
4	11.49	470.00	.794	10.00	.22	1.33	6.35	154.95	2.05	.66	145.44	14.35
5	11.29	460.00	.794	10.00	.22	1.62	6.60	161.84	2.22	.80	148.91	14.54
6	11.09	450.00	.794	10.00	.22	1.92	6.95	170.96	2.46	.95	154.18	14.89
7	10.89	440.01	.794	10.00	.22	2.23	7.39	182.43	2.78	1.11	161.50	15.42
8	10.89	430.01	.794	10.00	.22	2.56	7.93	196.40	3.20	1.27	171.05	16.15
9	10.89	420.01	.794	10.00	.22	2.91	8.57	212.95	3.74	1.44	182.97	17.11
10	10.89	410.01	1.598	10.00	.22	.81	8.59	208.08	3.76	1.62	203.53	18.30
11	10.89	400.01	1.598	10.00	.22	.91	8.62	208.92	3.79	1.82	203.81	20.35
12	10.89	390.01	1.598	10.00	.22	1.01	8.66	209.94	3.82	2.03	204.21	20.38
13	10.81	380.01	1.598	10.00	.22	1.11	8.71	211.16	3.86	2.23	204.75	20.42
14	10.73	370.01	1.598	10.00	.22	1.22	8.76	212.59	3.91	2.44	205.44	20.47
15	10.73	360.01	1.598	10.00	.22	1.32	8.82	214.25	3.97	2.64	206.29	20.54
16	10.73	350.01	1.598	10.00	.22	1.42	8.89	216.14	4.03	2.85	207.34	20.63
17	10.73	340.01	1.598	10.00	.22	1.52	8.97	218.30	4.10	3.06	208.58	20.73
18	10.61	330.01	1.598	10.00	.22	1.63	9.07	220.72	4.19	3.27	210.04	20.86
19	10.49	320.01	1.598	10.00	.22	1.73	9.17	223.41	4.29	3.48	211.74	21.00
20	10.49	310.01	2.000	10.00	.22	1.17	9.21	223.30	4.32	3.69	216.55	21.17
21	10.49	300.01	2.000	10.00	.22	1.24	9.25	224.41	4.36	3.90	217.16	21.65
22	10.49	290.01	2.000	10.00	.22	1.31	9.30	225.63	4.40	4.12	217.87	21.72
23	10.49	280.01	2.000	10.00	.22	1.38	9.35	226.98	4.45	4.34	218.68	21.79
24	10.49	270.01	2.000	10.00	.22	1.45	9.40	228.45	4.51	4.56	219.59	21.87
25	10.49	260.01	2.000	10.00	.22	1.52	9.46	230.05	4.57	4.78	220.60	21.96
26	10.49	250.01	2.000	10.00	.22	1.59	9.53	231.78	4.63	5.00	221.72	22.06
27	10.49	240.01	2.000	10.00	.22	1.66	9.60	233.65	4.70	5.22	222.97	22.17
28	10.37	230.01	2.000	10.00	.22	1.73	9.68	235.67	4.78	5.44	224.33	22.30
29	10.25	220.01	2.000	10.00	.22	1.80	9.77	237.83	4.86	5.67	225.82	22.43
30	10.09	210.01	2.000	10.00	.22	1.88	9.85	240.14	4.95	5.89	227.45	22.58
31	9.93	200.01	2.000	10.00	.22	1.95	9.95	242.60	5.05	6.12	229.20	22.74

OUTFALL PIPELINE

TOTAL DISCHARGE = 6.35 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.02 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 7.15 M

1 FLOW CHARACTERISTICS FOR U(1) = 7.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.35		7.00	133.39	2.50		433.03	
2	11.54	490.00	.794	10.00	.22	.87	7.07	171.39	2.55	.43	166.39	43.30
3	11.51	480.00	.794	10.00	.22	1.21	7.20	175.07	2.64	.60	167.39	16.64
4	11.49	470.00	.794	10.00	.22	1.55	7.41	180.77	2.79	.77	169.68	16.74
5	11.29	460.00	.794	10.00	.22	1.89	7.70	188.82	3.03	.94	173.73	16.97
6	11.09	450.00	.794	10.00	.22	2.24	8.11	199.44	3.35	1.11	179.87	17.37
7	10.89	440.01	.794	10.00	.22	2.61	8.62	212.83	3.78	1.29	188.41	17.99
8	10.89	430.01	.794	10.00	.22	2.99	9.25	229.12	4.36	1.48	199.55	18.84
9	10.89	420.01	.794	10.00	.22	3.39	10.00	248.44	5.10	1.68	213.46	19.96
10	10.89	410.01	1.598	10.00	.22	.94	10.03	242.75	5.12	1.89	237.45	21.35
11	10.89	400.01	1.598	10.00	.22	1.06	10.06	243.73	5.16	2.13	237.78	23.75
12	10.89	390.01	1.598	10.00	.22	1.18	10.11	244.92	5.20	2.37	238.24	23.78
13	10.81	380.01	1.598	10.00	.22	1.30	10.16	246.35	5.26	2.60	238.87	23.82
14	10.73	370.01	1.598	10.00	.22	1.42	10.22	248.02	5.32	2.84	239.67	23.89
15	10.73	360.01	1.598	10.00	.22	1.54	10.29	249.95	5.40	3.08	240.67	23.97
16	10.73	350.01	1.598	10.00	.22	1.66	10.37	252.16	5.49	3.32	241.88	24.07
17	10.73	340.01	1.598	10.00	.22	1.78	10.47	254.67	5.59	3.57	243.33	24.19
18	10.61	330.01	1.598	10.00	.22	1.90	10.58	257.49	5.70	3.81	245.04	24.33
19	10.49	320.01	1.598	10.00	.22	2.02	10.70	260.64	5.83	4.05	247.02	24.50
20	10.49	310.01	2.000	10.00	.22	1.37	10.74	260.51	5.88	4.30	252.63	24.70
21	10.49	300.01	2.000	10.00	.22	1.45	10.79	261.80	5.93	4.55	253.35	25.26
22	10.49	290.01	2.000	10.00	.22	1.53	10.84	263.23	5.99	4.81	254.17	25.33
23	10.49	280.01	2.000	10.00	.22	1.61	10.90	264.80	6.06	5.06	255.11	25.42
24	10.49	270.01	2.000	10.00	.22	1.69	10.97	266.51	6.13	5.32	256.17	25.51
25	10.49	260.01	2.000	10.00	.22	1.77	11.04	268.38	6.21	5.57	257.35	25.62
26	10.49	250.01	2.000	10.00	.22	1.86	11.12	270.40	6.30	5.83	258.67	25.74
27	10.49	240.01	2.000	10.00	.22	1.94	11.20	272.58	6.40	6.09	260.12	25.87
28	10.37	230.01	2.000	10.00	.22	2.02	11.29	274.93	6.50	6.35	261.71	26.01
29	10.25	220.01	2.000	10.00	.22	2.11	11.39	277.45	6.61	6.61	263.45	26.17
30	10.09	210.01	2.000	10.00	.22	2.19	11.50	280.15	6.74	6.87	265.34	26.34
31	9.93	200.01	2.000	10.00	.22	2.27	11.61	283.02	6.87	7.14	267.39	26.53

OUTFALL PIPELINE

TOTAL DISCHARGE = 7.41 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.36 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 9.72 M

1 FLOW CHARACTERISTICS FOR U(1) = 8.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.35		8.00	152.45	3.26		494.89	
2	11.54	490.00	.794	10.00	.22	1.00	8.08	195.88	3.33	.49	190.16	49.49
3	11.51	480.00	.794	10.00	.22	1.38	8.23	200.08	3.45	.69	191.30	19.02
4	11.49	470.00	.794	10.00	.22	1.77	8.46	206.59	3.65	.88	193.92	19.13
5	11.29	460.00	.794	10.00	.22	2.16	8.80	215.79	3.95	1.07	198.54	19.39
6	11.09	450.00	.794	10.00	.22	2.56	9.26	227.93	4.37	1.27	205.57	19.85
7	10.89	440.01	.794	10.00	.22	2.98	9.85	243.23	4.94	1.47	215.32	20.56
8	10.89	430.01	.794	10.00	.22	3.41	10.57	261.85	5.69	1.69	228.06	21.53
9	10.89	420.01	.794	10.00	.22	3.88	11.43	283.92	6.66	1.92	243.95	22.81
10	10.89	410.01	1.598	10.00	.22	1.08	11.46	277.43	6.69	2.16	271.37	24.40
11	10.89	400.01	1.598	10.00	.22	1.21	11.50	278.55	6.74	2.43	271.74	27.14
12	10.89	390.01	1.598	10.00	.22	1.35	11.55	279.91	6.80	2.70	272.27	27.17
13	10.81	380.01	1.598	10.00	.22	1.49	11.61	281.53	6.87	2.98	272.98	27.23
14	10.73	370.01	1.598	10.00	.22	1.62	11.68	283.44	6.95	3.25	273.90	27.30
15	10.73	360.01	1.598	10.00	.22	1.76	11.76	285.65	7.05	3.52	275.04	27.39
16	10.73	350.01	1.598	10.00	.22	1.90	11.86	288.18	7.16	3.80	276.43	27.50
17	10.73	340.01	1.598	10.00	.22	2.03	11.97	291.04	7.30	4.08	278.09	27.64
18	10.61	330.01	1.598	10.00	.22	2.17	12.09	294.27	7.45	4.35	280.04	27.81
19	10.49	320.01	1.598	10.00	.22	2.31	12.23	297.86	7.62	4.63	282.30	28.00
20	10.49	310.01	2.000	10.00	.22	1.57	12.28	297.71	7.68	4.92	288.71	28.23
21	10.49	300.01	2.000	10.00	.22	1.66	12.33	299.19	7.75	5.20	289.53	28.87
22	10.49	290.01	2.000	10.00	.22	1.75	12.39	300.83	7.83	5.49	290.48	28.95
23	10.49	280.01	2.000	10.00	.22	1.84	12.46	302.62	7.91	5.78	291.55	29.05
24	10.49	270.01	2.000	10.00	.22	1.94	12.54	304.58	8.01	6.08	292.76	29.16
25	10.49	260.01	2.000	10.00	.22	2.03	12.62	306.71	8.12	6.37	294.11	29.28
26	10.49	250.01	2.000	10.00	.22	2.12	12.71	309.02	8.23	6.66	295.61	29.41
27	10.49	240.01	2.000	10.00	.22	2.22	12.80	311.52	8.36	6.96	297.27	29.56
28	10.37	230.01	2.000	10.00	.22	2.31	12.91	314.20	8.49	7.26	299.09	29.73
29	10.25	220.01	2.000	10.00	.22	2.41	13.02	317.08	8.64	7.55	301.07	29.91
30	10.09	210.01	2.000	10.00	.22	2.50	13.14	320.16	8.80	7.86	303.24	30.11
31	9.93	200.01	2.000	10.00	.22	2.60	13.27	323.44	8.97	8.16	305.58	30.32

OUTFALL PIPELINE

TOTAL DISCHARGE = 8.46 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.70 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 12.70 M

BOTTOM PROFILE

DISTANCE M	DEPTH M
.00	.00
25.00	.00
35.00	.50
40.00	1.50
50.00	3.00
60.00	4.00
70.00	6.00
90.00	8.00
100.00	9.00
125.00	9.20
150.00	9.30
175.00	9.50
200.00	9.80
225.00	9.80
250.00	9.80
275.00	9.90
300.00	10.00
325.00	10.00
350.00	10.50
375.00	10.50
400.00	11.00
425.00	11.00
450.00	11.00
475.00	11.10
510.00	11.30

MANIFOLD 4
TRACE C

LIST OF SYMBOLS

N = NO OF PORT
DEPTH(N) = DEPTH AT PORT N
DIST(N) = DISTANCE FROM SHORE
DIA(N) = DIAMETER OF MANIFOLD BETWEEN PORT N AND N-1
DL(N) = LENGTH BETWEEN PORT N AND N-1
D(N) = DIAMETER OF PORT N
V(N) = VELOCITY IN MANIFOLD BETWEEN PORT N AND N-1
U(N) = DISCHARGEVELOCITY OF PORT N
FN(N) = DENSIMETRIC FROUDE NO OF JET AT PORT N
E(N) = TOTAL HEAD AT PORT N
SQ(N) = TOTAL DISCHARGE UP TO PORT N
Q(N) = DISCHARGE OF PORT N
QL(N) = DISCHARGE LOAD PR LENGTH OF MANIFOLD
QDES = DESIGN DISCHARGE FLOW
VMIN = MINIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
VMAX = MAXIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
DENS = (SPEC.GRAV. SEAW.-SPEC.GRAV. WASTEW.)/(SPEC.GRAV. WASTEW.)
FRM = DARCY FRICTION FACTOR IN MANIFOLD
FRP = DARCY FRICTION FACTOR IN OUTFALL PIPELINE
VPIPE = UPPER LIMIT FOR VELOCITY IN OUTFALL PIPELINE AT DESIGN FLOW

INITIAL VALUES FOR THE CALCULATION OF THE MANIFOLD .

QDES = 4.100 CUM/SEC
VMAX = 2.00 M/SEC
VMIN = .50 M/SEC
DIST(1) = 500.00 M
U(1) = 4.00 M/SEC
DIA(2) = .794 M
DL(2) = 10.00 M
D(2) = .22 M
DL(3) = 10.00 M
DENS = .001
VPIPE = 1.20 M/SEC
FRM = .100
FRP = .100
PORT NO K1 = 20
DIA(K1) = 2.000 M
DL(K1) = 10.00 M
D(K1) = .22 M

PORT NO K2 = 0
DIA(K2) = .000 M
DL(K2) = .00 M
D(K2) = .00 M

PORT NO K3 = 0
DIA(K3) = .000 M
DL(K3) = .00 M
D(K3) = .00 M

THE LENGTH BETWEEN THE PORTS DL(N) AND THE DIAMETER OF THE PORTS
D(N) ARE KEPT CONSTANT ALONG THE MANIFOLD AND SET EQUAL TO
RESPECTIVELY DL(3) AND D(2).
IF WANTED THE DIA(N),DL(N) AND D(N) CAN BE CHANGED FOR PORT NO
N = K TO DIA(K),DL(K) AND D(K).

1

FLOW CHARACTERISTICS FOR U(1) = 4.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.24	500.00			.35		4.00	76.22	.82		247.45	
2	11.19	490.00	.794	10.00	.22	.50	4.04	97.94	.83	.25	95.08	24.74
3	11.13	480.00	.794	10.00	.22	.69	4.11	100.04	.86	.34	95.65	9.51
4	11.07	470.00	.794	10.00	.22	.89	4.23	103.30	.91	.44	96.97	9.57
5	11.03	460.00	.794	10.00	.22	1.08	4.40	107.90	.99	.54	99.28	9.70
6	10.99	450.00	.794	10.00	.22	1.28	4.63	113.97	1.09	.63	102.79	9.93
7	10.95	440.00	.794	10.00	.22	1.49	4.92	121.62	1.24	.74	107.67	10.28
8	10.95	430.00	.794	10.00	.22	1.71	5.28	130.93	1.42	.84	114.04	10.77
9	10.95	420.00	.794	10.00	.22	1.94	5.71	141.97	1.66	.96	121.98	11.40
10	10.95	410.00	1.598	10.00	.22	.54	5.73	138.72	1.67	1.08	135.69	12.20
11	10.95	400.00	1.598	10.00	.22	.61	5.75	139.28	1.69	1.22	135.98	13.57
12	10.95	390.00	1.598	10.00	.22	.67	5.77	139.96	1.70	1.35	136.14	13.59
13	10.75	380.00	1.598	10.00	.22	.74	5.80	140.78	1.72	1.49	136.51	13.61
14	10.55	370.00	1.598	10.00	.22	.81	5.84	141.74	1.74	1.63	136.97	13.65
15	10.55	360.00	1.598	10.00	.22	.88	5.88	142.85	1.76	1.76	137.54	13.70
16	10.55	350.00	1.598	10.00	.22	.95	5.93	144.11	1.79	1.90	138.24	13.75
17	10.55	340.00	1.598	10.00	.22	1.02	5.98	145.54	1.82	2.04	139.07	13.82
18	10.35	330.01	1.598	10.00	.22	1.09	6.05	147.16	1.86	2.18	140.05	13.91
19	10.15	320.01	1.598	10.00	.22	1.16	6.11	148.97	1.91	2.32	141.18	14.00
20	10.15	310.01	2.000	10.00	.22	.78	6.14	148.89	1.92	2.46	144.39	14.12
21	10.15	300.01	2.000	10.00	.22	.83	6.17	149.63	1.94	2.60	144.80	14.44
22	10.15	290.01	2.000	10.00	.22	.87	6.20	150.45	1.96	2.75	145.27	14.48
23	10.11	280.01	2.000	10.00	.22	.92	6.23	151.35	1.98	2.89	145.81	14.53
24	10.07	270.01	2.000	10.00	.22	.97	6.27	152.33	2.00	3.04	146.42	14.58
25	10.03	260.01	2.000	10.00	.22	1.01	6.31	153.40	2.03	3.18	147.10	14.64
26	9.99	250.01	2.000	10.00	.22	1.06	6.36	154.55	2.06	3.33	147.85	14.71
27	9.95	240.01	2.000	10.00	.22	1.11	6.40	155.80	2.09	3.48	148.68	14.78
28	9.95	230.01	2.000	10.00	.22	1.16	6.46	157.14	2.12	3.63	149.59	14.87
29	9.95	220.01	2.000	10.00	.22	1.20	6.51	158.58	2.16	3.78	150.58	14.96
30	9.95	210.01	2.000	10.00	.22	1.25	6.57	160.12	2.20	3.93	151.66	15.06
31	9.95	200.01	2.000	10.00	.22	1.30	6.63	161.76	2.24	4.08	152.83	15.17

OUTFALL PIPELINE

TOTAL DISCHARGE = 4.23 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.35 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 3.18 M

