

Orlando Study of Lift Stations 12, 107, 124, 138 and 249.

Level measurements

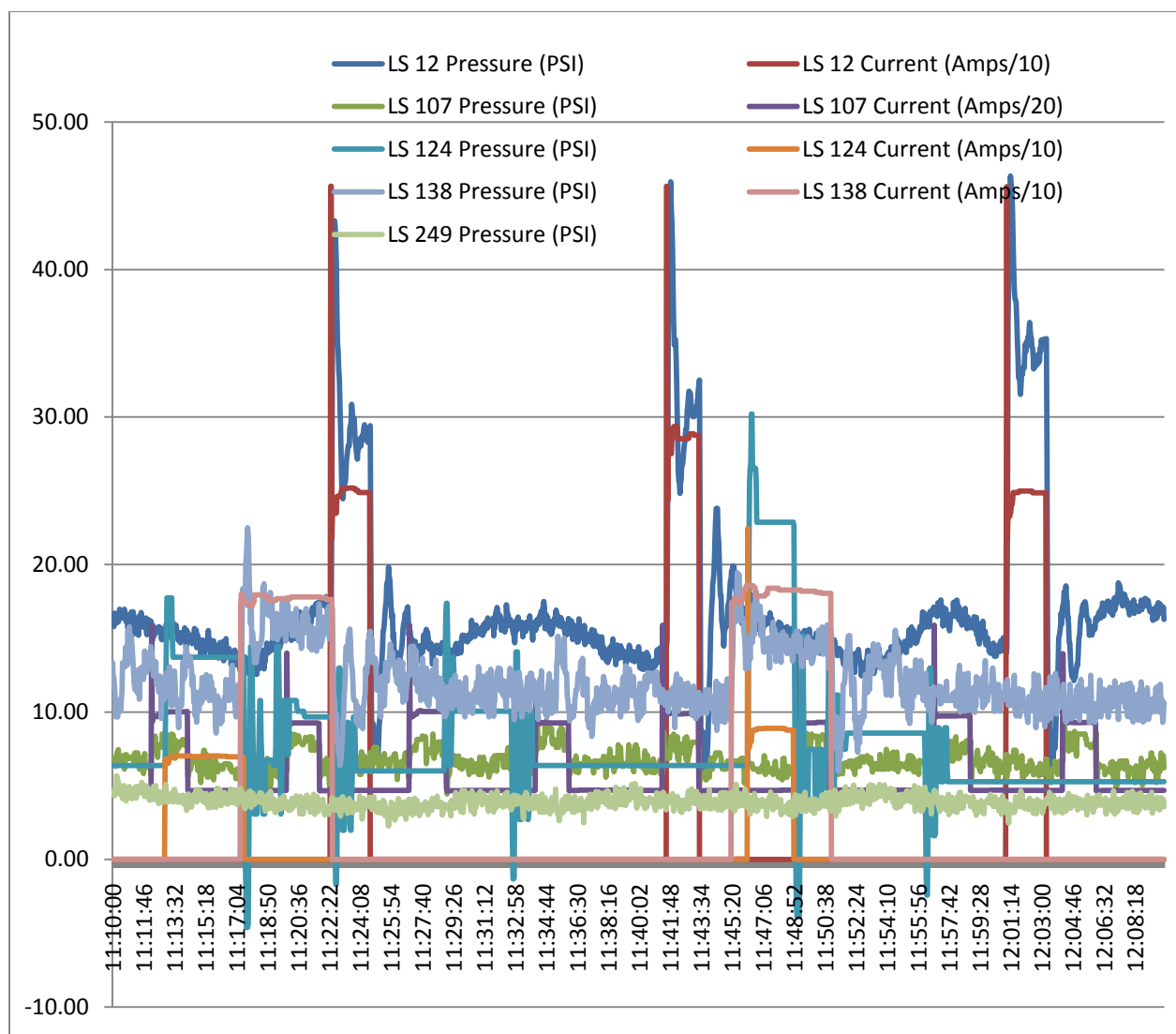
At each site, a laser beam was used to calculate the distance between the OFF and LEAD levels (the accumulated grease line). Most of the time, the measurements were taken at an angle of about 8 feet, which means that 6% must be added to the measurements differentials to compensate for the angle.

Excel Graphs

Examples of graphs were created in Excel to show when the increase of pressure was caused by the operation of a pump at this location. All graphs are for a period of one hour.

