

W
462

KEUFFEL & ESSER CO.

DRAWING MATERIALS
AND
SURVEYING INSTRUMENTS.
NEW YORK.

CHICAGO. ST. LOUIS. SAN FRANCISCO. MONTREAL.

TABLES FOR EXCAVATIONS AND EMBANKMENTS.

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.
ROADWAY 18 FEET WIDE. SIDE SLOPES 1 TO 1.
FOR SINGLE TRACK EXCAVATION.

"Copyright, 1895, by Keuffel & Esser Co."

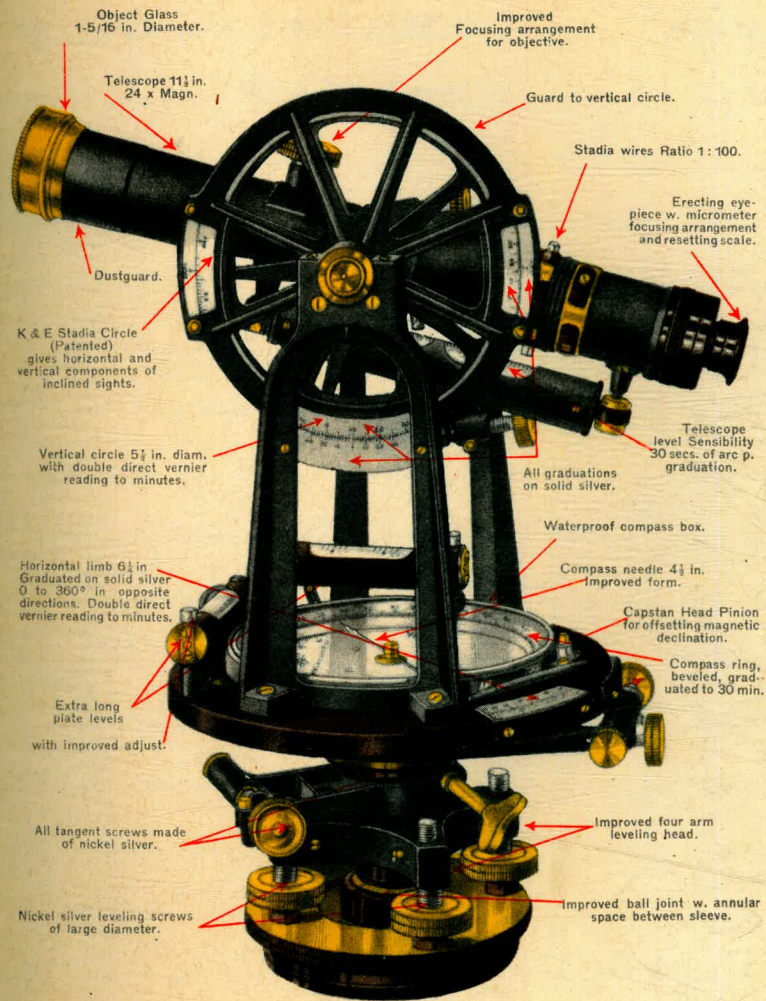
	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	0
1	10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9	1
2	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	2
3	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	3
4	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	4
5	14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	5
6	15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9	6
7	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	7
8	17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	8
9	18.0	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9	9
10	19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	19.8	19.9	10
11	20.0	20.1	20.2	20.3	20.4	20.5	20.6	20.7	20.8	20.9	11
12	21.0	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9	12
13	22.0	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9	13
14	23.0	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9	14
15	24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9	15
16	25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9	16
17	26.0	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9	17
18	27.0	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9	18
19	28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	19
20	29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	20
21	30.0	30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	30.9	21
22	31.0	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9	22
23	32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9	23
24	33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9	24
25	34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9	25
26	35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9	26
27	36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9	27
28	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9	28
29	38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9	29
30	39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	30
31	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	31
32	41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	32
33	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	33
34	43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9	34
35	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9	35
36	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	36

Calculated by Julion A. Hall, M. Am. Soc. C. E.

462

UNIVERSITY OF MICHIGAN
LIBRARY

EXTRA FINE ENGINEERS' TRANSIT
No. 5060 S
KEUFFEL & ESSER CO., N.Y.



Object Glass
1-5/16 in. Diameter.

Improved
Focusing arrangement
for objective.

Telescope 11 1/2 in.
24 x Magn.

Guard to vertical circle.

Stadia wires Ratio 1:100.

Erecting eye-
piece w. micrometer
focusing arrangement
and resetting scale.

Dustguard.

K & E Stadia Circle
(Patented)
gives horizontal and
vertical components of
inclined sights.

Telescope
level Sensibility
30 secs. of arc p.
graduation.

Vertical circle 5 1/2 in. diam.
with double direct vernier
reading to minutes.

Waterproof compass box.

Horizontal limb 6 1/2 in.
Graduated on solid silver
0 to 360° in opposite
directions. Double direct
vernier reading to minutes.

Compass needle 4 1/2 in.
Improved form.

Capstan Head Pinion
for offsetting magnetic
declination.

Compass ring,
beveled, grad-
uated to 30 min.

Extra long
plate levels
with improved adjust.

All tangent screws made
of nickel silver.

Improved four arm
leveling head.

Nickel silver leveling screws
of large diameter.

Improved ball joint w. annular
space between sleeve.

ALSO MADE WITH
INTERNAL FOCUSING TELESCOPE
PRACTICALLY DUST AND MOISTURE PROOF.

EL CAPITAN DAM

133881
11371

Computations for final rock Embankment

from N 3100 to N 3510

P. 1 to 79

By J. W. Harris.

East	N3160 D.S.	Ht	Mean Ht	Dist.	Area in Sq. Ft.
4830	596.5	596.6	0.0		
				1.2 x 3.5 =	4.2
4836.9 ^v	700.0	597.6	2.4		
				2.15 x 3.1 =	6.7
40	700.0	98.1	1.9		
50	"	97.0	3.0	6.75 x 10 =	67.5
60	"	97.3	2.7		
70	"	99.4	0.6 _x		
				1.0 x 4.7 =	4.7
74.7	700.0	98.6	1.4		
				0.7 x 2.2 =	1.5
4876.9 ^v	700.0	700.0	0.0		
					866 sq. ft. ✓

From El. 700.0 to 750.9 = $\frac{19}{2} \times 50.9 = 482.1$ ft²

750.9 to 768.5 = $\frac{3+3}{2} \times 17.6 = 52.8$ ft²

768.5 to 771.5 = $\frac{1563}{2} + 13 \times 3 = 46.9$ ft²

East	N3160. 4.5.	Ht	Mean Ht	Dist.	Area in Sq. Ft.
From	667.5 to 700.5 = 73.8				$\frac{58.6}{2} + 43.5 \times 33 = 1935.4$ sq. ft
5153.7	667.5	667.5	0.0		
				2.05 x 6.3 =	12.9
60	67.5	63.4	4.1		
				5.3 x 3.8 =	20.1
63.8	67.5	61.0	6.5		
				6.2 x 6.2 =	38.4
70	667.5	61.6	5.9		
80	"	62.5	5.0		
90	"	63.0	4.5		
5200	"	63.3	4.2	22.75 x 10 =	227.5
10	"	63.6	3.9		
20	"	63.1	4.4		
				2.2 x 7.5 =	16.5
5227.5	667.5	667.5	0.0		
					2250.8 sq. ft. ✓
From	768.5 to 771.5 = $\frac{1581}{2} + 13 \times 3 =$				47.6 ft ²
"	751.2 to 768.5 = $\frac{1175}{2} + 10 \times 17.3 =$				203.3 ft ²
"	700.5 to 751.2 = $\frac{235}{2} + 13.5 \times 50.7 =$				1191.4 ft ²

N 3170

Downstream

East	Top Elev.	Bottom Elev.	Ht.	Mean Dist. ft.	Area Sq.ft.
4820.5	691.9	691.9	0.		
30	96.6	91.2	5.4	2.7 x 9.5	25.6
36.9	700.1	92.4	7.7	6.5 x 6.9	44.8
40	00.1	92.9	7.2	7.5 x 3.1	23.2
50	00.1	92.4	7.7	15. x 10	150.0
60	00.1	92.7	7.4		
63.8	00.1	92.7	7.4	7.4 x 3.8	28.1
				3.7 x 13.1	48.5
76.9	700.1	700.1	0		
	✓	✓	✓	✓	✓
					320.2 sq. ft.

$$\text{From El. } 700.1 \text{ to El. } 751.0 = \frac{30 + 8}{2} \times 50.9 = 967.1 \text{ } \square$$

$$\text{" } 751.0 \text{ to } 768.5 = \frac{3 + 3}{2} \times 17.5 = 52.5 \text{ } \square$$

$$\text{" } 768.5 \text{ to } 771.5 = \frac{15.03}{2} \times 3 = 46.9 \text{ } \square$$

N 3170

J.W.W. - 1

Up stream

East	Top Elev.	Bottom Elev.	Ht.	Mean Dist. ft.	Area Sq.ft.
5102.17	700.6	700.6	0.		
10	00.6	695.6	5.0	2.5 x 7.83	19.6
20	00.6	89.2	11.4		
30	00.6	82.7	17.9	43.95 x 10	439.5
40	00.6	76.3	24.3		
				26.1 x 5.67	148.0
45.67	00.6	72.7	27.9		
50	698.8	69.9	28.9	28.4 x 4.23	123.0
60	94.7	63.5	31.2	62.5 x 10	625.0
70	90.7	57.1	33.6		
				33.7 x 0.8	27.0
70.8	90.4	56.5	33.9		
				31.9 x 9.2	293.5
80	86.7	56.8	29.9		
90	82.6	58.3	24.3		
5200	98.6	58.8	19.8	81.3 x 10	813.0
10	94.5	58.7	15.8		
20	670.5	657.6	12.9		
	✓	✓	✓	✓	✓

N 3170
up stream

East	Top Elev.	Bottom Elev.	Ht.	Mean Ht.	Dist.	area Sq. ft
5230	666.5	655.8	10.7			
5240	62.4	54.4	8.0	26.4	10	264.00
50	58.4	55.9	2.5			
				12.5	3.5	4.4
53.5	657.0	657.0	.0			

2757.0 sq. ft.

From El. 768.5 to 771.5	$\frac{15.85}{2}$	$= 18.7 + 13 \times 3$	$= 47.6$ sq.
" " 751.2 to 762.5	$\frac{11.35}{2}$	$= 13.5 + 10 \times 17.3$	$= 203.3$ sq.
" " 700.6 to 751.2	$\frac{23.5}{2}$	$= 33.5 + 13.5 \times 50.6$	$= 1189.1$ sq.

225.0

N 3180

2

Downstream

East	Top Elev.	Bottom El.	Ht.	Mean Ht.	Dist.	area Sq. ft
4805	684.1	684.1	.0			
						12 x 5 = 60
10	86.6	84.2	2.4			
20	91.6	85.9	5.7	11.6	10	= 116.0
30	96.6	87.2	9.4			
						10.7 x 6.9 = 73.8
4836.9	700.1	688.1	12.0			
						11.8 x 3.1 = 36.7
40	00.1	88.4	11.7			11.85 x 10 = 118.5
50	00.1	88.1	12.0			
						11.65 x 6.7 = 78.1
56.7	00.1	88.8	11.3			
						10.4 x 3.3 = 34.3
60	00.1	90.6	9.5			6.7 x 10 = 67.0
70	00.1	96.2	3.9			
						1.95 x 6.9 = 13.5
76.92	700.1	700.1	0			

543.9 sq. ft.

East

N 3180
D5.

From El. 700.1 to 751.2 = $\frac{30+8}{2} \times 51.1 = 970.9 \text{ } \square$
 " 751.2 to 768.6 = $\frac{3+3}{2} \times 17.4 = 52.2 \text{ } \square$
 " 768.6 to 771.6 = $\frac{18.7+13}{2} \times 3 = 46.9 \text{ } \square$

5160

694.9

663.5

 31.4 Ht. Mean Dist. Area Sq. Ft.
 $62.8 \times 10 = 628.0$

70 90.9 57.1 33.8

34.75, 91 = 316.2

5179.1 687.0 51.3 35.7

35.5, 09 = 31.9

80 86.8 51.4 35.4

90 82.7 52.0 30.7

5200 78.7 53.1 25.6

10 74.6 53.8 20.8

20 70.6 53.9 16.7 $144.15 \times 10 = 1441.5$

30 66.5 51.4 15.1

40 62.4 48.1 14.3

50 58.4 51.9 6.5

5256 655.9 655.9 0 $3.25 \times 6 = 19.5$

10 00.7 695.6 5.1

20 00.7 89.2 11.5

30 00.7 82.8 17.9

40 00.7 76.4 24.3

 $44.1 \times 10 = 441.0$ $26.1 \times 5.67 = 148.0$

45.67 00.7 72.8 27.9

 $28.45 \times 4.33 = 123.2$

50 699.0 670.0 29.0

N 3180 up stream

East

	Ht.	Mean Ht.	Dist.	Area Sq. Ft.
5102.2	700.7	700.7	0	
				$2.55 \times 7.8 = 19.9 \text{ Sq. Ft.}$
10	00.7	695.6	5.1	
20	00.7	89.2	11.5	
30	00.7	82.8	17.9	
40	00.7	76.4	24.3	
45.67	00.7	72.8	27.9	
50	699.0	670.0	29.0	

 $2.55 \times 7.8 = 19.9 \text{ Sq. Ft.}$

5256 655.9 655.9 0

 $3.25 \times 6 = 19.5$

10 00.7 695.6 5.1

20 00.7 89.2 11.5

30 00.7 82.8 17.9

40 00.7 76.4 24.3

83

 $44.1 \times 10 = 441.0$ $26.1 \times 5.67 = 148.0$

45.67 00.7 72.8 27.9

 $28.45 \times 4.33 = 123.2$

50 699.0 670.0 29.0

From El. 768.6 to 771.6 = $\frac{15.85}{2} + 13 \times 3 = 47.6 \text{ } \square$

" 751.3 to 768.6 = $\frac{11.75}{2} + 10 \times 17.3 = 203.3 \text{ } \square$

" 700.7 to 751.3 = $\frac{23.5}{2} + 13.5 \times 50.6 = 1189.1 \text{ } \square$

N3190
Downstream

East	Ht.	Mean	Dist.	Area	Sq. ft
4800	681.7	681.7	.0		
10	86.7	79.0	7.7		
20	91.7	82.0	9.7	$19.45 \times 10 = 194.5$	
30	96.7	84.9	11.8		
4836.9	700.2	82.6	17.6	$14.7 \times 6.9 = 101.4$	

				$18.1 \times 3.1 = 56.1$	
40	00.2	81.6	18.6	$18.0 \times 5 = 90.0$	
45	00.2	82.7	17.5	$16.25 \times 5 = 81.2$	
50	00.2	85.2	15.0	$18.95 \times 10 = 189.5$	
60	00.2	90.7	9.5		
70	00.2	96.3	39	$1.95 \times 6.92 = 13.5$	

4876.92 700.2 700.2 .0

726.2

From El. $700.3 \frac{1}{2}$ to $751.3 = \frac{30+8}{2} \times 51 = 969.0$
 " " $751.3 \frac{1}{2}$ to $768.8 = \frac{3+3}{2} \times 17.5 = 52.5$
 " " $768.8 \frac{1}{2}$ to $771.8 = \frac{18.25+13}{2} \times 3 = 46.9$

N3190
upstream

East	Top	Bottom	Ht.	Mean Dist.	Area	Sq. ft
5102.19	700.7	700.7	.0			
					$2.5 \times 7.83 = 19.6$	
5110	00.7	695.7	5.0			
20	00.7	89.2	11.5			
30	00.9	82.8	17.9	$39.05 \times 10 = 390.5$		
40	00.7	76.4	14.3			
					$21.1 \times 5.67 = 119.6$	
5145.67	00.7	72.8	27.9			
					$28.4 \times 4.33 = 123.0$	
50	698.9	70.0	28.9			
60	94.9	63.5	31.4			
70	90.8	57.1	33.7			
80	86.8	50.7	36.1			
90	82.7	44.3	38.4			
5200	781.7	46.9	32.0	$2650.5 \times 10 = 2650.5$		
10	74.6	48.5	26.1			
20	70.5	49.0	21.5			
30	66.5	45.2	21.3			
40	62.4	642.2	20.2			

N3190 upstream					
East	Top	Bottom	Ht.	Mean Dist.	Area Sq. ft.
5250	658.4	644.8	13.6	$237 \times 10 = 2370$	
60	654.3	654.3	0		
					3540.2

From El. 768.7 to 771.7 = $\frac{15.25}{2} \times 3 = 47.6$

" " 751.4 to 768.7 = $\frac{16.75}{2} \times 17.3 = 289.8$

" " 700.7 to 751.4 = $\frac{23.5}{2} \times 50.7 = 1191.4$

N3200 D.S.					
East	Top	Bottom	Ht.	Mean Dist.	Area Sq. ft.
From El.	700.3	751.3	$\frac{19}{2}$	$30 \times 8 = 240$	$240 \times 51 = 9690$
"	751.3	768.8	$\frac{3+3}{2}$	17.5	51.5
"	768.8	771.8	$\frac{18.5}{2}$	13×3	469.6

N3200 Downstream					
East	Top	Bottom	Ht.	Mean Dist.	Area Sq. ft.
4783	673.2	673.2	0	$0.85 \times 7 = 6.0$	
90	76.7	75.0	1.7		
4200	81.7	73.9	7.8		
10	86.8	76.7	10.1	$42.45 \times 10 = 424.5$	
20	91.8	76.5	15.3		
30	96.8	80.0	16.8		
					$18.95 \times 6.92 = 131.1$
4876.92	700.3	79.2	21.1		
					$70.85 \times 3.08 = 642.2$
40	00.3	79.7	20.6		
50	00.3	85.3	15.0		
60	00.3	90.8	9.5	$36.75 \times 10 = 367.5$	
70	00.3	96.4	3.9		
					$1.95 \times 6.92 = 13.5$
4876.92	700.3	700.3	0		
					1584.8

H3200
Upstream

6

Ht. Mean Dist. Area Sqft

5195 680.7 641.1 39.6

$39 \times 5 = 195.0$

$38.9 \times 5 = 194.5$

5200 78.7 40.5 38.2

10 74.6 40.8 33.8

20 70.5 42.3 28.2

30 66.5 41.1 25.4

$1523 \times 10 = 15230$

40 62.4 38.2 24.2

50 58.4 40.8 17.6

60 54.3 46.3 8.0

$4 \times 4 = 16.0$

5164 652.7 652.7 .0

40081.4

East H3200
Upstream
Ht. Mean Dist. Area Sqft.

