

## **Quivira Backwater Channel survey**

Prepared for Sonoma County Water Agency

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### **EXECUTIVE SUMMARY:**

The ten figures included represent the data and accompanying graphs for the survey completed at the backwater channel located at Quivira Winery and Vineyards. Each figure contains a description of where along the channel measurements were read in reference to the site map provided by Interfluve. Rebar pins were monumented along the alluvial bank between the channel and Dry Creek for each cross section. Along the longitudinal profile, rebar pins were monumented at the three set up points in the channel. Noteworthy are transects one, two, and three, which originated from the same set up point at the confluence. This area is of high importance for future surveys due to sedimentation. All measurements were read in meters.

The survey was completed in accordance with the USDA stream channel reference manual publication 1994.

#### ***Data Table Abbreviations/Use***

**Height of Instrument (HI)** is the elevation of the line of sight projected by the instrument. An arbitrary number of 100 was added to the backsight (**BS**) reading of the temporary benchmark.

**Foresight(FS)** measurement read through the autolevel and then subtracted from the **HI** for the elevation

### **METHODS:**

This survey was conducted in accordance with USDA protocols for characterization of streams and rivers published in 1994. Equipment used for this survey include and auto-level, stadia rod, measuring tape, and rebar pins. A longitudinal profile survey was shot for the roughly 150 meter back water channel at the Quivira Vineyards site. Eight channel cross section stations were monumented.

#### ***Longitudinal profile survey***

This survey was conducted to measure the slope of the channel bed. Readings of the stadia rod were taken with an auto level at every fifteen meters or if a significant change in elevation occurred. Two turning points, which were necessary due to the length and physical features of the channel, were established at sixty meters and ninety two meters. The starting point, "0", and the turning points were monumented with rebar pins for the purpose of the ongoing study.

### *Chanel cross sections*

Eight cross channel section stations were established from the confluence of the channel and Dry Creek to the top area of the construction. Cross Sections are measure to channel form from bank to bank. Critical for channel characterization, future studies can use these monuments to determine channel changes and areas of instability. The established anchored log jams served as 3 of the stations and additional stations were set up in between where erosion seemed more prevalent. Each location was monumented from the north side in between the main stem of Dry Creek and the backwater channel.

## **RESULTS:**

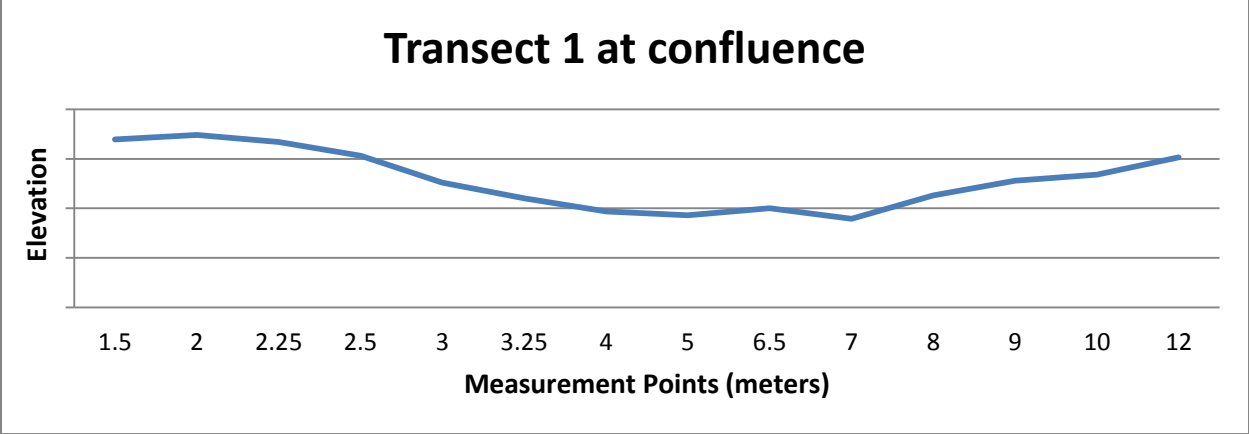
### *Longitudinal Profile*

The longitudinal profile was taken from the confluence of the channel with Dry Creek. The complete length of the profile was 131 meters. Monuments were place as set-up one “O”, set-up two “60”, and set-up three, “92”. The graph and data table are represented in figure 1.

