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ENVIRONMENTAL
SCIENCES

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RE:
1. Seattle, Port of, 1996-4-02325
2. Port of Seattle's Response to Previous Comment Letters on impacts to wetlands, streams and fisheries resources resulting from proposed 3rd runway and related development actions at Seattle-Tacoma International Airport.

Dear Ms. Walker, Ms. Terzi and Ms. Kenny,

The following comments address recent Port of Seattle's responses to continuing questions raised by Azous Environmental Sciences (AES), the Environmental Protection Agency (EPA) and the Corps of Engineers (Corps) regarding the potential impacts to wetlands and streams resulting from the proposed 3rd runway and related development actions at Seattle-Tacoma International Airport.[1]

Attachment A provides a list of documents reviewed previously, several of which are referred to in this report. The following documents were also reviewed and are addressed in this report:

- Response to 2000 Public Notice Comments [Draft]. March 19, 2001. Master Plan Update Projects-Section 404/401 Permits. Seattle Tacoma International Airport.
- Response to Corps Request for Information– Section 404(b)(1). May 11, 2001. STIA Masterplan Update Improvements. 50248448.02.
- Wetland Function Assessment and Impact Analysis. Seattle Tacoma International Airport Master Plan Update. December 2000April 2001. 556-2912-001.

[1] Response to 2000 Public Notice Comments [Draft]. March 19, 2001. Master Plan Update Projects-Section 404/401 Permits. Seattle Tacoma International Airport.

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- CENWS-OD-RG. Memorandum for the Record (MFR). Subject: Meeting with the Port. Enclosures 1 and 2 containing water level data and data sheets from the Wetland Functional Analysis. Parametrix, Inc.
- Memo from Sally Marquis, Manager Aquatic Resources Unit, United States Environmental Protection Agency Region 10, to Colonel Ralph Graves, District Engineer, Seattle District, Corps of Engineers, dated June 8, 2001 listing issues of concern related to 1996-4-02325.
- Memorandum for the Record (MFR). CENWS-OD-RG. April 24, 2001. Subject: Summary of telephone conversations with Elizabeth Leavitt and/or Jim Kelly regarding Corps review of the draft response to comments from Azous and Sheldon.

Based on these latest documents, recently made available to ACC, the proposed fill activities in wetlands still do not comply with Part 230 of the Section 404(b)(1) Guidelines. The Port's proposal neither preserves water quality nor prevents adverse impacts to aquatic resources in the Miller and Des Moines Creek systems. The proposed STIA Masterplan Update Improvements are likely to result in significant degradation of the aquatic ecosystem under Part 230.10(c)(3).

The proposed project does not include all appropriate and practicable measures to minimize potential harm to the aquatic ecosystem. In several key areas, the Port has supplied insufficient information to support the claim that the proposed discharges will comply with Section 404 approval requirements. The shortcomings of the Port's proposals continue to include inadequate compensation for the lost wetlands and aquatic resource functions and no analysis of cumulative effects including no evaluation of the impact of eliminating a significant proportion of the remaining wetland acres in the Miller Creek watershed.

The decision on what constitutes equivalent mitigation for impacts resulting from the construction of the Third Runway in this proceeding will set a far-reaching standard. Defining "one-for-one functional replacement" in permits requiring mitigation is fundamental to the Clean Water Act's protection for wetlands and necessary to achieving progress towards the state and national goal of no net loss.[2] Purported mitigation that depends on enhancement without regard to loss of critical wetland functions is fundamentally flawed and has demonstrably failed to stem the tide of wetland loss nationally or in Washington State.[3,4] To allow this will result in a significant diminution of the character, quality and functioning of remaining wetlands in the Miller and Des Moines Creek watersheds. Decisions made here will affect wetlands protection efforts throughout the region and will foretell the success of your agencies in achieving national and Washington State mandates well into the future.

The Net Loss Remains

The objective of mitigation for unavoidable impacts is to offset environmental losses. The Memorandum of Agreement Between the Environmental Protection Agency (EPA) and the US Army Corps of Engineers (Corps) prescribes that mitigation will provide, at a minimum, one for one

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[2] Memorandum Of Agreement Between The Environmental Protection Agency And The Department Of The Army Concerning The Determination Of Mitigation Under The Clean Water Act Section 404(B)(1) Guidelines, February 6, 1990. Section III.B.

[3] Compensating for Wetland Losses Under the Clean Water Act. National Academy of Sciences Committee on Mitigating Wetland Losses. National Academy Press, Washington DC. 2001 Pre-Publication Copy.

[4] *Wetland Mitigation Evaluation Study Phase 1*, Department of Ecology Publication No. 00-06-016, June 2000.

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functional replacement, specifically mentioning that there be no net loss of values, and directs that the mitigation be planned with an adequate margin of safety to reflect the expected degree of success associated with the mitigation plan. After reviewing recent responses to questions and requests for information provided by the Port to the Corps, the essential question remains unanswered: How does the mitigation proposed by the Port for filling wetlands in the Miller and Walker Creek watersheds provide one for one replacement of functions being lost?

In answer to this question the Port, in its March 19, 2001 response to the Corps, refers the reviewer to Chapters 3, 4, 5 and 7 of the Natural Resources Mitigation Plan (NRMP) as well as tables 30-3 (which does not exist in the NRMP) and Tables 4.1-1 through 4.1-3.[5] These were reviewed previously and formed the basis of the February 16th comment letter by AES. Referring the reviewer back to documentation already identified as incomplete is not responsive to the questions posed. The Port has failed to resolve the following outstanding issues (among others), each of which is addressed below:

- Unaccounted For Loss Of Wetland Functions
- Reduced Organic Carbon Production From Loss of Wetlands
- Unaccounted for Loss of Wetland Landscape Functions
- Underestimated Permanent Impacts
- Unaccounted for Loss From Out of Watershed Exchange for Miller and Des Moines Creek Functions
- Functional Loss From Unaccounted for and Unmitigated Cumulative Effects
- Functional Loss From Underestimated Hydrologic Impacts

Unaccounted For Loss Of Wetland Functions

The Port's March 19th submission to the Corps acknowledges the request for an overall logical accounting of the wetland area and functions proposed for elimination in several responses including number 2, 6, 7, 9, and 28, which all refer the reader to Chapter 4 of the NRMP and Tables 4.1-1 through 4.1-3. However, the data presented in these tables simply do not provide a quantitative analysis of one-for-one functional exchanges. Tables 4.1-1 to 4.1-3 are nothing more than lists of proposed mitigation activities. The tables and accompanying discussion claim that individual listed activities will mitigate for other listed losses, but the Port does not demonstrate through quantitative analysis or scientific references that the activities proposed will, in fact, mitigate for the wetland functions eliminated.

