APPENDIX C

QUALITY CONTROL/QUALITY ASSURANCE ASSESSMENT

QA/QC For
Task 5: Assessment of Biosolids Releases on BB and WOBs

Data QC Summary

DATE	ANALYSIS				# DAYS	
	FIELD DATA	EC	TSS	BOD	Count 1	Count 2
5/10/2005						
5/11/2005						
5/12/2005						
5/13/2005						
5/14/2005						
5/15/2005						
5/16/2005						
5/17/2005						
5/18/2005						
5/19/2005						
5/20/2005						
5/21/2005						1
5/22/2005					1	2
5/23/2005						3
5/24/2005					2	4
5/25/2005					3	5
5/26/2005						6
5/27/2005					4	7
5/28/2005						8
5/29/2005						9
5/30/2005					5	10
5/31/2005					6	11
6/1/2005					7	12
6/2/2005					8	13
6/3/2005					9	14
6/4/2005						15
6/5/2005						16
6/6/2005						17

KEY

	Field data had to be flagged
	Problem with TSS data because lab dups didn't meet the %RPD
	Problem with BOD data because lab dups didn't meet the %RPD. If we report only the LCD/LCDS pairs, we meet all the time but frequency may be low (QAPP says one per batch)
	BOD data are not available

We don't have data to support the reporting limit (AWRL) and BOD data do not have lab blanks
For TSS only one LCS was run per batch, a LCSD was never run

Table 1. Frequency of Laboratory QC Samples

QC Sample	# Samples	# QC Samples	Frequency	Requirement
Laboratory Blanks				
- EC	105	28	27%	one per batch
- TSS	105	9	9%	one per batch
- BOD	69	9	13%	one per batch
Laboratory Duplicates				
- EC	105	105	100%	10%
- BOD	69	69	100%	10%
- TSS	105	15	14%	10%
Laboratory Control Standards				
- BOD	69	12	17%	10%
- TSS	105	6	6%	10%
AWRL				
- TSS	105	4	4%	one per batch
- BOD	69	9	13.0%	one per batch

Table 4. Laboratory Blank Results

Date	Sample ID	EC Result (MPN/dL)
5/10/2005	Laboratory Blank	<1
5/11/2005	Laboratory Blank	<1
5/12/2005	Laboratory Blank	<1
5/13/2005	Sterile Water	<1
5/14/2005	Water Blank	<1
5/15/2005	Blank	<1
5/16/2005	Laboratory Blank	<1
5/17/2005	Laboratory Blank	<1
5/18/2005	Laboratory Blank	<1
5/19/2005	Laboratory Blank	<1
5/20/2005	Laboratory Blank	<1
5/21/2005	Laboratory Blank	<1
5/22/2005	Laboratory Blank	<1
5/23/2005	Laboratory Blank	<1
5/24/2005	Laboratory Blank	<1
5/25/2005	Laboratory Blank	<1
5/26/2005	Laboratory Blank	<1
5/27/2005	Laboratory Blank	<1
5/28/2005	Laboratory Blank	<1
5/29/2005	Laboratory Blank	<1
5/30/2005	Laboratory Blank	<1
5/31/2005	Laboratory Blank	<1
6/1/2005	Laboratory Blank	<1
6/2/2005	Laboratory Blank	<1
6/3/2005	Laboratory Blank	<1
6/4/2005	Laboratory Blank	<1
6/5/2005	Laboratory Blank	<1
6/6/2005	Laboratory Blank	<1

Table 2a. Laboratory QC Results fof TSS and BOD Samples

Date Performe	Sample ID	Laboratory Duplicates								Blanks (mg/L)	Laboratory Control Standard			AWRL		
		TSS (mg/L)				BOD (mg/L)					Standard Conc (mg/L)	Measured Conc (mg/L)	Met DOQ?[c]	AWRL (mg/L)	Measured Conc (mg/L)	Met DOQ?[c]
		Measur. 1	Measur 2	%RPD[a]	Met DOQ?[b]	Measur. 1	Measur 2.	%RPD[a]	Met DOQ?[b]							
5/17/2005	10495-099									< 1.8						
5/19/2005	11485	3.6	3.6	0.0%	Y											
5/26/2005	11485	2.2	3.3	40.0%	N					< 1.8						
5/27/2005										< 1.8	130	125	Y			
6/1/2005	11375	1	1.2	18.2%	Y					< 1.8	130	131	Y			
6/1/2005	10495-099	1.8	2	10.5%	Y											
6/3/2005										< 1.8				2.6	1.5	N
6/6/2005	11375	0.8	0.9	11.8%	Y						130	125.6	Y	2.6	2	Y
6/28/2005	10495-099	1.7	1.3	26.7%	Y					< 1.8				2.6	2	Y
6/28/2005	11485	4.3	3.7	15.0%	Y											
6/28/2005	LCS/LCSD	116.7	121.7	4.2%	Y						130	121.7	Y			
7/5/2005	11485-instream	832.1	834.6	0.3%	Y					< 1.8	130	119.3	Y	2.6	2.5	Y
7/5/2005	11375-upstream	41.6	39.7	4.7%	Y					< 1.8						
7/5/2005	11375-instream	20.4	25.2	21.1%	N											
7/5/2005	LCS/LCSD	119.3	121.2	1.6%	Y						130	121.2	Y			
7/21/2005	11485A	1.3	2.0	42.4%	N					< 1.8						
5/21/2005	11375					1.18	1.98	50.6%	N							
5/21/2005	11485					1.87	2.36	23.2%	N							
5/21/2005	10495-099					2.26	3.90	53.2%	N							
5/22/2005	11375					2.17	3.61	49.8%	N							
5/22/2005	11485					2.29	2.29	0.0%	Y							
5/22/2005	10495-099					3.18	5.43	52.4%	N							
5/23/2005	11375					1.93	2.80	36.8%	N							
5/23/2005	11485					1.79	3.30	59.3%	N							
5/23/2005	10495-099					4.89	6.21	23.7%	N							
5/24/2005	11485					2.30	2.95	24.9%	N							
5/24/2005	10495-099					5.41	6.77	22.3%	N							
5/24/2005	NW					32.49	212.25	146.9%	N							
5/24/2005	TC					174.45	174.45	0.0%	Y							
5/25/2005	11375					4.28	4.61	7.3%	Y							
5/25/2005	10495-099					3.02	4.36	36.5%	N							
5/26/2005	11375					2.16	4.76	75.1%	N							
5/26/2005	11485					2.88	4.95	52.9%	N							
5/26/2005	10495-099					4.36	5.43	21.9%	N							
5/26/2005	11375-Dup					2.24	4.71	71.1%	N							
5/27/2005	11375					2.50	3.41	30.7%	N							