5102.17 700.7 700.7 .0

$2.5 \times 7.83 = 19.6$

10 00.7 696.7 5.0

20 00.7 89.2 11.5

$44.05 \times 10 = 440.5$

30 00.7 82.8 17.9

40 00.7 76.4 24.3

$26.1 \times 5.67 = 148.0$

5145.67 00.7 72.8 27.9

$28.4 \times 4.33 = 123.0$

50 698.9 70.0 28.9

60 94.9 63.5 31.4

70 90.8 57.1 33.7

$134.85 \times 10 = 1348.5$

80 86.8 50.7 36.1

90 682.7 644.3 38.4

From El. 768.8 to 771.8 = $\frac{15.85}{2} + 13 \times 3 = 47.6$

" " 751.5 to 768.8 = $\frac{11.75}{2} + 10 \times 17.3 = 203.3$

" " 700.7 to 751.5 = $\frac{23.5}{2} + 13.5 \times 50.8 = 1193.8$

N 3220
Downstream

East	Ht.	Mean Dist.	area	Sq. ft
4800	681.8	664.7	17.1	$15.85 \times 5 = 79.2$
10	86.8	67.2	19.6	$61.8 \times 10 = 618.0$
20	91.9	69.6	22.3	
30	96.9	74.2	22.7	$22.55 \times 6.92 = 156.0$
4836.92	700.4	78.0	22.4	$18.75 \times 13.8 = 245.3$
50	00.4	85.3	15.1	
60	00.4	90.9	9.5	$24 \times 10 = 240.0$
70	00.4	96.5	13.9	$6.95 \times 6.92 = 48.1$
4876.92	700.4	700.4	.0	1675.14
$\text{Area El } 700.4 \text{ to } 751.3 = \frac{30+19}{2} \times 50.9 = 967.1$ $\text{" } 751.3 \text{ to } 768.9 = \frac{3+3}{2} \times 17.6 = 52.8$ $\text{" } 768.9 \text{ to } 771.9 = \frac{15+3}{2} \times 3 = 46.9$				

H 3220
UPSTREAM J.W.W. 9

East	Ht.	Mean Dist.	area	Sq. ft
5102.17	700.9	700.9	.0	$2.55 \times 7.83 = 20.0$
10	00.9	695.8	5.1	
20	00.9	89.4	11.5	$44.15 \times 10 = 441.5$
30	00.9	83.0	17.9	
40	00.9	76.5	24.4	$26.2 \times 5.67 = 148.3$
5145.67	700.9	72.9	28.0	$28.5 \times 4.33 = 123.4$
50	699.1	70.1	29.0	
60	95.0	63.6	31.4	
70	91.0	57.2	33.8	
80	86.9	50.8	36.1	
90	82.8	44.3	38.5	
5200	78.8	37.9	40.9	$314.8 \times 10 = 3148.0$
10	74.7	36.4	38.3	
20	70.6	35.2	35.4	
30	66.6	34.2	32.4	
40	662.5	635.5	27.0	

N 3220
upstream

East	Ht.	Mean Dist	Area Sq. ft.
5250	658.4	635.2	23.2 $43.75 \times 10 = 437.5$
60	54.3	40.2	14.1
			$7.05 \times 85 = 60.0$
5268.5	650.9	650.9	.0
			4378.7^{\square}

N 3230
Downstream

East	Ht.	Mean Dist	Area Sq. ft.
4691	635.6	635.6	.0
			$1.5 \times 9 = 13.5$
4700	39.2	36.2	3.0
10	43.2	38.5	4.7 $875 \times 10 = 87.5$
20	47.2	42.1	5.1 _x
			$3.95 \times 6.92 = 27.3$
4776.9 ⁹¹	650.0	47.2	2.8
			$1.4 \times 4.08 = 5.7$

From El	768.9 to 771.9	$= \frac{1585}{2} \times 3 = 2377.5$	147.6^{\square}
"	751.6 to 768.9	$= \frac{1175}{2} \times 17.3 = 10181.25$	203.3^{\square}
"	700.9 to 751.6	$= \frac{235}{2} \times 50.7 = 5951.75$	1191.4^{\square}

4731	650.0	50.0	.0
			Nothing
4752	657.6	57.6	.0
			$3.4 \times 8 = 27.2$
60	61.7	54.9	6.8
70	66.7	56.9	9.8
80	71.8	58.4	13.4
90	76.8	60.7	16.1
			$71.05 \times 10 = 710.5$
4800	81.9	63.8	18.1
10	86.9	66.4	20.5 _x
			$22.1 \times 6 = 132.6$
16	690.0	666.3	23.7

East		N3230 Downstream			Mean Dist.	Area Sq. ft
E		Ht.	Mean Dist.	Area Sq. ft		
4	4830	697.0	674.2	22.8	23.25 x 14 = 325.5	
					22.6 x 6.92 = 156.4	
	4836.92	700.5	78.1	22.4	18.75 x 13.8 = 245.2	
	50	700.5	85.4	15.1		
	60	00.5	91.0	9.5	19 x 10 = 190.0	
	70	00.5	96.6	3.9		
					1.95 x 6.92 = 13.5	
4	4876.92	700.5	700.5	.0		
					1609.4	
48						
	From El.	700.5 to 751.5	$= \frac{30+8}{2} \times 51$		= 96.9	
	" "	751.5 to 769	$= \frac{3+3}{2} \times 17.5$		= 52.5	
	" "	769 to 772	$= \frac{15+3}{2} \times 3$		= 46.9	

East		N3230 Upstream			Mean Dist.	Area Sq. ft
E		Ht.	Mean Dist.	Area Sq. ft		
		701.0	701.0	.0		
					2.5 x 7.83 = 19.6	
	10	01.0	696.0	5.0		
	20	01.0	69.5	11.5	44.1 x 10 = 441.0	
	30	01.0	83.1	17.9		
	40	01.0	76.6	24.4		
					26.25 x 5.67 = 148.8	
	5145.67	701.0	72.9	28.1		
					35.1 x 59.33 = 2082.5	
	5205	676.8	634.7	42.1		
					41.4 x 5 = 207.0	
	10	74.8	34.1	40.7		
	20	70.7	33.4	37.3		
	30	66.6	32.2	34.4	15265 x 10 = 1526.5	
	40	62.5	31.8	30.7		
	50	58.4	36.3	22.1		
	60	54.3	38.7	15.6		
					13.3 x 5 = 66.5	
	65	52.3	41.3	11.0	6.5 x 5.67 = 36.9	
	5270.67	650.0	48.0	2.0	1.0 x 1.83 = 1.8	
	72.5	650.0	650.0	0.0		
					4530.6	

N3230
U.S.

From	El.	To	HT.	Mean Dist.	Area Sq. ft
From	769	to 772	18.7	13×3	$= 47.5$
"	751.7	to 769	13.5	10×17.3	$= 203.3$
"	701.0	to 751.7	33.5	13.5×50.7	$= 1191.4$

East

N3240
Downstream

HT.	Mean Dist.	Area Sq. ft
4687	634.1	634.1
		$1.2 \times 3 = 3.6$
40	35.2	32.8
		2.4
4700	39.2	33.5
		5.7
10	43.2	36.7
		6.5
20	47.2	38.7
		$8.5 \times$
4726.92	650.1	40.2
		9.9
		$9.2 \times 6.92 = 63.7$
30	650.1	640.9
		9.2
		$9.55 \times 3.08 = 29.5$

N3240
Downstream

12

HT.	Mean Dist.	Area Sq. ft
4736.92	650.1	644.8
		5.3
		$7.25 \times 6.92 = 50.2$
		$5.2 \times 3.08 = 16.0$
40	51.6	46.5
		5.1
50	56.7	48.0
		8.7
60	61.8	51.7
		10.1
70	66.8	53.7
		13.1
		$83.2 \times 10 = 832.0$
80	71.9	55.7
		16.2
90	76.9	56.4
		20.5
4800	82.0	57.9
		$24.1 \times$
		$24.3 \times 1.5 = 36.5$
015	82.7	58.2
		24.5
		$23.5 \times 35.42 = 832.4$
4836.92	700.6	78.1
		22.5
		$11.85 \times 40 = 475.0$
4876.92	700.6	700.6
		10
		2490.4

N3240
DS.

N3240
UPSTREAM

13

East

Ht. Mean Dist. Area Sq. ft
4.75 x 9.33 = 44.3

From El 700.6 to 751.5 = $\frac{19}{2} \times 8 \times 50.9 = 967.1$

5280 650° 648.6 1.4

1.3 x 0.67 = 0.9

" " 751.5 to 769.1 = $\frac{3+3}{2} \times 17.6 = 52.8$

" " 769.1 to 772.1 = $\frac{15.63}{2} + 13 \times 3 = 46.9^{\circ}$

5280.67 650° 48.8 1.2

0.6 x 1.33 = 0.8

82 649.5 649.5 0

East

N3240
UPSTREAM

Ht. Mean Dist. Area Sq. ft.

4779.2^{sq}

5102.17 701.1 701.1 .0

14.05 x 435 = 611.2

5145.67 701.1 673.0 28.1

36.2 x 6833 = 2473.5

From El 769.1 to 772.1 = $\frac{15.85}{2} + 13 \times 3 = 47.5^{\circ}$

" " 751.8 to 769.1 = $\frac{11.75}{2} + 10 \times 17.3 = 203.3^{\circ}$

5214 73.7 28.9 443

" " 701.1 to 751.8 = $\frac{23.5}{2} + 13.5 \times 50.7 = 1191.4^{\circ}$

43.35 x 6 = 260.1

20 70.7 28.3 424

30 66.6 32.3 343

40 62.5 30.5 32.0 124.7 x 10 = 1247.0

N3250

East

DOWNSTREAM

50 58.5 30.5 28.0

4685 633.3 633.3 .0

60 54.4 36.0 184^x

2.45 x 5 = 12.2

13.25 x 10.67 = 141.4

70 35.3 30.4 49

5270.67 650.0 641.9 81

4700 629.3 629.0 10.3^x

7.6 x 10 = 76.0

East

N 3250

up stream

Ht. Mean Dist. Area Sq.ft

5260 650.2 634.5 15.7 $32.65 \times 10 = 326.5$

70 50.2 37.0 13.2

$13 \times 0.67 = 8.7$

5270.67 50.2 37.4 12.8

$10.15 \times 9.33 = 94.7$

80 50.2 42.7 7.5

$3.75 \times 6 = 22.5$

5286 648.1 648.1 .0

5027.0^{\square}

From

N 3260

Down stream

Ht. Mean Dist. Area Sq.ft

15

East 4682.5 632.4 632.4 .0

4682.5 632.4 632.4 .0

$3.65 \times 7.5 = 27.4$

90 35.4 28.1 7.3

4700 39.5 26.4 13.1

$40.05 \times 10 = 400.5$

10 43.5 28.1 15.4

20 47.5 31.7 15.8

$15.5 \times 6.92 = 107.3$

4726.92 650.3 35.1 15.2

$14.45 \times 3.08 = 44.6$

30 50.3 36.6 13.7

$12.8 \times 6.92 = 88.6$

4736.92 50.3 38.4 11.9

$11.5 \times 3.08 = 35.4$

40 50.3 39.2 11.1

50 50.3 41.0 9.2 $19.85 \times 10 = 198.5$ 60 50.3 40.1 $10.2 \times 10.25 \times 4 = 41.0$ 64 50.3 40.0 $10.3 \times 9 \times 6 = 54.0$ 70 50.3 42.6 7.7 $9 \times 6 = 54.0$ 80 50.3 47.1 3.2 $5.45 \times 10 = 54.5$

$1.6 \times 6.92 = 11.1$

4786.92 650.3 650.3 .0

N3260
Downstream

From 650.3 to 700.9
East

$\frac{50+40}{2} \times 50.6 = 2277.4$

3339.9⁴

16

N3260
upstream

East	Ht.	Mean Dist.	Area Sq. ft
5250	50.2	27.8	22.4
5260	650.2	629.2	21.0
70	50.2	34.4	15.8 ^x
			$15.75 \times 0.67 = 10.5$
5270.67	50.2	34.5	15.7
			$1485 \times 9.33 = 138.6$
80	50.2	36.2	14.0
90	46.5	38.9	7.6
			$10.8 \times 10 = 108.0$
			$3.8 \times 4 = 15.2$
5294	646.9	646.9	.0
			5278 ⁴

N3260
upstream

From 650.2 to 701.2

$\frac{89.6+49.5}{2} \times 51 = 3394.4$

Ht.	Mean Dist.	Area Sq. ft
5181	650.2	650.2
		$2.9 \times 9 = 26.1$
90	50.2	44.4
5200	50.2	37.9
		$12.3 \times 46.5 \times 10 = 465.0$
10	50.2	31.5
		$18.7 \times 9.25 \times 10 = 172.875$
20	50.2	25.0
		25.2
20	50.2	24.4
		25.8
30	50.2	25.8
		$24.4 \times 112.1 \times 10 = 1121.0$
40	650.2	626.7
		23.5

H 3270 Down stream			
East	Ht.	Mean Dist.	Area Sq. ft
4680.5	631.6	631.6	0
			$4.65 \times 9.5 = 44.2$
90	35.4	26.1	93
4700	39.4	25.5	13.9
			$40.55 \times 10 = 405.5$
10	43.4	28.9	145
20	47.4	32.4	150
			$15.5 \times 6.9 = 106.9$
4726.9	650.2	34.2	160
			$15.6 \times 3.1 = 48.4$
30	50.2	35.0	15.2
			$15 \times 6.9 = 103.5$
4736.9	50.2	35.4	14.8
			$14.7 \times 3.1 = 45.6$
40	50.2	35.6	14.6
			$14.8 \times 10 = 148.0$
50	50.2	35.2	15.0
			$13.4 \times 5 = 67.0$
55	50.2	38.4	11.8
			$12.6 \times 2.5 = 31.5$
4757.5	650.2	632.8	13.4
			$6.7 \times 29.4 = 197.0$

H 3270 Down stream			
East	Ht.	Mean Dist.	Area Sq. ft
4786.9	650.2	650.2	0.0
From 650.2 to 700.9 = $\frac{50+40}{2} \times 50.7 = 2281.5 \text{ } \square'$			
<u>3479.1</u> ⁴			

H 3270 Up stream			
East	Ht.	Mean Dist.	Area Sq. ft
From 650.3 to 701.2 = $\frac{89.8+43.5}{2} \times 50.9 = 3397.5 \text{ } \square'$			
5180.9	650.3	650.3	0
			$12.15 \times 37.6 = 456.8$
5218.5	50.3	26.0	24.3
			$24.25 \times 1.5 = 36.4$
20	50.3	26.1	24.2
30	50.3	27.1	23.2
			$70.25 \times 10 = 702.5$
40	50.3	26.7	23.6
50	650.3	627.6	22.7

East

N 3270
upstream

	Ht.	Mean Dist.	Area	Sq. Ft.
5260	650.3	627.8	22.5	$446.5 \times 10 = 446.5$
70	50.3	28.7	21.6	

$$21.45 \times 0.67 = 14.4$$

5270.67	50.3	29.0	21.3	
---------	------	------	------	--

$$19.15 \times 9.33 = 178.7$$

80	50.3	33.3	17.0	
----	------	------	------	--

$$16.25 \times 0.67 = 11.3$$

5280.67	50.3	33.6	16.7	
---------	------	------	------	--

$$13.5 \times 9.33 = 126.0$$

90	46.5	36.2	10.3	
----	------	------	------	--

$$5.15 \times 8 = 41.2$$

5298	643.3	643.3	10	
------	-------	-------	----	--

$$540630$$

East

N 3280
Downstream

18

	Ht.	Mean Dist.	Area	Sq. Ft.
4673	628.6	628.6	.0	

$$3.35 \times 7 = 23.4$$

80	31.4	24.7	6.7	
----	------	------	-----	--

90	35.4	23.7	11.7	
----	------	------	------	--

4700	39.5	23.5	16.0	$58.65 \times 10 = 586.5$
------	------	------	------	---------------------------

10	43.5	25.5	18.0	
----	------	------	------	--

20	47.5	28.3	19.2	
----	------	------	------	--

$$19.75 \times 6.9 = 136.3$$

4726.9	650.3	30.0	20.3	
--------	-------	------	------	--

$$19.9 \times 3.1 = 61.7$$

30	50.3	30.8	19.5	
----	------	------	------	--

$$19.3 \times 6.9 = 133.2$$

4736.9	50.3	31.2	19.1	
--------	------	------	------	--

$$19.05 \times 3.1 = 59.1$$

40	50.3	31.3	19.0	
----	------	------	------	--

$$18.95 \times 5.5 = 104.2$$

4745.5	50.3	31.4	18.9	
--------	------	------	------	--

$$9.45 \times 41.4 = 391.2$$

4786.9	650.3	650.3	.0	
--------	-------	-------	----	--

N 3280
D.S.