As an example, tables 4.1-2 and 4.1-3 of the December 2000 NRMP state that in-basin mitigation will restore 6.6 acres of prior converted cropland to provide flood storage eliminated by constructing the runway embankment in the Miller Creek floodplain.[6] Yet, the wetlands data provided by the Port, when analyzed, show that only 20 percent of wetland acres eliminated were

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[5] *Response to 2000 Public Notice Comments [Draft]. Azous Environmental Sciences,* March 19, 2001. Master Plan Update Projects-Section 404/401 Permits. Seattle Tacoma International Airport, Responses 2, 6, and 9.

[6] *Natural Resource Mitigation Plan (NRMP);* Seattle-Tacoma International Airport; Master Plan Update Improvements dated December 2000, Parametrix, Inc. Pages 4-7 to 4-10.

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ranked moderate to high for flood storage functions.[7] Why is flood storage the primary goal of the major in-basin restoration activity when flood storage is not the predominant wetland function being eliminated? Flood storage serves the Port, but it does not serve the Clean Water Act requirement to mitigate one-for-one losses of aquatic system functions.

When acres of wetlands are evaluated with respect to the functions they provide within the watershed, the most important functions provided by the wetlands the Port proposes to fill are nutrient cycling, sediment trapping, groundwater exchange, habitat for small mammals, passerine birds and to a lesser extent amphibians. In addition, the Port identified 50 percent of the wetland acres as moderate to highly valued for organic export and 43 percent for their function in supporting resident anadromous fish. Yet, the scientific basis for and the area extent of mitigation activities planned to compensate for these critical wetland functions, identified within the Miller and Des Moines Creek watersheds by the Port in its Wetland Functional Assessment, are not disclosed in Tables 4.1-1, -2 or 4.1-3.

The Port's March 19th response to this significant flaw in its mitigation strategy (Response No. 7) demonstrates its confusion. Figure 1 in the AES comment letter of February 16, 2001 shows that the Port has ranked the majority of wetland acres it proposes to eliminate as having moderate to high nutrient sediment trapping and groundwater exchange functions and low to moderate flood storage functions. Instead of *demonstrating* that the most highly ranked functions provided by the wetlands proposed for elimination in the watershed will be mitigated, the Port focuses on AES's use of two summarized categories of the Port's five rankings for the wetlands, as if examining only two categories weakens the need to assess whether the proposed mitigation is quantitatively equivalent or better. In doing so the Port missed the point that it has not tied the acres of wetlands proposed for elimination to the functions they provide and matched it with a mitigation package that will meet the regulatory standard of functional replacement. AES used two categories for purposes of simplifying the analysis so the point would be more easily understood. The same analytical procedure could be performed by the Port, using all five rankings, to relate the mitigation proposal to the functions provided by the wetlands the Port proposes to eliminate and would result in analogous outcomes.

The Port offers Table 3-3 of the Wetland Functional Assessment and Impact Analysis, which provides rankings for eight wetland functions for the impacted wetlands, as the proof that it has used data to design mitigation offering equivalent functions.[8] But, Table 3-3 is simply a list ranking each impacted wetland for each function. It does not relate wetland area to eliminated functions and does not demonstrate any connection with the Port's mitigation proposal. Simply listing a series of rankings for each wetland does not relate the functions lost to the functions proposed for creation. In the AES February 16th comment letter it was demonstrated that, when measured in terms of the number of wetland acres providing the most highly valued functions, there was a significant disparity between the functions lost and gained.

Tables 24 through 28 in the May 11th Port response to the Corps also list impacts to the ecological functions of wetlands to be affected by the Port's proposal. These descriptions are informative but again neglect to quantify the relationship between function, area and mitigation

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[7] Figure 1. Functional rankings assigned to wetlands being eliminated for the Third Runway Project. Comments on impacts to wetlands, streams and fisheries resources resulting from proposed 3rd runway and related development actions at Seattle-Tacoma International Airport. Azous Environmental Sciences. February 16, 2001.

[8] *Response to 2000 Public Notice Comments [Draft]. Azous Environmental Sciences,* March 19, 2001. Master Plan Update Projects-Section 404/401 Permits. Seattle Tacoma International Airport, p. 2. Response 7.

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proposed.[9] Regardless of whether Ecology or the Corps exercises authority to limit the scope of options in a mitigation plan to areas on or near the project site or to habitat types that are the same as those proposed for elimination by the project, your agencies are tasked to approve plans that clearly provide equal or better biological functions and values within the watershed.[10, 11] Establishing equivalency can only be assured with an accounting of losses and gains, and to account for losses and gains the exchange must be quantified. When recent in-depth studies by Ecology and the federal government demonstrate that mitigation more often than not fails, it is essential under the Clean Water Act that the proposed wetland elimination be denied unless the Port can quantify functional losses and prove it can mitigate to *effectively* stem further degradation of Miller and Des Moines Creek aquatic habitats prior to wetland destruction.[12, 13]

Although the Port describes its mitigation proposal as mostly on-site and in kind, the proposal has no break down of in kind and out of kind mitigation provided to substantiate the claim.[14] A review of the mitigation activities listed in Table 4.1-3 of the NRMP shows that with the exception of the 6.6 acre Vacca Farm restoration, the remaining 60.4 acres of in-watershed mitigation is enhancement; 41.8 acres of enhanced buffer and 18.61 acres of enhanced wetland. The failure of enhancement activities to compensate for wetland loss is well documented in the scientific literature.[15, 16] Yet the Port is arguing that enhancement of an upland buffer and remaining wetlands is an equivalent functional exchange for eliminating 18.37 acres of existing wetlands. Here, the riparian wetlands targeted for elimination by the Port have far superior water quality and water storage functions in comparison to the upland buffer the Port intends to restore.[17, 18] Moreover enhancement of the Miller Creek riparian buffer and remaining wetlands could actually reduce those area's effectiveness for water quality and storage functions because of disturbance to the soil.[19] Such an exchange of functions is not based on sound science and does not meet the standard of in-kind.[20]

The National Academy of Sciences (NAS) has just issued a comprehensive study evaluating the efficacy of mitigation practices to restore and maintain no net loss under the Clean Water Act. The study concluded that the functions of a wetland proposed for fill need to be precisely characterized and quantified, as should the functions of the proposed compensatory mitigation.[21] The NAS study

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[9] *Response to Corps Request for Information– Section 404(b)(1).* May 11, 2001. STIA Masterplan Update Improvements. 50248448.02. Tables 24-28, pp. 53-62.

