

8-30-2008

Ex. 277-US-425

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Stream: Williamson River
 Site: 626
 Date: 5/11/2004
 Habitat: Pool

Date: 8/19/2004
 Habitat: Pool

Flow: Low

(1) Level Loop Survey (BM & HP)

BM/HP	BS (ft)	HI (ft)	FS (ft)	Elev (ft)
BM	3.62	103.62		100.00
HP1			6.90	96.72
HP2			7.73	95.89
HP3			5.54	98.08
TP				
HP3	5.30	103.38		95.88
HP2			7.50	95.88
HP1			6.66	96.72
BM			3.39	99.99

Comment:

(1) Level Loop Survey

BM/HP	BS (ft)	HI (ft)	FS (ft)	Elev (ft)
BM	4.31	104.31		100.00
HP1			7.59	96.72
HP2			8.43	95.88
HP3			6.24	98.07
TP				
HP3	6.11	104.18		95.86
HP2			8.32	95.86
HP1			7.48	96.70
BM			4.19	99.99

Comment:

(2) Water Surface Elevation (WSE) Survey

TR	River Station		HI (ft)	FS (ft)	Rod (ft)	WSE (ft)	Ave WSE (ft)	Q (cfs)
	L/R bank	Ave						
1-L	0	0	101.12	10.34	0.00	90.78	90.78	1077
1-R	0	0	103.38	12.60	0.00	90.78	90.78	1077
2-L	50	57	101.12	10.34	0.00	90.78	90.78	1161
2-R	63	63	103.38	12.60	0.00	90.78	90.78	1161
3-L	150	125	101.12	10.33	0.00	90.79	90.79	878
3-R	100	100	103.38	12.59	0.00	90.79	90.79	878
Ave Q= 1038.6								

Note: RWSE calc's need to be modified for TR1, TR2, and TR3
 WSE slope = 0.008%

(2) Water Surface Elevation (WSE) Survey

TR	River Station		HI (ft)	FS (ft)	Rod (ft)	WSE (ft)	Ave WSE (ft)	Q (cfs)
	L/R bank	Ave						
1-L	0	0	100.66	10.43		90.23	90.23	
1-R	0	0	104.18	13.95		90.23	90.23	
2-L	50	57	100.66	10.36		90.30	90.30	469
2-R	63	63	100.66	10.36		90.30	90.30	469
3-L	150	125	101.22	10.89		90.33	90.30	458
3-R	100	100	101.22	10.95		90.27	90.27	458
Ave Q= 463.4								

Note: WSE slope = 0.056%

(3) Meter and propeller ID for Velocity Correction

Meter ID: 0068
 Propeller ID: na
 Meter ID: 3602
 Propeller ID: 3A

(3) Meter and propeller ID for Velocity Correction

Meter ID: 3602
 Propeller ID: 3b
 Meter ID:
 Propeller ID:

1

Stream: Williamson River				11-May-04					29-Jun-04					19-Aug-04				
Site:	626	FS	Ground	Depth	Vel (ft/s)	FS	Ground	Depth	Vel (ft/s)	FS	Ground	Depth	Vel (ft/s)	FS	Ground	Depth	Vel (ft/s)	
Transsect:	1	(ft)	(ft)	(ft)	V _{0.20/6}	(ft)	(ft)	(ft)	V _{0.20/6}	(ft)	(ft)	(ft)	V _{0.20/6}	(ft)	(ft)	(ft)	V _{0.8}	
Habitat:	Pool																	
Survey	HI	Q																
Date	(ft)	(cfs)																
5/11/2004	101.12	1076.8																
6/29/2004	100.79	528.1																
8/19/2004	100.66																	
Survey	R-HI	Q																
Date	(ft)	(cfs)																
6/29/2004	101.38																	

Station	FS	Ground	Depth	Vel (ft/s)	FS	Ground	Depth	Vel (ft/s)	FS	Ground	Depth	Vel (ft/s)	Substrate
-23.0	5.23	96.15											1.3
-4.0	6.09	95.29											1.3
0.5	7.43	93.95											1.3
RWP 1.0	8.66	92.72											2.1
5.0	9.66	91.72											2.1
7.5	10.46	90.92											2.1
10.0	10.78	90.60											2.1
12.0	10.84	90.54											2.1
14.0	10.46	90.92											2.1
15.5	10.60	90.78											2.1
RWE 16.0	90.42												2.9
19.0		89.37	1.05	-0.04									2.9
21.0		88.92	1.50	-0.05									2.9
28.0		85.72	4.70	0.13									2.3
35.0		82.82	7.60	0.23									2.3
42.0		79.92	10.50	0.13									2.3
49.0		78.32	12.10	0.11									8.2
56.0		76.82	13.60	0.37									8.2
63.0		76.12	14.30	-0.19									8.3
70.0		74.62	15.80	0.08									8.2
77.0		72.72	17.70	-0.13									8.2
84.0		71.42	19.00	0.15									8.2
91.0		71.12	19.30	0.11									8.2
98.0		70.72	19.70	0.85									8.2
105.0		70.82	19.60	0.77									8.2
112.0		71.52	18.90	0.08									8.2
119.0		72.22	18.20	0.09									8.2
126.0		73.92	16.50	0.13									8.2
133.0		76.92	13.50	0.04									2.8
swfr 140.0		79.92	10.50	0.30									2.3
147.0		83.92	6.50	0.30									2.3
154.0		86.02	4.40	0.21									2.9
161.0		87.92	2.50	0.14									9.2
168.0		87.62	2.80	-0.01									2.9
173.0		88.07	2.35	0.01									2.9
177.0		90.02	0.40	0.10									9.2
LWE 179.6		90.42	0.00	0.00									9.2
179.7	10.04	90.75											9.3
181.3	7.18	93.61											1.3
182.5	6.21	94.58											1.3
LWP 185.0	5.43	95.36											1.3
197.0	5.37	95.42											1.3

