



## **Bugg Spring/Uniflora Connection**

I began monitoring the flow and level of Bugg Spring on a monthly basis on 3/11/1990. Measurements are made about the middle of the month. Since then the flow has averaged 9.6 CFS (6.1 MGD). The highest flow measured was 19.8 CFS (12.6 MGD), on 7/13/1990 and the lowest was 3.8 CFS (2.4 MGD) on 1/17/1992. The weather on 1/17/92 was freezing and I could hear irrigation pumps running in the distance as Uniflora Fernery watered to prevent frost damage. The stage that morning was 63.17 feet above sea level.

The water level is determined by measuring down from a fiducial mark on the western most post of the Navy's fence across the run, where the flow determinations are made. The elevation of the mark was surveyed from a benchmark on the SE shore of the spring, installed by Hall Farner of Leesburg.

In 2000 the drought conditions became extreme. I installed a new gage on a pier in front of our house, and began taking more frequent readings on 10/29/2000. The elevation at the pier was extrapolated from the water level determined from the fence post. A drum recorder was also installed to record the level continuously for 24 hr. periods. Since then

there have been several freezes. Each time there was a freeze, or threat of freeze, the spring level fell after the pumps were turned on and rose again after they were turned off. These events were measured and several of them recorded on the drum recorder.

The chart of Daily Bugg Spring Elevations shows daily observations from 10/29/00 to 1/10/01. Excel inserted the trend line. Data at the time of freezing weather is presented in the table.

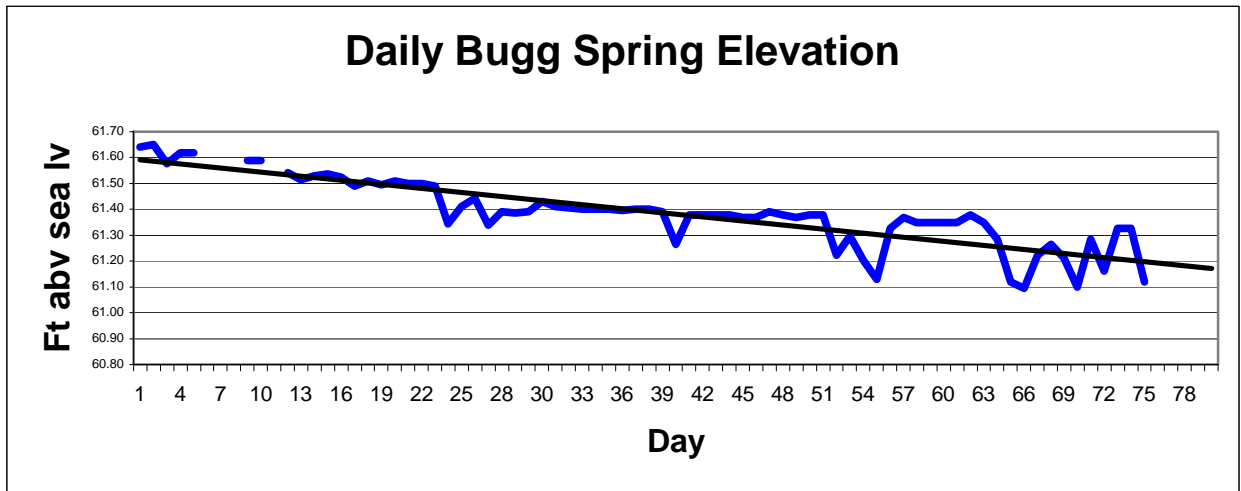


Table of Elevation of Bugg Spring on Days of Frost and Pumping at Uniflora Fernery

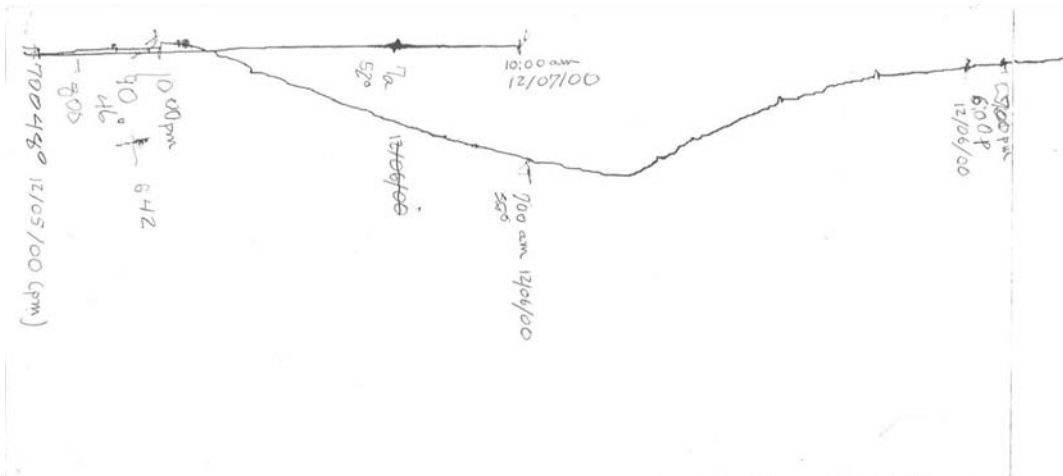
Day	Date	time	Spring Elevation		
			Pier Gage(in)	Ft above mean sea level	
23	11/20/00	8:00	10.19	61.49	
24	11/21/00	7:45	8.44	61.34	frost
25	11/21/00	10:45	9.25	61.41	
26	11/22/00	17:00	9.63	61.44	
27	11/23/00	7:45	8.38	61.34	frost
28	36854	0.25	9	61.39	
39	12/5/00	7:30	9.00	61.39	
40	12/6/00	7:00	7.50	61.27	frost, recorded
41	12/7/00	7:00	8.88	61.38	
51	12/17/00	7:30	8.88	61.38	trace of rain
52	12/18/00	7:00	7.00	61.22	cold
53	12/19/00	7:30	7.88	61.30	cold
54	12/20/00	8:30	6.75	61.20	frost, recorded
55	12/21/00	7:30	5.88	61.13	cold
56	12/22/00	8:00	8.25	61.33	warmer
57	12/23/00	7:30	8.75	61.37	
62	12/28/00	9:00	8.875	61.38	rain .57 in