[10] RCW 90.74.020(2).

[11] Part 230.75 Section 404(b)(1) Subpart H.

[12] *Wetland Mitigation Evaluation Study Phase 1*, Department of Ecology Publication No. 00-06-016, June 2000.

[13] Compensating for Wetland Losses Under the Clean Water Act. National Academy of Sciences Committee on Mitigating Wetland Losses. National Academy Press, Washington DC. 2001 Pre-Publication Copy. p.2.

[14] *Natural Resources Mitigation Plan* (NRMP), Parametrix, Inc., December 2000. Page 4-1

[15] Compensating for Wetland Losses Under the Clean Water Act. National Academy of Sciences Committee on Mitigating Wetland Losses. National Academy Press, Washington DC. 2001 Pre-Publication Copy.

[16] *Wetland Mitigation Evaluation Study Phase 1*, Department of Ecology Publication No. 00-06-016, June 2000. DOE found only 14% of enhancement projects met performance standards for the mitigation.

[17] Dunne and Black 1970. *Partial area contributions to storm runoff production in permeable soils.* Water Resources Research 6:1296-1311.

[18] Dunne and Leopold 1978. Water in Environmental Planning. San Francisco, W. H. Freeman.

[19] Shaffer, P. W and T. L Ernst. 1999. Distribution of soil organic matter in freshwater emergent/open water wetlands in the Portland, Oregon Metropolitan Area. Wetlands 19:505-516.

[20] The need to quantify and explain the basis for one for one functional exchange was extensively discussed in comments dated August 16, 2000 and September 1, 2000 from Azous Environmental Sciences.

[21] Compensating for Wetland Losses Under the Clean Water Act. National Academy of Sciences Committee on Mitigating Wetland Losses. National Academy Press, Washington DC. 2001 Pre-Publication Copy., p 108.

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also concluded that mitigation is often focused on too few functions, often leaving out functions that are critical to the watershed, such as hydrologic connectivity and hydrogeomorphic characteristics. Since hydrology is the important determinant of wetland functions, best available wetland science requires that restoration and mitigation in Miller and Des Moines Creek watersheds result in mitigation that re-establish the natural wetland's hydrogeomorphology to improve the likelihood of actually mitigating the lost wetland functions.[22] Although the Port provides the hydrogeomorphic class of the wetlands proposed for fill, project documentation offers no evidence that this information was used to develop the mitigation strategy for replacing lost wetland functions.

The importance of quantifying functional exchanges cannot be emphasized enough because as permitted wetland alterations change the number, types and positions of wetlands on the landscape, maintaining the diversity of hydrologic regimes becomes more difficult and increasingly critical to preserving the diversity of functions provided by wetlands.[23, 24, 25, 26] To date the Port has failed to demonstrate that its plan can mitigate for the loss of slope and riverine wetland functions. As a consequence the agencies are left with a proposal for largely ineffectual enhancement activities.[27]

Reduced Organic Carbon Production from Loss of Wetlands

The Port argues in its March 19th response that there will be no loss of organic carbon export to the Miller Creek and Des Moines Creek systems because enhancement plantings in buffer areas and in Vacca Farm will offset the loss of wetlands that currently provide that function.[28] The Port promises, with no scientific substantiation, that enhancement of the buffer will offset the losses of productive wetlands. The Port's response to concerns about the cumulative harm to the structure and function of the aquatic food web, in particular through the loss of production of organic carbon, is to state that organic carbon production will be enhanced from the present condition. But, the Port provides no supporting evidence that this will be the case and the claim is contrary to scientific understanding concerning the role of uplands versus wetlands in organic carbon export.

The boundary zones (ecotones) between land and inland wetlands and streams are the principal routes for the transport of organic matter and nutrients within a watershed.[29] The condition of plants growing in water or saturated soil provides a steady supply of water and nutrients that have the potential to support high productivity, typically three or more times the organic carbon

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[22] Shaffer, P. W., M. E. Kentula and S. E. Gwin. *Characterization of Wetland Hydrology Using Hydrogeomorphic Classification.* Wetlands, Vol. 19, No. 3, Sept. 99, pp. 490-504.

[23] Kentula, M. E., R. E. Brooks, S. E. Gwinn, C. C. Holland, A. D. Sherman, and J. C. Sifneos. 1992. An approach to Decision Making in Wetland Creation and Restoration. Island Press, Washington DC, USA.

[24] Holland, C. C., J. E. Honea, S. E. Gwinn and M. E. Kentula. 1995. *Wetland Degradation and Loss in a Rapidly Urbanizing Area of Portland Oregon.* Wetlands 15:336-345.

[25] Bedford, B. L. 1996. *The need to define hydrologic equivalence at the landscape scale for freshwater wetland mitigation.* Ecological Applications 6:57-68.

[26] Gwin, S. E., M. E. Kentula and P. W. Shaffer, 1999. *Evaluating the effects of wetland regulation through hydrogeomorphic classification and landscape profiles..* Wetlands 19:477-489.

[27] Shaffer, P. W and T. L Ernst. 1999. *Distribution of soil organic matter in freshwater emergent/open water wetlands in the Portland, Oregon Metropolitan Area.* Wetlands 19:505-516.