1

FLOW CHARACTERISTICS FOR U(1) = 1.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.24	500.00			.35		1.00	19.06	.05		61.86	
2	11.19	490.00	.794	10.00	.22	.13	1.01	24.50	.05	.06	23.78	6.19
3	11.13	480.00	.794	10.00	.22	.17	1.03	25.04	.05	.09	23.94	2.38
4	11.07	470.00	.794	10.00	.22	.22	1.06	25.86	.06	.11	24.28	2.39
5	11.03	460.00	.794	10.00	.22	.27	1.10	27.02	.06	.13	24.86	2.43
6	10.99	450.00	.794	10.00	.22	.32	1.16	28.54	.07	.16	25.75	2.49
7	10.95	440.00	.794	10.00	.22	.37	1.23	30.46	.08	.18	26.98	2.57
8	10.95	430.00	.794	10.00	.22	.43	1.32	32.79	.09	.21	28.57	2.70
9	10.95	420.00	.794	10.00	.22	.48	1.43	35.55	.10	.24	30.55	2.86
10	10.95	410.00	1.598	10.00	.22	.13	1.43	34.74	.10	.27	33.98	3.06
11	10.95	400.00	1.598	10.00	.22	.15	1.44	34.88	.11	.30	34.03	3.40
12	10.95	390.00	1.598	10.00	.22	.17	1.45	35.05	.11	.34	34.10	3.40
13	10.75	380.00	1.598	10.00	.22	.19	1.45	35.29	.11	.37	34.22	3.41
14	10.55	370.00	1.598	10.00	.22	.20	1.47	35.56	.11	.41	34.36	3.42
15	10.55	360.00	1.598	10.00	.22	.22	1.48	35.83	.11	.44	34.51	3.44
16	10.55	350.00	1.598	10.00	.22	.24	1.49	36.15	.11	.48	34.68	3.45
17	10.55	340.00	1.598	10.00	.22	.25	1.50	36.51	.11	.51	34.89	3.47
18	10.35	330.01	1.598	10.00	.22	.27	1.52	36.94	.12	.55	35.16	3.49
19	10.15	320.01	1.598	10.00	.22	.29	1.54	37.42	.12	.58	35.48	3.52
20	10.15	310.01	2.000	10.00	.22	.20	1.54	37.40	.12	.62	36.28	3.55
21	10.15	300.01	2.000	10.00	.22	.21	1.55	37.59	.12	.65	36.38	3.63
22	10.15	290.01	2.000	10.00	.22	.22	1.56	37.79	.12	.69	36.50	3.64
23	10.11	280.01	2.000	10.00	.22	.23	1.57	38.02	.12	.73	36.64	3.65
24	10.07	270.01	2.000	10.00	.22	.24	1.58	38.28	.13	.76	36.79	3.66
25	10.03	260.01	2.000	10.00	.22	.25	1.59	38.55	.13	.80	36.97	3.68
26	9.99	250.01	2.000	10.00	.22	.27	1.60	38.84	.13	.84	37.16	3.70
27	9.95	240.01	2.000	10.00	.22	.28	1.61	39.16	.13	.87	37.38	3.72
28	9.95	230.01	2.000	10.00	.22	.29	1.62	39.50	.13	.91	37.60	3.74
29	9.95	220.01	2.000	10.00	.22	.30	1.64	39.86	.14	.95	37.85	3.76
30	9.95	210.01	2.000	10.00	.22	.31	1.65	40.24	.14	.99	38.12	3.79
31	9.95	200.01	2.000	10.00	.22	.33	1.67	40.65	.14	1.02	38.41	3.81

OUTFALL PIPELINE

TOTAL DISCHARGE = 1.06 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .34 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = .21 M

1 FLOW CHARACTERISTICS FOR U(1) = 2.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.24	500.00			.35		2.00	38.11	.20		123.72	
2	11.19	490.00	.794	10.00	.22	.25	2.02	48.98	.21	.12	47.55	12.37
3	11.13	480.00	.794	10.00	.22	.35	2.06	50.03	.22	.17	47.84	4.75
4	11.07	470.00	.794	10.00	.22	.44	2.12	51.67	.23	.22	48.50	4.78
5	11.03	460.00	.794	10.00	.22	.54	2.20	53.97	.25	.27	49.66	4.85
6	10.99	450.00	.794	10.00	.22	.64	2.32	57.01	.27	.32	51.42	4.97
7	10.95	440.00	.794	10.00	.22	.74	2.46	60.84	.31	.37	53.86	5.14
8	10.95	430.00	.794	10.00	.22	.85	2.64	65.49	.36	.42	57.04	5.39
9	10.95	420.00	.794	10.00	.22	.97	2.86	71.01	.42	.48	61.01	5.70
10	10.95	410.00	1.598	10.00	.22	.27	2.87	69.39	.42	.54	67.87	6.10
11	10.95	400.00	1.598	10.00	.22	.30	2.88	69.67	.42	.61	67.96	6.79
12	10.95	390.00	1.598	10.00	.22	.34	2.89	70.01	.43	.68	68.10	6.80
13	10.75	380.00	1.598	10.00	.22	.37	2.90	70.43	.43	.74	68.29	6.81
14	10.55	370.00	1.598	10.00	.22	.41	2.92	70.92	.44	.81	68.54	6.83
15	10.55	360.00	1.598	10.00	.22	.44	2.94	71.47	.44	.88	68.82	6.85
16	10.55	350.00	1.598	10.00	.22	.47	2.97	72.10	.45	.95	69.17	6.88
17	10.55	340.00	1.598	10.00	.22	.51	2.99	72.82	.46	1.02	69.58	6.92
18	10.35	330.01	1.598	10.00	.22	.54	3.03	73.64	.47	1.09	70.08	6.96
19	10.15	320.01	1.598	10.00	.22	.58	3.06	74.56	.48	1.16	70.66	7.01
20	10.15	310.01	2.000	10.00	.22	.39	3.07	74.52	.48	1.23	72.27	7.07
21	10.15	300.01	2.000	10.00	.22	.41	3.09	74.89	.49	1.30	72.47	7.23
22	10.15	290.01	2.000	10.00	.22	.44	3.10	75.30	.49	1.37	72.71	7.25
23	10.11	280.01	2.000	10.00	.22	.46	3.12	75.75	.50	1.45	72.98	7.27
24	10.07	270.01	2.000	10.00	.22	.48	3.14	76.24	.50	1.52	73.29	7.30
25	10.03	260.01	2.000	10.00	.22	.51	3.16	76.78	.51	1.59	73.63	7.33
26	9.99	250.01	2.000	10.00	.22	.53	3.18	77.36	.52	1.67	74.00	7.36
27	9.95	240.01	2.000	10.00	.22	.55	3.21	77.99	.52	1.74	74.42	7.40
28	9.95	230.01	2.000	10.00	.22	.58	3.23	78.66	.53	1.82	74.88	7.44
29	9.95	220.01	2.000	10.00	.22	.60	3.26	79.38	.54	1.89	75.37	7.49
30	9.95	210.01	2.000	10.00	.22	.63	3.29	80.14	.55	1.97	75.91	7.54
31	9.95	200.01	2.000	10.00	.22	.65	3.32	80.96	.56	2.04	76.50	7.59

OUTFALL PIPELINE

TOTAL DISCHARGE = 2.12 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .67 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = .80 M

1

FLOW CHARACTERISTICS FOR U(1) = 3.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.24	500.00			.35		3.00	57.17	.46		185.58	
2	11.19	490.00	.794	10.00	.22	.37	3.03	73.46	.47	.19	71.32	18.56
3	11.13	480.00	.794	10.00	.22	.52	3.09	75.04	.49	.26	71.75	7.13
4	11.07	470.00	.794	10.00	.22	.66	3.17	77.48	.51	.33	72.73	7.17
5	11.03	460.00	.794	10.00	.22	.81	3.30	80.93	.56	.40	74.47	7.27
6	10.99	450.00	.794	10.00	.22	.96	3.47	85.49	.62	.48	77.10	7.45
7	10.95	440.00	.794	10.00	.22	1.12	3.69	91.23	.70	.55	80.76	7.71
8	10.95	430.00	.794	10.00	.22	1.28	3.96	98.21	.80	.63	85.54	8.08
9	10.95	420.00	.794	10.00	.22	1.45	4.29	106.49	.94	.72	91.50	8.55
10	10.95	410.00	1.598	10.00	.22	.40	4.30	104.05	.94	.81	101.78	9.15
11	10.95	400.00	1.598	10.00	.22	.46	4.31	104.47	.95	.91	101.92	10.18
12	10.95	390.00	1.598	10.00	.22	.51	4.33	104.98	.96	1.01	102.12	10.19
13	10.75	380.00	1.598	10.00	.22	.56	4.35	105.60	.97	1.12	102.39	10.21
14	10.55	370.00	1.598	10.00	.22	.61	4.38	106.33	.98	1.22	102.75	10.24
15	10.55	360.00	1.598	10.00	.22	.66	4.41	107.15	.99	1.32	103.18	10.27
16	10.55	350.00	1.598	10.00	.22	.71	4.45	108.10	1.01	1.42	103.70	10.32
17	10.55	340.00	1.598	10.00	.22	.76	4.49	109.18	1.03	1.53	104.32	10.37
18	10.35	330.01	1.598	10.00	.22	.81	4.53	110.40	1.05	1.63	105.06	10.43
19	10.15	320.01	1.598	10.00	.22	.87	4.59	111.75	1.07	1.74	105.92	10.51
20	10.15	310.01	2.000	10.00	.22	.59	4.61	111.70	1.08	1.84	108.32	10.59
21	10.15	300.01	2.000	10.00	.22	.62	4.63	112.25	1.09	1.95	108.63	10.83
22	10.15	290.01	2.000	10.00	.22	.66	4.65	112.86	1.10	2.06	108.98	10.86
23	10.11	280.01	2.000	10.00	.22	.69	4.68	113.54	1.11	2.17	109.39	10.90
24	10.07	270.01	2.000	10.00	.22	.73	4.70	114.28	1.13	2.28	109.84	10.94
25	10.03	260.01	2.000	10.00	.22	.76	4.73	115.08	1.14	2.39	110.35	10.98
26	9.99	250.01	2.000	10.00	.22	.80	4.77	115.95	1.16	2.50	110.92	11.04
27	9.95	240.01	2.000	10.00	.22	.83	4.80	116.88	1.18	2.61	111.54	11.09
28	9.95	230.01	2.000	10.00	.22	.87	4.84	117.89	1.20	2.72	112.22	11.15
29	9.95	220.01	2.000	10.00	.22	.90	4.88	118.97	1.22	2.83	112.97	11.22
30	9.95	210.01	2.000	10.00	.22	.94	4.93	120.12	1.24	2.95	113.78	11.30
31	9.95	200.01	2.000	10.00	.22	.97	4.98	121.35	1.26	3.06	114.65	11.38

OUTFALL PIPELINE

TOTAL DISCHARGE = 3.18 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.01 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 1.80 M

1 FLOW CHARACTERISTICS FOR U(1) = 5.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.24	500.00			.35		5.00	95.28	1.27		309.31	
2	11.19	490.00	.794	10.00	.22	.62	5.05	122.43	1.30	.31	118.85	30.93
3	11.13	480.00	.794	10.00	.22	.87	5.14	125.05	1.35	.43	119.57	11.89
4	11.07	470.00	.794	10.00	.22	1.11	5.29	129.13	1.43	.55	121.21	11.96
5	11.03	460.00	.794	10.00	.22	1.35	5.50	134.87	1.54	.67	124.09	12.12
6	10.99	450.00	.794	10.00	.22	1.60	5.79	142.46	1.71	.79	128.48	12.41
7	10.95	440.00	.794	10.00	.22	1.86	6.16	152.02	1.93	.92	134.58	12.85
8	10.95	430.00	.794	10.00	.22	2.13	6.60	163.66	2.22	1.06	142.54	13.46
9	10.95	420.00	.794	10.00	.22	2.42	7.14	177.46	2.60	1.20	152.47	14.25
10	10.95	410.00	1.598	10.00	.22	.67	7.16	173.39	2.61	1.35	160.61	15.25
11	10.95	400.00	1.598	10.00	.22	.76	7.19	174.09	2.63	1.52	160.84	16.06
12	10.95	390.00	1.598	10.00	.22	.84	7.22	174.95	2.66	1.69	170.17	16.98
13	10.75	380.00	1.598	10.00	.22	.93	7.26	175.97	2.68	1.86	170.62	17.02
14	10.55	370.00	1.598	10.00	.22	1.01	7.30	177.16	2.72	2.03	171.20	17.06
15	10.55	360.00	1.598	10.00	.22	1.10	7.35	178.54	2.75	2.20	171.92	17.12
16	10.55	350.00	1.598	10.00	.22	1.18	7.41	180.12	2.80	2.37	172.78	17.19
17	10.55	340.00	1.598	10.00	.22	1.27	7.48	181.92	2.85	2.55	173.82	17.28
18	10.35	330.01	1.598	10.00	.22	1.36	7.56	183.94	2.91	2.72	175.04	17.39
19	10.15	320.01	1.598	10.00	.22	1.44	7.64	186.19	2.98	2.90	176.46	17.50
20	10.15	310.01	2.000	10.00	.22	.98	7.67	186.09	3.00	3.07	180.47	17.65
21	10.15	300.01	2.000	10.00	.22	1.04	7.71	187.02	3.03	3.25	180.98	18.05
22	10.15	290.01	2.000	10.00	.22	1.09	7.75	188.04	3.06	3.43	181.57	18.10
23	10.11	280.01	2.000	10.00	.22	1.15	7.79	189.16	3.09	3.62	182.24	18.16
24	10.07	270.01	2.000	10.00	.22	1.21	7.84	190.39	3.13	3.80	183.00	18.22
25	10.03	260.01	2.000	10.00	.22	1.27	7.89	191.72	3.17	3.98	183.85	18.30
26	9.99	250.01	2.000	10.00	.22	1.33	7.94	193.17	3.22	4.16	184.79	18.38
27	9.95	240.01	2.000	10.00	.22	1.39	8.00	194.73	3.26	4.35	185.82	18.48
28	9.95	230.01	2.000	10.00	.22	1.44	8.07	196.40	3.32	4.54	186.96	18.58
29	9.95	220.01	2.000	10.00	.22	1.50	8.14	198.20	3.38	4.72	188.20	18.70
30	9.95	210.01	2.000	10.00	.22	1.56	8.21	200.12	3.44	4.91	189.55	18.82
31	9.95	200.01	2.000	10.00	.22	1.62	8.29	202.17	3.51	5.10	191.01	18.95

OUTFALL PIPELINE

TOTAL DISCHARGE = 5.29 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.69 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 4.97 M

1 FLOW CHARACTERISTICS FOR U(1) = 6.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.24	500.00			.35		6.00	114.33	1.83		371.17	
2	11.19	490.00	.794	10.00	.22	.75	6.06	146.91	1.87	.37	142.62	37.12
3	11.13	480.00	.794	10.00	.22	1.04	6.17	150.06	1.94	.51	143.48	14.26
4	11.07	470.00	.794	10.00	.22	1.33	6.35	154.95	2.05	.66	145.45	14.35
5	11.03	460.00	.794	10.00	.22	1.62	6.60	161.84	2.22	.80	148.91	14.54
6	10.99	450.00	.794	10.00	.22	1.92	6.95	170.95	2.46	.95	154.17	14.89
7	10.95	440.00	.794	10.00	.22	2.23	7.39	182.42	2.78	1.11	161.49	15.42
8	10.95	430.00	.794	10.00	.22	2.56	7.93	196.38	3.20	1.27	171.04	16.15
9	10.95	420.00	.794	10.00	.22	2.91	8.57	212.94	3.74	1.44	182.96	17.10
10	10.95	410.00	1.598	10.00	.22	.81	8.59	208.07	3.76	1.62	203.59	18.30
11	10.95	400.00	1.598	10.00	.22	.91	8.62	208.91	3.79	1.82	203.80	20.35
12	10.95	390.00	1.598	10.00	.22	1.01	8.66	209.93	3.82	2.03	204.20	20.38
13	10.75	380.00	1.598	10.00	.22	1.11	8.71	211.15	3.86	2.23	204.74	20.42
14	10.55	370.00	1.598	10.00	.22	1.22	8.76	212.59	3.91	2.44	205.43	20.47
15	10.55	360.00	1.598	10.00	.22	1.32	8.82	214.24	3.97	2.64	206.29	20.54
16	10.55	350.00	1.598	10.00	.22	1.42	8.89	216.14	4.03	2.85	207.33	20.63
17	10.55	340.00	1.598	10.00	.22	1.52	8.97	218.29	4.10	3.06	208.57	20.73
18	10.35	330.01	1.598	10.00	.22	1.63	9.07	220.71	4.19	3.27	210.04	20.86
19	10.15	320.01	1.598	10.00	.22	1.73	9.17	223.41	4.29	3.48	211.74	21.00
20	10.15	310.01	2.000	10.00	.22	1.17	9.21	223.30	4.32	3.69	216.54	21.17
21	10.15	300.01	2.000	10.00	.22	1.24	9.25	224.41	4.36	3.90	217.16	21.65
22	10.15	290.01	2.000	10.00	.22	1.31	9.30	225.63	4.40	4.12	217.87	21.72
23	10.11	280.01	2.000	10.00	.22	1.38	9.35	226.98	4.45	4.34	218.68	21.79
24	10.07	270.01	2.000	10.00	.22	1.45	9.40	228.45	4.51	4.56	219.59	21.87
25	10.03	260.01	2.000	10.00	.22	1.52	9.46	230.05	4.57	4.78	220.60	21.96
26	9.99	250.01	2.000	10.00	.22	1.59	9.53	231.78	4.63	5.00	221.73	22.06
27	9.95	240.01	2.000	10.00	.22	1.66	9.60	233.65	4.70	5.22	222.97	22.17
28	9.95	230.01	2.000	10.00	.22	1.73	9.68	235.67	4.78	5.44	224.33	22.30
29	9.95	220.01	2.000	10.00	.22	1.80	9.76	237.82	4.86	5.67	225.82	22.43
30	9.95	210.01	2.000	10.00	.22	1.88	9.85	240.13	4.95	5.89	227.44	22.58
31	9.95	200.01	2.000	10.00	.22	1.95	9.95	242.59	5.05	6.12	229.19	22.74

