

Urinary Mutagenicity and Risk for Bladder Cancer in Northern New England

This file contains the primary data for this study. The study determined the urinary mutagenicity of subjects in a bladder cancer case-control study performed in northern New England. The organics were deconjugated from glucuronide by enzymatic hydrolysis using sulfatase and β -glucuronidase, and then the organics were extracted from the urine by C18-methanol. The organics were solvent exchanged at 150X in dimethyl sulfoxide (DMSO), which was the control solvent.

The *Salmonella* plate-incorporation mutagenicity assay using strain YG1041 with metabolic activation (S9) was used to evaluate the mutagenicity of the urine extracts. As shown on the following data sheets, the dose of urine extract was expressed as ml-equivalent of urine per petri plate (ml-eq/plate), and the number of mutants (revertants or rev) colonies per plate were expressed as rev/plate. The study involved 156 bladder cancer cases and 247 controls. There was sufficient urine such that >70% of the samples were tested at 2 plates/dose; the remaining samples were tested at 1 plate/dose.

The data sheets show data for hydrolyzed (enzymatically deconjugated) and unhydrolyzed (not deconjugated) urine. The doses were 0, 0.3, 0.6 1.2, 3, 6, and 12 ml-eq/plate. The bold values are the average of the numbers of rev/plate from 2 plates. The sample IDs are shown but are not decoded here; this was done by the NIH/NCI authors; thus, the experiments were performed blinded to the EPA scientists performing the extractions and mutagenicity analyses as to whether the samples were from bladder cancer cases or controls.

Negative control data for the mutagenesis experiments are shown as SP- (spontaneous rev/plate in the absence of S9) or SP+ (spontaneous rev/plate with S9). The positive control data were generated using 2-aminoanthracene (2A) at 2 ug/plate with S9, and 2-nirofluorene (2NF) at 5 ug/plate without S9. Controls were performed using 3 plates/condition.

The data were analyzed using Prism (GraphPad, San Diego, CA) software by performing linear regressions. The slope (rev/ml-eq) of the linear regression was the mutagenic potency of each sample and is shown as "s"; the r-squared statistic of the regression is shown as "rs."

NHEERL/ECD/MTB/DMD/2006-02-Ro

Urinary Mutagenicity Study for New England Bladder Cancer / Arsenic

Experiment date : 9/03/2008

Strain: YG1041

Activation :RLAO98 2X 2ppd

Batch #14
PPM

Hydrolyzed

Controls :	SP-	Plate 1	Plate 2	Plate 3	avg.
SP-	0	46	38	25	
SP+	0.3	58	53	62	58
2A	0.6	1208	1294	1285	
2NF	1.2	1548	1997	1765	

Sample ID:
ml-eq/pl

	UCO0405 H	UCO02482 H	UCO03948 H
0	58	58	58
0.3	74	63	69
0.6	106	130	118
1.2	69	40	76
3	256	260	258
6	285	230	258
12	231	231	231
rs.		121	90
s		109	90
		71	91
	0.98	0	0.98
	66.4	0	18.6

Sample ID:
ml-eq/pl

	UCO02651 H	UCO01664 H	UCO00554 H
0	58	58	58
0.3	57	58	58
0.6	71	70	71
1.2			
3	124	138	131
6	231	224	228
12	310	310	310
rs.		86	58
s		48	41
		51	51
	0.97	0	0
	22.1	131	97

Sample ID:

UCO1610 H

ml-eq/pl	0	0.3	0.6	1.2	3	6	12
rs	58	50	72	83	92	88	70
s	58	71	89	96	99	111	118
	58	68	70	92	99	110	110
	58	65	81	72	83	100	100
	58	70	78	83	92	110	110

UCO000193 H

ml-eq/pl	0	0.3	0.6	1.2	3	6	12
rs	58	74	79	74	104	107	65
s	58	70	43	46	60	63	62
	58	63	43	46	60	63	62
	58	65	81	72	83	100	100
	58	70	78	83	92	110	110

UCO3678 H

ml-eq/pl	0	0.3	0.6	1.2	3	6	12
rs	58	74	79	74	104	107	65
s	58	70	43	46	60	63	62
	58	63	43	46	60	63	62
	58	65	81	72	83	100	100
	58	70	78	83	92	110	110

Sample ID:

UCO1043 H

ml-eq/pl	0	0.3	0.6	1.2	3	6	12
rs	58	74	79	74	104	107	65
s	58	70	43	46	60	63	62
	58	63	43	46	60	63	62
	58	65	81	72	83	100	100
	58	70	78	83	92	110	110

Blank H

58 58 58 60
69 73 73 61
62 70 70 52
64 79 88 52
75 80 66 52
76 88 73 52
79 80 66 52
88 86 101 52
101 94 71 52
120 128 99 52
135 120 71 52

0 0 0 0

58 58 58 60
67 73 73 61
67 70 70 61
75 80 80 61
80 86 101 61
101 94 71 61
120 128 99 61
135 120 71 61

0.97 10.6

58 58 58 60
79 67 67 60
75 70 70 60
80 86 86 60
86 101 101 60
101 120 120 60
120 135 135 60

0 0 0 0

58 58 58 60
69 73 73 60
62 70 70 60
64 79 88 60
75 80 66 60
76 88 73 60
79 80 66 60
88 86 101 60
101 94 71 60
120 128 99 60
135 120 71 60

0 0 0 0

Sample ID:
ml-eq/pl

Blank Uh

UCO1043 Uh

58 58 58
71 64 68
67 62 65
75 69 72
78 104 91
108 118 113
12 66 66

avg. 68

58

0 0

58

71

70

70

73

66

66

66

66

66

66

66

66

66

66

66

66

66

66

66

66

66

66

66

66

0 0.3 0.6 1.2 3 6 12

rs.
s

rs.
s

6

NHEERL/ECDD/MTB/DMD/2006-02-R0
Urimary Mutagenicity Study for New England Bladder Cancer / Arsenic
Experiment date : 9/03/2008
Strain = YG1041
Activation : RLA098 2X 2ppd

Batch #14
PPM
Unhydrolyzed

Sample ID: ml-eq/pl	UCO00405 Uh	UCO02482 Uh	UCO03948 Uh	avg.
0	58	58	58	58
0.3	86	70	54	58
0.6	105	81	74	63
1.2	114	71	77	83
3	67	52	65	82
6	73	73	91	88
12	76	106	87	155

rs.
s

0.91
14.5

Sample ID: ml-eq/pl	UCO002651 Uh	UCO01664 Uh	UCO00554 Uh	avg.
0	58	58	58	58
0.3	72	71	72	62
0.6	78	61	71	74
1.2	38	107	73	91
3	106	114	110	56
6	142	233	188	69
12				70

rs.
s

0
0

0.98
21.0

Sample ID:
ml-eq/pl
UCO1610 Uh
avg.

UCO00193 Uh
UCO3678 Uh
avg.

7

NHEERL/ECD/MTB/DMD/2006-02-R0

Urinary Mutagenicity Study for New England Bladder Cancer / Arsenic

Experiment date : 9/11/2008

Strain: YG1041

Activation :RLAO98 2X 2ppd

Hydrolyzed

		Batch #15 PPM			Batch #16 PPM		
Controls :		Plate 1	Plate 2	Plate 3	avg.	Plate 1	Plate 2
SP-		36	34	35	35	63	63
SP+		62	56	70	63	52	56
2A		1295	1232	1087	1132	89	94
2NF		1863	1876	1824	1849	121	110
Sample ID: ml-eq/pl		UCO1560 H			UCO2873 H		
0		63	63	63	63	121	110
0.3		54	52	61	55	112	109
0.6		57	69	89	66	109	90
1.2							
3							
6							
12							
rs. s		0	0	0	0	0	0
Sample ID: ml-eq/pl		UCO0609 H			UCO1765 H		
0		63	63	63	63	63	63
0.3		69	68	65	66	66	53
0.6		84	80	82	76	78	74
1.2							
3							
6							
12							
rs. s		172	146	159	98	103	80
		62	64	63	86	105	71
		28		92	70	101	0
						0	0
						32.4	

61

Sample ID:
ml-eq/pl

UCO1603 H

0	63
0.3	62
0.6	58
1.2	49
3	85
6	107
12	104
rs.	0
s	0

UCO0661 H

0	63
0.3	82
0.6	73
1.2	73
3	96
6	96
12	58
rs.	0
s	0

Sample ID:
ml-eq/pl

UCO2515 H

0	63
0.3	83
0.6	100
1.2	98
3	137
6	143
12	102

Blank H

avg.	63
rs.	0.93
s	23.9

6

NHEERL/ECD/MTB/DMD/2006-02-R0

Urinary Mutagenicity Study for New England Bladder Cancer / Arsenic

Experiment date : 9/11/2008

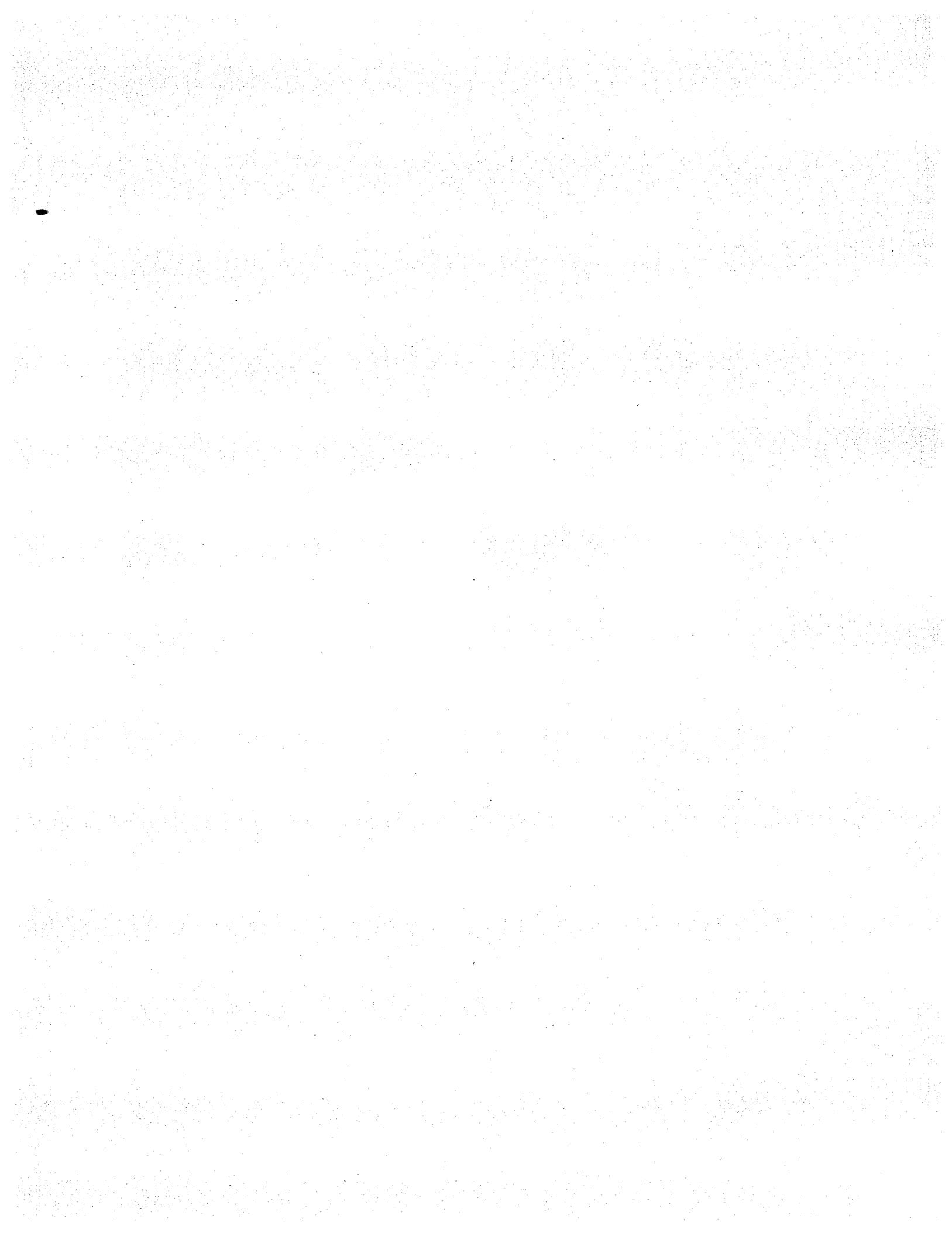
Strain: YG1041

Activation :RLAO98 2X 2ppd

Unhydrolyzed

Sample ID: ml-eq/pl	UCO1560 Uh	UCO2873 Uh	UCO3384 Uh
0	63	63	63
0.3	44	42	48
0.6	50	75	79
1.2	65	62	67
3	61	111	122
6	90	198	206
12	88	206	202
rs.	0	0	0.96
s	0	24.5	0

Sample ID: ml-eq/pl	UCO0609 Uh	UCO1765 Uh	
0	63	63	63
0.3	62	67	67
0.6	63	56	59
1.2	52	48	62
3	65	61	70
6			85
12			94
rs.	0	0	0
s	0	0	0



Sample ID:	UCO1603 Uh	UCO0661 Uh	UCO3172 Uh	
ml-equiv	0	63	63	0
	0.3	68	73	52
	0.6	53	56	59
	1.2	71	60	58
	3	62	69	78
	6	85	98	89
	12			0
				0

Sample ID: ml-eq/pl	Blank	UCO2515	Uh
0	63	63	63
0.3	63	72	68
0.6	70	47	59
1.2	54	61	58
3	99	112	106
6	130	136	136
12	141		

NHEERL/ECD/MTB/DMD/2006-02-R0
 Urinary Mutagenicity Study for New England Bladder Cancer / Arsenic
 Experiment date : 9/11/2008
 Strain: YG1041

Batch #16 Hydrolyzed

Controls :		Plate 1	Plate 2	Plate 3	avg.		
SP-		36	34	35			
SP+		62	56	70	63		
2A		1295	1232	1087			
2NF		1863	1876	1824			
Sample ID:		UCO02752 H	UCO1452 H	UCOO196 H			
ml-eq/pl							
0		63	63	63	63		
0.3		78	81	54	62	65	
0.6		77	67	73	73	66	
1.2							
3		45	68	105	111	121	82
6				104	100	66	83
12				58		74	
rs					0	0	
s					0	0	
Sample ID:		UCOO0738 H	UCO02760 H	UCOO0944 H			
ml-eq/pl							
0		63	63	63	63	63	
0.3		48	77	61	57	60	56
0.6		71	74	75	82	85	72
1.2							
3		77	89	87	96	84	98
6		66	89	89	77	75	83
12		55		70		88	
rs				0	0	0	0
s				0	0	0	0

13

Sample ID: ml-eq/pl	UCO0586 H			UCO3500 H			UCO1810 H		
	0	0.3	0.6	1.2	3	6	12	rs	s
0	63	63	63	63	63	63	63	63	63
0.3	66	66	66	74	66	74	55	65	60
0.6	74	101	88	92	113	112	95	79	73
1.2	111	141	167	154	104	146	124	100	97
3	111	113	113	112	112	104	95	135	106
6	141	167	167	154	146	146	124	106	90
12	178	88	88	88	88	88	88	88	90
					0.97	0.98	0.98	0	0
					14.6	14.6	11.7		

Sample ID: ml-eq/pl	UCO3495 H			Blank H		
	0	0.3	0.6	1.2	3	6
0	63	86	97	189	179	191
0.3	81	93	93	200	200	209
0.6	95	59	184	54	54	70
1.2	62	62	62	106	106	106
3	59	59	59	68	68	68
6	68	68	68			
12						
				0.99	38.8	
				rs	s	

14

NHEERL/ECD/MTB/DMD/2006-02-Ro
 Urinary Mutagenicity Study for New England Bladder Cancer / Arsenic
 Experiment date : 9/11/2008
 Strain: YG1041
 Activation: RLAQ98 2X 2ppd

		Unhydrolyzed																	
		Batch #16						Batch #17											
		PPM			UCO1452 Uh			UCO0196 Uh			UCO02752 Uh			UCO02760 Uh			UCO00944 Uh		
Sample ID:	ml-equiv/l																		
	0	63	63	63	78	67	63	63	63	63	0	0	0	0	0	0			
	0.3	74	69	60	56	62	54	62	65	67	0	0	0	0	0	0			
	0.6	60	56	61	66	68	70	72	63	63	0	0	0	0	0	0			
	1.2	61	60	47	72	87	t	t	62	62	0	0	0	0	0	0			
	3	60	t	t	t	t	t	t	75	75	0	0	0	0	0	0			
	6	t	t	t	t	t	t	t	88	88	0	0	0	0	0	0			
	12	t	t	t	t	t	t	t	108	108	0	0	0	0	0	0			
rs	s																		

Sample ID:
ml-eq/pl

UCO0586 Uh

	0	0.3	0.6	1.2	3	6	12
rs	63	70	55	71	106	116	178
s	63	65	67	73	116	166	154
avg.	63	68	61	72	111	111	100
	63	78	68	68	77	63	71
	63	71	69	68	77	63	71
	63	69	55	58	71	33	102
	63	68	49	72	61		

rs
s

0.98	0
17.9	0

Sample ID:
ml-eq/pl

UCO3495 Uh

	0	0.3	0.6	1.2	3	6	12
rs	63	53	77	80	140	187	382
s	63	60	79	79	140	363	343
avg.	63	60	78	80	164	163	70
	57	78	66	68	50	65	60
	63	66	66	68	50	65	60
	57	78	66	68	50	65	60
	57	78	66	68	50	65	60

rs
s

0.97
50.9

0

0

0

0

0

0

0

0

0

0

0

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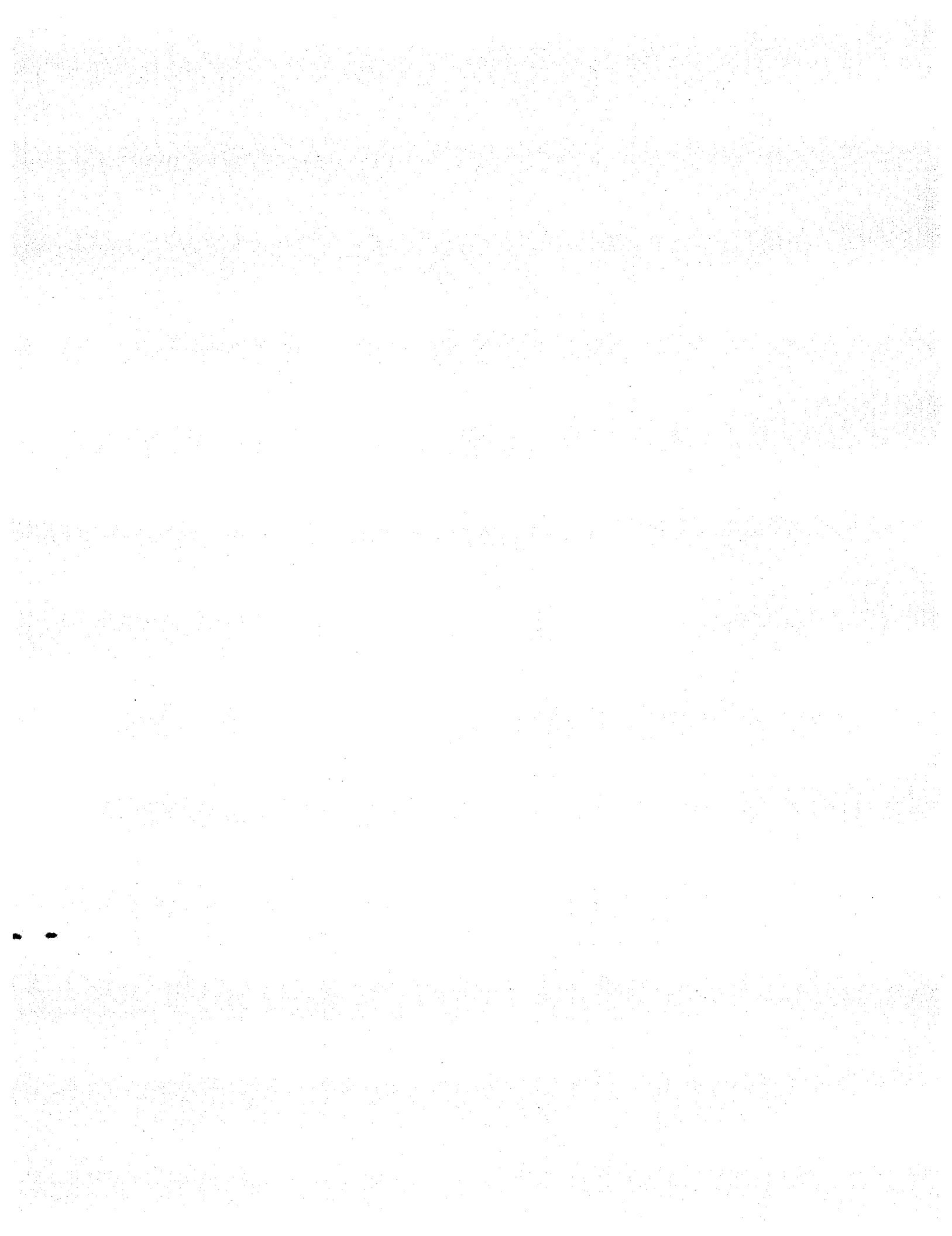
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NHEERL/ECD/MTB/DMD/2006-02-Ro
 Urinary Mutagenicity Study for New England Bladder Cancer/Arsenic
 Experiment date : 9/17/2008

Strain : YG104-1

Activation : RLAO 98.2X 2ppd

Batch #18
 SHW PPM Unhydrolyzed

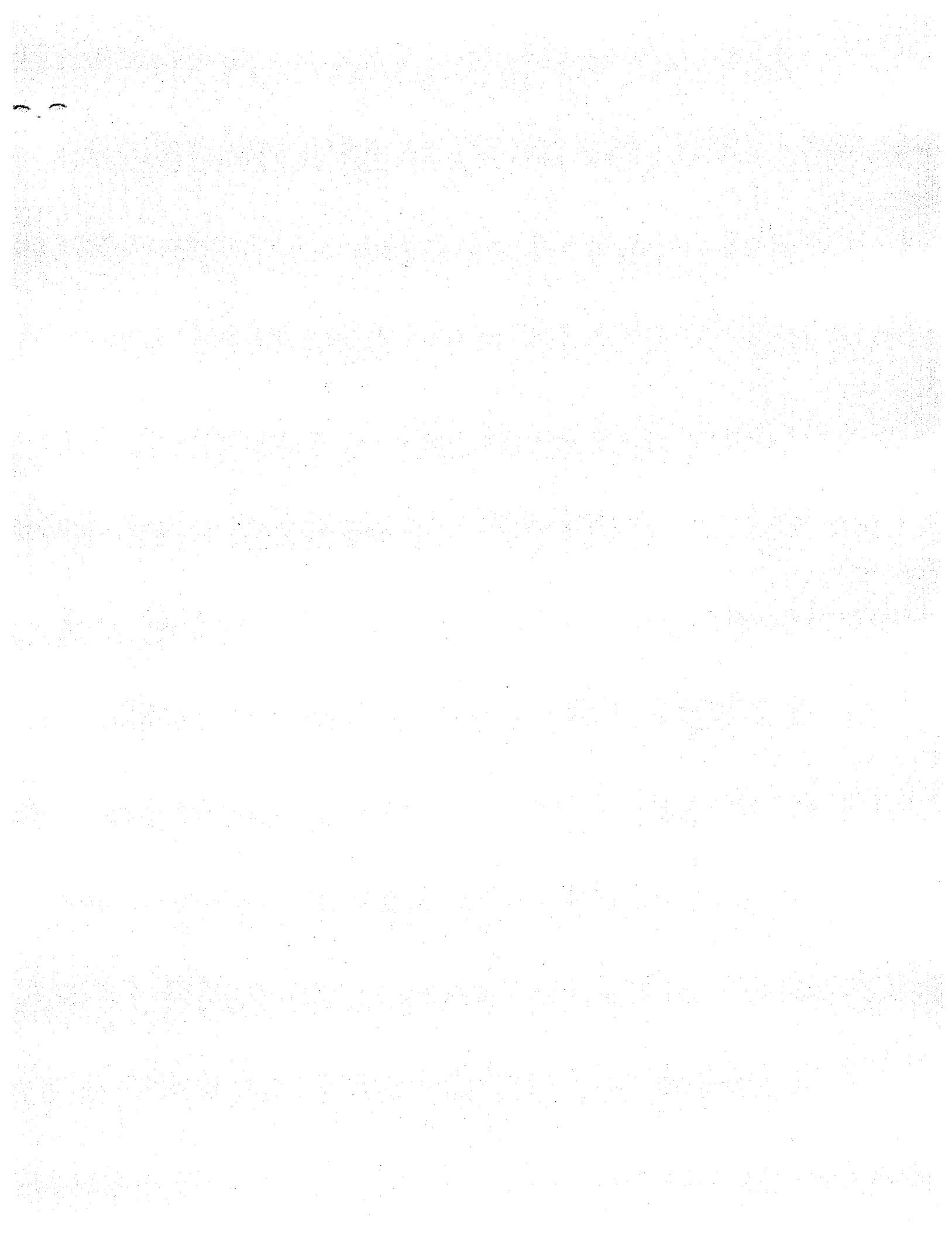
Controls	Plate 1	Plate 2	Plate 3	avg.	Batch #18 PPM	Unhydrolyzed
SP-	33	24	25	25		
SP+	51	65	52	56		
2A	1124	1040	968			
2NF	1225	1178	1195			
Sample ID: ml-equiv/pl	UCO1565 Uh	UCO3252 Uh	UCO2836 Uh	UCO1156 Uh	UCO3509 Uh	UCO1587 Uh
0	56	56	56	56	56	56
0.3	54	47	51	53	58	53
0.6	50	63	57	64	57	62
1.2	59	c	59	61	68	65
3	89	92	91	88	92	71
6	105	88	97	117	76	67
12	112	129	121	12 t	123	69
t	0	0.90	0.97	0.97	0.86	0
s	0	5.9	11.9	27.1	0	0
Sample ID: ml-equiv/pl	UCO3694 Uh	UCO3797 Uh	UCO1587 Uh	UCO3509 Uh	UCO1587 Uh	UCO1587 Uh
0	56	56	56	56	56	56
0.3	65	66	63	54	55	52
0.6	68	56	1	64	43	55
1.2	45	49	54	53	48	57
3	5	1	194	186	80	79
6	c	t	242	207	54	60
12	t	t	133	177	67	86
t	0	0	0	0	0	0

rs
 s

16

Sample ID: ml-eq/pl	UCOO346 Uh		UCO2118 Uh		UCO2118 H		UCO1156 H	
	rs	s	rs	s	rs	s	avg.	avg.
0	56	56	56	56	56	56	56	56
0.3	63	62	72	68	69	65	67	57
0.6	49	61	70	72	65	69	60	54
1.2	58	69 ^c	81	80	105	104	68	59
3	75	67	73	55	137	146	102	103
6	54 ^c	1 t	96	80	211	194	131	148
12	2 t	0	99	95	286	244	160	159
		0	0	0	0	0	0	0
							0.97	0.96
							24.7	14.5

NHEERL/ECD/MTB/DMD/2006-02-Ro
 Urinary Mutagenicity Study for New England Bladder Cancer/Arsenic
 Experiment date : 9/17/2008
 Strain YG1041
 Activation ;RLAO 98 2X 2ppd



Sample ID:
ml-eq/pl

UCO3694 H

0	56
0.3	61
0.6	63
0.9	65
1.2	88
3	76
6	6
12	0
rs	0
s	0

UCO3797 H

0	56
0.3	52
0.6	55
0.9	103
1.2	23
3	144
6	219
12	222
rs	0
s	0

UCO3509 H

0	56
0.3	63
0.6	52
0.9	48
1.2	80
3	105
6	144
12	174
rs	224
s	8

avg.
0

avg.
0.97
14.3

avg.
0

UCO0346 H

Blank H

0	56
0.3	72
0.6	75
1.2	82
3	84
6	107
12	121
rs	104
s	100

avg.