Table 2a. Laboratory QC Results fof TSS and BOD Samples

Date Performe	Sample ID	Laboratory Duplicates								Blanks (mg/L)	Laboratory Control Standard			AWRL		
		TSS (mg/L)				BOD (mg/L)					Standard Conc (mg/L)	Measured Conc (mg/L)	Met DOQ?[c]	AWRL (mg/L)	Measured Conc (mg/L)	Met DOQ?[c]
		Measur. 1	Measur 2	%RPD[a]	Met DOQ?[b]	Measur. 1	Measur 2.	%RPD[a]	Met DOQ?[b]							
5/27/2005	11485					2.55	3.36	27.4%	N							
5/27/2005	10495-099					3.44	3.86	11.4%	Y							
5/28/2005	LCS/LCSD					221.97	225.47	1.6%	Y		200	225.47	Y			
5/29/2005	11375					2.02	3.70	58.9%	N							
5/29/2005	11485					2.59	3.97	42.3%	N							
5/29/2005	10495-099					6.41	8.51	28.2%	N							
5/30/2005	10495-099A					20.60	23.06	11.3%	Y							
5/30/2005	10495-099B					20.12	20.72	2.9%	Y							
5/30/2005	10495-099U					215.60	246.80	13.5%	Y							
5/30/2005	11485A					12.20	19.58	46.4%	N							
5/30/2005	11485B					8.84	14.78	50.3%	N							
5/31/2005	11375					1.56	2.68	53.0%	N							
5/31/2005	11485					1.48	3.28	75.5%	N							
6/1/2005	10495-099A					7.65	8.73	13.2%	Y							
6/1/2005	10495-099B					7.47	7.75	3.7%	Y							
6/1/2005	10495B-Dup					7.03	7.77	10.0%	Y							
5/31/2005	LCS/LCSD					208.56	227.06	8.5%	Y		200	227.06	Y			
6/2/2005	LCS/LCSD					216.98	217.73	0.3%	Y		200	217.73	Y			
6/23/2005	LCS/LCSD					214.92	226.42	5.2%	Y	0.2	200	226.42	Y			
6/24/2005	LCS/LCSD					215.72	219.22	1.6%	Y	0.2	200	219.22	Y			
6/25/2005	LCS/LCSD					208.04	222.54	6.7%	Y	0.3	200	222.54	Y			
6/26/2005	LCS/LCSD					184.98	202.98	9.3%	Y	0.2	200	202.98	Y			
6/27/2005	LCS/LCSD					198.92	200.92	1.0%	Y	0.2	200	198.92	Y			
6/28/2005	LCS/LCSD					206.24	210.74	2.2%	Y	0.4	200	210.74	Y			
6/29/2005	LCS/LCSD					208.48	209.98	0.7%	Y	0.2	200	209.98	Y			
6/30/2005	LCS/LCSD					193.98	212.48	9.1%	Y	0.2	200	212.48	Y			
7/1/2005	LCS/LCSD					207.43	212.93	2.6%	Y	0.3	200	212.93	Y			

[a] Percentage difference calculated as [abs(t1-t2)/average(t1,t2)]

[b] QAPP states that lab duplicates meet the DQO if the RPD is less than 10% for TSS higher than 100 mg/L; less than 20% for BOD and TSS between 10-100 mg/L; and less than 30% for TSS less than 10 mg/L. Values that do not meet the DQO are highlighted.

[c] QAPP states that % recovery of matrix spikes should be 80-120 for TOC.

Table 2b. Laboratory Duplicate Precision Results for EC Samples

Count	Date	Sample ID	E. COLI (MPN/100mL)					Accept?
			D1	D2	L1	L2	R_{logs}	
1	5/9/2005	10495-099	5172	9340	3.71	3.97	0.26	Y
2	5/9/2005	10495-099U	24191.7	36540	4.38	4.56	0.18	Y
3	5/10/2005	11375	45.45	45.45	1.66	1.66	0.00	Y
4	5/10/2005	10495-099	61	200	1.79	2.30	0.52	Y
5	5/11/2005	11485	4.1	5.2	0.61	0.72	0.10	Y
6	5/11/2005	10495-099	54.75	54.75	1.74	1.74	0.00	Y
7	5/12/2005	11485	103.9	520	2.02	2.72	0.70	Y
8	5/12/2005	10495-099	9.6	62	0.98	1.79	0.81	Y
9	5/13/2005	10495-099	4.1	31	0.61	1.49	0.88	Y
10	5/14/2005	11485	10.9	63	1.04	1.80	0.76	Y
11	5/14/2005	10495-099	7.4	20	0.87	1.30	0.43	Y
12	5/15/2005	10495-099	3	20	0.48	1.30	0.82	Y
13	5/16/2005	10495-099	3.1	20	0.49	1.30	0.81	Y
14	5/17/2005	11485	2	2	0.30	0.30	0.00	Y
15	5/17/2005	10495-099	3	5.2	0.48	0.72	0.24	Y
						ΣR_{logs}	***6.51***	
16	5/17/2005	10495-099D	3	5.2	0.48	0.72	0.24	Y
17	5/19/2005	10495-099	2	5.2	0.30	0.72	0.41	Y
18	5/20/2005	11375	20	20	1.30	1.30	0.00	Y
19	5/20/2005	10495-099	2	2	0.30	0.30	0.00	Y
20	5/21/2005	11485	41	41	1.61	1.61	0.00	Y
21	5/23/2005	10495-099	2	4.1	0.30	0.61	0.31	Y
22	5/24/2005	10495-099	3.1	10	0.49	1.00	0.51	Y
23	5/25/2005	10495-099	5.1	10	0.71	1.00	0.29	Y
24	5/26/2005	10495-099	3.1	6.3	0.49	0.80	0.31	Y
25	5/27/2005	10495-099	2	4.1	0.30	0.61	0.31	Y
26	5/28/2005	10495-099	2	2	0.30	0.30	0.00	Y
27	5/29/2005	11485	2	3	0.30	0.48	0.18	Y
28	5/29/2005	10495-099	3.1	20	0.49	1.30	0.81	Y
29	5/30/2005	10495-099-AA	850	2980	2.93	3.47	0.54	Y
30	5/30/2005	10495-099-EBA	1317	2780	3.12	3.44	0.32	Y
31	5/30/2005	10495-099-U	10462.4	68670	4.02	4.84	0.82	Y
32	5/31/2005	10495-099	29.5	73	1.47	1.86	0.39	Y
33	6/1/2005	10495-099A	14.3	30	1.16	1.48	0.32	Y
34	6/1/2005	10495-099B	13.2	200	1.12	2.30	1.18	Y
35	6/1/2005	10495-099B-D	15.6	52	1.19	1.72	0.52	Y
36	6/1/2005	11485A	54.6	54.6	1.74	1.74	0.00	Y
37	6/1/2005	11485B	52	866.4	1.72	2.94	1.22	Y
38	6/2/2005	10495-099	5.1	9.8	0.71	0.99	0.28	Y
39	6/3/2005	10495-099	2	3.1	0.30	0.49	0.19	Y
40	6/4/2005	10495-099	5.2	5.2	0.72	0.72	0.00	Y
41	6/5/2005	10495-099	3	4.1	0.48	0.61	0.14	Y
42	6/6/2005	10495-099	3.1	3.1	0.49	0.49	0.00	Y

Count	Date	Sample ID	E. COLI (MPN/100mL)					Accept?
			D1	D2	L1	L2	R_{logs}	
43	6/23/2005	11485	0.5	0.5	-0.30	-0.30	0.00	Y
44	6/23/2005	10495-099	0.5	4.1	-0.30	0.61	0.91	Y
45	6/24/2005	11485	0.5	0.5	-0.30	-0.30	0.00	Y
46	6/24/2005	11485	0.5	0.5	-0.30	-0.30	0.00	Y
47	6/24/2005	10495-099	3.1	9.7	0.49	0.99	0.50	Y
48	6/24/2005	10495-099D	4.1	12.2	0.61	1.09	0.47	Y
49	6/25/2005	11485	0.5	0.5	-0.30	-0.30	0.00	Y
50	6/25/2005	10495-099	0.5	5.2	-0.30	0.72	1.02	Y
51	6/26/2005	11485	0.5	0.5	-0.30	-0.30	0.00	Y
52	6/26/2005	10495-099	0.5	2	-0.30	0.30	0.60	Y
53	6/27/2005	11485	0.5	0.5	-0.30	-0.30	0.00	Y
54	6/27/2005	10495-099	0.5	9.7	-0.30	0.99	1.29	Y
55	6/28/2005	11485	0.5	0.5	-0.30	-0.30	0.00	Y
56	6/28/2005	11485D	0.5	0.5	-0.30	-0.30	0.00	Y
57	6/28/2005	10495-099	5.2	41	0.72	1.61	0.90	Y
58	6/29/2005	11485	0.5	0.5	-0.30	-0.30	0.00	Y
59	6/29/2005	10495-099	2	3.1	0.30	0.49	0.19	Y
60	6/30/2005	11485	0.5	0.5	-0.30	-0.30	0.00	Y
61	6/30/2005	10495-099	4.1	5.2	0.61	0.72	0.10	Y
62	7/1/2005	11485	0.5	0.5	-0.30	-0.30	0.00	Y
63	7/1/2005	10495-099	0.5	71.2	-0.30	1.85	2.15	N