OUTFALL PIPELINE

TOTAL DISCHARGE = 6.35 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.02 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 7.15 M

1 FLOW CHARACTERISTICS FOR U(1) = 7.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	11.24	500.00			.35		7.00	133.39	2.50		433.03	
2	11.19	490.00	.794	10.00	.22	.87	7.07	171.39	2.55	.43	166.39	43.30
3	11.13	480.00	.794	10.00	.22	1.21	7.20	175.07	2.64	.60	167.39	16.64
4	11.07	470.00	.794	10.00	.22	1.55	7.41	180.77	2.80	.77	169.69	16.74
5	11.03	460.00	.794	10.00	.22	1.89	7.70	188.81	3.02	.94	173.72	16.97
6	10.99	450.00	.794	10.00	.22	2.24	8.10	199.44	3.35	1.11	179.87	17.37
7	10.95	440.00	.794	10.00	.22	2.61	8.62	212.82	3.78	1.29	188.40	17.99
8	10.95	430.00	.794	10.00	.22	2.99	9.25	229.11	4.36	1.48	199.54	18.84
9	10.95	420.00	.794	10.00	.22	3.39	10.00	248.43	5.10	1.68	213.45	19.95
10	10.95	410.00	1.598	10.00	.22	.94	10.03	242.74	5.12	1.89	237.44	21.35
11	10.95	400.00	1.598	10.00	.22	1.06	10.06	243.72	5.16	2.13	237.77	23.74
12	10.95	390.00	1.598	10.00	.22	1.18	10.10	244.91	5.20	2.37	238.23	23.79
13	10.75	380.00	1.598	10.00	.22	1.30	10.16	246.34	5.26	2.60	238.86	23.92
14	10.55	370.00	1.598	10.00	.22	1.42	10.22	248.01	5.32	2.84	239.67	23.99
15	10.55	360.00	1.598	10.00	.22	1.54	10.29	249.94	5.40	3.08	240.66	23.97
16	10.55	350.00	1.598	10.00	.22	1.66	10.37	252.16	5.49	3.32	241.88	24.07
17	10.55	340.00	1.598	10.00	.22	1.78	10.47	254.66	5.59	3.57	243.33	24.19
18	10.35	330.01	1.598	10.00	.22	1.90	10.58	257.49	5.70	3.81	245.04	24.33
19	10.15	320.01	1.598	10.00	.22	2.02	10.70	260.64	5.83	4.05	247.01	24.50
20	10.15	310.01	2.000	10.00	.22	1.37	10.74	260.50	5.88	4.30	252.62	24.70
21	10.15	300.01	2.000	10.00	.22	1.45	10.79	261.80	5.93	4.55	253.35	25.26
22	10.15	290.01	2.000	10.00	.22	1.53	10.84	263.23	5.99	4.81	254.17	25.33
23	10.11	280.01	2.000	10.00	.22	1.61	10.90	264.80	6.06	5.06	255.11	25.42
24	10.07	270.01	2.000	10.00	.22	1.69	10.97	266.51	6.13	5.32	256.17	25.51
25	10.03	260.01	2.000	10.00	.22	1.77	11.04	268.38	6.21	5.57	257.36	25.62
26	9.99	250.01	2.000	10.00	.22	1.86	11.12	270.40	6.30	5.83	258.67	25.74
27	9.95	240.01	2.000	10.00	.22	1.94	11.20	272.59	6.40	6.09	260.12	25.87
28	9.95	230.01	2.000	10.00	.22	2.02	11.29	274.93	6.50	6.35	261.71	26.01
29	9.95	220.01	2.000	10.00	.22	2.11	11.39	277.45	6.61	6.61	263.45	26.17
30	9.95	210.01	2.000	10.00	.22	2.19	11.50	280.14	6.74	6.87	265.33	26.34
31	9.95	200.01	2.000	10.00	.22	2.27	11.61	283.01	6.87	7.14	267.38	26.53

OUTFALL PIPELINE

TOTAL DISCHARGE = 7.41 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.36 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 9.72 M

1 FLOW CHARACTERISTICS FOR U(1) = 8.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.24	500.00			.35		8.00	152.45	3.26		494.89	
2	11.19	490.00	.794	10.00	.22	1.00	8.08	195.88	3.33	.49	190.16	49.49
3	11.13	480.00	.794	10.00	.22	1.38	8.23	200.08	3.45	.69	191.30	19.02
4	11.07	470.00	.794	10.00	.22	1.77	8.46	206.59	3.65	.88	193.93	19.13
5	11.03	460.00	.794	10.00	.22	2.16	8.80	215.79	3.95	1.07	198.54	19.39
6	10.99	450.00	.794	10.00	.22	2.56	9.26	227.93	4.37	1.27	205.56	19.85
7	10.95	440.00	.794	10.00	.22	2.98	9.85	243.22	4.94	1.47	215.31	20.56
8	10.95	430.00	.794	10.00	.22	3.41	10.57	261.84	5.69	1.69	228.05	21.53
9	10.95	420.00	.794	10.00	.22	3.88	11.43	283.92	6.65	1.92	243.94	22.80
10	10.95	410.00	1.598	10.00	.22	1.08	11.46	277.42	6.69	2.16	271.36	24.39
11	10.95	400.00	1.598	10.00	.22	1.21	11.50	278.54	6.74	2.43	271.73	27.14
12	10.95	390.00	1.598	10.00	.22	1.35	11.55	279.90	6.80	2.70	272.26	27.17
13	10.75	380.00	1.598	10.00	.22	1.49	11.61	281.53	6.87	2.98	272.98	27.23
14	10.55	370.00	1.598	10.00	.22	1.62	11.68	283.44	6.95	3.25	273.90	27.30
15	10.55	360.00	1.598	10.00	.22	1.76	11.76	285.64	7.05	3.52	275.04	27.39
16	10.55	350.00	1.598	10.00	.22	1.90	11.86	288.17	7.16	3.80	276.43	27.50
17	10.55	340.00	1.598	10.00	.22	2.03	11.96	291.04	7.30	4.08	278.09	27.64
18	10.35	330.01	1.598	10.00	.22	2.17	12.09	294.27	7.45	4.35	280.04	27.81
19	10.15	320.01	1.598	10.00	.22	2.31	12.23	297.86	7.62	4.63	282.29	28.00
20	10.15	310.01	2.000	10.00	.22	1.57	12.28	297.71	7.68	4.92	288.71	28.23
21	10.15	300.01	2.000	10.00	.22	1.66	12.33	299.19	7.75	5.20	289.53	28.87
22	10.15	290.01	2.000	10.00	.22	1.75	12.39	300.82	7.83	5.49	290.48	28.95
23	10.11	280.01	2.000	10.00	.22	1.84	12.46	302.62	7.91	5.78	291.55	29.05
24	10.07	270.01	2.000	10.00	.22	1.94	12.54	304.58	8.01	6.08	292.76	29.16
25	10.03	260.01	2.000	10.00	.22	2.03	12.62	306.71	8.12	6.37	294.11	29.28
26	9.99	250.01	2.000	10.00	.22	2.12	12.71	309.02	8.23	6.66	295.61	29.41
27	9.95	240.01	2.000	10.00	.22	2.22	12.80	311.52	8.36	6.96	297.27	29.56
28	9.95	230.01	2.000	10.00	.22	2.31	12.91	314.20	8.49	7.26	299.09	29.73
29	9.95	220.01	2.000	10.00	.22	2.41	13.02	317.08	8.64	7.55	301.07	29.91
30	9.95	210.01	2.000	10.00	.22	2.50	13.14	320.15	8.80	7.86	303.23	30.11
31	9.95	200.01	2.000	10.00	.22	2.60	13.27	323.43	8.97	8.16	305.57	30.32

OUTFALL PIPELINE

TOTAL DISCHARGE = 8.46 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.70 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 12.70 M

BOTTOM PROFILE

DISTANCE M	DEPTH M
.00	.00
25.00	.00
35.00	1.00
40.00	2.00
50.00	3.50
62.00	5.00
75.00	6.50
90.00	8.50
100.00	9.00
120.00	9.00
125.00	9.00
150.00	9.50
175.00	10.00
200.00	11.00
210.00	11.50
225.00	12.00
250.00	12.50
275.00	13.00
300.00	13.50
325.00	13.60
350.00	14.00
375.00	14.00
400.00	14.00
450.00	14.00
510.00	14.00

MANIFOLD 5

TRACE A

LIST OF SYMBOLS

N = NO OF PORT
DEPTH(N) = DEPTH AT PORT N
DIST(N) = DISTANCE FROM SHORE
DIA(N) = DIAMETER OF MANIFOLD BETWEEN PORT N AND N-1
DL(N) = LENGTH BETWEEN PORT N AND N-1
D(N) = DIAMETER OF PORT N
V(N) = VELOCITY IN MANIFOLD BETWEEN PORT N AND N-1
U(N) = DISCHARGEVELOCITY OF PORT N
FN(N) = DENSIMETRIC FROUDE NO OF JET AT PORT N
E(N) = TOTAL HEAD AT PORT N
SQ(N) = TOTAL DISCHARGE UP TO PORT N
Q(N) = DISCHARGE OF PORT N
QL(N) = DISCHARGE LOAD PR LENGTH OF MANIFOLD
QDES = DESIGN DISCHARGE FLOW
VMIN = MINIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
VMAX = MAXIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
DENS = (SPEC.GRAV. SEAW.-SPEC.GRAV. WASTEW.)/(SPEC.GRAV. WASTEW.)
FRM = DARCY FRICTION FACTOR IN MANIFOLD
FRP = DARCY FRICTION FACTOR IN OUTFALL PIPELINE
VPIPE = UPPER LIMIT FOR VELOCITY IN OUTFALL PIPELINE AT DESIGN FLOW

INITIAL VALUES FOR THE CALCULATION OF THE MANIFOLD

QDES = 4.000 CUM/SEC
VMAX = 2.00 M/SEC
VMIN = .50 M/SEC
DIST(1) = 500.00 M
D(1) = 4.00 M/SEC
DIA(2) = .794 M
DL(2) = 10.00 M
D(2) = .23 M
DL(3) = 10.00 M
DENS = .001
VPIPE = 1.20 M/SEC
FRM = .100
FRP = .100
PORT NO K1 = 10
DIA(K1) = 1.600 M
DL(K1) = 10.00 M
D(K1) = .22 M

PORT NO K2 = 20
DIA(K2) = 2.000 M
DL(K2) = 10.00 M
D(K2) = .21 M

PORT NO K3 = 0
DIA(K3) = .000 M
DL(K3) = .00 M
D(K3) = .00 M

THE LENGTH BETWEEN THE PORTS DL(N) AND THE DIAMETER OF THE PORTS
D(N) ARE KEPT CONSTANT ALONG THE MANIFOLD AND SET EQUAL TO
RESPECTIVELY DL(3) AND D(2).
IF WANTED THE DIA(N),DL(N) AND D(N) CAN BE CHANGED FOR PORT NO
N = K TO DIA(K),DL(K) AND D(K).

1 FLOW CHARACTERISTICS FOR U(1) = 4.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	14.00	500.00			.35		4.00	76.22	.82		247.45	
2	14.00	490.00	.794	10.00	.23	.50	4.04	95.79	.83	.25	103.92	24.74
3	14.00	480.00	.794	10.00	.23	.71	4.12	97.96	.86	.35	104.50	10.39
4	14.00	470.00	.794	10.00	.23	.92	4.24	101.42	.92	.46	105.97	10.45
5	14.00	460.00	.794	10.00	.23	1.14	4.43	106.37	1.00	.56	108.67	10.60
6	14.00	450.00	.794	10.00	.23	1.35	4.69	112.96	1.12	.67	112.86	10.87
7	14.00	440.00	.794	10.00	.23	1.58	5.01	121.30	1.28	.78	118.75	11.29
8	14.00	430.00	.794	10.00	.23	1.82	5.41	131.47	1.49	.90	126.49	11.88
9	14.00	420.00	1.598	10.00	.23	.51	5.43	128.52	1.50	1.03	140.48	12.65
10	14.00	410.00	1.600	10.00	.22	.58	5.45	131.96	1.51	1.17	128.69	14.05
11	14.00	400.00	1.600	10.00	.22	.65	5.47	132.61	1.53	1.30	128.95	12.87
12	14.00	390.00	1.600	10.00	.22	.71	5.50	133.39	1.54	1.43	129.30	12.90
13	14.00	380.00	1.600	10.00	.22	.77	5.53	134.31	1.56	1.56	129.74	12.93
14	14.00	370.00	1.600	10.00	.22	.84	5.57	135.37	1.58	1.69	130.29	12.97
15	14.00	360.00	1.600	10.00	.22	.90	5.62	136.58	1.61	1.82	130.96	13.03
16	14.00	350.00	1.600	10.00	.22	.97	5.67	137.95	1.64	1.95	131.76	13.10
17	14.00	340.00	1.600	10.00	.22	1.03	5.73	139.49	1.67	2.08	132.69	13.19
18	13.84	330.00	1.600	10.00	.22	1.10	5.80	141.21	1.71	2.21	133.78	13.27
19	13.66	320.00	1.600	10.00	.22	1.17	5.87	143.11	1.76	2.35	135.02	13.38
20	13.64	310.00	2.000	10.00	.21	.79	5.90	146.40	1.77	2.48	126.13	13.50
21	13.60	300.00	2.000	10.00	.21	.83	5.92	147.18	1.79	2.61	126.56	12.61
22	13.56	290.00	2.000	10.00	.21	.87	5.96	148.03	1.81	2.73	127.04	12.66
23	13.36	280.00	2.000	10.00	.21	.91	5.99	148.97	1.83	2.86	127.57	12.70
24	13.16	270.01	2.000	10.00	.21	.95	6.03	149.97	1.85	2.99	128.16	12.76
25	12.96	260.01	2.000	10.00	.21	.99	6.07	151.06	1.88	3.12	128.81	12.82
26	12.76	250.01	2.000	10.00	.21	1.03	6.11	152.22	1.91	3.24	129.53	12.88
27	12.56	240.01	2.000	10.00	.21	1.07	6.16	153.47	1.94	3.37	130.30	12.95
28	12.36	230.01	2.000	10.00	.21	1.12	6.21	154.80	1.97	3.50	131.14	13.03
29	12.16	220.02	2.000	10.00	.21	1.16	6.27	156.21	2.00	3.64	132.05	13.11
30	11.95	210.02	2.000	10.00	.21	1.20	6.32	157.72	2.04	3.77	133.03	13.20
31	11.49	200.03	2.000	10.00	.21	1.24	6.39	159.32	2.08	3.90	134.08	13.30

OUTFALL PIPELINE

TOTAL DISCHARGE = 4.03 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.28 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 2.93 M

1

FLOW CHARACTERISTICS FOR U(1) = 1.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	14.00	500.00			.35		1.00	19.06	.05		61.86	
2	14.00	490.00	.794	10.00	.23	.13	1.01	23.95	.05	.06	25.98	6.19
3	14.00	480.00	.794	10.00	.23	.18	1.03	24.49	.05	.09	26.12	2.60
4	14.00	470.00	.794	10.00	.23	.23	1.06	25.36	.06	.11	26.49	2.61
5	14.00	460.00	.794	10.00	.23	.28	1.11	26.59	.06	.14	27.17	2.65
6	14.00	450.00	.794	10.00	.23	.34	1.17	28.24	.07	.17	28.22	2.72
7	14.00	440.00	.794	10.00	.23	.40	1.25	30.32	.08	.20	29.69	2.82
8	14.00	430.00	.794	10.00	.23	.46	1.35	32.87	.09	.23	31.62	2.97
9	14.00	420.00	1.598	10.00	.23	.13	1.36	32.13	.09	.26	35.12	3.16
10	14.00	410.00	1.600	10.00	.22	.15	1.36	32.99	.09	.29	32.17	3.51
11	14.00	400.00	1.600	10.00	.22	.16	1.37	33.15	.10	.32	32.24	3.22
12	14.00	390.00	1.600	10.00	.22	.18	1.37	33.35	.10	.36	32.32	3.23
13	14.00	380.00	1.600	10.00	.22	.19	1.38	33.58	.10	.39	32.44	3.23
14	14.00	370.00	1.600	10.00	.22	.21	1.39	33.84	.10	.42	32.57	3.24
15	14.00	360.00	1.600	10.00	.22	.23	1.40	34.14	.10	.45	32.74	3.26
16	14.00	350.00	1.600	10.00	.22	.24	1.42	34.49	.10	.49	32.94	3.27
17	14.00	340.00	1.600	10.00	.22	.26	1.43	34.87	.10	.52	33.17	3.29
18	13.94	330.00	1.600	10.00	.22	.28	1.45	35.33	.11	.55	33.47	3.32
19	13.68	320.00	1.600	10.00	.22	.29	1.47	35.83	.11	.59	33.80	3.35
20	13.64	310.00	2.000	10.00	.21	.20	1.48	36.65	.11	.62	31.58	3.38
21	13.60	300.00	2.000	10.00	.21	.21	1.48	36.86	.11	.65	31.69	3.16
22	13.56	290.00	2.000	10.00	.21	.22	1.49	37.08	.11	.68	31.92	3.17
23	13.36	280.00	2.000	10.00	.21	.23	1.50	37.34	.11	.72	31.98	3.18
24	13.16	270.01	2.000	10.00	.21	.24	1.51	37.62	.12	.75	32.15	3.20
25	12.96	260.01	2.000	10.00	.21	.25	1.52	37.92	.12	.78	32.34	3.22
26	12.76	250.01	2.000	10.00	.21	.26	1.54	38.24	.12	.81	32.55	3.23
27	12.56	240.01	2.000	10.00	.21	.27	1.55	38.58	.12	.84	32.77	3.25
28	12.36	230.01	2.000	10.00	.21	.28	1.56	38.94	.12	.88	33.00	3.28
29	12.16	220.02	2.000	10.00	.21	.29	1.58	39.32	.13	.91	33.25	3.30
30	11.83	210.02	2.000	10.00	.21	.30	1.59	39.74	.13	.94	33.54	3.33
31	11.49	200.03	2.000	10.00	.21	.31	1.61	40.19	.13	.98	33.84	3.35