Station	FS	Ground	Depth	Vel (ft/s)
140.0		79.92	10.50	0.30
147.0		83.92	6.50	0.30
154.0		86.02	4.40	0.21
161.0		87.92	2.50	0.14
168.0		87.62	2.80	-0.01
173.0		88.07	2.35	0.01
177.0		90.02	0.40	0.10
LWE 179.6		90.42	0.00	0.00
179.7	10.04	90.75		
181.3	7.18	93.61		
182.5	6.21	94.58		
LWP 185.0	5.43	95.36		
197.0	5.37	95.42		

TR1 - Bed profiles comparison

Station	FS	Ground	Depth	Vel (ft/s)
140.0		79.92	10.50	0.30
147.0		83.92	6.50	0.30
154.0		86.02	4.40	0.21
161.0		87.92	2.50	0.14
168.0		87.62	2.80	-0.01
173.0		88.07	2.35	0.01
177.0		90.02	0.40	0.10
LWE 179.6		90.42	0.00	0.00
179.7	10.04	90.75		
181.3	7.18	93.61		
182.5	6.21	94.58		
LWP 185.0	5.43	95.36		
197.0	5.37	95.42		

Pool HIGH TRANSECT 1
 IOC 1100000100001000101000
 QARD 160.0
 QARD 200.0
 QARD 250.0
 QARD 300.0
 QARD 350.0
 QARD 379.7
 QARD 460.9
 QARD 500.0
 QARD 550.0
 QARD 600.0
 QARD 650.0
 QARD 700.0
 QARD 750.0
 QARD 800.0
 QARD 900.0
 QARD 998.5
 QARD 1100.
 QARD 1200.
 QARD 1300.
 QARD 1400.
 QARD 1500.
 QARD 1600.
 QARD 1700.
 QARD 1800.
 QARD 1900.
 QARD 2000.
 QARD 2100.
 QARD 2200.
 QARD 2300.
 QARD 2500.
 XSEC 0.0 0.00 1.0 71.68 0.00008
 0.0-23.0 96.2 -4.0 95.3 0.5 93.9 1.0 92.7 5.0 91.7 7.5 90.9
 0.0 10.0 90.6 12.0 90.5 14.0 90.9 15.5 90.8 19.0 89.8 21.0 89.2
 0.0 28.0 85.6 35.0 83.2 42.0 80.8 49.0 79.5 56.0 77.6 63.0 77.0
 0.0 70.0 75.7 77.0 73.9 84.0 72.5 91.0 71.7 98.0 71.7105.0 71.8
 0.0112.0 72.3119.0 73.2126.0 75.1133.0 77.8140.0 81.4147.0 84.0
 0.0154.0 86.0161.0 86.9168.0 87.5173.0 89.8177.0 90.4180.0 90.8
 0.0181.3 93.6182.5 94.6185.0 95.4197.0 95.4
 NS 0.0 1.3 1.3 1.3 1.2 2.1 2.1
 NS 0.0 2.1 2.1 2.1 2.1 0.5 2.9 0.5 9.2
 NS 0.0 0.3 2.3 0.15 2.3 2.3 8.2 8.2 8.3
 NS 0.0 0.3 8.2 8.2 8.2 8.2 .065 8.2 8.2
 NS 0.0 8.2 8.2 8.2 2.8 2.3 2.3
 NS 0.0 2.9 9.2 0.15 2.9 2.9 0.3 9.2 9.3
 NS 0.0 1.3 1.3 1.3 1.3
 WSL 0.0 89.87 89.95 90.03 90.11 90.20 90.25
 WSL 0.0 90.45 90.50 90.55 90.57 90.60 90.62
 WSL 0.0 90.65 90.67 90.73 90.77 90.83 90.87
 WSL 0.0 90.91 90.95 90.99 91.02 91.05 91.08
 WSL 0.0 91.11 91.13 91.16 91.18 91.20 91.25
 CAL1 0.0 90.78 998.5
 VEL1 0.0 0.00-0.11-0.09
 VEL1 0.0 0.01 0.25 0.75 0.53 0.57 0.44 0.18 0.49 0.43 0.74 1.67 0.82
 VEL1 0.0 0.49 0.43 0.46 0.51 0.58 0.55 0.69 0.31 0.10 0.08 0.01 0.00
 VEL1 0.0
 CAL2 0.0 90.42 460.9
 VEL2 0.0
 VEL2 0.0
 VEL2 0.0
 VEL2 0.0
 CAL3 0.0 90.23 379.7
 VEL3 0.0
 VEL3 0.0
 VEL3 0.0
 VEL3 0.0
 ENDJ