0	56
0.3	49
0.6	50
1.2	55
3	80
6	95
12	100

0.94
7.9

UCO2118 H

0	56
0.3	58
0.6	50
1.2	49
3	57
6	57
12	60
rs	56
s	56

avg.

0	56
0.3	51
0.6	48
1.2	49
3	57
6	43
12	60

0.94
7.9

NHEERL/ECD/MTB/DMD/2006-02-RO
 Urinary Mutagenicity Study for New England Bladder Cancer/ Arsenic
 Experiment date : 9/19/2008

Strain: YG104-1
 Activation: RLOA98 2X 2ppd

Batch # 19

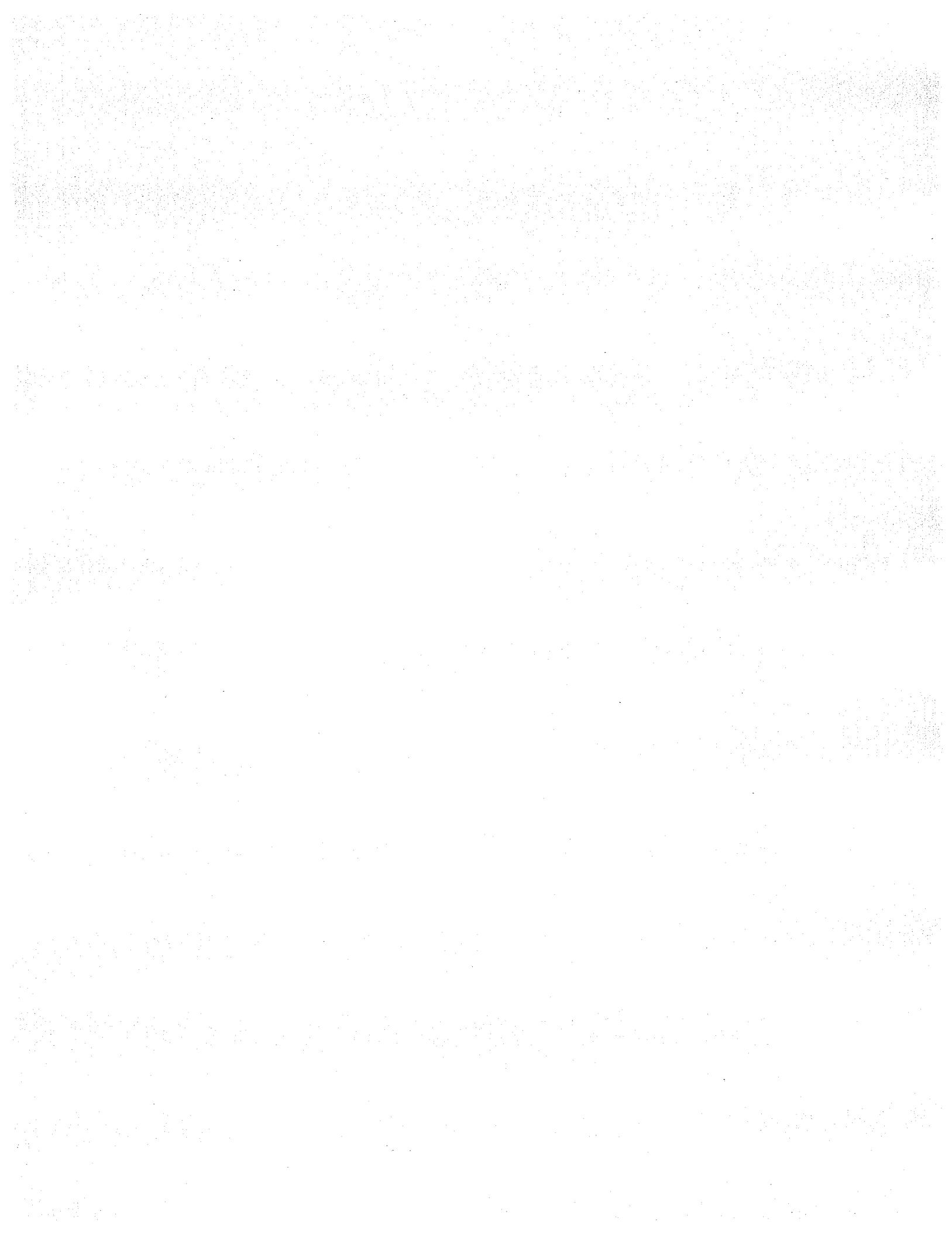
PPM/ DMD

Controls:	Plate 1			Plate 2			Plate 3			Hydrolyzed		
	SP-	44	39	SP+	70	41	SP+	70	52	SP+	70	54
SP-	0	54	54	SP+	63	71	SP+	73	85	SP+	70	54
SP+	0.3	63	76	SP+	73	85	SP+	74	75	SP+	70	60
2A	0.6	73	86	2A	86	94	2A	67	70	2A	63	65
2NF	1.2	86	94	3	78	86	3	88	70	3	78	71
	1.8	86	94	6	70	71	6	87	75	6	126	125
	3	78	86	12	61	57	12	88	88	12	136	130
	6	70	71								99	101
	12	61	57								0	4
rs	0	0	0	s	0	0	s	0	0	avg.	0.97	0
Sample ID: m/1μg-equiv	UCO1816 H	UCO0512 H	UCO0964 H	UCO3654 H	UCO3529 H	UCO3864 H	UCO3698 H	UCO3529 H	UCO3864 H	avg.	0	0
0	54	54	54	54	54	54	54	54	54	54	54	54
0.3	63	71	76	66	66	63	63	60	60	6	6	3
0.6	73	85	74	67	75	67	67	65	65	4	4	2
1.2	86	94	86	70	70	63	78	71	71	5	5	3
3	78	86	88	70	70	126	124	125	125	4	4	1
6	70	71	75	87	87	103	136	130	130	2	2	2
12	61	57	88	88	88	99	101	99	99	3	4	4
rs	0	0	0	s	0	0	s	0	0	avg.	0	0
Sample ID: m/1μg-equiv	UCO3168 H	UCO3864 H	UCO3529 H	UCO3698 H	UCO3529 H	UCO3864 H	UCO3698 H	UCO3529 H	UCO3864 H	avg.	0.95	21.7
0	54	54	54	54	54	54	54	54	54	54	54	54
0.3	49	55	46	63	50	68	75	60	70	70	70	70
0.6	72	69	66	68	76	78	89	70	80	80	80	80
1.2	60	73	83	70	71	82	88	102	95	102	102	95
3	85	80	80	79	88	88	127	120	124	120	120	124
6	70	78	101	65	83	78	135	158	147	158	158	147
12	60	71	73	83	64	71	175	165	170	165	165	170
rs	0	0	0	s	0	0	s	0	0	avg.	0	0

Sample ID: ml (μ g/pl)	UCO2263 H			UCO0390 H			Blank H		
	rs	s	avg.	rs	s	avg.	rs	s	avg.
0	54	54	54	54	54	54	54	54	54
0.3	61	72	69	70	70	70	52	52	52
0.6	56	59	84	106	95	95	59	59	59
1.2	60	56	99	103	101	101	40	40	40
3	50	45	108	117	113	113	53	53	53
6	51	43	99	111	105	105	59	59	59
12	60	64	99	109	104	104	66	66	66
			0.86						
			39.6						

NHEERL/ECD/MTB/DMD/2006-02-RO
Urinary Mutagenicity Study for New England Bladder Cancer/ Arsenic
Experiment date : 9/19/2008
Strain: YG1041
Activation: RLOA98 2X 2ppd

Sample ID: ml (μ g/pl)	UCO1816 Uh			UCO0512 Uh			UCO0964 Uh			UCO3654 Uh		
	rs	s	avg.									
0	54	54	54	54	54	54	54	54	54	54	54	54
0.3	58	60	52	68	52	52	60	4	60	4	4	2
0.6	48	65	61	61	61	60	60	3	60	3	1	1
1.2	50	43	70	69	59	59	68	4	68	4	5	5
3	35	41	83	63	48	48	49	3	49	3	1	1
6	104	94	81	79	51	51	53	2	53	2	1	1
12	99	90	111	99	6	6	12	3	12	2	3	3
			0				0		0	0	0	0



Sample ID:

M\Taq-eq/pl UCO3168 Uh

	0	0.3	0.6	1.2	3	6	12
rs	54	50	62	84	80	89	104
s	54	69	50	82	77	85	0

	0	0.3	0.6	1.2	3	6	12
rs	0	0	0	0	0	0	0
s	0	0	0	0	0	0	0

Sample ID:

M\Taq-eq/pl UCO2263 Uh

	0	0.3	0.6	1.2	3	6	12
rs	54	59	39	12	11	3	9
s	54	60	32	15	1	4	8

Sample ID:

M\Taq-eq/pl UCO0390 Uh

	0	0.3	0.6	1.2	3	6	12
rs	54	54	54	54	54	105	0
s	54	60	78	66	114	104	0

UCO3864 Uh

	0	0.3	0.6	1.2	3	6	12
rs	54	54	52	50	46	81	73
s	54	55	54	46	70	70	93

UCO3529 Uh

	0	0.3	0.6	1.2	3	6	12
rs	54	54	54	54	54	90	86
s	54	50	51	67	70	95	167

UCO3608 Uh

	0	0.3	0.6	1.2	3	6	12
rs	54	54	54	54	54	90	86
s	54	60	58	67	70	95	193

Blank Uh

	0	0.3	0.6	1.2	3	6	12
rs	0.96	0	0	0	0	0	0
s	20.3	0	0	0	0	0	0

NHEERL/ECD/MTB/DMD/2006-02-RO

Urinary Mutagenicity Study for New England Bladder Cancer/ Arsenic

Experiment date : 9/19/2008

Strain: YG1041

Activation: RLOA98 2X 2ppd

Batch # 20
PPM/ DMD

Controls:

Plate 1

avg.

Plate 2

avg.

Plate 3

avg.

Sample ID: UCO3413 H

Sample ID: UCO0742 H

Sample ID: UCO3203 H

Sample ID: UCO1675 H

SP-	44	39	37	54
SP+	70	41	52	48
2A	1159	1189	1211	68
2NF	1711	1571	1721	78

rs	0	0	0	54
s	0	0	0	49

Sample ID: UCO0697 H

SP-	0	54	54	54
SP+	0.3	51	42	50
2A	0.6	71	57	48
2NF	1.2	75	75	73
	3	99	82	103
	6	71	74	90
	12	44	57	131
				134
				125
				121

rs	0	0	0	54
s	0	0	0	46

10

Sample ID: UCO0712 H

SP-	0	54	54	54
SP+	0.3	63	51	54
2A	0.6	56	62	54
2NF	1.2	69	74	41
	3	79	80	41
	6	69	78	45
	12	59	50	74
				76
				75

rs	0	0	0	54
s	0	0	0	46

Sample ID: UCO1950 H

SP-	0	54	54	54
SP+	0.3	63	70	56
2A	0.6	56	58	46
2NF	1.2	69	71	71
	3	79	91	104
	6	69	78	99
	12	59	50	116
				145
				165
				171
				186

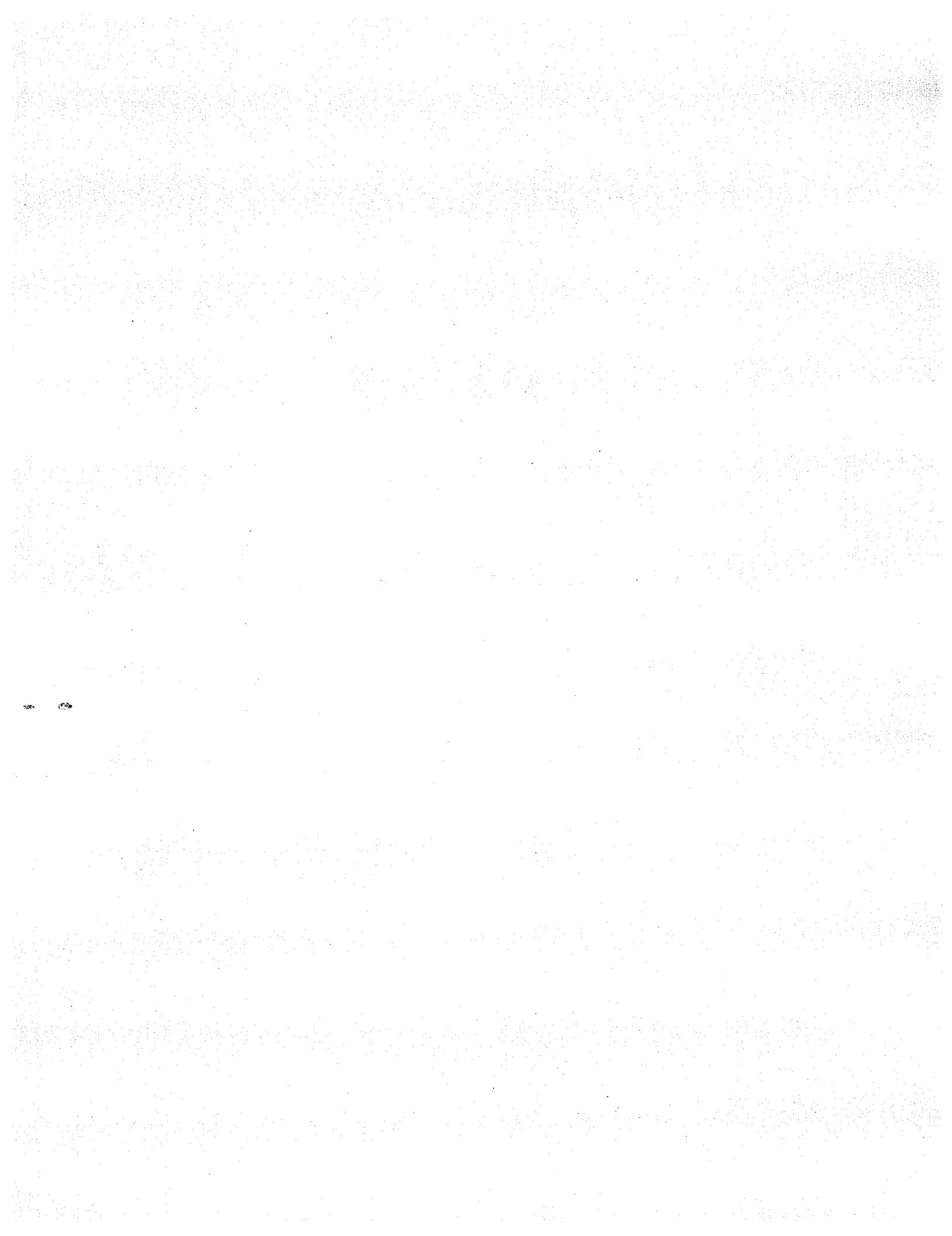
rs	0	0	0	54
s	0	0	0	46

rs	0.93
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s	27.0
---	------

rs	0.97
----	------

s	35.8
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Sample ID:	Mg-eq/pl	UCO2442 Uh	UCO2302 Uh	Blank H
	0	54	54	54
	0.3	48	56	52
	0.6	58	82	70
	1.2	95	80	88
	3	121	111	116
	6	147	136	142
	12	70	85	51
rs		0.93	0	0
s		15.1	0	0

NHEERL/ECD/MTB/DMD/2006-02-RO
Urinary Mutagenicity Study for New England Bladder Cancer/ Arsenic
Experiment date : 9/19/2008
Strain: YG1041
Activation; RLOA98 2X 2ppd

Sample ID:	Mg-eq/pl	UCO3413 Uh	UCO0742 Uh	UCO3203 Uh	UCO1675 Uh	avg.
	0	54	54	54	54	54
	0.3	47	53	55	44	52
	0.6	63	53	64	62	58
	1.2	47	61	48	40	51
	3	61	60	58	63	71
	6	84	81	98	71	82
	12	109	101	74	92	100
rs		0	0	0	0	0
s		0	0	0	0	0

Sample ID:

UCO0697 Uh

UCO1950 Uh

avg.

	0	0.3	0.6	1.2	3	6	12	rs	s
UCO0697 Uh	54	55	56	40	49	66	70	85	85
UCO2396 Uh	54	56	63	47	57	62	63	93	93
UCO0712 Uh	54	60	63	69	54	80	84	101	101
UCO1950 Uh	54	68	71	61	61	69	75	90	90
avg.	54	45	44	62	67	79	77	162	162

rs	s
0	0

rs	s
0.98	11.2

Sample ID:

UCO2442 Uh

	0	0.3	0.6	1.2	3	6	12	rs	s
--	---	-----	-----	-----	---	---	----	----	---

UCO2442 Uh	54	52	46	54	60	70	127	202	200
------------	----	----	----	----	----	----	-----	-----	-----

UCO0712 Uh	54	63	71	61	61	69	75	107	101
------------	----	----	----	----	----	----	----	-----	-----

UCO1950 Uh	54	68	71	62	62	79	77	90	90
------------	----	----	----	----	----	----	----	----	----

avg.	54	45	44	62	67	79	77	162	162
------	----	----	----	----	----	----	----	-----	-----

rs	s
----	---

*** note -sample #UCO1675 the urine was red

12

NHEERL/ECDIM/TB/DMD/2006-02-RO

Urinary Mutagenicity Study for New England Bladder Cancer/ Arsenic

Experiment date : 9/24/2008

Strain: YG1041

Activation: RLOA98 2X 2ppd

Batch # 21

Hydrolyzed

Controls:	Plate 1			Plate 2			Plate 3			Avg			UC02656H
	SP-	SP+	Avg	SP-	SP+	Avg	SP-	SP+	Avg	SP-	SP+	Avg	
SP-	.	40	36	38	63	59	31	60	59	59	75	57	59
SP+	54	54	54	1337	1409	1344	1286	1344	1344	65	77	87	81
2A	1337	1409	1409	1808	1808	1787	1769	1787	1787	61	77	77	68
2NF	1785	1785	1785							72	82	88	85
Sample ID: ml-equiv/l	UC01563H			UC01316H			UC03809H			UC01044H			
0	59	59	59	59	59	59	59	59	59	59	59	59	59
0.3	80	66	73	51	62	59	72	65	75	75	87	87	81
0.6	64	64	64	57	67	61	61	77	58	77	77	77	68
1.2	67	80	76	76	72	72	95	94	82	82	88	88	85
3	85	87	70	70	49	49	80	105	128	128	99	99	114
6	89	86	89	89	82	82	92	82	356	356	417	417	387
12	100	76	84	84	67	67	89	99	408	408	404	404	404
rs	0	0	0	0	0	0	0	0	0	0	0	0	0
s	0	0	0	0	0	0	0	0	0	0	0	0	0
Sample ID: ml-equiv/l	UC00972H			UC00869H			UC01245H			UC01044H			
0	59	59	59	59	59	59	59	59	59	59	59	59	59
0.3	59	68	44	44	56	56	63	63	64	64	64	64	61
0.6	74	85	43	43	66	66	110	110	92	92	92	92	72
1.2	92	90	73	73	60	60	102	102	90	90	90	90	74
3	99	93	69	69	87	87	64	64	50	50	50	50	63
6	107	115	66	66	80	80	108	108	109	109	109	109	90
12	99	81	81	81	60	60	90	90	80	80	80	80	76
rs	0	0	0	0	0	0	0	0	0	0	0	0	0
s	0	0	0	0	0	0	0	0	0	0	0	0	0

4

Sample ID:
ml-eqpl

UC00643H

Blank

H

0	59	59	59
0.3	61	72	60
0.6	82	66	76
1.2	71	68	81
3	83	79	73
6	81	103	101
12	72	99	NES

rs
s

0
0

NHEERL/ECD/MTB/DMD/2006-02-RO

Urinary Mutagenicity Study for New England Bladder Cancer/ Arsenic

Experiment date : 9/24/2008

Strain: YG1041

Activation: RLOA98 2X 2ppd

Batch # 21

Sample ID:
ml-eqpl

UC01563UH

UC01316UH

UC03809UH

UC02327H

0	59	59	59
0.3	49	66	51
0.6	74	56	70
1.2	63	70	60
3	70	57	71
6	100	51	67
12	87	48	62

rs
s

0
0

0	59	59	59
0.3	51	55	51
0.6	60	67	61
1.2	63	56	66
3	73	72	77
6	80	95	75
12	101	67	78

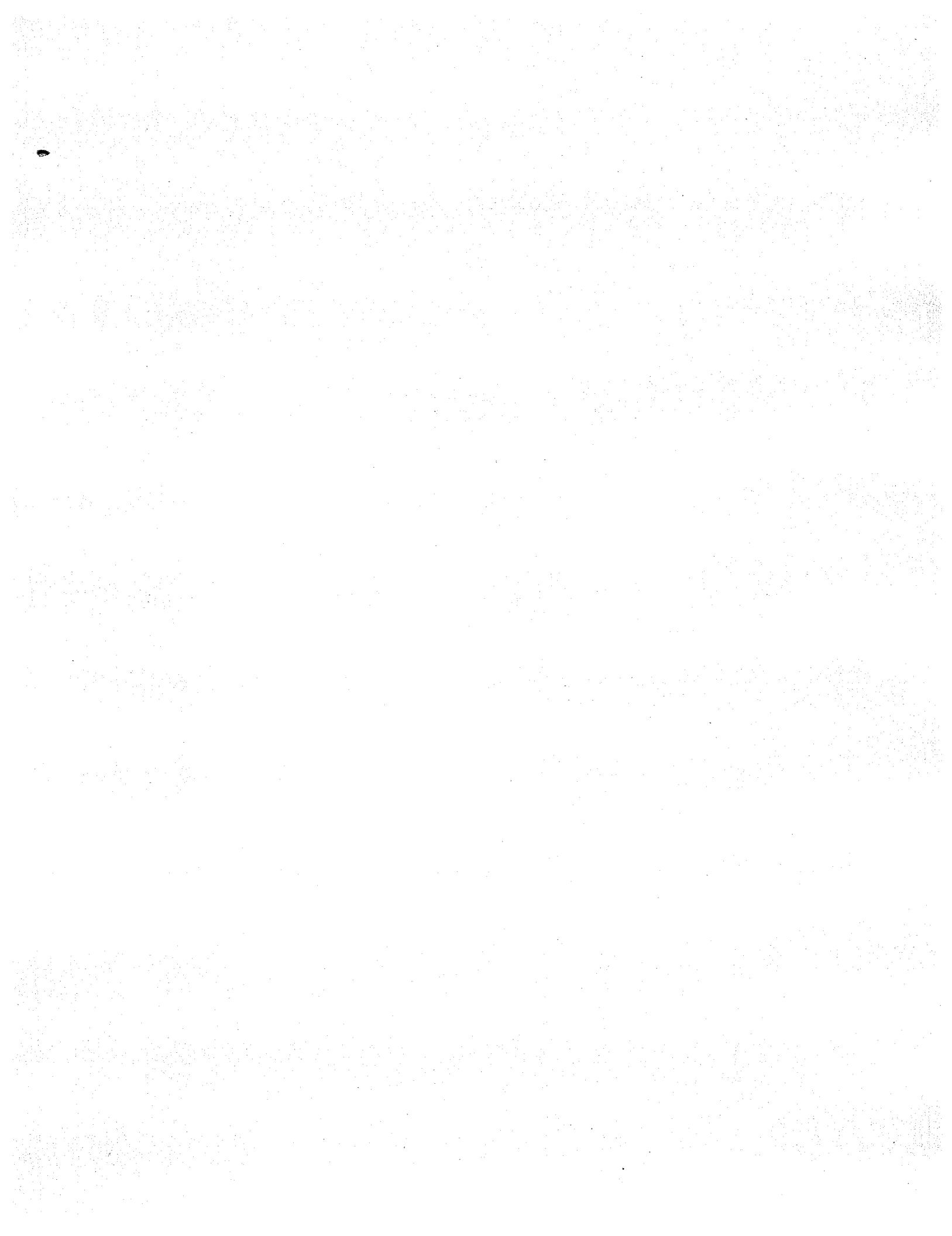
0
0

0	59	59	59
0.3	66	68	68
0.6	76	67	58
1.2	81	67	60
3	73	77	63
6	101	84	83
12	103	85	85

0
0

57

0
0
0

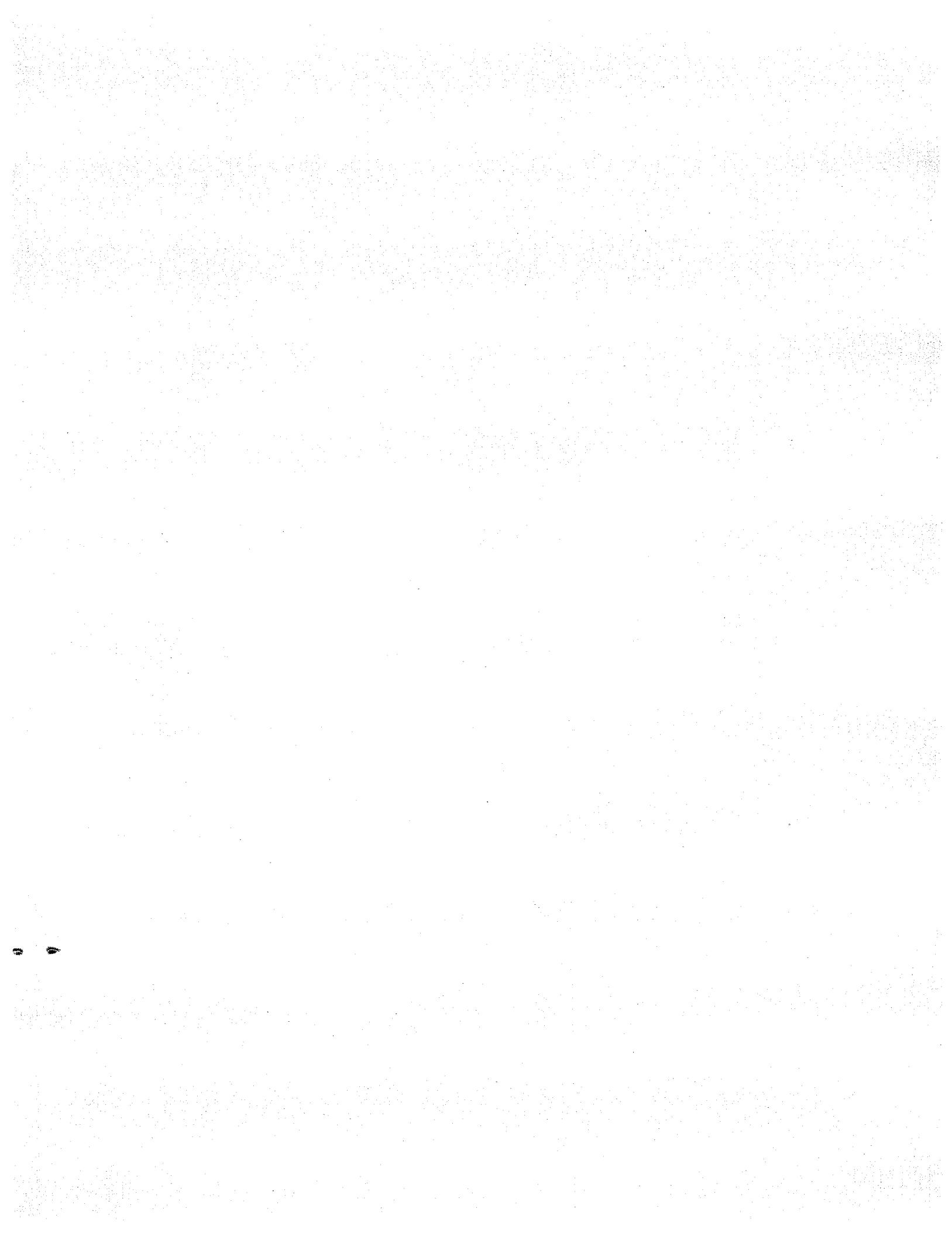


NHEERL/ECDD/MTB/DMD/2006/-02-RO
 Urinary Mutagenicity Study for New England Bladder Cancer/Arsenic
 Experiment date: 10/08/2008
 Strain: YG1041
 Activation: RLA098 2X 2ppd