### *Cross Section stations*

Three cross sections were measured from one set up monumented point near the confluence. This area is of high importance for the survey as this is an area of concern for sediment build up. Graphs and data tables are represented in figures 2, 3, and 4.

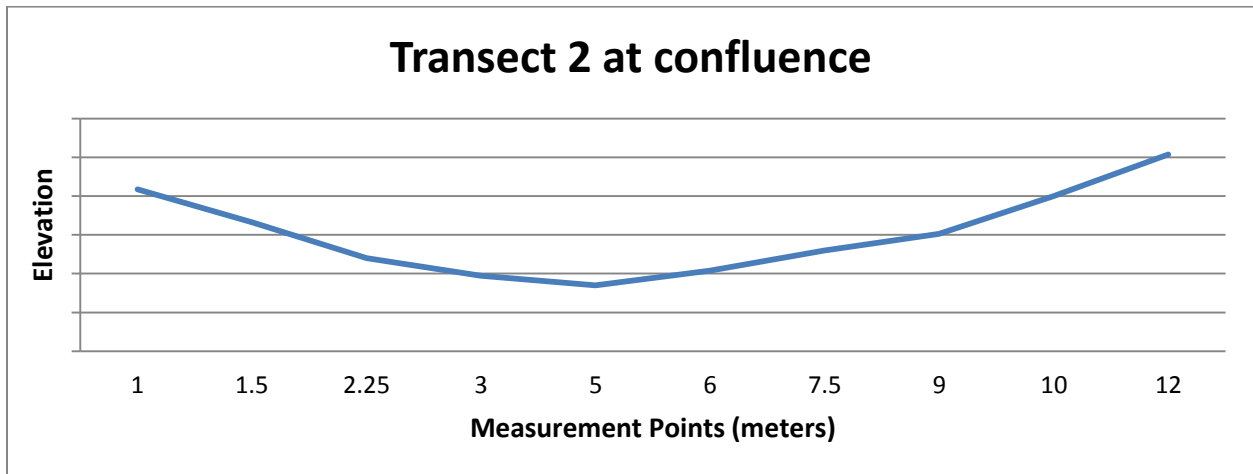
The remaining cross sections were measured along the longitudinal profile at 15m, 31m, 47m, 70m, 102m, and 116m. These locations were chosen where there were significant changes along the channel. The graphs and data table are represented in figures 5, 6, 7, 8, 9, 10 respectively.



Measurement Points (meters)	BS(+)	HI	(FS-)	Elevation
	1.28	101.28		100
1.5			1.085	100.195
2			1.04	100.24
2.25			1.11	100.17
2.5			1.25	100.03
3			1.52	99.76
3.25			1.68	99.6
4			1.81	99.47
5			1.85	99.43
6.5			1.78	99.5
7			1.885	99.395
8			1.65	99.63
9			1.5	99.78
10			1.44	99.84
12			1.265	100.015