Precision criteria for samples 1-75 = 3.27*6.51/15= 1.42

Note: not-detects assumed equal to 0.5 MPN for log calculation

Table 4. Incubation Time Analysis

Sample ID	Start Incubation	End Incubation	Incubator time (days)	Meet DQO?
10495099D	5/8/01 12:05 PM	5/9/01 2:51 PM	1.1	Y
10495099U	5/8/01 12:05 PM	5/9/01 2:51 PM	1.1	Y
11375	5/9/01 12:30 PM	5/10/01 12:40 PM	1.0	Y
11485	5/9/01 12:30 PM	5/10/01 12:40 PM	1.0	Y
10495099	5/9/01 12:30 PM	5/10/01 1:13 PM	1.0	Y
11375	5/10/01 12:30 PM	5/11/01 1:13 PM	1.0	Y
11485	5/10/01 12:30 PM	5/11/01 1:13 PM	1.0	Y
10495099	5/10/01 12:30 PM	5/11/01 1:13 PM	1.0	Y
11375	5/11/01 12:30 PM	5/12/01 2:24 PM	1.1	Y
11485	5/11/01 12:30 PM	5/12/01 2:24 PM	1.1	Y
10495099	5/11/01 12:30 PM	5/12/01 2:24 PM	1.1	Y
11375	5/12/01 12:00 PM	5/13/01 12:34 PM	1.0	Y
11485	5/12/01 12:00 PM	5/13/01 12:34 PM	1.0	Y
10495099	5/12/01 12:00 PM	5/13/01 12:34 PM	1.0	Y
11375	5/13/01 12:38 PM	5/14/01 12:58 PM	1.0	Y
11485	5/13/01 12:38 PM	5/14/01 12:58 PM	1.0	Y
10495099	5/13/01 12:38 PM	5/14/01 12:58 PM	1.0	Y
11375	5/14/01 12:38 PM	5/15/01 1:23 PM	1.0	Y
11485	5/14/01 12:38 PM	5/15/01 1:23 PM	1.0	Y
10495099	5/14/01 12:38 PM	5/15/01 1:23 PM	1.0	Y
11375	5/15/01 1:24 PM	5/16/01 3:00 PM	1.1	Y
11485	5/15/01 1:24 PM	5/16/01 3:00 PM	1.1	Y
10495099	5/15/01 1:24 PM	5/16/01 3:00 PM	1.1	Y
11375	5/16/01 1:55 PM	5/17/01 2:30 PM	1.0	Y
11485	5/16/01 1:55 PM	5/17/01 2:30 PM	1.0	Y
10495099	5/16/01 1:55 PM	5/17/01 2:30 PM	1.0	Y
11375	5/17/01 12:13 PM	5/18/01 2:35 PM	1.1	Y
11485	5/17/01 12:13 PM	5/18/01 2:35 PM	1.1	Y
10495099	5/17/01 12:13 PM	5/18/01 2:35 PM	1.1	Y
11375	5/18/01 1:40 PM	5/19/01 1:50 PM	1.0	Y

Table 4. Incubation Time Analysis

Sample ID	Start Incubation	End Incubation	Incubator time (days)	Meet DQO?
11485	5/30/01 1:37 PM	5/31/01 2:06 PM	1.0	Y
10495099	5/30/01 1:37 PM	5/31/01 2:06 PM	1.0	Y
11375	5/31/01 2:06 PM	6/1/01 2:45 PM	1.0	Y
11485	5/31/01 2:06 PM	6/1/01 2:45 PM	1.0	Y
10495099	5/31/01 2:06 PM	6/1/01 2:45 PM	1.0	Y
11375	6/1/01 1:10 PM	6/2/01 2:32 PM	1.1	Y
11485	6/1/01 1:10 PM	6/2/01 2:32 PM	1.1	Y
10495099	6/1/01 1:10 PM	6/2/01 2:32 PM	1.1	Y
11375	6/2/01 2:32 PM	6/3/01 3:03 PM	1.0	Y
11485	6/2/01 2:32 PM	6/3/01 3:03 PM	1.0	Y
10495099	6/2/01 2:32 PM	6/3/01 3:03 PM	1.0	Y
11375	6/3/01 2:16 PM	6/4/01 2:26 PM	1.0	Y
11485	6/3/01 2:16 PM	6/4/01 2:26 PM	1.0	Y
10495099	6/3/01 2:16 PM	6/4/01 2:26 PM	1.0	Y
11375	6/4/01 2:24 PM	6/5/01 2:37 PM	1.0	Y
11485	6/4/01 2:24 PM	6/5/01 2:37 PM	1.0	Y
10495099	6/4/01 2:24 PM	6/5/01 2:37 PM	1.0	Y
11375	6/5/01 11:57 AM	6/6/01 12:56 PM	1.0	Y
11485	6/5/01 11:57 AM	6/6/01 12:56 PM	1.0	Y
10495099	6/5/01 11:57 AM	6/6/01 12:56 PM	1.0	Y
11375	6/22/01 11:30 AM	6/23/01 12:41 PM	1.0	Y
11485	6/22/01 11:30 AM	6/23/01 12:41 PM	1.0	Y
10495099	6/22/01 11:30 AM	6/23/01 12:41 PM	1.0	Y
11375	6/23/01 12:45 PM	6/24/01 1:15 PM	1.0	Y
11485	6/23/01 12:45 PM	6/24/01 1:15 PM	1.0	Y
10495099	6/23/01 12:45 PM	6/24/01 1:15 PM	1.0	Y
11375	6/25/01 1:35 PM	6/26/01 2:00 PM	1.0	Y
11485	6/25/01 1:35 PM	6/26/01 2:00 PM	1.0	Y
10495099	6/25/01 1:35 PM	6/26/01 2:00 PM	1.0	Y
11375	6/26/01 11:11 AM	6/27/01 1:54 PM	1.1	Y
11485	6/26/01 11:11 AM	6/27/01 1:54 PM	1.1	Y
10495099	6/26/01 11:11 AM	6/27/01 1:54 PM	1.1	Y
11375	6/27/01 1:24 PM	6/28/01 2:03 PM	1.0	Y
11485	6/27/01 1:24 PM	6/28/01 2:03 PM	1.0	Y
10495099	6/27/01 1:24 PM	6/28/01 2:03 PM	1.0	Y
10495099	6/27/01 2:02 PM	6/28/01 2:03 PM	1.0	Y
11485	6/27/01 2:02 PM	6/28/01 2:03 PM	1.0	Y
10495099 D Sed	6/27/01 4:57 PM	6/28/01 5:40 PM	1.0	Y
10495099 U Sed	6/27/01 5:05 PM	6/28/01 5:40 PM	1.0	Y
10495099 U	6/27/01 2:02 PM	6/28/01 2:03 PM	1.0	Y
10495099 D	6/27/01 2:02 PM	6/28/01 2:03 PM	1.0	Y
10495099 In	6/27/01 2:02 PM	6/28/01 2:03 PM	1.0	Y
10495099 In Sed	6/27/01 5:05 PM	6/28/01 5:40 PM	1.0	Y
10495099 E	6/29/01 11:50 AM	6/30/01 1:30 PM	1.1	Y
11485 E	6/29/01 11:50 AM	6/30/01 1:30 PM	1.1	Y
11485 U	6/29/01 11:50 AM	6/30/01 1:30 PM	1.1	Y
11485 D	6/29/01 11:50 AM	6/30/01 1:30 PM	1.1	Y
11485 I	6/29/01 11:50 AM	6/30/01 1:30 PM	1.1	Y
11485 U Sed	6/29/01 1:54 PM	6/30/01 3:30 PM	1.1	Y
11485 D Sed	6/29/01 1:54 PM	6/30/01 3:30 PM	1.1	Y
11485 In Sed	6/29/01 1:54 PM	6/30/01 3:30 PM	1.1	Y
10495099	6/28/01 10:38 AM	6/29/01 11:50 AM	1.0	Y
11485	6/28/01 10:38 AM	6/29/01 11:50 AM	1.0	Y
10495099	6/28/01 10:38 AM	6/29/01 11:50 AM	1.0	Y
11485	6/30/01 12:40 PM	7/1/01 2:25 PM	1.1	Y
11375 E	6/30/01 12:40 PM	7/1/01 2:25 PM	1.1	Y
11375 U	6/30/01 12:40 PM	7/1/01 2:25 PM	1.1	Y
11375 D	6/30/01 12:40 PM	7/1/01 2:25 PM	1.1	Y
11375 I	6/30/01 12:40 PM	7/1/01 2:25 PM	1.1	Y

Minimum incubatoin period of 24 hours was not met.