Batch #22

Controls:		Plate 1	Plate 2	Plate 3	avg.	Hydrolyzed	
SP-	SP+	43	37	30	66		
SP+	SP+	64	63	70	66		
2A	2A	1230	1660	1060			
2NF	2NF	1605	1645	1590			
Sample ID: ml-equiv		UCO3302 H	UCO0435 H	UCO1257 H	UCO0114 H		
0	0	66	66	66	66	66	66
0.3	0.3	78	69	76	71	61	68
0.6	0.6	78	73	88	78	74	88
1.2	1.2	93	70	96	70	83	68
3	3	81	82	109	100	105	83
6	6	89	116	207	196	202	87
12	12	115	128	270	270	270	76
rs	rs	0	0	0.97	17.9	0	0
s	s	0	0	0	0	0	0
Sample ID: ml-equiv		UCO0814 H	UCO2005 H	UCO2237 H	UCO1464 H		
0	0	66	66	66	66	66	66
0.3	0.3	72	63	61	69	48	47
0.6	0.6	54	67	62	60	86	79
1.2	1.2	85	67	75	68	138	134
3	3	78	70	85	84	90	70
6	6	89	83	81	81	3	74
12	12	68	106	86	90	3	107
rs	rs	0	0	0	0	0	0
s	s	0	0	0	0	0	0

4



Sample ID: ml-equiv	UCO0982 H	avg.
0	66	66
0.3	83	72
0.6	135	117
1.2	195	179
3	152	239
6	457	485
12	494	437
		0.94
		62.9
rs	s	

Sample ID: ml-equiv	UCO2052 H	Blank H
0	66	66
0.3	62	64
0.6	70	85
1.2	72	89
3	84	76
6	93	107
12	111	92
	66	66
	0	0
rs	s	

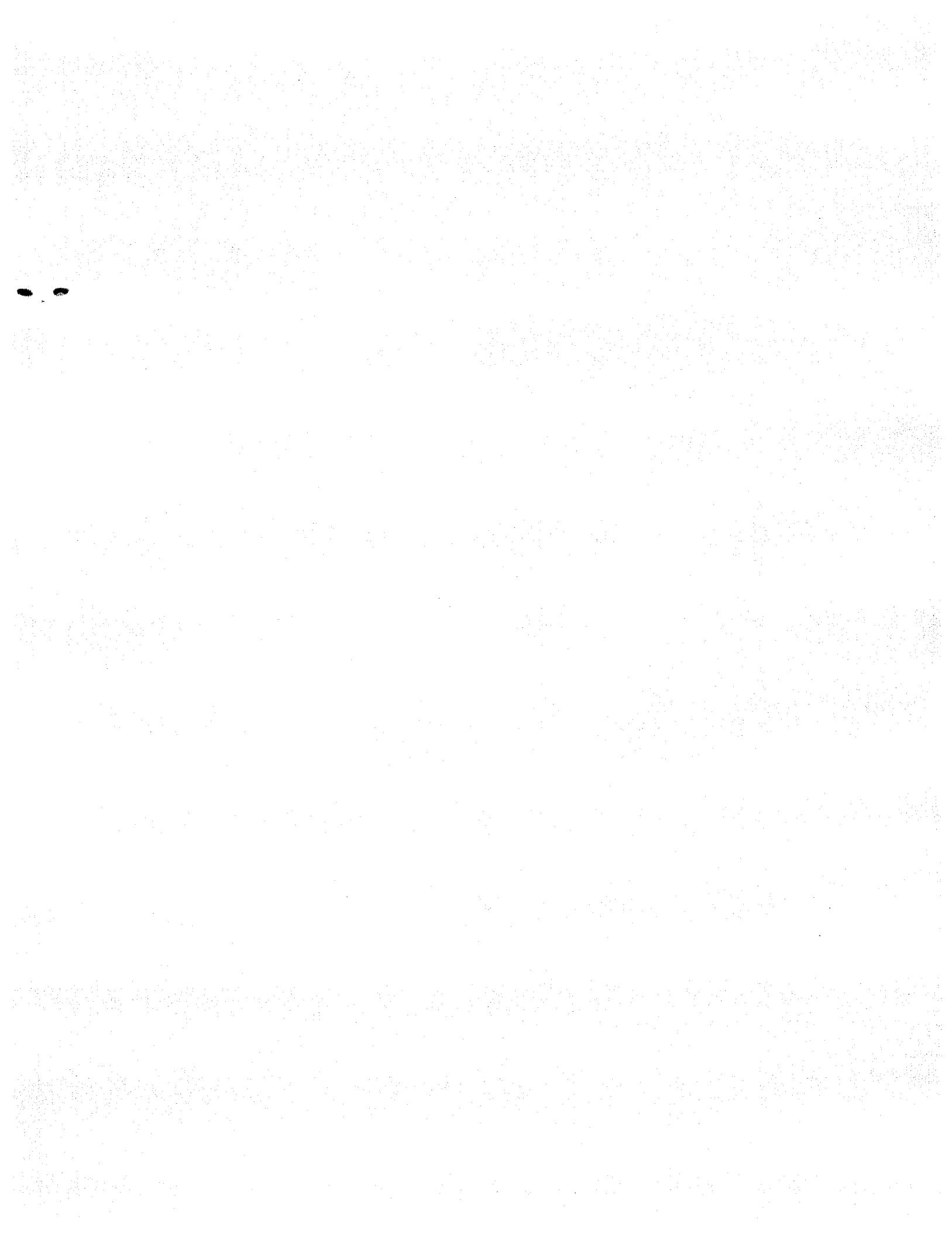
NHEERL/ECD/MTB/DMD/2006/-02-Ro
Urinary Mutagenicity Study for New England Bladder Cancer/Arsenic
Experiment date 10/08/2008
Strain: YG1041
Activation: RLAO98 2X 2ppd
Batch #22 Unhydrolyzed

Sample ID: ml-equiv	UCO3302 Uh	UCO0435 Uh	UCO1257 Uh	UCO1114 Uh	avg.
0	66	66	66	66	66
0.3	67	53	50	56	59
0.6	54	70	47	76	74
1.2	81	64	65	98	88
3	68	89	74	93	93
6	118	99	80	147	136
12	120	0	102	99	152
			131	142	86
rs	s			88	81
				97	78
				76	71
				78	66
				72	67
				0	0
				0.94	0.94
				11.7	11.7

Sample ID: ml-equiv	UCO0814 Uh			UCO2005 Uh			UCO2237 Uh			UCO1464 Uh		
	0	66	66	66	66	66	66	66	66	66	66	66
0.3	58	72	70	61	49	45	121	57	64	64	64	64
0.6	82	60	67	61	129	121	68	68	66	66	66	66
1.2	54	70	70	66	99	99	99	65	66	66	66	66
3	91	96	70	67	127	99	99	56	76	76	76	76
6	130	101	65	67	0	1	1	57	94	94	94	94
12	89	140	85	69	1	1	1	83	84	84	84	84
rs	0	0	0	0	0	0	0	0	0	0	0	0

Sample ID: ml-equiv	UCO0982 Uh			UCO2052 Uh			Blank Uh		
	0	66	66	66	66	66	66	66	66
0.3	93	83	88	88	88	84	84	84	84
0.6	187	190	189	189	70	68	68	68	68
1.2	292	348	320	320	58	60	60	60	60
3	310	266	288	288	67	62	62	62	62
6	452	372	412	412	87	91	91	91	91
12	36	43	43	43	106	103	103	103	103
rs	0.97	0	223.1	0	0	0	0	0	0

6



NHEERL/ECDD/MTB/DMD/2006-02-r0

Urinary Mutagenicity Study for New England Bladder Cancer /Arsenic

Experiment date : 10/15/2008

Strain: YG1041

Activation :RLAO 98 2X 2ppd

Batch # 23

Hydrolyzed

Controls:	Plate 1	Plate 2	Plate 3	avg.
SP-	35	32	44	
SP+	95	69	79	81
2A	1195	1785	1237	
2NF	1603	1732	1605	

Sample ID:

ml-eq/pl

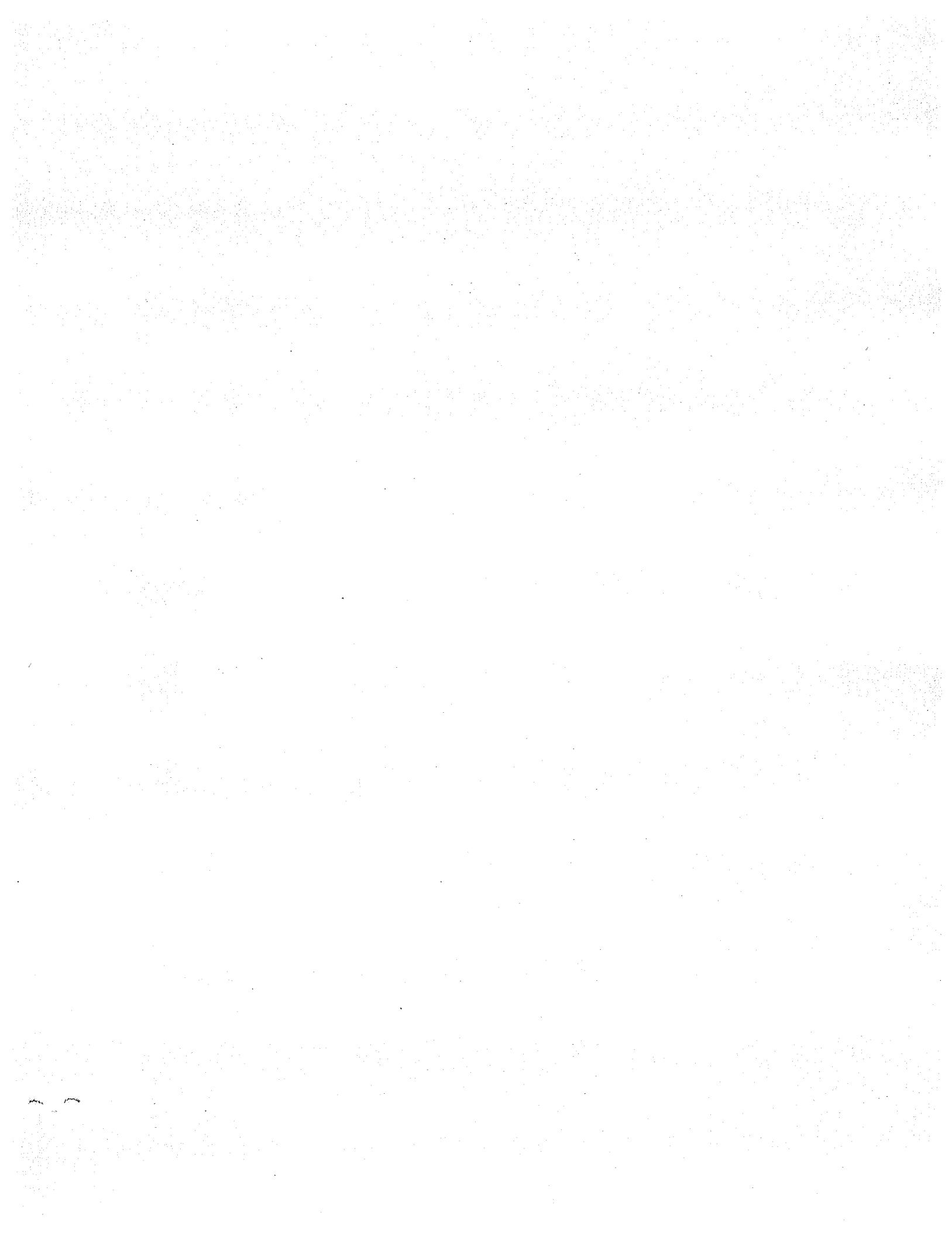
	UCO2719 H	UCO2696 H	UCO3806 H	UCO0284 H
0	81	81	81	81
0.3	83	84	96	76
0.6	83	95	92	93
1.2	101	115	94	96
3	82	106	109	104
6	171	144	117	110
12	141	142	139	99
rs	0	0	0	0
s	0	0	0	0

Sample ID:

ml-eq/pl

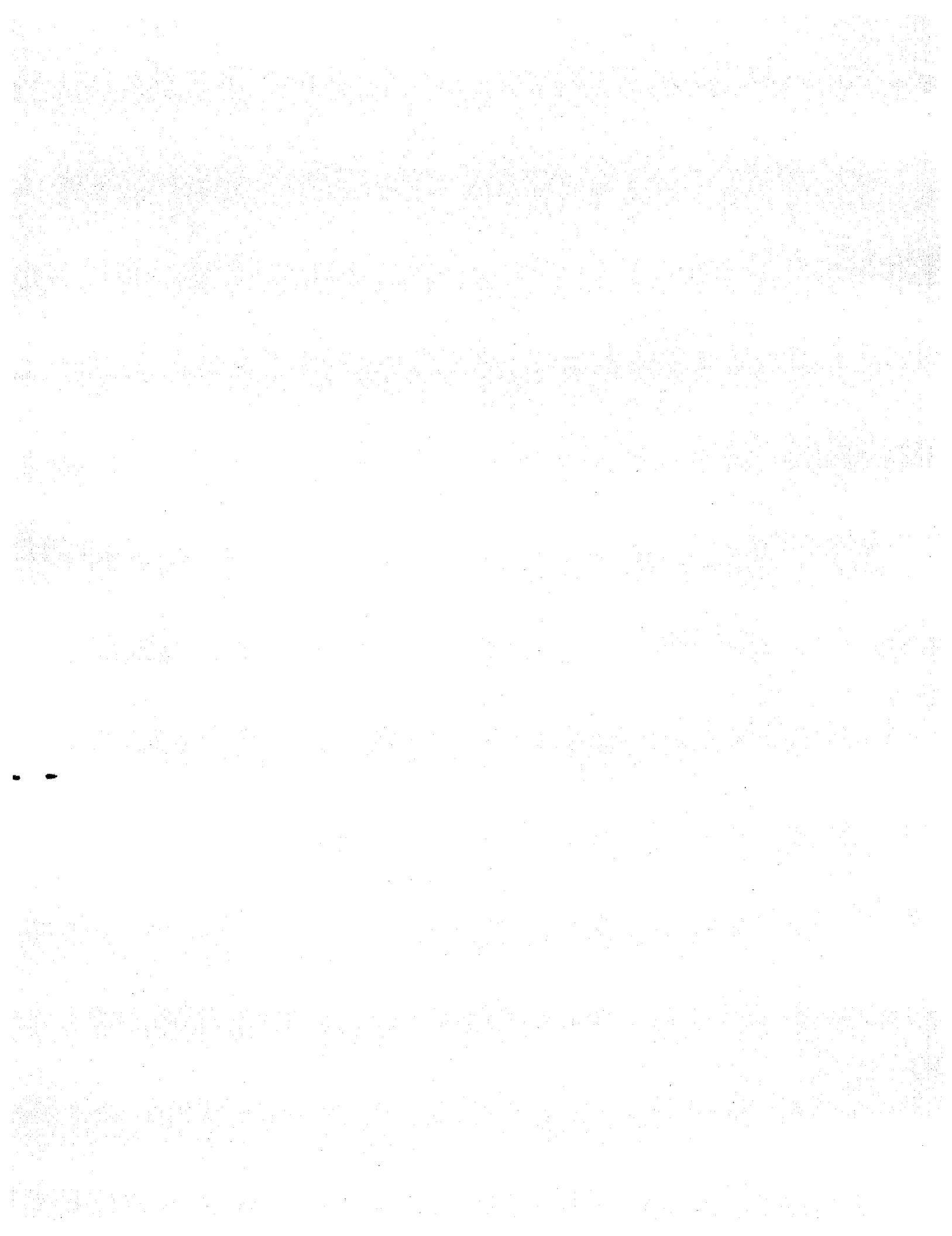
	UCO1726 H	UCO1408 H	UCO1408 H	avg.
0	81	81	81	81
0.3	100	111	115	110
0.6	107	105	108	120
1.2	110	122	71	127
3	124	106	117	146
6	48	40	95	163
12	31	46	69	11.1
rs	0	0	0	0.79
s	0	0	0	0

7



Sample ID: ml-equiv	UCO1353 H	UCO1575 H	Blank
0	81	81	81
0.3	111	123	97
0.6	140	173	88
1.2	192	199	113
3	179	171	90
6	122	143	92
12	102	112	72
		75	63
		0	0
		0	0
	s		
	rs		

8



NHEERL/ECDDMTB/DMD/2006-02-r0
 Urinary Mutagenicity Study for New England Bladder Cancer /Arsenic
 Experiment date :10/15/2008
 Strain: YG1041
 Activation :RLAO 98 2X 2ppd

Batch # 23

Unhydrolyzed

Sample ID: ml-eq/pl	UCO 2719Uh	UCO2696Uh	UCO264Uh	UCO3806Uh	UCO0284Uh
0	81	81	81	81	81
0.3	74	68	12	77	74
0.6	82	70	3	64	64
1.2	70	63	1	72	72
3	83	70	0	81	82
6	105	80	0	74	100
12	106	0	0	93	87
			117	95	106
			116	115	123
				125	125
rs	0	0	0	0	0
s	0	0	0	0	0

Sample ID: ml-eq/pl	UCO2613 Uh	avg.	UCO3902 Uh	UCO1726 Uh
0	81	81	81	81
0.3	85	88	87	75
0.6	90	101	96	67
1.2	98	101	100	86
3	89	96	93	78
6	129	130	130	84
12	162	166	164	69
			110	69
			108	81
			102	110
rs	0.95	0	0	0
s	33.6	0	0	0

9

Sample ID:

UCO1408Uh UCO1353 Uh UCO1575Uh

ml-equiv

	0	0.3	0.6	0.6	1.2	3	6	6	12
rs	81	70	80	96	110	110	172	169	214
s	81	65	71	88	93	95	171	171	157

rs s

	avg.	81	81	81	81	81	81	81	81
rs	0.92	14.9	0.92	14.9	0.92	14.9	0.92	14.9	0.92
s	33.6	0	33.6	0	33.6	0	33.6	0	33.6

Sample ID:

Blank

ml-equiv

	0	0.3	0.6	1.2	3	6	12
rs	81	71	73	52	75	71	68
s	81	71	73	52	75	71	68

rs s

10

NHEERL/ECDD/MTB/DMD/2006-02-r0

Urinary Mutagenicity Study for New England Bladder Cancer /Arsenic

Experiment date :10/15/2008

Strain: YG1041

Activation :RLAO 98 2X 2ppd

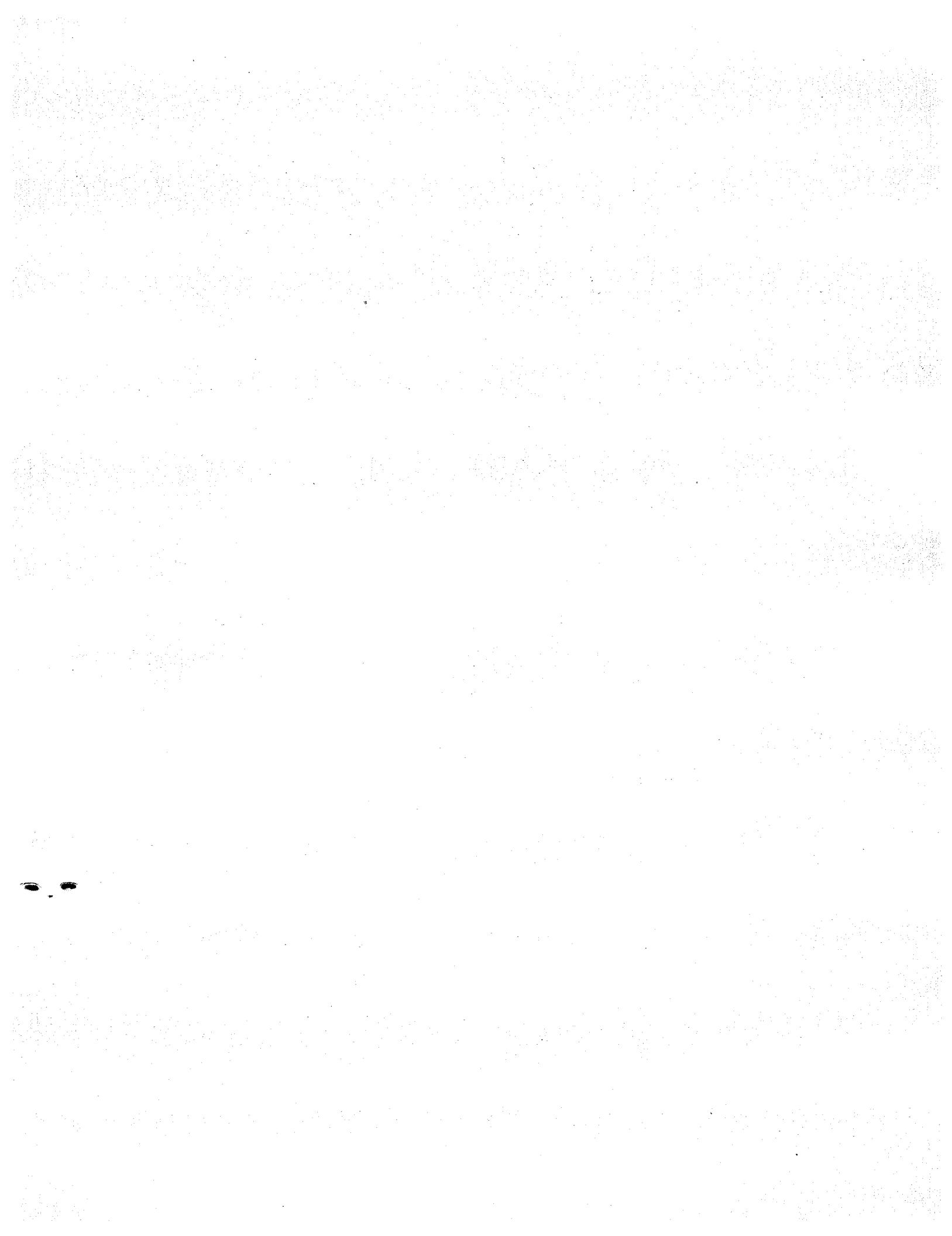
Batch # 24

Hydrolyzed

Controls:	Plate 1	Plate 2	Plate3	avg.
SP-	35	32	44	
SP+	95	69	79	81
2A	1195	1785	1237	
2NF	1603	1732	1605	

Sample ID: ml-equiv/l	UCO3699H			UCO1161 H	UCO2131H	UCO0250H	UCO2874H	UCO3792H	UCO1979H	UCO2395H	UCO1979H	UCO2874H
0	81	81	81	81	81	81	81	81	81	81	81	81
0.3	57	68	99	93	87	66	80	75	73	75	90	75
0.6	77	96	120	85	74	103	88	128	85	114	120	128
1.2	106	106	123	114	89	87	93	93	95	91	93	93
3	108	102	110	109	95	109	91	75	107	112	108	107
6	120	118	100	91	82	96	59	66	113	103	67	68
12	95	82	72	95	0	0	0	0	104	116	67	68
rs	0	0	0	0	0	0	0	0	0	0	0	0
s	0	0	0	0	0	0	0	0	0	0	0	0

11



Sample ID: ml-eq/pl	UCO2439H			UCO1648H			Blank		
0	81	81	81	76	76	76			
0.3	82	100	74	92	92	92			
0.6	85	88	103	101	101	101			
1.2	94	84	91	112	112	112			
3	87	98	92	101	101	101			
6	106	115	65	92	92	92			
12	106	108	49	52	52	52			
			0	0	0	0			
			0	0	0	0			
rs	s								

NHEERL/ECD/MTB/DMD/2006-02-r0
Urinary Mutagenicity Study for New England Bladder Cancer /Arsenic
Experiment date :10/15/2008
Strain: YG1041
Activation :RLAO 98 2X 2ppd

Sample ID: ml-eq/pl	UCO3699UH			UCO1161UH			UCO2131UH			UCO0250UH		
0	81	81	81	81	81	81	81	81	81	81	81	81
0.3	77	72	73	66	66	66	96	96	96	69	69	75
0.6	69	57	72	68	68	68	91	91	91	80	80	77
1.2	46	70	68	69	69	69	73	73	73	69	69	77
3	58	61	83	81	81	81	71	71	71	94	94	75
6	0	0	103	91	91	91	87	87	87	112	112	110
12	0	0	108	116	116	116	105	105	105	104	104	178
							0	0	0	0	0	0
rs	s											

12

Sample ID:

UCO2395Uh

ml-equiv

0	81	81
0.3	85	75
0.6	79	93
1.2	78	70
3	81	89
6	106	99
12	116	110

rs
s

0	0	0
0.88	0	0
7.6	0	0
0.88	0	0
7.6	0	0

Sample ID:

UCO2874Uh

avg

0	81	81
0.3	85	80
0.6	82	82
1.2	70	93
3	79	74
6	101	98
12	143	137

Sample ID:

UCO1648Uh

ml-equiv

0	81	81
0.3	77	73
0.6	83	83
1.2	70	79
3	71	60
6	98	71
12	106	100

rs
s

0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

Blank

0	81	64
0.3	64	66
0.6	61	82
1.2	91	84
3	105	76
6	112	139
12	148	133

13

NHEERL/ECDD/MTB/DMD/2006-02-R0
 Urinary Mutagenicity Study for New England Bladder Cancer / Arsenic
 Experiment date : 10/24/2008

Strain: YG1041
 Activation :RLA098 2X 2ppd

Batch # 25

Controls : SP- SP+ 2A 2NF

Plate 1 33 65 1298 1787

Plate 2 30 53 1270 1916

Plate 3 43 56 1518 1860

avg.

Sample ID: UCO03091 H UCO3590 H UCO0910 H

0	58	58	58
0.3	79	60	83
0.6	103	90	64
1.2	80	91	60
3	70	95	96
6	72	67	96
12	59	58	68

rs.
S

Sample ID: UCO1216 H UCO2361 H UCO106 H

0	58	58	58
0.3	75	61	66
0.6	71	60	87
1.2	66	68	79
3	70	72	96
6	76	83	193
12	84	57	219

58	58	58
66	77	77
84	80	80
90	105	105
67	76	76
105	105	105
70	70	70

avg.	58	58
83	80	80
128	122	122
125	146	146
157	175	175
226	259	259
233	252	252

0.92	0.98	0.98
21.1	19.2	19.2

Sample ID:

UCO2662 H

avg.

0	58	58
0.3	54	64
0.6	84	82
1.2	90	81
3	77	85
6	97	129
12	127	135

rs

s

UCO1358 H

0	58	58
0.3	81	74
0.6	94	107
1.2	165	163
3	73	130
6	252	541
12	668	580

avg.

47.3

H

H

H

H

H

H

H

H

H

H

H

H

H

H

H

H

H

H

H

H

H

H

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H

H

H

H

H

H

H

H

H

H

H

H

H

H

H

H

UCO1151 H

0	58	58
0.3	92	88
0.6	113	99
1.2	160	140
3	70	70
6	146	143
12	94	123

rs

s

avg.