From 650.3 to 701.0 = $\frac{50+40}{2} \times 50.7 = 2281.5$ ft

3777.1 ft

N 3280
upstream

From 650.3 to 701.3 = $\frac{19.7+43.5}{2} \times 51.0 = 3396.6$ ft

	Ht.	Mean Dist.	Area	Sq. ft.
5180.9	650.3	650.3	12.65	391 = 494.6

5220	50.3	25.0	25.3	
------	------	------	------	--

$25.3 \times 12 = 303.6$

32	50.3	25.0	25.3	
----	------	------	------	--

see next page

5225	619.6	619.6	.0	
------	-------	-------	----	--

$1.75 \times 5 = 8.8$

30	623.5	20.0	3.5	
----	-------	------	-----	--

$4.05 \times 2 = 8.1$

32	625.0	620.4	4.6	
----	-------	-------	-----	--

East

N 3280
U.S.

19

	Ht.	Mean Dist.	Sq. ft.
5232	650.3	620.4	29.9
5240	650.3	21.8	28.5
50	50.3	24.1	26.7
60	50.3	27.8	22.5
70	50.3	27.6	22.7
80	50.3	27.7	22.6
5200.67	50.3	28.0	22.3

$22.45 \times 0.67 = 15.0$

$18.2 \times 9.33 = 169.8$

90	46.6	32.5	14.1
5300	42.5	35.0	7.5
5303.5	641.1	641.1	.0

$10.8 \times 10 = 108.0$

$3.75 \times 3.5 = 13.1$

5720.7 ft

East	N 3290 Downstream			Ht.	Mean	Dist.	Area	Sq. ft.
4664	625.0	625.0	0					
							$1.65 \times 6 = 9.9$	
70	27.4	24.1	33				$74 \times 10 = 74.0$	
80	31.4	19.9	11.5				$12.25 \times 7 = 85.8$	
87	34.2	21.2	13.0				$15.05 \times 5 = 75.2$	
92	36.3	19.2	17.1				$14.3 \times 3 = 42.9$	
95	37.5	26.0	11.5				$11.5 \times 5 = 57.5$	
4700	39.5	28.0	11.5				$14.65 \times 3 = 44.0$	
4703	40.7	22.9	17.8				$18.6 \times 7 = 130.2$	
10	43.5	24.1	19.4				$20.95 \times 10 = 209.5$	
20	47.5	25.0	22.5				$23.2 \times 6.9 = 160.1$	
47269	650.3	26.4	23.9				$23.55 \times 3.1 = 73.0$	
30	50.3	27.1	23.2				$23.35 \times 5.5 = 128.4$	
4735.5	650.3	626.8	23.5				$11.75 \times 51.4 = 604.0$	

East	N 3290 Downstream			J.W.V.	20			
	Ht.	Mean	Dist.	Area	Sq. ft.			
4726.92	650.3	650.3	0.0					
From 650.3 to 701.3 = $\frac{50+40}{2} \times 50.7 = 2281.5$ sq'								
<hr/>								
3976.0 sq'								
<hr/>								
East	N 3290 Upstream			Ht.	Mean	Dist.	Area	Sq. ft.
From 650.3 to 701.3 = $\frac{89.7+43.5}{2} \times 51.0 = 3396.6$ sq'								
5180.9	650.3	650.3	0				$12.65 \times 39.1 = 494.6$	
5220	50.3	25.0	25.3				$25.3 \times 12 = 303.6$	
32	650.3	625.0	25.3					
See Next page								

East

N3290
upstream

			Ht.	Mean Dist.	Area Sq. ft.
5224.5	619.2	619.2	.0		
					$1.85 \times 5.5 = 10.2$
30	23.5	19.8	3.7		
					$4.45 \times 2 = 8.9$
32	625.0	19.8	5.2		
	Nothing				
32	650.3	19.8	30.5		
					$30.6 \times 8 = 244.8$
40	50.3	19.6	30.7		
50	50.3	22.2	28.1		
60	50.3	27.2	23.1	101.5	$10 = 1015.0$
70	50.3	27.1	23.2		
80	50.3	26.8	23.5		
					$23.45 \times 0.67 = 15.7$
5280.67	50.3	26.9	23.4		
					$20.6 \times 9.33 = 192.2$
90	46.5	28.7	17.8		
					$14.35 \times 10 = 143.5$
5300	42.5	31.6	10.9		
					$10 \times 10 = 100$
10.8	638.2	638.2	.0		
					$5.45 \times 10.8 = 58.9$
					5884.0

East

N3300
Downstream

			Ht.	Mean Dist.	Area Sq. ft.
4681.5	620.0	620.0	.0		
					$2 \times 8.5 = 17.0$
60	23.4	19.4	4.0		
70	27.4	17.9	9.5		
80	31.5	16.4	15.1		
90	35.5	22.3	13.2	89.95	$10 = 899.5$
4700	39.5	22.4	17.1		
10	43.6	22.9	20.7		
20	647.6	622.9	24.7		

N3300
Downstream

	Ht.	Mean Dist.	Area Sq. ft.
		$25.95 \times 6.92 = 179.6$	
4726.92	650.4	623.2	27.2
		$27.1 \times 108 = 29.3$	
4728.	50.4	23.4	27.0
		$13.5 \times 58.92 = 795.4$	
4786.92	650.4	650.4	.0

$$\text{From } 650.4 \text{ to } 701.2 = \frac{50 + 40}{2} \times 50.8 = 2286.4$$

$$42068.4$$

East

N3300
upstream

22

$$\text{From } 650.4 \text{ to } 701.4 = \frac{89.8 + 43.5}{2} \times 57.0 = 3399.15$$

	Ht.	Mean Dist.	Area Sq. ft.
		$12.7 \times 39.2 = 497.8$	
5120.8	650.4	650.4	.0
		$25.4 \times 2 = 50.8$	
5220	50.4	25.0	25.4
		$25.4 \times 2 = 50.8$	
32	50.4	25.0	25.4
		$1.05 \times 4 = 4.2$	
5216	612.7	12.7	.0
		$4.6 \times 10 = 46.0$	
20	15.8	13.7	2.1
		$7.75 \times 2 = 15.5$	
30	23.5	16.4	7.1
		$7.75 \times 2 = 15.5$	
32	25.0	16.6	8.4
		$33.35 \times 8 = 266.8$	
32	50.4	16.6	33.8
		$31.9 \times 10 = 319.0$	
40	50.4	17.5	32.9
		$30.9 \times 10 = 309.0$	
50	650.4	619.5	30.9

East

N 3300
Upstream

Ht. Mean Dist. Area Sq.ft.

	Ht.	Mean Dist.	Area Sq.ft.
5260	650.4	621.9	28.5 $29.7 \times 10 = 297.0$ $25.6 \times 15 = 384.0 \checkmark$
75	50.4	27.7	22.7 $27.45 \times 5.67 = 155.6 \checkmark$
5280.67	50.4	27.2	23.2 $21.35 \times 9.33 = 199.2$
90	46.6	27.1	19.5 $11.4 \times 10 = 114.0$
5300	42.6	27.8	14.8 $28.55 \times 10 = 285.5$
10	38.6	30.6	8.0 $4 \times 2 = 8.0$
06	40.2	29.6	10.6 $40 \times 6.6 = 26.4$
5316.6	635.9	635.9	0 $5.3 \times 7 = 37.1$
10	627.4	637.4	0

5946.9

N 3310
Downstream

23

East

Ht. Mean Dist. Area Sq.ft.

	Ht.	Mean Dist.	Area Sq.ft.
4641	615.8	615.8	0 $16 \times 9 = 144$
50	19.4	16.2	3.2
60	23.5	15.4	8.1
70	27.5	15.5	12.0
80	31.5	17.8	13.7
90	35.6	20.4	15.2 $106 \times 10 = 1060.0$
4700	39.6	20.8	18.8
10	43.7	20.5	23.2
20	47.7	20.9	26.8 _x
			$27.3 \times 2 = 54.6$
22	48.5	20.7	27.8
			$27.65 \times 49 = 136.0$
4726.92	650.5	230	27.5
			$13.75 \times 60 = 825.0$
4786.92	650.5	650.5	0

From 650.5 to $701.4 = \frac{50+40}{2} \times 50.9 = 2290.5$
 4380.54

N 3310
upstream

24

Ht Mean Dist Area Sq.ft.
6.9 x 10 = 69.0

5230 623.5 613.7 9.8 x
10.5 x 2 = 21.0

32 v 625.0 13.8 11.2

32 ^ 650.4 13.8 36.6

36.4 x 8 = 291.2

40 50.4 14.2 36.2

50 50.4 16.8 33.6

60 50.4 19.2 31.2 123.5 x 10 = 1235.0

70 50.4 22.6 27.8

80 50.4 24.8 25.6 x

25.55 x 0.67 = 17.1

5280.7 50.4 24.9 25.5

22.85 x 9.33 = 213.2

90 46.6 26.4 20.2

5300 42.6 25.4 17.2 32.8 x 10 = 328.0

10 38.6 27.6 11.0 x

7.0 x 7 = 49.0

17 635.7 632.7 3.0

East

N 3310
upstream

From 650.4 to 701.2 = $\frac{89.9 + 43.5}{2} \times 50.8 = 3388.4 \text{ ft}^2$

Ht.	Mean Dist	Area Sq.ft
5180.7	650.4	50.4
		.0

12.7 x 39.3 = 499.1

5220	50.4	25.0	25.4
------	------	------	------

25.4 x 12 = 304.8

32	v	50.4	25.0	25.4
----	---	------	------	------

5212.5	^	610.0	610.0	.0
--------	---	-------	-------	----

2.0 x 7.5 = 15.0

20		615.8	611.8	4.0
----	--	-------	-------	-----

East		N3310 Upstream			
		Ht.	Mean	Dist.	Area Sq.ft.
5370	6345	33.1	1.4		
				$2.9 \times 3 = 8.7$	
23	33.3	33.3	.0		
				6439.5^A	

East		N3370 Downstream				25
		Ht.	Mean	Dist.	Area Sq.ft.	
4670	627.5	614.7	12.8			
80	31.5	15.8	15.7		$105.45 \times 10 = 1054.5$	
90	35.6	15.7	19.9			
4700	39.6	17.5	22.1			
10	43.7	18.1	25.6			
					$26.85 \times 6 = 161.1$	
16	46.1	18.0	28.1			
					$28. \times 4 = 112.0$	
20	47.7	19.8	27.9			
					$27.7 \times 6.9 = 191.7$	
4726.92	650.5	23.0	27.5			
					$13.75 \times 60 = 825.0$	
4786.92	650.5	650.5	.0			

East		N3370 Downstream			
		Ht.	Mean	Dist.	Area Sq.ft.
4625	609.3	609.3	.0		
				$0.85 \times 5 = 4.3$	
30	11.3	9.6	1.7		
40	15.4	10.4	5.0		
50	19.4	12.9	6.5		
60	623.5	613.7	9.8		

From 650.5 to 701.5 = $\frac{50+40}{2} \times 51.0 = 2295.0^A$

4643.6^A

East

N3320
Upstream

Area $650.4 \times 701.5 = \frac{89.6 + 43.5}{2} \times 51.1 = 3400.70$

Ht. Mean Dist. Area Sq. Ft.

5781.1	650.4	650.4	.0	
				$12.6 \times 38.9 = 490.1$
5720	50.4	25.2	25.2	
				$25.2 \times 12 = 302.4$
32	50.4	25.2	25.2	
5207	606.0	606.0	.0	
				$1.15 \times 3 = 3.4$
10	608.3	06.0	23	
20	16.0	10.4	5.6	$13.08 \times 10 = 130.8$
30	23.5	10.8	12.7	
				$13.45 \times 2 = 26.9$
32	625.2	611.0	14.2	

East.

N3320
Upstream

Ht. Mean Dist. Area Sq. Ft.

5732	650.4	611.0	39.4	
				$38.95 \times 8 = 311.6$
40	50.4	11.9	38.5	
50	50.4	15.0	35.4	
60	50.4	19.6	30.8	$1240.5 \times 10 = 12405$
70	50.4	24.2	26.2	
80	50.4	25.6	24.8	
				$24.9 \times 0.67 = 16.7$
5280.67	50.4	25.4	25.0	
				$24.4 \times 9.33 = 227.6$
90	46.6	22.8	23.8	
5300	42.6	20.4	22.2	
				$57.45 \times 10 = 574.5$
10	38.6	20.9	17.7	
20	34.5	23.2	11.3	
				$10.95 \times 4 = 43.8$
24	32.9	22.3	10.6	
				$5.9 \times 6 = 35.4$
30	630.5	629.3	1.2	
31	630.5	630.5	0	$0.6 \times 1 = 0.6$
				6805.0

East	N3330 Downstream			Ht. Mean Dist. Area Sq. Ft.
4660	623.5	612.2	11.3	
70	27.6	13.5	14.1	$118.75 \times 10 = 1187.5$
80	31.6	13.4	18.2	
90	35.7	14.9	20.8	
4700	39.7	15.7	24.0	
10	43.8	16.4	27.4	
				$27.95 \times 2 = 55.9$
12	44.6	16.1	28.5	
				$28.25 \times 8 = 226.0$

East	N3330 Downstream			Ht. Mean Dist. Area Sq. Ft.
4615	605.3	605.3	0	
20	07.3	05.1	2.2	
				$8.55 \times 5 = 42.8$
25	09.3	04.7	4.6	
30	11.4	7.9	3.5	
40	15.4	10.5	4.9	
50	619.5	609.5	10.0	

20	47.8	19.8	28.0	
				$27.8 \times 6.9 = 191.8$
4726.9	650.6	23.0	27.6	
				$13.8 \times 60 = 828.0$
4786.9	650.6	650.6	.0	
From 650.6 to 701.5 =				$\frac{50+40}{2} \times 50.9 = 2290.5$
				<hr/> 4822.5

East

N3330
upstream

From 650.5 to 701.6 = $\frac{89.6+43.5}{2} \times 51.1 = 3400.70'$

	Ht.	Mean Dist.	Area Sq. ft.
5181.1	650.5	650.5	.0
			$12.6 \times 38.9 = 490.1$
5220	50.5	25.3	25^2
			$25^2 \times 12 = 302.4$
32	50.5	25.3	25^2
5196.5	598.0	598.0	.0
			$1.4 \times 3.5 = 4.9$
5200	600.7	99.9	2.8
10	08.4	99.7	8.7
			$31.7 \times 10 = 317.0$
20	16.1	02.6	13.5
30	23.5	07.3	16.2 _x
			$16.85 \times 2 = 33.7$
5232	625.3	07.8	17.5
32	650.5	07.8	42.7
			$41.75 \times 8 = 334.0$
40	650.5	609.7	40.8

East

N3330
upstream

28

	Ht.	Mean Dist.	Area Sq. ft.
5250	650.5	611.5	39.0
60	50.5	16.4	$34.1 \times 144.25 \times 10 = 1442.5$
70	50.5	16.1	34.4
80	50.5	17.8	32.7 _x
			$32.75 \times 0.67 = 21.9$
5280.67	650.5	17.7	32.8
			$31.45 \times 9.33 = 293.4$
90	46.7	16.6	30.4
5300	42.7	17.2	25.5
10	38.7	17.2	21.5 $84.8 \times 10 = 848.0$
20	34.6	17.5	17.1
30	30.6	19.3	11.3 _x
			$5.65 \times 8 = 45.2$
5328	627.3	627.3	.0
			7533.8^{\square}