Table 5. Incubation and Reading Temperatures

	Incubate Temp (^oC)			Read Temp (^oC)			Meet DQO?
	A	B	C	A	B	C	
5/8/2001	35	35		35.5	35		Y
5/9/2001	35	35		35	35		Y
5/10/2001	35	35		35	35		Y
5/11/2001	35	35		35	35		Y
5/12/2001	35	35		35	35		Y
5/13/2001	35	35		35	35		Y
5/14/2001	35	36		35	35		Y
5/15/2001	36	35		35	35		Y
5/16/2001		35			35		Y
5/17/2001	36	36		36	36		N
5/18/2001	37			34			N
5/19/2001		36			35		N
5/20/2001	35	36		37	35		N
5/21/2001		36			37		N
5/22/2001	36			36			N
5/23/2001		37			37		N
5/24/2001		37			36		N
5/25/2001			35			35	Y
5/26/2001			35			35.1	Y
5/27/2001			35.1			35.1	Y
5/28/2001			35.1			35.1	Y
5/29/2001			35			35	Y
5/30/2001			35			35	Y
5/31/2001			35			35	Y
6/1/2001			35			35	Y
6/2/2001			35			35	Y
6/3/2001			35.4			35	Y
6/4/2001			35			35	Y
6/5/2001			35			35	Y
6/22/2001			35			35	Y
6/23/2001			35			35	Y
6/24/2001			35			35	Y
6/25/2001			35			35	Y
6/26/2001			35			35	Y
6/27/2001			35			35	Y
6/28/2001			35			35	Y
6/29/2001			35			35	Y
6/30/2001			35			35	Y