74.29

Blank H

0	58	60
0.3	60	60
0.6	60	60
1.2	62	62
3	63	63
6	61	61
12	60	60

avg.

47.3

H

H

H

H

H

H

H

H

H

H

H

H

H

H

H

H

H

H

H

H

H

H

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H

H

H

H

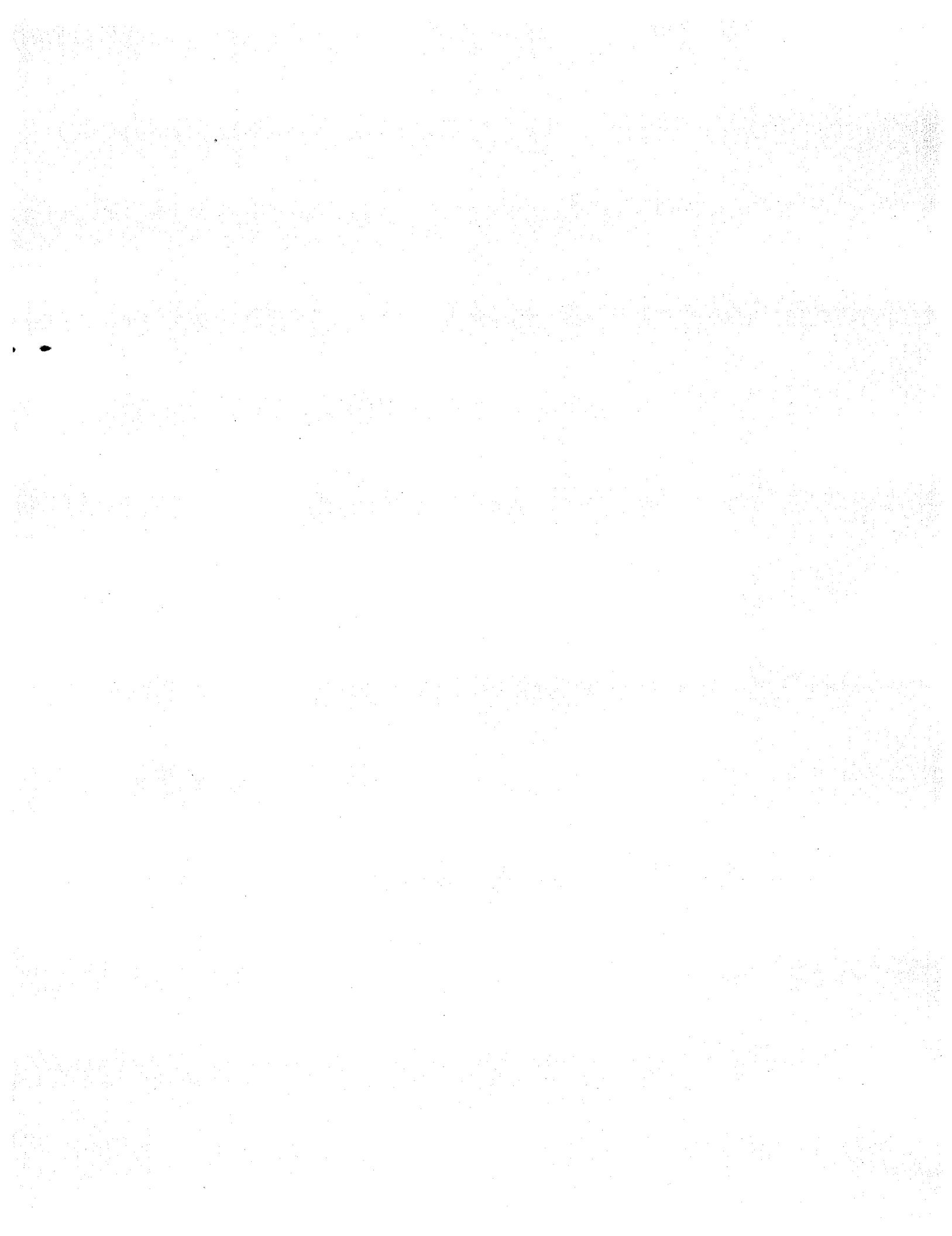
NHEERL/ECD/MTB/DMD/2006-02-Ro
Urinary Mutagenicity Study for New England Bladder Cancer / Arsenic
Experiment date : 10/24/2008
Strain: YG1041

Activation :RLAO98 2X 2ppd

Batch # 25

Unhydrolyzed

Sample ID: ml-eq/pl		UCO3091 Uh	UCO3590 Uh	UCO0910 Uh	avg.	avg.	avg.	avg.
0	58	58	58	58	58	58	58	58
0.3	58	55	57	71	62	72	65	69
0.6	74	50	62	61	69	71	69	70
1.2	70	77	72	56	58	73	76	75
3	103	70	87	64	67	61	79	70
6	110	130	120	79	65	122	117	120
12	158	0	158	71	82	110	102	106
rs.		0.98			0.83			
s		8.6			8.7			
Sample ID: ml-eq/pl		UCO1216 Uh	UCO2361 Uh	UCO106 Uh	avg.	avg.	avg.	avg.
0	58	58	58	58	58	58	58	58
0.3	45	39	72	77	75	57	70	64
0.6	74	64	52	77	65	81	89	85
1.2	74	71	82	79	81	87	66	77
3	78	72	68	98	83	135	90	113
6	74	95	273	240	257	267	260	264
12	101	92	381	330	356	352	451	402
rs.		0.94			0.98			
s		25.94			29.7			



Sample ID:
ml-eq/pl

UCO2662 Uh

	avg.	58	58	58	58	58	58
0	58	58	58	58	58	58	58
0.3	66	71	69	68	53	82	78
0.6	70	60	65	78	85	70	76
1.2	48	55	52	68	73	73	74
3	62	66	64	83	76	81	88
6	86	81	84	116	107	171	85
12	144	99	122	104	123	206	198

rs
s

	0.89	5.1	0.95	11.6

Sample ID:
ml-eq/pl

UCO1151 Uh

	58	58	58	58	58	58	58
0	58	58	58	58	58	58	58
0.3	85	56	56	56	56	56	56
0.6	96	92	92	92	92	92	92
1.2	71	84	84	84	84	84	84
3	78	104	104	104	104	104	104
6	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0

rs
s

*** sample # 1151 unhydrolyzed toxic

Blank Uh

	58	58	58	58	58	58

NHEERL/ECDD/MTB/DMD/2006-02-Ro

Urinary Mutagenicity Study for New England Bladder Cancer / Arsenic

Experiment date : 10/24/2008

Strain: YG1041

Activation :RLAO98 2X 2ppd

Batch # 26

Controls : SP- SP+ 2A 2NF

Plate 1 33 65 1298 1787
Plate 2 30 53 1270 1916
Plate 3 43 56 1518 1860
avg. 58 58 58 58

Sample ID: UCO2892 H

0 58 58 58 58
0.3 69 72 71 74
0.6 80 77 79 89
1.2 92 92 92 83
3 87 74 81 120
6 133 170 151 174
12 146 140 143 192
rs. s 0.85 13.1 0.98 20.8

UCO1913 H

avg. 58 58 58 58
71 74 71 73
79 89 93 91
92 92 112 98
87 74 81 120
133 170 151 212
146 140 143 180
4 4 2 2 86 79 79 79

UCO1023 H

avg. 58 58 58 58
71 73 73 73
93 91 91 91
112 112 98 98
130 130 125 125
180 186 186 186
4 4 2 2 86 79 79 79

UCO0449 H

avg. 58 58 58 58
71 73 73 73
91 91 91 91
112 112 98 98
130 130 125 125
186 186 186 186
4 4 2 2 86 79 79 79

99

0.93 9.0

UCO3026 H

avg. 58 58 58 58
71 73 73 73
91 91 91 91
112 112 98 98
130 130 125 125
186 186 186 186
4 4 2 2 86 79 79 79

UCO3982 H

avg. 58 58 58 58
71 73 73 73
91 91 91 91
112 112 98 98
130 130 125 125
186 186 186 186
4 4 2 2 86 79 79 79

99

0.93 9.0

rs s

Sample ID:
ml-eq/pl

UCO0394 H

0	58
0.3	73
0.6	98
1.2	93
3	94
6	103
12	84

rs
s

Sample ID:
ml-eq/pl

UCO2190 H

0	58
0.3	75
0.6	77
1.2	79
3	82
6	108
12	90

rs
s

UCO0394 H

0	58
0.3	71
0.6	79
1.2	80
3	81
6	72
12	68

Blank H

58
66
65
63
64
63
59

UCO3740 H

0	58
0.3	68
0.6	67
1.2	60
3	87
6	79
12	59

NHEERL/ECDD/MTB/DMD/2006-02-Ro
Urinary Mutagenicity Study for New England Bladder Cancer / Arsenic
Experiment date : 10/24/2008
Strain: YG1041

Activation :RLAO98 2X 2ppd

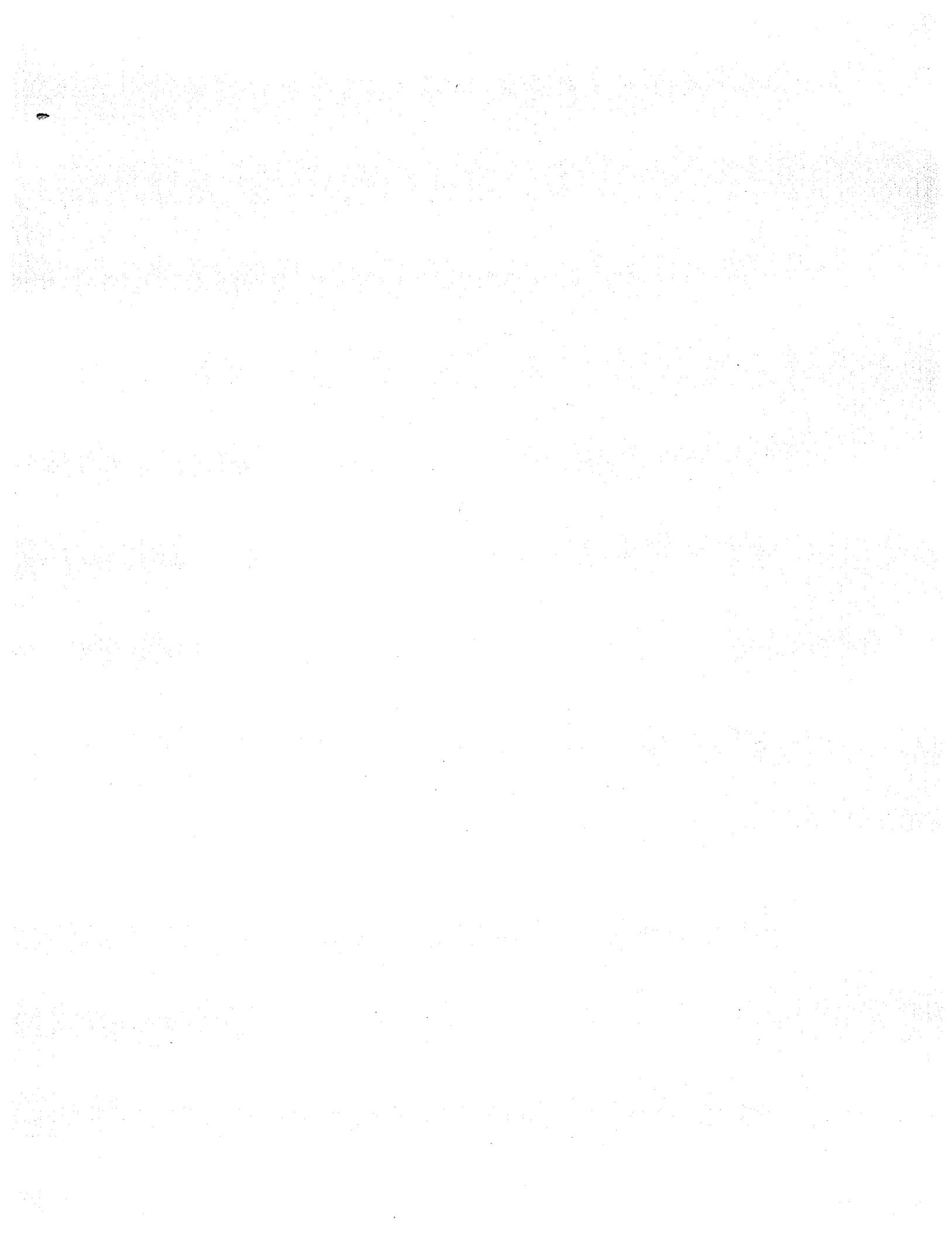
Unhydrolyzed

Sample ID: ml-eq/pl	UCO2892 Uh	Batch # 26	UCO1023 Uh	avg.	UCO1913 Uh	avg.
0	58	58	58	58	58	58
0.3	63	67	65	67	74	49
0.6	68	66	67	68	78	55
1.2	66	75	71	98	93	58
3	75	75	75	127	99	69
6	113	120	117	220	113	72
12	162	168	165	278	233	227
					20	18
					287	9
					3	
rs.	0.98	8.8	0.96	0.98	104	93
s	26.2	26.2	26.2	26.2		

rs
s

Sample ID: ml-eq/pl	UCO3982 Uh	Batch # 26	UCO3026 Uh	avg.	UCO0449 Uh	avg.
0	58	58	58	58	58	58
0.3	66	65	77	67	78	65
0.6	80	59	65	74	49	52
1.2	54	60	88	91	67	63
3	80	62	87	93	68	77
6	103	90	100	102	74	74
12	81	116	90	118	104	93

rs
s



Sample ID:
ml-equiv

UCO0394 Uh

0	58	58
0.3	49	62
0.6	62	77
1.2	57	61
3	75	66
6	107	100
12	103	99

rs
sSample ID:
ml-equiv

UCO2190 Uh

0	58	58
0.3	81	60
0.6	56	62
1.2	67	71
3	62	47
6	72	91
12	83	111

rs
s

Blank Uh

58	58
46	46
45	45
55	55
45	45
58	58
60	60

avg.

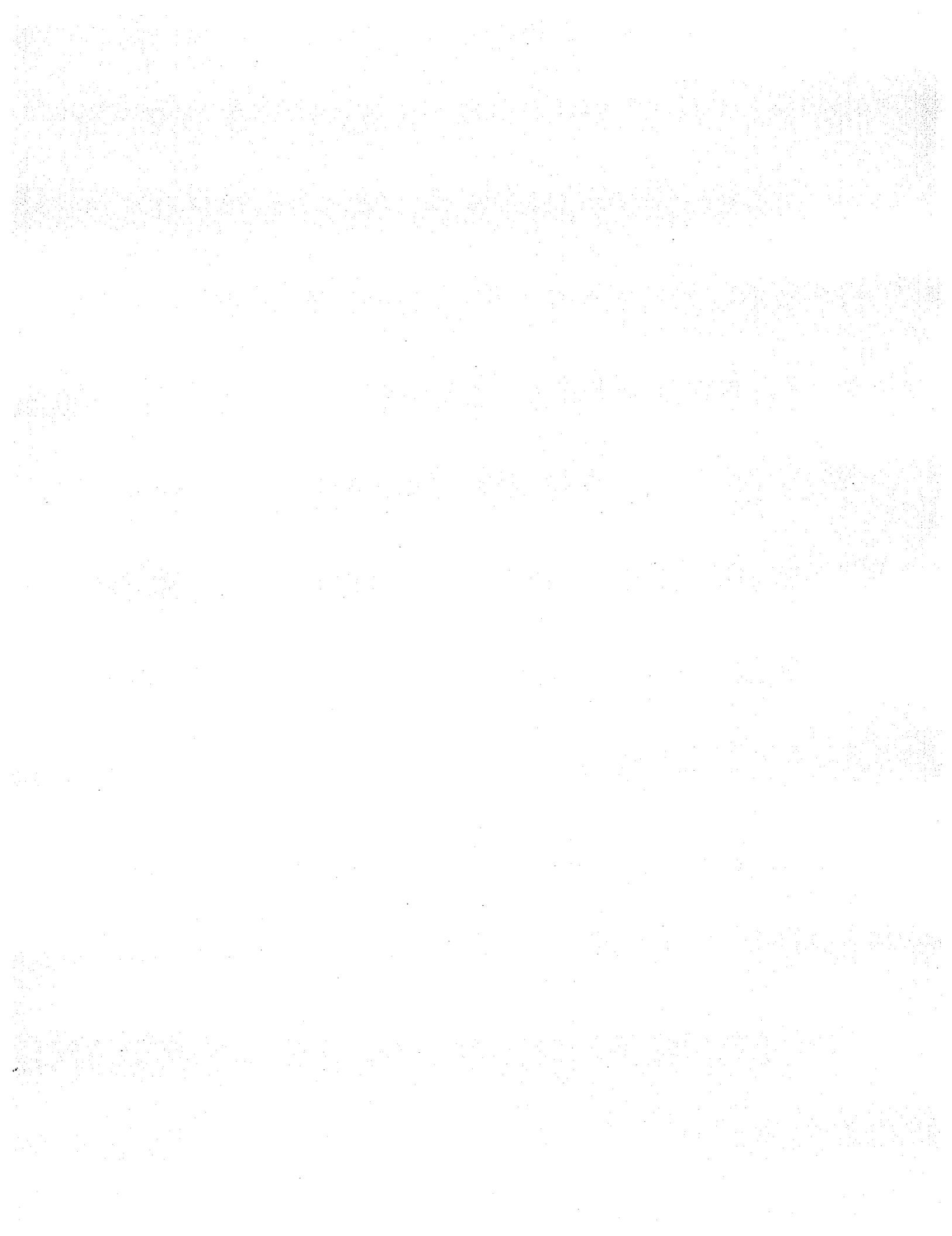
58	58
63	63
54	54
42	42
71	71
98	98
121	121

0.90
5.3

avg.

58	58
68	68
54	54
52	52
75	75
116	116

0.90
5.3



NHEERL/ECD/MTB/DMD/2006-02-r0

Urinary Mutagenicity Study for New England Bladder Cancer /Arsenic

Experiment date : 10/28/2008

Strain: YG1041

Activation :RLAO 98 2X 2ppd

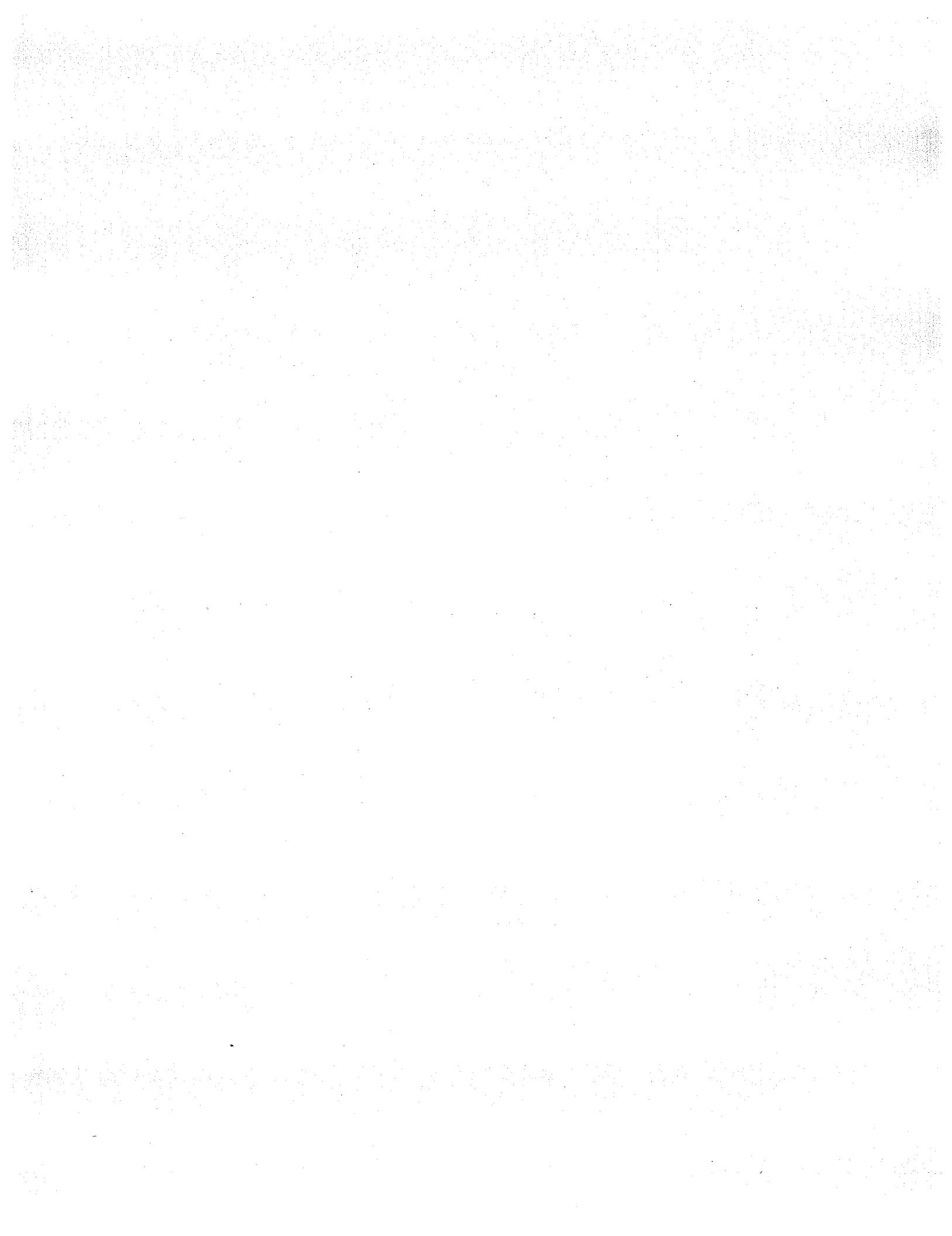
Batch # 27
Hydrolyzed

Controls:	Plate 1	Plate 2	Plate 3	avg.
SP-	34	27	30	
SP+	56	63	54	58
2A	1367	1385	1164	
2NF	1655	1851	1962	

Sample ID: UCO00401 H

eq-ml/pl	rs	s	UCO00401 H	UCO02062 H	UCO00611 H	UCO2827 H	UCO3641 H	UCO2320 H	UCO00051 H	UCO03754 H	UCO00051 H	UCO2320 H	UCO3641 H
0	0	0	58	58	58	58	58	58	58	58	58	58	58
0.3	48	35	62	70	71	51	48	48	48	48	48	48	49
0.6	52	53	83	64	41	38	76	76	76	76	76	76	76
1.2	51	63	92	81	66	68	72	72	72	72	72	72	72
3	59	48	91	80	92	82	51	51	51	51	51	51	51
6	86	80	86	96	75	46	94	94	94	94	94	94	94
12	80	74	97	95	82	80	75	75	75	75	75	75	75
	0	0	0	0	0	0	0	0	0	0	0	0	0

4



Sample ID:

UCO3754 Uh

eq-ml/pl

	0	0.3	0.6	0.9	1.2	1.5	3	6	12
rs	58	64	55	43	58	84	86	86	0
s	0	0	0	0	0	0	0	0	0

UCO0051 Uh

eq-ml/pl

	0	0.3	0.6	0.9	1.2	1.5	3	6	12
rs	58	46	61	52	48	48	58	58	58
s	0	0	0	0	0	0	0	0	0

Sample ID:

UCO2641 Uh

avg.

	0	0.3	0.6	1.2	3	6	12
rs	58	63	67	89	63	213	338
s	0	0	0	0	0	0	0

UCO1831 Uh

Blank Uh

	0	0.3	0.6	1.2	3	6	12
rs	58	53	67	94	78	214	329
s	0	0	0	0	0	0	0

rs
s

	0.96	0.88
rs	23.4	13.7
s	0	0

(5)

Sample ID: eq-ml/pl	UCO02641 H			UCO1831 H			Blank		
			avg.			avg.			avg.
0	58	58	58	58	58	58	58	58	58
0.3	39	65	52	69	54	62	41	41	41
0.6	59	85	72	80	75	78	59	59	59
1.2	83	73	78	105	96	101	40	40	40
3	112	89	101	119	136	128	46	46	46
6	162	139	151	133	102	118	57	57	57
12	174	206	190	93	103	40			
rs			0.98	37.6	23.7				
s									

Sample ID: eq-ml/pl	UCO0401 Uh			UCO2062 Uh			UCO0611 Uh			UCO2827 Uh		
			avg.			avg.			avg.			avg.
0	58	58	58	58	58	58	58	58	58	58	58	58
0.3	47	52	44	60	64	61	58	58	58	55	52	52
0.6	60	54	42	48	49	62	51	60	48	52	52	56
1.2	70	60	63	63	48	45	57	62	70	70	66	66
3	68	55	55	55	56	56	59	73	87	87	80	80
6	66	57	69	69	76	55	62	104	110	107	118	118
12						t 20	t 26	t 26	t 26	t 26	t 26	t 26
rs							0	0	0	0	0	0
s												

NHEERL/EC/DMTB/DMD/2006-02-r0
Urinary Mutagenicity Study for New England Bladder Cancer /Arsenic
Experiment date :10/28/2008
Strain: YG1041
Activation :RLAO 98 2X 2ppd

6

NHEERL/ECD/MTB/DMD/2006-02-10

Urinary Mutagenicity Study for New England Bladder Cancer/Arsenic

Experiment date : 11/07/2008

Strain: YG1041

Activation :RLAO 99 2X 2ppd

Batch # 28

Hydrolyzed

Controls:	Plate 1	Plate 2	Plate3	avg.
SP-	32	40	25	
SP+	40	55	42	46
2A	1342	1334	1237	
2NF	1326	1409		

Sample ID :

eq-m/l/pl

UCOO668 H

0	46	46	46	46
0.3	50	53	72	72
0.6	62	43	63	72
1.2	45	49	66	64
3	62	60	14	14
6	87	78	2	3
12	68	53	3	3

rs 0

s 0

UCO2856 H

0	46	46	46	46
0.3	53	64	72	72
0.6	62	64	89	72
1.2	49	79	76	64
3	60	14	89	82
6	87	2	76	86
12	53	3	43	55

Sample ID :

eq-m/l/pl

UCO3370 H

0	46	46	46	46
0.3	53	64	68	72
0.6	62	64	89	72
1.2	49	79	76	64
3	60	14	89	82
6	87	2	76	86
12	53	3	43	55

rs 0

s 0

UCO2647 H

0	46	46	46	46
0.3	53	64	68	70
0.6	62	69	70	65
1.2	63	71	83	50
3	83	71	76	80
6	94	94	60	102
12	80	78	73	51

rs 0

s 0

0.89 16.3

0.7 0

7

Sample ID:
eq-m/p

UCO3878 H

0	46	46	46	46	46	46	46	43
0.3	50	40	60	60	60	60	63	63
0.6	51	52	63	74	74	74	59	51
1.2	63	44	66	45	45	45	54	76
3	51	49	88	76	76	76	54	61
6	61	65	84	93	93	93	69	82
12	51	53	70	67	67	67	0	0
rs	0	0	0	0	0	0	0	0
s	0	0	0	0	0	0	0	0