East

N3340
Down stream

Ht. Mean Dist. Area Sq.ft

	Ht.	Mean Dist.	Area Sq.ft
4607	602.1	602.1	0
			$0.2 \times 3 = 0.6$
10	03.3	02.9	0.4
			$2.25 \times 10 = 22.5$
20	07.3	03.2	4.1*
25	09.3	03.4	5.9
			$10.35 \times 5 = 51.8$
30	11.4	06.6	4.8*
40	15.4	06.5	8.9
50	19.5	07.0	12.5
60	23.5	10.6	12.9
			$109.75 \times 10 = 1097.5$
70	27.6	11.8	15.8
80	31.6	11.5	20.1
90	35.7	11.7	24.0
4700	639.7	613.4	26.3*

East

N3340
Down stream

29

Ht. Mean Dist. Area Sq.ft.
 $27.55 \times 6 = 165.3$

4706	642.2	613.4	28.8
			$28.55 \times 6.9 = 197.0$
4726.9	650.6	622.3	28.3
			$14.15 \times 60 = 849.0$

4786.9 650.6 650.6 10

From 650.6 to 701.6 = $\frac{50+40}{2} \times 51.0 = 2295.0$ □
4678.7 □

East

N3340
UPSTREAM

From	650.6	701.7			
					$89.6 + 43.5 \times 51.1 = 3400.7'$
5181.1	650.6	650.6	0		Ht. Mean Dist. Area Sq.ft
					$12.6 \times 38.9 = 490.1$
5220	50.6	25.4	25.2		$25.2 \times 12 = 302.4$
5232	50.6	25.4	25.2		
5194.5	596.2	596.2	0		$2.05 \times 5.5 = 11.3$
5200	600.4	596.3	4.1		
10	08.1	96.1	12.0		$42.1 \times 10 = 421.0$
20	15.8	97.6	18.2		
30	623.5	603.8	19.7		$20 \times 2 = 400$
32	625.0	604.7	20.3		
32	650.6	604.7	45.9		$44.05 \times 8 = 352.4$
40	50.6	08.4	42.2		
50	50.6	09.1	41.5		
60	650.6	610.0	40.6		$122.3 \times 10 = 1223.0$

East

N3340
UPSTREAM

30

5280	650.6	612.4	38.2					
								$38.15 \times 0.67 = 25.6$
5280.67	50.6	12.5	38.1					
								$35.65 \times 9.33 = 332.6$
90	46.8	13.6	33.2					
5300	42.8	14.7	28.1					
10	38.7	15.1	23.6					$94.35 \times 10 = 943.5$
20	34.7	16.0	18.7					
30	30.6	15.9	14.7					
								$121 \times 9 = 108.9$
39	27.0	17.5	9.5					
								$4.75 \times 8 = 38.0$
5347	623.8	623.8	0					
								$7689.5'$

East

N3350
Downstream

31

Ht. Mean Dist. Area Sq. ft.

4640	615.5	606.9	8.6
50	19.5	08.3	11.2
60	23.6	08.1	15.5
70	27.6	09.7	17.9
80	31.6	09.7	21.9
90	35.7	10.5	25.2

$$124.55 \times 10 = 1245.5$$

4700	39.7	12.8	26.9
------	------	------	------

$$27.85 \times 4 = 111.4$$

04	41.3	12.5	28.8
----	------	------	------

$$28.7 \times 6 = 172.2$$

10	43.8	15.2	28.6
----	------	------	------

$$28.3 \times 10 = 283.0$$

20	47.8	19.8	28.0
----	------	------	------

$$27.8 \times 6.9 = 191.8$$

4626.92	650.6	629.0	27.6
---------	-------	-------	------

$$13.8 \times 60 = 828.0$$

4786.92	650.6	650.6	.0
---------	-------	-------	----

$$\text{From } 650.6 \text{ to } 701.8 = \frac{50+40}{2} \times 51.2 = 2304 \text{ ft.}$$

$$\frac{5170.4}{19}$$

East

N3350
Downstream

Ht. Mean Dist. Area Sq. ft.

4585	597.3	597.3	.0
------	-------	-------	----

$$1.1 \times 5 = 5.5$$

90	99.4	97.2	2.2
----	------	------	-----

$$2.3 \times 1.9 = 4.4$$

4591.9	600.0	97.6	2.4
--------	-------	------	-----

$$1.6 \times 8.1 = 13.0$$

4600	600.0	99.2	0.8
------	-------	------	-----

$$0.6 \times 1.9 = 1.1$$

4601.92	600.	99.6	0.4
---------	------	------	-----

$$1.3 \times 8.1 = 10.5$$

10	603.4	601.2	2.2
----	-------	-------	-----

20	07.4	04.2	3.2
----	------	------	-----

30	611.4	604.9	6.5
----	-------	-------	-----

100000

East

N3350
upstream

32

	Ht.	Mean Dist.	Area Sq.ft.
5200	600.4	594.5	5.9
10	08.1	95.1	13.0
20	15.8	95.4	20.4
30	23.5	99.6	23.9

$51.65 \times 10 = 516.5$

$24.05 \times 2 = 48.1$

5232	625.0	600.8	24.2
------	-------	-------	------

5232	650.6	600.8	49.8
------	-------	-------	------

$47.3 \times 8 = 378.4$

East

N3350
upstream

From 650.6 to 701.7 = $\frac{89.6 + 43.5}{2} \times 51.1 = 3400.70'$

40	50.6	05.8	44.8
----	------	------	------

Ht. Mean Dist. Area Sq.ft.

5181.1	650.6	650.6	0
--------	-------	-------	---

$12.6 \times 28.9 = 364.1$

50	50.6	07.9	42.7
----	------	------	------

60	50.6	07.7	42.9
----	------	------	------

$171.1 \times 10 = 1711.0$

70	50.6	08.2	42.4
----	------	------	------

5220	50.6	25.4	25.2
------	------	------	------

$25.2 \times 12 = 302.4$

80	50.6	09.2	41.4
----	------	------	------

$41.35 \times 0.67 = 27.7$

32	50.6	25.4	25.2
----	------	------	------

5280.67	50.6	09.3	41.3
---------	------	------	------

$38.65 \times 9.33 = 360.6$

5189	591.9	591.9	0
------	-------	-------	---

$0.4 \times 1 = 0.4$

90	46.8	10.8	36.0
----	------	------	------

5300	42.8	12.8	30.0
------	------	------	------

$61.25 \times 10 = 612.5$

70	592.6	591.8	0.8
----	-------	-------	-----

10	638.7	612.2	26.5
----	-------	-------	------

East

N3350
Upstream

Ht. Mean Dist Area Sq.ft

			Ht.	Mean Dist	Area	Sq.ft
5320	634.7	614.2	20.5			
30	30.6	14.8	15.8			
					$66.6 \times 10 = 666.0$	
40	26.6	13.6	13.0			
50	22.5	14.4	8.1			
					$4.05 \times 5 = 20.2$	
5355	620.5	620.5	.0			
					8408.6	

East

N3360
Downstream

Ht. Mean Dist Area Sq.ft

33

			Ht.	Mean Dist	Area	Sq.ft
4582	597.3	597.3	.0			
					$0.75 \times 8 = 6.0$	
90	99.4	97.9	1.5			
					$1.8 \times 1.9 = 3.4$	
4591.9	600.0	97.9	2.1			
					$2.05 \times 8.1 = 16.6$	
4600	600.0	98.0	2.0			
					$1.7 \times 1.9 = 3.2$	
4601.9	600.0	98.6	1.4			
					$1.75 \times 8.1 = 14.2$	
10	603.3	601.2	2.1			
20	607.3	04.1	3.2			
30	11.4	04.1	7.3			
40	15.5	06.0	9.5			
50	19.5	08.2	11.3	104.8	$10 = 1048.0$	
60	23.6	08.0	15.6			
70	27.6	08.6	19.0			
80	31.7	07.7	24.0			
90	635.7	608.0	27.7			

East.

N 3360
Downstream

			Ht.	Mean Dist.	Area Sq. ft
4693	636.9	607.4	29.5	$28.6 \times 3 = 85.8$	
				$28.6 \times 33.9 = 970.1$	
4726.92	650.7	623.0	27.7	$13.85 \times 60 = 831.0$	
4786.92	650.7	650.7	.0		

From 650.7 to 701.8 = $\frac{50 + 40}{2} \times 51.1 = 2299.5$
 $\frac{5192.0}{}$

N 3360
UPstream

34

East

From	650.6	to	701.7 =	$\frac{89.6 + 43.5}{2} \times 51.1 = 3400.7$	$4'$	
				Ht.	Mean Dist.	Area Sq. ft
51811	650.6	650.6	.0			
					$12.6 \times 38.9 = 490.1$	
5220	650.6	25.4	25.2			
					$25.2 \times 12 = 302.4$	
32	50.6	25.4	25.2			
5186	589.6	589.6	.0			
					$1.1 \times 4 = 4.4$	
90	92.7	90.5	2.2			
5200	600.4	91.4	9.0			
10	08.1	92.2	15.9	$62.65 \times 10 = 626.5$		
20	15.8	93.7	22.1			
30	23.5	94.4	29.1			
					$29.5 \times 2 = 59.0$	
5232	625.0	595.1	29.9			
5232	650.6	595.1	55.5			

East		H 3360 Upstream		Ht.	Mean Dist.	Area Sq. ft.
5240	650.6	597.8	52.8		$54.15 \times 8 = 433.2$	
50	650.6	603.7	46.9			
60	50.6	05.3	45.3		$184.95 \times 10 = 1849.5$	
70	50.6	06.1	44.5			
80	50.6	06.9	43.7			
					$436 \times 0.67 = 292$	

5280.67	650.6	07.0	43.6		$41.3 \times 9.33 = 385.3$	
90	46.8	07.8	39.0			
5300	42.8	07.1	35.7			
10	38.7	08.4	30.3			
20	34.7	08.7	26.0		$163.4 \times 10 = 1634.0$	
30	30.6	09.2	21.4			
40	26.6	10.7	15.9			
50	22.5	11.6	10.9			
60	18.5	11.1	07.4		$3.7 \times 2 = 7.4$	

5362 617.7 617.7 .0
 9221.7

East		H 3370 Downstream		Ht.	Mean Dist.	Area Sq. ft.
4580	596.5	596.5	.0		$2.55 \times 10 = 25.5$	
90	99.5	94.4	5.1		$5.35 \times 1.9 = 10.2$	
4591.9	600.1	94.5	5.6		$5.15 \times 8.1 = 41.7$	
4600	00.1	95.4	4.7		$4.25 \times 1.9 = 8.1$	
4601.9	00.1	96.3	3.8		$3.6 \times 8.1 = 29.2$	
10	603.4	600.0	3.4			

East

N3370
Downstream

			Ht.	Mean Dist.	Area Sq.ft
			Ht.		
4670	607.4	604.5	2.9		
30	11.5	04.5	7.0		
40	15.6	05.4	10.2		
50	19.6	06.0	13.6	$82.4 \times 10 = 824.0$	
60	23.7	08.8	14.9		
70	27.7	08.0	19.7		
80	31.8	07.0	24.8*		

$$27.4 \times 8.5 = 232.9$$

4688.5 635.3 605.3 30.0

$$288.5 \times 38.4 = 1107.8$$

4726.9 650.8 23.1 27.7

$$138.5 \times 60 = 831.0$$

4786.9 650.8 650.8 .0

$$\text{From } 650.8 \text{ to } 702.8 = \frac{50+40}{2} \times 51.0 = 2295.0$$

$$5405.4^{\square}$$

East

26

N3370
Upstream

$$\text{From } 650.7 \text{ to } 701.7 = \frac{89.6 + 43.5}{2} \times 51.0 = 3394.0^{\square}$$

Ht. Mean Dist. Area Sq.ft.

5181. 650.7 650.7 .0

$$12.6 \times 39. = 491.4$$

5220 50.7 25.5 25.2

$$25.2 \times 12 = 302.4$$

32 50.7 25.5 25.2

5111 525.8 525.8 .0

$$2.25 \times 9 = 20.2$$

90 92.7 88.2 4.5

5200 600.4 90.1 10.3 $20.8 \times 10 = 208.0$

10 608.1 591.6 16.5*

East	N 3370 upstream			Ht. Mean Dist. Area Sq. ft
5220	615.8	592.7	23.1	$468 \times 10 = 4680$
30	23.5	92.6	30.9	
				$31.55 \times 2 = 63.1$
5232	625.0	92.8	32.2	
5232	650.7	92.8	57.9	
				$57.45 \times 8 = 459.6$
40	50.7	93.7	57.0	
50	50.7	95.8	54.9	
60	50.7	99.8	50.9	$208 \times 10 = 2080.0$
70	50.7	601.3	49.4	
80	50.7	02.1	48.6	
				$48.5 \times 0.67 = 32.5$
5280.67	50.7	02.3	48.4	
				$45 \times 9.33 = 419.8$
90	46.9	05.3	41.6	
5300	42.9	09.4	33.5	
10	38.8	05.9	32.9	
20	634.8	605.0	29.8	

East	N 3370 upstream			Ht. Mean Dist. Area Sq. ft	37
5330	630.7	604.8	25.9	$1820 \times 10 = 1820.0$	
40	26.6	06.9	19.7		
50	22.6	08.2	14.4		
60	18.5	08.5	10.0		
				$7.95 \times 8 = 63.6$	
68	15.3	09.4	5.9		
				$3.55 \times 3 = 10.6$	
71	14.1	12.9	1.2		
				$0.6 \times 3 = 1.8$	
74	612.9	612.9	.0		
					9835.0

East	N 3380 Downstream		
	Ht	Mean Dist	Area Sq.ft
4572	593.4	593.4	0.0
			$0.75 \times 8 = 6.0$
80	96.1	94.6	1.5
			$2.75 \times 10 = 27.5$
90	99.5	95.5	4.0
			$4.25 \times 1.9 = 8.1$
4591.92	600.1	95.6	4.5
			$4.25 \times 8.1 = 34.4$
4600	600.1	96.1	4.0
			$3.85 \times 1.9 = 7.3$
4601.92	600.1	96.4	3.7
			$4.75 \times 8.1 = 38.5$
10	603.4	97.6	5.8
20	607.4	601.4	6.0
30	11.5	01.2	10.3
40	15.6	01.6	14.0
			$784 \times 10 = 784.0$
50	19.6	04.9	14.7
60	23.7	04.4	19.3
70	627.7	605.3	22.4
			$28 \times 6.9 = 193.2$
4676.92	630.9	597.3	33.6

East	N 3380 Downstream			38
	Ht	Mean Dist	Area Sq.ft.	
4676.92	630.9	600.1	30.8	
				$29.2 \times 50 = 1460.0$
4726.92	650.8	623.2	27.6	
				$138 \times 60 = 828.0$
4786.92	650.8	650.8	0	
From 650.8 to 702.0 = $\frac{50+40}{2} \times 51.2 = 2304.0$				
4676.92	600.1	597.3	2.8	
				$3.0 \times 3.1 = 9.3$
4680	596.9	593.7	3.2	
				$1.6 \times 1.9 = 3.0$
4681.9	585.0	585.0	0.0	
				<hr/> 5703.3

East

N 3380
UPSTREAMFrom 650.7 to 701.8 = $\frac{89.6 + 43.5}{2} \times 51.1 = 3400.7$

Ht. Mean Dist. Area Sq. ft.

5181.1 650.7 650.7 .0

 $12.6 \times 38.9 = 490.1$

5220 50.7 25.5 25.2

 $25.2 \times 12 = 302.4$

32 y 50.7 25.5 25.2

5177 ^ 582.9 582.9 .0

 $1.05 \times 3 = 3.2$

80 85.0 82.9 2.1

90 92.7 84.9 7.8

5200 600.4 86.1 14.3

 $82 \times 10 = 820.0$

10 88.1 88.9 19.2

20 15.8 91.2 24.6

30 23.5 93.4 30.1 x

 $30.95 \times 2 = 61.9$

5232 y 625.0 593.2 31.8

East

N 3380
UPSTREAM

39

Ht. Mean Dist. Area Sq. ft.