[28] *Response to 2000 Public Notice Comments [Draft]. Azous Environmental Sciences,* March 19, 2001. Master Plan Update Projects-Section 404/401 Permits. Seattle Tacoma International Airport, p. 11 Responses 34-38.

[29] Hillbricht-Ilkowska, Phosphorus and Nitrogen Retention in Ecotones of Lowland Temperate Lakes and Rivers, HYDROBIOLOGIA, 1993, Vol. 251, No. 1-3.

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produced by an upland woodland shrub complex.[30] The soil of a wetland is the locus of most of the physical, chemical and biological processes that give wetlands the ability to improve water quality. Sediment retention takes place at the soil surface. Soil permeability affects its ability to store and convey water. More than planting trees and shrubs is required to offset the functional losses caused by excavating and removing the wetland soils, especially as the planned enhancement activities likely will adversely disturb the remaining soils.

The Port has also stated that replanting Vacca Farm will increase the potential for carbon export functions from the area, providing mitigation for the role existing wetlands play.[31, 32] The Port's proposal is to excavate and regrade the soils at Vacca Farm. Although planting trees and shrubs might otherwise eventually improve organic carbon export, nutrient cycling and sediment trapping at Vacca Farm, it is unlikely to occur any time in the near future as the most productive soils will be excavated and graded. As a result, the production of organic carbon will likely be significantly diminished for many years.[33]

The Port's May 11th response to the Corps also contradicts its claim that it is adequately protecting aquatic resources. On page 18 the Port argues that the very high concentrations of organic carbon (OC) currently found in Miller and Des Moines creeks will limit bioavailability of copper and zinc from the Port's stormwater discharges. The assessment that OC is sufficient to perform this role is based on 11 samples taken from different locations along Des Moines and Miller Creeks. Four of the eleven samples were taken January 14, 1999, five on April 13th, 2001 and two on April 14th, 2001. The Port's sampling regime provides no historical record because each sample location was sampled only once; it provides no seasonal record because all samples were taken in January or April in different locations; and it offers, at best, a very limited snapshot view of OC in Miller and Des Moines Creeks because too few samples were taken on each stream system in the same day.

Although some of the samples collected show high levels of OC, the Port offers no evaluation of or data on the source of organic carbon (OC), whether seasonal changes might affect OC availability, or a candid assessment of whether the Port's activities such as the proposed Vacca Farm excavation will diminish OC availability. This information is essential if the Port is citing the presence of ample OC to prevent water quality degradation from its contribution of zinc and copper. In addition, the Port has still not defined the role of Miller Creek's adjacent wetlands and hillslope seeps to the high organic carbon levels on which it relies to avoid impacts to aquatic species. Without a better analysis of the relationship of existing wetlands to the organic carbon levels found in Miller and Des Moines Creeks and without more scientific foundation to the Port's claim, there is no reasonable assurance that the remaining aquatic resources will be protected from further degradation.

The issue of organic carbon is also important in evaluating the functional role Miller and Walker creek wetlands play in providing food web support to the creeks.[34] Part 230.31(a) and (b) of the

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[30] Barnes and Mann, Fundamentals of Aquatic Ecosystems. Tables 4.1 and 11.1.

[31] Response to Corps Request for Information– Section 404(b)(1). May 11, 2001. STIA Masterplan Update Improvements. 50248448.02. Table 30, p. 70.

[32] *Response to 2000 Public Notice Comments [Draft]. Azous Environmental Sciences,* March 19, 2001. Master Plan Update Projects-Section 404/401 Permits. Seattle Tacoma International Airport, p. 11 Items 34-38.

[33] Day, F. P. Jr. and J. P. Meginigal 1993. *The relationship between variable hydroperiod, production allocation, and below ground organic turnover in forested wetlands.* Wetlands 13:115-121.

[34] This issue was previously discussed in February 16, 2001 comments by Azous Environmental Sciences to USACE and DOE.

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Section 404(b)(1) Guidelines refer to potential impacts that alter or eliminate populations in lower trophic levels, such as detrital feeders, and thereby impair the energy flow of primary consumers to higher trophic levels. The guidelines go on to point out that the reduction and possible elimination of food chain organism populations can decrease the overall productivity and nutrient export capability of an aquatic system. In addition to the threat of lead and zinc affecting stream chemistry, the metals that are expected to bind to organic carbon instead of fish gills are still likely to end up in the food chain when filter and detrital feeders consume the organic carbon, resulting in significant adverse consequences to the entire aquatic community.[35] Understanding that organic carbon is both the basis of the food web in Miller and Des Moines Creeks *and* the Port's argument for justifying increasing zinc and copper loadings in the creeks, it is prudent to demand a more rigorous analysis of the Port's claim that water quality standards will be met and the food web will not be affected.

Unaccounted for Loss of Wetland Landscape Functions

The filling of wetlands heavily influences the aquatic resources provided by urban watersheds. Fills redistribute and reform the wetland landscape usually adversely affecting watershed resources.[36, 37, 38] For example, permitted wetland activities in three Portland urban landscapes altered the wetland mosaic by decreasing the proportion of slope and riverine wetlands present and increasing the proportion of depressional wetlands.[39] This is a significant alteration of these watersheds because hydrologic conditions affect primary production and the allocation of fixed carbon in plants, which determines the pool of carbon that is available for soil production and to the food web of aquatic systems.[40, 41, 42] This scenario is very similar to Miller Creek, where slope and riverine wetlands are being eliminated from the watershed and replaced primarily by enhancement plantings and the restoration of a wetland designed primarily for periodic water storage. Again a predictable result of the landscape level alteration of wetland distribution in the Miller and Des Moines Creek watersheds is a decrease in the availability of carbon for soil production and food web support, a reduction in available aquatic habitat and an overall degradation of watershed resources from loss of wetland landscape functions. Simply stating, as the Port does, that adverse impacts won't occur in the watershed from its activities, does not provide reasonable assurance when studies of similar situations suggest otherwise.

Underestimated Permanent Impacts

The Port's May 11, 2001 Response to the Corps incorrectly states that lower quality category III and IV wetlands dominate the acres of impacted wetlands on the West Side. The Port's response

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[35] See discussion on Aquatic Invertebrate Response to Zinc Exposure in Fundamentals of Urban Runoff Management. Horner, R. R., J. J. Skupien, E. H. Livingston and H. E. Shaver. Terrence Institute and USEPA. August 1994. Pp. 51-52. Study indicated intermittent episodes of low loadings (0 to 30 µg/L) of zinc resulted in significant reductions in live Amphipods.