Sample ID:
eq-m/p

UCO3109 H

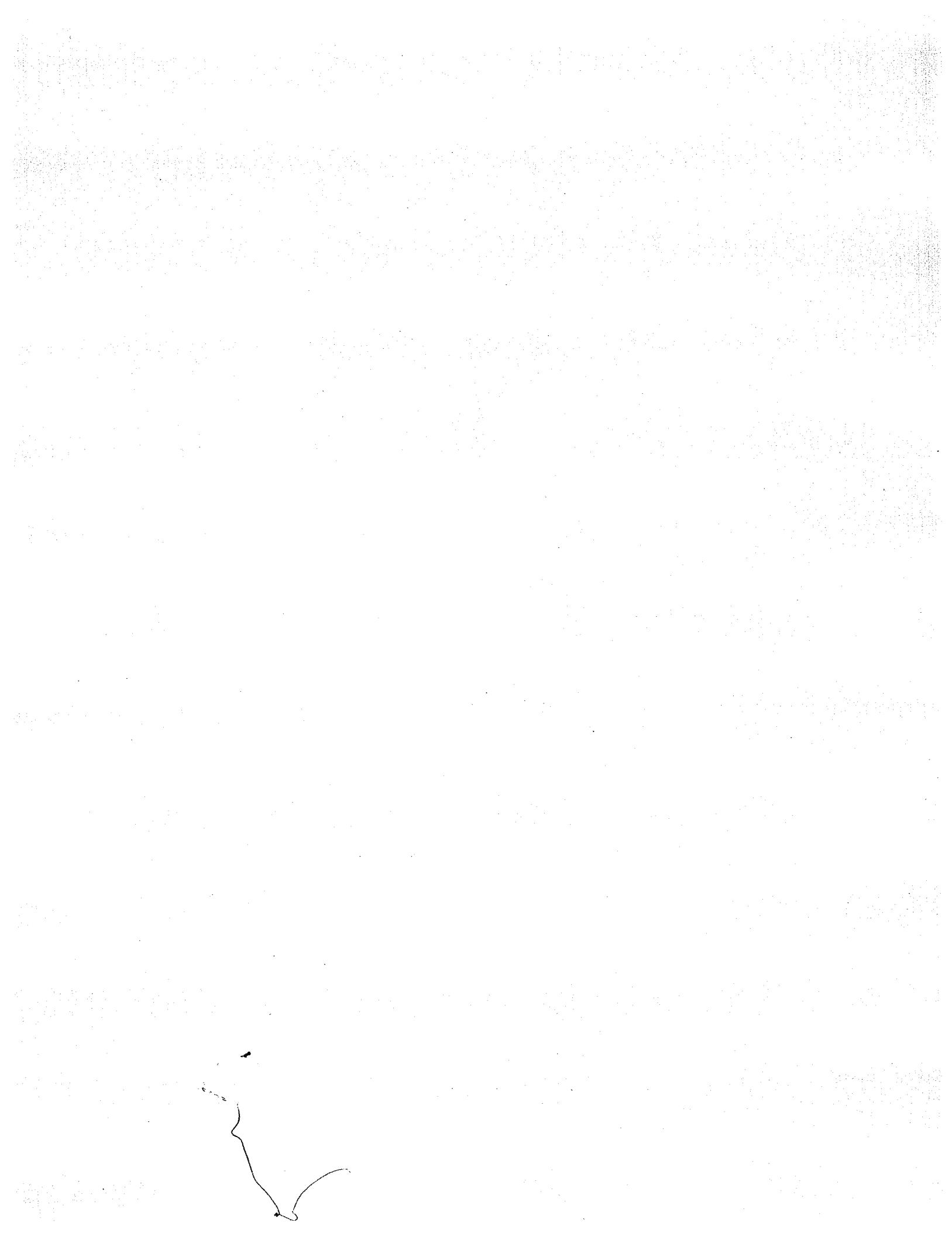
0	46	46	46	46	46	46	46	46
0.3	48	64	69	58	58	58	48	48
0.6	57	75	75	69	69	69	39	39
1.2	74	73	73	49	49	49	38	38
3	76	73	73	54	54	54	54	54
6	6	56	46	0	0	0	0	0
12	0	0	0	0	0	0	0	0
rs	0	0	0	0	0	0	0	0
s	0	0	0	0	0	0	0	0

***Samples # 3878
2767 very dark red

Blank H

0	0	0	0	0	0	0	0	0
0.3	0	0	0	0	0	0	0	0
0.6	0	0	0	0	0	0	0	0
1.2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0

8



NHEERL/ECDD/MTB/DMD/2006-02-r0

Urinary Mutagenicity Study for New England Bladder Cancer /Arsenic

Experiment date : 11/07/2008

Strain: YG1041

Activation :RLAO 99 2X 2ppd

Batch # 28
Unhydrolyzed

Sample ID : eq-ml/pl	UCO0668 Uh	UCO2856 Uh	UCO3370 Uh	avg.
0	46	46	46	46
0.3	39	60	71	73
0.6	32	50	50	44
1.2	36	35	56	53
3	43	32	30	50
6	42	1	4	92
12	75	68	5	8
rs	0	0	0	0.45
s	0	0	0	5.6

Sample ID : eq-ml/pl	UCO3416 Uh	UCO2647 Uh	avg.
0	46	46	46
0.3	51	42	49
0.6	46	0	38
1.2	53	45	47
3	48	59	53
6	50	47	48
12	9	4	67
rs	0	0	0
s	0	0	0

9

Sample ID :

UCO3878 Uh

eq-m/pl	0	46	46	46	46	46	46
0.3	66	58	54	37	35	41	
0.6	47	49	39	52	42	50	
1.2	41	34	45	36	49	42	
3	34	49	58	45	53	49	
6	44	51	61	70	38	53	
12	46	39	74	83	44	50	
rs		0	0	0	0	0	
s		0	0	0	0	0	

Sample ID :

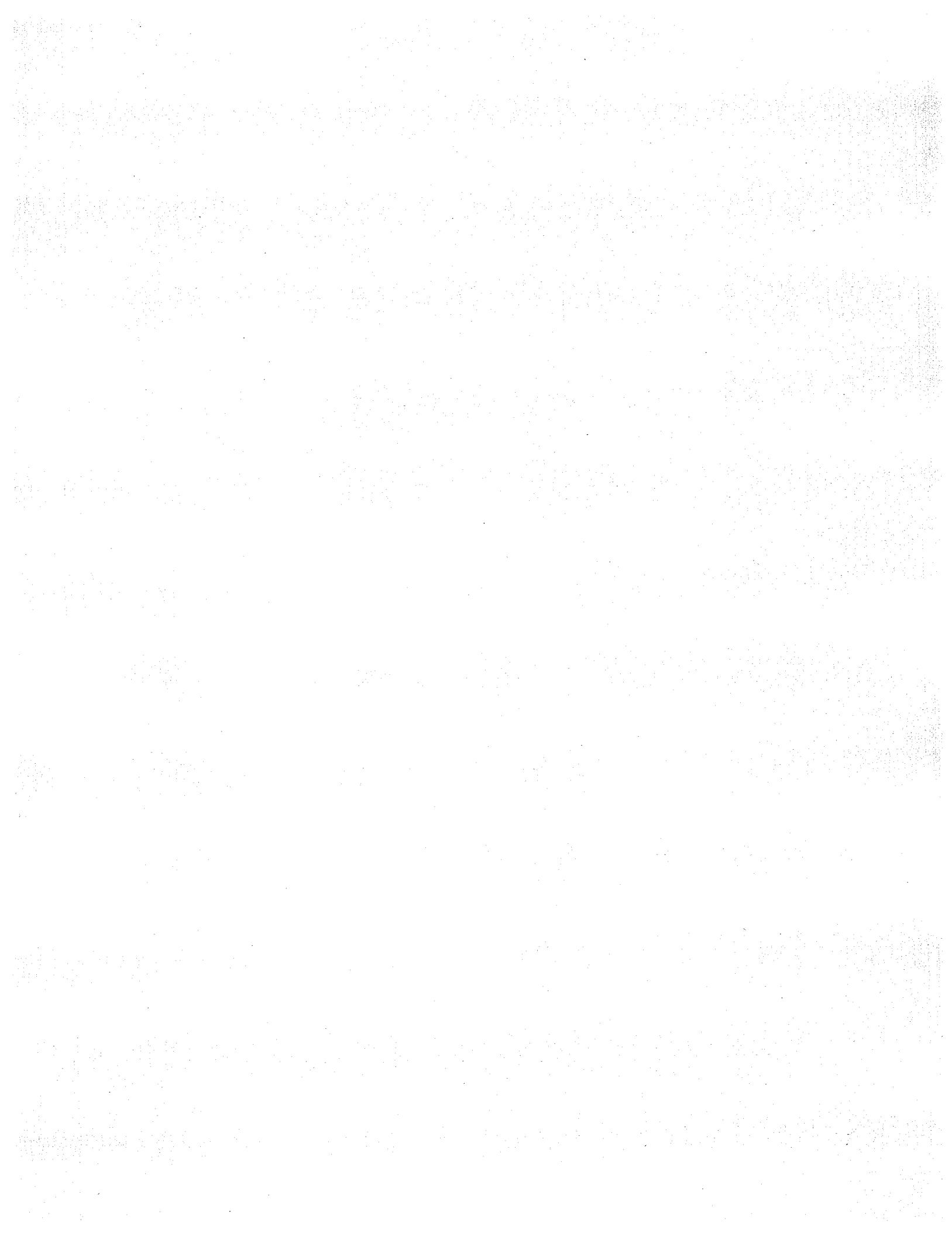
UCO3109 Uh

eq-m/pl	0	46	46	46	46	46	46
0.3	58	34	32	32			
0.6	53	38	46				
1.2	47	43	52				
3	47	48	39				
6	69	58	46				
12	71	66					
rs		0	0	0	0	0	
s		0	0	0	0	0	

***Samples # 3878
2767 very dark red

rs

s



NHEERL/ECDF/MTB/DMD/2006-02-r0
 Urinary Mutagenicity Study for New England Bladder Cancer /Arsenic
 Experiment date :11/07/2008

Strain: YG1041
 Activation :RLAO 99 2X 2ppd

Batch # 29

Hydrolyzed

Controls:	Plate 1	Plate 2	Plate3	avg.
SP-	32	40	25	
SP+	40	55	42	46
2A	1342	1334	1237	
2NF	1326	1409		

Sample ID : UCOO602 H

eq-ml/pl	avg.	avg.	avg.	avg.
0	46	46	46	46
0.3	62	57	60	59
0.6	93	106	100	80
1.2	107	89	98	54
3	107	124	116	54
6	209	200	205	66
12	257	216	237	62

rs
s

0.92
23.4

UCO1108 H

eq-ml/pl	avg.	avg.	avg.	avg.
0	46	46	46	46
0.3	60	54	48	43
0.6	56	62	66	76
1.2	62	64	74	94
3	44	80	103	98
6	87	87	162	136
12	71	70	151	121

rs
s

0
0

UCO1796 H

eq-ml/pl	avg.	avg.	avg.	avg.
0	46	46	46	46
0.3	52	43	43	48
0.6	64	69	69	67
1.2	64	50	50	57
3	75	64	70	70
6	80	105	93	93
12	90	80	80	80

0.87
7.1

UCO3708 H

eq-ml/pl	avg.	avg.	avg.	avg.
0	46	46	46	46
0.3	52	43	43	48
0.6	64	69	69	67
1.2	64	50	50	57
3	75	64	70	70
6	80	105	93	93
12	90	80	80	80

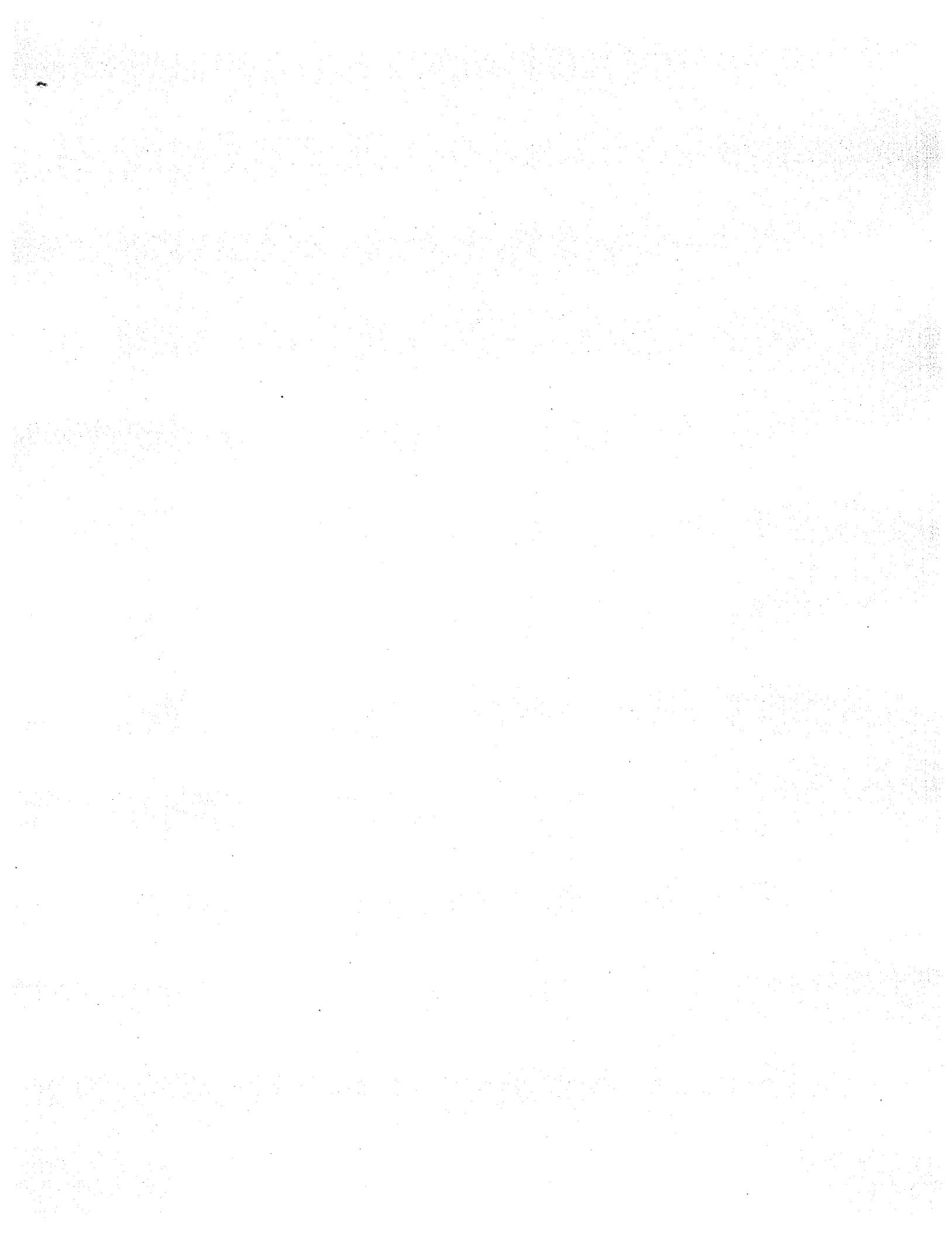
0.93
16.1

UCO1683 H

eq-ml/pl	avg.	avg.	avg.	avg.
0	46	46	46	46
0.3	52	60	60	52
0.6	64	81	81	80
1.2	64	63	63	81
3	71	92	92	82
6	127	135	103	119
12	136	135	103	128

0.86
12.8

11



Sample ID:

eq-mll/pl

UCO3010 H

	rs	s	avg.	46	46	46	46	46	46	46	46
0	46	46	46	46	46	46	46	46	46	46	46
0.3	74	83	79	61	45	53	40	64	64	52	52
0.6	99	124	112	80	75	78	68	51	51	60	60
1.2	141	102	122	91	89	90	65	72	72	69	69
3	132	152	142	88	88	88	63	58	58	61	61
6	2	4	4	110	120	115	78	84	84	81	81
12	3	1	1	6	85	94	95	95	95	95	95

rs

s

	rs	s	avg.	46	46	46	46	46	46	46	46
0	0.85	62.0	0.85	46	46	46	46	46	46	46	46
0.3	9.7	3.6	0.76	45	45	45	45	45	45	45	45
0.6	12.0	3.6	0.86	46	46	46	46	46	46	46	46
1.2	12.0	3.6	0.86	46	46	46	46	46	46	46	46

	rs	s	avg.	46	46	46	46	46	46	46	46
0	0.76	9.7	0.76	46	46	46	46	46	46	46	46
0.3	12.0	3.6	0.86	46	46	46	46	46	46	46	46
0.6	12.0	3.6	0.86	46	46	46	46	46	46	46	46
1.2	12.0	3.6	0.86	46	46	46	46	46	46	46	46

UCOO279 H

	rs	s	avg.	46	45	46	46	46	46	46	46
0	0	0	0	46	46	46	46	46	46	46	46
0.3	58	45	45	45	45	45	45	45	45	45	45
0.6	72	77	77	77	77	77	77	77	77	77	77
1.2	63	53	53	53	53	53	53	53	53	53	53
3	70	62	62	62	62	62	62	62	62	62	62
6	60	51	51	51	51	51	51	51	51	51	51
12	53	47	47	47	47	47	47	47	47	47	47

rs

s

0

0

12

NHEERL/ECD/MTB/DMD/2006-02-10

Urinary Mutagenicity Study for New England Bladder Cancer /Arsenic

Experiment date :11/07/2008

Strain: YG104¹

Activation :RLAO 99 2X 2ppd

Batch # 29
Unhydrolyzed

Sample ID : UCO0602 Uh

eq-ml/pl

0	46
0.3	46
0.6	47
1.2	54
3	42
6	120
12	175

rs
s0.94
10.7

avg.

46
53
50
47
52

UCO3708 Uh

UCO1796 Uh

avg.

46

50

51

51

48

42

44

58

60

56

62

62

59

60

80

69

75

0

0

0

0

0

0.76
7.4

UCO3256 Uh

UCO0683 Uh

avg.

46

53

46

41

62

49

53

68

59

55

49

107

90

10

0

0

0

0

0

0

0.76
7.4

UCO1108 Uh

avg.

46

54

46

41

62

49

53

68

59

55

49

107

90

10

0

0

0

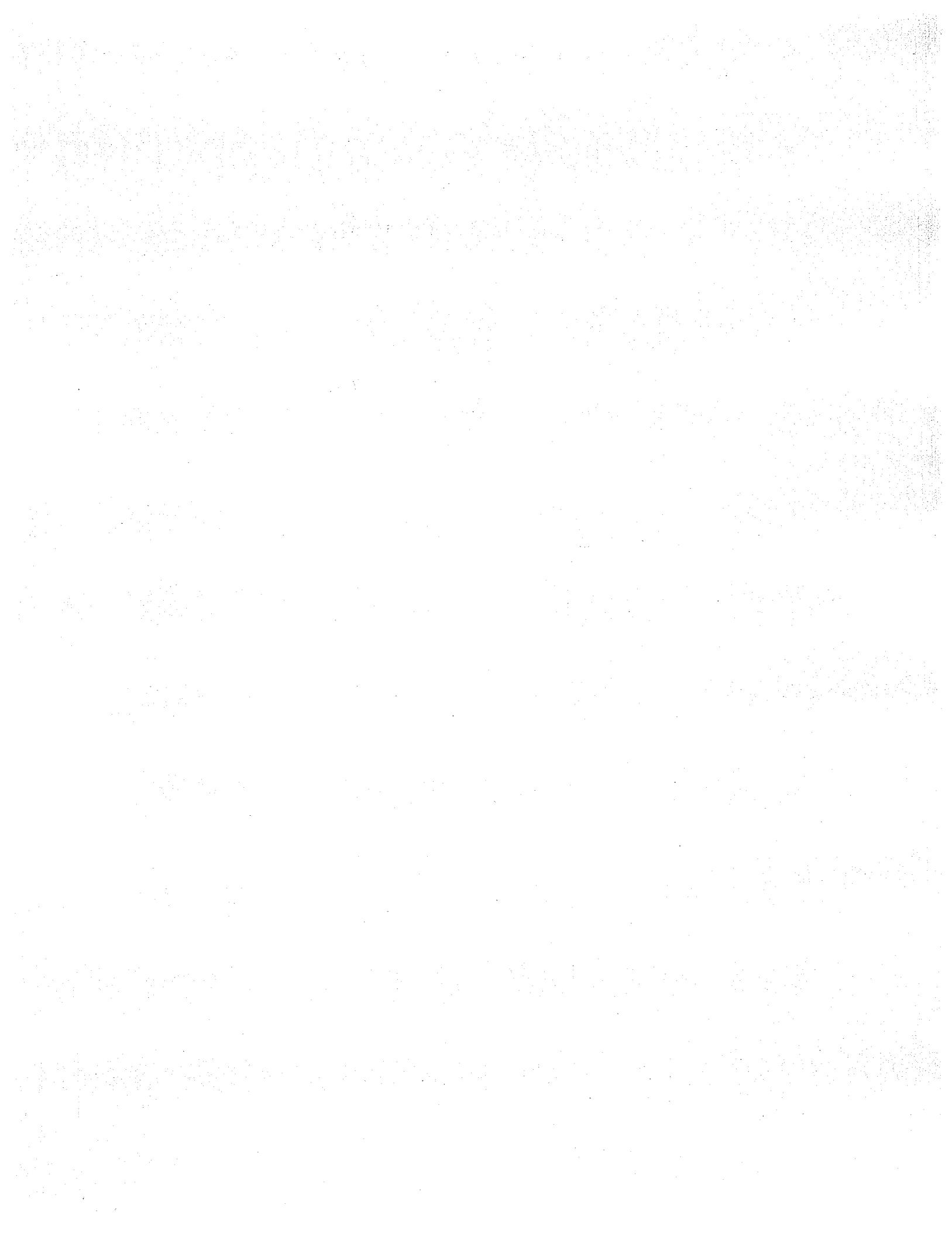
0

0

0

0.76
7.4

13



Sample ID : UCOO3010 Uh

eq-ml/pl	rs	s
0	46	0
0.3	55	0
0.6	70	0
1.2	70	0
3	71	0
6	7	0
12	1	0

Sample ID : UCO1821 Uh

eq-ml/pl	rs	s
0	46	0
0.3	51	0
0.6	65	0
1.2	60	0
3	76	0
6	5	0
12	70	0

Sample ID : UCOO279 Uh

eq-ml/pl	rs	s
0	46	0
0.3	41	0
0.6	45	0
1.2	46	0
3	41	0
6	60	0
12	55	0

Blank Uh

eq-ml/pl	rs	s
0	46	0
0.3	41	0
0.6	233	0
1.2	51	0

rs
s

eq-ml/pl	rs	s
0	46	0
0.3	50	0
0.6	40	0
1.2	59	0
3	56	0
6	65	0
12	63	0

eq-ml/pl	rs	s
0	46	0
0.3	48	0
0.6	51	0
1.2	59	0
3	65	0
6	83	0
12	30	0

rs
s

eq-ml/pl	rs	s
0	46	0
0.3	48	0
0.6	51	0
1.2	59	0
3	65	0
6	83	0
12	44	0

rs
s

NHEERL/ECDF/MTB/DMD/2006-02-r0

Urinary Mutagenicity Study for New England Bladder Cancer /Arsenic

Experiment date :11/19/2008

Strain: YG104-1

Activation :RLAO 99 2X 2ppd

Batch # 30

Unhydrolyzed

Controls:	Plate 1	Plate 2	Plate3	avg.
SP-	34	39	35	36
SP+	52	44	42	46
2A	1238	1336	1421	
2NF	1447	1510	1562	

Sample ID:

eq/fml-pl UCOO238 Uh

rs.	0.82	0.89	0
s	3.7	4.6	0
0	46	46	46
0.3	60	53	40
0.6	57	60	48
1.2	67	53	54
3	40	49	57
6	54	72	47
12	103	88	51

Sample ID:

eq/fml-pl UCO1255 Uh

rs.	0.89	0	0
s	4.6	0	0
0	46	46	46
0.3	52	37	40
0.6	54	54	48
1.2	81	71	47
3	69	79	57
6	75	91	51
12	105	103	51

Sample ID:

eq/fml-pl UCO0744 Uh

rs.	0.89	0	0
s	4.6	0	0
0	46	46	46
0.3	54	54	48
0.6	61	71	47
1.2	69	79	57
3	75	91	51
6	83	103	51
12	104	103	51

Sample ID:

eq/fml-pl UCO3928 Uh

rs.	0.89	0	0
s	4.6	0	0
0	46	46	46
0.3	63	63	55
0.6	81	83	68
1.2	58	75	82
3	205	206	67
6	297	308	77
12	308	303	77

Sample ID:

eq/fml-pl UCO1110 Uh

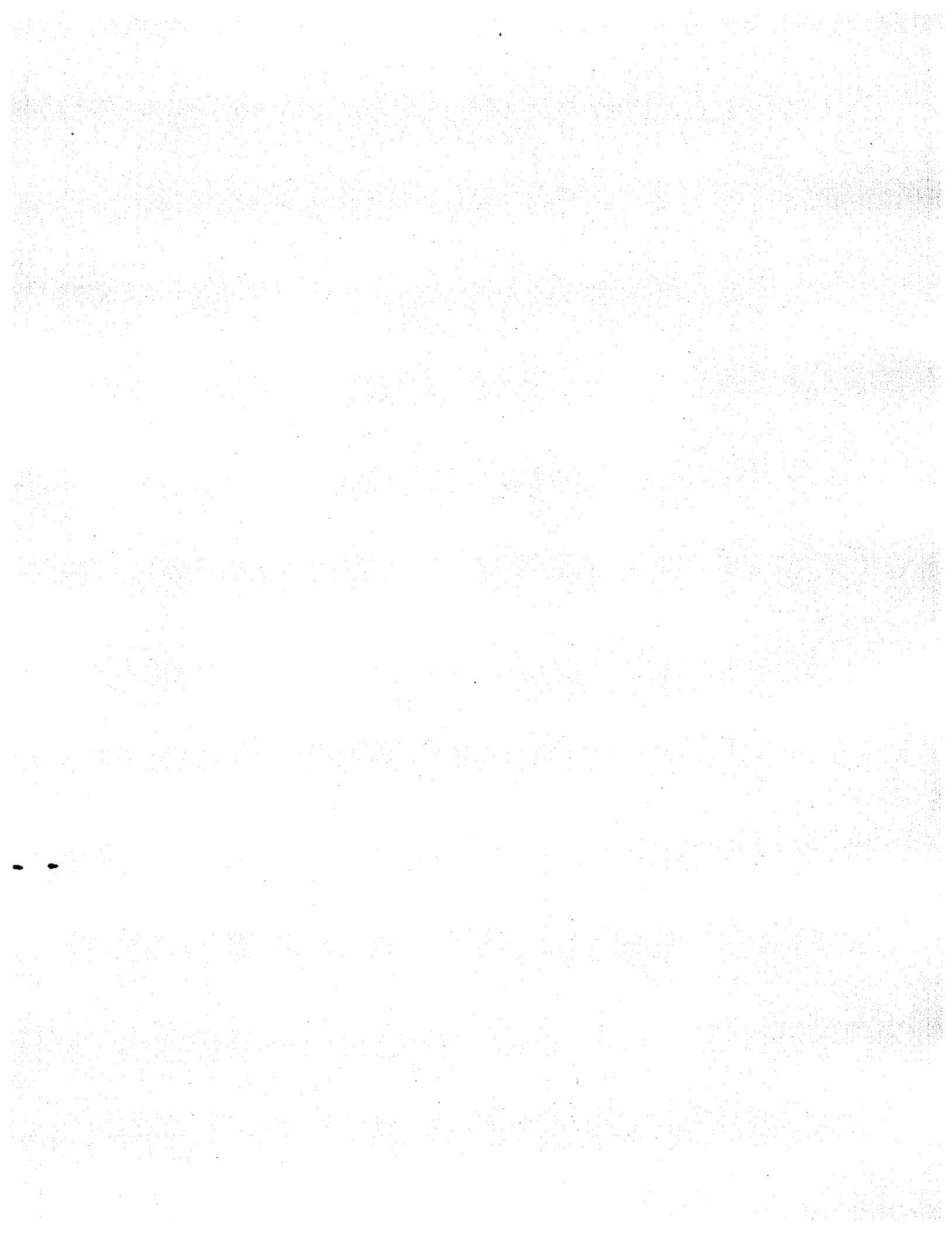
rs.	0.89	0	0
s	4.6	0	0
0	46	46	46
0.3	56	56	55
0.6	57	57	60
1.2	62	62	66
3	53	53	63
6	55	55	68
12	68	68	77

24

Sample ID: eq/ml-pI	UCO3632 Uh			UCO0103 Uh			UCO0654 Uh		
	0	0.3	0.6	1.2	3	6	12	0	0
rs.	46	59	58	51	65	76	51	46	46
s.	46	52	66	59	52	64	51	39	45
	59	52	66	59	52	64	51	72	91
	58	58	51	51	52	64	51	109	176
	51	51	59	59	52	64	51	176	176
	59	59	59	59	52	64	51	90	90
	51	51	51	51	52	64	51	190	181
	51	51	51	51	51	51	51	227	258
								0.93	0
								116.0	0

Sample ID: eq/ml-pI	Blank Uh			***sample # 3432 ,0103 pin point colonies		
	0	0.3	0.6	1.2	3	6
rs.	46	49	64	43	49	49
s.	46	61	43	58	61	58
	49	61	43	48	61	58
	43	58	48	52	61	58
	61	58	58	52	61	59
	50	50	50	51	59	59
	58	58	58	58	58	59
	59	59	59	59	59	59
					0	0

rs.
s.