Pool HIGH TRANSECT 2
 IOC 1100000100001000101000
 QARD 160.0
 QARD 200.0
 QARD 250.0
 QARD 300.0
 QARD 350.0
 QARD 379.7
 QARD 460.9
 QARD 500.0
 QARD 550.0
 QARD 600.0
 QARD 650.0
 QARD 700.0
 QARD 750.0
 QARD 800.0
 QARD 900.0
 QARD 998.5
 QARD 1100.
 QARD 1200.
 QARD 1300.
 QARD 1400.
 QARD 1500.
 QARD 1600.
 QARD 1700.
 QARD 1800.
 QARD 1900.
 QARD 2000.
 QARD 2100.
 QARD 2200.
 QARD 2300.
 QARD 2500.
 XSEC 0.0 0.00 1.0 71.68 0.00008
 0.0-23.0 95.6 -7.0 95.4 -3.0 94.3 1.0 93.2 5.0 92.2 8.0 91.5
 0.0 9.5 90.8 10.5 89.7 16.0 88.9 23.0 87.4 30.0 84.7 37.0 87.7
 0.0 44.0 85.9 51.0 86.4 58.0 82.0 65.0 74.7 72.0 71.8 79.0 70.6
 0.0 86.0 68.7 93.0 67.6100.0 67.6107.0 68.3114.0 70.3121.0 72.8
 0.0128.0 74.6135.0 77.4142.0 80.4149.0 85.2156.0 89.2157.0 90.2
 0.0162.1 90.8167.3 91.5169.8 91.4171.7 92.6173.8 91.9176.8 92.1
 0.0180.0 92.5181.5 93.7182.3 94.4183.3 94.3195.3 95.8210.3 96.0
 NS 0.0 1.3 1.3 1.3 1.3 1.3 1.3
 NS 0.0 1.2 9.2 9.2 2.9 8.2 7.8
 NS 0.0 8.2 8.2 8.2 0.25 8.2 8.3 8.3
 NS 0.0 .083 8.3 8.3 8.3 8.3 8.3 8.3
 NS 0.0 8.3 3.2 3.2 3.2 2.3 2.9
 NS 0.0 1.3 1.3 1.3 1.3 1.3 1.3
 NS 0.0 1.3 1.3 1.3 1.3 1.2 1.2
 WSL 0.0 89.88 89.95 90.04 90.11 90.20 90.25
 WSL 0.0 90.46 90.50 90.55 90.58 90.60 90.63
 WSL 0.0 90.65 90.68 90.73 90.77 90.83 90.88
 WSL 0.0 90.92 90.95 90.99 91.02 91.05 91.08
 WSL 0.0 91.11 91.14 91.16 91.19 91.21 91.25
 CAL1 0.0 90.78 998.5
 VEL1 0.0 0.00 0.05-0.20-0.11 0.68 0.70
 VEL1 0.0 0.95 0.82 0.53 0.22 0.54 1.04 1.38 0.90 0.81 0.63 0.31 0.49
 VEL1 0.0 0.36 0.30 0.19 0.20-0.11-0.03 0.00
 VEL1 0.0
 CAL2 0.0 90.43 460.9
 VEL2 0.0
 VEL2 0.0
 VEL2 0.0
 VEL2 0.0
 CAL3 0.0 90.30 379.7
 VEL3 0.0
 VEL3 0.0
 VEL3 0.0
 VEL3 0.0
 ENDJ

Pool HIGH

TRANSECT 3

IOC 1100000100001000101000

QARD 160.0
 QARD 200.0
 QARD 250.0
 QARD 300.0
 QARD 350.0
 QARD 379.7
 QARD 460.9
 QARD 500.0
 QARD 550.0
 QARD 600.0
 QARD 650.0
 QARD 700.0
 QARD 750.0
 QARD 800.0
 QARD 900.0
 QARD 998.5
 QARD 1100.
 QARD 1200.
 QARD 1300.
 QARD 1400.
 QARD 1500.
 QARD 1600.
 QARD 1700.
 QARD 1800.
 QARD 1900.
 QARD 2000.
 QARD 2100.
 QARD 2200.
 QARD 2300.
 QARD 2500.

XSEC 0.0 0.00 1.0 76.69 0.00008
 0.0-19.0 96.7 -3.0 96.4 0.0 95.4 1.0 94.1 2.3 92.9 3.5 92.2
 0.0 4.7 92.4 6.0 91.9 6.4 90.4 6.9 90.4 8.0 90.3 11.0 88.9
 0.0 18.0 85.7 25.0 84.4 32.0 82.6 39.0 81.4 46.0 80.4 53.0 79.3
 0.0 60.0 78.5 67.0 77.3 74.0 76.7 81.0 85.3 88.0 86.4 95.0 84.3
 0.0102.0 85.3109.0 87.2111.0 90.0118.0 88.7125.0 88.3132.0 88.6
 0.0136.5 89.3137.0 90.0140.0 90.0141.4 90.2142.4 91.5143.8 92.1
 0.0144.8 92.4152.8 96.7164.8 98.7174.8 99.9
 NS 0.0 1.3 1.3 3.1 3.1 3.1 1.3
 NS 0.0 1.3 1.3 2.9 2.9 9.2 9.2
 NS 0.0 9.2 8.2 8.2 8.7 8.7 8.7
 NS 0.0 8.7 8.7 8.7 8.7 8.7 8.7
 NS 0.0 8.7 8.7 8.2 8.2 7.6 8.9
 NS 0.0 8.2 8.2 8.2 2.8 1.3 1.3
 NS 0.0 1.3 1.3 1.3 1.3
 WSL 0.0 89.91 89.98 90.07 90.14 90.23 90.28
 WSL 0.0 90.48 90.53 90.58 90.60 90.62 90.65
 WSL 0.0 90.67 90.70 90.75 90.79 90.85 90.89
 WSL 0.0 90.93 90.96 90.99 91.02 91.05 91.08
 WSL 0.0 91.11 91.14 91.16 91.19 91.21 91.25
 CAL1 0.0 90.79 998.5
 VEL1 0.0 0.00-0.27-0.14
 VEL1 0.0-0.21 0.02 0.37 0.33 0.70 1.08 1.26 1.93 1.01 2.21 2.31 1.38
 VEL1 0.0 1.36 1.11 0.61 0.53 0.76-0.09 0.49 0.60 0.60 0.22
 VEL1 0.0
 CAL2 0.0 90.44 460.9
 VEL2 0.0
 VEL2 0.0
 VEL2 0.0
 VEL2 0.0
 CAL3 0.0 90.31 379.7
 VEL3 0.0
 VEL3 0.0
 VEL3 0.0
 VEL3 0.0
 ENDJ

Stream: Williamson River
 Site: 626
 Date: 5/11/2004
 Habitat: Run

Flow: High

BM/HP (ft)	BS (ft)	HI (ft)	FS (ft)	Elev (ft)
BM	4.50	104.50		100.00
HP1			5.26	99.24
HP2			4.84	99.66
HP3			4.62	99.88
TP				
HP3	4.39	104.27		
HP2			4.60	99.67
HP1			5.01	99.26
BM			4.26	100.01

Comment:

Date: 6/29/2004
 Habitat: Run

Flow: Mid

BM/HP (ft)	BS (ft)	HI (ft)	FS (ft)	Elev (ft)
BM	4.50	104.50		100.00
HP1			5.26	99.24
HP2			4.85	99.65
HP3			4.63	99.87
TP				
HP3	4.74	104.61		
HP2			5.96	98.65
HP1			5.37	99.24
BM			4.61	100.00