[36] Kentula, M. E., J. C. Sifneos, J. W. Good, M. Rylko and K. Kunz. 1992. *Trends and patterns in Section 404b permitting requiring compensatory mitigation in Oregon and Washington, USA.* Environmental Management 16:109-119.

[37] *Wetland Mitigation Evaluation Study Phase 1*, Department of Ecology Publication No. 00-06-016, June 2000.

[38] *Wetland Mitigation Replacement Ratios: An Annotated Bibliography*, Publication #92-09, February 1992.

[39] Gwin, S. E., M. E. Kentula and P. W. Shaffer, 1999. *Evaluating the effects of wetland regulation through hydrogeomorphic classification and landscape profiles.* Wetlands 19:477-489.

[40] Kantrud H. A., J. B. Millar, and A. G. van der Valk. 1989, *Vegetation of wetlands in the Prairie Pothole Region.* P. 132-187. *In* A. G. van der Valk (ed.) Northern Prairie Wetlands. Iowa State University Press, Ames, IA USA.

[41] Day, F. P. Jr. and J. P. Meginigal 1993. *The relationship between variable hydroperiod, production allocation, and below ground organic turnover in forested wetlands.* Wetlands 13:115-121.

[42] Wetzel R. G. 1983. Limnology. Saunders College Publishing Company, Philadelphia, PA USA.

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refers the reader to a Table that is not identified but is likely meant to be Table 2, which follows the paragraph.[43] In actuality, the majority of wetlands impacted on the West Side are Category II (8.37 acres), which is 59 percent of the total 14.23 acres the Port has predicted will be impacted on the West Side.[44] The 5.86 acres or 41 percent (referred to by the Port as 70 percent of the wetlands) are mostly Category III wetlands comprising 4.89 acres and only 0.97 acres (7 percent) are Category IV wetlands. It is revealing that the Port continues to misstate the value of the wetland resource of Miller Creek to the extent that it both failed to crosscheck its conclusions with its previous documentation or properly analyze the data found in its own table. The result is a serious failure, intentional or not, to objectively evaluate the functions of Miller Creek wetlands.

As part of its refusal to provide an accurate evaluation for agency review, the Port continues to claim it is only impacting an already degraded wetland system without addressing the important, if not desperate role, the remaining wetlands play in maintaining existing aquatic uses. The Port attempts to deflect criticisms on this point by discussing differences between Ecology's wetland rating system and a wetland functional assessment system.[45] But this response does not address the key issue, which is that wetland functions are dependent upon wetland structure (which is the basis of Ecology's wetland rating system). Eliminating 56% of the Class II wetlands (which have more structural elements than Class III and IV wetlands) will reduce the structural diversity of the remaining system thereby reducing the level of wetland function disproportionate to the lost acreage. The Port pretends that this permanent loss will not occur and proposes no mitigation for it.

In its March 19th response to the Corps, the Port claims that "reductions in wetland size will result in little or no impact to wetland functions" and argues that small remnants, such as the 0.04 acres remaining of Wetland R1, the 0.03 acres remaining of Wetland A12, should not be included in tallies of permanent impacts. The Port argues that such wetlands will continue to provide one for one area replacement of all functions found in the original wetland, even though these wetland remnants are subjected to "temporary" construction impacts.[46] According to the Port, temporary impacts from the project include temporary access roads, temporary sediment and erosion control ponds, staging areas and stockpiling areas.[47] These are all activities that severely compact and disturb soil, interrupt drainage patterns and adversely impact habitat functions.

The successful restoring of wetland functions is highly dependant on the degree of disturbance to hydrology, organic soils and vegetation structure. The National Academy of Science (NAS) found that the time for reaching equivalency for soil, plant and animal components in wetland restoration projects ranged from more than three to 30 years for soils, 10 years or more for below ground biomass and more than five to 10 years for establishing a target species composition with the

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[43] Response to Corps Request for Information– Section 404(b)(1). May 11, 2001. STIA Masterplan Update Improvements. 50248448.02. Response 4, Section 2(b)(1) Description of Discharge Sites, West Side (Third Runway), p. 9.

[44] *Natural Resource Mitigation Plan (NRMP)*; Seattle-Tacoma International Airport; Master Plan Update Improvements dated December 2000, Parametrix, Inc. Table 3-1, Pages 3-2 to 3-3.

[45] *Response to 2000 Public Notice Comments [Draft]. Azous Environmental Sciences,* March 19, 2001. Master Plan Update Projects-Section 404/401 Permits. Seattle Tacoma International Airport, p. 3 Items 10-11.

[46] *Response to 2000 Public Notice Comments [Draft]. Azous Environmental Sciences,* March 19, 2001. Master Plan Update Projects-Section 404/401 Permits. Seattle Tacoma International Airport, p. 5 Item 15.

[47] Response to Corps Request for Information– Section 404(b)(1). May 11, 2001. STIA Masterplan Update Improvements. 50248448.02, p. 63.

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higher time frames representing wetlands with greater damage.[48] The Port's analysis of what constitutes a "temporary" impact, described in its May 11th response to the Corps, is inconsistent with the NAS analysis. The Port proposes to re-establish pre-disturbance conditions by removing stockpiled fill material, aerating soils and planting with native forest and shrub vegetation--all of which are unlikely to result in a restoration of wetland functions to these highly impacted wetlands within a reasonable time frame. The wetlands utilized for temporary roads, erosion control, staging and stockpiling will be heavily damaged by these activities. According to the NAS study, these high disturbance activities will significantly reduce the predictability of the restoration effort and require many years to reach equivalency. Further, based on the Port's own estimate of construction time frames ranging from one to as long as five years, such as for Wetland 18, the Port's claim of temporary impacts absurd. The acknowledged permanent loss of most of Wetland 18 in addition to the long term consequences of "temporary" impacts to most of its remaining 0.72 acres effectively removes the majority of its wetland functions from the Miller Creek system for 15 or more years--hardly a temporary impact.

