

MINUTES :
HSCA – EPARC - Infrastructure Group
Monday November 14, 2016 from 7:00 – 9:00 PM in the Tim Tyler Board Room at
HSCA.

Attendees: Peggi M, Kerri T, Charlie Lund, Richard B, Mike B, Pat J, Reg J, Brad S, John M

Guests: Frank Frigo, Manager River Engineering, Water Resources, City of Calgary

Attachment: Frank's presentation (...)\Dropbox\HSCA Flood Task Force\--Infrastructure - Technical\SunnysideFTF-HydrologyNov2016.pdf

- (1) Welcome & Introductions – Charlie Lund (5 min)

- (2) Bow river hydrology and specifically the historic series of peak flows and the unusual nature of the records on the Bow – Frank Frigo/All (105 min)
 - Please refer to Frank's presentation (available on Dropbox).
 - Bow River Catchment reviewed—7800km² of terrain drains into this basin. Most of the area is mountainous with very little in the way of storage. Elbow River is 1200 km² at Calgary. The Bow River is relatively steep 0.22 % locally but much steeper upstream.
 - The majority of our rainfall comes in May-Aug. June has the largest rainfall at 19% of annual total.
 - There is a large variety of flow over the year with the highest flow May to Sept.
 - Most storage is too high in the catchment to control the majority of flooding, Dam capacity reviewed: Bearspaw 7.8 x 10⁶, Glenmore 10.3 x 10⁶, Ghost,
 - Original target: Elbow River mitigate to 150 cms, Bow R mitigate to 450cms. Perhaps the Bow River target is low and 800 cms is now more appropriate.
 - 2013 Event precipitation: Bulls eye was over Elbow River. If it was more north it would have had a worse impact on the Bow River catchment. One would expect that the storm centres would be randomly distributed north and south along the foothills, yet both the 2005 and 2013 events were centred towards the south. It is unknown where the pre-1932 storms were centred. With so few data points it is possible that the historical record is not evenly distributed but instead is skewed to the south, ie. lower flows on the Bow.
 - Frank et al are studying models of higher flows and impacts on our catchment. Most studies are done on the Elbow as they require the data to maintain the Elbow River dam. Up to 325mm over 2.5 days (this is the usual rainfall for Calgary for the full year).
 - Past floods Bow River: 1879 (2200 m³/s), 1897(2200m³/s), 1925, 1929, 1932, 2005, 2013(1750m³/s). The 1933-2004 period appears to be an anomaly. At very least it means the data is
 - If data is reviewed further back than 1879 using different techniques it makes it look like the last 70 years of river flows were abnormally low. As per Brad S, if you look back to 300 years the data shows much higher river flows (estimates based on tree ring analysis).
 - From 1870 to 1932 there were 8 years where the flow exceeded 2005 flood levels.
 - The 2001 "Six Cases" report and Frank's own work conclude that the 1933-2004 flows were not significantly mitigated by any upstream dams. The anomalous flows are real.
 - Summary: Five important Factors:
 - (i) If the centre of precipitation was slightly north the flow on the Bow would be much greater.
 - (ii) The anomalous period without high flows should be removed from the data or discounted which will make historical flows statistically higher.
 - (iii) Climate change is expected to make extreme high flows and drought more frequent.
 - (iv) Total volume can be more important than peak flow. Even a storm lasting just a bit longer than the one in 2013 can amplify the effects.

- (v) Regardless of what dataset is used there will be statistical uncertainty resulting in a range of possible flows. It would be more conservative to plan for the 95% high flow rather than the middle of the range.
- The Bow River is unpredictable so we should consider the risk higher and protect accordingly. However, as of this writing the five factors above have not been translated into specific numbers for planning purposes.
- Frank indicated using caution as if we increase our interpretation of our risk our community may become unsustainable- Charlie suggested that we could be bought out for 1 billion

(3) Reflect on the recent engagement sessions and Frank's presentation relative to the Hillhurst-Sunnyside position on "Berms and Dams". Provide input to Charlie in advance of the next CAG meeting. Develop "next steps" for the group to further our goal/position – Charlie/All (5 min)

- structure of sessions discussed. Why were there not 4 options vs 3. Frank states that they just wanted our feedback and the options are not individually that important.
- Frank suggests- advocate for upstream storage
- It was agreed that Sunnyside will advocate for upstream storage and also for immediate construction of complementary berm improvements, including groundwater protection

(5) Date for next meeting: Tuesday, December 6, 2016 (5 min)

(6) Adjourn