



MEMORANDUM

Date: **August 14, 2000**
To: **Linda Logan**
From: **Brian Pippin**
Subject: **Critical condition for WER-related sampling**
cc: **John Brooker**

Project Number: **556-2912-001**
Project Name: **Port of Seattle WERs**

In accordance with the Permit Writers Manual, WERs must be measured three times during critical conditions and once during non-critical conditions. Conditions are considered critical when the physical, chemical, and biological characteristics of a receiving water interact with the effluent to produce the greatest potential adverse impact. The process of determining critical conditions for the third runway treated stormwater discharge may be somewhat unique because both the receiving water (Miller Creek) and the discharge are significantly affected by the same rainfall events. This memo summarizes several points to consider in deciding which dilution conditions (i.e.-flows, seasons) should be considered critical.

For streams, the 7Q10 and 30Q5 flows are often considered critical. Last year, we started evaluating dilution scenarios for the discharge of treated stormwater into Miller Creek. Realizing that both the Miller Creek flow and the stormwater discharge rates might be significantly affected by the same rainfall events, we developed a statistical approach for evaluating dilution. Based on HSPF hindcasting using data for the trailing 49 year time interval, we prepared hourly estimates of the Miller Creek and third runway stormwater discharge rates. We determined that there was essentially zero probability of any stormwater discharge during stream stages that would ordinarily be considered critical (i.e.-7Q10, 30Q5). We predicted there would never be third runway stormwater discharge during stream flows below the 10th percentile flowrate, which is substantially higher than the 7Q10. In fact, the only scenarios with probability greater than 0.001 occurred when stream flow and effluent discharge were both at rates higher than their respective 80th percentile rates. That was consistent with our intuitive understanding that both the stream flow and third runway discharge rates were strongly dependent upon the same rainfall events.

So... critical conditions probably occur with the first storm after summer low flow, will be ~~more~~ influenced more by water quality than quantity.

need wa for summer

i) hardness ii) TSS iii) TOC