Comment: Addit pts surveyed d/s and u/s

Date: 8/19/2004
 Habitat: Run

Flow: Low

BM/HP (ft)	BS (ft)	HI (ft)	FS (ft)	Elev (ft)
BM	4.68	104.68		100.00
HP1			5.43	99.25
HP2			5.03	99.65
HP3			4.81	99.87
TP				
HP3	4.71	104.58		
HP2			4.93	99.65
HP1			5.33	99.25
BM			4.58	100.00

Comment:

(2) Water Surface Elevation (WSE) Survey

TR	River Station		Rod (ft)	FS (ft)	HI (ft)	FS (ft)	WSE (ft)	Ave	
	L/R bank (ft)	Ave (ft)						WSE (ft)	Q (cfs)
1-L	0	0	0.00	8.48	104.27	8.48	95.79	95.79	983.5
1-R	0	0	0.00	8.49	104.27	8.49	95.78	95.78	983.5
2-L	163	163	0.00	8.42	104.27	8.42	95.85	95.86	978.1
2-R	163	163	0.00	8.40	104.27	8.40	95.87	95.87	978.1
3-L	276	276	0.00	8.34	104.27	8.34	95.93	95.92	1029.4
3-R	276	276	0.00	8.36	104.27	8.36	95.91	95.91	1029.4

Note: TR2 LWSE surveyed ~20 ft d/s of TR, HI Assumed.
 WSE slope = 0.049%

(3) Meter and propeller ID for Velocity Correction

Meter ID: 0068
 Propeller ID: NA

(2) Water Surface Elevation (WSE) Survey

TR	River Station		Rod (ft)	FS (ft)	HI (ft)	FS (ft)	WSE (ft)	Ave	
	L/R bank (ft)	Ave (ft)						WSE (ft)	Q (cfs)
1-L	0	0	0.00	9.43	104.61	9.43	95.18	95.16	444.9
1-R	0	0	0.00	9.47	104.61	9.47	95.14	95.14	444.9
2-L	163	163	0.00	9.42	104.61	9.42	95.19	95.21	477.0
2-R	163	163	0.50	9.89	104.61	9.89	95.22	95.22	477.0
3-L	276	276	0.00	9.37	104.61	9.37	95.24	95.23	472.2
3-R	276	276	0.00	9.39	104.61	9.39	95.22	95.22	472.2

Note: Three WSE's measured for TR1, TR2
 WSE slope = 0.025%

(3) Meter and propeller ID for Velocity Correction

Meter ID: 0068
 Propeller ID: na

(2) Water Surface Elevation (WSE) Survey

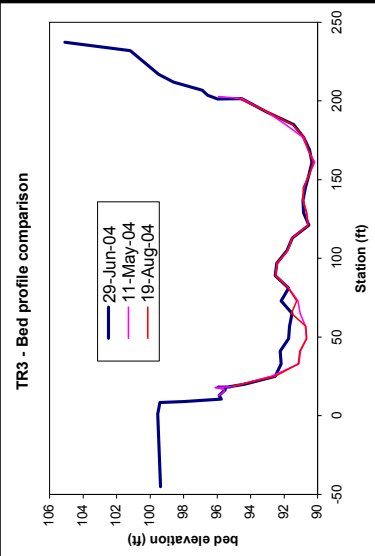
TR	River Station		Rod (ft)	FS (ft)	HI (ft)	FS (ft)	WSE (ft)	Ave	
	L/R bank (ft)	Ave (ft)						WSE (ft)	Q (cfs)
1-L	0	0	0.00	8.94	103.94	8.94	95.00	94.99	361
1-R	0	0	0.00	8.96	103.94	8.96	95.00	94.98	361
2-L	163	163	0.00	9.56	104.58	9.56	95.02	95.04	316.8
2-R	163	163	0.00	9.53	104.58	9.53	95.05	95.05	316.8
3-L	276	276	0.00	9.50	104.56	9.50	95.06	95.06	378.9
3-R	276	276	0.00	9.51	104.56	9.51	95.05	95.05	378.9

Note: 150' u/s of TR3 FS=9.40 (HI=104.56)
 WSE slope = 0.024%

(3) Meter and propeller ID for Velocity Correction

Meter ID: 3602
 Propeller ID: 3b

Stream: Williamson Rive			11-May-04							29-Jun-04							19-Aug-04																			
Site:	626		Sta	FS	Ground	Depth	$V_{0.20.6}$	$V_{0.8}$	Ave	q	substrate	Sta	FS	Ground	Depth	$V_{0.20.6}$	$V_{0.8}$	Ave	q	substrate	Sta	FS	Ground	Depth	$V_{0.20.6}$	$V_{0.8}$	Ave	q	substrate							
Transsect:	3		(ft)	(ft)	(ft)	(ft)	(ft/s)	(ft/s)	(ft/s)	(cfs)		(ft)	(ft)	(ft)	(ft)	(ft/s)	(ft/s)	(ft/s)	(ft/s)	(cfs)		(ft)	(ft)	(ft)	(ft)	(ft/s)	(ft/s)	(ft/s)	(ft/s)	(cfs)						
Habitat:	Run		RWP 1.0																																	
Survey	HI	Q	12.8	95.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00																									
Date			15.5	95.57	0.35	0.29	0.37	0.29	0.08	0.02	1.3																									
5/11/2004	104.27	1029.4	17.3	95.62	0.30	0.05	0.08	0.02			1.3																									
6/29/2004	104.61	472.2	18.0	96.12	-0.20						8.3																									
8/19/2004	104.56	378.9	18.5	95.12	0.80	0.27	0.35	0.92			8.8																									
			25.0	92.75	3.17	0.56	0.54	0.66	15.12		8.1																									
			33.0	91.12	4.80	0.54	0.49	0.62	23.77		1.8																									
			41.0	91.02	4.90	0.58	0.50	0.65	25.37		1.3																									
			49.0	90.67	5.25	0.67	0.24	0.56	23.45		8.3																									
			57.0	90.72	5.20	0.74	0.46	0.72	29.81																											
			65.0	91.05	4.87	0.70	0.27	0.59	23.03																											
			73.0	91.17	4.75	0.69	0.49	0.70	26.76																											
			81.0	91.72	4.20	0.94	0.61	0.91	30.59																											
			89.0	92.52	3.40	1.15	0.79	1.13	30.79																											
			97.0	92.42	3.50	1.30	1.08	1.38	38.69																											
			105.0	91.77	4.15	1.30	0.99	1.33	44.16																											
			113.0	91.52	4.40	1.30	1.23	1.47	51.67																											
			121.0	90.57	5.35	1.59	0.83	1.41	60.15																											
			129.0	90.67	5.25	1.44	1.35	1.62	67.89																											
			137.0	90.87	5.05	1.55	1.53	1.78	71.98																											
			145.0	90.82	5.10	1.78	1.50	1.90	77.32																											
			153.0	90.52	5.40	2.12	1.75	2.23	96.29																											
			161.0	90.17	5.75	2.34	1.29	2.09	96.31																											
			169.0	90.57	5.35	2.52	1.94	2.57	109.84																											
			177.0	90.87	5.05	1.88	1.16	1.76	71.00																											
			185.0	91.92	4.00	0.52	0.30	0.50	16.12																											
			193.0	93.02	2.90	-0.08	-0.02	-0.08	-1.85																											
			201.4	94.52	1.40	-0.01	-0.02	-0.02	-0.11																											
			LWE 202.9	95.92	0.00	0.00	0.00	0.00	0.00																											
			LWP 216.9																																	