In summary, the Port uses the notion of "temporary" impacts to describe what, in the case of wetlands 18, 37, A12 and R1, will be activities which disturb wetland functions to the extent the remaining portions will require complete reconstruction. The NAS study calls into serious question how the extent of wetland alterations proposed by the Port could be classified as temporary given the timelines for reaching equivalency. Add to that the Port's optimistic but mistaken view that small remnants will provide one for one area replacement of all functions found in the original wetland, and the Port's argument that it has accurately tallied permanent adverse impacts from temporary ones loses significant credibility.

The Port also underestimates permanent functional losses in its May 11th response to the Corps when it claims that most riparian functions provided by Wetlands 18 and 37 will remain because fill in the wetlands will be limited to areas greater than 50 feet from Miller Creek.[49] The Port's assertion that the functions provided by riparian wetlands, including wetlands 18 and 37, are located only in the first 50 feet adjacent to the stream is not referenced and is not supported by science. The Port takes the position that the almost eight acres of wetlands lost between wetlands 18 and 37 provide little or no functional support to the less than one acre of undisturbed (according to the Port) wetland that will remain of each when the Port's project is constructed. A review of studies which measured upland buffer effectiveness according to environmental indicators, such as levels of benthic invertebrates and salmonid egg development in the receiving water, generally found that *at least 98 feet* was needed to effectively buffer a stream in order for it to maintain shade, retain a water temperature low enough for salmonid habitat and to maintain contributions of large woody debris.[50, 51] Those studies looked at upland buffers and did not even consider the added functions provided by riparian wetlands, such as those here, which provide associated habitat, water quality treatment and hydrologic support to a stream in addition to shade and temperature control.

The Port claims that it has accurately accounted for permanent wetland impacts relies heavily on the preservation of seepage flows from the embankment wall as a means of retaining functions in

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[48] Compensating for Wetland Losses Under the Clean Water Act. National Academy of Sciences Committee on Mitigating Wetland Losses. National Academy Press, Washington DC. 2001 Pre-Publication Copy. P. 36 Table 2.2.

[49] P 55 Biological Functions. Response to Corps Request for Information– Section 404(b)(1). May 11, 2001. STIA Masterplan Update Improvements. 50248448.02.

[50] *Wetland Mitigation Evaluation Study Phase 1*, Department of Ecology Publication No. 00-06-016, June 2000. p. 48.

[51] *How Ecology Regulates Wetlands*, Washington State Department of Ecology, Publication 97-112 (Revised April 1998). Section: The Case for Buffers..

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the remnant wetlands left after construction. But the ability to maintaining seepage flows from the embankment wall while maintaining the wall's structural stability has not yet been demonstrated as feasible.[52] The Port's non-responses to concerns expressed by AES regarding how stormwater management and erosion controls will operate effectively while maintaining seepage flows to wetlands is contained in the Port's March 19th letter to the Corps.[53] The Port essentially repeats information that has been provided in previous documents and refers the reader to the Wetland Functional Assessment and Impact Analysis report which, in combination with AES's reviews of the NRMP appendices and the Port's Stormwater Management Plan (SMP), generated the concerns over inconsistencies between the documents in the first place.

Finally, the Port acknowledges no permanent impact from the construction dewatering that will occur to depths of 20 feet and to lateral distances of ten's of feet in the construction area.[54] Although the Port describes this impact as "very limited", that conclusion cannot be supported when the remaining buffer between construction activities and Miller Creek is often only 50 feet and in some cases as narrow as 30 feet. The Port's dewatering activities will interrupt seepage flows to the remaining slope and riparian wetlands and potentially may affect hydrology in Miller Creek. Dewatering, even "temporarily", the wetlands the Port is relying on to provide critical OC support to Miller Creek and nutrient cycling functions will further reduce the Port's claimed provisions for protection of watershed aquatic resources.

Unaccounted for Loss From Out of Watershed Exchange for Miller and Des Moines Creek Wetland Functions

Off-site mitigation in the watershed is addressed by 33 CFR Part 320.4(q)(1). Off-site mitigation as long as it is within the same Water Resource Inventory Area (WRIA) is addressed by RCW 90.74.010 (1). RCW 90.74.010 (6) also specifies that a WRIA be defined as a watershed. But a WRIA is composed of many watersheds and natural resource scientists know that wetland functions are generally most valuable locally. The RCW addresses this concern in its definition of context for out of watershed mitigation, which requires a plan for managing wetland resources. The RCW stipulates the following information requirements for determining whether equal or better biological functions will result from a permit decision:[55]

> (a) The relative value of the mitigation for the target resources, in terms of the quality and quantity of biological functions and values provided;
>
> (b) The compatibility of the proposal with the intent of broader resource management and habitat management objectives and plans, such as existing resource management plans, watershed plans, critical areas ordinances, and shoreline master programs;
>
> (c) The ability of the mitigation to address scarce functions or values within a watershed;

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[52] June 25, 2001 memo from Northwest Hydraulic Consultants to US Army Corps of Engineers and Washington State Department of Ecology..

[53] *Response to 2000 Public Notice Comments [Draft]. Azous Environmental Sciences,* March 19, 2001. Master Plan Update Projects-Section 404/401 Permits. Seattle Tacoma International Airport, p. 13-15 Items 47 to 49.

[54] *Wetland Functional Assessment and Impact Analysis; Master Plan Update Improvements,* Seattle-Tacoma International Airport, December 2000 by Parametrix, Inc., Appendix B, p.223-24.

[55] RCW 90.74.020 (3)

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(d) The benefits of the proposal to broader watershed landscape, including the benefits of connecting various habitat units or providing population-limiting habitats or functions for target species;

(e) The benefits of early implementation of habitat mitigation for projects that provide compensatory mitigation in advance of the project's planned impacts; and

(f) The significance of any negative impacts to nontarget species or resources.

These requirements mean that if off-site mitigation is proposed outside of the actual watershed in which impacts occur, it must at minimum, be done within a reasoned context. The selection of out of basin mitigation must have a scientific basis and be supportable in terms of long-term goals and planning strategies. The existence of a local, WRIA or state wetland plan is critical to show a framework for deciding when out of watershed mitigation is appropriate and when it will work to meet local, state or federal wetland goals. The flexibility intended by the legislation is allowed only within a sound scientific and planning context.