5232 ^ 650.7 593.2 57.5

 $57.9 \times 8 = 463.2$

40 50.7 92.4 58.3

50 50.7 91.4 59.3

60 50.7 93.2 57.5 $226.7 \times 10 = 2267.0$

70 50.7 95.8 54.9

80 50.7 99.0 51.7 x

 $51.65 \times 0.67 = 34.6$

5230 ^ 50.7 99.1 51.6

 $48.7 \times 9.33 = 454.4$

90 46.9 601.1 45.8

5200 42.9 04.9 38.0

10 38.8 03.6 35.2

20 34.8 02.9 31.9

30 30.7 02.9 27.8 $225.65 \times 10 = 2256.5$

40 26.6 01.6 25.0

50 22.6 01.5 21.1

60 18.5 01.8 16.7

70 614.5 600.4 14.1 x

N3380
Up Stream

	Ht.	Mean Dist.	Area	Sq. ft.
5377	611.6	599.6	12.0	$13.05 \times 7 = 91.4$
				$6 \times 6 = 36.0$
5383	609.2	609.2	.0	
				10681.4

N3390
Downstream

40

	Ht.	Mean Dist.	Area	Sq. ft.
4600	600.1	595.2	4.9	$5.65 \times 8.1 = 51.4$
				$4.9 \times 1.9 = 9.3$
4601.92	00.1	75.2	4.9	
				$6.7 \times 8.1 = 54.3$
10	03.4	94.9	8.5	
20	07.4	97.6	9.8	
30	11.5	98.3	13.2	
40	15.6	98.8	16.8	$97.15 \times 10 = 971.5$
50	19.6	600.3	19.3	
60	23.7	02.8	20.9	
70	27.7	01.9	25.8	

$28.7 \times 6.9 = 198.0$

4676.92 630.6 600.0 30.6

$2915 \times 50 = 1457.5$

East.

N3390
Downstream

	Ht.	Mean Dist.	Area	Sq. ft.
4560	589.4	589.4	.0	
70	92.7	90.9	1.8	$7.25 \times 10 = 72.5$
80	96.1	92.8	3.3	
90	99.4	93.3	6.1	
				$6.25 \times 1.9 = 11.9$
4591.92	600.1	593.7	6.4	

$\frac{50+40}{2} \times 51.2 = 7304$

$\frac{650.8 + 702.0}{2} = 5961.4$

N 3390
Upstream

East	HT.	Mean Dist.	Area Sq. ft
5190	592.7	581.9	10.8
5200	600.4	83.1	17.3
10	08.1	84.4	23.7
20	15.8	89.4	26.4
30	23.5	91.2	32.3
			$32.95 \times 2 = 65.9$
32	625.0	91.4	33.6

East

N 3390
Upstream

From 650.9 to 702 = $\frac{89.9 + 43.5}{2} \times 51.1 = 3408.4$

HT.	Mean Dist.	Area Sq. ft
5180.7	650.9	650.9
		.0
		$12.7 \times 39.3 = 499.1$
5220	50.9	25.5
		25.4
		$25.4 \times 12 = 304.8$
32	50.9	25.5
		25.4
5177	582.7	582.7
		.0
		$1.2 \times 3 = 3.6$
80	585.0	582.6
		2.4

5235	650.9	91.4	59.5
			$59.1 \times 8 = 472.8$
40	50.9	92.2	58.7
50	50.9	93.3	57.6
60	50.9	94.8	56.1
			$231.35 \times 10 = 2313.5$
70	50.9	91.5	59.4
80	50.9	93.1	57.8
			$57.7 \times 0.67 = 38.7$
5280.67	50.9	93.3	57.6
			$54.15 \times 9.33 = 505.2$
90	647.1	596.4	50.7

East

N3390
upstreamHt. Mean Dist. Area Sq.ft.
Ht.

4	5300	643.0	598.6	44.4	
	10	38.9	99.0	39.9	
	20	34.9	600.4	34.5	
	30	30.8	01.4	29.4	
	40	26.7	599.5	27.2	$271.45 \times 10 = 2714.5$
4	50	22.7	98.2	24.5	
	60	18.6	98.1	20.5	
4	70	14.5	96.1	18.4	
	80	10.5	95.9	14.6 _x	
4					$13.65 \times 6 = 81.9$
	86	08.0	95.3	12.7	

$$6.35 \times 7 = 44.4$$

5393	625.7	625.2	.0
------	-------	-------	----

$$\frac{11408.3^0}{\quad}$$

East

N3400
Downstream

J.W.W.

42

Ht. Mean Dist. Area Sq.ft.

4547	585.1	585.1	.0	
				$0.4 \times 3 = 1.2$
50	86.1	85.3	0.8	
60	89.4	86.2	3.2	
70	92.8	87.8	5.0	$1855 \times 10 = 185.5$
80	96.1	90.8	5.3	
90	99.5	90.2	9.3 _x	
				$9.55 \times 1.9 = 18.1$
4591 ⁴⁴	600.1	90.3	9.8	
				$9.7 \times 8.1 = 78.6$
4600	00.1	90.5	9.6	
				$9.35 \times 1.9 = 17.8$
4601 ⁹²	00.1	91.0	9.1	
				$8.05 \times 8.1 = 65.2$
10	00.1	93.1	7.0	
20	00.1	91.3	8.8	
30	00.1	93.0	7.1	$26.75 \times 10 = 267.5$
40	00.1	95.0	5.1	
50	600.1	595.6	4.5 _x	

East

N3400

Downstream

Ht. Mean Dist. Area Sq.ft

4660 600.1 597.9 2.2 $5.65 \times 10 = 56.5$

70 00.1 97.7 2.4

 $2.5 \times 6.9 = 17.2$ 4676.9^v 600.1 597.5 2.6 $1.3 \times 2.5 = 3.2$

4679.4 597.5 597.5 0

From 600.1 to 650.9 = $\frac{75+60}{2} \times 50.8 = 3429.0$ From 650.9 to 702.1 = $\frac{50+40}{2} \times 51.2 = 2304.0$ 6443.8

East

N3400

Upstream

43

From 650.9 to 702.0 = $\frac{81.7+43.5}{2} \times 51.1 = 3403.3$ From 625.6 to 650.9 = $\frac{122.8+99.7}{2} \times 25.3 = 2814.6$

Ht. Mean Dist. Area Sq.ft.

5176 581.9 81.9 0

 $1.7 \times 4 = 6.8$

80 85.0 81.6 3.4

90 92.7 80.8 11.9

5200 600.4 80.5 $19.9 \times 112.0 \times 10 = 1120.0$

10 08.1 80.6 27.5

20 15.8 83.5 32.3

30 23.5 86.1 37.4

 $37.95 \times 2 = 75.9$ 5232 \checkmark 625.0 586.5 38.532 \wedge 625.6 586.5 39.1 $38.35 \times 8 = 306.8$

40 25.6 82.0 37.6

 $36.4 \times 10 = 364.0$

50 625.6 590.4 35.2

East

N3400
Upstream

Ht. Mean Dist. Area Sq. ft.

5260	625.6	591.6	34.0	
70	25.6	90.8	34.8	
80	25.6	91.0	34.6	
90	25.6	90.4	35.2	$316.7 \times 10 = 3167.0$

5300	25.6	90.8	34.8	
10	25.6	89.6	36.0	
20	25.6	89.2	36.4	
30	25.6	89.3	36.3	
40	25.6	91.6	34.0	*

$33.55 \times 2.8 = 93.9$

5342.8	625.6	592.5	33.1	
--------	-------	-------	------	--

$30.5 \times 7.2 = 219.6$

50	22.7	94.8	27.9	
----	------	------	------	--

60	18.6	96.3	22.3	
----	------	------	------	--

70	14.5	94.9	19.6	$80.25 \times 10 = 802.5$
----	------	------	------	---------------------------

80	10.4	93.3	17.1	
----	------	------	------	--

90	06.4	91.8	14.6	
----	------	------	------	--

$12.85 \times 9 = 115.6$

5399	002.7	91.6	11.1	
------	-------	------	------	--

$5.55 \times 5.3 = 29.4$

5404.3	600.4	600.4	.0	
--------	-------	-------	----	--

12619.4

44

East

N3410
DownstreamFrom E/ 542 to 575 = $33' \times 4.9 = 161.7$ "

Ht. Mean Dist. Area Sq. ft.

4501	583.0	583.0	.0	
------	-------	-------	----	--

$0.75 \times 9 = 6.8$

50	86.1	84.6	1.5	
----	------	------	-----	--

60	89.5	85.4	4.1	
----	------	------	-----	--

70	92.8	86.0	6.8	$2645 \times 10 = 2645$
----	------	------	-----	-------------------------

80	96.1	87.1	9.0	
----	------	------	-----	--

90	99.5	87.9	11.6	*
----	------	------	------	---

$11.95 \times 1.9 = 22.7$

4591.9	600.1	587.8	12.3	
--------	-------	-------	------	--

$12.6 \times 8.1 = 102.1$

East.

N3410
Downstream
Ht. Mean Dist. Area Sq.ft.

4600	600.1	587.2	12.2	
10	00.1	87.7	12.4	
20	00.1	87.8	12.3	
30	00.1	89.0	11.1	
40	00.1	90.9	9.2	$66.55 \times 10 = 665.5$
50	00.1	93.2	6.9	
60	00.1	94.6	5.5	
70	00.1	94.7	5.4	
				$6.2 \times 6.9 = 42.8$
4676.92	00.1	93.1	7.0	
4676.92	600.0	93.1	6.9	
4680	96.9	92.4	4.5	$5.7 \times 3.08 = 17.60$
4685	592.0	592.0	.0	$2.25 \times 5. = 11.2$

From 600.1 to 650.9 = $\frac{75+60}{2} \times 50.8 = 3429.0$

From 650.9 to 702.1 = $\frac{50+40}{2} \times 51.2 = 2304.0$
 702.1

East.

N3410
Upstream

From 650.9 to 702.0 = $\frac{89.7+43.5}{2} \times 51.1 = 3403.3$

From 625.6 to 650.9 = $\frac{123+99.7}{2} \times 25.3 = 2817.2$

	Ht.	Mean Dist.	Area Sq.ft.	
5161	570.3	570.3	.0	
			$15 \times 9 = 13.5$	
70	77.3	74.3	3.0	
80	85.0	79.9	5.1	
90	92.7	79.8	12.9	
5200	600.4	79.7	20.7	$127.15 \times 10 = 1271.5$
10	08.1	79.6	28.5	
20	15.8	78.6	37.2	
30	23.5	81.0	42.5	
			$42.95 \times 2 = 85.9$	
32	625.0	581.6	43.4	
32	625.6	581.6	44.0	
			$42.75 \times 8 = 342.0$	
40	625.6	584.1	41.5	

East

N

3410

Upstream

Ht. Mean Dist. Area Sq.ft.
Ht.

5250.	625.6	586.6	39.0	
60	25.6	88.4	37.2	
70	25.6	89.4	36.2	
80	25.6	90.6	35.0	
90	25.6	90.3	35.3	$373.3 \times 10 = 3733.0$
5300	25.6	89.1	36.5	
10	25.6	88.5	37.1	
20	25.6	87.6	38.0	
30	25.6	86.8	38.8	
40	625.6	586.7	38.9	
				$389.5 \times 3 = 116.8$
43	625.6	586.6	39.0	
				$37.7 \times 7 = 263.9$
50	22.8	86.4	36.4	
60	18.7	88.0	30.7	
70	14.7	90.6	24.1	$116.3 \times 10 = 1163.0$
80	10.6	91.7	18.9	
90	06.6	89.3	17.3	
5400	602.5	588.3	14.2	$13.2 \times 5.67 = 74.8$
	✓	✓	✓	

N 3410

upstream

46

Ht. Mean Dist. Area Sq.ft.
Ht.

5405.67	600.2	588.0	12.2	
				$12.55 \times 4.33 = 54.3$
10	600.2	87.3	12.9	
				$12.75 \times 5.67 = 72.3$
5415.67	600.2	87.6	12.6	
				$11.8 \times 4.33 = 51.1$
5420	598.8	587.8	11.0	
				$5.5 \times 6 = 33.0$
5426	596.7	596.7	0	
				13495.6^{\square}

East

N 3420

Down Stream

4499.5	575.0	542.0	33.0	
				$33.0 \times 2.5 = 82.5$
12		542.0	33.0	
4509.5	575.0	575.0	0	$16.5 \times 7.5 = 123.8$
	✓	✓	✓	

East				N 3420 Downstream			
From 542.0 to 575				$\frac{25+17}{2} \times 33 = 693 \text{ sq. ft.}$			
	Ht.	Mean Dist.	Area Sq. ft.		Ht.	Mean Dist.	Area Sq. ft.
4532	580.1	580.1	.0				
				$0.8 \times 8 = 6.4$			
40	82.8	81.4	1.6				
50	86.2	83.1	3.1				
60	89.5	84.5	5.0				
70	92.9	84.6	8.3	$35.2 \times 10 = 352.0$			
80	96.2	85.9	10.3				
90	99.6	84.2	15.4				
				$15.8 \times 1.9 = 29.9$			
4591.92	600.2	584.1	16.1				
				$16.25 \times 8.1 = 131.6$			
4600	00.2	83.8	16.4				
10	00.2	84.5	15.7				
20	00.2	85.6	14.6				
30	00.2	86.9	13.3				
40	00.2	89.3	10.9	$86. \times 10 = 860.0$			
50	00.2	89.8	10.4				
60	00.2	92.1	8.1				
70	600.2	590.6	9.6				
				$9.8 \times 6.9 = 67.6$			

East				N 3420 Downstream				47
	Ht.	Mean Dist.	Area Sq. ft.		Ht.	Mean Dist.	Area Sq. ft.	
4476.92	600.2	590.2	10.0					
				$5 \times 10.4 = 52.0$				
87.2	589.6	589.6	.0					
From 600.2 to 651.0 = $\frac{75+60}{2} \times 50.8 = 3429. \text{ sq. ft.}$								
From 651.0 to 702.1 = $\frac{50+40}{2} \times 51.1 = 2299.5 \text{ sq. ft.}$								
								7434.3 sq. ft.

East		N 3470 upstream		
From	651.0 to	702.0 =	$\frac{89.8 + 43.5}{2} \times 51.0 = 3399.2$	
From	625.7 to	651.0 =	$\frac{122.9 + 99.8}{2} \times 25.3 = 2817.2$	
			Ht. Mean Dist Area Sq.ft	
5158.6	568.6	568.6	0	
			0.5 x 1.4 = 0.7	
60	69.7	68.7	1.0	
70	77.3	69.3	8.0	
80	85.0	69.6	15.4	
90	92.7	74.0	18.7	
5700	600.4	78.7	21.7	154.15 x 10 = 1541.5
10	08.1	78.9	29.2	
20	15.8	77.5	38.3	
30	23.5	78.8	44.7	
			45.3 x 2 = 90.6	
5232	625.0	579.1	45.9	
5232	625.7	579.1	46.6	
			45.95 x 8 = 367.6	
40	625.7	580.4	45.3	

East		N 3470 upstream		48	
	Ht.	Mean Ht.	Dist.	Area	Sq.ft.
5250	625.7	582.1	43.6		
60	25.7	82.8	42.9		
70	25.7	83.8	41.9		
80	25.7	86.1	39.6		
90	25.7	90.4	35.3	405.15 x 10 =	4051.5
5300	25.7	84.5	41.2		
10	25.7	86.1	39.6		
20	25.7	86.7	39.0		
30	25.7	86.1	39.6		
40	25.7	86.1	39.6		
				39.6 x 2.9 =	114.8
5342.9	625.7	586.1	39.6		
				38.15 x 7.1 =	270.9
50	22.8	86.1	36.7		
60	18.8	85.6	33.2		
70	14.7	83.2	31.3		
				139.6 x 10 =	1396.0
10	10.6	84.1	26.5		
20	06.6	85.2	21.4		
5400	02.5	84.8	17.7		
				16.8 x 5.67 =	95.2
5405.67	600.2	584.3	15.9		

East

N 3420
Upstream

			Ht.	Mean Dist	Area Sq. ft.
5410	600.2	583.9	16.3	$16.10 \times 4.33 = 69.7$	
				$16.2 \times 5.67 = 91.8$	
5415.67	00.2	84.1	16.1		
				$15.3 \times 4.33 = 66.2$	
20	598.8	84.3	14.5	$12.95 \times 10 = 129.5$	
30	95.4	84.0	11.4		
				$10.35 \times 3 = 32.6$	
33	94.4	84.1	10.3		
				$5.15 \times 6.4 = 33.0$	
5439.4	592.2	592.2	.0	$\frac{114568.0}{4}$	

N 3430

East

Down Stream

			Ht.	Mean Dist	Area Sq. ft.
4489.3	575.0	541.9	33.1	$33.1 \times 1.7 = 56.3$	
91	"	541.9	33.1	$31. \times 9 = 279.0$	
4500	"	546.1	28.9	$23.1 \times 8 = 184.8$	
08	"	557.7	17.3	$12.3 \times 2 = 24.6$	
10.	"	567.7	7.3		
4513.5	575.0	575.0	0	$3.65 \times 3.5 = 12.8$	

East

N 3430
Downstream

49

			Ht.	Mean Dist	Area Sq. ft.
4530	579.4	579.4	.0		
40	82.8	80.2	2.6		
50	86.2	80.8	5.4		
60	89.5	80.6	8.9	$51.6 \times 10 = 516.0$	
70	92.9	81.4	11.5		
80	96.2	81.6	14.6		
90	99.6	82.4	17.2		
				$17.55 \times 1.9 = 33.3$	
4591.9	600.2	82.3	17.9		
				$18.05 \times 8.1 = 146.2$	