63	12/29/00	12:30	8.5	61.35	
64	12/30/00	8:30	7.75	61.29	cold 38deg
65	12/31/00	7:30	6.125	61.15	frost, recorded
		10:30	5.875	61.13	frost, recorded
		12:00	5.75	61.12	frost, recorded
		5:30	7.25	61.24	frost, recorded
66	1/1/01	7:00	5.5	61.10	frost, recorded
		9:45	5.4375	61.09	frost, recorded
67	1/2/01	8:00	7	61.22	40deg
68	1/3/01	7:00	7.5	61.27	33deg, recorded
69	1/4/01	8:00	6.875	61.21	31deg
70	1/5/01	7:00	5.5	61.10	freeze
71	1/6/01	8:00	7.75	61.29	40deg
72	1/7/01	8:45	6.25	61.16	Freeze. Pump just turned off
		17:00	7.875	61.30	
73	1/8/01	7:45	8.25	61.33	rain, 57deg

On some days the level of the spring was recorded on a drum recorder rotating at one revolution in 24 hours. The pen was attached to a float that rose and fell with the water level. The drum was rotated to mark the level, a base line, when the record was started. Information was penciled onto the record as needed. The records were scanned for insertion into this document.

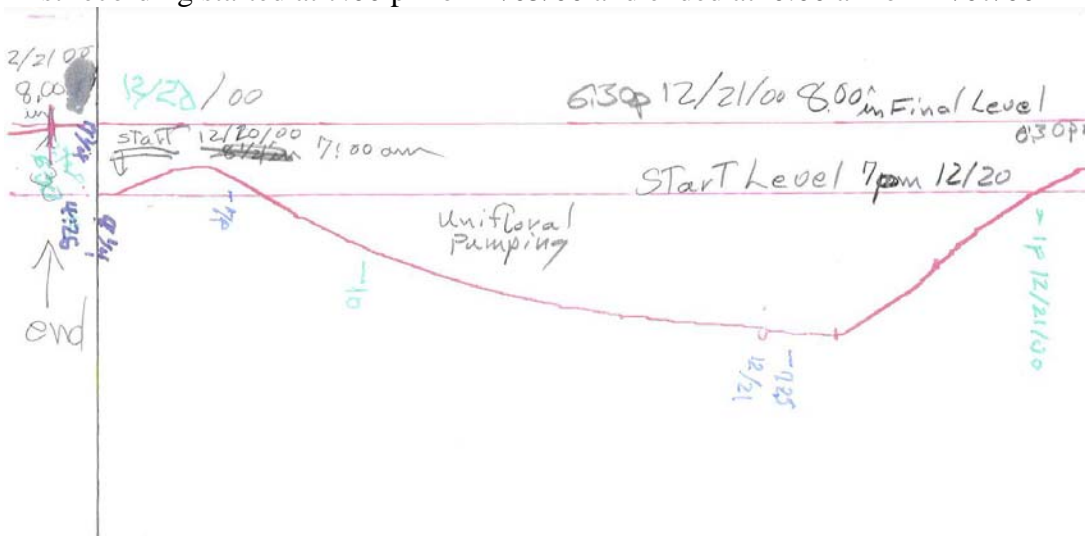
One pump has been observed in operation (N28.75055, W081.88763, 0.78 miles, 096° E from the spring) to prevent foliage damage. According to a former employee of Uniflora who had the wells installed, there are three 12" wells (two 75' and one 125' deep) pumped with V8 Perkins engines, each capable of moving 3,000 gal./min., and two smaller wells (6" and 8"). These wells were put in by Allan Hardwick of Umitila, at one year intervals with the last one in 1986.

The elevation of the spring is determined from a benchmark near the spring that was surveyed in by Hall Farner about five years ago. The spring flow was determined to be 8.5 CFS (5.4 MGD) on 12/15/00. On 12/20/00 it was found to be 3.7 CFS (2.4 MGD) early in the morning while the pump was running and the second recording below was being made. Flow on 1/21/01.