OUTFALL PIPELINE

TOTAL DISCHARGE = 1.01 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .32 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = .20 M

1 FLOW CHARACTERISTICS FOR U(1) = 2.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SO(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	14.00	500.00			.35		2.00	38.11	.20		123.72	
2	14.00	490.00	.794	10.00	.23	.25	2.02	47.89	.21	.12	51.96	12.37
3	14.00	480.00	.794	10.00	.23	.35	2.06	48.98	.22	.18	52.25	5.20
4	14.00	470.00	.794	10.00	.23	.46	2.12	50.71	.23	.23	52.99	5.22
5	14.00	460.00	.794	10.00	.23	.57	2.22	53.19	.25	.28	54.33	5.30
6	14.00	450.00	.794	10.00	.23	.68	2.34	56.08	.28	.34	56.43	5.43
7	14.00	440.00	.794	10.00	.23	.79	2.51	60.65	.32	.39	59.38	5.64
8	14.00	430.00	.794	10.00	.23	.91	2.71	65.74	.37	.45	63.25	5.94
9	14.00	420.00	1.598	10.00	.23	.26	2.71	64.26	.38	.51	70.24	6.32
10	14.00	410.00	1.600	10.00	.22	.29	2.72	65.98	.38	.58	64.35	7.02
11	14.00	400.00	1.600	10.00	.22	.32	2.74	66.31	.38	.65	64.48	6.43
12	14.00	390.00	1.600	10.00	.22	.35	2.75	66.70	.39	.71	64.65	6.45
13	14.00	380.00	1.600	10.00	.22	.39	2.77	67.15	.39	.78	64.87	6.46
14	14.00	370.00	1.600	10.00	.22	.42	2.79	67.68	.40	.84	65.15	6.49
15	14.00	360.00	1.600	10.00	.22	.45	2.81	68.29	.40	.91	65.48	6.51
16	14.00	350.00	1.600	10.00	.22	.48	2.84	68.97	.41	.97	65.88	6.55
17	14.00	340.00	1.600	10.00	.22	.52	2.86	69.74	.42	1.04	66.35	6.59
18	13.84	330.00	1.600	10.00	.22	.55	2.90	70.61	.43	1.11	66.90	6.63
19	13.68	320.00	1.600	10.00	.22	.58	2.94	71.58	.44	1.17	67.53	6.69
20	13.64	310.00	2.000	10.00	.21	.39	2.95	73.22	.44	1.24	67.09	6.75
21	13.60	300.00	2.000	10.00	.21	.42	2.96	73.61	.45	1.30	67.30	6.31
22	13.56	290.00	2.000	10.00	.21	.44	2.98	74.04	.45	1.37	67.54	6.33
23	13.36	280.00	2.000	10.00	.21	.46	3.00	74.52	.46	1.43	67.92	6.35
24	13.16	270.01	2.000	10.00	.21	.48	3.02	75.04	.46	1.49	68.13	6.38
25	12.96	260.01	2.000	10.00	.21	.50	3.04	75.59	.47	1.56	68.46	6.41
26	12.76	250.01	2.000	10.00	.21	.52	3.06	76.18	.48	1.62	68.83	6.45
27	12.56	240.01	2.000	10.00	.21	.54	3.08	76.82	.48	1.69	69.23	6.48
28	12.36	230.01	2.000	10.00	.21	.56	3.11	77.50	.49	1.75	69.66	6.52
29	12.16	220.02	2.000	10.00	.21	.58	3.14	78.21	.50	1.82	70.12	6.57
30	11.95	210.02	2.000	10.00	.21	.60	3.17	78.99	.51	1.88	70.63	6.61
31	11.49	200.03	2.000	10.00	.21	.62	3.20	79.80	.52	1.95	71.17	6.66

OUTFALL PIPELINE

TOTAL DISCHARGE = 2.02 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .64 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = .74 M

1

FLOW CHARACTERISTICS FOR U(1) = 3.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	14.00	500.00			.35		3.00	57.17	.46		185.58	
2	14.00	490.00	.794	10.00	.23	.37	3.03	71.84	.47	.19	77.94	18.56
3	14.00	480.00	.794	10.00	.23	.53	3.09	73.47	.49	.26	78.37	7.79
4	14.00	470.00	.794	10.00	.23	.69	3.18	76.07	.52	.34	79.48	7.84
5	14.00	460.00	.794	10.00	.23	.85	3.32	78.78	.56	.42	81.50	7.95
6	14.00	450.00	.794	10.00	.23	1.02	3.51	84.72	.63	.50	84.65	8.15
7	14.00	440.00	.794	10.00	.23	1.19	3.76	90.97	.72	.59	88.07	8.46
8	14.00	430.00	.794	10.00	.23	1.37	4.06	98.60	.84	.68	94.87	8.91
9	14.00	420.00	1.598	10.00	.23	.38	4.07	96.39	.84	.77	105.36	9.49
10	14.00	410.00	1.600	10.00	.22	.44	4.09	98.97	.85	.88	96.52	10.54
11	14.00	400.00	1.600	10.00	.22	.48	4.10	99.46	.86	.97	96.71	9.65
12	14.00	390.00	1.600	10.00	.22	.53	4.12	100.04	.87	1.07	96.97	9.67
13	14.00	380.00	1.600	10.00	.22	.58	4.15	100.73	.88	1.17	97.31	9.70
14	14.00	370.00	1.600	10.00	.22	.63	4.18	101.53	.89	1.26	97.72	9.73
15	14.00	360.00	1.600	10.00	.22	.68	4.21	102.43	.91	1.36	98.22	9.77
16	14.00	350.00	1.600	10.00	.22	.73	4.25	103.46	.92	1.46	98.82	9.82
17	14.00	340.00	1.600	10.00	.22	.78	4.30	104.62	.94	1.56	99.52	9.88
18	13.84	330.00	1.600	10.00	.22	.83	4.35	105.91	.96	1.66	100.34	9.95
19	13.66	320.00	1.600	10.00	.22	.88	4.40	107.34	.99	1.76	101.27	10.03
20	13.64	310.00	2.000	10.00	.21	.59	4.42	109.91	1.00	1.86	94.61	10.13
21	13.60	300.00	2.000	10.00	.21	.62	4.44	110.39	1.01	1.95	94.93	9.46
22	13.56	290.00	2.000	10.00	.21	.65	4.47	111.04	1.02	2.05	95.29	9.49
23	13.36	280.00	2.000	10.00	.21	.68	4.49	111.74	1.03	2.15	95.69	9.53
24	13.16	270.01	2.000	10.00	.21	.71	4.52	112.50	1.04	2.24	96.14	9.57
25	12.96	260.01	2.000	10.00	.21	.74	4.55	113.32	1.06	2.34	96.63	9.61
26	12.76	250.01	2.000	10.00	.21	.78	4.59	114.20	1.07	2.43	97.17	9.66
27	12.56	240.01	2.000	10.00	.21	.81	4.62	115.13	1.09	2.53	97.76	9.72
28	12.36	230.01	2.000	10.00	.21	.84	4.66	116.14	1.11	2.63	98.39	9.78
29	12.16	220.02	2.000	10.00	.21	.87	4.70	117.20	1.13	2.73	99.07	9.84
30	11.93	210.02	2.000	10.00	.21	.90	4.75	118.34	1.15	2.83	99.81	9.91
31	11.49	200.03	2.000	10.00	.21	.93	4.79	119.54	1.17	2.93	100.61	9.98

OUTFALL PIPELINE

TOTAL DISCHARGE = 3.03 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .96 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 1.66 M

1 FLOW CHARACTERISTICS FOR U(1) = 5.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	14.00	500.00			.35		5.00	95.28	1.27		309.31	
2	14.00	490.00	.794	10.00	.23	.62	5.05	119.73	1.30	.31	129.90	30.93
3	14.00	480.00	.794	10.00	.23	.89	5.15	122.45	1.35	.44	130.62	12.99
4	14.00	470.00	.794	10.00	.23	1.15	5.31	126.78	1.43	.57	132.46	13.06
5	14.00	460.00	.794	10.00	.23	1.42	5.54	132.96	1.56	.70	135.84	13.25
6	14.00	450.00	.794	10.00	.23	1.69	5.86	141.20	1.75	.84	141.08	13.59
7	14.00	440.00	.794	10.00	.23	1.98	6.26	151.62	2.00	.98	148.44	14.11
8	14.00	430.00	.794	10.00	.23	2.28	6.77	164.34	2.33	1.13	158.12	14.84
9	14.00	420.00	1.588	10.00	.23	.64	6.79	160.65	2.35	1.29	175.59	15.81
10	14.00	410.00	1.600	10.00	.22	.73	6.81	164.94	2.36	1.46	160.86	17.56
11	14.00	400.00	1.600	10.00	.22	.81	6.84	165.76	2.38	1.62	161.19	16.00
12	14.00	390.00	1.600	10.00	.22	.89	6.87	166.74	2.41	1.78	161.62	16.12
13	14.00	380.00	1.600	10.00	.22	.97	6.92	167.88	2.44	1.95	162.18	16.16
14	14.00	370.00	1.600	10.00	.22	1.05	6.97	169.21	2.47	2.11	162.97	16.22
15	14.00	360.00	1.600	10.00	.22	1.13	7.02	170.72	2.51	2.27	163.70	16.20
16	14.00	350.00	1.600	10.00	.22	1.21	7.09	172.44	2.56	2.43	164.70	16.37
17	14.00	340.00	1.600	10.00	.22	1.29	7.16	174.36	2.61	2.60	165.97	16.47
18	13.84	330.00	1.600	10.00	.22	1.38	7.24	176.51	2.67	2.76	167.22	16.59
19	13.68	320.00	1.600	10.00	.22	1.46	7.34	178.89	2.74	2.93	168.77	16.72
20	13.64	310.00	2.000	10.00	.21	.99	7.37	182.89	2.77	3.10	157.66	16.88
21	13.60	300.00	2.000	10.00	.21	1.04	7.41	183.97	2.79	3.26	158.19	15.77
22	13.56	290.00	2.000	10.00	.21	1.09	7.45	185.03	2.83	3.42	158.79	15.82
23	13.36	280.00	2.000	10.00	.21	1.14	7.49	186.20	2.86	3.57	158.45	15.88
24	13.16	270.01	2.000	10.00	.21	1.19	7.54	187.45	2.89	3.73	160.19	15.95
25	12.96	260.01	2.000	10.00	.21	1.24	7.59	188.80	2.93	3.89	161.00	16.02
26	12.76	250.01	2.000	10.00	.21	1.29	7.64	190.26	2.98	4.06	161.89	16.10
27	12.56	240.01	2.000	10.00	.21	1.34	7.70	191.81	3.02	4.22	162.85	16.19
28	12.36	230.01	2.000	10.00	.21	1.40	7.76	193.47	3.07	4.38	163.90	16.29
29	12.16	220.02	2.000	10.00	.21	1.45	7.83	195.23	3.13	4.54	165.03	16.39
30	11.85	210.02	2.000	10.00	.21	1.50	7.90	197.11	3.18	4.71	166.25	16.50
31	11.49	200.03	2.000	10.00	.21	1.55	7.98	199.10	3.25	4.88	167.56	16.62

OUTFALL PIPELINE

TOTAL DISCHARGE = 5.04 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.61 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 4.58 M

1 FLOW CHARACTERISTICS FOR U(1) = 6.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M-SEC
1	14.00	500.00			.35		6.00	114.33	1.83		371.17	
2	14.00	490.00	.794	10.00	.23	.75	6.06	143.68	1.87	.37	155.88	37.12
3	14.00	480.00	.794	10.00	.23	1.06	6.18	146.94	1.94	.53	156.75	15.59
4	14.00	470.00	.794	10.00	.23	1.38	6.37	152.13	2.07	.68	158.96	15.67
5	14.00	460.00	.794	10.00	.23	1.70	6.65	159.56	2.25	.84	163.00	15.90
6	14.00	450.00	.794	10.00	.23	2.03	7.03	169.44	2.52	1.01	169.29	16.30
7	14.00	440.00	.794	10.00	.23	2.37	7.52	181.94	2.88	1.18	178.13	16.83
8	14.00	430.00	.794	10.00	.23	2.73	8.12	197.21	3.36	1.35	189.74	17.81
9	14.00	420.00	1.588	10.00	.23	.77	8.14	198.78	3.38	1.54	210.71	18.97
10	14.00	410.00	1.600	10.00	.22	.87	8.17	199.93	3.40	1.75	193.04	21.07
11	14.00	400.00	1.600	10.00	.22	.97	8.21	199.92	3.43	1.95	193.43	19.30
12	14.00	390.00	1.600	10.00	.22	1.06	8.25	200.09	3.47	2.14	193.95	19.34
13	14.00	380.00	1.600	10.00	.22	1.16	8.30	201.46	3.51	2.33	194.61	19.39
14	14.00	370.00	1.600	10.00	.22	1.26	8.36	203.05	3.56	2.53	195.44	19.46
15	14.00	360.00	1.600	10.00	.22	1.36	8.43	204.87	3.62	2.72	196.44	19.54
16	14.00	350.00	1.600	10.00	.22	1.45	8.51	206.92	3.69	2.92	197.64	19.64
17	14.00	340.00	1.600	10.00	.22	1.55	8.59	209.23	3.76	3.12	199.04	19.76
18	13.84	330.00	1.600	10.00	.22	1.65	8.69	211.81	3.85	3.32	200.66	19.90
19	13.68	320.00	1.600	10.00	.22	1.75	8.80	214.66	3.95	3.52	202.52	20.07
20	13.64	310.00	2.000	10.00	.21	1.18	8.84	219.58	3.99	3.72	189.19	20.25
21	13.60	300.00	2.000	10.00	.21	1.25	8.89	220.76	4.02	3.91	189.92	18.93
22	13.56	290.00	2.000	10.00	.21	1.31	8.93	222.03	4.07	4.10	190.54	18.98
23	13.36	280.00	2.000	10.00	.21	1.37	8.99	223.43	4.12	4.29	191.34	19.05
24	13.16	270.01	2.000	10.00	.21	1.43	9.04	224.93	4.17	4.48	192.22	19.13
25	12.96	260.01	2.000	10.00	.21	1.49	9.10	226.55	4.22	4.67	193.19	19.22
26	12.76	250.01	2.000	10.00	.21	1.55	9.17	228.29	4.29	4.87	194.25	19.32
27	12.56	240.01	2.000	10.00	.21	1.61	9.24	230.15	4.35	5.06	195.41	19.43
28	12.36	230.01	2.000	10.00	.21	1.67	9.32	232.14	4.42	5.26	196.66	19.54
29	12.16	220.02	2.000	10.00	.21	1.74	9.40	234.26	4.50	5.45	198.02	19.67
30	11.85	210.02	2.000	10.00	.21	1.80	9.48	236.51	4.58	5.65	199.48	19.80
31	11.49	200.03	2.000	10.00	.21	1.86	9.57	238.90	4.67	5.85	201.04	19.95

OUTFALL PIPELINE

TOTAL DISCHARGE = 6.05 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.93 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 6.58 M

1 FLOW CHARACTERISTICS FOR U(1) = 7.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M*SEC
1	14.00	500.00			.35		7.00	133.39	2.50		433.03	
2	14.00	490.00	.794	10.00	.23	.87	7.07	167.62	2.55	.43	181.86	43.30
3	14.00	480.00	.794	10.00	.23	1.24	7.20	171.44	2.65	.61	182.97	18.10
4	14.00	470.00	.794	10.00	.23	1.61	7.43	177.49	2.81	.80	185.45	18.29
5	14.00	460.00	.794	10.00	.23	1.99	7.76	186.15	3.07	.98	190.17	18.55
6	14.00	450.00	.794	10.00	.23	2.37	8.20	197.68	3.43	1.17	197.51	19.02
7	14.00	440.00	.794	10.00	.23	2.77	8.77	212.27	3.92	1.37	207.92	19.75
8	14.00	430.00	.794	10.00	.23	3.19	9.47	230.07	4.57	1.58	221.37	20.79
9	14.00	420.00	1.598	10.00	.23	.90	9.50	224.91	4.60	1.80	245.83	22.14
10	14.00	410.00	1.600	10.00	.22	1.02	9.53	230.92	4.63	2.05	225.21	24.58
11	14.00	400.00	1.600	10.00	.22	1.13	9.57	232.07	4.67	2.27	225.66	22.52
12	14.00	390.00	1.600	10.00	.22	1.24	9.62	233.44	4.72	2.50	226.27	22.57
13	14.00	380.00	1.600	10.00	.22	1.36	9.68	235.04	4.78	2.72	227.05	22.63
14	14.00	370.00	1.600	10.00	.22	1.47	9.75	236.89	4.85	2.95	228.01	22.70
15	14.00	360.00	1.600	10.00	.22	1.58	9.83	239.01	4.93	3.18	229.18	22.80
16	14.00	350.00	1.600	10.00	.22	1.70	9.92	241.41	5.02	3.41	230.58	22.92
17	14.00	340.00	1.600	10.00	.22	1.81	10.03	244.11	5.12	3.64	232.21	23.06
18	13.84	330.00	1.600	10.00	.22	1.93	10.14	247.11	5.24	3.87	234.11	23.22
19	13.68	320.00	1.600	10.00	.22	2.04	10.27	250.43	5.38	4.10	236.27	23.41
20	13.64	310.00	2.000	10.00	.21	1.38	10.32	256.18	5.42	4.34	220.72	23.63
21	13.60	300.00	2.000	10.00	.21	1.45	10.37	257.54	5.48	4.56	221.46	22.07
22	13.56	290.00	2.000	10.00	.21	1.52	10.42	259.04	5.54	4.78	222.29	22.15
23	13.36	280.00	2.000	10.00	.21	1.59	10.48	260.66	5.60	5.00	223.22	22.23
24	13.16	270.01	2.000	10.00	.21	1.67	10.55	262.41	5.67	5.23	224.25	22.32
25	12.96	260.01	2.000	10.00	.21	1.74	10.62	264.30	5.75	5.45	225.38	22.43
26	12.76	250.01	2.000	10.00	.21	1.81	10.70	266.33	5.83	5.68	226.62	22.54
27	12.56	240.01	2.000	10.00	.21	1.88	10.78	268.50	5.92	5.90	227.97	22.66
28	12.36	230.01	2.000	10.00	.21	1.95	10.87	270.82	6.02	6.13	229.43	22.80
29	12.16	220.02	2.000	10.00	.21	2.03	10.96	273.29	6.13	6.36	231.00	22.94
30	11.83	210.02	2.000	10.00	.21	2.10	11.06	275.91	6.24	6.59	232.71	23.10
31	11.49	200.03	2.000	10.00	.21	2.17	11.17	278.69	6.36	6.83	234.53	23.27

