Rationale and cost/benefit for funding flow gages on the Spokane River at Trent and Nine Mile

As requested by the Spokane River Regional Toxic Task Force, this document describes the costs and benefits of collecting Spokane River flow data from gages located at Trent Avenue and Nine Mile locations. This information is provided in support of the Task Forces' ongoing PCB source assessment and loading activities in the Spokane River system, and may guide decision makers in establishing funding priorities for ongoing projects.

It is well established that the Spokane River and the Spokane Valley-Rathdrum Prairie Aquifer (aquifer) are closely connected and exchange water. There are distinct locations where the Spokane River 'loses' water to the aquifer, and other areas where the river 'gains' water from the aquifer. The actual quantity of water exchanged between the aquifer and river at any particular location varies seasonally and with river flow. Additionally, there are areas on the Spokane River that lose water at certain times of the year but gain water in others; this interaction appears to be a function of river elevation and seasonal aquifer levels. Based on information collected to date, PCBs have been identified in the aquifer and are in connection with the river. In order to have reliable information regarding actual quantities of water exchanged between the aquifer and river (i.e., contaminant loading from groundwater), real time, synoptic flow data from multiple locations along the Spokane River is required.

It is possible to collect water samples from the river, absent flow information, and conduct PCB analyses to determine in-river concentrations. This type of data provides limited information…time and location only. However, in order to perform an evaluation of *LOADING* of PCB in the a river system, thereby incorporating the active interchange of river and aquifer water, then synoptic river flow information is needed to quantify those sources within the system.

Trent Gage – The Trent Avenue gage has historically been operated by Avista Utilities, and was active for the 2014 synoptic survey. Avista suspended funding for that location in 2015. The annual fee for the USGS to provide full time, real time monitoring and publication of the flow data is approximately $19K per year. The value of this location is that it is located near the downstream end of a gaining reach of the Spokane River, where a significant load of PCBs associated with groundwater was observed in the 2014 synoptic study. This reach of the river has been recommended for consideration of future assessment by the consultant. If future PCB assessment and loading activities include sampling of the groundwater and/or the Spokane River in the area between Barker Road and Trent Bridge, river flow information will be needed at both Barker Road and Trent Avenue in order to quantify the magnitude of the loading associated with that gaining reach. If funding is not available for full time monitoring at Trent Avenue, one-time only measurements may be collected by the USGS for $700 per event. It should be noted that for the 2014 synoptic survey, the consultant collected one time measurements from Barker Road and used the available real time information for Trent Avenue.

Nine Mile Gage - The Nine Mile gage is located downstream from the Nine Mile Dam, and has been inactive for many years. To reactivate the gage will cost approximately $25K in materials and labor (per the USGS). Permits associated with gage installation will also be required as work will occur within/near shorelines. This will require limited design and review tasks, and may also require a fair amount of in-kind labor to and fees to obtain the permit. The annual fee for the USGS to provide full time, real time monitoring and publication of flow data is approximately $19K per year. Avista has expressed a

willingness to fund the gage for real time annual monitoring, but only if another entity pays for installation. The value of this gage location is that it provides flow information at the downstream end of a gaining reach in the West Arm of The Spokane River between the Spokane gage and Nine Mile Dam. The Nine Mile gage is located downstream of the dam; Spokane River flow will be affected by Nine Mile Dam operations and may not accurately reflect the natural exchange of river and aquifer water in that reach. Nonetheless, river flow information at the Nine Mile gage may provide data to support a PCB loading assessment from groundwater in the West Arm entering the Spokane River, and will provide direct information about PCB loads in the lower section of the Spokane River and Lake Spokane. This data, coupled with eventual PCB loading information from the Little Spokane River, will have value in identifying the relative contributions from the Spokane River and Little Spokane River to Lake Spokane. If funding is not available for installation at Nine Mile, one-time only measurements may be collected by the USGS for $700 per event.

Note from above that one-time flow monitoring events can be collected in either location by USGS at the time of sampling for $700. Hired consultants can collect flow information as well. This option will work, and has the benefit of lower cost; but this option is very limited in temporal application. Real time data, collected on a full time basis, will allow for evaluating the various gaining and losing reaches at a variety of flow regimes, which will help in quantifying PCB loading to the Spokane River and Lake Spokane on a seasonal basis, and in varying scenarios.