4600

10

20

30

40

50

60

70

4676.9

00.2

00.2

00.2

00.2

00.2

00.2

00.2

00.2

600.2

82.0

82.7

83.1

85.0

85.3

85.6

88.1

87.9

587.5

18.2

17.5

17.1

15.2

14.4

14.6

12.1

12.3

12.7

 $106.65 \times 10 = 1066.5$ $12.5 \times 6.9 = 86.2$

East

N3430
Downstream

			Ht.	Mean Dist.	Area sq. ft.
4680	596.9	587.3	9.6	$11.15 \times 3.1 = 34.6$	
90	586.8	586.8	.0	$4.8 \times 10 = 48.0$	

$$\text{From } 600.2 \text{ to } 651.2 = \frac{75 + 60}{2} \times 51.0 = 3402.5 \text{ sq. ft.}$$

$$\text{From } 651.2 \text{ to } 702.1 = \frac{50 + 40}{2} \times 50.9 = 2290.5 \text{ sq. ft.}$$

$$\underline{\underline{8221.3 \text{ sq. ft.}}}$$

N3430
Upstream

50

East

$$\text{From } 651.1 \text{ to } 702.1 = \frac{89.7 + 43.5}{2} \times 51.0 = 3396.6 \text{ sq. ft.}$$

$$\text{From } 625.8 \text{ to } 651.1 = \frac{122.9 + 127}{2} \times 25.5 = 2815.9 \text{ sq. ft.}$$

			Ht.	Mean Dist.	Area Sq. ft.
515.2	568.3	568.3	.0		
					$0.6 \times 1.8 = 1.1$
60	69.7	68.5	1.2		
70	77.3	68.6	8.7		
80	85.0	68.3	16.7		
90	92.7	67.7	25.0		
5200	600.4	67.6	32.8		$191.35 \times 10 = 1913.5$
10	08.1	67.9	38.2		
20	15.8	72.9	42.9		
30	23.5	70.6	52.9		
					$53.7 \times 2 = 107.4$
5232	625.0	570.5	54.5		
5232	625.8	70.5	53.3		
40	25.8	70.0	53.8		$55.55 \times 8 = 444.4$
50	625.8	575.2	50.6		$53.2 \times 10 = 532.0$

East		N3430 UPSTREAM		Ht.	Mean Dist.	Area Sq.ft
				Ht.		
5260	625.8	576.7	49.1			
70	25.8	78.1	47.7			
80	25.8	79.2	46.6			
90	25.8	79.7	46.1			
5300	25.8	78.4	47.4		$419.1 \times 10 = 4191.0$	
10	25.8	81.2	44.6			
20	25.8	82.1	43.7			
30	25.8	80.3	45.5			
40	25.8	79.6	46.2			
					$46.15 \times 2.1 = 133.8$	
5342.9	25.8	79.7	46.1			
					$44.5 \times 7.1 = 316.0$	
50	22.4	80.0	42.9			
60	18.9	80.1	38.8			
70	14.8	80.7	34.1			
80	10.7	78.9	31.8		$165.55 \times 10 = 1655.5$	
90	06.6	78.5	28.1			
5400	02.6	80.0	22.6			
					$2.15 \times 5.67 = 119.9$	
5405.67	600.3	580.6	19.7			

East		N3430 UPSTREAM		Ht.	Mean Dist.	Area Sq.ft
				Ht.		
5410	600.3	581.1	19.2			$19.45 \times 4.33 = 84.2$
						$19.05 \times 5.67 = 108.0$
5456.7	600.3	81.4	18.7			$18.05 \times 4.33 = 78.2$
20	598.8	81.6	17.2			
30	95.5	81.9	13.6		$27.65 \times 10 = 276.5$	
40	92.1	81.2	10.9			
						$10.55 \times 5 = 52.8$
45	590.4	581.2	9.2			
						$4.6 \times 6.8 = 31.3$
5457.8	588.2	588.2	0			
	✓	✓	✓			$\frac{16258.1}{16258.1}$

East

N3440
Downstream

			Ht.	Mean Dist.	Area	Sq.ft.
			Ht.	Ht.		
4479.1	75.0	41.5	33.5			
				$32 \times 10.9 = 34.9$		
90	75.0	44.5	30.5	$11.2 \times 12 = 134.4$		
4500	75.0	46.6	28.4	$53.7 \times 10 = 537.0$		
10	75.0	54.9	20.1	x		
10	75.0	66.4	8.6	x		
				$7.35 \times 6.9 = 50.7$		
4516.92	575.0	568.9	6.1			
				$6.05 \times 3.1 = 18.8$		
20	76.0	70.0	6.0			
25	77.7	77.5	0.2	$3.95 \times 5 = 19.8$		
30	74.4	77.9	1.5			
40	82.8	77.3	5.5			
50	86.2	77.4	8.8			
60	89.5	78.2	11.3			
				$66.35 \times 10 = 663.5$		
70	92.9	79.0	13.9			
80	596.3	579.8	16.5			

East

N3440
Downstream

52

			Ht.	Mean Dist.	Area	Sq.ft.
			Ht.	Ht.		
4590	599.7	580.5	19.2	x		
					$19.45 \times 1.9 = 37.0$	
4591.92	600.3	80.6	19.7			
					$19.55 \times 8.1 = 158.4$	
4600	600.3	80.9	19.4			
10	00.3	80.6	19.7			
20	00.3	80.3	20.0			
30	00.3	79.8	20.5			
					$132.3 \times 10 = 1323.0$	
40	00.3	80.8	19.5			
50	00.3	82.6	17.7			
60	00.3	83.0	17.3			
70	00.3	84.5	15.8	x		
					$15.7 \times 6.9 = 108.3$	
76.92	600.3	84.7	15.6			
76.02	600.0	84.7	15.3			
					$13.7 \times 3.1 = 42.5$	
80	596.9	84.8	12.1			
					$7.65 \times 10 = 76.5$	
90	86.9	83.7	3.2			
					$1.6 \times 3.4 = 5.4$	
934	583.5	583.5	0.0	v	v	v

East

N 3440
Downstream

$$\text{From } 600.3 \text{ to } 651.2 = \frac{75+60}{2} \times 50.9 = 3435.8$$

$$\text{From } 651.2 \text{ to } 702.1 = \frac{50+40}{2} \times 50.9 = 2290.5$$

8802.1⁸

East

N 3440
Upstream

$$\text{From } 651.2 \text{ to } 702.1 = \frac{89.9+43.5}{2} \times 50.9 = 3395.0$$

$$\text{From } 625.8 \text{ to } 651.2 = \frac{123.2+99.9}{2} \times 25.4 = 2833.4$$

5144.3

557.6

557.6

Ht. Mean Dist. area Sq. ft.

.0

$$0.4 \times 5.7 = 2.3$$

East

N 3440
Upstream

53

Ht. Mean Dist. Area Sq. ft.

	Ht.	Mean Dist.	Area Sq. ft.
5150	562.0	561.2	0.8
60	69.7	65.9	3.8
70	77.3	68.3	9.0
80	85.0	69.0	16.0
90	92.7	68.0	24.7
5200	600.4	67.5	32.7
10	08.1	67.1	41.0
20	15.8	66.7	49.1
30	23.5	66.2	57.3

$$58.05 \times 2 = 116.1$$

32 ✓ 625.0 66.2 58.8

32 ✓ 625.8 66.2 59.6

$$59.6 \times 8 = 476.8$$

40 25.8 66.2 59.6

50 25.8 66.4 59.4

60 25.8 66.3 59.5 237.5 × 10 = 2375.0

70 25.8 66.4 59.4

80 625.8 567.0 58.8

✓

✓

✓

✓

✓

✓

✓

East

N3450

Downstream

Below D.S. Toe Wall

4438.4 542.7 542.7 .0

$3.55 \times 1.6 = 5.7$

40 43.4 26.3 71
 $9.8 \times 10 = 98.0$ 50 47.8 35.3 125
 $13.35 \times 4.5 = 60.1$

54.5 ✓ 49.7 35.5 142

54.5 ✓ 49.7 40.0 97
 $10.3 \times 3 = 30.9$ 57.5 50.9 40.0 109
 $5.45 \times 5 = 27.2$ 62.5 553.0 553.0 0.0
 $2219^{0.1}$

Above D.S. Toe Wall

4475.5 575.5 543.1 324
 $3205 \times 4.5 = 144.2$ 80 75.5 43.8 31.7
 $91.6 \times 10 = 916.0$

90 75.5 44.2 31.3

4500 75.5 45.1 30.4

10 575.5 547.4 28.1 ✓
 $26.4 \times 4 = 105.6$

East

N3450

Downstream

55

4514 575.5 550.8 24.7

$24.2 \times 2.9 = 70.2$

16.9² 75.5 51.8 23.7
 $23.65 \times 3.1 = 73.3$

20 76.5 52.9 23.6

30 79.8 60.4 19.4

40 83.1 65.9 17.2

50 86.4 70.4 16.0
 $126.1 \times 10 = 1260.0$

60 89.8 75.5 14.3

70 93.1 76.1 17.0

80 96.4 77.5 18.9

90 99.7 76.9 22.8^{*}

$23.05 \times 1.9 = 43.8$

91² 600.3 77.0 23.3

$22.95 \times 8.1 = 185.9$

4600 00.3 77.7 22.6

10 00.3 78.4 21.9
 $68.1 \times 10 = 681.0$

20 00.3 77.4 22.9

30 600.3 576.3 24.0^{*}

East

N3450
Downstream

	Ht.	Mean Dist.	Area Sq. Ft.
4640	600.3	577.5	22.8
50	00.3	79.1	21.2 $\times 85.55 = 855.5$
60	00.3	80.5	19.8
70	00.3	80.8	19.5 ^x
			19.4 $\times 6.9 = 133.9$
76.9 ^v	600.3	581.0	19.3
76.9 ^v	600.0	600.0	.0
			7.9 $\times 3.1 = 24.5$
80	596.9	581.1	15.8
			12.05 $\times 7 = 84.4$
87	89.9	81.6	8.3
			8.95 $\times 3 = 26.8$
90	86.9	77.3	9.6
			7.15 $\times 10 = 71.5$
4700	76.7	72.2	4.7
			2.35 $\times 5 = 11.8$
05	571.9	571.9	.0
From 600.3 to 651.3 =	$\frac{75+60}{2}$	$\times 51.0 = 3442.5$	sq'
From 651.3 to 702.1 =	$\frac{50+40}{2}$	$\times 50.8 = 2286.0$	sq'
		10416.8	

East

N3450
Upstream

	Ht.	Mean Dist.	Area Sq. Ft.
From 651.3 to 702.2 =	$\frac{90+43.5}{2}$	$\times 50.9 = 3397.6$	sq'
From 625.9 to 651.3 =	$\frac{123+100}{2}$	$\times 25.4 = 2832.1$	sq'
5137	552.0	552.0	.0
			1.2 $\times 3 = 3.6$
40	54.3	51.9	2.4
50	62.0	54.8	7.2
			27.35 $\times 10 = 273.5$
60	69.7	52.3	11.4
70	577.3	562.2	15.1 ^x

East	N 3450 upstream			Ht.	Mean Dist.	Area Sq. ft.
5180	585.0	564.8	20.2			
90	92.7	64.1	28.6			
5200	600.4	62.4	38.0		$216.1 \times 10 = 2161.0$	
10	08.1	64.3	43.8			
20	15.8	66.1	49.7			
30	23.5	67.0	56.5 ^x			
					$57.4 \times 2 = 114.8$	
5232	√ 625.0	566.7	58.3			
32	∧ 625.9	566.7	59.2			
					$59.8 \times 8 = 478.4$	
40	25.9	65.5	60.4			
50	25.9	64.8	61.1			
60	25.9	64.5	61.4			
70	25.9	64.0	61.9			
80	25.9	63.3	62.6			
90	25.9	63.7	62.2		$602.15 \times 10 = 6021.5$	
5300	25.9	63.3	62.6			
10	25.9	65.7	60.2			
20	625.9	588.9	59.0			
	✓	✓	✓	✓	✓	✓

East	N 3450 upstream			Ht.	Mean Dist.	Area
5330	625.9	570.3	55.6			
40	25.9	71.2	54.7 ^x			
						$54.2 \times 3 = 162.6$
43	25.9	72.2	53.7			
						$51.05 \times 7 = 357.4$
50	23.1	74.7	48.4			
60	19.0	75.4	43.6			
70	14.9	74.1	40.8			
						$194.5 \times 10 = 1945.0$
80	10.8	72.3	38.5			
90	06.8	73.0	33.8			
5400	02.7	75.5	27.2 ^x			
						$26.3 \times 5.67 = 149.1$
05.67	600.4	575.0	25.4			
						$2555 \times 4.33 = 110.6$
10	00.4	74.7	25.7			
						$25.5 \times 5.67 = 144.6$
15.67	00.4	75.1	25.3			
						$24.4 \times 4.33 = 105.6$
20	598.9	575.4	23.5			
	✓	✓	✓	✓	✓	✓

East

N3450
upstream

Ht. Mean Dist. Area Sq. Ft.

5430	595.5	578.8	16.7
40	92.2	77.1	15.1
50	88.8	76.8	12.0
60	85.4	76.1	9.3
70	82.0	74.5	7.5
80	78.6	77.1	1.5
90	75.2	73.5	1.7

$1.7 \times 0.67 = 1.1$

90.67 575.0 73.3 1.7

$2.95 \times 9.33 = 27.5$

5500. 75.0 70.8 4.2

10 75.0 68.1 6.9

$24.1 \times 10 = 241.0$

20 75.0 65.8 9.2

30 75.0 63.2 11.8

$11.9 \times 6.5 = 77.4$

5536.5 575.0 563.0 12.0

19351.4

above U.S. Tool Wall

5540.5 575.0 575.0 0

$5.6 \times 4.5 = 25.2$

5545 573.7 562.5 11.2

$10.9 \times 2 = 21.8$

N3450
Upstream

58

East
above U.S. Tool Wall

Ht. Mean Dist. Area Sq. Ft.

5547 573.1 562.5 10.6

5547 573.1 560.0 13.1

$11.3 \times 3 = 33.9$

50 72.3 62.8 9.5

60 69.3 64.1 5.2

$10.7 \times 10 = 107.0$

70 66.3 64.8 1.5

$0.75 \times 5 = 3.8$

75 564.9 564.9 .0

191.7

East		N3460 Downstream		Ht.	Mean Dist.	Area Sq. ft.
Below O.S. Toe Wall				Ht.		
4418.8 Vert.	543.7	542.0	12			
					$7.2 \times 11.2 = 80.6$	
30	48.0	34.8	13.2			
40	52.2	35.4	16.8			
					$56.15 \times 10 = 569.5$	
50	56.6	35.8	20.8			
60	60.8	35.3	25.5 ^x			
					$26.1 \times 3 = 78.3$	
v 63.	v 62.0	35.3	26.7			
^ 63.	^ 62.0	42.0	20.0			
					$10 \times 95 = 950$	
72.5	566.7	566.7	0		823.4^H	
<u>Vertical</u>						
4480	575.5	42.1	33.4			
90	75.5	42.9	32.6			
					$95. \times 10 = 950.0$	
4500	75.5	44.9	30.6			
10	75.5	45.3	30.2 ^x			
					$29.5 \times 6.9 = 203.6$	
16.92	75.5	45.7	29.3			
					$29.75 \times 3.1 = 92.2$	
20	576.0	545.8	30.2			

East		N3460 Downstream		Ht.	Mean Dist.	Area Sq. ft.
				Ht.		
4530	579.4	547.2	32.2			
					$119.9 \times 10 = 1199.0$	
40	82.8	49.4	33.4			
50	86.2	56.1	30.1			
60	89.5	71.3	18.2 ^x			
65	91.7	75.2	16.0		$33.75 \times 5 = 168.8$	
70	92.9	75.6	17.3			
80	96.3	76.1	20.2		$40.45 \times 10 = 404.5$	
90	99.7	76.5	23.2 ^x			
					$23.5 \times 1.9 = 44.6$	
41.92	600.3	76.5	23.8			
					$23.8 \times 8.1 = 192.8$	
4600	00.3	76.5	23.8			
10	00.3	76.0	24.3			
20	00.3	75.1	25.2			
					$126.3 \times 10 = 1263.0$	
30	00.3	74.9	25.4			
40	00.3	73.7	26.6			
50	600.3	574.5	25.8 ^x			

		N 3460 Upstream			
East		Ht.	Mean Dist.	Area	Sq. ft.
5232	626.0	570.5	55.5		
				$57.25 \times 8 = 458.0$	
40	26.0	67.0	59.0		
50	26.0	65.4	60.6		
60	26.0	64.2	61.8		
70	26.0	63.5	62.5		
80	26.0	62.9	63.1		
90	26.0	61.8	64.2	$62.6 \times 10 = 6262.0$	
5300	26.0	61.9	64.1		
10	26.0	62.2	63.8		
20	26.0	62.4	63.6		
30	26.0	63.6	62.4		
40	26.0	64.8	61.2		
				$61.1 \times 2.9 = 177.2$	
42.9	26.0	65.0	61.0		
				$54.25 \times 7.1 = 385.2$	
50	23.1	65.6	57.5		
60	19.0	66.4	52.6		
70	614.9	570.2	44.7		