**Figure 2**

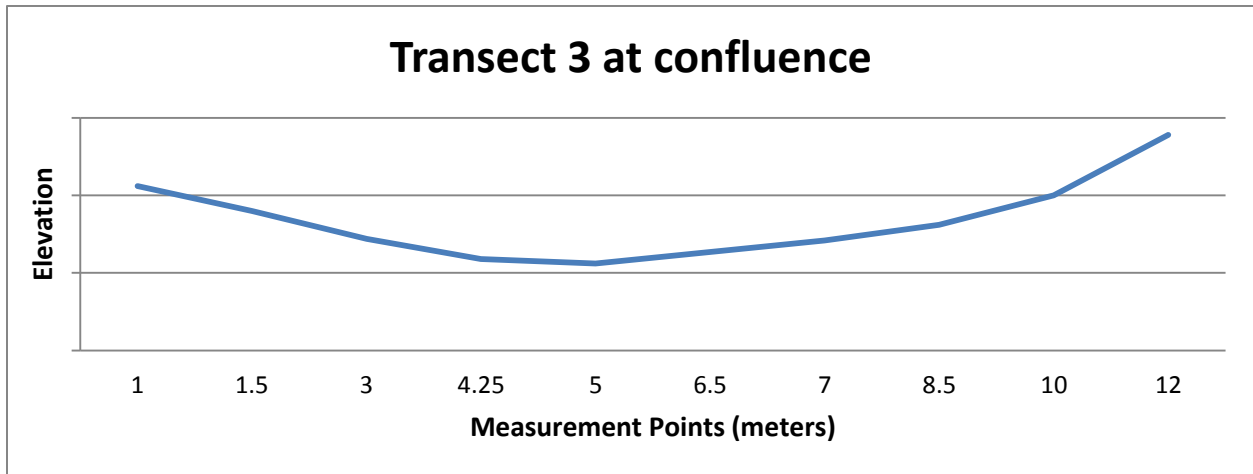
This transect was measured at the confluence with Dry Creek. The twelve meter section originates at the set up point on the alluvial bank between the channel and the main stem. The log jam at the opposite side (terrace) serves as the endpoint (site 2, feature 6).



Station #	BS(+)	HI	(FS-)	Elevation
	1.28	101.28		100
1			1.245	100.035
1.5			1.415	99.865
2.25			1.6	99.68
3			1.69	99.59
5			1.74	99.54
6			1.665	99.615
7.5			1.56	99.72
9			1.475	99.805
10			1.28	100
12			1.065	100.215

**Figure 3**

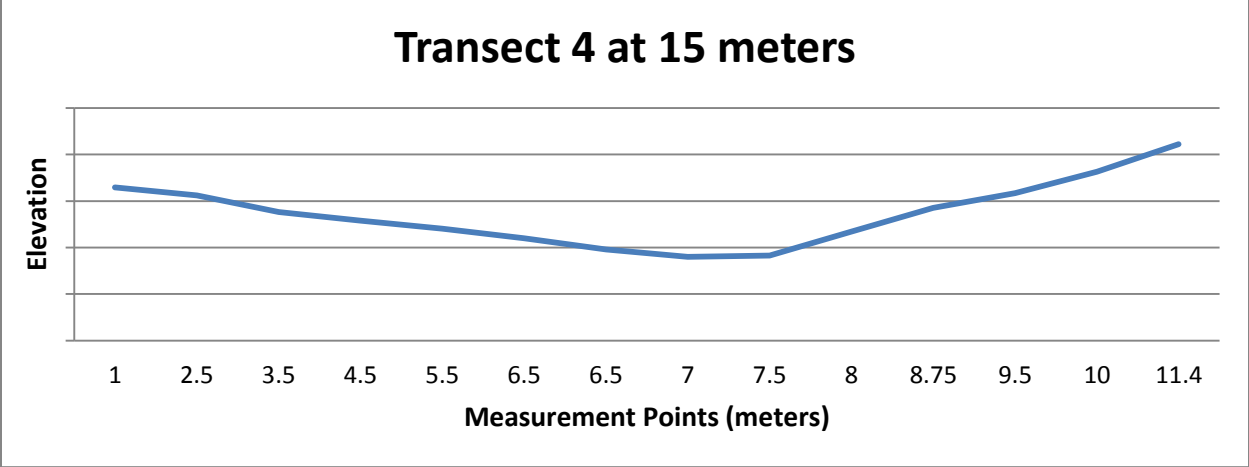
Originating at the same set up as transect 1, this 12 meter measurement has an endpoint just up channel from the same log jam (site 2, feature 6).