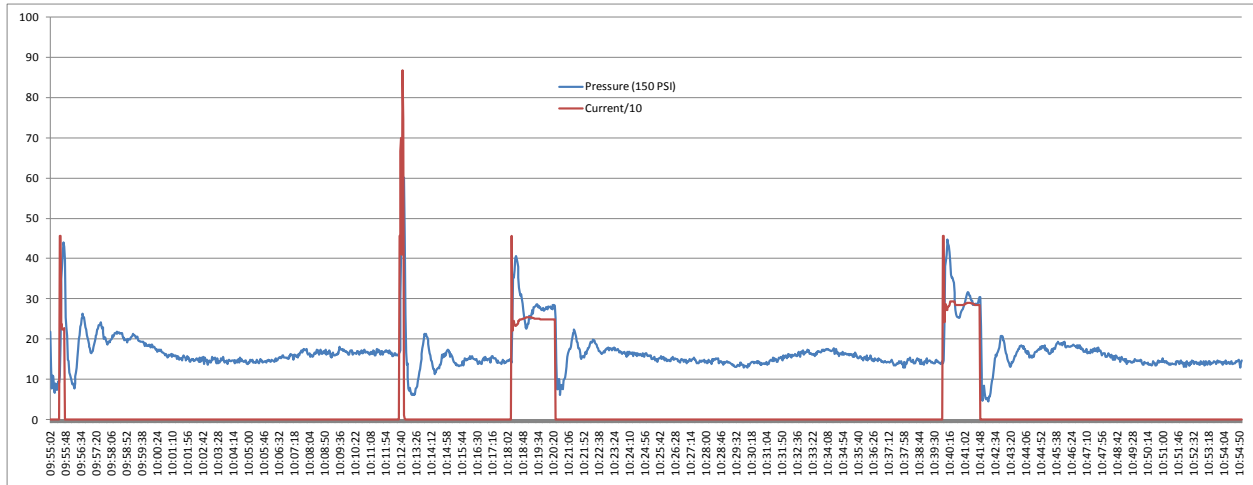
ALL Stations

I combined into two Excel files the data of all 2 and 10 seconds per line of all stations. Data from two data loggers were partially lost due to hardware failure and bad cellular transmission. Still, we have good combined data for 325 hours (13.55 days) from all sources. This is 585,490 records of combined data out of the 922,858 lines of data. You have more data than you need. Using Excel 2007 or 2010 is required to view these files.



LS 12

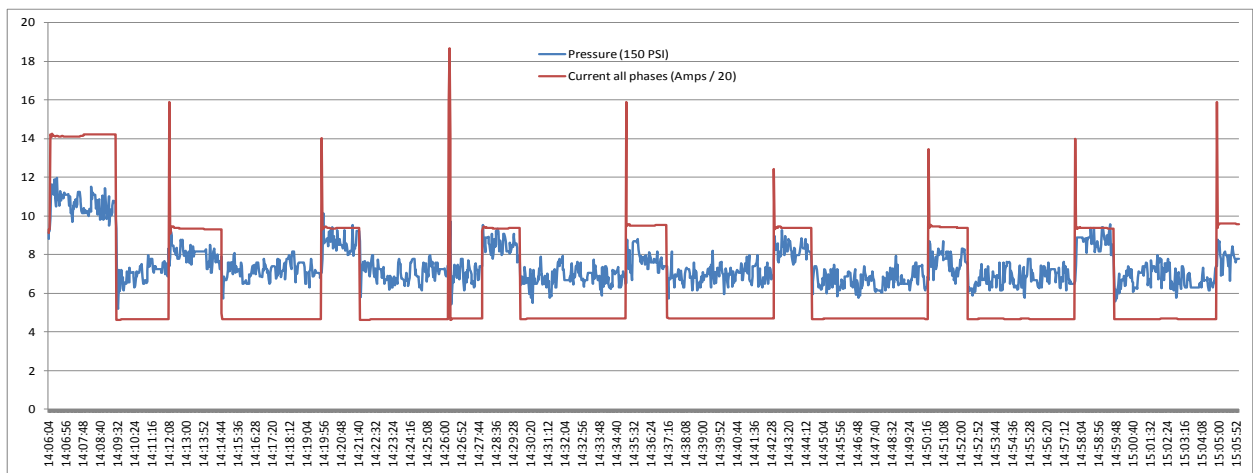
With a very acceptable efficiency of about 4 gallons/Watt (GPW) for each pump, this makes me believe the volumes used to calculate the flow rates were good. Switching to more efficient 5 GPW (as advertize by some manufacturer) would only save \$1095 per year. The following one hour graph shows that pressure (blue) is influence by the pumps operation (red).



