Q. **Tab 27; Volume II: Implement Terminal Station Flood Mitigation – Springdale**
Hydro states on page 2 that "the installation will be designed to prevent flooding of the terminal station during a 1 in 100 year rainfall event."

How do the referenced rainfall events in 2006 and 2015 compare to the 1 in 100 year criteria?

A. Flooding of the Springdale Terminal Station occurred on April 18, 2006, and April 29, 2015. Both events were the result of increasing water levels in nearby Davis Brook.

As there is no flow data available for Davis Brook, a Regional Flood Frequency Analysis was completed to estimate the flow rates during the most recent flood event. To complete this exercise, the peak water levels of the 2015 flood were used for hydraulic model calibration purposes.

A nearby hydrometric station was used to replicate the flows in Davis Brook. To ensure that this station was representative of the flow regime for Davis Brook, the selected station contained similar physiographic parameters, had a period of record greater than or equal to 18 years, and was an active station during the storm event of interest; April 2015.

Hourly flow rates obtained from this station were correlated, using drainage area, to Davis Brook in order to derive the calibration inflow sequence for the April 2015 storm event. These flows were then compared to the Intensity-Duration-Frequency return period rainfall amounts for a 24 hour period.

Based on the analysis, the flows at Davis Brook, during the 2015 storm event, were estimated to be 38.8 m^3/s. This equates to a 1 in 20 year event. Using the representative hydrometric station, a 1 in 20 year event will result in a 24 hour rainfall accumulation of approximately 73.4 mm and an average rainfall intensity of 3.1 mm/hr.

Similarly, a theoretical flow was calculated for a 1 in 100 year rainfall. For an event of this magnitude, the flow rate is estimated to be 50.7 m^3/s. This event would result in a 24 hour rainfall accumulation of 91.3 mm, with an average rainfall intensity of 3.8 mm/hr.

Having experienced two previous flood events at the Springdale Terminal Station, Hydro deemed it prudent to complete the retention berm design for the higher intensity rainfall event. For this reason, the 1 in 100 year return period was selected as the basis of design for the retention berms.