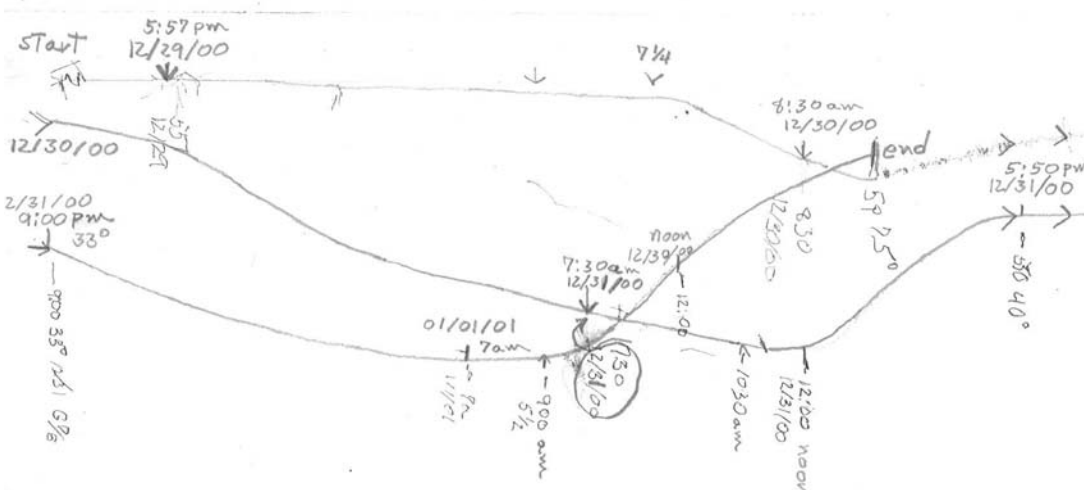


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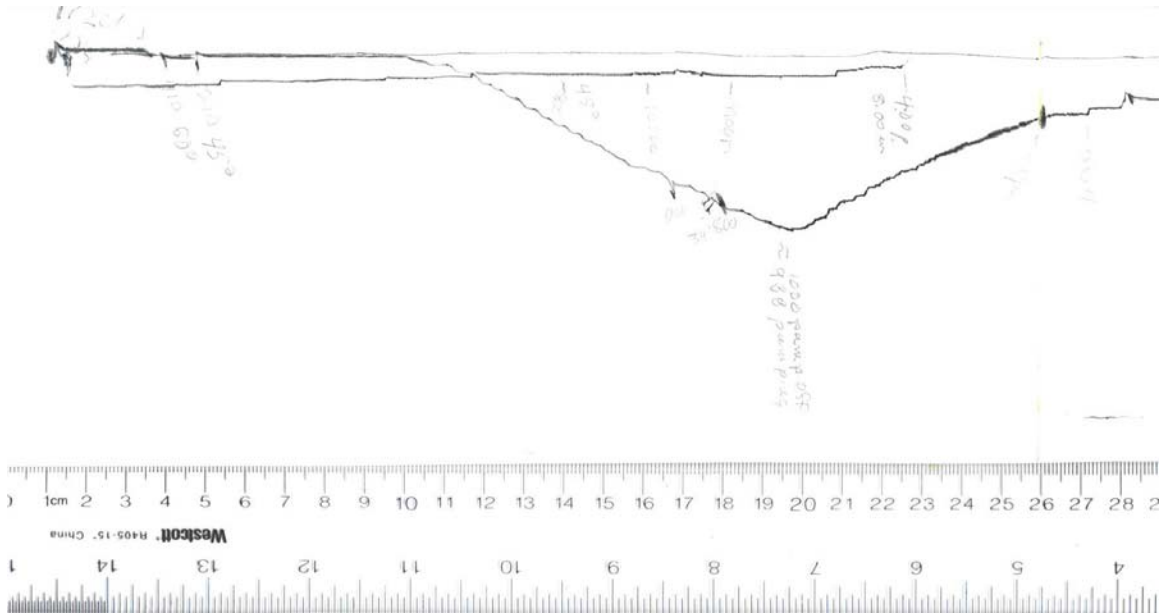
First recording started at 7:00 pm on 12/05/00 and ended at 10:00 am on 12/07/00



Second recording started at 7:00 pm on 12/20/00 and ended 8:00 pm on 12/21/00.



Third recording started at 5:57 pm on 12/29/00 and ended at 5 pm on 01/01/01.



Record of freeze effect on 1/21/01



The recording gage on the pier

Recorder making the record of 1/21/01



The fernery when the spring was drawn down  
12/21/00



The Uniflora pump from Oak  
Ridge Cemetery

The surface area of the spring is about 2.4 acres; so one inch of draw down is about 65,170 gallons of water, or about as much as one person uses in a year (at 750 gal/person). Each recorded draw down has been one and a half to two inches so far.

On Thursday 1/22/09 the temperature fell to 24° at 7am as predicted by NWS, and rose to 57° by 4pm. The stage was 61.55 Ft at 7am and had risen to 61.59 ft by 4pm. Uniflora no longer is an operating fernery.