OUTFALL PIPELINE

TOTAL DISCHARGE = 7.06 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.25 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 8.96 M

1 FLOW CHARACTERISTICS FOR U(1) = 8.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	14.00	500.00			.35		8.00	152.45	3.26		494.89	
2	14.00	490.00	.794	10.00	.23	1.00	8.08	191.57	3.33	.49	207.84	49.49
3	14.00	480.00	.794	10.00	.23	1.42	8.23	195.93	3.46	.70	208.00	20.79
4	14.00	470.00	.794	10.00	.23	1.84	8.49	202.85	3.67	.91	211.94	20.99
5	14.00	460.00	.794	10.00	.23	2.27	8.86	212.74	4.00	1.12	217.34	21.19
6	14.00	450.00	.794	10.00	.23	2.71	9.37	225.91	4.48	1.34	225.72	21.73
7	14.00	440.00	.794	10.00	.23	3.17	10.02	242.59	5.12	1.57	237.51	22.57
8	14.00	430.00	.794	10.00	.23	3.65	10.82	262.94	5.97	1.80	252.99	23.75
9	14.00	420.00	1.598	10.00	.23	1.03	10.86	257.04	6.01	2.06	280.95	25.30
10	14.00	410.00	1.600	10.00	.22	1.16	10.89	263.91	6.05	2.34	257.38	28.10
11	14.00	400.00	1.600	10.00	.22	1.29	10.94	265.22	6.10	2.60	257.30	25.74
12	14.00	390.00	1.600	10.00	.22	1.42	11.00	266.79	6.17	2.85	258.60	25.79
13	14.00	380.00	1.600	10.00	.22	1.55	11.07	268.62	6.24	3.11	259.48	25.86
14	14.00	370.00	1.600	10.00	.22	1.68	11.15	270.73	6.33	3.37	260.59	25.95
15	14.00	360.00	1.600	10.00	.22	1.81	11.24	273.16	6.44	3.63	261.93	26.06
16	14.00	350.00	1.600	10.00	.22	1.94	11.34	275.90	6.56	3.89	263.52	26.19
17	14.00	340.00	1.600	10.00	.22	2.07	11.46	278.98	6.69	4.16	265.39	26.35
18	13.84	330.00	1.600	10.00	.22	2.20	11.59	282.41	6.85	4.43	267.55	26.54
19	13.68	320.00	1.600	10.00	.22	2.33	11.74	286.21	7.02	4.69	270.02	26.76
20	13.64	310.00	2.000	10.00	.21	1.58	11.79	292.77	7.08	4.96	252.24	27.00
21	13.60	300.00	2.000	10.00	.21	1.66	11.85	294.33	7.15	5.21	253.09	25.22
22	13.56	290.00	2.000	10.00	.21	1.74	11.91	296.04	7.23	5.47	254.05	25.31
23	13.36	280.00	2.000	10.00	.21	1.82	11.98	297.89	7.32	5.72	255.11	25.40
24	13.16	270.01	2.000	10.00	.21	1.90	12.06	299.90	7.41	5.98	256.28	25.51
25	12.96	260.01	2.000	10.00	.21	1.98	12.14	302.05	7.51	6.23	257.57	25.63
26	12.76	250.01	2.000	10.00	.21	2.07	12.23	304.37	7.62	6.49	258.99	25.76
27	12.56	240.01	2.000	10.00	.21	2.15	12.32	306.85	7.74	6.75	260.52	25.90
28	12.36	230.01	2.000	10.00	.21	2.23	12.42	309.50	7.86	7.01	262.19	26.05
29	12.16	220.02	2.000	10.00	.21	2.32	12.53	312.32	8.00	7.27	264.00	26.22
30	11.96	210.02	2.000	10.00	.21	2.40	12.64	315.32	8.15	7.53	265.94	26.40
31	11.49	200.03	2.000	10.00	.21	2.48	12.77	318.49	8.31	7.80	268.02	26.59

OUTFALL PIPELINE

TOTAL DISCHARGE = 8.07 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.57 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.64 M
TOTAL HEAD AT SHORE = 11.69 M

BOTTOM PROFILE

DISTANCE M	DEPTH M
.00	.00
25.00	.00
40.00	1.00
50.00	3.00
60.00	4.50
65.00	5.00
75.00	6.50
90.00	7.00
100.00	8.50
125.00	9.00
150.00	9.10
175.00	9.50
200.00	9.80
225.00	10.20
250.00	10.50
275.00	10.50
300.00	10.50
325.00	10.50
350.00	10.80
375.00	10.80
400.00	11.00
425.00	11.00
450.00	11.00
475.00	11.50
510.00	11.60

MANIFOLD 5
TRACE B

LIST OF SYMBOLS

N = NO OF PORT
DEPTH(N) = DEPTH AT PORT N
DIST(N) = DISTANCE FROM SHORE
DIA(N) = DIAMETER OF MANIFOLD BETWEEN PORT N AND N-1
DL(N) = LENGTH BETWEEN PORT N AND N-1
D(N) = DIAMETER OF PORT N
V(N) = VELOCITY IN MANIFOLD BETWEEN PORT N AND N-1
U(N) = DISCHARGEVELOCITY OF PORT N
FN(N) = DENSIMETRIC FROUDE NO OF JET AT PORT N
E(N) = TOTAL HEAD AT PORT N
SQ(N) = TOTAL DISCHARGE UP TO PORT N
Q(N) = DISCHARGE OF PORT N
QL(N) = DISCHARGE LOAD PR LENGTH OF MANIFOLD
QDES = DESIGN DISCHARGE FLOW
VMIN = MINIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
VMAX = MAXIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
DENS = (SPEC.GRAV. SEAW.-SPEC.GRAV. WASTEW.)/(SPEC.GRAV. WASTEW.)
FRM = DARCY FRICTION FACTOR IN MANIFOLD
FRP = DARCY FRICTION FACTOR IN OUTFALL PIPELINE
VPIPE = UPPER LIMIT FOR VELOCITY IN OUTFALL PIPELINE AT DESIGN FLOW

INITIAL VALUES FOR THE CALCULATION OF THE MANIFOLD

QDES = 4.000 CUM/SEC
VMAX = 2.00 M/SEC
VMIN = .50 M/SEC
DIST(1) = 500.00 M
Q(1) = 4.00 M/SEC
DIA(2) = .794 M
DL(2) = 10.00 M
D(2) = .23 M
DL(3) = 10.00 M
DENS = .001
VPIPE = 1.20 M/SEC
FRM = .100
FRP = .100
PORT NO K1 = 10
DIA(K1) = 1.600 M
DL(K1) = 10.00 M
D(K1) = .22 M

PORT NO K2 = 20
DIA(K2) = 2.000 M
DL(K2) = 10.00 M
D(K2) = .21 M

PORT NO K3 = 0
DIA(K3) = .000 M
DL(K3) = .00 M
D(K3) = .00 M

THE LENGTH BETWEEN THE PORTS DL(N) AND THE DIAMETER OF THE PORTS
D(N) ARE KEPT CONSTANT ALONG THE MANIFOLD AND SET EQUAL TO
RESPECTIVELY DL(3) AND D(2).
IF WANTED THE DIA(N),DL(N) AND D(N) CAN BE CHANGED FOR PORT NO
N = K TO DIA(K),DL(K) AND D(K).

1 FLOW CHARACTERISTICS FOR U(1) = 4.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SO(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M/SEC
1	11.57	500.00			.35		4.00	76.22	.82		247.45	
2	11.54	490.00	.794	10.00	.23	.50	4.04	95.79	.83	.25	103.92	24.74
3	11.51	480.00	.794	10.00	.23	.71	4.12	97.97	.86	.35	104.50	10.39
4	11.49	470.00	.794	10.00	.23	.92	4.25	101.43	.92	.46	105.98	10.45
5	11.29	460.00	.794	10.00	.23	1.14	4.43	106.39	1.00	.56	108.69	10.60
6	11.09	450.00	.794	10.00	.23	1.35	4.69	112.98	1.12	.67	112.89	10.87
7	10.89	440.01	.794	10.00	.23	1.58	5.01	121.33	1.28	.78	118.79	11.29
8	10.89	430.01	.794	10.00	.23	1.82	5.41	131.50	1.49	.90	126.53	11.88
9	10.89	420.01	1.598	10.00	.23	.51	5.43	128.55	1.50	1.03	140.51	12.65
10	10.89	410.01	1.600	10.00	.22	.58	5.45	131.99	1.51	1.17	128.72	14.05
11	10.89	400.01	1.600	10.00	.22	.65	5.47	132.65	1.53	1.30	128.98	12.87
12	10.89	390.01	1.600	10.00	.22	.71	5.50	133.43	1.54	1.43	129.33	12.90
13	10.81	380.01	1.600	10.00	.22	.77	5.54	134.35	1.56	1.56	129.78	12.93
14	10.73	370.01	1.600	10.00	.22	.84	5.57	135.41	1.58	1.69	130.33	12.99
15	10.73	360.01	1.600	10.00	.22	.90	5.62	136.62	1.61	1.82	131.00	13.03
16	10.73	350.01	1.600	10.00	.22	.97	5.67	137.99	1.64	1.95	131.80	13.10
17	10.73	340.01	1.600	10.00	.22	1.03	5.73	139.53	1.67	2.08	132.73	13.19
18	10.61	330.01	1.600	10.00	.22	1.10	5.80	141.25	1.71	2.21	133.82	13.27
19	10.49	320.01	1.600	10.00	.22	1.17	5.87	143.15	1.76	2.35	135.06	13.39
20	10.49	310.01	2.000	10.00	.21	.79	5.90	146.43	1.77	2.48	126.16	13.51
21	10.49	300.01	2.000	10.00	.21	.83	5.93	147.22	1.79	2.61	126.59	12.62
22	10.49	290.01	2.000	10.00	.21	.87	5.96	148.07	1.81	2.73	127.07	12.66
23	10.49	280.01	2.000	10.00	.21	.91	5.99	148.99	1.83	2.86	127.59	12.71
24	10.49	270.01	2.000	10.00	.21	.95	6.03	149.99	1.85	2.99	128.18	12.76
25	10.49	260.01	2.000	10.00	.21	.99	6.07	151.07	1.88	3.12	128.82	12.82
26	10.49	250.01	2.000	10.00	.21	1.03	6.11	152.23	1.91	3.25	129.53	12.88
27	10.49	240.01	2.000	10.00	.21	1.07	6.16	153.46	1.94	3.37	130.30	12.95
28	10.37	230.01	2.000	10.00	.21	1.12	6.21	154.79	1.97	3.51	131.13	13.03
29	10.25	220.01	2.000	10.00	.21	1.16	6.27	156.20	2.00	3.64	132.04	13.11
30	10.09	210.01	2.000	10.00	.21	1.20	6.32	157.71	2.04	3.77	133.01	13.20
31	9.93	200.01	2.000	10.00	.21	1.24	6.38	159.30	2.08	3.90	134.06	13.30

OUTFALL PIPELINE

TOTAL DISCHARGE = 4.04 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.29 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 2.93 M

1 FLOW CHARACTERISTICS FOR U(1) = 1.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	11.57	500.00			.35		1.00	19.06	.05		61.86	
2	11.54	490.00	.794	10.00	.23	.13	1.01	23.95	.05	.06	25.09	6.19
3	11.51	480.00	.794	10.00	.23	.18	1.03	24.50	.05	.09	26.14	2.60
4	11.49	470.00	.794	10.00	.23	.23	1.06	25.37	.06	.11	26.51	2.61
5	11.29	460.00	.794	10.00	.23	.28	1.11	26.65	.06	.14	27.24	2.65
6	11.09	450.00	.794	10.00	.23	.34	1.18	28.34	.07	.17	28.33	2.72
7	10.89	440.01	.794	10.00	.23	.40	1.26	30.46	.08	.20	29.84	2.83
8	10.89	430.01	.794	10.00	.23	.46	1.36	33.00	.09	.23	31.77	2.98
9	10.89	420.01	1.598	10.00	.23	.13	1.36	32.26	.09	.26	35.26	3.18
10	10.89	410.01	1.600	10.00	.22	.15	1.37	33.12	.10	.29	32.31	3.53
11	10.89	400.01	1.600	10.00	.22	.16	1.37	33.29	.10	.33	32.37	3.23
12	10.89	390.01	1.600	10.00	.22	.18	1.38	33.48	.10	.36	32.46	3.24
13	10.81	380.01	1.600	10.00	.22	.19	1.39	33.73	.10	.39	32.58	3.25
14	10.73	370.01	1.600	10.00	.22	.21	1.40	34.00	.10	.42	32.73	3.26
15	10.73	360.01	1.600	10.00	.22	.23	1.41	34.31	.10	.46	32.90	3.27
16	10.73	350.01	1.600	10.00	.22	.24	1.42	34.65	.10	.49	33.10	3.29
17	10.73	340.01	1.600	10.00	.22	.26	1.44	35.04	.11	.52	33.33	3.31
18	10.61	330.01	1.600	10.00	.22	.28	1.46	35.49	.11	.55	33.62	3.33
19	10.49	320.01	1.600	10.00	.22	.29	1.48	35.98	.11	.59	33.95	3.36
20	10.49	310.01	2.000	10.00	.21	.20	1.48	36.81	.11	.62	31.71	3.40
21	10.49	300.01	2.000	10.00	.21	.21	1.49	37.00	.11	.65	31.92	3.17
22	10.49	290.01	2.000	10.00	.21	.22	1.50	37.21	.11	.69	31.94	3.19
23	10.49	280.01	2.000	10.00	.21	.23	1.51	37.45	.12	.72	32.07	3.19
24	10.49	270.01	2.000	10.00	.21	.24	1.52	37.70	.12	.75	32.22	3.21
25	10.49	260.01	2.000	10.00	.21	.25	1.53	37.97	.12	.78	32.38	3.22
26	10.49	250.01	2.000	10.00	.21	.26	1.54	38.26	.12	.81	32.56	3.24
27	10.49	240.01	2.000	10.00	.21	.27	1.55	38.57	.12	.85	32.75	3.26
28	10.37	230.01	2.000	10.00	.21	.28	1.56	38.92	.12	.88	32.97	3.27
29	10.25	220.01	2.000	10.00	.21	.29	1.58	39.29	.13	.91	33.22	3.30
30	10.09	210.01	2.000	10.00	.21	.30	1.59	39.69	.13	.95	33.48	3.32
31	9.93	200.01	2.000	10.00	.21	.31	1.61	40.11	.13	.98	33.76	3.35

OUTFALL PIPELINE

TOTAL DISCHARGE = 1.01 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .32 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = .19 M

1 FLOW CHARACTERISTICS FOR U(1) = 2.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	11.57	500.00			.35		2.00	38.11	.20		123.72	
2	11.54	490.00	.794	10.00	.23	.25	2.02	47.90	.21	.12	51.96	12.37
3	11.51	480.00	.794	10.00	.23	.36	2.06	48.99	.22	.18	52.26	5.20
4	11.49	470.00	.794	10.00	.23	.46	2.12	50.72	.23	.23	53.00	5.23
5	11.29	460.00	.794	10.00	.23	.57	2.22	53.22	.25	.28	54.37	5.30
6	11.09	450.00	.794	10.00	.23	.68	2.34	56.53	.28	.34	56.49	5.44
7	10.89	440.01	.794	10.00	.23	.79	2.51	60.71	.32	.39	59.45	5.65
8	10.89	430.01	.794	10.00	.23	.91	2.71	65.80	.37	.45	63.32	5.95
9	10.89	420.01	1.598	10.00	.23	.26	2.72	64.33	.38	.51	70.31	6.33
10	10.89	410.01	1.600	10.00	.22	.29	2.73	66.04	.38	.58	64.41	7.03
11	10.89	400.01	1.600	10.00	.22	.32	2.74	66.37	.38	.65	64.54	6.44
12	10.89	390.01	1.600	10.00	.22	.36	2.75	66.76	.39	.71	64.72	6.45
13	10.81	380.01	1.600	10.00	.22	.39	2.77	67.23	.39	.78	64.94	6.47
14	10.73	370.01	1.600	10.00	.22	.42	2.79	67.76	.40	.84	65.23	6.49
15	10.73	360.01	1.600	10.00	.22	.45	2.81	68.37	.40	.91	65.56	6.52
16	10.73	350.01	1.600	10.00	.22	.48	2.84	69.06	.41	.97	65.96	6.56
17	10.73	340.01	1.600	10.00	.22	.52	2.87	69.83	.42	1.04	66.43	6.60
18	10.61	330.01	1.600	10.00	.22	.55	2.90	70.69	.43	1.11	66.98	6.64
19	10.49	320.01	1.600	10.00	.22	.58	2.94	71.65	.44	1.17	67.60	6.70
20	10.49	310.01	2.000	10.00	.21	.40	2.95	73.30	.44	1.24	68.15	6.76
21	10.49	300.01	2.000	10.00	.21	.42	2.97	73.69	.45	1.30	68.36	6.32
22	10.49	290.01	2.000	10.00	.21	.44	2.98	74.11	.45	1.37	68.60	6.34
23	10.49	280.01	2.000	10.00	.21	.46	3.00	74.58	.46	1.43	68.87	6.36
24	10.49	270.01	2.000	10.00	.21	.48	3.02	75.08	.46	1.50	69.16	6.39
25	10.49	260.01	2.000	10.00	.21	.50	3.04	75.61	.47	1.56	69.48	6.42
26	10.49	250.01	2.000	10.00	.21	.52	3.06	76.19	.48	1.62	69.83	6.45
27	10.49	240.01	2.000	10.00	.21	.54	3.08	76.81	.48	1.69	65.22	6.48
28	10.37	230.01	2.000	10.00	.21	.56	3.11	77.48	.49	1.75	65.64	6.52
29	10.25	220.01	2.000	10.00	.21	.58	3.14	78.20	.50	1.82	66.10	6.56
30	10.09	210.01	2.000	10.00	.21	.60	3.17	78.96	.51	1.89	66.60	6.61
31	9.93	200.01	2.000	10.00	.21	.62	3.20	79.76	.52	1.95	67.13	6.66