RIFFLE

HIGH

TRANSECT 1

IOC 110110000001000101000

QARD 160.0
 QARD 200.0
 QARD 250.0
 QARD 300.0
 QARD 350.0
 QARD 379.7
 QARD 460.9
 QARD 500.0
 QARD 550.0
 QARD 600.0
 QARD 650.0
 QARD 700.0
 QARD 750.0
 QARD 800.0
 QARD 900.0
 QARD 998.5
 QARD 1100.
 QARD 1200.
 QARD 1300.
 QARD 1400.
 QARD 1500.
 QARD 1600.
 QARD 1700.
 QARD 1800.
 QARD 1900.
 QARD 2000.
 QARD 2100.
 QARD 2200.
 QARD 2300.
 QARD 2500.

XSEC 0.0 0.00 1.0 88.59 0.00049
 0.0-27.0 99.4 1.0 99.1 4.4 98.6 6.9 97.7 9.1 96.3 9.5 95.4
 0.0 10.7 95.2 11.3 95.8 13.5 94.6 15.0 93.4 19.0 92.6 23.0 91.2
 0.0 31.0 90.8 39.0 89.5 47.0 88.8 55.0 88.6 63.0 88.8 71.0 89.2
 0.0 79.0 89.7 87.0 91.2 95.0 93.4 96.5 94.5 99.0 94.4 99.5 93.3
 0.0103.0 92.3111.0 92.9119.0 93.4127.0 93.9135.0 94.2143.0 93.7
 0.0151.0 93.7159.0 93.8167.0 94.2174.0 94.4175.0 95.1181.5 94.9
 0.0182.0 94.4187.5 94.1190.5 95.7192.0 95.8192.1 96.2193.8 96.0
 0.0196.3 95.8197.3 97.5198.3 98.2202.3 98.3230.3100.2
 NS 0.0 1.3 1.3 1.3 1.3 1.3 3.1
 NS 0.0 3.1 1.2 0.5 8.2 8.2 0.2 2.9 5.6
 NS 0.0 7.6 6.2 .12 8.7 6.7 6.7 6.7
 NS 0.0 7.6 8.7 8.7 8.9 .09 8.9 .095 8.9
 NS 0.0 7.9 7.6 7.6 6.7 6.7 6.7
 NS 0.0 7.6 7.6 7.6 7.6 8.7 8.7
 NS 0.0 7.8 7.6 2.7 1.2 1.2 1.2
 NS 0.0 1.2 1.2 1.3 1.3 1.3
 CAL1 0.0 95.79 998.5
 VEL1 0.0 0.00 0.01 0.11 0.24 0.97
 VEL1 0.0 1.62 1.93 0.67 3.01 2.78 2.59 2.35 0.71 0.67 0.81 0.23 0.39
 VEL1 0.0 0.68 0.63 0.54 0.49 1.26 1.31 1.16 0.45 0.55 1.29 1.06 0.76
 VEL1 0.0 0.53 0.30 0.14 0.00
 CAL2 0.0 95.16 460.9
 VEL2 0.0
 VEL2 0.0
 VEL2 0.0
 VEL2 0.0
 CAL3 0.0 94.99 379.7
 VEL3 0.0
 VEL3 0.0
 VEL3 0.0
 VEL3 0.0
 ENDJ

RIFFLE

HIGH

TRANSECT 2

IOC 110110000001000101000

QARD 160.0
 QARD 200.0
 QARD 250.0
 QARD 300.0
 QARD 350.0
 QARD 379.7
 QARD 460.9
 QARD 500.0
 QARD 550.0
 QARD 600.0
 QARD 650.0
 QARD 700.0
 QARD 750.0
 QARD 800.0
 QARD 900.0
 QARD 998.5
 QARD 1100.
 QARD 1200.
 QARD 1300.
 QARD 1400.
 QARD 1500.
 QARD 1600.
 QARD 1700.
 QARD 1800.
 QARD 1900.
 QARD 2000.
 QARD 2100.
 QARD 2200.
 QARD 2300.
 QARD 2500.