LS 107

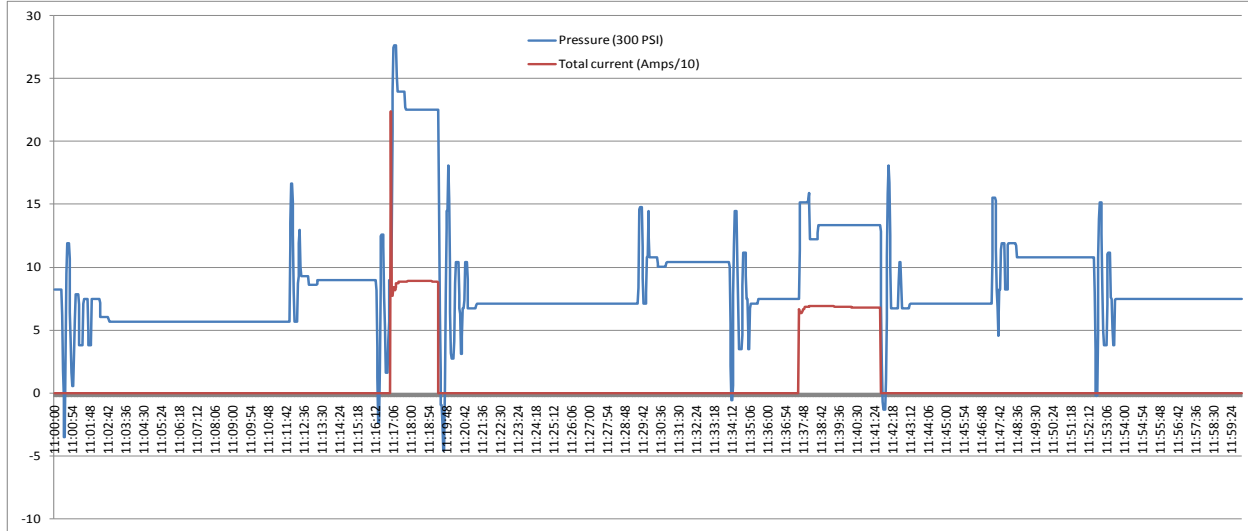
This is a triplex pump station with pump #3 running all the time. Volumetric flow algorithms expect pumps to stop from time to time in order to calculate flow, but this never occurred at this lift station. We can use derived flow to compensate for this but we need the pump capacity of pump #3 to do this. In the mean time, I used Volucalc to calculate the capacity of combinations of pumps and assumed that single pump operation would be about 75-80% of combined value, using the dimensions supplied. This gives a capacity of 1200 GPM for single pump operation and an efficiency of only 2.75 GPW. 1745 GPM would be needed to be at 4 GPW.

Measurements taken manually at installation time gave me 1481 gallons between lead and off, compared to the supplied 2188 gallons. I would advise to physically recheck the dimensions in this lift station. The reports were generated using the supplied information.