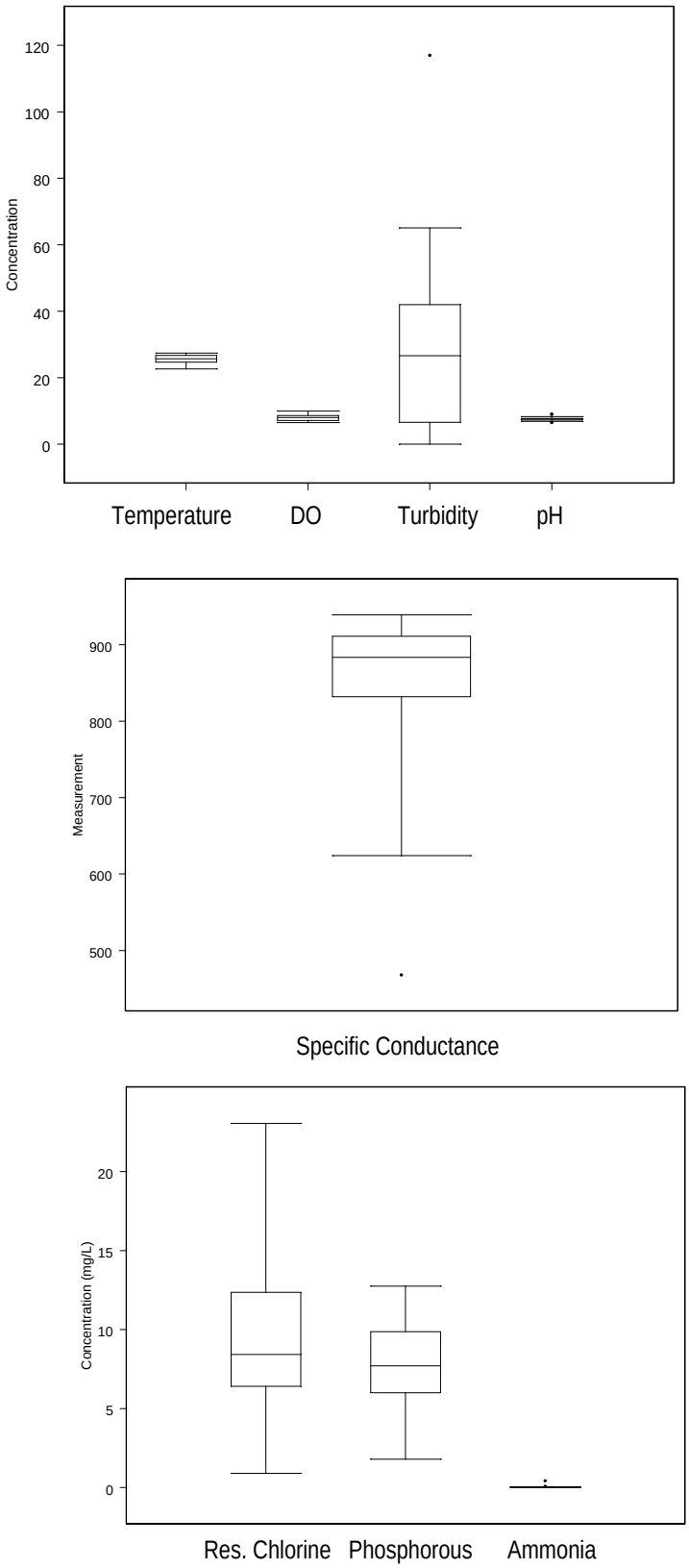

Figure 3. Control charts for field data collected at WWTP 11375

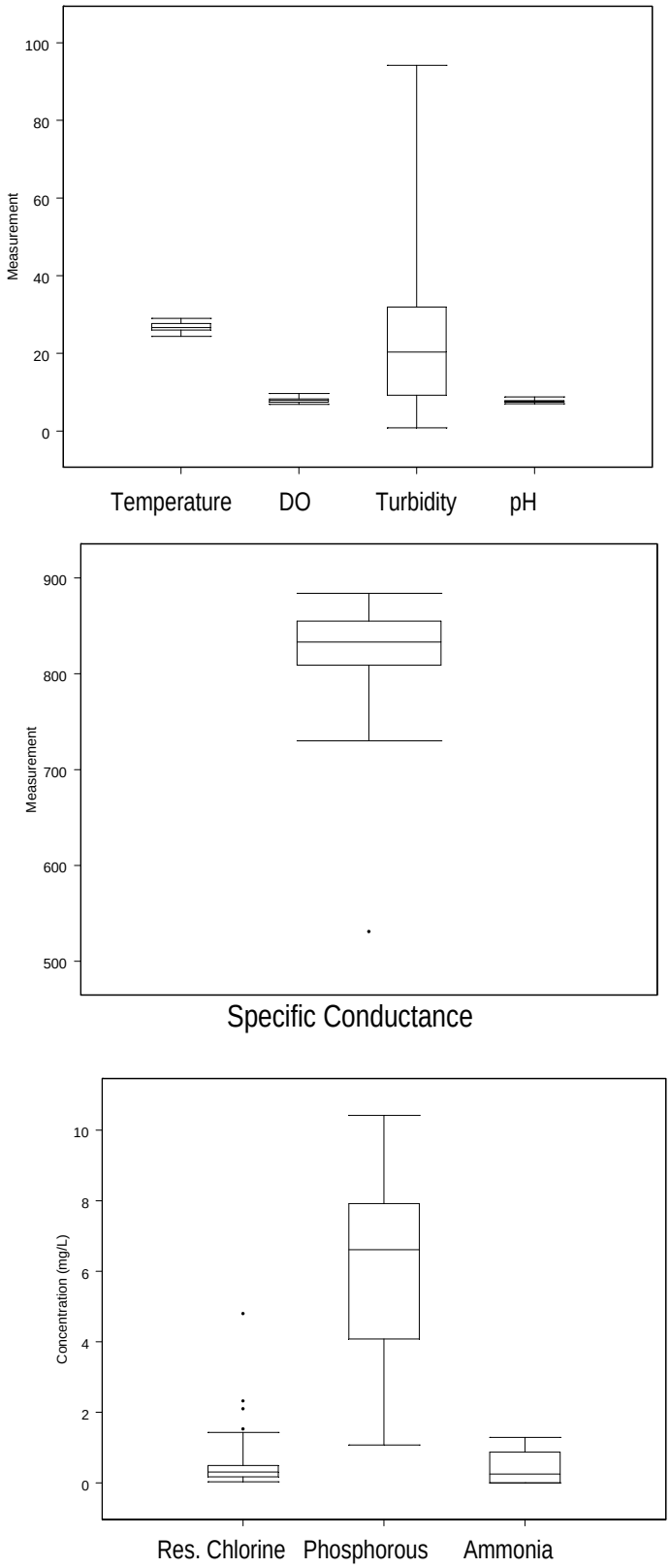

Figure 2. Control charts for field data collected at WWTP 11485

QA/QC For
Task 8: Assessment of EC Levels Downstream of WWTPs

Table 1. Percent Laboratory Duplicates

Analysis	Total Samples	# Lab Duplicates	% Lab Duplicates
TSS	30	6	20%
EC Water	25	25	100%
EC Sed	21	21	100%
% Moisture	21	2	10%

Table 2. TSS and Percent Moisture Laboratory Duplicate Precision

Sample ID	Sample Date	Analysis	Result 1	Result 2	% RPD
11523-001-U	07/06/05	% Moisture	35%	37%	6%
11563-001-U	07/05/05	% Moisture	30%	31%	4%
11485-001-E	06/30/05	TSS (mg/L)	3.6	2.5	36%
11485-001-I	06/30/05	TSS (mg/L)	832.1	834.6	0.3%
11375-001-I	07/01/05	TSS (mg/L)	20.4	25.2	21%
11375-001-U	07/01/05	TSS (mg/L)	41.7	39.8	5%
10495-139-D	07/06/05	TSS (mg/L)	50.0	46.9	6%
12795-001-D	07/06/05	TSS (mg/L)	12.4	12.7	3%

Table 3. Laboratory Method Blanks

Analysis	Sample Date	Result 1
% Moisture	07/10/05	0.0%
EC (MPN/dL)	06/28/05	<1
EC (MPN/dL)	06/28/08	<1
EC (MPN/dL)	06/30/05	<1
EC (MPN/dL)	06/30/05	<1
EC (MPN/dL)	07/01/05	<1
EC (MPN/dL)	07/05/05	<1
EC (MPN/dL)	07/06/05	<1
EC (MPN/dL)	07/06/05	<1
EC (MPN/dL)	07/07/05	<1
EC (MPN/dL)	07/07/05	<1
EC (MPN/dL)	07/13/05	<1
EC (MPN/dL)	07/15/05	<1
EC (MPN/dL)	07/11/05	<1
TSS (mg/L)	07/05/05	<2
TSS (mg/L)	07/05/05	<2
TSS (mg/L)	07/09/05	<2
TSS (mg/L)	07/09/05	<2

Table 4. Laboratory Control Standards

Parameter	**Lot #**	**Date**	**MPN – Total Coliform** MPN/100 mL	**MPN - *E. Coli*** MPN/100 mL	**Meet DQO**
Klebsiella pneumoniae	CA212	7/19/05		0	Y
Pseudomonas aeruginosa	CA212	7/19/05	0	0	Y
Escherichia coli	CA212	7/19/05	21.3	21.3	Y
Klebsiella pneumoniae	374EZ	7/19/05	235	0	Y
Pseudomonas aeruginosa	374EZ	7/19/05	0	0	Y
Escherichia coli	374EZ	7/19/05	1870	1870	Y

Table 5. Lab Control Standards (Standard = 120 mg/L)

Sample Date	R1 (mg/L)	R2 (mg/L)	Bias R1	Bias R2	Precision
7/5/2005	119.3	121.2	99%	101%	-2%
7/9/2005	121.1	124.1	101%	103%	-2%

Table 6. Reporting Limits

Sample Date	AWRL (mg/L)	Standard (mg/L)	Bias
7/5/2005	2	2	100%
7/5/2005	2.5	2	125%
7/9/2005	2.5	2	125%

Table 7. Bacterial Laboratory Duplicate Precision

Count	Date	Sample ID	E. COLI (MPN/100mL)					Meet Criteria?
			D1	D2	L1	L2	R_{logs}	
1	06/28/05	10495-099 Up	2479	2981	7.82	8.00	0.18	-
2	06/28/05	10495-099 In	4601	5532	8.43	8.62	0.18	-
3	06/28/05	10495-099 DN	4851	6476	8.49	8.78	0.29	-
4	06/28/05	10495-099-E	6	6	1.79	1.79	0.00	-
5	06/28/05	10495-099-I-Sed	1779	2909	7.48	7.98	0.21	-
6	06/28/05	10495-099-U-Sed	6830	8010	8.83	8.99	0.07	-
7	06/28/05	10495-099-D-Sed	9870	10460	9.20	9.26	0.03	-
	06/30/05	11485 Dn Sed	<1	70				-
	06/30/05	11485 In Dup Sed	<1	126				-
8	06/30/05	11485 In-Sed	32	199	3.45	5.29	1.84	
9	06/30/05	11485-001-D	121	162	4.80	5.09	0.13	-
10	06/30/05	11485-001-U	166	185	5.11	5.22	0.05	-
11	06/30/05	11395-001-D	148	152	5.00	5.02	0.01	-
12	07/01/05	11375 In Sed	52	52	3.96	3.96	0.00	-
13	07/01/05	11375 Up Sed	<1	109				-
14	07/01/05	11375 Dn Sed	423	461	6.05	6.13	0.09	-
15	07/05/05	11563-U-Dup Sed	212	241	5.36	5.48	0.13	-
		Precision criteria for first 15 = 3.28*1.68/15=					0.70	-
16	07/05/05	11563-U Sed	288	316	5.66	5.76	0.09	Y
17	07/05/05	11563-Dn Sed	2332	2706	7.75	7.90	0.15	Y
18	07/05/05	11563-In Sed	4145	6161	8.33	8.73	0.40	Y
19	07/05/05	11563-001-D	194	214	5.27	5.37	0.10	Y
20	07/05/05	11563-001-U	501	613	6.22	6.42	0.20	Y
21	07/05/05	11563-001-I	517	687	6.25	6.53	0.28	Y
22	07/05/05	11563-001-D	687	726	6.53	6.59	0.06	Y
23	07/05/05	11395-001-U	131	135	4.88	4.91	0.03	Y
24	07/06/05	10495-139-D	871	1416	6.77	7.26	0.49	Y
25	07/06/05	10495-139-Up	3540	6887	8.17	8.84	0.67	Y
26	07/06/05	10495-139-In	7387	10627	8.91	9.27	0.36	Y
27	07/06/05	11523-D Sed	16506	24790	9.71	10.12	0.41	Y

Table 7. Bacterial Laboratory Duplicate Precision continued

28	07/06/05	11523-I Sed	31446	48059	10.36	10.78	0.42	Y
29	07/06/05	11523-U Sed	42774	49029	10.66	10.80	0.14	Y
30	07/06/05	10495-139-U	387	435	5.96	6.08	0.12	Y
31	07/06/05	11523-D-DUP	435	529	6.08	6.27	0.20	Y
32	07/06/05	11523-I	579	836	6.36	6.73	0.37	Y
33	07/06/05	11523-D	579	594	6.36	6.39	0.03	Y
34	07/06/05	11523-U	726	866	6.59	6.76	0.18	Y
35	07/07/05	12795-D-Dup Sed	650	684	6.48	6.53	0.05	Y
36	07/07/05	12795-Dn Sed	666	891	6.50	6.79	0.29	Y
37	07/07/05	12795-U Sed	7976	9498	8.98	9.16	0.17	Y
38	07/07/05	12795-In Sed	469584	730695	13.06	13.50	0.44	Y
39	07/07/05	12795-001-D	2	4	0.69	1.39	0.69	Y
40	07/07/05	12795-001-D-Dup	13	<1	2.56	0.41	2.16	N
41	07/07/05	11395-001-I	26	28	3.26	3.33	0.07	Y