XSEC 0.0 0.00 1.0 91.36 0.00049
 0.0-23.0 99.2 1.0 99.4 2.6 99.4 6.6 98.6 8.0 97.7 8.6 96.9
 0.0 10.4 96.3 11.7 95.1 12.0 95.9 14.0 94.4 18.0 93.4 27.0 92.4
 0.0 36.0 92.2 45.0 91.9 54.0 91.8 63.0 92.6 65.0 94.9 68.5 95.3
 0.0 69.0 92.6 78.0 93.9 87.0 91.7 96.0 91.5105.0 91.4114.0 91.6
 0.0123.0 92.6132.0 93.4141.0 93.7150.0 93.9159.0 94.0168.0 93.6
 0.0177.0 93.5186.0 93.3195.0 93.3204.0 93.3213.0 93.2222.0 93.0
 0.0228.0 93.5232.0 94.4235.6 95.9237.5 96.2239.0 98.3241.6 99.4
 0.0247.6101.1

NS 0.0 1.3 1.3 1.3 1.3 1.3 1.3
 NS 0.0 1.2 8.2 8.2 8.2 2.9 5.4
 NS 0.0 6.7 6.5 5.6 8.4 8.3 .022 8.3
 NS 0.0 8.3 8.7 5.4 5.4 6.5 7.6
 NS 0.0 6.7 7.6 7.6 7.6 7.6 7.6
 NS 0.0 7.6 7.6 6.7 6.7 6.7 6.2
 NS 0.0 2.7 2.1 1.2 1.2 1.3 1.3
 NS 0.0 1.3

CAL1 0.0 95.86 998.5

VEL1 0.0 0.00 0.75 0.95 1.26

VEL1 0.0 1.50 1.73 1.32 0.53 0.52 2.22 1.40 1.75 2.15 2.37 2.13 1.61

VEL1 0.0 1.50 1.94 1.44 1.72 1.72 1.22 1.19 1.01 1.55 1.44 1.09 0.90

VEL1 0.0 0.17-0.11 0.00

CAL2 0.0 95.21 460.9

VEL2 0.0

VEL2 0.0

VEL2 0.0

VEL2 0.0

CAL3 0.0 95.04 379.7

VEL3 0.0

VEL3 0.0

VEL3 0.0

VEL3 0.0

ENDJ

RIFFILE HIGH

TRANSECT 3

IOC 1101100000001000101000

QARD 160.0
 QARD 200.0
 QARD 250.0
 QARD 300.0
 QARD 350.0
 QARD 379.7
 QARD 460.9
 QARD 500.0
 QARD 550.0
 QARD 600.0
 QARD 650.0
 QARD 700.0
 QARD 750.0
 QARD 800.0
 QARD 900.0
 QARD 998.5
 QARD 1100.
 QARD 1200.
 QARD 1300.
 QARD 1400.
 QARD 1500.
 QARD 1600.
 QARD 1700.
 QARD 1800.
 QARD 1900.
 QARD 2000.
 QARD 2100.
 QARD 2200.
 QARD 2300.
 QARD 2500.

XSEC 0.0 0.00 1.0 92.00 0.00049
 0.0-45.0 99.4 1.0 99.6 8.4 99.4 9.0 98.0 10.5 95.7 12.8 95.9
 0.0 15.5 95.6 17.3 95.6 18.0 96.1 18.5 95.1 25.0 92.7 33.0 91.1
 0.0 41.0 91.0 49.0 90.7 57.0 90.7 65.0 91.1 73.0 91.2 81.0 91.7
 0.0 89.0 92.5 97.0 92.4105.0 91.8113.0 91.5121.0 90.6129.0 90.7
 0.0137.0 90.9145.0 90.8153.0 90.5161.0 90.2169.0 90.6177.0 90.9
 0.0185.0 91.9193.0 93.0201.4 94.5202.9 95.9203.7 96.6206.9 96.9
 0.0211.9 98.6216.9 99.5231.9101.2237.4105.1
 NS 0.0 1.3 1.3 1.3 3.1 8.3 8.8
 NS 0.0 8.1 .05 1.8 .05 1.3 .05 8.2 8.2 8.2
 NS 0.0 8.2 2.1 8.9 8.9 8.2 3.2
 NS 0.0 4.5 5.4 5.4 5.4 7.6 7.6
 NS 0.0 6.7 6.7 6.7 7.6 6.7 6.7
 NS 0.0 6.7 9.2 2.9 1.3 1.3 1.3
 NS 0.0 1.3 1.3 5.1 5.1
 CAL1 0.0 95.92 998.5
 VEL1 0.0 0.00 0.37 0.08 0.35 0.66 0.62
 VEL1 0.0 0.65 0.56 0.72 0.59 0.70 0.91 1.13 1.38 1.33 1.47 1.41 1.62
 VEL1 0.0 1.78 1.90 2.23 2.09 2.57 1.76 0.50-0.08-0.02 0.00
 VEL1 0.0
 CAL2 0.0 95.23 460.9
 VEL2 0.0
 VEL2 0.0
 VEL2 0.0
 VEL2 0.0
 CAL3 0.0 95.06 379.7
 VEL3 0.0
 VEL3 0.0
 VEL3 0.0
 VEL3 0.0
 ENDJ

Stream: Williamson River
 Site: 626
 Date: 5/11/2004
 Habitat: Riffle

Flow: High

(1) Level Loop Survey (BM & HP)

BM/HP (ft)	BS (ft)	HI (ft)	FS (ft)	Elev (ft)
BM	7.82	107.82		100.00
HP1			5.09	102.73
HP2			6.15	101.67
HP3			4.96	102.86
TP				
HP3	5.23	108.09		
HP2			6.40	101.69
HP1			5.34	102.75
BM			8.08	100.01

Comment: Addit survey pt d/s of TR1

Date: 6/29/2004
 Habitat: Riffle

Flow: Mid

(1) Level Loop Survey

BM/HP (ft)	BS (ft)	HI (ft)	FS (ft)	Elev (ft)
BM	9.21	109.21		100.00
HP1			6.47	102.74
HP2			7.52	101.69
HP3			6.36	102.85
TP				
HP3	6.48	109.33		
HP2			7.64	101.69
HP1			6.60	102.73
BM			9.33	100.00

