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## The use of a 3<sup>rd</sup> U/S or D/S sensor in Salt Dilution Flow Measurements

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Salt Dilution flow measurement is a relatively accurate and easy way to measure flow in turbulent waterways. However, its accuracy and precision are governed by the Signal to Noise (SNR) Ratio, which can be very low in urban, sub-urban, and rural waterways due to a highly variable Background specific Electrical Conductivity (BG ECT) signal. Conventionally, more salt is added to the waterway to overcome the noise in the BG ECT. The “noise” is a combination of random noise, which is amplified by the typically high BGECT (>500 uS/cm), but also lower frequency noise that changes on the same time scale as the salt breakthrough curve. To compensate for the changing BG ECT, we have employed a 3<sup>rd</sup> UpStream (U/S) probe to track the BG ECT, along with algorithms to transform the signal in 3 domains: magnitude (ECT offset), time (transit time of pulse), and frequency (to compensate for storage in the waterway). Additionally, we have tested the use of a 3<sup>rd</sup> DownStream (D/S) probe to measure cross-channel variance when mixing is not complete in order to achieve a reasonable flow estimate. Results are compared and discussed.