OUTFALL PIPELINE

TOTAL DISCHARGE = 2.02 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .64 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = .74 M

1 FLOW CHARACTERISTICS FOR U(1) = 3.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.35		3.00	57.17	.46		185.58	
2	11.54	490.00	.794	10.00	.23	.37	3.03	71.84	.47	.19	77.94	18.56
3	11.51	480.00	.794	10.00	.23	.53	3.09	73.48	.49	.26	78.38	7.79
4	11.49	470.00	.794	10.00	.23	.69	3.18	76.07	.52	.34	79.49	7.84
5	11.29	460.00	.794	10.00	.23	.85	3.32	79.80	.56	.42	81.53	7.95
6	11.09	450.00	.794	10.00	.23	1.02	3.52	84.75	.63	.50	84.68	8.15
7	10.89	440.01	.794	10.00	.23	1.19	3.76	91.02	.72	.59	88.12	8.47
8	10.89	430.01	.794	10.00	.23	1.37	4.06	98.65	.84	.68	94.92	8.91
9	10.89	420.01	1.598	10.00	.23	.38	4.07	96.43	.85	.77	105.41	9.49
10	10.89	410.01	1.600	10.00	.22	.44	4.09	99.01	.85	.88	96.56	10.54
11	10.89	400.01	1.600	10.00	.22	.48	4.11	99.50	.86	.97	96.76	9.66
12	10.89	390.01	1.600	10.00	.22	.53	4.13	100.09	.87	1.07	97.02	9.68
13	10.81	380.01	1.600	10.00	.22	.58	4.15	100.78	.88	1.17	97.36	9.70
14	10.73	370.01	1.600	10.00	.22	.63	4.18	101.58	.89	1.26	97.77	9.74
15	10.73	360.01	1.600	10.00	.22	.68	4.22	102.49	.91	1.36	98.28	9.78
16	10.73	350.01	1.600	10.00	.22	.73	4.26	103.52	.92	1.46	98.87	9.83
17	10.73	340.01	1.600	10.00	.22	.78	4.30	104.67	.94	1.56	99.57	9.89
18	10.61	330.01	1.600	10.00	.22	.83	4.35	105.96	.96	1.66	100.39	9.96
19	10.49	320.01	1.600	10.00	.22	.88	4.40	107.39	.99	1.76	101.32	10.04
20	10.49	310.01	2.000	10.00	.21	.59	4.42	109.86	1.00	1.86	94.65	10.13
21	10.49	300.01	2.000	10.00	.21	.62	4.45	110.44	1.01	1.96	94.97	9.47
22	10.49	290.01	2.000	10.00	.21	.65	4.47	111.08	1.02	2.05	95.33	9.50
23	10.49	280.01	2.000	10.00	.21	.68	4.50	111.78	1.03	2.15	95.72	9.53
24	10.49	270.01	2.000	10.00	.21	.71	4.52	112.53	1.04	2.24	96.16	9.57
25	10.49	260.01	2.000	10.00	.21	.74	4.55	113.33	1.06	2.34	96.64	9.62
26	10.49	250.01	2.000	10.00	.21	.78	4.59	114.20	1.07	2.43	97.17	9.66
27	10.49	240.01	2.000	10.00	.21	.81	4.62	115.13	1.09	2.53	97.75	9.72
28	10.37	230.01	2.000	10.00	.21	.84	4.66	116.13	1.11	2.63	98.38	9.77
29	10.25	220.01	2.000	10.00	.21	.87	4.70	117.19	1.13	2.73	99.06	9.84
30	10.09	210.01	2.000	10.00	.21	.90	4.74	118.32	1.15	2.83	99.79	9.91
31	9.93	200.01	2.000	10.00	.21	.93	4.79	119.52	1.17	2.93	100.58	9.99

OUTFALL PIPELINE

TOTAL DISCHARGE = 3.03 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .96 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 1.65 M

1 FLOW CHARACTERISTICS FOR U(1) = 5.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.35		5.00	95.28	1.27		309.31	
2	11.54	490.00	.794	10.00	.23	.62	5.05	119.73	1.30	.31	120.90	30.93
3	11.51	480.00	.794	10.00	.23	.89	5.15	122.46	1.35	.44	130.62	12.99
4	11.49	470.00	.794	10.00	.23	1.15	5.31	126.78	1.44	.57	132.47	13.06
5	11.29	460.00	.794	10.00	.23	1.42	5.54	132.97	1.56	.70	135.95	13.25
6	11.09	450.00	.794	10.00	.23	1.69	5.86	141.22	1.75	.84	141.10	13.59
7	10.89	440.01	.794	10.00	.23	1.98	6.26	151.65	2.00	.98	148.47	14.11
8	10.89	430.01	.794	10.00	.23	2.28	6.77	164.37	2.33	1.13	158.15	14.85
9	10.89	420.01	1.598	10.00	.23	.64	6.79	160.68	2.35	1.29	175.62	15.81
10	10.89	410.01	1.600	10.00	.22	.73	6.81	164.97	2.36	1.46	160.99	17.56
11	10.89	400.01	1.600	10.00	.22	.81	6.84	165.79	2.38	1.62	161.22	16.09
12	10.89	390.01	1.600	10.00	.22	.89	6.88	166.77	2.41	1.78	161.65	16.12
13	10.81	380.01	1.600	10.00	.22	.97	6.92	167.91	2.44	1.95	162.21	16.16
14	10.73	370.01	1.600	10.00	.22	1.05	6.97	169.24	2.47	2.11	162.90	16.22
15	10.73	360.01	1.600	10.00	.22	1.13	7.02	170.75	2.52	2.27	163.74	16.28
16	10.73	350.01	1.600	10.00	.22	1.21	7.09	172.47	2.56	2.43	164.73	16.37
17	10.73	340.01	1.600	10.00	.22	1.29	7.16	174.39	2.62	2.60	165.90	16.47
18	10.61	330.01	1.600	10.00	.22	1.38	7.25	176.54	2.68	2.76	167.25	16.59
19	10.49	320.01	1.600	10.00	.22	1.46	7.34	178.92	2.74	2.93	168.80	16.73
20	10.49	310.01	2.000	10.00	.21	.99	7.37	183.02	2.77	3.10	157.69	16.88
21	10.49	300.01	2.000	10.00	.21	1.04	7.41	184.00	2.80	3.26	158.22	15.77
22	10.49	290.01	2.000	10.00	.21	1.09	7.45	185.06	2.83	3.42	158.81	15.82
23	10.49	280.01	2.000	10.00	.21	1.14	7.49	186.22	2.86	3.58	159.47	15.88
24	10.49	270.01	2.000	10.00	.21	1.19	7.54	187.47	2.90	3.73	160.20	15.95
25	10.49	260.01	2.000	10.00	.21	1.24	7.59	188.81	2.93	3.90	161.01	16.02
26	10.49	250.01	2.000	10.00	.21	1.29	7.64	190.26	2.98	4.06	161.89	16.10
27	10.49	240.01	2.000	10.00	.21	1.34	7.70	191.81	3.02	4.22	162.85	16.19
28	10.37	230.01	2.000	10.00	.21	1.40	7.76	193.46	3.07	4.38	163.89	16.29
29	10.25	220.01	2.000	10.00	.21	1.45	7.83	195.23	3.13	4.54	165.02	16.39
30	10.09	210.01	2.000	10.00	.21	1.50	7.90	197.10	3.18	4.71	166.24	16.50
31	9.93	200.01	2.000	10.00	.21	1.55	7.98	199.09	3.25	4.88	167.54	16.62

OUTFALL PIPELINE

TOTAL DISCHARGE = 5.04 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.61 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 4.57 M

1 FLOW CHARACTERISTICS FOR U(1) = 6.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M-SEC
1	11.57	500.00			.35		6.00	114.33	1.83		371.17	
2	11.54	490.00	.794	10.00	.23	.75	6.06	143.68	1.87	.37	155.88	37.12
3	11.51	480.00	.794	10.00	.23	1.06	6.18	146.95	1.94	.53	156.75	15.59
4	11.49	470.00	.794	10.00	.23	1.38	6.37	152.14	2.07	.68	158.96	15.67
5	11.29	460.00	.794	10.00	.23	1.70	6.65	159.57	2.25	.84	163.02	15.90
6	11.09	450.00	.794	10.00	.23	2.03	7.03	169.45	2.52	1.01	169.31	16.30
7	10.89	440.01	.794	10.00	.23	2.37	7.52	181.97	2.88	1.18	178.16	16.93
8	10.89	430.01	.794	10.00	.23	2.73	8.12	197.23	3.36	1.35	189.77	17.82
9	10.89	420.01	1.598	10.00	.23	.77	8.14	192.80	3.38	1.54	210.74	18.98
10	10.89	410.01	1.600	10.00	.22	.87	8.17	197.96	3.40	1.75	193.06	21.07
11	10.89	400.01	1.600	10.00	.22	.97	8.21	198.94	3.43	1.95	193.45	19.31
12	10.89	390.01	1.600	10.00	.22	1.07	8.25	200.11	3.47	2.14	193.97	19.34
13	10.81	380.01	1.600	10.00	.22	1.16	8.30	201.49	3.51	2.33	194.64	19.40
14	10.73	370.01	1.600	10.00	.22	1.26	8.36	203.08	3.56	2.53	195.47	19.46
15	10.73	360.01	1.600	10.00	.22	1.36	8.43	204.89	3.62	2.72	196.47	19.55
16	10.73	350.01	1.600	10.00	.22	1.45	8.51	206.95	3.69	2.92	197.67	19.65
17	10.73	340.01	1.600	10.00	.22	1.55	8.60	209.26	3.77	3.12	199.07	19.77
18	10.61	330.01	1.600	10.00	.22	1.65	8.69	211.84	3.85	3.32	200.69	19.91
19	10.49	320.01	1.600	10.00	.22	1.75	8.80	214.69	3.95	3.52	202.55	20.07
20	10.49	310.01	2.000	10.00	.21	1.18	8.84	219.61	3.99	3.72	189.21	20.25
21	10.49	300.01	2.000	10.00	.21	1.25	8.89	220.78	4.03	3.91	189.95	18.92
22	10.49	290.01	2.000	10.00	.21	1.31	8.93	222.06	4.07	4.10	190.56	18.98
23	10.49	280.01	2.000	10.00	.21	1.37	8.99	223.44	4.12	4.29	191.35	19.06
24	10.49	270.01	2.000	10.00	.21	1.43	9.04	224.94	4.17	4.48	192.23	19.14
25	10.49	260.01	2.000	10.00	.21	1.49	9.10	226.56	4.22	4.67	193.20	19.22
26	10.49	250.01	2.000	10.00	.21	1.55	9.17	228.29	4.29	4.87	194.25	19.32
27	10.49	240.01	2.000	10.00	.21	1.61	9.24	230.15	4.35	5.06	195.40	19.43
28	10.37	230.01	2.000	10.00	.21	1.67	9.32	232.14	4.42	5.26	196.66	19.54
29	10.25	220.01	2.000	10.00	.21	1.74	9.40	234.25	4.50	5.45	198.01	19.67
30	10.09	210.01	2.000	10.00	.21	1.80	9.48	236.50	4.58	5.65	199.47	19.80
31	9.93	200.01	2.000	10.00	.21	1.86	9.57	238.88	4.67	5.85	201.03	19.95

OUTFALL PIPELINE

TOTAL DISCHARGE = 6.05 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.93 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 6.58 M

1 FLOW CHARACTERISTICS FOR U(1) = 7.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SO(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	11.57	500.00			.35		7.00	133.39	2.50		433.03	
2	11.54	490.00	.794	10.00	.23	.87	7.07	167.63	2.55	.43	181.96	43.30
3	11.51	480.00	.794	10.00	.23	1.24	7.20	171.44	2.65	.61	182.87	18.19
4	11.49	470.00	.794	10.00	.23	1.61	7.43	177.49	2.81	.80	185.45	18.29
5	11.29	460.00	.794	10.00	.23	1.99	7.76	186.16	3.07	.98	190.18	18.55
6	11.09	450.00	.794	10.00	.23	2.37	8.20	197.69	3.43	1.17	197.52	19.09
7	10.89	440.01	.794	10.00	.23	2.77	8.77	212.29	3.92	1.37	207.94	19.75
8	10.89	430.01	.794	10.00	.23	3.19	9.47	230.09	4.57	1.58	221.39	20.78
9	10.89	420.01	1.598	10.00	.23	.90	9.50	224.93	4.60	1.80	245.95	22.14
10	10.89	410.01	1.600	10.00	.22	1.02	9.53	230.94	4.63	2.05	225.23	24.59
11	10.89	400.01	1.600	10.00	.22	1.13	9.57	232.09	4.67	2.27	225.68	22.53
12	10.89	390.01	1.600	10.00	.22	1.24	9.63	233.46	4.72	2.50	226.29	22.57
13	10.81	380.01	1.600	10.00	.22	1.36	9.68	235.06	4.78	2.72	227.07	22.63
14	10.73	370.01	1.600	10.00	.22	1.47	9.75	236.92	4.85	2.95	228.04	22.71
15	10.73	360.01	1.600	10.00	.22	1.58	9.83	239.03	4.93	3.18	229.21	22.80
16	10.73	350.01	1.600	10.00	.22	1.70	9.92	241.43	5.02	3.41	230.60	22.92
17	10.73	340.01	1.600	10.00	.22	1.81	10.03	244.13	5.12	3.64	232.24	23.06
18	10.61	330.01	1.600	10.00	.22	1.93	10.14	247.13	5.24	3.87	234.13	23.22
19	10.49	320.01	1.600	10.00	.22	2.04	10.27	250.46	5.38	4.10	236.29	23.41
20	10.49	310.01	2.000	10.00	.21	1.38	10.32	256.20	5.42	4.34	220.73	23.63
21	10.49	300.01	2.000	10.00	.21	1.45	10.37	257.57	5.48	4.56	221.48	22.07
22	10.49	290.01	2.000	10.00	.21	1.52	10.42	259.06	5.54	4.78	222.31	22.15
23	10.49	280.01	2.000	10.00	.21	1.59	10.48	260.67	5.60	5.01	223.24	22.23
24	10.49	270.01	2.000	10.00	.21	1.67	10.55	262.42	5.67	5.23	224.26	22.32
25	10.49	260.01	2.000	10.00	.21	1.74	10.62	264.31	5.75	5.45	225.39	22.43
26	10.49	250.01	2.000	10.00	.21	1.81	10.70	266.33	5.83	5.68	226.62	22.54
27	10.49	240.01	2.000	10.00	.21	1.88	10.78	268.50	5.92	5.90	227.96	22.66
28	10.37	230.01	2.000	10.00	.21	1.95	10.87	270.82	6.02	6.13	229.42	22.80
29	10.25	220.01	2.000	10.00	.21	2.03	10.96	273.28	6.13	6.36	231.00	22.94
30	10.09	210.01	2.000	10.00	.21	2.10	11.06	275.90	6.24	6.59	232.70	23.10
31	9.93	200.01	2.000	10.00	.21	2.17	11.17	278.68	6.36	6.83	234.52	23.27

OUTFALL PIPELINE

TOTAL DISCHARGE = 7.06 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.25 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 8.95 M