The small wetlands remaining in the Miller and Des Moines Creek watersheds are critical components to maintaining habitat and significantly influence the habitat suitability of the creek systems and remaining undeveloped watershed.[56, 57] The off-site mitigation plan proposed by the Port has not been tied to an identified need for wetland categories or functions at risk in the WRIA.[58] In the absence of such a proven context the Port offers a compromise of environmental protection standards in favor of flexibility spurred by its self-interest.

Functional Loss From Unaccounted for and Unmitigated Cumulative Effects

A cumulative impacts analysis is essential for compliance with the Clean Water Act regulations and to meet principles embedded in sound science. The requirement for a cumulative effects analysis is based on the recognition by state and federal agencies that project level impacts can accumulate and exceed thresholds that adversely affect a watershed beyond what would be predicted from individual reviews of proposed project components.[59, 60, 61] The Clean Water Act, State Environmental Policy Act, National Environmental Policy Act and local regulations all depend on a cumulative impacts analysis to identify any additional mitigation required to prevent degradation of watershed resources. The Port's list of projects that it identifies as a "cumulative impact assessment" is inadequate information for evaluating potential cumulative degradation to beneficial uses within the watershed.[62, 63] The need for a proper cumulative effects study was discussed in

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[56] Magee, T. K., T. L. Ernst. M. E. Kentula and K. A. Dwire. 1999. *Floristic comparison of freshwater wetlands in an urbanizing environment.* Wetlands 19:517-534.

[57] Naugle, D. E., R.R. Johnson, M. E. Estey, K. F. Higgins. 2000. *A landscape approach to conserving wetland bird habitat in the prairie pothole region of Eastern South Dakota.* Wetlands 20:599-604.

[58] LA Peyre, M. L., M. A. Reams and I. A. Medlessohn. 2001. *Linking actions to outcomes in wetland management: an overview of U.S. state wetland management.* Wetlands 21:66-74.

[59] Section 230.11(g) Section 404(b)(1) Subpart B.

[60] Memo from Sally Marquis, Manager Aquatic Resources Unit, United States Environmental Protection Agency Region 10, to Colonel Ralph Graves, District Engineer, Seattle District, Corps of Engineers, dated June 8, 2001 listing issues of concern related to 1996-4-02325.

[61] Memorandum for the Record (MFR). CENWS-OD-RG. April 24, 2001. Subject: Summary of telephone conversations with Elizabeth Leavitt and/or Jim Kelly regarding Corps review of the draft response to comments from Azous and Sheldon.

[62] Pieces of a State Wetlands Program. Recommendations of the Washington State Wetlands Integration Strategy Working Group (SWIS).

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detail in my comment dated February 16, 2001 and some examples were provided to show the kinds of information that should be evaluated.

Since the February 16, 2001 comment letter I have had an opportunity to evaluate further the acres of wetlands in the Miller Creek watershed now, compared to if the proposal is permitted. There are currently approximately 37.42 acres of wetlands that are hydrologically connected to Miller Creek remaining in Miller Creek Watershed.[64] Of that set, 26.02 acres of wetlands are located in the upper Miller Creek watershed. Of those remaining hydrologically connected wetlands, 7.05 acres will be eliminated by the Port's proposal, which is 21 percent of the entire watershed and 27 percent of the upper watershed. Eliminating such a high percentage of remaining wetlands within an already degraded watershed will very likely exceed key thresholds for protecting water quality, aquatic ecosystem diversity, productivity and stability resulting in significant harm, among them reduced food web support, changes in water chemistry and alterations to invertebrate communities. Under these circumstances, the mitigation proposal offers little reasonable assurance that watershed resources will be protected. The Port's upbeat claims are conspicuously divorced from supporting data and do not provide a measurable basis for the Corps and Ecology to make a reasonable judgment of compliance.

Functional Losses From Underestimated Hydrologic Impacts

The first data offered by the Port showing pre-construction hydrologic conditions for wetlands in the construction zones is presented in Enclosure 2 of the June 25, 2001 MFR from Muffy Walker. The first monitoring date is April 15, 2000. The second is almost a year later, February 22, 2001 followed by March 29th and May 1st. This sparse database cannot be used to define pre-construction hydrology. Sampling must occur a minimum of nine times a year to establish a hydroperiod for the wetland.[65] Second, the early spring from February 1st to May 31st is the most critical period for determining wetland plant and animal communities and water depth should have been measured more frequently for that period during 2001, the only year for which such data is offered.[66] Third, sampling should not occur exclusively during a low rainfall year such as 2001 because the measured depths to saturation and to water will likely be lower than normal for the seasons measured and therefore not representative of normal conditions. Finally, the Port should not be given the benefit of the doubt for its construction activities over the last year. The pre-construction condition of wetlands has already been altered to the extent that irrigation and septic sources of groundwater flows have been eliminated, and clearing vegetation and stockpiling soils have altered the microclimate around numerous wetlands. The Port's delay in providing essential data while it altered the pre-construction landscape makes it impossible to rely on data gathered now as accurately representing pre-construction wetland conditions.

Interestingly, the Port discusses the hydrology of specific wetlands in its March 19th submission and says that performance standards for the Borrow Areas are based on observations that the

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[63] Bedford, B. L. 1999. *Cumulative Effects on Wetland Landscapes: links to wetland restoration in the United States and Southern Canada.* Wetlands 19(4):775-788.

[64] This number was derived from the Port's data identifying wetlands that are immediately adjacent or hydrologically connected to Miller Creek and from the wetland inventories provided by the Cities of Des Moines, Burien and Normandy Park. It does not include ponds or lakes.

[65] Azous and Horner. Wetlands and Urbanization: Implications for the Future. Lewis Publishers. Boca Raton, FL 2001, p. 308.

[66] Ibid., p. 312.