NHEERL/ECD/MTB/DMDD/2006-02-10

Urinary Mutagenicity Study for New England Bladder Cancer /Arsenic

Experiment date :11/19/2008

Strain: YG104/1

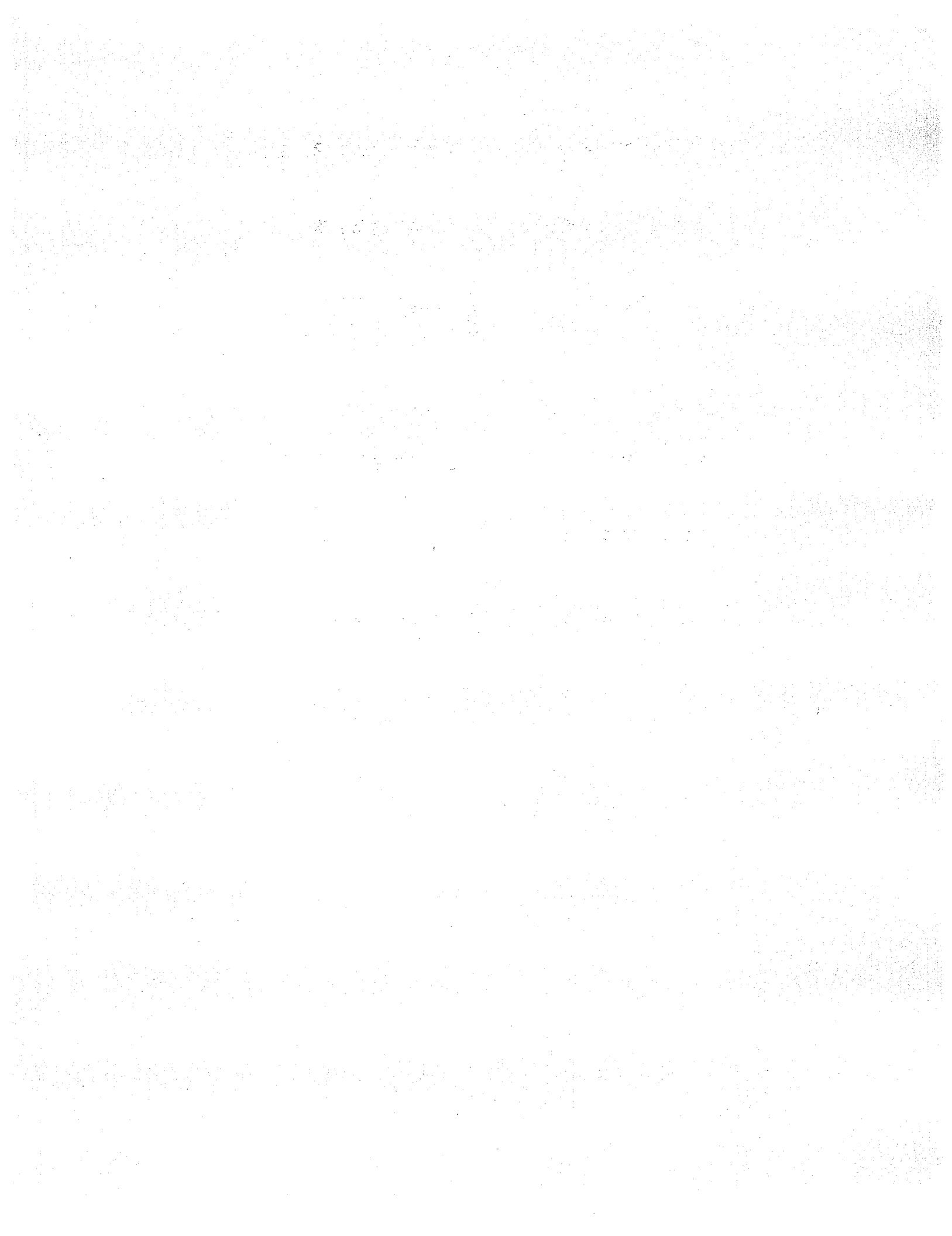
Activation:RLAO 99 2X 2ppd

Batch # 30 Hydrolyzed

Sample ID: eq/ml-pl	UCOO238 H						UCOO1255 H						UCOO744 H						UCO03928 H					
	Batch # 30			Hydrolyzed			avg			avg			avg			avg			avg			avg		
0	46	46	46	46	51	54	53	49	51	46	51	50	46	46	46	46	52	54	46	46	52	54	56	56
0.3	63	62	72	72	76	90	83	75	72	76	72	74	74	74	74	74	63	63	63	63	63	63	58	58
0.6	78	78	88	79	83	81	82	69	79	69	69	66	66	66	66	66	57	57	57	57	57	57	57	57
1.2	88	79	83	83	101	83	92	62	62	62	62	69	69	69	69	69	83	83	83	83	83	83	83	83
3	73	73	57	47	113	104	109	89	89	89	89	91	90	90	90	90	79	79	79	79	79	79	79	79
6	57	47	37	40	87	97	97	97	97	97	97	118	118	118	118	118	129	129	129	129	129	129	108	108
12	40	40	0	0	0	0	0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	86	86	86	86	86	86	86	86
rs.	0	0	0	0	0	0	0	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
s	0	0	0	0	0	0	0	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9

Sample ID: eq/ml-pl	UCO2913 H						UCO1110 H						UCO3928 H						
	Batch # 30			Hydrolyzed			avg			avg			avg			avg			
0	46	46	46	46	44	47	46	46	46	46	46	46	46	46	46	46	54	54	54
0.3	0	0	0	0	71	84	78	78	78	78	78	78	78	78	78	78	58	58	58
0.6	0	0	0	0	67	84	76	76	76	76	76	76	76	76	76	76	57	57	57
1.2	0	0	0	0	91	70	81	81	81	81	81	81	81	81	81	81	83	83	83
3	85	84	85	85	91	83	84	84	84	84	84	84	84	84	84	84	90	90	90
6	139	116	128	128	85	85	83	83	83	83	83	83	83	83	83	83	108	108	108
12	106	99	103	103	103	103	103	103	103	103	103	103	103	103	103	103	86	86	86
rs.	0	0	0	0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	13.7	13.7	13.7
s	0	0	0	0	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4

26



Sample ID:

UCO3632 H

eq/ml-pl

	0	0.3	0.6	1.2	3	6	12
rs.	46	48	70	79	79	94	108
s	46	55	87	87	114	88	99

rs.
s0.54
3.7

Sample ID:

UCO2091 H

eq/ml-pl

	0	0.3	0.6	1.2	3	6	12
rs.	46	63	58	61	87	44	51
s	46	66	69	60	63	61	50

rs.
s0
0

Sample ID:

UCOO103 H

avg.

	0	0.3	0.6	1.2	3	6	12
rs.	46	52	79	83	97	91	104
s	46	145	157	150	68	27	162

	0.83	0.80	0.83
rs.	7.3	180.0	7.3
s			

Blank H

***sample # 2913 lost sample

due to vial breakage

****# 0103 pin point colonies

***# urine very dark red

Sample ID:

UCOO654 H

avg.

	0	0.3	0.6	1.2	3	6	12
rs.	46	52	79	83	97	91	104
s	46	148	150	154	68	27	184

	0.83	0.80	0.83
rs.	7.3	180.0	7.3
s			

27

NHEERL/ECDD/MTB/DMD/2006-02-r0

Urinary Mutagenicity Study for New England Bladder Cancer /Arsenic

Experiment date: 11/12/2008

Strain: YG1041

Activation :RLAO 99 2X 2ppd

Batch # 31

Hydrolyzed

Controls:

SP-

SP+

2A

2NF

avg.

Plate 1

Plate 2

Plate3

avg.

UCOO3835 H

UCOO567 H

UCOO133 H

UCOO2294 H

UCOO1771 H

UCOO919 H

UCOO3149 H

UCOO111 H

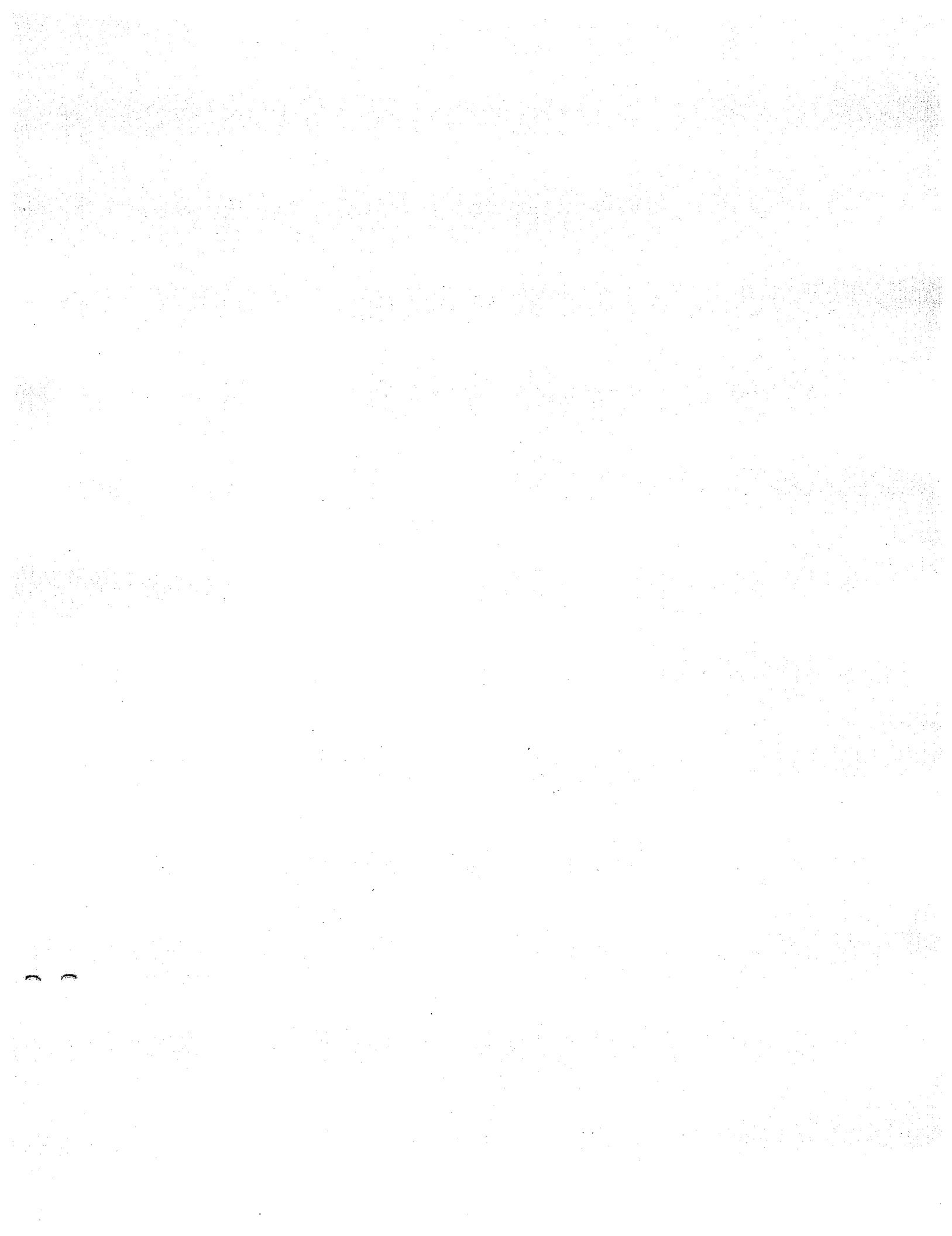
Sample ID:
eq-ml/pl

0	46	46	46	46	46	46
0.3	53	68	49	66	46	49
0.6	66	43	62	41	48	55
1.2	61	58	71	74	71	58
3	59	66	70	75	68	50
6	89	74	128	104	100	102
12	67	69	114	118	116	111

rs
s

0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0

CO J



Sample ID:	UCO1074 H	UCC3118 H	UCO2722 H	Blank H
eq-ml/pl				
0	46	46	46	46
0.3	58	48	60	51
0.6	65	56	68	47
1.2	70	59	74	51
3	51	63	57	34
6	79	30	83	54
12	63	77	66	48
			73	47
rs		0	73	42
s	0	0	78	51
		0	0	46
		0	0	39
			69	54
			62	50
			72	47
			73	42
			78	51

sample # 3149, 1771,3118 urine very dark red
 sample # 1074 tech error, spilled plate

NHEERL/ECID/MTB/DMD/2006-02-r0
 Urinary Mutagenicity Study for New England Bladder Cancer /Arsenic
 Experiment date :11/21/2008
 Strain: YG1041
 Activation :RLAO 99 2X 2ppd

Sample ID:	UCO03835 Uh	UCOO567 Uh	UCOO133 Uh	avg.
eq-ml/pl				
0	46	46	46	46
0.3	49	58	50	51
0.6	53	53	48	52
1.2	59	44	58	56
3	47	55	56	55
6	53	55	91	72
12	61	56	96	81
rs		0	97	88
s	0	0	98	81
			97	88
			137	139
		0	0	0.84
		0	0	4.6

38

Sample ID:

avg.

UCO2294 Uh

eq-m/p/ l	0	46
	0.3	43
	0.6	40
	1.2	42
	3	41
	6	60
	12	76

rs
s

0	0	0.98
		4.0

Sample ID:

UCO3149 Uh

eq-m/p/ l	0	46
	0.3	49
	0.6	55
	1.2	46
	3	41
	6	67
	12	62

0	0	0.98
		4.0

Sample ID:

UCO1074 Uh

eq-m/p/ l	0	46
	0.3	53
	0.6	44
	1.2	32
	3	53
	6	45
	12	40

0	0	0.98
		4.0

Sample ID:

UCO1771 Uh

eq-m/p/ l	0	46
	0.3	44
	0.6	50
	1.2	52
	3	54
	6	54
	12	81

0	0	0.98
		4.0

Sample ID:

UCO3118 Uh

eq-m/p/ l	0	46
	0.3	44
	0.6	56
	1.2	51
	3	57
	6	71
	12	79

0	0	0.98
		4.0

Sample ID:

Blank Uh

eq-m/p/ l	0	46
	0.3	49
	0.6	48
	1.2	49
	3	45
	6	50
	12	53

0	0	0.98
		4.0

39 R5

NHEERL/ECDM/TB/DMD/2006-02-r0

Urinary Mutagenicity Study for New England Bladder Cancer/Arsenic

Experiment date : 11/21/2008

Strain: YG1041

Activation :RLAO 99 2X 2ppd

Batch # 32

Hydrolyzed

Controls:	Plate 1	Plate 2	Plate3	avg.	Batch # 32	Hydrolyzed
SP-	20	37	37	37	46	46
SP+	46	56	59	53	52	52
2A	1643	1777	1664	1664	61	61
2NF	1668	1552	1541	1552	78	78
Sample ID: eq-ml/pl	UCO3704 H	UCO3601 H	UCO1632 H	UCO0285 H	UCO3568 H	UCO3555 H
0	46	46	46	46	46	46
0.3	56	53	49	50	52	52
0.6	64	67	59	67	73	73
1.2	78	76	88	64	50	50
3	85	88	54	75	73	73
6	88	107	97	86	64	64
12	72	82	72	66	56	56
rs	0	0	0	0	0	0
s	0	0	0	0	0	0
						40

Sample ID:

UCO1978 H

Blank H

eq-ml/pl	0	0.3	0.6	1.2	3	6	12	rs	s
	46	45	50	59	57	81	94	0	0
	46	45	53	69	67	73	81	0	0
	46	45	53	69	67	73	81	0	0
	46	45	53	69	67	73	81	0	0
	46	45	53	69	67	73	81	0	0
	46	45	53	69	67	73	81	0	0
	46	45	53	69	67	73	81	0	0
	46	45	53	69	67	73	81	0	0
	46	45	53	69	67	73	81	0	0

NHEERL/ECD/MTB/DMD/2006-02-r0

Urinary Mutagenicity Study for New England Bladder Cancer /Arsenic

Experiment date :11/21/2008

Strain: YG1041

Activation :RLAO 99 2X 2ppd

Batch # 32

Unhydrolyzed

Sample ID:

UCO3704 Uh

UCO0295 Uh

UCO1632 Uh

UCO3601 Uh

UCO0285 Uh

Sample ID:

UCO3704 Uh

UCO0295 Uh

UCO1632 Uh

UCO3601 Uh

UCO0285 Uh

Sample ID:

UCO3704 Uh

UCO0295 Uh

UCO1632 Uh

UCO3601 Uh

UCO0285 Uh

Sample ID:

UCO3704 Uh

UCO0295 Uh

UCO1632 Uh

UCO3601 Uh

UCO0285 Uh

Sample ID:

UCO3704 Uh

UCO0295 Uh

UCO1632 Uh

UCO3601 Uh

UCO0285 Uh

Sample ID:

UCO3704 Uh

UCO0295 Uh

UCO1632 Uh

UCO3601 Uh

UCO0285 Uh

Sample ID:

UCO3704 Uh

UCO0295 Uh

UCO1632 Uh

UCO3601 Uh

UCO0285 Uh

Sample ID:

UCO3704 Uh

UCO0295 Uh

UCO1632 Uh

UCO3601 Uh

UCO0285 Uh

rs

0

0

0

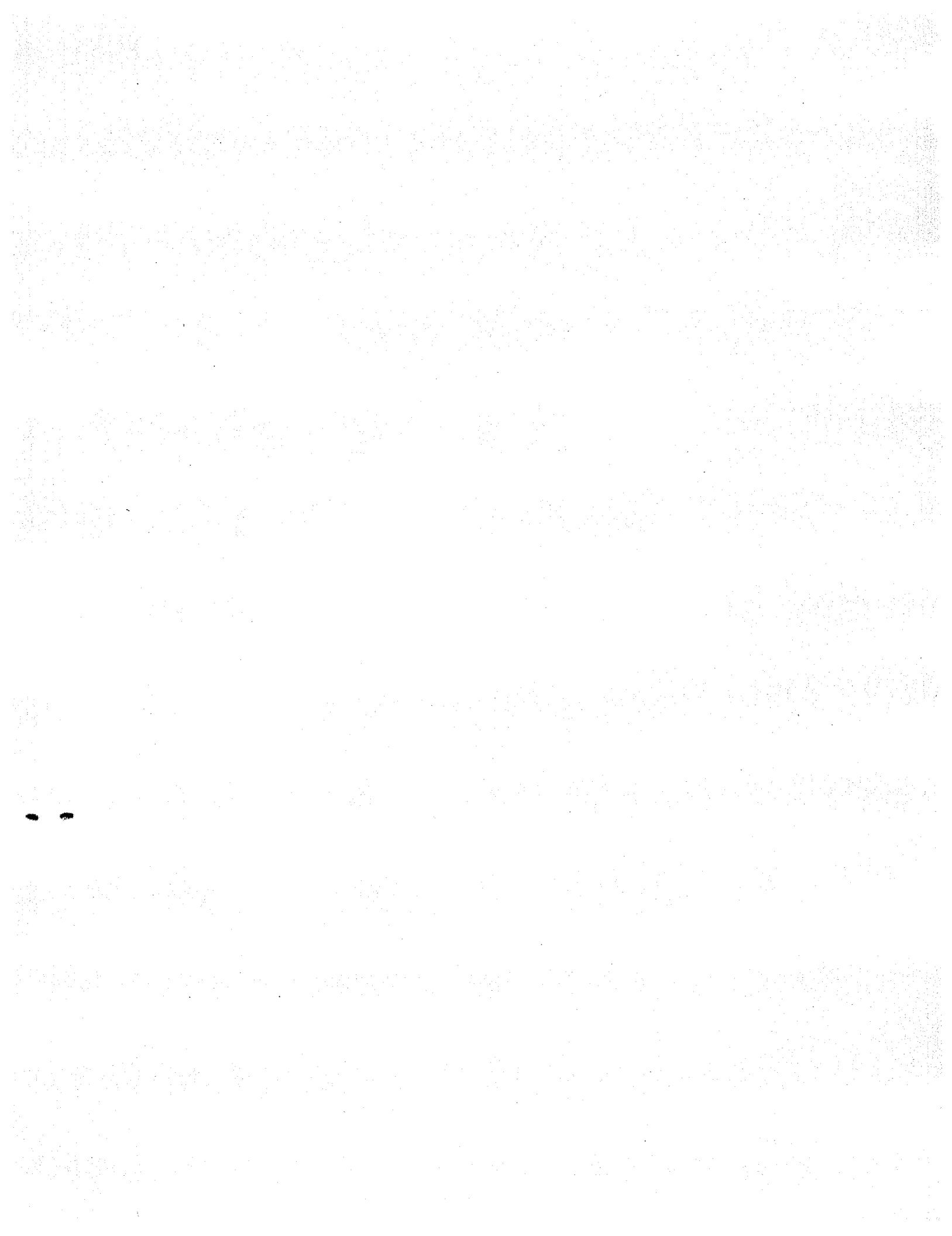
s

0

0

0

11



UCO3568 Uh

Sample ID: eq-m/p/ pl	UCO3055 Uh	UCO3147 Uh	UCO3555 Uh	UCO3568 Uh
0	46	46	46	46
0.3	56	48	41	57
0.6	54	60	45	59
1.2	50	48	45	40
3	37	34	44	55
6	64	62	65	47
12	66	68	60	54
rs	0	0	0	0
s	0	0	0	0

UCO3055 Uh

Sample ID: eq-m/p/ pl	UCO3055 Uh	UCO3147 Uh	UCO3555 Uh	UCO3568 Uh
0	46	46	46	46
0.3	56	48	41	57
0.6	54	60	45	59
1.2	50	48	45	40
3	37	34	44	55
6	64	62	65	47
12	66	68	60	54
rs	0	0	0	0
s	0	0	0	0

UCO3568 Uh

Sample ID: eq-m/p/ pl	UCO3055 Uh	UCO3147 Uh	UCO3555 Uh	UCO3568 Uh
0	46	46	46	46
0.3	56	48	41	57
0.6	54	60	45	59
1.2	50	48	45	40
3	37	34	44	55
6	64	62	65	47
12	66	68	60	54
rs	0	0	0	0
s	0	0	0	0

UCO3555 Uh

Sample ID: eq-m/p/ pl	UCO3055 Uh	UCO3147 Uh	UCO3555 Uh	UCO3568 Uh
0	46	46	46	46
0.3	56	48	41	57
0.6	54	60	45	59
1.2	50	48	45	40
3	37	34	44	55
6	64	62	65	47
12	66	68	60	54
rs	0	0	0	0
s	0	0	0	0

UCO3147 Uh

Sample ID: eq-m/p/ pl	UCO3055 Uh	UCO3147 Uh	UCO3555 Uh	UCO3568 Uh
0	46	46	46	46
0.3	56	48	41	57
0.6	54	60	45	59
1.2	50	48	45	40
3	37	34	44	55
6	64	62	65	47
12	66	68	60	54
rs	0	0	0	0
s	0	0	0	0

UCO3555 Uh

Sample ID: eq-m/p/ pl	UCO3055 Uh	UCO3147 Uh	UCO3555 Uh	UCO3568 Uh
0	46	46	46	46
0.3	56	48	41	57
0.6	54	60	45	59
1.2	50	48	45	40
3	37	34	44	55
6	64	62	65	47
12	66	68	60	54
rs	0	0	0	0
s	0	0	0	0

Blank Uh

Sample ID: eq-m/p/ pl	UCO3055 Uh	UCO3147 Uh	UCO3555 Uh	UCO3568 Uh
0	46	46	46	46
0.3	56	48	41	57
0.6	54	60	45	59
1.2	50	48	45	40
3	37	34	44	55
6	64	62	65	47
12	66	68	60	54
rs	0	0	0	0
s	0	0	0	0

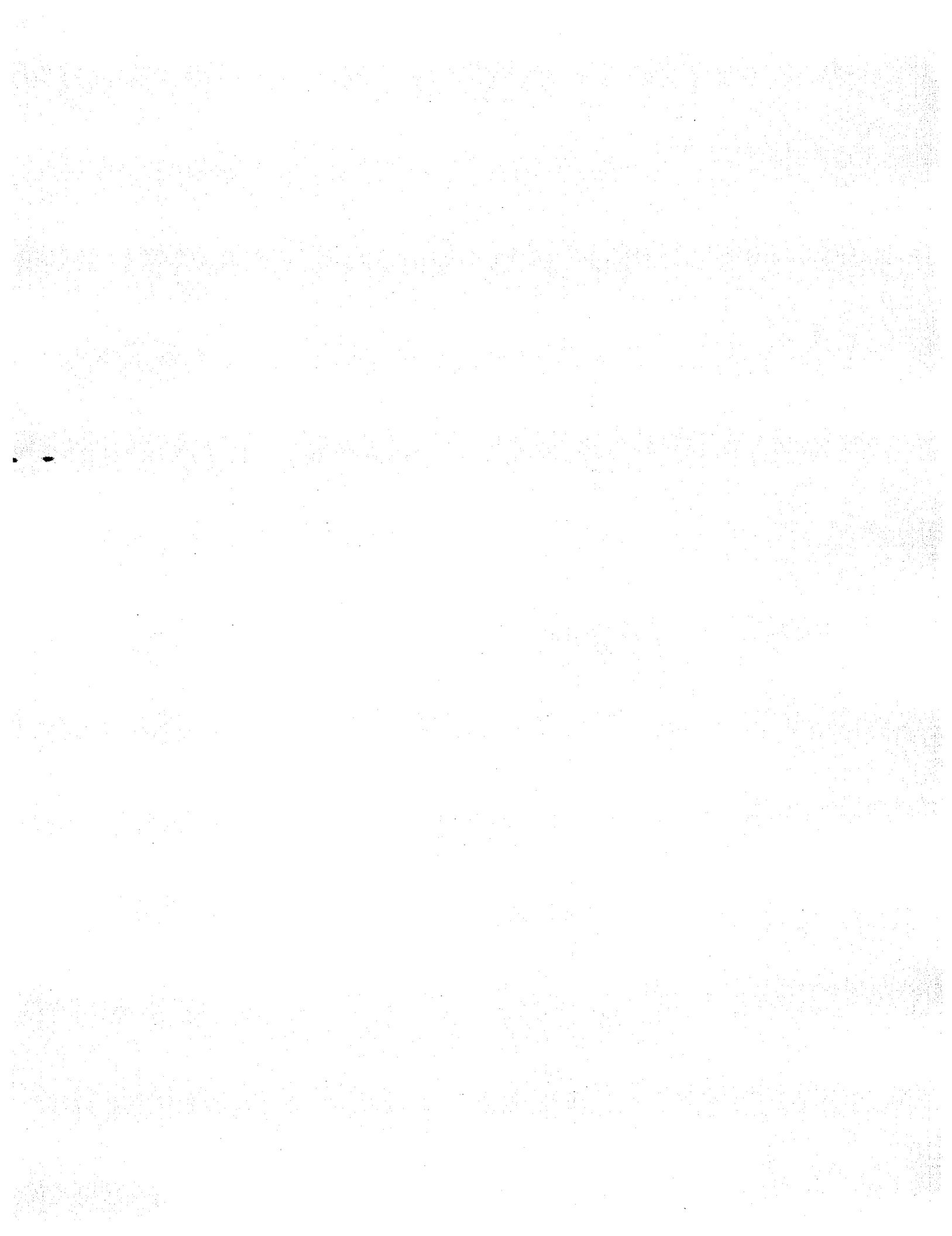
UCO0295 Uh

Sample ID: eq-m/p/ pl	UCO3055 Uh	UCO3147 Uh	UCO3555 Uh	UCO3568 Uh
0	46	46	46	46
0.3	52	41	45	49
0.6	38	48	51	48
1.2	62	56	49	53
3	41	47	41	37
6	53	57	56	61
12	72	81	66	75
rs	0	0	0	0
s	0	0	0	0

UCO1978 Uh

Sample ID: eq-m/p/ pl	UCO3055 Uh	UCO3147 Uh	UCO3555 Uh	UCO3568 Uh
0	46	46	46	46
0.3	52	41	45	44
0.6	38	48	51	48
1.2	62	56	49	60
3	41	47	41	56
6	53	57	56	51
12	72	81	66	51
rs	0	0	0	0
s	0	0	0	0

***sample #3147 very dark red



NHEERL/ECD/MTB/DMD/2006-02-r0

Urinary Mutagenicity Study for New England Bladder Cancer /Arsenic

Experiment date :12/10/2008

Strain: YG1041

Activation :RLAO 99 2X 2ppd

Batch # 33

Hydrolyzed

avg.