Comment: Addit survey pt d/s of TR1

Date: 8/19/2004
 Habitat: Riffle

Flow: Low

(1) Level Loop Survey

BM/HP (ft)	BS (ft)	HI (ft)	FS (ft)	Elev (ft)
BM	7.95	107.95		100.00
HP1			5.21	102.74
HP2			6.26	101.69
HP3			5.11	102.84
TP				
HP3	5.33	108.17		
HP2			6.50	101.67
HP1			5.45	102.72
BM			8.19	99.98

Comment:

(2) Water Surface Elevation (WSE) Survey

TR	River Station		HI (ft)	FS (ft)	Rod (ft)	WSE (ft)	Ave WSE (ft)	Q (cfs)
	L/R bank (ft)	Ave (ft)						
1-L	0	0	108.09	14.21	0.00	93.88	93.87	1019.1
1-R	0	0	108.09	14.24	0.00	93.85	93.85	993.2
2-L	80	132	108.09	14.07	0.00	94.02	94.01	993.2
2-R	183	183	108.09	14.10	0.00	93.99	93.99	867.3
3-L	145	200	108.09	14.01	0.00	94.08	94.11	867.3
3-R	254	254	108.09	13.96	0.00	94.13	94.13	867.3

Note: Additional WSE's surveyed
 WSE slope = 0.120%

Ave Q= 959.9

(3) Meter and propeller ID for Velocity Correction

Meter ID: 4099
 Propeller ID: 1a

(2) Water Surface Elevation (WSE) Survey

TR	River Station		HI (ft)	FS (ft)	Rod (ft)	WSE (ft)	Ave WSE (ft)	Q (cfs)
	L/R bank (ft)	Ave (ft)						
1-L	0	0	109.33	15.66	0.00	93.67	93.54	440.6
1-R	0	0	109.33	15.93	0.00	93.40	93.40	440.6
2-L	80	132	109.33	15.58	0.00	93.75	93.72	440.6
2-R	183	183	109.33	15.64	0.00	93.69	93.69	440.6
3-L	145	200	109.33	15.53	0.00	93.80	93.79	440.6
3-R	254	254	109.33	15.55	0.00	93.78	93.78	440.6

Note: Additional WSE's surveyed
 WSE slope = 0.128%

Ave Q= 440.6

(3) Meter and propeller ID for Velocity Correction

Meter ID: 3602
 Propeller ID: 3a

(2) Water Surface Elevation (WSE) Survey

TR	River Station		HI (ft)	FS (ft)	Rod (ft)	WSE (ft)	Ave WSE (ft)	Q (cfs)
	L/R bank (ft)	Ave (ft)						
1-L	0	0	108.20	14.69	0.00	93.51	93.38	446
1-R	0	0	108.17	14.92	0.00	93.25	93.25	446
2-L	80	132	108.20	14.53	0.00	93.67	93.63	401.5
2-R	183	183	108.20	14.62	0.00	93.58	93.58	401.5
3-L	145	200	108.20	14.53	0.00	93.67	93.67	374.7
3-R	254	254	108.20	14.54	0.00	93.66	93.66	374.7

Note: WSE slope = 0.143%

Ave Q= 407.3

(3) Meter and propeller ID for Velocity Correction

Meter ID: 4099
 Propeller ID: 1a

RIFFLE HIGH TRANSECT 1
 IOC 1101100000001000101000
 QARD 160.0
 QARD 200.0
 QARD 250.0
 QARD 300.0
 QARD 350.0
 QARD 379.7
 QARD 460.9
 QARD 500.0
 QARD 550.0
 QARD 600.0
 QARD 650.0
 QARD 700.0
 QARD 750.0
 QARD 800.0
 QARD 900.0
 QARD 998.5
 QARD 1100.
 QARD 1200.
 QARD 1300.
 QARD 1400.
 QARD 1500.
 QARD 1600.
 QARD 1700.
 QARD 1800.
 QARD 1900.
 QARD 2000.
 QARD 2100.
 QARD 2200.
 QARD 2300.
 QARD 2500.
 XSEC 0.0 0.00 1.0 91.52 0.00120
 0.0-11.0103.1 -4.0 99.1 1.0 95.9 3.0 94.9 4.4 94.4 6.3 94.0
 0.0 6.9 93.9 8.0 93.0 15.0 92.2 30.0 91.6 45.0 91.5 60.0 91.5
 0.0 75.0 91.6 82.0 92.1 90.0 92.5105.0 92.5120.0 92.5135.0 92.3
 0.0150.0 92.2165.0 92.0180.0 92.1195.0 92.1210.0 92.4217.0 92.5
 0.0225.0 92.5233.0 92.5240.0 92.5250.0 92.8260.0 92.8270.0 93.2
 0.0272.5 93.4273.5 93.7274.5 93.3275.5 93.2280.0 93.2295.0 92.9
 0.0310.0 92.4320.0 92.1330.0 92.7333.5 92.8334.5 93.6336.5 93.9
 0.0337.0 93.9339.0 93.9339.5 93.5339.6 93.9341.7 94.2344.7 95.1
 0.0347.2 97.0350.2 98.1358.2100.9374.2101.3
 NS 0.0 1.3 1.3 1.3 1.3 1.3 1.3
 NS 0.0 1.2 4.8 4.5 5.9 5.9 5.9
 NS 0.0 5.9 9.5 5.9 5.9 5.9 5.9
 NS 0.0 5.9 5.9 5.4 5.6 5.6 5.4
 NS 0.0 .05 5.9 5.4 5.9 5.4 5.9 5.4
 NS 0.0 1.1 .05 1.1 .05 1.1 5.4 5.4 5.4
 NS 0.0 5.6 6.9 6.9 9.5 9.2 2.1
 NS 0.0 2.1 2.1 1.2 1.2 1.2 1.3
 NS 0.0 1.3 1.3 1.3 1.3
 CAL1 0.0 93.87 998.5
 VEL1 0.0 0.00 0.52 1.82 1.65 1.71 1.67
 VEL1 0.0 1.78 1.67 1.81 2.49 2.41 2.30 2.70 2.83 2.52 2.40 2.19 2.05
 VEL1 0.0 0.85 2.18 2.14 2.22 1.20 2.21 2.34 0.01 0.01 1.41 1.50 1.78
 VEL1 0.0 1.89 2.08 2.32 0.68 0.00 0.01 0.00 0.00 0.11 0.00
 VEL1 0.0
 CAL2 0.0 93.54 460.9
 VEL2 0.0
 VEL2 0.0
 VEL2 0.0
 VEL2 0.0
 VEL2 0.0
 CAL3 0.0 93.38 379.7
 VEL3 0.0
 VEL3 0.0
 VEL3 0.0
 VEL3 0.0
 ENDJ