LS 124

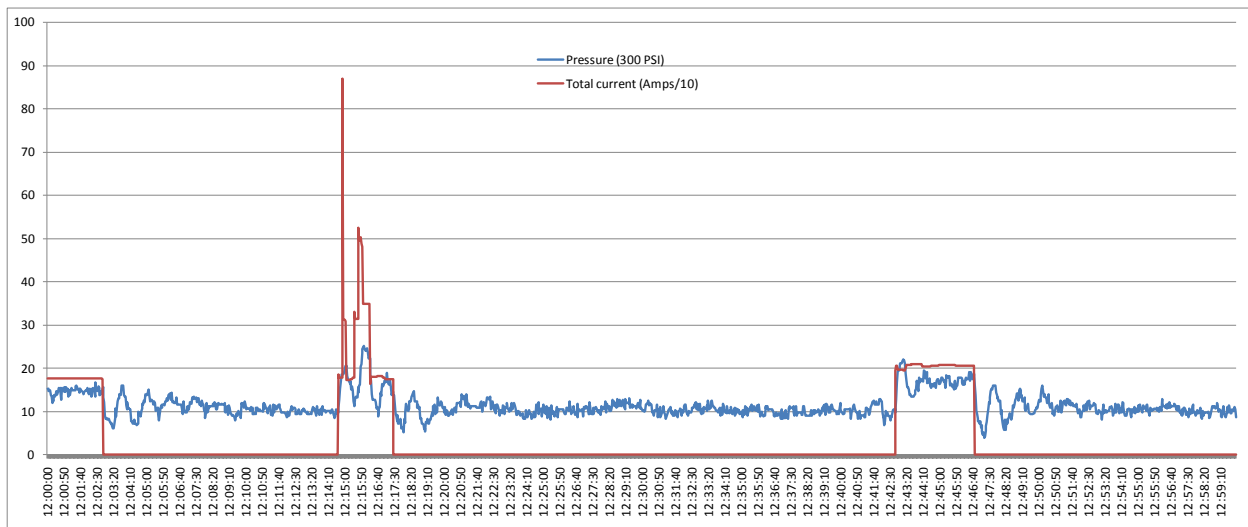
Distance supplied is 42 inches compared to 31 on site, a 35% variation. The difference is 1316 gallons instead of 970 gallons. I would advise to physically recheck all dimensions in this lift station. Even at 42 inches, the efficiency of the pumps is extremely low at 1.12 and 1.42 GPW. I expect the pumps to be really inefficient. An efficiency of 5 GPW would save over \$1500 per year.



LS 138

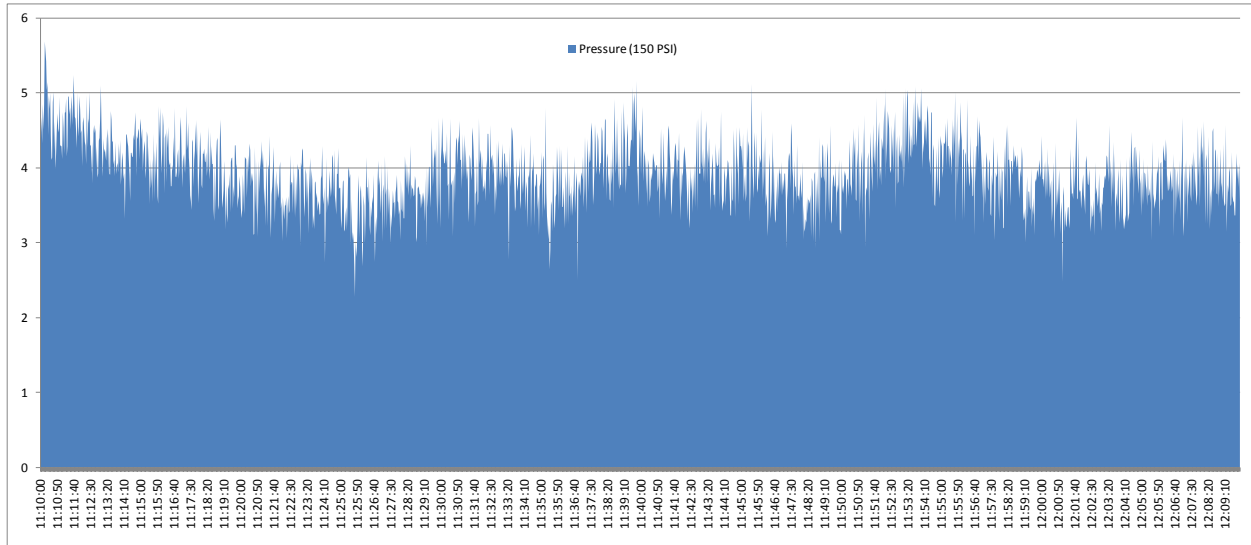
This lift station can start and stop pumps based on their run times and their levels. Calculating volumetric flow under these conditions is more than complicated. Pumps operated in combined mode for only a total 5 minutes in 10 separate events and it seems highly abnormal to have them operating for such a little time, I used derived flow when operating this way. The Excel file "LS 138 Flow per cycle" had negative volumes caused by abnormally short events. I suggest sorting the file based on duration, and then remove the short events before sorting back to time. I left them in the file for you to see these anomalies.

The low efficiency of these pumps is remarkably low at 1.34 to 1.52 GPW. Near \$5900 could be saved annually using more efficient pumps.



LS 249

The 2 seconds and 10 seconds per line Excel files is probably what will be the most useful. No Mermaid Reports were generated for this pump station.



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