Plate 1

Plate 2

Plate3

avg.

UCO2525 H

avg.

UCO2253 H

avg.

UCO2280 H

avg.

UCO0216 H

avg.

UCO2280 H

avg.

UCO02540 H

avg.

UCO0731 H

avg.

UCO02915 H

avg.

UCO0387 H

avg.

UCO02915 H

avg.

UCO02540 H

avg.

UCO0731 H

avg.

UCO02915 H

avg.

UCO02540 H

avg.

UCO0731 H

avg.

UCO02915 H

avg.

UCO02540 H

avg.

UCO0731 H

avg.

rs

s

rs

s

rs

s

0

0

0

0.93

11.4

0.83

12.1

0.86

5.2

0.9

5.1

50

Sample ID:
ml-equiv

	UCO3839 H	UCO3451 H	Blank H
0	48	48	48
0.3	36	52	67
0.6	8	69	79
1.2	2	85	44
3	24	94	51
6	0	39	49
12	0	0	40
	0	73	58
	0	15	14
		0	0
		0	0

rs s

***sample # 2540 (technician error)
***sample # 3451 (urine very dark red)

NHEERL/ECDD/MTB/DMD/2006-02-r0

Urinary Mutagenicity Study for New England Bladder Cancer /Arsenic

Experiment date :12/10/2008

Strain: YG1041

Activation :RLAO 99 2X 2ppd

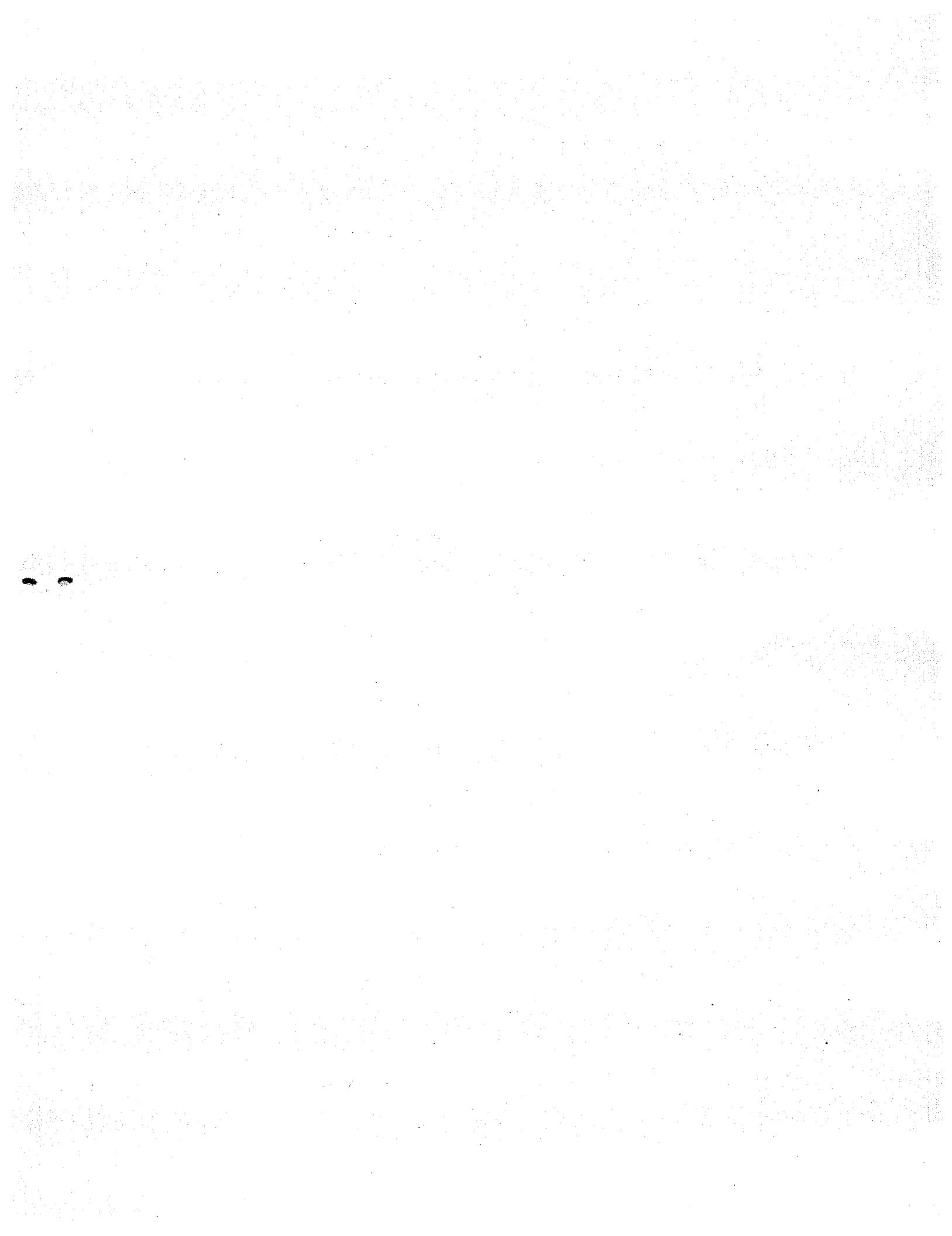
Batch # 33

Unhydrolyzed

Sample ID: ml-equiv/pl	UCO2525 Uh			UCO2253 Uh			UCO2280 Uh			UCO0216 Uh		
	avg.	avg.	avg.									
0	48	48	48	48	48	48	48	48	48	48	48	48
0.3	48	48	53	54	52	41	47	61	46	46	46	46
0.6	61	48	46	49	57	56	57	40	39	39	39	39
1.2	52	60	48	54	52	64	58	51	52	52	52	52
3	36	36	54	51	72	70	71	58	50	50	50	50
6	1	2	69	71	129	141	135	72	78	78	78	78
12	0	0	71	72	175	188	182	85	83	83	83	83
rs	0	0	0	0	0.97	0	0	0	0	0	0	0
s	0	0	0	0	11.8	0	0	0	0	0	0	0

Sample ID: ml-equiv/pl	UCO0387 Uh			UCO2915 Uh			UCO0731 Uh			UCO2540 Uh		
	avg.	avg.	avg.									
0	48	48	48	48	48	48	48	48	48	48	48	48
0.3	65	60	54	59	52	50	46	48	48	48	48	48
0.6	50	58	70	62	74	50	50	40	45	45	45	45
1.2	61	69	63	64	53	61	67	68	68	68	68	68
3	61	55	74	62	68	65	67	76	72	72	72	72
6	97	74	111	134	123	54	71	118	128	123	123	123
12	98	92	204	231	218	72	74	139	143	141	141	141
rs	0	0	0	0.97	0	0	0	0	0	0	0	0
s	0	0	0	13.7	0	0	0	0	0	0	0	0

52



Sample ID: ml-eq/pl	UCO3839 Uh		UCO3451 Uh		Blank Uh	
	48	48	48	48	48	48
0	51	53	69	50	55	48
0.3	0	0	63	61	64	55
0.6	0	0	53	68	58	53
1.2	0	0	57	50	42	42
3	0	0	5	1	41	41
6	16	0	2	0	0	0
12	0	0	0	0	0	0

rs
s

NHEERL/ECDF/MTB/DMD/2006-02-r0

Urinary Mutagenicity Study for New England Bladder Cancer /Arsenic

Experiment date :01/06/2009

Strain: YG1041

Activation :RLAO 100 2X 2ppd

Batch # 34 Hydrolyzed

Controls:	Plate 1	Plate 2	Plate 3	avg.
SP-	35	31	21	
SP+	47	56	48	47
2NF	1708	1555	1635	
2A	1156	1286	1474	

Sample ID: UCO3242 41

eq-ml/pl	avg.	UCO0895 41	avg.	UCO1785 41	avg.
0	47	47	47	47	47
0.3	56	51	54	58	63
0.6	85	74	74	88	85
1.2	94	75	85	94	88
3	0	71	71	0	79
6	102	108	105	83	141
12	119	108	114	76	128

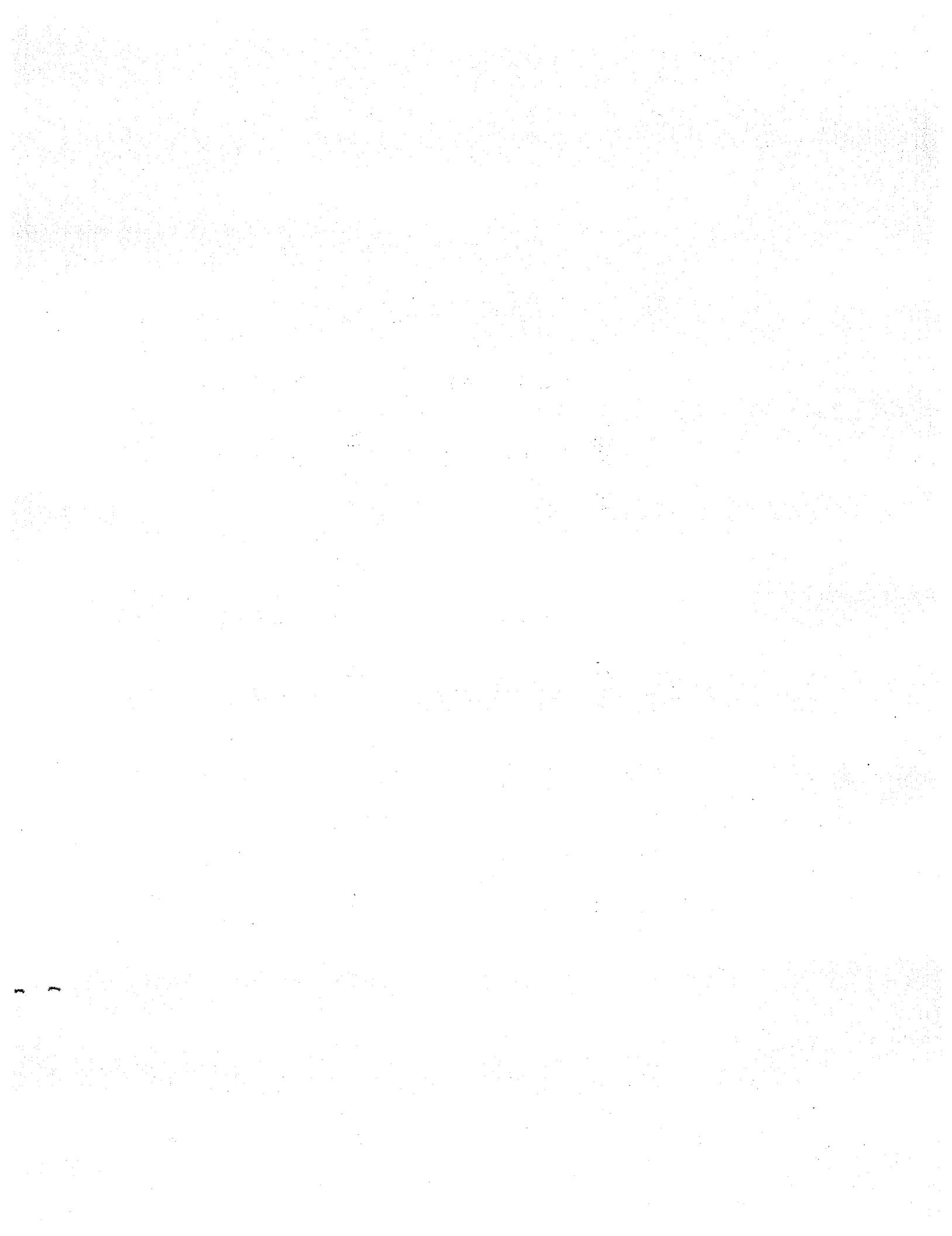
rs 0.80
s 12.4

Sample ID: UCO0584 41

eq-ml/pl	avg.	UCO2300 41	avg.	UCO3963 41	avg.
0	47	47	47	47	47
0.3	75	80	78	68	52
0.6	80	75	78	71	67
1.2	90	96	93	95	83
3	55	87	71	0	0
6	110	95	103	137	104
12	102	88	95	126	80

rs 0.42
s 5.4rs 0.63
s 11.2

60



Sample ID:
eq-mi/pl

UCO0076-H

avg.

0	47	47	47	47	47	47	47	47
0.3	64	50	57	70	60	65	57	81
0.6	91	131	111	101	93	97	75	69
1.2	118	129	124	128	118	123	86	77
3	78	143	111	52	111	82	0	70
6	241	246	244	188	152	170	101	97
12	247	230	239	201	196	199	98	123

rs
s

0.85
28.3

0.79
11.3

Sample ID:
eq-mi/pl

UCO0837-H

avg.

0	47	47	47	47	47	47	47	47
0.3	83	75	79	79	79	79	40	40
0.6	131	142	137	137	137	137	51	51
1.2	212	215	214	214	214	214	50	50
3	210	216	213	213	213	213	54	54
6	405	332	369	369	369	369	50	50
12	398	362	380	380	380	380	57	57

rs
s

0.99
142.6

Blank H

Sample ID:
eq-mi/pl

UCO3735-H

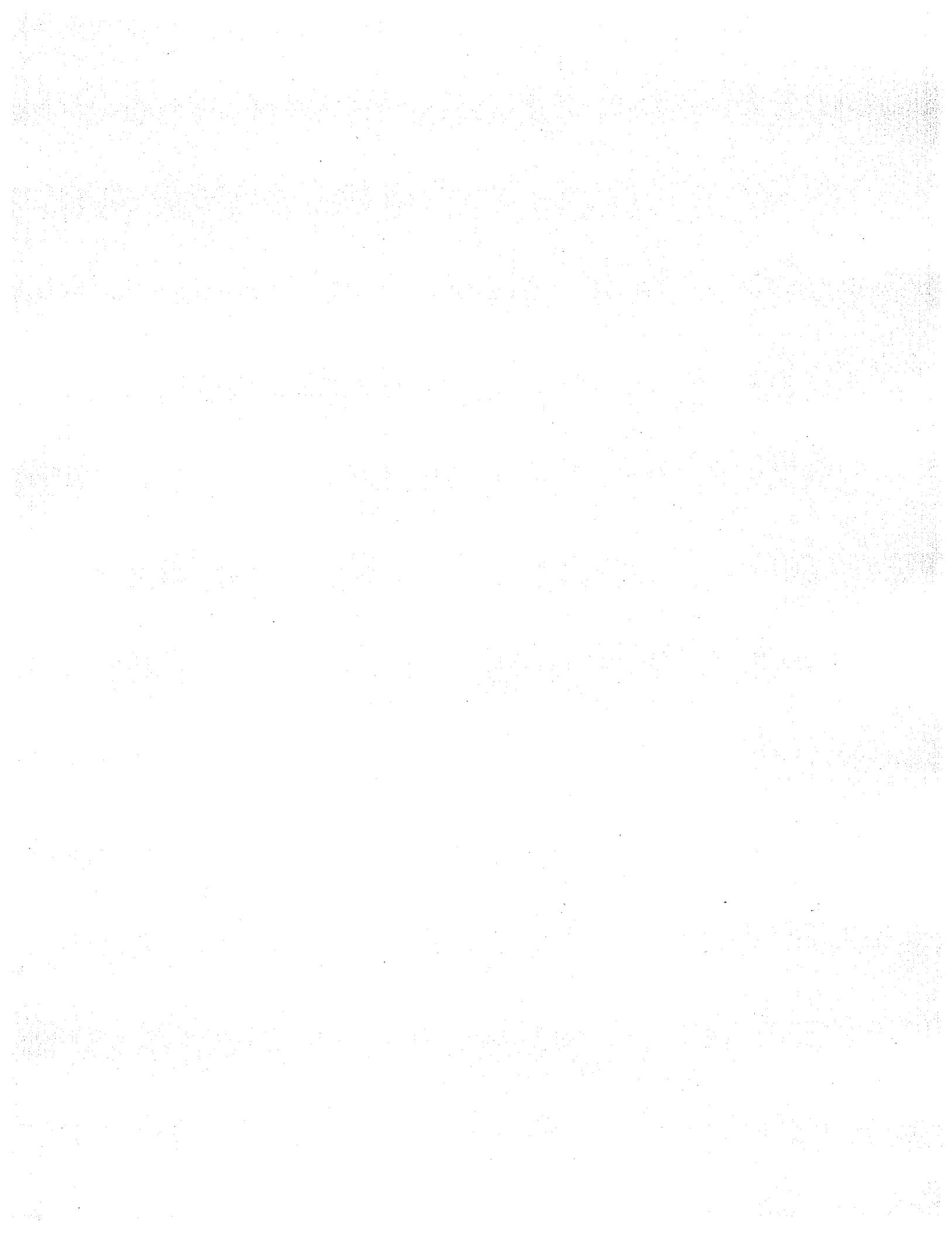
avg.

0	47	47	47	47	47	47	47	47
0.3	91	131	111	101	93	97	75	69
0.6	118	129	124	128	118	123	86	77
1.2	78	143	111	52	111	82	0	70
3	241	246	244	188	152	170	101	97
6	247	230	239	201	196	199	98	123

rs
s

0.79
11.3

61



NHEERL/ECD/MTB/DMD/2006-02-r0
Urinary Mutagenicity Study for New England Bladder Cancer/Arsenic

Experiment date :01/06/2009

Strain: YG1041

Activation :RLAO 100 2X 2ppd

Batch # 34 Unhydrolyzed

Sample ID: eq-ml/pl	UCO03242 Unh	avg.	UCO0895 Unh	avg.	UCO1785 Unh	avg.
0	47	47	47	47	47	47
0.3	55	46	53	52	53	56
0.6	40	46	50	56	53	59
1.2	62	48	58	60	59	51
3	56	45	43	45	44	57
6	56	82	93	94	94	78
12	80	86	115	105	110	80

rs
s

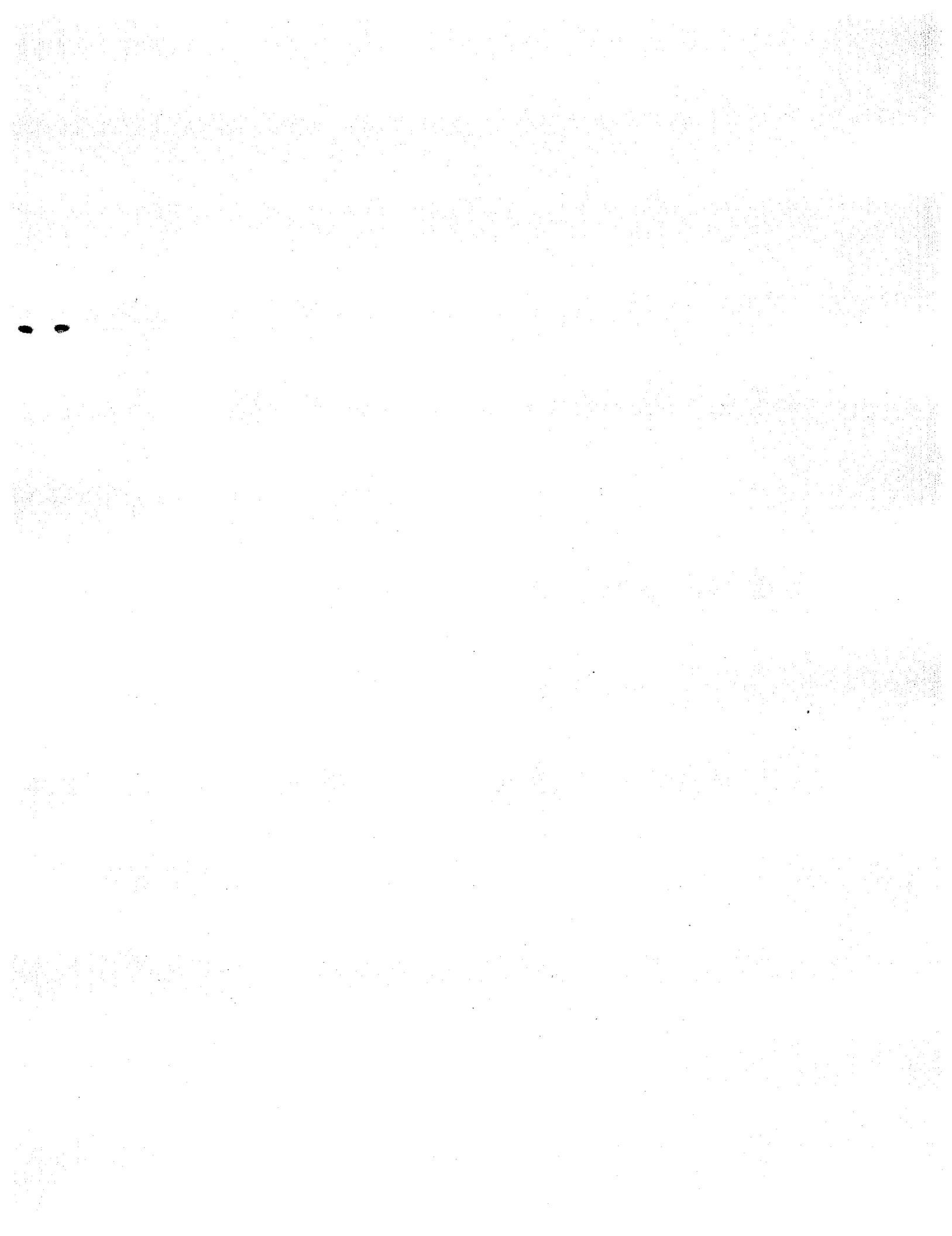
Sample ID: eq-ml/pl	UCO0584 Unh	avg.	UCO2300 Unh	avg.	UCO39963 Unh	avg.
0	47	47	47	47	47	47
0.3	46	49	48	49	49	41
0.6	65	56	61	50	56	63
1.2	71	57	50	45	48	63
3	42	44	46	64	60	62
6	47	110	114	62	81	72
12	117	121	118	108	112	78

rs
s

0.79
6.5

0.97
5.2

62



Sample ID:

	UCO0076 <i>Unk</i>			UCO0255 <i>Unk</i>			UCO3735 <i>Unk</i>		
eq-ml/pl	0	avg.	47	0	avg.	47	0	avg.	47
0	47	47	47	50	52	51	50	45	47
0.3	50	52	51	52	60	56	42	40	40
0.6	52	60	56	50	60	55	60	51	52
1.2	50	60	55	55	60	58	53	68	56
3	55	60	58	55	60	54	54	63	61
6	158	130	144	130	192	203	108	110	59
12	214	192	203	192	170	170	168	168	46
rs									46
s									40

Sample ID:

	UCO0837 <i>Unk</i>			Blank <i>Unk</i>					
eq-ml/pl	0	avg.	47	0	avg.	47	0	avg.	47
0	47	47	47	67	51	59	64	78	57
0.3	67	51	59	64	91	78	104	107	35
0.6	64	91	78	104	110	107	131	117	52
1.2	104	110	107	131	102	117	336	282	50
3	131	102	117	336	282	309	290	357	54
6	336	282	309	290	357	324	290	357	51
12	290	357	324	290	357	324	290	357	51
rs									
s									