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wetlands lose wetland hydrology in early to mid spring.[67] The Port states that all of the wetlands near the Borrow Area lack saturated sols in the late spring and summer months. These statements imply that wetlands were observed more than once throughout some spring season. Since the Port's report was written prior to the 2001 spring monitoring of wetland water levels, the statements suggest there is other data available describing or measuring wetland hydrology. If so this data has not been published in documents reviewed to date with the exception of observed hydrologic indicators documented for one site visit. The Port should supply this data or limit its conclusions accordingly.

Summary

The Port's mitigation package is far removed from Ecology's longstanding guidelines for appropriate mitigation activities and ratios.[68, 69] The project, as proposed, is inconsistent with federal and state mandates. Encouraging flexibility in meeting no net loss is not license to abandon it. A review process open to alternative means of achieving mitigation must still require applicants to demonstrate how no net loss is being met.

The departures from best available scientific knowledge of how to effectively mitigate for wetland functional losses inherent in the Port's proposal significantly undercut the Port's claims of improving watershed resources through its proposed mitigation. These departures also leave the agencies in the uncomfortable position of being called to permit a project that ignores basic science-based principles of wetland protection. There is ample evidence from government-sponsored studies that the experiment of permitting mitigation and, in particular permitting "enhancement", in exchange for destruction of natural wetlands has failed. There should be no exceptions for the Port in applying wetland science or regulations. The decisions made here are not trivial and will set a standard for wetlands protection efforts well into the future.

The Port's responses to date are unresponsive and monotonous claims that the job is done and the Port has complied with the Clean Water Act. Notwithstanding Dorothy's experience in Oz, the Port's repeating of this claim does not make it so. There are profound negative implications for wetlands and aquatic resources from the Port's unwillingness or inability to fully comply with the Clean Water Act and the Port's attempt to apply an inferior and unscientific standard of mitigation. It is up to the agencies to resist the pressure to succumb to the Port's campaign of wearing repetition.

Thank-you for your time spent in reviewing this material. Please call me or email me if you have any questions or comments.

Sincerely,

Amanda Azous

Cc: Kimberley Lockard, Airport Communities Coalition (ACC)
Ms. Joan Cabreza, USEPA

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[67] *Response to 2000 Public Notice Comments [Draft]. Azous Environmental Sciences,* March 19, 2001. Master Plan Update Projects-Section 404/401 Permits. Seattle Tacoma International Airport, p. 12-13 Items 40-43.

[68] *How Ecology Regulates Wetlands*, Washington State Department of Ecology, Publication 97-112 (Revised April 1998). See discussion on Compensatory mitigation regarding adequacy of mitigation methods.

[69] *Wetland Mitigation Ratios: Defining Equivalency*, Shorelands and Coastal Zone Management Program, Washington State Department of Ecology Publication Number 92-8, February 1992.

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Attachment A: List of Documents Reviewed

- *Addendum to the Final Supplemental Environmental Impact Statement*, Auburn Wetland Mitigation Project, Port of Seattle, May 5, 2000.
- *Appendices A-E Design Drawings Natural Resource Mitigation Plan*, Seattle-Tacoma International Airport, Parametrix, Inc. No Date.
- *Assessment of Spawning and Habitat in three Puget Sound Streams*, Washington (BioAnalysts, Inc., April 1999).
- B*iological Assessment, Master Plan Update Improvements*; Prepared for FAA and Port of Seattle by Parametrix, Inc., June 2000.
- *Biological Assessment*, Revised Draft, Parametrix, November 1999.
- *Comprehensive Stormwater Management Plan, Master Plan Update Improvements; Technical Appendices J, Q and R*, by Parametrix, Inc., December 2000.
- *Feasibility of Stormwater Infiltration, Third Runway Project Sea-Tac International Airport, Sea-Tac, Washington*, prepared for Port of Seattle by Hart Crouser, December 6, 2000. J-4978-06.
- *Implementation Addendum, Natural Resource Mitigation Plan, Master Plan Update Improvements*, Seattle-Tacoma International Airport, Parametrix Inc., June 2000.
- *Natural Resource Mitigation Plan (NRMP) Appendices A-E Design Drawings* dated December 2000, Parametrix, Inc.
- *Natural Resource Mitigation Plan (NRMP) Revised Implementation Addendum* dated August 2000 Parametrix, Inc., Number 556-2912-001 (03).
- *Natural Resource Mitigation Plan (NRMP)*; Seattle-Tacoma International Airport; Master Plan Update Improvements dated December 2000, Parametrix, Inc.
- *Natural Resources Mitigation Plan*, Draft, Parametrix, Inc., July 1999.
- *Natural Resources Mitigation Plan*, Revised Draft, Parametrix, Inc., August 1999.
- *Pacific Coast Salmon Essential Fish Habitat Assessment; Master Plan Update Improvements*; Prepared for FAA and Port of Seattle by Parametrix, Inc., December 2000. Number 556-2912-001 (01) (48).
- SeaTac Runway Fill Hydrologic Studies Report, Pacific Groundwater Group, June 19, 2000.
- *Seattle Tacoma International Airport (SEA) Wildlife Hazard Management Plan*, developed by Seattle-Tacoma International Airport in cooperation with US Department of Agriculture, Animal and Plant Health Inspection Service Wildlife Services, August 2000.
- *Supplement to Biological Assessment, Master Plan Update Improvements*; Prepared for FAA and Port of Seattle by Parametrix, Inc., December 2000.
- *Supplemental Airport Site Wetland and Stream Analysis*, Parametrix, Inc., November 1999.
- *Supplemental Airport Site Wetland and Stream Analysis*, Parametrix, Inc., November 1999.
- *Wetland Delineation Report, Revised Draft*, Parametrix, Inc., August 1999.
- *Wetland Delineation Report; Master Plan Update Improvements*; Seattle-Tacoma International Airport, December 2000 by Parametrix, Inc.
- *Wetland Functional Assessment and Impact Analysis Draft*, Parametrix, Inc., July 1999.

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- *Wetland Functional Assessment and Impact Analysis, Revised Draft*, Parametrix, Inc., August 1999.
- *Wetland Functional Assessment and Impact Analysis; Master Plan Update Improvements*, Seattle-Tacoma International Airport, December 2000 by Parametrix, Inc.
- *Wetlands Re-Evaluation Document*, Draft, Port of Seattle, August 1999.

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