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FLOW CHARACTERISTICS FOR U(1) = 8.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.57	500.00			.35		8.00	152.45	3.26		404.89	
2	11.54	490.00	.794	10.00	.23	1.00	8.08	191.57	3.33	.49	207.84	49.49
3	11.51	480.00	.794	10.00	.23	1.42	8.23	195.93	3.46	.70	209.00	20.78
4	11.49	470.00	.794	10.00	.23	1.84	8.49	202.85	3.67	.91	211.95	20.90
5	11.29	460.00	.794	10.00	.23	2.27	8.86	212.75	4.00	1.12	217.35	21.19
6	11.09	450.00	.794	10.00	.23	2.71	9.37	225.93	4.48	1.34	225.74	21.73
7	10.89	440.01	.794	10.00	.23	3.17	10.02	242.61	5.12	1.57	237.53	22.57
8	10.89	430.01	.794	10.00	.23	3.65	10.83	262.96	5.97	1.80	253.01	23.75
9	10.89	420.01	1.598	10.00	.23	1.03	10.86	257.06	6.01	2.06	280.97	25.30
10	10.89	410.01	1.600	10.00	.22	1.16	10.89	263.93	6.05	2.34	257.40	28.10
11	10.89	400.01	1.600	10.00	.22	1.29	10.94	265.24	6.10	2.60	257.92	25.78
12	10.89	390.01	1.600	10.00	.22	1.42	11.00	266.80	6.17	2.85	258.61	25.79
13	10.81	380.01	1.600	10.00	.22	1.55	11.07	268.63	6.24	3.11	259.50	25.86
14	10.73	370.01	1.600	10.00	.22	1.68	11.15	270.75	6.33	3.37	260.61	25.95
15	10.73	360.01	1.600	10.00	.22	1.81	11.24	273.18	6.44	3.63	261.95	26.06
16	10.73	350.01	1.600	10.00	.22	1.94	11.34	275.92	6.56	3.89	263.54	26.19
17	10.73	340.01	1.600	10.00	.22	2.07	11.46	279.00	6.69	4.16	265.41	26.35
18	10.61	330.01	1.600	10.00	.22	2.20	11.59	282.43	6.85	4.42	267.57	26.54
19	10.49	320.01	1.600	10.00	.22	2.33	11.74	286.23	7.02	4.69	270.04	26.76
20	10.49	310.01	2.000	10.00	.21	1.58	11.79	292.79	7.09	4.96	252.26	27.00
21	10.49	300.01	2.000	10.00	.21	1.66	11.85	294.35	7.16	5.21	253.11	25.23
22	10.49	290.01	2.000	10.00	.21	1.74	11.91	296.06	7.23	5.47	254.06	25.31
23	10.49	280.01	2.000	10.00	.21	1.82	11.98	297.91	7.32	5.72	255.12	25.41
24	10.49	270.01	2.000	10.00	.21	1.90	12.06	299.90	7.41	5.98	256.29	25.51
25	10.49	260.01	2.000	10.00	.21	1.98	12.14	302.06	7.51	6.23	257.58	25.63
26	10.49	250.01	2.000	10.00	.21	2.07	12.23	304.37	7.62	6.49	258.99	25.76
27	10.49	240.01	2.000	10.00	.21	2.15	12.32	306.85	7.74	6.75	260.52	25.90
28	10.37	230.01	2.000	10.00	.21	2.23	12.42	309.50	7.86	7.01	262.19	26.05
29	10.25	220.01	2.000	10.00	.21	2.32	12.53	312.31	8.00	7.27	263.99	26.22
30	10.09	210.01	2.000	10.00	.21	2.40	12.64	315.31	8.15	7.53	265.93	26.40
31	9.93	200.01	2.000	10.00	.21	2.48	12.76	318.48	8.30	7.80	268.01	26.59

OUTFALL PIPELINE

TOTAL DISCHARGE = 8.07 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.57 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.62 M
TOTAL HEAD AT SHORE = 11.69 M

BOTTOM PROFILE

MANIFOLD 5

TRACE C

DISTANCE M	DEPTH M
.00	.00
25.00	.00
35.00	.50
40.00	1.50
50.00	3.00
60.00	4.00
70.00	6.00
90.00	8.00
100.00	9.00
125.00	9.20
150.00	9.30
175.00	9.50
200.00	9.80
225.00	9.80
250.00	9.80
275.00	9.90
300.00	10.00
325.00	10.00
350.00	10.50
375.00	10.50
400.00	11.00
425.00	11.00
450.00	11.00
475.00	11.10
510.00	11.30

LIST OF SYMBOLS

N = NO OF PORT
DEPTH(N) = DEPTH AT PORT N
DIST(N) = DISTANCE FROM SHORE
DIA(N) = DIAMETER OF MANIFOLD BETWEEN PORT N AND N-1
DL(N) = LENGTH BETWEEN PORT N AND N-1
D(N) = DIAMETER OF PORT N
V(N) = VELOCITY IN MANIFOLD BETWEEN PORT N AND N-1
U(N) = DISCHARGEVELOCITY OF PORT N
FN(N) = DENSIMETRIC FROUDE NO OF JET AT PORT N
E(N) = TOTAL HEAD AT PORT N
SQ(N) = TOTAL DISCHARGE UP TO PORT N
Q(N) = DISCHARGE OF PORT N
QL(N) = DISCHARGE LOAD PR LENGTH OF MANIFOLD
QDES = DESIGN DISCHARGE FLOW
VMIN = MINIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
VMAX = MAXIMUM VELOCITY IN MANIFOLD FOR DESIGN FLOW
DENS = (SPEC.GRAV. SEAW.-SPEC.GRAV. WASTEW.)/(SPEC.GRAV. WASTEW.)
FRM = DARCY FRICTION FACTOR IN MANIFOLD
FRP = DARCY FRICTION FACTOR IN OUTFALL PIPELINE
VPIPE = UPPER LIMIT FOR VELOCITY IN OUTFALL PIPELINE AT DESIGN FLOW

INITIAL VALUES FOR THE CALCULATION OF THE MANIFOLD

QDES = 4.000 CUM/SEC
VMAX = 2.00 M/SEC
VMIN = .50 M/SEC
DIST(1) = 500.00 M
D(1) = 4.00 M/SEC
DIA(2) = .794 M
DL(2) = 10.00 M
D(2) = .23 M
DL(3) = 10.00 M
DENS = .001
VPIPE = 1.20 M/SEC
FRM = .100
FRP = .100
PORT NO K1 = 10
DIA(K1) = 1.600 M
DL(K1) = 10.00 M
D(K1) = .22 M

PORT NO K2 = 20
DIA(K2) = 2.000 M
DL(K2) = 10.00 M
D(K2) = .21 M

PORT NO K3 = 0
DIA(K3) = .000 M
DL(K3) = .00 M
D(K3) = .00 M

THE LENGTH BETWEEN THE PORTS DL(N) AND THE DIAMETER OF THE PORTS
D(N) ARE KEPT CONSTANT ALONG THE MANIFOLD AND SET EQUAL TO
RESPECTIVELY DL(3) AND D(2).
IF WANTED THE DIA(N),DL(N) AND D(N) CAN BE CHANGED FOR PORT NO
N = K TO DIA(K),DL(K) AND D(K).

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FLOW CHARACTERISTICS FOR U(1) = 1.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.24	500.00			.35		1.00	19.06	.05		61.86	
2	11.19	490.00	.794	10.00	.23	.13	1.01	23.96	.05	.06	25.99	6.19
3	11.13	480.00	.794	10.00	.23	.18	1.03	24.52	.05	.09	26.15	2.60
4	11.07	470.00	.794	10.00	.23	.23	1.06	25.39	.06	.11	26.54	2.62
5	11.03	460.00	.794	10.00	.23	.28	1.11	26.64	.06	.14	27.32	2.65
6	10.99	450.00	.794	10.00	.23	.34	1.17	28.29	.07	.17	28.28	2.72
7	10.95	440.00	.794	10.00	.23	.40	1.26	30.39	.08	.20	29.76	2.83
8	10.95	430.00	.794	10.00	.23	.46	1.36	32.93	.09	.23	31.69	2.98
9	10.95	420.00	1.598	10.00	.23	.13	1.36	32.19	.09	.26	35.19	3.17
10	10.95	410.00	1.600	10.00	.22	.15	1.36	33.05	.09	.29	32.24	3.52
11	10.95	400.00	1.600	10.00	.22	.16	1.37	33.22	.10	.32	32.30	3.22
12	10.95	390.00	1.600	10.00	.22	.18	1.38	33.41	.10	.36	32.39	3.23
13	10.75	380.00	1.600	10.00	.22	.19	1.39	33.68	.10	.39	32.53	3.24
14	10.55	370.00	1.600	10.00	.22	.21	1.40	33.97	.10	.42	32.70	3.25
15	10.55	360.00	1.600	10.00	.22	.23	1.41	34.28	.10	.45	32.87	3.27
16	10.55	350.00	1.600	10.00	.22	.24	1.42	34.62	.10	.49	33.07	3.29
17	10.55	340.00	1.600	10.00	.22	.26	1.44	35.01	.11	.52	33.30	3.31
18	10.35	330.01	1.600	10.00	.22	.28	1.46	35.47	.11	.55	33.61	3.33
19	10.15	320.01	1.600	10.00	.22	.29	1.48	35.97	.11	.59	33.95	3.36
20	10.15	310.01	2.000	10.00	.21	.20	1.48	36.80	.11	.62	31.71	3.39
21	10.15	300.01	2.000	10.00	.21	.21	1.49	36.99	.11	.65	31.91	3.17
22	10.15	290.01	2.000	10.00	.21	.22	1.50	37.21	.11	.69	31.93	3.18
23	10.11	280.01	2.000	10.00	.21	.23	1.51	37.44	.12	.72	32.07	3.19
24	10.07	270.01	2.000	10.00	.21	.24	1.52	37.70	.12	.75	32.22	3.21
25	10.03	260.01	2.000	10.00	.21	.25	1.53	37.98	.12	.78	32.39	3.22
26	9.99	250.01	2.000	10.00	.21	.26	1.54	38.27	.12	.81	32.57	3.24
27	9.95	240.01	2.000	10.00	.21	.27	1.55	38.59	.12	.85	32.77	3.26
28	9.95	230.01	2.000	10.00	.21	.28	1.56	38.92	.12	.88	32.98	3.28
29	9.95	220.01	2.000	10.00	.21	.29	1.58	39.27	.13	.91	33.20	3.30
30	9.95	210.01	2.000	10.00	.21	.30	1.59	39.65	.13	.95	33.44	3.32
31	9.95	200.01	2.000	10.00	.21	.31	1.60	40.04	.13	.98	33.70	3.34

OUTFALL PIPELINE

TOTAL DISCHARGE = 1.01 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .32 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = .19 M

1 FLOW CHARACTERISTICS FOR U(1) = 4.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SC(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	11.24	500.00			.35		4.00	76.22	.82		247.45	
2	11.19	490.00	.794	10.00	.23	.50	4.04	95.79	.83	.25	103.92	24.74
3	11.13	480.00	.794	10.00	.23	.71	4.12	97.97	.86	.35	104.50	10.39
4	11.07	470.00	.794	10.00	.23	.92	4.25	101.43	.92	.46	105.98	10.45
5	11.03	460.00	.794	10.00	.23	1.14	4.43	106.38	1.00	.56	109.68	10.60
6	10.99	450.00	.794	10.00	.23	1.35	4.69	112.97	1.12	.67	112.38	10.87
7	10.95	440.00	.794	10.00	.23	1.58	5.01	121.31	1.28	.78	118.77	11.29
8	10.95	430.00	.794	10.00	.23	1.82	5.41	131.49	1.49	.90	126.51	11.88
9	10.95	420.00	1.598	10.00	.23	.51	5.43	128.54	1.50	1.03	140.49	12.65
10	10.95	410.00	1.600	10.00	.22	.58	5.45	131.97	1.51	1.17	128.71	14.05
11	10.95	400.00	1.600	10.00	.22	.65	5.47	132.63	1.53	1.30	129.97	12.87
12	10.95	390.00	1.600	10.00	.22	.71	5.50	133.41	1.54	1.43	129.31	12.90
13	10.75	380.00	1.600	10.00	.22	.77	5.53	134.33	1.56	1.56	129.77	12.93
14	10.55	370.00	1.600	10.00	.22	.84	5.57	135.40	1.58	1.69	130.33	12.98
15	10.55	360.00	1.600	10.00	.22	.90	5.62	136.61	1.61	1.82	131.00	13.03
16	10.55	350.00	1.600	10.00	.22	.97	5.67	137.98	1.64	1.95	131.79	13.10
17	10.55	340.00	1.600	10.00	.22	1.03	5.73	139.52	1.67	2.08	132.73	13.18
18	10.35	330.01	1.600	10.00	.22	1.10	5.80	141.25	1.71	2.21	133.81	13.27
19	10.15	320.01	1.600	10.00	.22	1.17	5.87	143.15	1.76	2.35	135.06	13.39
20	10.15	310.01	2.000	10.00	.21	.79	5.90	146.43	1.77	2.48	126.16	13.51
21	10.15	300.01	2.000	10.00	.21	.83	5.93	147.21	1.79	2.61	126.59	12.62
22	10.15	290.01	2.000	10.00	.21	.87	5.96	148.07	1.81	2.73	127.06	12.66
23	10.11	280.01	2.000	10.00	.21	.91	5.99	148.99	1.83	2.86	127.59	12.71
24	10.07	270.01	2.000	10.00	.21	.95	6.03	149.99	1.85	2.99	128.18	12.76
25	10.03	260.01	2.000	10.00	.21	.99	6.07	151.07	1.88	3.12	128.83	12.82
26	9.99	250.01	2.000	10.00	.21	1.03	6.11	152.23	1.91	3.25	129.53	12.88
27	9.95	240.01	2.000	10.00	.21	1.07	6.16	153.47	1.94	3.37	130.30	12.95
28	9.95	230.01	2.000	10.00	.21	1.12	6.21	154.79	1.97	3.50	131.13	13.03
29	9.95	220.01	2.000	10.00	.21	1.16	6.27	156.20	2.00	3.64	132.03	13.11
30	9.95	210.01	2.000	10.00	.21	1.20	6.32	157.70	2.04	3.77	133.00	13.20
31	9.95	200.01	2.000	10.00	.21	1.24	6.38	159.28	2.08	3.90	134.04	13.30

OUTFALL PIPELINE

TOTAL DISCHARGE = 4.04 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.29 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 2.93 M

1 FLOW CHARACTERISTICS FOR U(1) = 2.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.24	500.00			.35		2.00	38.11	.20		123.72	
2	11.19	490.00	.794	10.00	.23	.25	2.02	47.90	.21	.12	51.97	12.37
3	11.13	480.00	.794	10.00	.23	.36	2.06	48.99	.22	.18	52.26	5.20
4	11.07	470.00	.794	10.00	.23	.46	2.12	50.73	.23	.23	53.01	5.23
5	11.03	460.00	.794	10.00	.23	.57	2.22	53.21	.25	.28	54.36	5.30
6	10.99	450.00	.794	10.00	.23	.68	2.34	56.51	.28	.34	56.46	5.44
7	10.95	440.00	.794	10.00	.23	.79	2.51	60.68	.32	.39	59.41	5.65
8	10.95	430.00	.794	10.00	.23	.91	2.71	65.77	.37	.45	63.28	5.94
9	10.95	420.00	1.598	10.00	.23	.26	2.72	64.29	.38	.51	70.27	6.33
10	10.95	410.00	1.600	10.00	.22	.29	2.72	66.01	.38	.58	64.38	7.03
11	10.95	400.00	1.600	10.00	.22	.32	2.74	66.34	.38	.65	64.51	6.44
12	10.95	390.00	1.600	10.00	.22	.36	2.75	66.73	.39	.71	64.68	6.45
13	10.75	380.00	1.600	10.00	.22	.39	2.77	67.20	.39	.78	64.92	6.47
14	10.55	370.00	1.600	10.00	.22	.42	2.79	67.75	.40	.84	65.21	6.49
15	10.55	360.00	1.600	10.00	.22	.45	2.81	68.36	.40	.91	65.55	6.52
16	10.55	350.00	1.600	10.00	.22	.48	2.84	69.04	.41	.97	65.95	6.55
17	10.55	340.00	1.600	10.00	.22	.52	2.87	69.81	.42	1.04	66.41	6.59
18	10.35	330.01	1.600	10.00	.22	.55	2.90	70.68	.43	1.11	66.97	6.64
19	10.15	320.01	1.600	10.00	.22	.58	2.94	71.65	.44	1.17	67.60	6.70
20	10.15	310.01	2.000	10.00	.21	.40	2.95	73.29	.44	1.24	63.15	6.76
21	10.15	300.01	2.000	10.00	.21	.42	2.97	73.68	.45	1.30	63.36	6.31
22	10.15	290.01	2.000	10.00	.21	.44	2.98	74.11	.45	1.37	63.60	6.34
23	10.11	280.01	2.000	10.00	.21	.46	3.00	74.57	.46	1.43	63.87	6.36
24	10.07	270.01	2.000	10.00	.21	.48	3.02	75.08	.46	1.49	64.16	6.39
25	10.03	260.01	2.000	10.00	.21	.50	3.04	75.62	.47	1.56	64.49	6.42
26	9.99	250.01	2.000	10.00	.21	.52	3.06	76.20	.48	1.62	64.84	6.45
27	9.95	240.01	2.000	10.00	.21	.54	3.08	76.82	.48	1.69	65.23	6.48
28	9.95	230.01	2.000	10.00	.21	.56	3.11	77.48	.49	1.75	65.64	6.52
29	9.95	220.01	2.000	10.00	.21	.58	3.14	78.19	.50	1.82	66.09	6.56
30	9.95	210.01	2.000	10.00	.21	.60	3.17	78.94	.51	1.89	66.58	6.61
31	9.95	200.01	2.000	10.00	.21	.62	3.20	79.73	.52	1.95	67.10	6.66

OUTFALL PIPELINE

TOTAL DISCHARGE = 2.02 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .64 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = .74 M