***samples# 0584, 0076, 0255, 0837 urine very dark red

63

NHEERL/ECDD/MTB/DMD/2006-02-r0

Urinary Mutagenicity Study for New England Bladder Cancer /Arsenic

Experiment date :01/08/2009

Strain: YG1041

Activation :RLAO 100 2X 2ppd

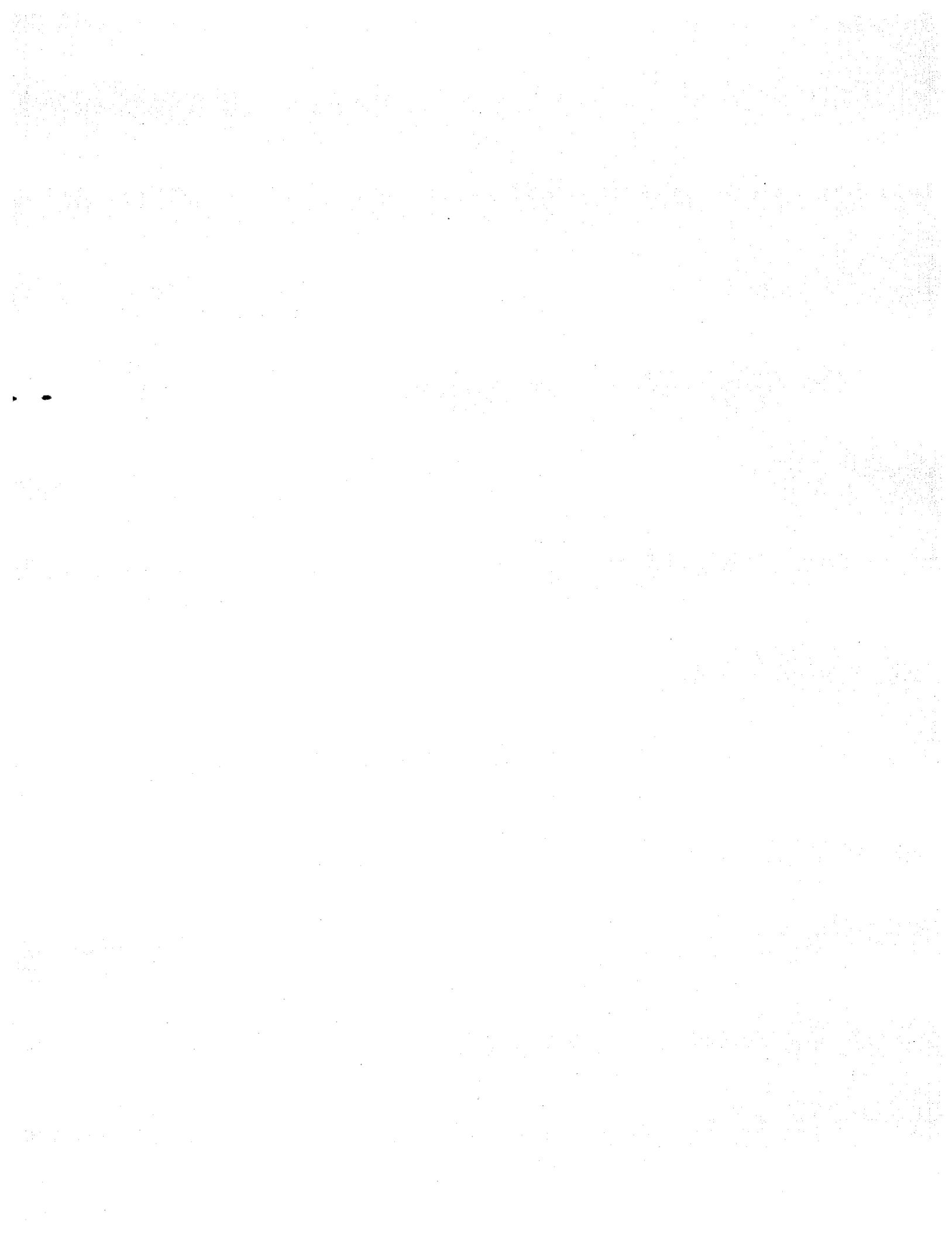
PPM

Batch # 35

Hydrolyzed

Controls:	Plate 1			Plate 2			Plate 3			avg.			avg.			avg.			avg.			avg.		
	SP-	SP+	2NF	2A	22	43	1256	1053	30	30	1207	1082	33	43	1184	1035	39	39	1184	1035	39	39	1260 H	avg.
Sample ID eq-ml/pl	0	0	0	0	39	53	71	73	39	53	82	88	71	71	91	91	62	66	95	95	139	139	59	53
	0.3	0.3	0.6	0.6	53	74	73	73	53	74	82	88	71	71	91	91	98	95	123	123	145	145	61	67
	1.2	1.2	1.2	1.2	73	90	90	90	73	90	82	88	71	71	91	91	154	154	123	123	145	145	64	66
	3	3	3	3	53	88	107	107	53	88	82	99	71	71	91	91	167	167	145	145	240	240	0	86
	6	6	6	6	107	99	72	72	107	99	99	93	71	71	91	91	103	103	240	240	384	384	255	255
	12	12	12	12	93	83	93	93	93	83	93	83	83	83	83	83	83	83	83	83	375	375	124	127
rs																								
s																								
Sample ID eq-ml/pl	0	0	0	0	39	65	65	65	39	65	62	68	62	68	63	63	50	49	97	97	109	109	192	192
	0.3	0.3	0.6	0.6	65	68	68	68	65	68	68	68	62	62	68	68	83	83	322	322	109	109	278	278
	1.2	1.2	1.2	1.2	68	62	62	62	68	62	62	62	62	62	62	62	91	91	97	97	82	82	192	192
	3	3	3	3	54	70	70	70	54	70	70	70	70	70	70	70	82	82	109	109	371	371	343	343
	6	6	6	6	46	43	43	43	46	43	43	43	43	43	43	43	195	195	192	192	371	371	343	343
	12	12	12	12	48	33	33	33	48	33	33	33	33	33	33	33	290	290	278	278	314	314	294	294
rs																								
s																								

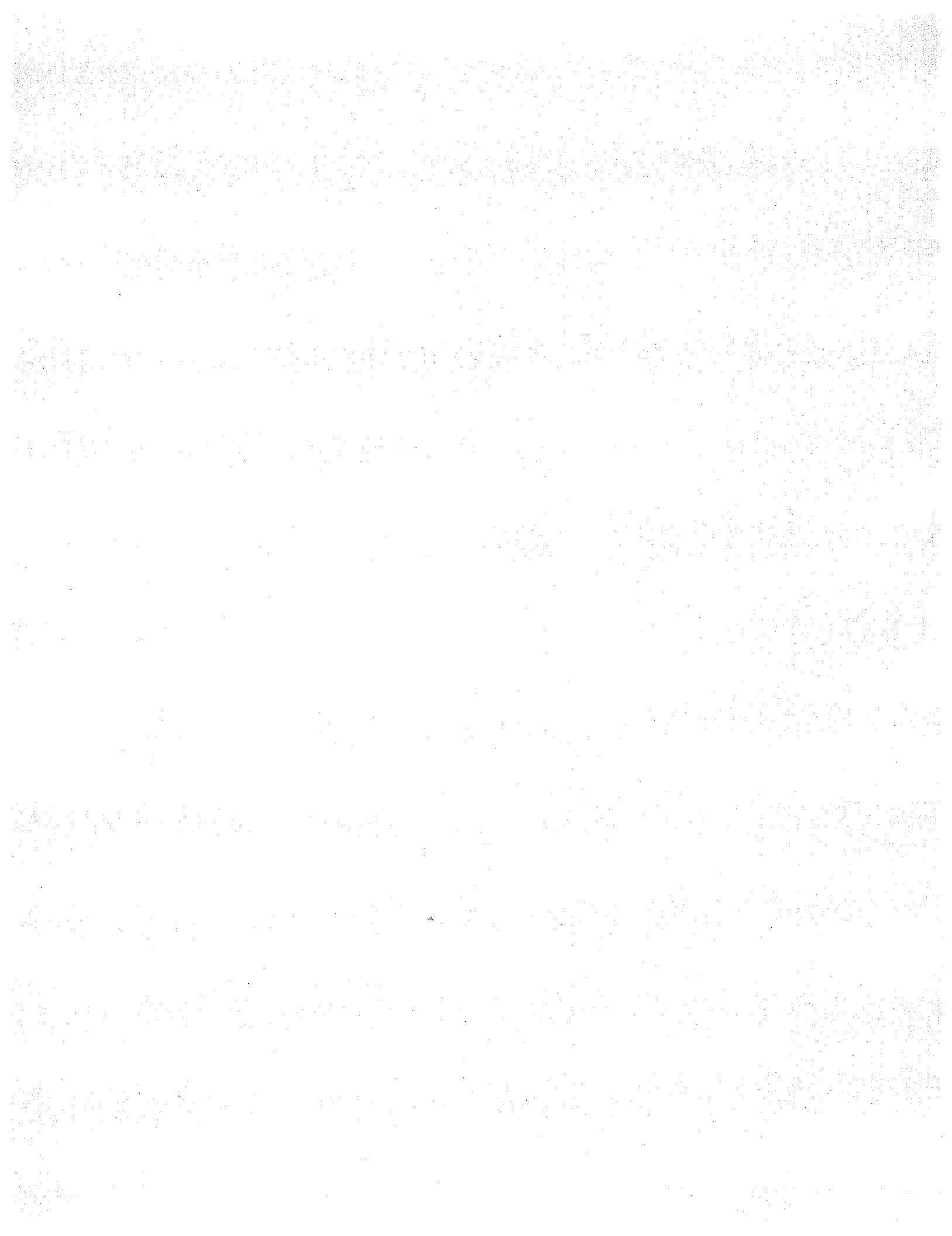
70



Sample ID eq-m/pl	UCOOO27 H			UCOO3673 H			UCOO678 H		
	0	avg.	39	39	39	39	39	39	39
0.3	68	49	59	50	66	46	53	50	50
0.6	71	66	69	64	77	77	67	72	72
1.2	78	85	82	80	73	66	68	67	67
3	74	63	69	0	71	53	74	64	64
6	70	69	70	64	90	71	88	80	80
12	70	91	81	60	60	58	55	57	57
rs				0.92			0.96		
s				34.0			55.0		

Sample ID eq-m/pl	UCO1289 H			Blank H		
	0	avg.	39	39	39	39
0.3	67	77	72	40		
0.6	78	89	84	40		
1.2	88	73	81	39		
3	101	103	102	41		
6	117	119	118	33		
12	115	107	111	40		
rs				0.73		
s				10.1		

71



NHEERL/ECDF/MTB/DMD/2006-02-10

Urinary Mutagenicity Study for New England Bladder Cancer /Arsenic

Experiment date :01/08/2009

Strain: YG1041

Activation :RLAO 100 2X 2ppd

PPM

Batch # 35

Unhydrolyzed

Sample ID eq-ml/pl	UCO1480 Uh	UCO0142 Uh	UCO1260 Uh
0	39	39	39
0.3	42	48	64
0.6	66	43	71
1.2	55	55	75
3	47	51	59
6	61	63	182
12	75	72	232
rs			0.92
s			15.6

Sample ID eq-ml/pl	UCO3135 Uh	UCO0708 Uh	UCO3624 Uh
0	39	39	39
0.3	59	41	52
0.6	60	56	45
1.2	67	45	61
3	44	50	0
6	50	40	127
12	20	29	174
rs			0
s			0

avg. 39 39 39
 avg. 39 39 39
 avg. 39 39 39
 avg. 39 39 39

0.94
 293.3

0.93
 11.0

72

Sample ID eq-ml/pl	UCOOO27 Uh	UCO3673 Uh	UCOO678 Uh
0	39	39	39
0.3	51	54	43
0.6	49	57	54
1.2	70	64	62
3	0	47	47
6	86	99	93
12	66	107	97
rs		0.73	0.94
s		4.4	5.1
avg.			

Sample ID eq-ml/pl	UCO1289 Uh	Blank Uh
0	39	39
0.3	48	46
0.6	69	60
1.2	54	58
3	67	76
6	78	65
12	73	79
rs		0
s		0

***sample # 0142, 3135, 0708, 3624, 0027 urine very dark red

73

NHEERL/ECDD/MTB/DMD/2006-02-r0

Urinary Mutagenicity Study for New England Bladder Cancer /Arsenic

Experiment date :01/08/2009

Strain: YG1041

Activation :RLAO 100 2X 2ppd

PPM/ SHW

Batch # 36

Hydrolyzed

Controls:

SP-

SP+

2NF

2A

Plate 1

Plate 2

Plate 3

avg.

Sample ID

UCO0226 H

UCO2015 H

UCO3386 H

eq-ml/pl

0

0.3

0.6

1.2

3

6

12

39

48

79

77

76

93

94

81

39

49

69

75

85

117

106

39

58

81

58

36

2 t

79

39

55

68

65

38

2 t

t

39

57

68

57

38

77

65

2 t

67

62

38

67

62

38

39

39

57

67

57

71

79

60

120

106

113

135

136

0.93

10.6

rs
s

Sample ID

UCO1085 H

UCO1344 H

UCO0734 H

eq-ml/pl

0

0.3

0.6

1.2

3

6

12

39

40

68

79

71

72

81

62

83

77

80

39

51

62

41

57

67

71

79

81

120

106

135

136

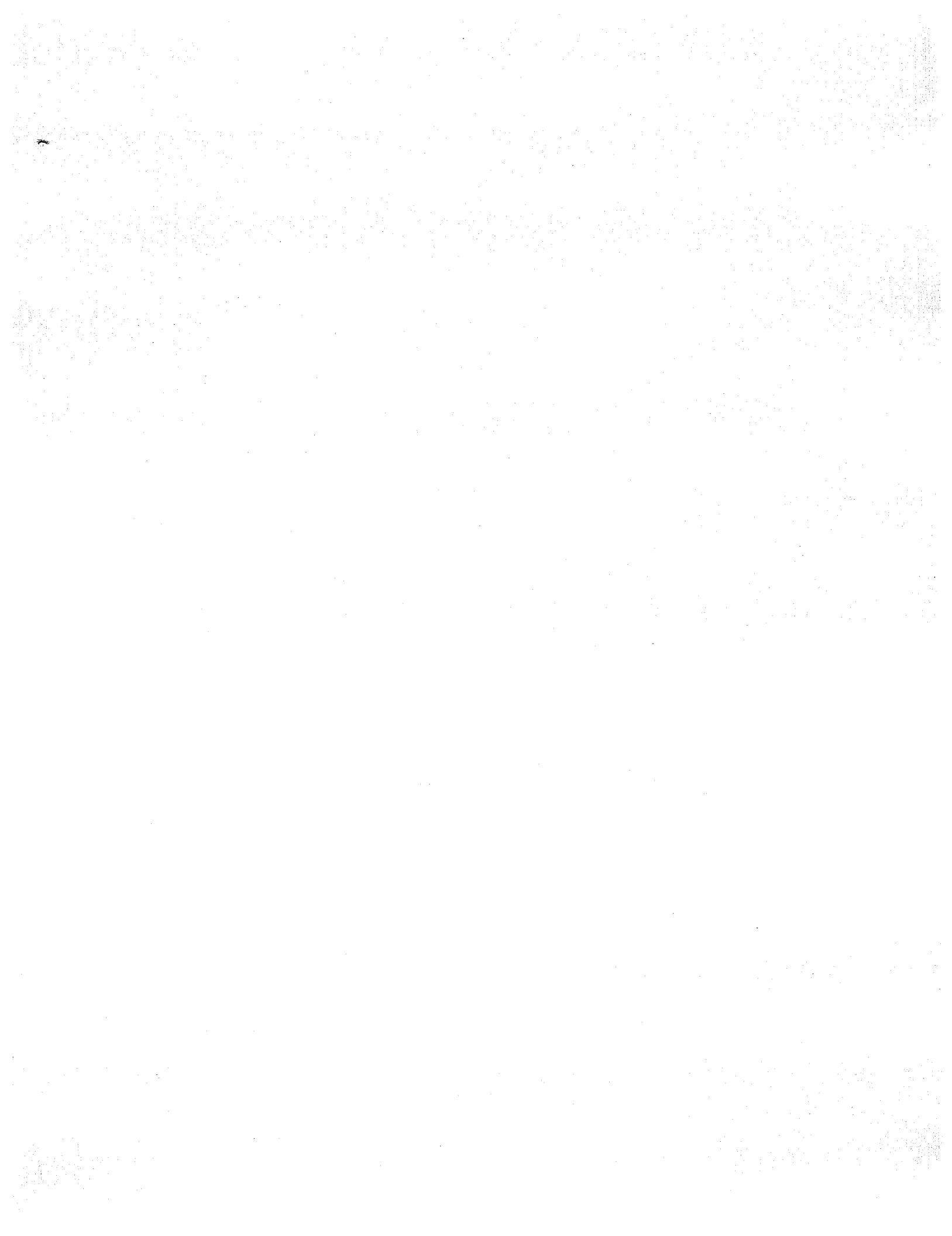
0.83

6.0

0

0

77



Sample ID eq-ml/ml	UCO2233 H												UCO3938 H												UCO3165 H											
	0	0.3	0.6	1.2	3	6	12	rs	s	0	0.3	0.6	1.2	3	6	12	rs	s	0	0.3	0.6	1.2	3	6	12	rs	s									
0	39	59	61	60	60	58	51	54	54	39	59	72	51	54	54	53	53	53	39	59	72	51	54	54	53	53	53	39	59	72	51	54	54	53	53	53
0.3	39	59	61	60	60	58	51	54	54	39	59	72	51	54	54	53	53	53	39	59	72	51	54	54	53	53	53	39	59	72	51	54	54	53	53	53
0.6	39	59	61	60	60	58	51	54	54	39	59	72	51	54	54	53	53	53	39	59	72	51	54	54	53	53	53	39	59	72	51	54	54	53	53	53
1.2	39	59	61	60	60	58	51	54	54	39	59	72	51	54	54	53	53	53	39	59	72	51	54	54	53	53	53	39	59	72	51	54	54	53	53	53
3	39	59	61	60	60	58	51	54	54	39	59	72	51	54	54	53	53	53	39	59	72	51	54	54	53	53	53	39	59	72	51	54	54	53	53	53
6	39	59	61	60	60	58	51	54	54	39	59	72	51	54	54	53	53	53	39	59	72	51	54	54	53	53	53	39	59	72	51	54	54	53	53	53
12	39	59	61	60	60	58	51	54	54	39	59	72	51	54	54	53	53	53	39	59	72	51	54	54	53	53	53	39	59	72	51	54	54	53	53	53
rs	39	59	61	60	60	58	51	54	54	39	59	72	51	54	54	53	53	53	39	59	72	51	54	54	53	53	53	39	59	72	51	54	54	53	53	53
s	39	59	61	60	60	58	51	54	54	39	59	72	51	54	54	53	53	53	39	59	72	51	54	54	53	53	53	39	59	72	51	54	54	53	53	53

rs s

78

NHEERL/ECD/MTB/DMD/2006-02-r0

Urinary Mutagenicity Study for New England Bladder Cancer /Arsenic

Experiment date :01/08/2009

Strain: YG1041

Activation :RLAO 100 2X 2ppd

PPM/ SHW

Batch # 36

Unhydrolyzed

Sample ID eq-ml/pl	UCO0226 Unh	UCO2015 Unh	UCO3386 Unh
0	39	39	39
0.3	52	51	61
0.6	55	45	55
1.2	43	42	30
3	53	63	23
6	89	70	t
12	75	93	t
rs		0.87	75
s		5.9	80

0.70
5.0

Sample ID eq-ml/pl	UCO1095 Unh	UCO1344 Unh	avg.	UCO0734Unh
0	39	39	39	39
0.3	50	55	45	45
0.6	53	50	54	50
1.2	63	46	63	50
3	49	82	73	54
6	89	102	75	40
12	112	111	110	54
rs		96	65	32
s		88	77	25

0.95
8.3

0.93
27.1

79

Sample ID eq-ml/pl	UCO2233 Unh						UCO3938 Unh						UCO3165 Unh																					
	0	0.3	0.6	1.2	3	6	12	rs	s	avg.	39	56	55	51	55	53	52	57	57	39	52	49	46	52	53	43	59	57	46	52	49	48	48	49
0	39	49	65	59	54	71	74	101	88	39	56	55	51	61	58	53	53	57	39	52	49	46	52	53	43	59	57	46	52	49	48	48	49	
0.3	49	56	55	51	61	77	74	101	88	39	56	55	51	61	58	53	53	57	39	52	49	46	52	53	43	59	57	46	52	49	48	48	49	
0.6	65	59	54	61	71	77	74	101	88	39	56	55	51	61	58	53	53	57	39	52	49	46	52	53	43	59	57	46	52	49	48	48	49	
1.2	59	51	61	77	74	74	74	88	75	39	56	55	51	61	58	53	53	57	39	52	49	46	52	53	43	59	57	46	52	49	48	48	49	
3	54	61	71	77	74	74	74	101	88	39	56	55	51	61	58	53	53	57	39	52	49	46	52	53	43	59	57	46	52	49	48	48	49	
6	71	77	74	74	74	74	74	101	88	39	56	55	51	61	58	53	53	57	39	52	49	46	52	53	43	59	57	46	52	49	48	48	49	
12	74	74	74	74	74	74	74	101	88	39	56	55	51	61	58	53	53	57	39	52	49	46	52	53	43	59	57	46	52	49	48	48	49	

Sample ID eq-ml/pl	UCO2578Unh						Blank Unh																					
	0	0.3	0.6	1.2	3	6	12	rs	s	avg.	39	50	35	61	79	92	93	96	95	39	49	57	51	73	38	40	52	0.95
0	39	48	43	61	79	92	93	96	95	39	50	35	61	79	92	93	96	95	39	49	57	51	73	38	40	52	0.95	9.2
0.3	49	55	50	67	87	96	96	96	95	39	56	39	67	87	96	96	96	95	39	49	57	51	73	38	40	52	0.95	9.2
0.6	55	50	48	61	79	92	93	96	95	39	56	39	67	87	96	96	96	95	39	49	57	51	73	38	40	52	0.95	9.2
1.2	50	43	46	54	73	94	94	95	95	39	56	39	67	87	96	96	96	95	39	49	57	51	73	38	40	52	0.95	9.2
3	51	43	46	54	73	94	94	95	95	39	56	39	67	87	96	96	96	95	39	49	57	51	73	38	40	52	0.95	9.2
6	51	46	46	54	73	94	94	95	95	39	56	39	67	87	96	96	96	95	39	49	57	51	73	38	40	52	0.95	9.2
12	54	43	46	54	73	94	94	95	95	39	56	39	67	87	96	96	96	95	39	49	57	51	73	38	40	52	0.95	9.2

80

NHEERL/ECD/MTB/DMD/2006-02-r0

Urinary Mutagenicity Study for New England Bladder Cancer /Arsenic

Experiment date :01/14/2009

Strain: YG1041

Activation :RLAO 100 2X 2ppd

Batch # 37
Hydrolyzed

Controls: SP- SP+ 2NF 2A	avg.				UCOOO85 H
	Plate 1	Plate 2	Plate 3	avg.	
0	61	61	61	61	61
0.3	77	61	69	68	70
0.6	85	75	80	71	72
1.2	100	122	111	92	85
3	123	112	118	74	95
6	120	121	148	96	111
12			121	121	128
rs				0.98	0.93
s				42.4	4.9
					54.7
Sample ID: eq-ml/pl	avg.				UCOO411 H
	Plate 1	Plate 2	Plate 3	avg.	
0	61	61	61	61	61
0.3	82	87	85	60	60
0.6	84	93	87	85	87
1.2	88	86	87	82	85
3	94	109	106	81	94
6	78	77	78	103	98
12	37	53	45	100	91
rs			0.74	0	0
s			11.5	0	35.2
Sample ID: eq-ml/pl	avg.				UCO2458 H
	Plate 1	Plate 2	Plate 3	avg.	
0	61	61	61	61	61
0.3	69	60	69	60	60
0.6	86	87	84	86	86
1.2	99	104	107	105	105
3	103	107	118	108	108
6	97	103	129	117	123
12	100	112	112	106	106
rs			0	0	0.88
s			35.2	0	35.2
					90

Sample ID:
eq-ml/pl

UCO2126 H

0	61
0.3	69
0.6	86
1.2	92
3	63
6	99
12	78
rs	0
s	0

UCO2470 H

61	61
69	94
94	104
77	111
80	102
107	107
50	90
45	80
50	45
0	0

0.93
35.4

Sample ID:
eq-ml/pl

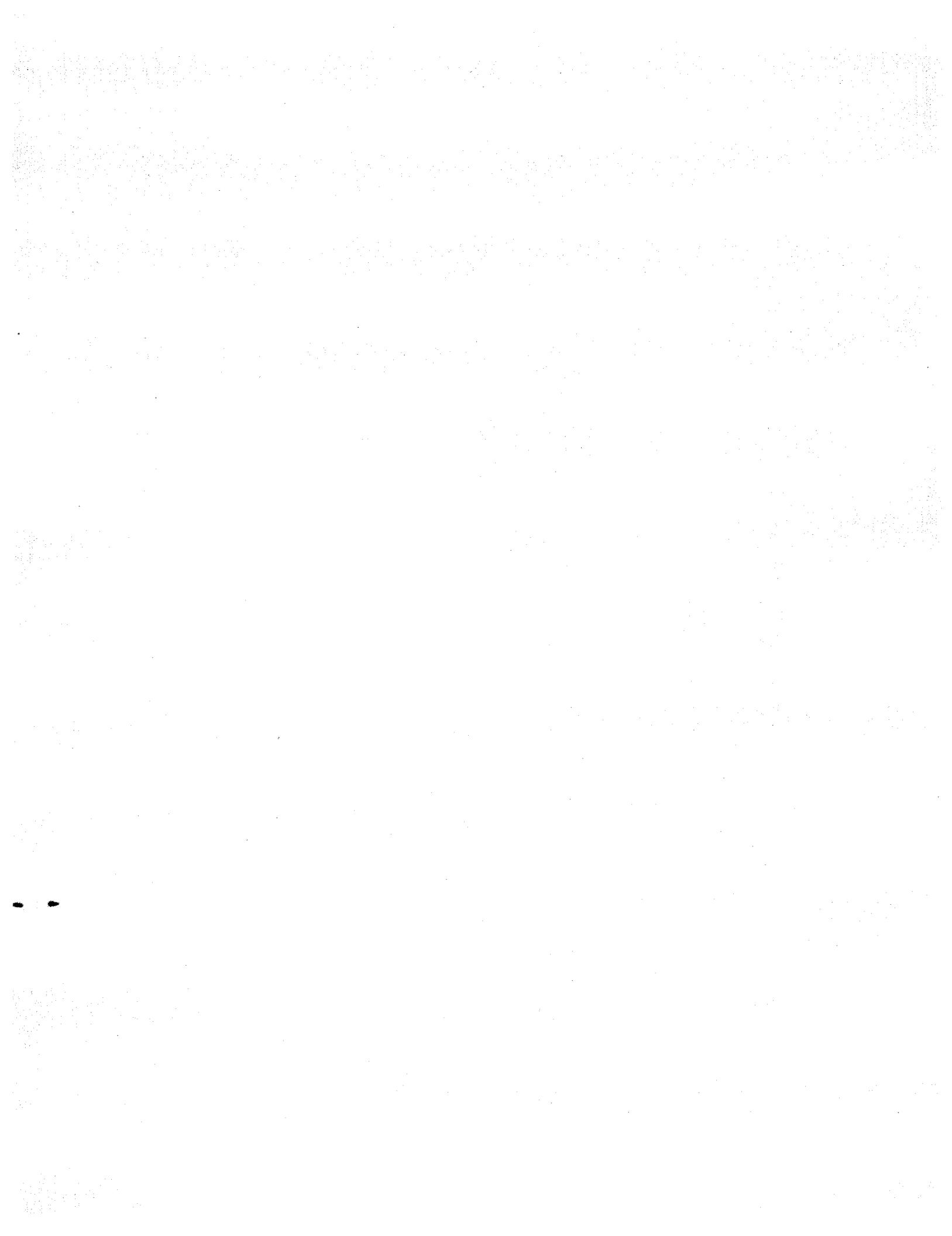
UCO3357 H

0	61
0.3	72
0.6	77
1.2	88
3	92
6	94
12	80
rs	78
s	68

91

Blank H

61	61
62	62
60	60
68	68
60	60
62	62
68	68
0	0
0	0



NHEERL/ECDF/MTB/DMD/2006-02-r0

Urinary Mutagenicity Study for New England Bladder Cancer /Arsenic

Experiment date .01/14/2009

Strain: YG1041

Activation :RLAO 100 2X 2ppd

Batch # 37
Unhydrolyzed

Sample ID: eq-ml/pl	UCOO631 Uh	UCOO2982 Uh	UCOO0085 Uh
0	61	61	61
0.3	58	67	61
0.6	52	69	56
1.2	71	53	61
3	68	61	63
6	72	82	75
12	36	20	100
rs	0	0	0
s	0	0	0
			0.90
			5.8
			avg.

Sample ID: eq-ml/pl	UCOO3838 Uh	UCOO2454 Uh	UCOO0411 Uh
0	61	61	61
0.3	80	64	65
0.6	78	82	73
1.2	72	82	72
3	76	93	60
6	68	72	50
12	48	36	63
rs	0	0	0
s	0	0	0
			0
			0
			0

92

Sample ID:
eq-ml/pl

UCO2126 Uh

0	61
0.3	72
0.6	68
1.2	60
3	65
6	71
12	55

rs
s

Sample ID:
eq-ml/pl

UCO3357 Uh

0	61
0.3	70
0.6	66
1.2	78
3	65
6	94
12	117

rs
s

Blank Uh

61	61
63	61
70	60
73	61
68	69
118	59
125	63

0
0

UCO2470 Uh

61	61
60	72
76	68
67	97
66	66
68	89
3	70
104	84
87	88
0	85
0	99

0
0

UCO3279 Uh

61	61
60	63
76	69
67	49
131	68
70	86
84	73
112	88
99	85

0
0

93

