DEPARTMENT OF ECOLOGY
NORTHWEST REGIONAL OFFICE
3190 – 160th Avenue S.E.
Bellevue, WA 98008-5452

Memorandum

August 7, 2001

TO: Ann Kenny, Ecology NWRO Shorelines and Environmental Assessment
Kevin Fitzpatrick, Ecology NWRO Water Quality Section Manager
Ray Hellwig, Ecology Northwest Regional Director

FROM: Dave Garland, NWRO Water Quality Watershed Unit Supervisor DWG

SUBJECT: *Review of "Low Flow Analysis, Flow Impact Offset Facility Proposal, Port of Seattle" Parametrix Inc., July 2001*

This memo is to document my review of the report, *"Low Flow Analysis, Flow Impact Offset Facility Proposal"* prepared for the Port of Seattle by Parametrix Inc., (July 2001). This most recent report presents considerable improvements in analysis and mitigation for predicted impacts of the proposed third runway on late summer streamflows. I also read review comments on the Port's Low Flow Analysis by King County Department of Natural Resources sent to Ann by Pam Bissonnette with a cover letter dated August 3, 2001 (DNR, August 3, 2001).

An earlier low flow analysis prepared for the Port, *"Sea-Tac Airport Master Plan Update Low Streamflow Analysis" (Earth Tech, December 2000)*, used the term "low streamflow" to refer to total flow in local streams during August and September, since those months were considered the most critical for minimum streamflows. After re-evaluating 47 years of streamflow records for Miller, Walker and Des Moines creeks, this more recent analysis uses a 3-month period for proposed low-flow augmentation. This provides a margin of safety for future climatic aberrations and, as pointed out by King County DNR, constitutes substantial streamflow mitigation for the third runway project.

In a special study commissioned by the 1998 legislature, Pacific Groundwater Group developed a "slice model" to quantify the hydrogeologic behavior of the proposed runway fill over a characteristic cross-section in *"Sea-Tac Runway Fill Hydrologic Studies Report"* (PGG, June 2000). The slice model predicted that infiltration of precipitation into pervious areas of the runway fill during winter months would result in summer drainage from the embankment. Subsequent low flow analyses, *(Earth Tech, December 2000)*, integrated the results of the PGG slice model over the 5,400-foot embankment distance along Miller Creek. Because the cross-section of the June 2000 'slice model' was located at an uncharacteristically thick section of the fill at the proposed Miller Creek retention wall, the groundwater flow characterized by integrating the original 'slice' along the length of the embankment adjacent to Miller Creek was thought to be unrepresentative. Accordingly, the subject re-evaluation of embankment drainage and other factors effecting the drainage (Parametrix, July 2001) takes several representative embankment 'slices' into account and provides more reasonable fill drainage estimates for the HSPF streamflow models.

Non-Hydrologic Impacts

Estimates of non-hydrologic impacts such as influence of imported water district water, exercise of water rights and on-site system effects were improved resulting in estimates of net reductions in project streamflow impacts as follows:

	Dec. 2000	July 2001
Miller Creek	.04 cfs	- .02 cfs
Walker Creek	0.0 cfs	- .01 cfs

CONCLUSIONS

1. The Port has provided a more detailed integration of the PGG 'slice model' (PGG, June 2000) over the length of the proposed runway embankment along Miller and Des Moines creeks. This more detailed consideration of fill thickness and fill soil characteristics yields improved low flow estimates for delayed embankment drainage to Miller and Des Moines creeks during the summer low flow months.

2. The long-term success of low streamflow maintenance at 1994 levels still depends on successful construction, maintenance and operation of new stormwater storage and release facilities on Miller, Walker and Des Moines creeks. Design and operation of these proposed storage facilities have been considered in detail in the Low Flow Analysis (Parametrix, July 2001) and are the subject of many of the comments from King County DNR (DNR, August 3, 2001).

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