Identification of noise at low flow levels:

Took total period of low flow paired with field observations of flow. Used highest of these low flow periods. Calculated it as a percentage of overall flow. If it was just noise then it would represent X % of overall flow and thus is or is not a concern in overestimating load.

Decided regardless of this percentage to apply a noise filter based on average pulse frequency that occurred when dry conditions were observed in the field. Then zeroed this flow frequency in the record. To filter out noise we selected smallest zero spacing (maximum flow) associated with dry outlet field observations and used this as a filter on corrected flow data.

JBT01: 6 inch pipe. highest of flow associated with no flow observation is 0.001 seperted by 11 zeros which equals 100L every 3 hours, assuming 8 weeks (0verestimate) of this type of conditions only = 0.11% of overall flow. Used 9 zeros for noise filter=200L every 4 hours.

JBT02: 4 inch pipe. highest of flow associated with no flow observation is 0.001 seperted by 8 zeros which equals 300L every 4 hours, assuming 8 weeks (0verestimate) of this type of conditions = 3.4% of overall flow. Used 10 zeros for noise filter=200L every 4 hours. ~2% of flow record is zeroed as a result.

JBT04: 4 inch pipe. highest of flow associated with no flow observation is 0.001 seperted by 8 zeros which equals 200L every 4 hours, assuming 6 weeks (0verestimate) of this type of conditions only = 1.2% of overall flow. Used 10 zeros for noise filter=200L every 4 hours. ~1% of flow record is zeroed as a result.

JBT05: ? inch pipe. highest of flow associated with no flow observation is 0.001 seperted by 2 zeros which equals 600L every 4 hours, assuming 6 weeks (0verestimate) of this type of conditions only = 1.7% of overall flow. Used 1 zeros for noise filter=600L every 4 hours. ~1% of flow record is zeroed as a result.

JBT06: ??

JBT07: 4 inch pipe. highest flow associated with no flow field observations was around 8-12 zeros between pulses. Used 8. Assuming 45 days (visually counting number of days that seem to have this pacing) of dry conditions this = 0.5% of overall flow. Using 10 zeros as spacings which equals 200L per 4 hours. Zeros 0% of flow record.

JBT11: 8 inch pipe. highest flow associated with no flow field observations was around 2 zeros between pulses. Assuming 40 days (visually counting number of days that seem to have this pacing) of dry conditions this = 5% of overall flow. Using 3 zeros as spacing which equals 500L per 4 hours. Zeros 1% of flow record.

JBT13: 6 inch pipe. Outlet is submerged, difficult to identify flow. Thus some “dry” field observations may in fact be flowing. Highest flow associated with no flow field observations was around 2 zeros between pulses. Assuming 50 days (visually counting number of days that seem to have this pacing) of dry conditions this = 6.5% of overall flow. Using 5 zeros as spacing which equals 300L per 4 hours. Zeros 2% of flow record.

JBT14: 8 inch pipe. Outlet is submerged/surcharged, not as difficult as JBT13. Highest flow associated with no flow field observations was around 2 zeros between pulses. Assuming 50 days (visually counting number of days that seem to have this pacing) of dry conditions this = 0.7% of overall flow. Using 3 zeros as spacing which equals 500L per 4 hours. Zeros 0.2% of flow record.

JBT16: 4 inch pipe. Not submerged, field observations likely accurate. Highest flow associated with no flow field observations was around 12 zeros between pulses. Assuming 30 days (visually counting number of days that seem to have this pacing) of dry conditions this = 0.03% of overall flow. Using 10 zeros as spacing which equals 200L per 4 hours. Zeros 0.2% of flow record.

JBT18: 6 inch pipe. Somewhat submerged, but field observations are fairly accurate. Highest flow associated with no flow field observations was around 4 zeros between pulses. Assuming 60 days (visually counting number of days that seem to have this pacing) of dry conditions this = 4% of overall flow. Using 9 zeros as spacing which equals 200L per 4 hours. Zeros 2% of flow record.

JBT19: 6 inch pipe. Outlet is submerged, difficult to identify flow. Thus some “dry” field observations may in fact be flowing. Highest flow associated with no flow field observations was around 4 zeros between pulses. Assuming 50 days (visually counting number of days that seem to have this pacing) of dry conditions this = 3% of overall flow. Using 6 zeros as spacing which equals 300L per 4 hours. Zeros 3% of flow record.

JBT06 Calibration and Offset Adjustments/Checks

Due to malfunction in Flowlink raw data from 4/12/17 through 11/30/17 was compiled by downloading files off of the webserver into an aggregated Excel file.

Removed obvious noise associated with field visits. Removals are flagged in record.

Applied if then statement to make any negative values zero. Further based on field observations of zero flow.

Applied proper offset to all other values based on reference adjustments and calibration adjustments. See JBT06 file under 15-309>Instruments.

JBT05 velocity meter and flow (pre mag-meter installation)

>Divded m3/s by m/s to see if cross sectional area was constant in raw flow record

Baseflow Gap Filling:

Looked at adjacent aggregate samples (earlier and later). If similar flow conditions and concentrations averaged to fill gap. If just one was similar, used that one. If manure application associated with one, discounted.

If period had zero flow, concentration was made zero.

JBT06: Long period from 8/4/17 to 10/7/17 of predominantly zero flows punctuated by small events. Entire period lacks samples. Used 7/26/17 sample concentration for these periods. 7/26/17 sample does have some elevated flow but no manure application is associated and concentration is relatively low. Also periods of flow during mainly zero flow account for only 1.5% of overall flow. Thus using this concentration is not very significant.

Analytical QC

Overholds >5 days are flagged

BL Biased Low