Station #	BS(+)	HI	(FS-)	Elevation
	1.28	101.28		100
1			1.22	100.06
1.5			1.38	99.9
3			1.56	99.72
4.25			1.69	99.59
5			1.72	99.56
6.5			1.645	99.635
7			1.57	99.71
8.5			1.47	99.81
10			1.28	100
12			0.89	100.39

**Figure 4**

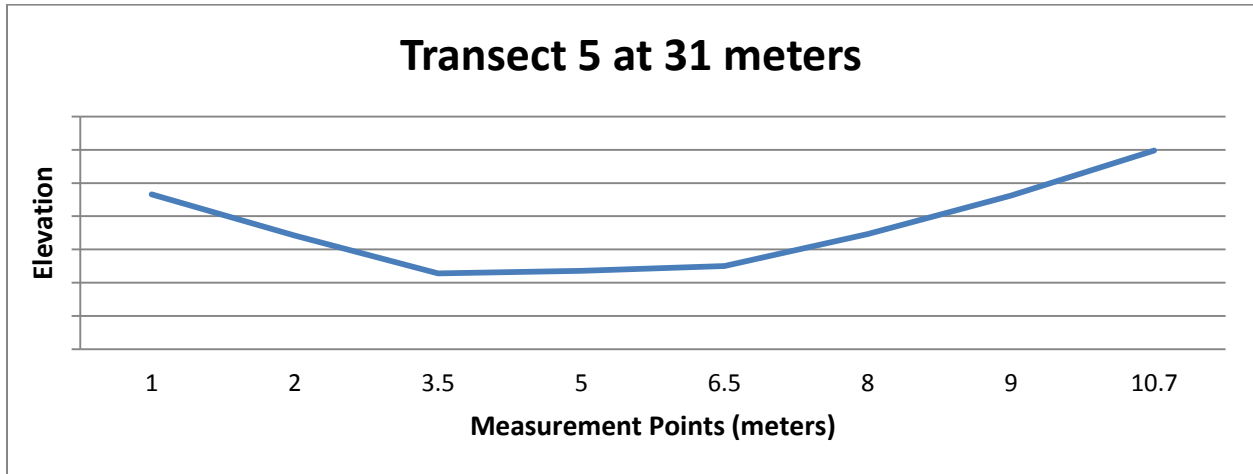
This transect is the last taken from the same set up point as 1 and 2. This twelve meter measurement runs straight across at the slight bend of the channel.



Station #	BS(+)	HI	(FS-)	Elevation
	1.83	101.83		100
1			1.54	100.29
2.5			1.71	100.12
3.5			2.065	99.765
4.5			2.25	99.58
5.5			2.425	99.405
6.5			2.63	99.2
6.5			2.87	98.96
7			3.03	98.8
7.5			3	98.83
8			2.485	99.345
8.75			1.975	99.855
9.5			1.66	100.17
10			1.203	100.627
11.4			0.61	101.22

**Figure 5**

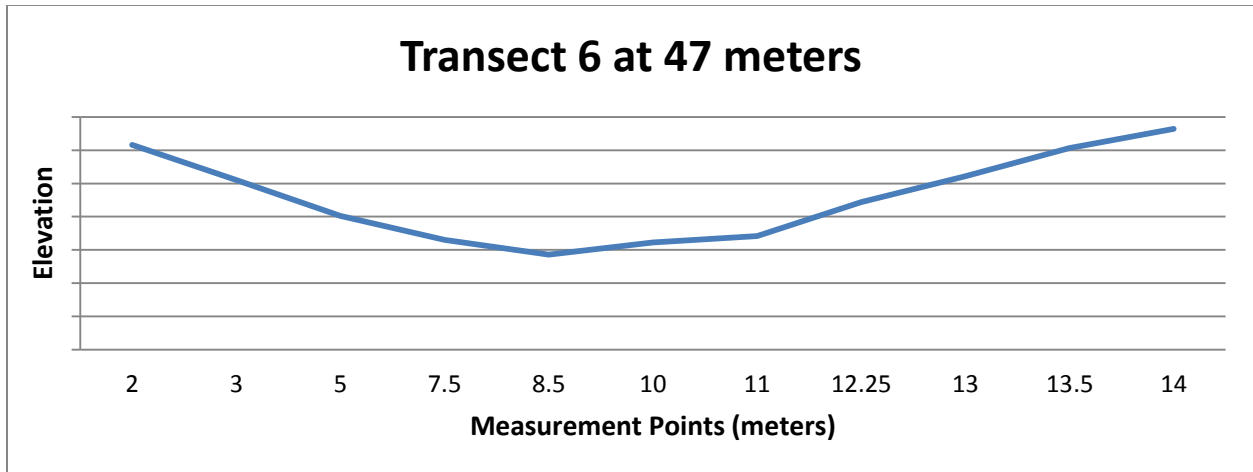
This transect was measured at 15 meters along the longitudinal profile. The starting point was monumented above the willow wall on the alluvial bank with a measurement width of 11.4 meters (Site 3, feature 1).