1 FLOW CHARACTERISTICS FOR U(1) = 3.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M.SEC
1	11.24	500.00			.35		3.00	57.17	.46		185.58	
2	11.19	490.00	.794	10.00	.23	.37	3.03	71.84	.47	.19	77.95	18.56
3	11.13	480.00	.794	10.00	.23	.53	3.09	73.48	.49	.26	78.38	7.79
4	11.07	470.00	.794	10.00	.23	.69	3.18	76.08	.52	.34	79.49	7.84
5	11.03	460.00	.794	10.00	.23	.85	3.32	79.79	.56	.42	81.52	7.95
6	10.99	450.00	.794	10.00	.23	1.02	3.51	84.74	.63	.50	84.67	8.15
7	10.95	440.00	.794	10.00	.23	1.19	3.76	90.99	.72	.59	88.09	8.47
8	10.95	430.00	.794	10.00	.23	1.37	4.06	98.62	.84	.68	94.99	8.91
9	10.95	420.00	1.588	10.00	.23	.38	4.07	96.41	.84	.77	105.38	9.40
10	10.95	410.00	1.600	10.00	.22	.44	4.09	98.99	.85	.88	96.54	10.54
11	10.95	400.00	1.600	10.00	.22	.48	4.10	99.48	.86	.97	96.73	9.65
12	10.95	390.00	1.600	10.00	.22	.53	4.13	100.07	.87	1.07	96.99	9.67
13	10.75	380.00	1.600	10.00	.22	.58	4.15	100.76	.88	1.17	97.34	9.70
14	10.55	370.00	1.600	10.00	.22	.63	4.18	101.57	.89	1.26	97.76	9.73
15	10.55	360.00	1.600	10.00	.22	.68	4.22	102.48	.91	1.36	98.27	9.78
16	10.55	350.00	1.600	10.00	.22	.73	4.25	103.51	.92	1.46	98.86	9.83
17	10.55	340.00	1.600	10.00	.22	.78	4.30	104.66	.94	1.56	99.56	9.89
18	10.35	330.01	1.600	10.00	.22	.83	4.35	105.96	.96	1.66	100.38	9.96
19	10.15	320.01	1.600	10.00	.22	.88	4.40	107.39	.99	1.76	101.32	10.04
20	10.15	310.01	2.000	10.00	.21	.59	4.42	109.85	1.00	1.86	94.65	10.13
21	10.15	300.01	2.000	10.00	.21	.62	4.45	110.44	1.01	1.96	94.97	9.46
22	10.15	290.01	2.000	10.00	.21	.65	4.47	111.08	1.02	2.05	95.32	9.50
23	10.11	280.01	2.000	10.00	.21	.68	4.50	111.77	1.03	2.15	95.72	9.53
24	10.07	270.01	2.000	10.00	.21	.71	4.52	112.53	1.04	2.24	96.16	9.57
25	10.03	260.01	2.000	10.00	.21	.74	4.55	113.34	1.06	2.34	96.65	9.62
26	9.99	250.01	2.000	10.00	.21	.78	4.59	114.21	1.07	2.43	97.18	9.66
27	9.95	240.01	2.000	10.00	.21	.81	4.62	115.14	1.09	2.53	97.76	9.72
28	9.95	230.01	2.000	10.00	.21	.84	4.66	116.13	1.11	2.63	98.38	9.78
29	9.95	220.01	2.000	10.00	.21	.87	4.70	117.18	1.13	2.73	99.06	9.84
30	9.95	210.01	2.000	10.00	.21	.90	4.74	118.31	1.15	2.83	99.78	9.91
31	9.95	200.01	2.000	10.00	.21	.93	4.79	119.50	1.17	2.93	100.56	9.98

OUTFALL PIPELINE

TOTAL DISCHARGE = 3.03 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = .96 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 1.65 M

1 FLOW CHARACTERISTICS FOR U(1) = 5.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.24	500.00			.35		5.00	95.28	1.27		300.31	
2	11.19	490.00	.794	10.00	.23	.62	5.05	119.73	1.30	.31	120.90	30.93
3	11.15	480.00	.794	10.00	.23	.89	5.15	122.46	1.35	.44	130.63	12.99
4	11.07	470.00	.794	10.00	.23	1.15	5.31	126.79	1.44	.57	132.47	13.06
5	11.03	460.00	.794	10.00	.23	1.42	5.54	132.97	1.56	.70	135.95	13.25
6	10.99	450.00	.794	10.00	.23	1.69	5.86	141.21	1.75	.84	141.09	13.59
7	10.95	440.00	.794	10.00	.23	1.98	6.26	151.63	2.00	.98	149.46	14.11
8	10.95	430.00	.794	10.00	.23	2.28	6.77	164.35	2.33	1.13	159.13	14.85
9	10.95	420.00	1.598	10.00	.23	.64	6.79	160.66	2.35	1.29	175.61	15.81
10	10.95	410.00	1.600	10.00	.22	.73	6.81	164.96	2.36	1.46	160.38	17.56
11	10.95	400.00	1.600	10.00	.22	.81	6.84	165.78	2.38	1.62	161.20	16.09
12	10.95	390.00	1.600	10.00	.22	.89	6.89	166.75	2.41	1.78	161.63	16.12
13	10.75	380.00	1.600	10.00	.22	.97	6.92	167.90	2.44	1.95	162.20	16.16
14	10.55	370.00	1.600	10.00	.22	1.05	6.97	169.23	2.47	2.11	162.89	16.22
15	10.55	360.00	1.600	10.00	.22	1.13	7.02	170.75	2.52	2.27	163.73	16.29
16	10.55	350.00	1.600	10.00	.22	1.21	7.09	172.46	2.56	2.43	164.73	16.37
17	10.55	340.00	1.600	10.00	.22	1.29	7.16	174.39	2.62	2.60	165.89	16.47
18	10.35	330.01	1.600	10.00	.22	1.38	7.25	176.54	2.68	2.76	167.25	16.59
19	10.15	320.01	1.600	10.00	.22	1.46	7.34	178.92	2.74	2.93	168.80	16.72
20	10.15	310.01	2.000	10.00	.21	.99	7.37	183.02	2.77	3.10	157.68	16.88
21	10.15	300.01	2.000	10.00	.21	1.04	7.41	183.99	2.80	3.26	158.22	15.77
22	10.15	290.01	2.000	10.00	.21	1.09	7.45	185.06	2.83	3.42	158.81	15.82
23	10.11	280.01	2.000	10.00	.21	1.14	7.49	186.22	2.86	3.58	159.47	15.88
24	10.07	270.01	2.000	10.00	.21	1.19	7.54	187.47	2.90	3.73	160.21	15.95
25	10.03	260.01	2.000	10.00	.21	1.24	7.59	188.81	2.93	3.90	161.01	16.02
26	9.99	250.01	2.000	10.00	.21	1.29	7.64	190.26	2.98	4.06	161.89	16.10
27	9.95	240.01	2.000	10.00	.21	1.34	7.70	191.81	3.02	4.22	162.85	16.19
28	9.95	230.01	2.000	10.00	.21	1.40	7.76	193.46	3.07	4.38	163.89	16.29
29	9.95	220.01	2.000	10.00	.21	1.45	7.83	195.22	3.13	4.54	165.02	16.39
30	9.95	210.01	2.000	10.00	.21	1.50	7.90	197.09	3.18	4.71	166.23	16.50
31	9.95	200.01	2.000	10.00	.21	1.55	7.98	199.07	3.24	4.88	167.53	16.62

OUTFALL PIPELINE

TOTAL DISCHARGE = 5.04 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.61 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 4.57 M

1 FLOW CHARACTERISTICS FOR U(1) = 6.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.24	500.00			.35		6.00	114.33	1.83		371.17	
2	11.19	490.00	.794	10.00	.23	.75	6.06	143.68	1.87	.37	155.88	37.12
3	11.13	480.00	.794	10.00	.23	1.06	6.18	146.95	1.94	.53	156.75	15.59
4	11.07	470.00	.794	10.00	.23	1.38	6.37	152.14	2.07	.68	158.97	15.68
5	11.03	460.00	.794	10.00	.23	1.70	6.65	159.56	2.25	.84	163.01	15.90
6	10.99	450.00	.794	10.00	.23	2.03	7.03	169.45	2.52	1.01	169.30	16.30
7	10.95	440.00	.794	10.00	.23	2.37	7.52	181.95	2.88	1.19	178.14	16.93
8	10.95	430.00	.794	10.00	.23	2.73	8.12	197.22	3.36	1.35	189.75	17.81
9	10.95	420.00	1.588	10.00	.23	.77	8.14	198.79	3.38	1.54	210.72	18.98
10	10.95	410.00	1.600	10.00	.22	.87	8.17	197.94	3.40	1.75	193.05	21.07
11	10.95	400.00	1.600	10.00	.22	.97	8.21	198.93	3.43	1.95	193.44	19.30
12	10.95	390.00	1.600	10.00	.22	1.06	8.25	200.10	3.47	2.14	193.96	19.34
13	10.75	380.00	1.600	10.00	.22	1.16	8.30	201.48	3.51	2.33	194.63	19.40
14	10.55	370.00	1.600	10.00	.22	1.26	8.36	203.07	3.56	2.53	195.46	19.46
15	10.55	360.00	1.600	10.00	.22	1.36	8.43	204.89	3.62	2.72	196.47	19.55
16	10.55	350.00	1.600	10.00	.22	1.45	8.51	206.95	3.69	2.92	197.66	19.65
17	10.55	340.00	1.600	10.00	.22	1.55	8.60	209.26	3.77	3.12	199.06	19.77
18	10.35	330.01	1.600	10.00	.22	1.65	8.69	211.83	3.85	3.32	200.69	19.91
19	10.15	320.01	1.600	10.00	.22	1.75	8.80	214.68	3.95	3.52	202.54	20.07
20	10.15	310.01	2.000	10.00	.21	1.18	8.84	219.61	3.99	3.72	180.21	20.25
21	10.15	300.01	2.000	10.00	.21	1.25	8.89	220.78	4.03	3.91	180.84	18.09
22	10.15	290.01	2.000	10.00	.21	1.31	8.93	222.06	4.07	4.10	180.56	18.09
23	10.11	280.01	2.000	10.00	.21	1.37	8.99	223.44	4.12	4.29	181.35	19.06
24	10.07	270.01	2.000	10.00	.21	1.43	9.04	224.94	4.17	4.48	182.23	19.14
25	10.03	260.01	2.000	10.00	.21	1.49	9.10	226.56	4.22	4.67	183.20	19.22
26	9.99	250.01	2.000	10.00	.21	1.55	9.17	228.30	4.29	4.87	184.26	19.32
27	9.95	240.01	2.000	10.00	.21	1.61	9.24	230.16	4.35	5.06	185.41	19.43
28	9.95	230.01	2.000	10.00	.21	1.67	9.32	232.14	4.42	5.26	186.66	19.54
29	9.95	220.01	2.000	10.00	.21	1.74	9.40	234.25	4.50	5.45	188.01	19.67
30	9.95	210.01	2.000	10.00	.21	1.80	9.48	236.49	4.58	5.65	189.46	19.80
31	9.95	200.01	2.000	10.00	.21	1.86	9.57	238.87	4.67	5.85	201.02	19.95

OUTFALL PIPELINE

TOTAL DISCHARGE = 6.05 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 1.93 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 6.58 M

1 FLOW CHARACTERISTICS FOR U(1) = 7.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M,SEC
1	11.24	500.00			.35		7.00	133.39	2.50		433.03	
2	11.19	490.00	.794	10.00	.23	.87	7.07	167.63	2.55	.43	181.96	43.30
3	11.13	480.00	.794	10.00	.23	1.24	7.20	171.44	2.65	.61	189.87	18.19
4	11.07	470.00	.794	10.00	.23	1.61	7.43	177.50	2.81	.80	185.46	18.20
5	11.03	460.00	.794	10.00	.23	1.99	7.76	186.15	3.07	.98	190.18	18.55
6	10.99	450.00	.794	10.00	.23	2.37	8.20	197.68	3.43	1.17	197.52	19.02
7	10.95	440.00	.794	10.00	.23	2.77	8.77	212.28	3.92	1.37	207.83	19.75
8	10.95	430.00	.794	10.00	.23	3.19	9.47	230.08	4.57	1.58	221.38	20.78
9	10.95	420.00	1.598	10.00	.23	.90	9.50	224.92	4.60	1.80	245.84	22.14
10	10.95	410.00	1.600	10.00	.22	1.02	9.53	230.93	4.63	2.05	225.92	24.58
11	10.95	400.00	1.600	10.00	.22	1.13	9.57	232.08	4.67	2.27	225.67	22.52
12	10.95	390.00	1.600	10.00	.22	1.24	9.62	233.45	4.72	2.50	226.28	22.57
13	10.75	380.00	1.600	10.00	.22	1.36	9.68	235.05	4.78	2.72	227.06	22.63
14	10.55	370.00	1.600	10.00	.22	1.47	9.75	236.91	4.85	2.95	228.03	22.71
15	10.55	360.00	1.600	10.00	.22	1.58	9.83	239.03	4.93	3.18	229.20	22.80
16	10.55	350.00	1.600	10.00	.22	1.70	9.92	241.43	5.02	3.41	230.60	22.92
17	10.55	340.00	1.600	10.00	.22	1.81	10.03	244.12	5.12	3.64	232.23	23.06
18	10.35	330.01	1.600	10.00	.22	1.93	10.14	247.13	5.24	3.87	234.13	23.22
19	10.15	320.01	1.600	10.00	.22	2.04	10.27	250.46	5.38	4.10	236.29	23.41
20	10.15	310.01	2.000	10.00	.21	1.38	10.32	256.20	5.42	4.34	220.73	23.63
21	10.15	300.01	2.000	10.00	.21	1.45	10.37	257.56	5.48	4.56	221.48	22.07
22	10.15	290.01	2.000	10.00	.21	1.52	10.42	259.06	5.54	4.78	222.31	22.15
23	10.11	280.01	2.000	10.00	.21	1.59	10.48	260.67	5.60	5.01	223.24	22.23
24	10.07	270.01	2.000	10.00	.21	1.67	10.55	262.42	5.67	5.23	224.26	22.32
25	10.03	260.01	2.000	10.00	.21	1.74	10.62	264.31	5.75	5.45	225.39	22.43
26	9.99	250.01	2.000	10.00	.21	1.81	10.70	266.34	5.83	5.68	226.62	22.54
27	9.95	240.01	2.000	10.00	.21	1.88	10.78	268.50	5.92	5.90	227.97	22.66
28	9.95	230.01	2.000	10.00	.21	1.95	10.87	270.82	6.02	6.13	229.42	22.80
29	9.95	220.01	2.000	10.00	.21	2.03	10.96	273.28	6.13	6.36	231.00	22.94
30	9.95	210.01	2.000	10.00	.21	2.10	11.06	275.90	6.24	6.59	232.69	23.10
31	9.95	200.01	2.000	10.00	.21	2.17	11.17	278.67	6.36	6.83	234.51	23.27

OUTFALL PIPELINE

TOTAL DISCHARGE = 7.06 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.25 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 8.95 M

1

FLOW CHARACTERISTICS FOR U(1) = 8.00 M/SEC

N	DEPTH(N) M	DIST(N) M	DIA(N) M	DL(N) M	D(N) M	V(N) M/SEC	U(N) M/SEC	FN(N)	E(N) M	SQ(N) CUM/SEC	Q(N) L/SEC	QL(N) L/M-SEC
1	11.24	500.00			.35		8.00	152.45	3.26		494.99	
2	11.19	490.00	.794	10.00	.23	1.00	8.08	191.57	3.33	.49	207.84	49.49
3	11.15	480.00	.794	10.00	.23	1.42	8.23	195.93	3.46	.70	209.00	20.78
4	11.07	470.00	.794	10.00	.23	1.84	8.49	202.85	3.67	.91	211.95	20.90
5	11.03	460.00	.794	10.00	.23	2.27	8.86	212.75	4.00	1.12	217.35	21.19
6	10.99	450.00	.794	10.00	.23	2.71	9.37	225.92	4.48	1.34	225.73	21.73
7	10.95	440.00	.794	10.00	.23	3.17	10.02	242.60	5.12	1.57	237.52	22.57
8	10.95	430.00	.794	10.00	.23	3.65	10.83	262.95	5.97	1.80	253.00	23.75
9	10.95	420.00	1.598	10.00	.23	1.03	10.86	257.05	6.01	2.06	280.96	25.30
10	10.95	410.00	1.600	10.00	.22	1.16	10.89	263.92	6.05	2.34	257.39	28.10
11	10.95	400.00	1.600	10.00	.22	1.29	10.94	265.23	6.10	2.60	257.91	25.74
12	10.95	390.00	1.600	10.00	.22	1.42	11.00	266.79	6.17	2.85	258.60	25.79
13	10.75	380.00	1.600	10.00	.22	1.55	11.07	268.63	6.24	3.11	259.50	25.86
14	10.55	370.00	1.600	10.00	.22	1.68	11.15	270.75	6.33	3.37	260.60	25.95
15	10.55	360.00	1.600	10.00	.22	1.81	11.24	273.17	6.44	3.63	261.94	26.06
16	10.55	350.00	1.600	10.00	.22	1.94	11.34	275.91	6.56	3.89	263.54	26.19
17	10.55	340.00	1.600	10.00	.22	2.07	11.46	278.99	6.69	4.16	265.40	26.35
18	10.35	330.01	1.600	10.00	.22	2.20	11.59	282.43	6.85	4.42	267.57	26.54
19	10.15	320.01	1.600	10.00	.22	2.33	11.74	286.23	7.02	4.69	270.04	26.76
20	10.15	310.01	2.000	10.00	.21	1.58	11.79	292.79	7.09	4.96	252.26	27.00
21	10.15	300.01	2.000	10.00	.21	1.66	11.85	294.35	7.16	5.21	253.11	25.23
22	10.15	290.01	2.000	10.00	.21	1.74	11.91	296.06	7.23	5.47	254.06	25.31
23	10.11	280.01	2.000	10.00	.21	1.82	11.98	297.91	7.32	5.72	255.12	25.41
24	10.07	270.01	2.000	10.00	.21	1.90	12.06	299.91	7.41	5.98	256.29	25.51
25	10.03	260.01	2.000	10.00	.21	1.98	12.14	302.06	7.51	6.23	257.58	25.63
26	9.99	250.01	2.000	10.00	.21	2.07	12.23	304.37	7.62	6.49	259.09	25.76
27	9.95	240.01	2.000	10.00	.21	2.15	12.32	306.85	7.74	6.75	260.52	25.90
28	9.95	230.01	2.000	10.00	.21	2.23	12.42	309.50	7.86	7.01	262.19	26.05
29	9.95	220.01	2.000	10.00	.21	2.32	12.53	312.31	8.00	7.27	263.99	26.22
30	9.95	210.01	2.000	10.00	.21	2.40	12.64	315.30	8.15	7.53	265.93	26.40
31	9.95	200.01	2.000	10.00	.21	2.48	12.76	318.47	8.30	7.80	268.01	26.59

OUTFALL PIPELINE

TOTAL DISCHARGE = 8.07 CUM/SEC
DIAMETER OF OUTFALL PIPELINE = 2.000 M
VELOCITY IN OUTFALL PIPELINE = 2.57 M/SEC
TOTAL LENGTH OF MANIFOLD = 300.00 M
TOTAL LENGTH OF OUTFALL PIPELINE = 200.63 M
TOTAL HEAD AT SHORE = 11.69 M