Note: Precision calculated for samples below detection limit (DL) using 1 + ½ DL

Table 8. Incubator Temperature Log

	Incubate Temp (^oC)			Read Temp (^oC)			Meet DQO?
	A	B	C	A	B	C	
6/30/2005	-	-	35	-	-	35	Y
7/1/2005	-	-	35	-	-	35	Y
7/5/2005	-	-	35	-	-	35	Y
7/6/2005	-	-	35	-	-	35	Y
7/6/2005	-	-	34.6	-	-	35	Y
7/7/2005	-	-	35	-	-	35	Y
7/7/2005	-	-	34.9	-	-	35	Y
7/11/2005	-	-	35	-	-	35	Y
7/15/2005	-	-	35	-	-	35	Y
7/19/2005	-	-	35	-	-	35	Y

Note: if incubator temperature is marked with "-", then incubator was not in use that day

Table 9. Lab Analysis Holding Times

Sample ID	Collection	Start Incubation	End Incubation	Incubator time (days)	Meet DQO for Incubation Time?	Holding time (hrs)	Exceed Holding Time ?	TSS Analysis Date	% Solids	Exceed Holding time TSS?
10495099 E	6/28/05 9:15 AM	6/28/05 1:24 PM	6/29/05 2:03 PM	1.0	Y	4:09	N	6/28/2005		N
10495099 D Sed	6/28/05 8:59 AM	6/28/05 4:57 PM	6/29/05 5:40 PM	1.0	Y	7:58	N		7/5/2005	
10495099 U Sed	6/28/05 9:30 AM	6/28/05 5:05 PM	6/29/05 5:40 PM	1.0	Y	7:35	N		7/5/2005	
10495099 U	6/28/05 9:30 AM	6/28/05 2:02 PM	6/29/05 2:03 PM	1.0	Y	4:32	N	6/28/2005		N
10495099 D	6/28/05 9:07 AM	6/28/05 2:02 PM	6/29/05 2:03 PM	1.0	Y	4:55	N	6/28/2005		N
10495099 In	6/28/05 9:21 AM	6/28/05 2:02 PM	6/29/05 2:03 PM	1.0	Y	4:41	N	6/28/2005		N
10495099 In Sed	6/28/05 9:21 AM	6/28/05 5:05 PM	6/29/05 5:40 PM	1.0	Y	7:44	N		7/5/2005	
11485 E	6/29/05 8:15 AM	6/29/05 10:38 AM	6/30/05 11:50 AM	1.0	Y	2:23	N	7/5/2005		N
11485 E	6/30/05 8:16 AM	6/30/05 11:50 AM	7/1/05 1:30 PM	1.1	Y	3:34	N	7/5/2005		N
11485 U	6/30/05 8:48 AM	6/30/05 11:50 AM	7/1/05 1:30 PM	1.1	Y	3:02	N	7/5/2005		N
11485 D	6/30/05 8:10 AM	6/30/05 11:50 AM	7/1/05 1:30 PM	1.1	Y	3:40	N	7/5/2005		N
11485 I	6/30/05 8:28 AM	6/30/05 11:50 AM	7/1/05 1:30 PM	1.1	Y	3:22	N	7/5/2005		N
11485 U Sed	6/30/05 8:50 AM	6/30/05 1:54 PM	7/1/05 3:30 PM	1.1	Y	5:04	N		7/5/2005	
11485 D Sed	6/30/05 8:13 AM	6/30/05 1:54 PM	7/1/05 3:30 PM	1.1	Y	5:41	N		7/5/2005	
11485 In Sed	6/30/05 8:32 AM	6/30/05 1:54 PM	7/1/05 3:30 PM	1.1	Y	5:22	N		7/5/2005	
11375 E	7/1/05 8:18 AM	7/1/05 12:40 PM	7/2/05 2:25 PM	1.1	Y	4:22	N	7/5/2005		N
11375 U	7/1/05 8:59 AM	7/1/05 12:40 PM	7/2/05 2:25 PM	1.1	Y	3:41	N	7/5/2005		N
11375 D	7/1/05 8:11 AM	7/1/05 12:40 PM	7/2/05 2:25 PM	1.1	Y	4:29	N	7/5/2005		N
11375 I	7/1/05 8:28 AM	7/1/05 12:40 PM	7/2/05 2:25 PM	1.1	Y	4:12	N	7/5/2005		N
11375 D Sed	7/1/05 8:11 AM	7/1/05 1:20 PM	7/2/05 2:25 PM	1.0	Y	5:09	N		7/10/2005	
11375 U Sed	7/1/05 8:59 AM	7/1/05 1:20 PM	7/2/05 2:25 PM	1.0	Y	4:21	N		7/10/2005	
11375 In Sed	7/1/05 8:28 AM	7/1/05 1:20 PM	7/2/05 2:25 PM	1.0	Y	4:52	N		7/10/2005	
11563 U	7/5/05 9:36 AM	7/5/05 2:02 PM	7/6/05 3:05 PM	1.0	Y	4:26	N	7/9/2005		N
11563 I	7/5/05 9:14 AM	7/5/05 2:02 PM	7/6/05 3:05 PM	1.0	Y	4:48	N	7/9/2005		N
11563 D	7/5/05 9:00 AM	7/5/05 2:02 PM	7/6/05 3:05 PM	1.0	Y	5:02	N	7/9/2005		N
11563 E	7/5/05 9:21 AM	7/5/05 2:02 PM	7/6/05 3:05 PM	1.0	Y	4:41	N	7/9/2005		N
11563 U Sed	7/5/05 9:36 AM	7/5/05 3:00 PM	7/6/05 4:36 PM	1.1	Y	5:24	N		7/10/2005	
11563 In Sed	7/5/05 9:14 AM	7/5/05 3:00 PM	7/6/05 4:36 PM	1.1	Y	5:46	N		7/10/2005	
11563 D Sed	7/5/05 9:00 AM	7/5/05 3:00 PM	7/6/05 4:36 PM	1.1	Y	6:00	N		7/10/2005	
11523 U	7/6/05 9:45 AM	7/6/05 2:05 PM	7/7/05 3:30 PM	1.1	Y	4:20	N	7/9/2005		N
11523 I	7/6/05 10:45 AM	7/6/05 2:05 PM	7/7/05 3:30 PM	1.1	Y	3:20	N	7/9/2005		N
11523 D	7/6/05 10:22 AM	7/6/05 2:05 PM	7/7/05 3:30 PM	1.1	Y	3:43	N	7/9/2005		N
10495139 U	7/6/05 7:37 AM	7/6/05 2:19 PM	7/7/05 3:30 PM	1.0	Y	6:42	N	7/9/2005		N
10495139 I	7/6/05 8:08 AM	7/6/05 2:19 PM	7/7/05 3:30 PM	1.0	Y	6:11	N	7/9/2005		N
10495139 D	7/6/05 8:26 AM	7/6/05 2:19 PM	7/7/05 3:30 PM	1.0	Y	5:53	N	7/9/2005		N
10495139 U Sed	7/6/05 7:42 AM	7/6/05 3:52 PM	7/7/05 4:00 PM	1.0	Y	8:10	Y		7/10/2005	