Station #	BS(+)	HI	(FS-)	Elevation
	1.51	101.51		100
1			2.18	99.33
2			2.8	98.71
3.5			3.37	98.14
5			3.33	98.18
6.5			3.26	98.25
8			2.78	98.73
9			2.2	99.31
10.7			1.52	99.99

**Figure 6**

Transect 5 was measured at 31 meters along the longitudinal profile. The width of the measurement was 10.7 meters with an endpoint in between the log jams (site 2, feature 4 and feature 5).

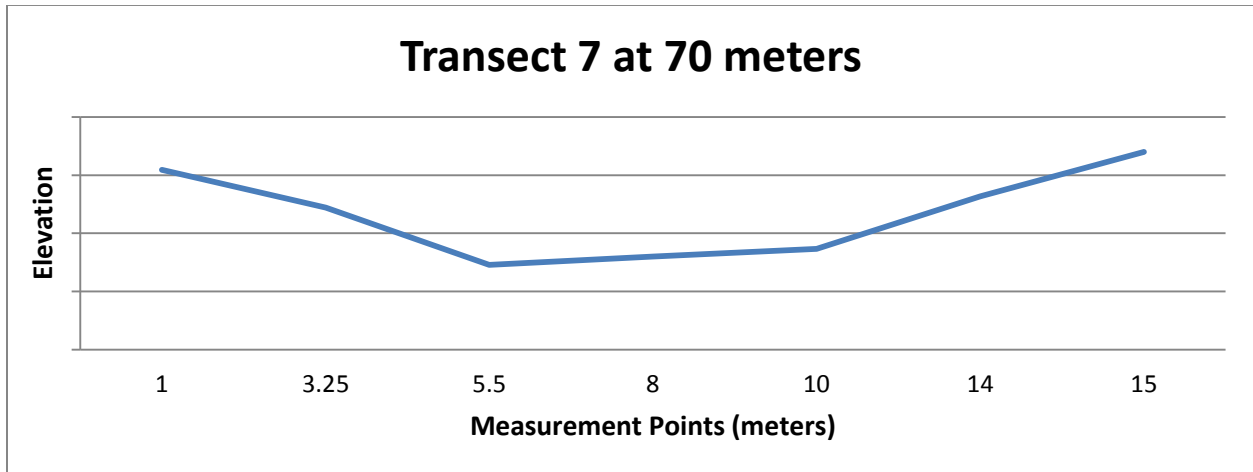


Station #	BS(+)	HI	(FS-)	Elevation
	1.32	101.32		100
2			1.74	99.58
3			2.27	99.05
5			2.81	98.51
7.5			3.17	98.15
8.5			3.39	97.93
10			3.21	98.11
11			3.11	98.21
12.25			2.6	98.72
13			2.21	99.11
13.5			1.79	99.53
14			1.5	99.82

**Figure 7**

Transect 6 was measured at 47 meters along the longitudinal profile with a width of 14 meters and an endpoint directly behind the log jam (site 2, feature 4)