IOC 1101100000001000101000

QARD 160.0
 QARD 200.0
 QARD 250.0
 QARD 300.0
 QARD 350.0
 QARD 379.7
 QARD 460.9
 QARD 500.0
 QARD 550.0
 QARD 600.0
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 QARD 2200.
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 QARD 2500.

XSEC 0.0 0.00 1.0 91.52 0.00120
 0.0-25.0100.2-10.0 99.4 -1.0 98.1 1.0 96.8 2.4 96.2 5.0 95.6
 0.0 10.0 95.5 13.0 95.2 16.0 94.8 18.6 94.0 19.6 93.6 20.6 93.4
 0.0 21.6 93.2 22.6 93.1 23.6 93.1 24.6 93.1 30.0 92.9 42.0 92.4
 0.0 54.0 92.1 66.0 92.0 78.0 91.8 90.0 92.0102.0 91.7114.0 91.4
 0.0126.0 91.6138.0 91.7150.0 91.8162.0 91.9174.0 92.0186.0 92.4
 0.0198.0 92.5210.0 92.5222.0 92.5234.0 92.5246.0 92.6258.0 92.4
 0.0270.0 92.1282.0 92.1294.0 92.4297.0 92.8298.5 92.9301.2 94.0
 0.0302.9 94.7303.7 94.1305.6 94.7307.4 95.4309.9 96.8312.4 97.5
 0.0324.4101.3338.4101.9

NS 0.0 1.3 1.3 1.3 1.3 1.3 1.3
 NS 0.0 1.2 1.2 1.2 1.2 1.2 2.9
 NS 0.0 2.9 2.9 2.9 2.9 4.5 5.9
 NS 0.0 5.4 5.9 5.9 5.4 5.4 5.9
 NS 0.0 5.4 6.5 6.5 6.5 5.6 5.6
 NS 0.0 5.6 5.4 5.4 5.4 5.4 5.9
 NS 0.0 5.9 5.9 5.9 2.9 2.9 1.1
 NS 0.0 1.2 2.1 2.1 1.2 1.2 1.2
 NS 0.0 1.3 1.3

CAL1 0.0 94.01 998.5
 VEL1 0.0 0.00 0.01 0.01
 VEL1 0.0 0.01 0.01 0.21 0.97 2.13 2.05 1.95 2.21 1.77 2.05 2.19 1.96
 VEL1 0.0 2.20 2.19 2.00 2.24 2.05 2.51 2.13 1.77 1.61 1.80 1.66 1.73
 VEL1 0.0 1.43 1.35 1.43 0.85 0.11 0.00

VEL1 0.0
 CAL2 0.0 93.72 460.9
 VEL2 0.0
 VEL2 0.0
 VEL2 0.0
 VEL2 0.0
 VEL2 0.0

CAL3 0.0 93.63 379.7
 VEL3 0.0
 VEL3 0.0
 VEL3 0.0
 VEL3 0.0

ENDJ

IOC 1101100000001000101000

QARD 160.0
 QARD 200.0
 QARD 250.0
 QARD 300.0
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 QARD 379.7
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XSEC 0.0 0.00 1.0 91.52 0.00120
 0.0-45.0102.5-20.0102.3 1.0 95.5 3.5 94.6 4.5 94.7 6.5 94.6
 0.0 6.9 94.1 8.3 93.8 9.0 93.1 11.0 92.8 19.0 92.3 29.0 92.0
 0.0 39.0 91.8 49.0 91.4 59.0 91.3 69.0 91.4 79.0 91.2 89.0 91.0
 0.0 99.0 90.9109.0 90.8119.0 90.6129.0 90.1139.0 89.7149.0 89.9
 0.0159.0 90.0169.0 90.4179.0 90.9189.0 91.4199.0 91.8209.0 92.1
 0.0219.0 91.8229.0 92.0239.0 92.1243.0 92.9245.0 93.5246.8 94.1
 0.0247.1 94.5248.2 94.7249.3 95.2251.8 96.8254.3 97.9263.3101.1
 0.0269.3101.6
 NS 0.0 1.3 1.3 1.3 1.3 1.3 1.3
 NS 0.0 1.2 9.2 .05 2.9 9.2 9.2 9.6
 NS 0.0 6.5 5.6 5.4 5.4 5.4 5.6
 NS 0.0 6.5 6.5 6.5 6.5 6.5 6.5
 NS 0.0 6.5 5.3 5.4 5.4 4.5 4.5
 NS 0.0 9.4 9.2 9.2 9.2 0.2 2.1 1.2
 NS 0.0 1.2 1.2 1.3 1.3 1.3 1.3
 NS 0.0 1.3
 CAL1 0.0 94.11 998.5
 VEL1 0.0 0.00 0.27 0.04 1.35 1.22 1.45
 VEL1 0.0 1.70 1.21 1.23 1.29 1.40 1.41 1.48 1.34 1.46 1.28 1.35 1.23
 VEL1 0.0 1.27 1.17 1.22 1.25 1.34 1.29 1.00 0.74 0.54 0.34 0.02 0.00
 VEL1 0.0
 CAL2 0.0 93.79 460.9
 VEL2 0.0
 VEL2 0.0
 VEL2 0.0
 VEL2 0.0
 CAL3 0.0 93.67 379.7
 VEL3 0.0
 VEL3 0.0
 VEL3 0.0
 VEL3 0.0
 ENDJ