Sample ID	Collection	Start Incubation	End Incubation	Incubator time (days)	Meet DQO for Incubation Time?	Holding time (hrs)	Exceed Holding Time ?	TSS Analysis Date	% Solids	Exceed Holding time TSS?
10495139 In Sed	7/6/05 8:15 AM	7/6/05 3:52 PM	7/7/05 4:00 PM	1.0	Y	7:37	N		7/10/2005	
10495139 D Sed	7/6/05 8:35 AM	7/6/05 3:52 PM	7/7/05 4:00 PM	1.0	Y	7:17	N		7/10/2005	
11523 In Sed	7/6/05 10:52 AM	7/6/05 3:52 PM	7/7/05 4:00 PM	1.0	Y	5:00	N		7/10/2005	
11523 U Sed	7/6/05 9:50 AM	7/6/05 3:52 PM	7/7/05 4:00 PM	1.0	Y	6:02	N		7/10/2005	
11523 D Sed	7/6/05 10:28 AM	7/6/05 3:52 PM	7/7/05 4:00 PM	1.0	Y	5:24	N		7/10/2005	
12795 U	7/7/05 8:52 AM	7/7/05 12:24 PM	7/8/05 4:02 PM	1.2	Y	3:32	N	7/9/2005		N
12795 I	7/7/05 8:45 AM	7/7/05 12:24 PM	7/8/05 4:02 PM	1.2	Y	3:39	N	7/9/2005		N
12795 D	7/7/05 8:15 AM	7/7/05 12:24 PM	7/8/05 4:02 PM	1.2	Y	4:09	N	7/9/2005		N
12795 In Sed	7/7/05 8:45 AM	7/7/05 12:50 PM	7/8/05 4:02 PM	1.1	Y	4:05	N		7/10/2005	
12795 U Sed	7/7/05 8:52 AM	7/7/05 12:50 PM	7/8/05 4:02 PM	1.1	Y	3:58	N		7/10/2005	
12795 D Sed	7/7/05 8:20 AM	7/7/05 12:50 PM	7/8/05 4:02 PM	1.1	Y	4:30	N		7/10/2005	
QC Samples		7/19/05 12:28 PM	7/20/05 2:52 PM	1.1	Y					

Table 1. Percent Field Duplicates.

Analysis	Total Samples	# Duplicates	% Duplicates
TSS	30	2	7%
Cl_2	13	1	8%
Phosphorous	25	2	8%
EC Water	25	4	16%
EC Sed	21	3	14%
% Moisture	21	2	10%

Table 2. Equipment Blanks (MPN/dL)

Analysis	Sample Date	Result
EC-Beaker	07/01/05	<1
EC-Beaker	07/05/05	<1
EC-Beaker	07/07/05	<1
EC-PVC	07/07/05	<!

Table 3. Field Split Results

Sample ID	Sample Date	Analysis	Result 1	Result 2	% RPD
11485-001-I	06/30/05	TSS (mg/L)	727.3	832.1	13%
11485-001-I	06/30/05	% Moisture	23%	22%	7%
11485-001-I	06/30/05	Phosphorous	8.6	7.5	13%
11485-001-I	06/30/05	EC (MPN/dL)	<1	<1	0%
11485-001-I	06/30/05	Sed EC (MPN/dL)	115	207	57%
11563-001-U	07/05/05	% Moisture	31%	26%	19%
11563-001-U	07/05/05	Sed EC (MPN/dL)	302	200	41%
11523-001-D	07/06/05	EC (MPN/dL)	587	489	18%
12745-001-D	07/07/05	TSS (mg/L)	12.7	15.7	21%
12745-001-D	07/07/05	Chlorine	1.15	1.13	2%
12795-001-D	07/07/05	Phosphorous	10.9	9.6	12%
12745-001-U	07/07/05	EC (MPN/dL)	92340	72840	24%
12745-001-D	07/07/05	EC (MPN/dL)	16	13	22%
12745-001-D	07/07/05	Sed EC	678	766	12%

Table 4. Field Equipment Blank Results - Task 5

Date	Sample ID	EC Result (MPN/dL)
5/10/2005	Equipment Blank	<1
5/11/2005	Equipment Blank	<1
5/12/2005	Equipment Blank	<1
5/13/2005	Equipment Blank	<1
5/17/2005	Equipment Blank	<1
5/27/2005	Equipment Blank	<1
5/30/2005	Equipment Blank	<1
6/3/2005	Equipment Blank	<1
6/24/2005	Equipment Blank	<1

Table 5. Field Sample Split Results - Task 5

Date	Parameter	Sample ID	Result 1 (mg/L)	Result 2 (mg/L)	%RPD[a]	Met DOQ?[b]
5/10/2005	Res. Chlorine	11485	0.25	0.37	39%	N
5/17/2005	Res. Chlorine	10495-099	0.08	0.12	40%	N
5/26/2005	Res. Chlorine	11375	12.15	12.40	2%	Y
6/1/2005	Res. Chlorine	10495-099B	0.05	0.07	33%	N
6/24/2005	Res. Chlorine	10495-099	0.01	0.08	156%	N
6/28/2005	Res. Chlorine	11485	0.42	0.40	5%	Y
5/10/2005	Orthophosphate	11485	2.97	2.68	10%	Y
5/17/2005	Orthophosphate	10495-099	4.14	4.11	1%	Y
5/26/2005	Orthophosphate	11375	10.54	9.22	13%	Y
6/1/2005	Orthophosphate	10495-099B	3.24	3.29	2%	Y
6/24/2005	Orthophosphate	10495-099	9.32	9.70	4%	Y
6/28/2005	Orthophosphate	11485	10.14	9.58	6%	Y
6/30/2005	Orthophosphate	11485	7.54	8.24	9%	Y
5/17/2005	Ammonia	10495-099	< 0.02	< 0.02	0%	Y
5/26/2005	Ammonia	11375	0.03	< 0.02	40%	
6/1/2005	Ammonia	10495-099B	0.67	0.61	9%	Y
6/24/2005	Ammonia	10495-099	0.25	0.11	78%	N
6/28/2005	Ammonia	11485	0.72	0.70	3%	Y
5/18/2005	TSS	10495-099	1.60	2.80	55%	N
5/22/2005	TSS	11485	2.20	3.30	40%	N
5/25/2005	TSS	11485	2.40	3.20	29%	Y
6/1/2005	TSS	10495-099A	1.80	2.00	11%	Y
6/1/2005	TSS	10495-099B	2.20	1.60	32%	N
6/5/2005	TSS	11485	2.40	2.20	9%	Y
6/24/2005	TSS	10495-099	1.00	1.70	52%	N
6/28/2003	TSS	11485	5.90	3.20	59%	N
5/26/2005	BOD	11375	3.45	3.43	1%	Y
6/1/2005	BOD	10495-099B	9.35	9.27	1%	Y
6/24/2005	BOD	10495-099	4.57	4.17	9%	Y
6/28/2005	BOD	11485	6.36	3.47	59%	N

Notes:

Values < detection limit were treated as the detection limit

[a] Percentage difference calculated as [abs(t1-t2)/average(t1,t2)]

[b] QAPP states that field splits meet the DQO if the RPD is less than or equal to 30%. Values that do not meet the DQO are highlighted.

