Questions Regarding Salem Bypass Testing For PSEG

(Reference: GL 2004-02 Final Supplemental Response – ADAMS Accession No. ML121290536)

1) The screen used to catch the fiber was 0.31mm or 310 micron. How was it ensured that fiber did not bypass the screen considering that Nukon is 7 micron diameter and many of the bypassed fiber pieces are less than 250 microns in length with almost all less than 500 microns? Any fiber bypassing the screen may have been caught on the strainer on its next pass. Please provide the bypass amounts and debris sizes that would be expected to pass through the strainer and captured on a 100% efficient filter, and the method and assumptions used to calculate these values.
2) The location of the screen in the test loop was not clear. Could turbulence in the flume have prevented some fiber from collecting on the screen or washed some of the fiber from the screen?
3) Discuss the procedures for handling the collection screens. How was debris ensured not to fall off the screen when it was removed, during drain down, handling, drying, etc?
4) How was it ensured that the samples were representative of an average amount that would be present downstream of the strainer over the sample interval? For example, what was the timing of the samples compared to the debris additions? Sampling has been noted to miss higher concentration clouds of fiber that pass the strainer during debris introduction. This may not be important if the sample results are not used for evaluation of fiber amounts over time.
5) The highest reported test velocities were about 80 times lower than the maximum expected velocity for the Salem strainer according to the vortex evaluation. How do velocity gradients of this magnitude affect bypass?
6) Related to the velocity question above, is using bypass per strainer area valid? Does a larger plant strainer area compared to the test strainer area result in linearly greater bypass or is it some other function? Would the larger plant strainer result in a less uniform debris deposition resulting in a change in bypass? How well do the bypass tests conducted validate this relationship?
7) Was sensitivity to water chemistry evaluated?
8) What were the batch sizes and what was the time interval between each batch? (Batch size may be expressed as a theoretical debris bed thickness). Large batch sizes could result in a debris bed forming more quickly than would actually occur in the plant, resulting in and less bypass.
9) What were the test results in lb of bypass? How will the results be used? Will a single maximum value be used or will a time dependent debris load be calculated?
10) Discuss the procedures for debris control during the tests. How were the fibers ensured to all make it into the test tank after weighing and preparation?
11) Discuss the controls in place for verifying an accurate weight of fiber in the collection screen. How was the drying process for the screen controlled before being weighed and inserted into the loop?
12) At what fiber load does bypass stop or reach a small constant value? Is this dependent on strainer size or penetration velocity? Was it determined that bypass had stopped or

reduced to some small constant value prior to the tests being secured? If not, what were the termination criteria?

13) Were the filters (screen) changed more than once during the test? If so, when and how were the changes performed?
14) What are the bypass amounts in the graphs included in the Salem supplemental response in Section 3.f.4.2.2 based upon (filter results or sampling)?
15) How were the debris amounts in table 3f.4.1.3.4-1 calculated? For example, in test 1 I calculate that 7.3 kg of debris should have been added.
    1212.5 ft^3/180.8x2.4lb/ft^3/2.2lb/kg = 7.3 kg, not 5.9 kg.
16) Did two sided strainer tests result in a different amount of bypass when other conditions were similar to the single sided test?
17) It is difficult to evaluate the results as presented for the 2008 tests because they are given in units of volume. There were 3 different types of fiber used, all with different densities. How does each of these contribute to bypass? How were the volumetric values determined? Was some sort of average or composite density used that assumed an equal bypass of each type of fiber?
18) Discuss why a test with a larger fiber load (test 2) resulted in a lower bypass value than a test with a lower fiber load (test 3). Did 2008 test 3 form a filtering bed over the entire strainer? Could this be related to artificially fast arrival time for the fiber as discussed above with regards to fiber batch size?