		N 3460 Upstream				61.
East		Ht.	Mean Dist.	Area	Sq. ft.	
5380	610.9	574.0	36.9			$213.25 \times 10 = 2132.5$
90	06.8	71.9	34.9			
5400	02.7	71.9	30.8			$29.35 \times 5.67 = 166.4$
05.67	600.4	72.5	27.9			$27.7 \times 4.33 = 119.9$
10	00.4	72.9	27.5			$27.5 \times 5.67 = 155.9$
15.67	00.4	72.9	27.5			$26.75 \times 4.33 = 115.8$
20	598.9	72.9	26.0			
30	95.5	71.7	23.8			
40	92.2	76.2	16.0			
50	88.8	74.2	14.6			$108.65 \times 10 = 1086.5$
60	85.4	73.6	11.8			
70	82.0	73.2	8.8			
80	78.6	64.5	14.1			
90	75.2	62.1	13.1			
						$13.05 \times 0.67 = 8.7$
90.57	575.0	562.0	13.0			$14.0 \times 9.33 = 130.6$

N 3460 Upstream			
East	Ht.	Mean Dist.	Area Sq. ft.
5500	575.0	560.0	15.0
10	75.0	60.7	14.3
20	75.0	59.8	15.2
30	75.0	59.6	15.4
			$44.7 \times 10 = 447.0$
			$15.2 \times 2 = 30.4$
✓ 32 Vert.	575.0	560.0	15.0
			20864.0

above U.S. Toewall

5537.5	575.0	575.0	0
			$3.2 \times 2.5 = 8.0$
40	73.9	67.5	6.4
			$8.6 \times 2 = 17.2$
42	73.3	62.5	10.8
			$10.75 \times 0.5 = 5.4$
✓ 42.5	✓ 73.2	62.5	10.7
✓ 42.5	✓ 73.2	55.8	17.4
			$13.35 \times 7.5 = 100.1$
50	70.9	61.6	9.3
60	567.9	562.0	5.9
			$11.75 \times 10 = 117.5$

N 3460 Upstream			
East	Ht.	Mean Dist.	Area Sq. ft.
5570	564.9	562.5	2.4
73	564.0	564.0	0
			$1.2 \times 3 = 3.6$
			251.8

N 3470			
East below U.S. Toewall			
Downstream	Ht.	Mean Ht.	Dist. Area Sq. ft.
4399.2	543.5	542.0	1.5
			$1.65 \times 0.8 = 1.3$
4400	43.8	42.0	1.8
10	48.1	33.0	15.1
			$25.45 \times 10 = 254.5$
20	552.5	533.6	18.9

East	Below D.S. Toe wall	N 3470	Downstream	Ht.	Mean.	Dist.	Area	Sq. ft.
30	556.9	535.0	21.9					
40	61.2	34.5	26.7				$100.45 \times 10 = 1004.5$	
50	65.8	36.7	29.1					
60	68.8	42.2	26.6					
							$27.7 \times 7 = 193.9$	
67	71.0	42.2	28.8					
67	71.0	40.0	31.0					
							$27.75 \times 3 = 83.2$	
70	72.0	47.5	24.5					
80	575.0	575.0	0				$12.25 \times 10 = 122.5$	
							1404.1^2	
4484.5 Vert.	575.5	542.1	33.4					
							$33.2 \times 5.5 = 182.6$	
90	75.5	42.5	33.0					
4500	75.5	44.2	31.3				$63.25 \times 10 = 632.5$	
10	75.5	44.6	30.9					
							$30.9 \times 6.9 = 213.2$	
16.92	75.5	44.6	30.9					
							$31.4 \times 3.1 = 97.3$	
20	576.5	544.6	31.7					

East	D. S.	N 3470	Ht.	Mean.	Dist.	Area	Sq. ft.
30	579.8	544.5	35.3				
40	83.2	44.7	38.5				
50	86.5	46.6	39.9				$217.4 \times 10 = 2174.0$
60	89.8	53.9	35.9				
70	93.1	74.7	18.4				
80	96.4	74.6	21.8				
90	99.8	76.5	23.3				
							$23.6 \times 1.9 = 44.8$
91.92	600.4	76.5	23.9				
							$23.95 \times 8.1 = 194.0$
4600	00.4	76.4	24.0				
10	00.4	77.0	23.4				
20	00.4	75.9	24.5				
30	00.4	75.0	25.4				$182.45 \times 10 = 1824.5$
40	00.4	73.3	27.1				
50	00.4	73.2	27.2				
60	00.4	72.1	28.3				
70	00.4	71.3	29.1				
							$29.4 \times 6.9 = 202.9$
76.72	600.4	570.7	29.7				

East	N3470 D.S.	Ht.	Mean Dist. Ht.	Area sq. ft.
4676.92	600.0	570.7	29.3	
				$27.9 \times 3.1 = 86.5$
80	596.9	70.4	26.5	
90	86.9	69.5	17.4	
4700	76.9	65.9	11.0	$43.4 \times 10 = 434.0$
10	66.9	63.4	3.5	
				$1.75 \times 5 = 8.8$
15	561.7	561.7	.0	

From 600.4 to 651.4 = $\frac{75+60}{2} \times 51 = 3442.5$ sq. ft.

" 651.4 to 702.1 = $\frac{50+40}{2} \times 50.7 = 2281.5$ sq. ft.

12074.9 sq. ft.

East	N3470 U.S.	Ht.	Mean Dist. Ht.	Area Sq. ft.
				$89.8 + 43.5 \times 50.9 = 3397.5$ sq. ft.
				$122.9 + 99.8 \times 25.3 = 2817.2$ sq. ft.
5134.3	549.9	549.9	.0	
				$2.55 \times 5.7 = 14.5$
40	54.3	49.2	5.1	
50	62.0	50.9	11.1	
60	69.7	51.8	17.9	
70	77.3	54.7	22.6	
80	85.0	54.8	30.2	
90	92.7	56.1	36.6	$309.9 \times 10 = 3099.0$
5200	600.4	54.4	46.0	
10	08.1	55.3	52.8	
20	15.8	56.5	59.3	
30	623.5	56.8	61.7	
				$62.45 \times 2 = 124.9$
32	625.0	56.8	63.2	
32	626.0	61.8	64.2	
				$64.3 \times 8 = 514.4$
40	626.0	56.6	64.4	

East		N3470 U.S.	Ht.	Mean Dist.	Area Sq.ft.
5250	626.0	559.5	66.5		
60	26.0	61.1	64.9		
70	26.0	62.4	63.6		
80	26.0	61.1	64.9		
90	26.0	60.8	65.2	647.15 x 10 =	6471.5
5300	26.0	61.7	64.3		
10	26.0	61.2	64.8		
20	26.0	61.1	64.9		
30	26.0	61.8	64.2		
40	26.0	62.7	63.3		
				63.25 x 2.9 =	183.4
42.9	626.0	562.8	63.2		
				61.6 x 7.1 =	437.4
50	23.1	63.1	60.0		
60	19.1	62.6	56.5		
70	15.0	65.4	49.6	234.9 x 10 =	2349.0
80	10.9	66.3	44.6		
90	06.9	69.4	37.5		
5400	02.8	69.4	33.4		
				32.2 x 5.67 =	182.6
05.67	600.5	564.5	31.0	30.45 x 10 =	304.5

East		N3470 U.S.	Ht.	Mean Dist.	Area Sq.ft.
5415.67	600.5	570.6	29.9		
				28.75 x 433 =	124.5
20	599.0	71.4	27.6		
30	95.6	70.2	25.4		
40	92.2	72.1	20.1		
50	88.8	76.0	12.8	122 x 10 =	1220.0
60	85.4	75.7	9.7		
70	82.0	65.6	16.4		
80	78.6	62.1	16.5		
90	75.2	60.6	14.6		
				14.65 x 0.67 =	9.8
5490.67	575.2	560.5	14.7		
				15.6 x 9.33 =	145.5
5500	75.2	58.7	16.5		
10	75.2	59.6	15.6	32.15 x 10 =	321.5
20	75.2	58.6	16.6		
				17.3 x 7.5 =	129.8
	27.5 Vert.	575.2	557.2	18.0	21842.0 ⁰
		U.S. 70 = Wall			
5532	575.0	575.0	.0		
				7.8 x 6.3 =	49.1

Above U.S. Toorwall		N3470 45.	HT	Mean Dist.	Area Sq. ft
East					
5538.3	573.1	557.5	15.6		
				$15.3 \times 2 = 30.6$	
40.3	572.5	557.5	15.0		
40.3	572.5	552.8	19.7		
				$15.15 \times 9.7 = 147.0$	
50	69.6	59.0	10.6		
60	66.5	61.4	5.1	$116.5 \times 10 = 116.5$	
70	63.5	61.0	2.5		
				$1.25 \times 4.3 = 5.4$	
74.3	562.2	562.2	.0		
				348.6	

East near D.S. Toorwall		N3480 D.S.	HT	Mean Dist.	Area Sq. ft
4320.4	543.7	543.7	.0		
90	46.5	37.5	9.0		$4.5 \times 9.6 = 43.2$
15	48.0	33.8	14.2		$27.35 \times 5 = 136.8$
4400	49.5	32.2	17.3		
10	52.4	33.1	19.3		$61.8 \times 10 = 618.0$
20	55.4	33.7	21.7		
30	58.4	34.1	24.3		
					$24.15 \times 5 = 120.8$
35	59.9	35.7	24.2		
					$22.5 \times 8 = 180.0$
43	62.3	41.5	20.8		
					$22.05 \times 7 = 154.4$
50	64.5	41.2	23.3		
60	67.5	40.9	26.6		$52.95 \times 10 = 529.5$
70	70.6	41.2	29.4		
					$29.55 \times 1 = 29.6$
4471	570.9	541.2	29.7		

East	N3480 0.5		Ht.	Mean Dist.	Area Sq.ft
4471.	570.9	540.0	30.9		
				15.45	13.5 x 208.6
84.5	575.0	575.0	0.0		2020.9
4488.5 Vert.	575.5	542.0	33.5		
				32.85	11.5 = 377.8
4500	75.5	43.3	32.2		
					31.85 x 10 = 318.5
10	75.5	44.0	31.5		
					31.6 x 6.9 = 218.0
4516.9	575.5	43.8	31.7		
					31.95 x 3.1 = 99.0
20	76.0	43.8	32.2		
30	79.4	43.5	35.9		
40	82.8	43.8	39.0		
50	86.2	44.2	42.0		
					235.65 x 10 = 2356.5
60	89.6	49.2	40.4		
70	93.0	70.0	23.0		
80	96.4	70.4	26.0		
90	599.7	573.2	26.5		
					26.9 x 1.9 = 51.1

East	N3480 0.5		Ht.	Mean Dist.	Area Sq.ft
4591.92	600.4	573.1	27.3		
					27.55 x 8.1 = 223.2
4600	00.4	72.6	27.8		
10	00.4	72.0	28.4		
20	00.4	74.1	26.3		
30	00.4	71.1	29.3		
					232.15 x 10 = 2321.5
40	00.4	59.7	40.7		
50	00.4	59.3	41.1		
60	00.4	67.7	32.7		
70	00.4	60.9	39.5		
					37.8 x 6.9 = 260.8
76.92	600.4	564.3	36.1		
76.92	600.0	564.3	35.7		
					33.4 x 3.1 = 103.5
80.	96.9	65.8	31.1		
90	86.9	58.4	28.5		
4700	76.9	56.9	20.0		
					74.55 x 10 = 745.5
10	66.9	56.9	10.0		
20	56.9	55.9	10.0		
					0.5 x 1 = 0.5
4721	555.9	555.9	0.0		

East		N3480 U.S		Ht.	Mean Dist	Area
				Ht.		Sq. Ft.
5370	626°	560.1	65.9			
					$19755 \times 10 = 1975.5$	
30	26°	60.9	66.0			
40	26°	60.5	65.5			
					$6535 \times 3 = 196.0$	
5343	26°	60.8	65.2			
					$63.4 \times 7 = 443.8$	
50	23.2	61.6	61.6			
60	19.1	58.8	60.3			
70	15.0	60.7	54.3		$25735 \times 10 = 2573.5$	
80	10.9	62.2	48.7			
90	06.9	63.7	43.2			
5400	02.8	62.7	40.1			
					$38.35 \times 5.67 = 213.6$	
05.67	600.5	563.1	36.6		$36.1 \times 4.33 = 156.3$	
10	00.5	64.9	35.6		$35.3 \times 5.67 = 200.2$	
15.67	00.5	65.5	35.0		$34.05 \times 4.33 = 147.4$	
20	599°	565.9	33.1			
30	95.7	73.4	22.3			
40	592.3	572.8	19.5		$1391 \times 10 = 1391.0$	
	✓	✓	✓		✓	✓

East		N3480 U.S		Ht.	Mean Dist	Area
				Ht.		Sq. Ft.
5450	589°	574.4	14.6			
60	85.6	67.9	17.7			
70	82.2	59.0	23.2			
80	78.9	61.6	17.3			
90	75.5	59.6	15.9			
					$15.85 \times 0.67 = 10.6$	
90.67	575.3	559.5	15.8			
					$16.75 \times 9.33 = 156.3$	
5500	75.3	57.6	17.7			
10	75.3	56.8	18.5		$37.3 \times 10 = 373.0$	
20	75.3	55.4	19.9			
					$19.8 \times 3.9 = 77.2$	
23.2	Ver. 575.3	555.6	19.7		22637.1°	
above 4.3 Top Wall						
5528.2	575.0	575.0	0.0			
					$10.2 \times 8.5 = 86.7$	
36.7	✓ 72.4	52.0	20.4			
36.7	^ 72.4	50.1	22.3			
					$20.8 \times 3.3 = 68.6$	
40	571.4	552.1	19.3		✓	✓
	✓	✓	✓		✓	✓

East above U.S. Toe Wall		N3480 U.S.	Ht.	Mean Dist.	Area sq. ft.
5550	568.3	554.0	14.3		$30.75 \times 10 = 307.5$
60	65.2	58.9	6.3		
70	62.2	61.2	1.0		$0.5 \times 0.6 = 0.3$

70.6	562.0	562.0	0.0		
	✓	✓	✓	✓	✓

463.1^{sq}

East below D.S. Toe Wall		N3490 D.S.	Ht.	Mean Dist.	Area sq. ft.
4380	542.0	542.0	0.0		
85	43.5	35.0	8.5		$14.25 \times 5 = 71.3$
90	545.0	533.5	11.5		

East		N3490 D.S.	Ht.	Mean Dist.	Area sq. ft.	70
4400	548.0	531.8	16.2		$30.75 \times 10 = 307.5$	
10	51.0	33.4	17.6		$17.5 \times 5 = 87.5$	
15	52.5	35.1	17.4			
20	54.0	38.4	15.6			
30	57.0	40.0	17.0		$123.45 \times 10 = 1234.5$	
40	60.1	40.4	19.7			
50	63.2	40.6	22.6			
60	66.3	40.7	25.6			
70	569.0	540.9	28.5			

$29.25 \times 5 = 146.2$

75	570.9	40.9	30.0		
----	-------	------	------	--	--

75	570.9	40.0	30.9		
----	-------	------	------	--	--

88	575.0	75.0	0.0		
----	-------	------	-----	--	--

$15.45 \times 13 = 200.8$
 2047.8

4492.3	Vert. 575.5	538.7	36.8		
--------	-------------	-------	------	--	--

$36.8 \times 7.7 = 283.4$

4500	75.5	38.7	36.8		
------	------	------	------	--	--

$35.6 \times 10 = 356.0$

10	75.5	41.1	34.4		
----	------	------	------	--	--

$33.55 \times 6.92 = 232.7$

1692	575.5	542.8	32.7		
------	-------	-------	------	--	--

$32.85 \times 3.1 = 101.8$

East		N3490 D.S.	Ht.	Mean Dist	Area
			Ht.	Ht.	Sq. Ft.
4520	576.5	543.5	33.0		
30	79.9	43.3	36.6		
40	83.2	43.0	40.2		
50	86.5	44.2	42.3		
60	89.9	47.9	42.0		
70	93.4	65.3	27.9		
80	96.5	66.4	30.1		
90	99.9	66.4	33.5		
				$252.5 \times 10 = 2523.5$	
				$33.35 \times 1.9 = 63.4$	
91.92	600.5	66.6	33.9		
				$38.55 \times 8.1 = 312.2$	
4600	00.5	67.3	33.2		
10	00.5	68.2	32.3		
20	00.5	67.7	32.8		
30	00.5	57.2	43.3		
				$282.55 \times 10 = 2825.5$	
40	00.5	55.3	45.2		
50	00.5	55.2	45.3		
60	00.5	55.4	45.1		
70	00.5	56.6	43.9		
				$44.05 \times 6.9 = 303.9$	
76.92	600.5	556.3	44.2		

East		N3490 D.S.	Ht.	Mean Dist	Area
			Ht.	Ht.	Sq. Ft.
4676.92	600.0	556.3	43.7		
				$42.2 \times 3.1 = 130.8$	
80	596.9	56.2	40.7		
90	86.9	55.7	31.2		
4700	76.9	55.5	21.4		
				$85.35 \times 10 = 853.5$	
10	66.9	55.3	11.6		
20	56.9	55.3	1.6		
				$0.8 \times 1.7 = 1.4$	
21.7	555.2	555.2	00		
From	600.5 to	651.4 =			
				$\frac{75+60}{2} \times 50.9 = 3435.8$	
	651.4 to	702.1 =			
				$\frac{50+40}{2} \times 50.7 = 2281.5$	
				13704.9	

East

N3490
U.S.From 651.5 to 702.2 = $\frac{90+43.5}{2} \times 50.7 = 3384.2$ " 626.1 to 651.5 = $\frac{123+100}{2} \times 25.4 = 2832.1$ Ht. Mean Dist. Area
Ht. 59.5ft

5134.5 550.1 550.1 0.0

 $145 \times 5.5 = 8.0$

40 54.3 51.4 2.9

50 62.0 47.7 14.3

60 69.7 49.5 20.2

70 77.3 50.2 27.1

80 85.0 50.2 34.8 $350.35 \times 10 = 3503.5$

90 92.7 50.1 42.6

5200 600.4 49.7 50.7

10 08.1 48.9 59.2

20 15.8 50.6 65.2

30 23.5 53.9 69.6

 $70.7 \times 2 = 141.4$ 32 \vee 625.0 53.2 71.832 \wedge 626.1 53.2 72.9 $74.2 \times 8 = 593.6$

40 626.1 550.6 75.5

East.