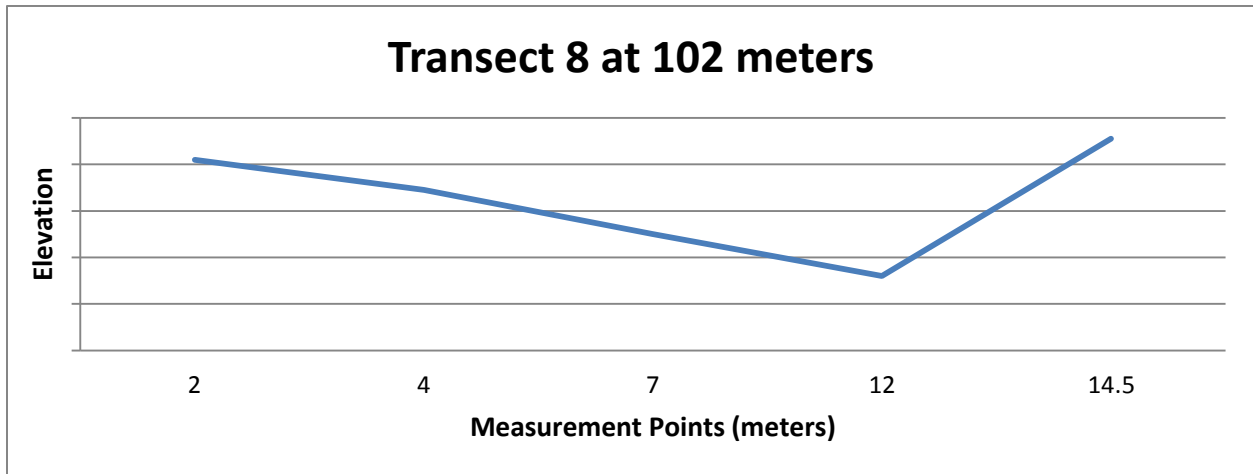




Station #	BS(+)	HI	(FS-)	Elevation
	2.9	102.9		100
1			1.81	101.09
3.25			2.46	100.44
5.5			3.445	99.455
8			3.3	99.6
10			3.17	99.73
14			2.265	100.635
15			1.5	101.4

**Figure 8**

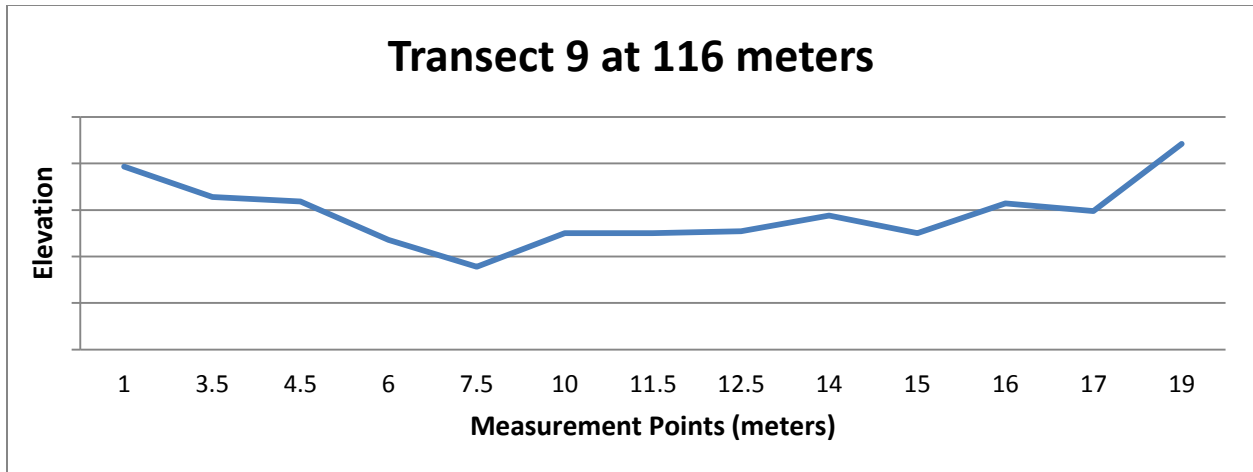
Transect 7 was measured at 70 meters along the longitudinal profile where a significant terrace is present above the log jam (site 2, feature 2) with a width of 15 meters.