Table 5. Field Sample Split Results - Task 5

Date	Sample ID	Result 1 (mg/L)	Result 2 (mg/L)	R_{logs}	RPD < criteria?
5/17/2005	10495-099	3	3	0.07	Y
5/26/2005	11375	< 1	< 1	0.00	Y
6/1/2005	10945-099B	56	26	0.33	N
5/10/2005	11485	< 1	< 1	0.00	Y
6/5/2005	11485	< 1	< 1	0.00	Y
6/24/2005	10495-099	4	6	0.18	Y
6/28/2005	11485	< 1	< 1	0.00	Y

Precision criteria for samples 1-11 = 3.27*0.4/5= 0.27

Table 7. Completeness

Type of Sample	Completed	Expected	% Complete
Hach	38	40	95%
YSI	133	150	89%
TSS	24	25	96%
EC	24	25	96%
Sediment EC	25	25	100%
Overall	245	268	92%

Table i. YSI Calibration Verification

	CALIBRATION													POSTCALIBRATION				POST-CALIBRATION CHECK		
Date	DO%		pH1		pH2		Conductivity (mS/cm)		Turbidity 1		Turbidity 2		Comments	DO%	pH	Conductivity	Turbidity			
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After						DO	pH	Sp. Conductance
5/13/2005	108.6	100.1	7.8	7	4.36	4	1020	983										7.2	0.2	0.04
5/14/2005	107.2	100.2	7.2	7.1	3.9	4	1024	983										-11.8	0.93	0.05
5/15/2005	88.2	100.1	7.92	7			1029	983										5.6	0.93	0.02
5/16/2005	105.6	100	7.93	7			1004	983										91	1.1	0.03
5/17/2005	191	100	8.1	7			1014	983										3.1	0.55	-0.01
5/18/2005	103.1	100.1	7.55	7			973	983										6.2	-0.34	0.05
5/19/2005	106.2	100.2	3.66	4.01			1028	983										-9.7	0.36	-0.12
5/20/2005	90.3	100.2	7.36	7			861	983	0.2	0								18	0.26	0.03
5/21/2005	118	100.1	7.26	7			1014	983	0.6	0								7	0.4	0.04
5/22/2005	107	100.2	7.4	7			1022	983	0.2	0								1.3	0.8	-0.03
5/23/2005	101.3	100.1	7.8	7.2			950	983	9.1	0								12.8	0.17	0.01
5/24/2005	112.8	99.6	7.17	7			991	983	9.6	0.1								-11.2	0.56	0.01
5/25/2003	88.8	100.2	7.56	7			996	983	69.6	100								-9.9	0.2	0.02
5/26/0005	100.2	100	7.2	7			1004	983	8.2	0.1								-9.9	0.6	0.02
5/27/2005	90.1	100.4	7.6	7			1004	983	126	100	0.1	0						4.3	0.6	-0.02
5/28/2005	104.3	100.2	7.6	7			967	983	88	100	0.1	0						-1.4	0.56	-0.01
5/29/2005	98.6	100.1	7.56	7.05			969	983	82.1	100	0.5	0							0.22	0.01
5/30/2005									73.9	99.8	30	0.1							0.22	
5/31/2005			7.22	7			0.14	0.14	76.4	99.9	2.7	0							-0.55	
6/1/2005			6.45	7			991	992	61.7	102	0	0							0.3	-0.02
6/2/2005																				
6/3/2005			7.3	7			976	991	120	100	0.9	0							0.1	-0.08
6/4/2005			7.1	7			910	999	82.9	100	0.5	0							0.29	-0.03
6/5/2005																			0.29	
6/6/2005			7.29	7			972	991	109	100	0.2	0								
6/23/2005	99.5	100					9130	9915						105.9		10187		5.9		0.03
6/24/2005	100.1	100					1.452	1.403						99.1		1.31		-0.9		-0.07
6/25/2005	101.8	100					1.385	1.404						98.9		1.451		-1.1		0.03
6/28/2005	100	100					9.675	9.915						99.4		9.849		-0.6		-0.01
6/29/2005	103.2	100					9980	9916						69		9972		-31		0.01
6/30/2005	96.4	99.9					13578	12881						100.6		12000		0.7		-0.07
7/1/2005	102.4	100					12892	12879						101.2		12889		1.2		0.00
7/5/2005	118	99.9					13028	12880						103		12295		3.1		-0.05
7/6/2005	106.6	99.6					12756	12880						105.9		12738		6.3		-0.01
7/7/2005	108.8	99.6					12738	12885						85.4		12847		-14.2		0.00
7/8/2005			6.85	7	4.37	1														
7/11/2005							11959	12878	0	124.6										
7/15/2005	99.6	99.9	7.02	7	10.03	10	1451	1400	121.8	123				96	7.1	1358	121.6	-3.9	0.1	-0.03

problem with values
not recorded
look for originals, couldn't see values
fails post-calibration criterion

Table 8. YSI Calibration Verification Contd

Date	Site	DO%		pH1		pH2		Conductance (mS/c		Turbidity 1		Turbidity 2		Depth		Comments	POST-CALIBRATION CHECK		
		Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After		DO	pH	Sp. Conductance
6/14/2004		111.7	99.9	6.36	7	6.92	4	9.495	10.091							pH 4 out of range	-0.1	0.88	-0.02
6/15/2004		99.9	99.5	7.88	7	7.03		9.896	9.989							pH 4 out of range	8	0.35	-0.06
6/21/2004		108	99.8					0.941	1.006	-1.5	0	-1.5	0	0.062	0		0	0.35	-0.02
6/22/2004		100	101.3	7.35	7	7	4	0.99	1.006							pH 4 out of range	2.4		-0.03
6/29/2004		102.4	100.4					10.329	10.033							pH probe in maintenance	-6.9		0.01
6/30/2004		93.1	99.9					10.091	10.155							pH probe in maintenance	-7.7		0.01
7/1/2004		92.3	100.2					10.243	10.151	-0.9	0	16.3	20			pH probe in maintenance	-4.4		0.00
7/2/2004		95.6	100					10.149	10.191	-0.2	0	13.1	20			pH probe in maintenance	-5.27		-0.90
7/3/2004		94.73	99.8					1	10.178	28.3	20					check conductance calib	-16.5		0.05
7/6/2004		83.5	100.2					10.638	10.633	-1.7	0	21.6	20.2	-0.01	0		-2.3		0.04
7/7/2004		97.7	102.8					11.007	11	21.5	20						13.2		0.04
7/9/2004		113.2	98					11.42	10.44	1.4	0	7.9	20			turb calib out of range	-21.9		-0.01
7/12/2004		78.1	101.8					10.338	9.967	-2.1	0	34.9	20				0		0.02
7/13/2004								10.13	10.63							no turbidity (600xlm)	0		-0.02
7/15/2004		100	100	3.95	4	7.09	7	10.41	10.63					0.847	0	no turbidity (600xlm)	0	0.13	-0.02
7/19/2004		100	100	4.13	4	6.72	7.03	10.444	10.663							no turbidity (600xlm)	0	-0.04	0.08
7/20/2004		100	100	3.96	4	7.3	7	11.48	10.64					0.048	0	no turbidity (600xlm)	1.5	-0.02	0.00
7/21/2004		101.5		6.98	7			10.63	10.63							not able to calibrate DO, DO charge low, membrane needs to be changed	-2.5	-0.1	0.00
7/22/2004		97.5	100	6.9	7			10.63	10.63								-4	0.01	-0.04
7/24/2004		96	100	7.01	7			10.23	10.63								-0.1	0.3	-0.01
7/25/2004				7.3	7	4.06	4	10.49	10.63					0.068	0.001	two teams that day but only calibration for one YSI	-0.1	0.04	0.00
8/2/2004		99.9	100	4.04	4	9.69	10	1.023	1.026							next page says 8/28, check date of calibration	8.7	-0.02	0.18
8/9/2004																no record of YSI calibration			
8/19/2004																no record of YSI calibration			
8/28/2004		108.7	100	3.98	4	9.81	10	1.213	1.023										

Table 8. YSI Calibration Verification Contd

Date	CALIBRATION												POSTCALIBRATION			
	DO%		pH1		pH2		Conductivity (mS/cm)		Turbidity 1		Turbidity 2		DO%	pH	Conductivity	Turbidity
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After				
6/28/2005	100	100	na	na	na	na	9.675	9.915	na	na	na	na	99.4		9.849	
6/30/2005	96.4	99.9	na	na	na	na	13578	12881	na	na	na	na	100.6		12000	
7/1/2005	102.4	100	na	na	na	na	12892	12879	na	na	na	na	101.2		12889	
7/5/2005	118	99.9	na	na	na	na	13028	12880	na	na	na	na	103		12295	
7/6/2005	106.6	99.6	na	na	na	na	12756	12880	na	na	na	na	105.9		12738	
7/7/2005	108.8	99.6	na	na	na	na	12738	12885	na	na	na	na	85.4		12847	

problem with values
not recorded
look for originals, couldn't see values
fails post-calibration criterion
na = not available