N3490
U.S.

5250 626.1 554.5 71.6

60 26.1 52.7 73.4

70 26.1 52.5 73.6

80 26.1 57.4 68.7

90 26.1 53.3 72.8

 $719.75 \times 10 = 7197.5$

5200 26.1 54.3 71.8

10 26.1 55.0 71.1

20 26.1 54.2 71.9

30 26.1 54.7 71.4

40 26.1 54.7 71.4

 $71.4 \times 3 = 214.2$

43 26.1 54.7 71.4

 $70 \times 7 = 490.0$

50 23.3 54.7 68.6

60 19.2 54.0 65.2

70 15.1 54.5 60.6

 $281.55 \times 10 = 2815.5$

80 11.0 59.8 51.2

90 07.0 58.9 48.1

5400 02.9 58.6 44.3

 $42.3 \times 5.67 = 239.8$

05.67 600.6 560.3 40.3

72

East	N3490 U.S.		Ht.	Mean Dist	Area sq. ft.
5415.67	600.6	562.8	37.8	$39.05 \times 10 = 390.5$	
				$36.65 \times 4.33 = 158.7$	
20	599.1	63.6	35.5		
30	95.8	62.6	33.2		
40	92.4	61.7	30.7		
50	89.0	61.5	27.5		
60	85.6	55.9	29.7	$198.35 \times 10 = 1983.5$	
70	82.3	54.7	27.6		
80	78.9	57.2	21.7		
90	75.5	55.1	20.4		
				$20.35 \times 0.67 = 13.6$	
96.67	575.3	555.0	20.3		
				$20.9 \times 9.33 = 195.0$	
5500	75.3	53.8	21.5		
10	75.3	53.4	21.9	$43.55 \times 10 = 435.5$	
20	75.3	53.5	21.8		
				$21.8 \times 0.4 = 8.7$	
20.4	575.3	553.5	21.8		24214.8 □

East	N3490 U.S.		Ht.	Mean Dist	Area	73
5524.4	575.0	575.0	0.0			
					$11.75 \times 9.6 = 112.8$	
34	72.1	48.6	23.5			
					$23.15 \times 2.2 = 50.9$	
36.2	71.4	48.6	22.8			
					$22.15 \times 3.8 = 84.2$	
40	70.2	48.7	21.5			
45	68.7	50.0	18.7		$36.75 \times 5 = 183.8$	
50	67.1	52.5	14.6		$10.55 \times 10 = 105.5$	
60	64.0	57.5	6.5			
					$3.25 \times 8.2 = 26.6$	
68.2	561.5	561.5	0.0			563.8 □

East below D.S. Toe Wall				N 3500 D.S.				
		Ht.	Mean Dist.	Area	Sqft.			
4420	558.9	539.7	19.2					
50	62.0	40.0	22.0					
60	65.0	40.1	24.9					
70	68.2	40.1	28.1					
						29.4 x 8.3 = 244.0		
4380.3	540.5	540.5	0.0	78.3	70.8	40.1	30.7	
				475 x 4.7 = 22.3	78.3	70.8	37.0	33.8
85	42.0	32.5	9.5					
						16.9 x 13.3 = 224.8		
90	43.5	33.2	10.3	20.55 x 5 = 102.8	91.6	575.0	575.0	0.0
						1922.2		
95	45.0	34.0	11.0					
				4495.6 Vert.	575.5	537.9	37.6	
						37.6 x 4.4 = 165.4		
4403	47.6	33.5	14.1	12.55 x 8 = 100.4	4500	75.5	37.9	37.6
						37.65 x 10 = 376.5		
07	48.9	39.4	9.5	11.8 x 4 = 47.2	10	75.5	37.8	37.7
						37.45 x 6.9 = 258.4		
10	49.9	39.6	10.3	9.9 x 3 = 29.7	16.92	75.5	38.3	37.2
						37.6 x 3.1 = 116.6		
20	52.8	39.5	13.3					
30	55.8	539.3	16.5	115.1 x 10 = 1151.0	20	76.5	38.5	38.0
						77.8 x 10 = 778.0		
					40	583.2	543.2	40.0

East	N 3500		Ht.	Mean Dist.	Area Sq. ft.
	D.S.		Ht.		
4550	586.5	544.3	422		
60	89.9	49.4	405		
70	93.2	59.3	339	$190.6 \times 10 = 1906.0$	
80	96.5	61.4	351		
90	99.9	62.1	378		
				$37.9 \times 1.9 = 72.0$	
91.92	600.5	62.5	38.0		
				$37 \times 8.1 = 299.7$	
4600	00.5	64.5	36.0		
10	00.5	63.4	37.1		
20	00.5	62.2	38.3		
30	00.5	55.7	44.8		
40	00.5	55.3	45.2	$295.95 \times 10 = 2959.5$	
50	00.5	55.3	45.2		
60	00.5	55.6	44.9		
70	00.5	55.6	44.9		
				$44.8 \times 6.9 = 309.1$	
76.92	600.5	555.8	44.7		
76.92	600.0	555.8	44.2		
				$42.6 \times 3.1 = 132.1$	
80	596.9	555.9	41.0		

		N 3500		75	
	D.S.	Ht.	Mean Dist.	Area Sq. ft.	
4690	586.9	555.9	31.0		
4700	76.9	55.1	21.8	$86.6 \times 10 = 866.0$	
10	66.9	54.7	12.2		
20	56.9	54.7	2.2		
				$1.1 \times 2.4 = 2.6$	
22.4	554.5	554.5	0.0		
From 600.5 to 651.5 = $\frac{75+60}{2} \times 51 = 3442.5 \text{ sq'}$					
" 651.5 to 702.1 = $\frac{50+40}{2} \times 50.6 = 2277.0 \text{ sq'}$					
$\sqrt{73961.4 \text{ sq'}}$					

East	N3500		
From	U.S		
651.5 to	702.2 =	$\frac{90+43.5}{2} \times 50.7 =$	3384.2 sq'
"	626.1 to 651.5 =	$\frac{123+100}{2} \times 25.4 =$	2832.1 sq'
"	600.7 to 626.1 =	$\frac{205.3+109.6}{2} \times 25.4 =$	3949.2 sq'
"	575.4 to 600.7 =	$\frac{313.2+215.3}{2} \times 25.3 =$	6812.0 sq'
		Ht.	Mean Dist.
		Ht.	Area Sq. ft.
5732.9	548.8	548.8	00
			3.1 x 7.1 = 22.0
40	54.3	48.1	6.2
50	62.0	49.3	12.7
			27.3 x 10 = 273.0
60	69.7	48.7	21.0
			23.6 x 7.5 = 177.0
67.5	75.4	49.2	26.2
			26.1 x 2.5 = 65.2
70	75.4	49.4	26.0
80	75.4	49.3	26.1
90	75.4	49.0	26.4
5200	75.4	49.0	26.4
10	75.4	48.7	26.7
20	75.4	48.2	27.2
30	575.4	548.3	27.1

East	N3500		
	U.S		
	Ht.	Mean Dist.	Area
5240	575.4	548.1	27.3
50	75.4	51.4	24.0
60	75.4	52.1	23.3
70	75.4	50.4	25.0
80	75.4	49.3	26.1
90	75.4	50.2	25.2
5300	75.4	50.2	25.2
			618 x 10 = 6180.0
10	75.4	53.9	21.5
20	75.4	53.0	22.4
30	75.4	52.7	22.7
40	75.4	52.3	23.1
50	75.4	52.3	23.1
60	75.4	52.5	22.9
70	75.4	52.5	22.9
80	75.4	52.7	22.7
90	75.4	53.0	22.4
5400	75.4	53.3	22.1
10	75.4	57.1	18.3
20	75.4	58.4	17.0
30	575.4	559.6	15.8

East		N3500 U.S.	Ht.	Mean Ht.	Dist	Area Sq. ft
5460	575.4	558.3	17.1			
50	75.4	56.2	19.2			
60	75.4	52.8	22.6			
70	75.4	53.5	21.9			
80	75.4	54.2	21.2		$168.4 \times 10 = 1684.0$	
90	75.4	53.2	22.2			
5500	75.4	51.8	23.6			
10	75.4	50.0	25.4			

$$25.3 \times 6.5 = 164.4$$

$$16.5 \text{ vert } 575.4 \quad 5502 \quad 25.2 \quad \underline{25593.1^{\square}}$$

Above U.S. Top Wall

5521	575.0	575.0	0.0			
					$14.4 \times 10.4 = 149.8$	
31.4	71.8	43.0	28.8			
					$28.55 \times 1.6 = 45.7$	
33	71.3	43.0	28.3			
33	71.3	47.0	24.3			
					$22.1 \times 7 = 154.7$	
40	569.1	549.2	19.9			

East		N3500 U.S.	Ht.	Mean Ht.	Dist	Area Sq. ft.
5545	567.5	550.0	17.5		$341 \times 5 = 170.5$	
50	65.9	52.6	13.3		$9.2 \times 10 = 92.0$	
60	62.8	57.7	5.1			
					$2.55 \times 7.7 = 19.6$	
67.7	560.4	560.4	0.0			
						632.3^{\square}

77

East		N3510			
Below D.S. Toewall		D.S.	Ht.	Mean Dist.	Area Sq. ft
4386.5	541.0	541.0	0.0		
				$4.1 \times 3.5 = 14.4$	
90	42.1	33.9	8.2		
4400	45.2	33.5	11.7		
10	48.3	40.0	8.3		
20	51.4	39.0	12.4		
30	54.5	38.8	15.7		
				$165.4 \times 10 = 1654.0$	
40	57.6	38.8	18.8		
50	60.8	38.2	22.6		
60	64.0	38.0	26.0		
70	67.1	37.7	29.4		
80	70.3	37.5	32.8		
				$33.05 \times 1.5 = 49.6$	
81.5	70.8	37.5	33.3		
				$16.65 \times 13.5 = 224.8$	
95	575.0	575.0	0.0		1942.8°
4499	575.5	37.3	38.2		
				$37.85 \times 11 = 416.4$	
4510	575.5	538.0	37.5		

East		N3510			
		D.S.	Ht.	Mean Dist.	Area Sq. ft
4520	575.5	538.3	37.2		
30	75.5	39.8	35.7		
40	75.5	40.3	31.2		
50	75.5	47.6	27.9		
60	75.5	55.0	20.5		
70	75.5	57.9	17.6		
80	75.5	58.1	17.4		
90	75.5	58.4	17.1		
4600	75.5	59.7	15.8		
10	75.5	58.7	16.8		$4217.5 \times 10 = 42175$
20	75.5	58.8	16.7		
30	75.5	56.3	19.2		
40	75.5	55.1	20.4		
50	75.5	55.1	20.4		
60	75.5	55.6	19.9		
70	75.5	56.2	19.3		
80	75.5	55.2	20.3		
90	75.5	56.6	18.9		
4700	75.5	54.1	21.4		
				$21.4 \times 1.4 = 30.0$	
01.4	575.5	554.1	21.4		
				$17 \times 8.6 = 146.2$	

add to the odd 25.75 = 25.8
 stand, sub. on the even 25.65 = 25.6

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 14 FEET WIDE. SIDE SLOPES 1 1/2 TO 1.

FOR SINGLE TRACK EMBANKMENT.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	7.0	7.2	7.3	7.5	7.6	7.8	7.9	8.1	8.2	8.4	0
1	8.5	8.7	8.8	9.0	9.1	9.3	9.4	9.6	9.7	9.9	1
2	10.0	10.2	10.3	10.5	10.6	10.8	10.9	11.1	11.2	11.4	2
3	11.5	11.7	11.8	12.0	12.1	12.3	12.4	12.6	12.7	12.9	3
4	13.0	13.2	13.3	13.5	13.6	13.8	13.9	14.1	14.2	14.4	4
5	14.5	14.7	14.8	15.0	15.1	15.3	15.4	15.6	15.7	15.9	5
6	16.0	16.2	16.3	16.5	16.6	16.8	16.9	17.1	17.2	17.4	6
7	17.5	17.7	17.8	18.0	18.1	18.3	18.4	18.6	18.7	18.9	7
8	19.0	19.2	19.3	19.5	19.6	19.8	19.9	20.1	20.2	20.4	8
9	20.5	20.7	20.8	21.0	21.1	21.3	21.4	21.6	21.7	21.9	9
10	22.0	22.2	22.3	22.5	22.6	22.8	22.9	23.1	23.2	23.4	10
11	23.5	23.7	23.8	24.0	24.1	24.3	24.4	24.6	24.7	24.9	11
12	25.0	25.2	25.3	25.5	25.6	25.8	25.9	26.1	26.2	26.4	12
13	26.5	26.7	26.8	27.0	27.1	27.3	27.4	27.6	27.7	27.9	13
14	28.0	28.2	28.3	28.5	28.6	28.8	28.9	29.1	29.2	29.4	14
15	29.5	29.7	29.8	30.0	30.1	30.3	30.4	30.6	30.7	30.9	15
16	31.0	31.2	31.3	31.5	31.6	31.8	31.9	32.1	32.2	32.4	16
17	32.5	32.7	32.8	33.0	33.1	33.3	33.4	33.6	33.7	33.9	17
18	34.0	34.2	34.3	34.5	34.6	34.8	34.9	35.1	35.2	35.4	18
19	35.5	35.7	35.8	36.0	36.1	36.3	36.4	36.6	36.7	36.9	19
20	37.0	37.2	37.3	37.5	37.6	37.8	37.9	38.1	38.2	38.4	20
21	38.5	38.7	38.8	39.0	39.1	39.3	39.4	39.6	39.7	39.9	21
22	40.0	40.2	40.3	40.5	40.6	40.8	40.9	41.1	41.2	41.4	22
23	41.5	41.7	41.8	42.0	42.1	42.3	42.4	42.6	42.7	42.9	23
24	43.0	43.2	43.3	43.5	43.6	43.8	43.9	44.1	44.2	44.4	24
25	44.5	44.7	44.8	45.0	45.1	45.3	45.4	45.6	45.7	45.9	25
26	46.0	46.2	46.3	46.5	46.6	46.8	46.9	47.1	47.2	47.4	26
27	47.5	47.7	47.8	48.0	48.1	48.3	48.4	48.6	48.7	48.9	27
28	49.0	49.2	49.3	49.5	49.6	49.8	49.9	50.1	50.2	50.4	28
29	50.5	50.7	50.8	51.0	51.1	51.3	51.4	51.6	51.7	51.9	29
30	52.0	52.2	52.3	52.5	52.6	52.8	52.9	53.1	53.2	53.4	30
31	53.5	53.7	53.8	54.0	54.1	54.3	54.4	54.6	54.7	54.9	31
32	55.0	55.2	55.3	55.5	55.6	55.8	55.9	56.1	56.2	56.4	32
33	56.5	56.7	56.8	57.0	57.1	57.3	57.4	57.6	57.7	57.9	33
34	58.0	58.2	58.3	58.5	58.6	58.8	58.9	59.1	59.2	59.4	34
35	59.5	59.7	59.8	60.0	60.1	60.3	60.4	60.6	60.7	60.9	35
36	61.0	61.2	61.3	61.5	61.6	61.8	61.9	62.1	62.2	62.4	36

Calculated by Julien A. Hall, M. Am. Soc. C. E.

MADE IN GERMANY.