Station #	BS(+)	HI	(FS-)	Elevation
	1.98	101.98		100
2			1.76	100.22
4			1.89	100.09
7			2.08	99.9
12			2.26	99.72
14.5			1.67	100.31

**Figure 9**

Transect 8 was measured at 102 meters along the longitudinal profile with a width of 14.5 meters directly above the single log jam (site 2, feature 1)

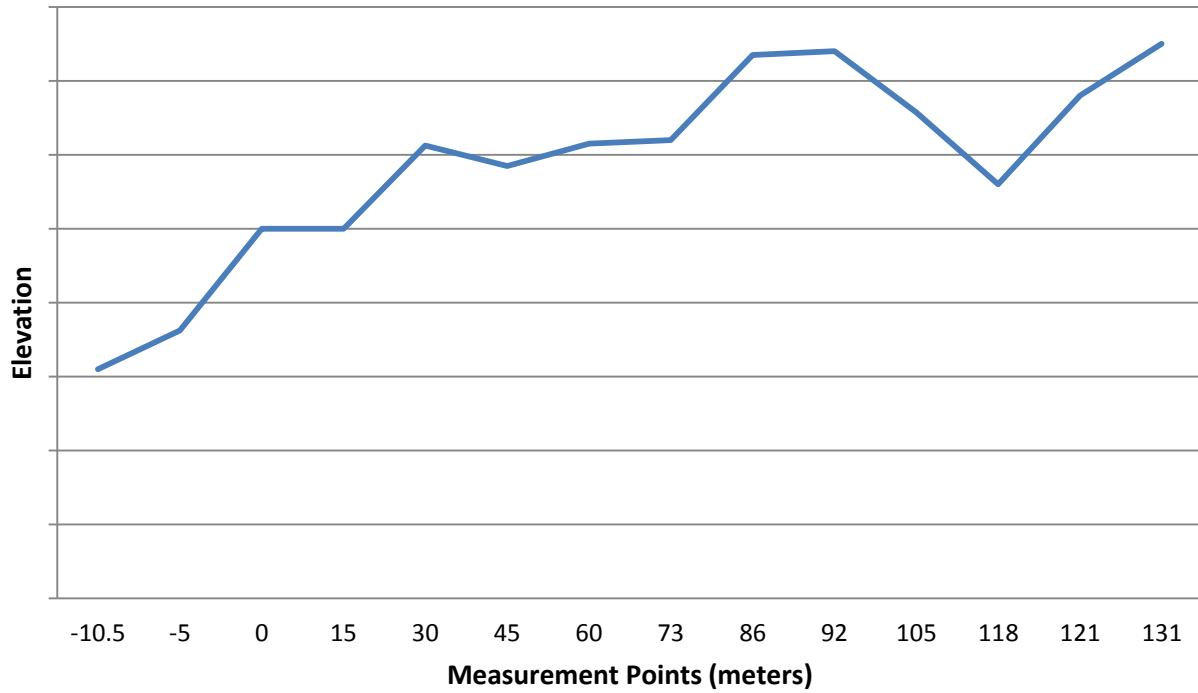


Station #	BS(+)	HI	(FS-)	Elevation
	1.4	101.4		100
1			1.435	99.965
3.5			1.76	99.64
4.5			1.81	99.59
6			2.22	99.18
7.5			2.51	98.89
10			2.15	99.25
11.5			2.15	99.25
12.5			2.13	99.27
14			1.96	99.44
15			2.15	99.25
16			1.83	99.57
17			1.91	99.49
19			1.19	100.21

**Figure 10**

Transect 9 was measured at 116 meters along the longitudinal profile with a width of 19 meters. This transect is located at the top of the channel with an endpoint at the SE portion of site 1.

## Longitudinal Profile



Measurement Point (meters)	STA	BS (+)	HI	FS (-)	Elevation (Meters)
		(+)		(-)	Meters
-10.5	0-10.5			1.75	99.62
-5	0-5			1.645	99.725
0	TB#1	1.37	101.37	1.6	99.77
15	0+15			1.37	100
30	0+30			1.145	100.225
45	0+45			1.2	100.17
x	TP1	1.75	101.67		
60	0+60			1.14	100.23
73	0+73			1.51	100.16
86	0+86			1.28	100.39
92	0+92			2.07	99.6
x	TP2	1.78	101.94		
105	0+105			1.465	100.475
118	0+118			1.66	100.28
121	0+121			1.42	100.52
131	0+131			1.28	100.66