

PORT OF SEATTLE MASTER PLAN UPDATE IMPROVEMENTS.

Summary of changes to the Natural Resources Mitigation Plan made to comply with the Water Quality Certification #1996-4-02325, September 21, 2001.

Revised Auburn Grading Plan (June 28, 2001)

	Comments	Resolution
1.	The revised grading plan (June 28, 2001) shows a culvert in the northwest corner of the site in the proposed new drainage swale. The culvert will pass flows under the site access path. The drawing shows this culvert approximately 60 feet long, passing under a path that is only approximately 15 feet wide. This culvert should be no longer than is necessary to pass the water under this pathway.	The referenced grading plan has been incorporated into Appendix E of the NRMMP. Note 7 on Sheet C5 was added to address culvert lengths.
2.	The revised grading plan (June 28, 2001) shows a culvert in the south central portion of the mitigation site. This culvert appears to be mis-located. It appears that the culvert should be shown in the wetland directly east of the shown location, where the wetland passes under the proposed maintenance path. This culvert should be no longer than is necessary to pass the water under this pathway.	Culverts at the wetland crossings are shown on Sheet C4 and C5.
3.	Two additional culverts need to be shown along the new drainage swale where the water outlets the southwestern basin, under the maintenance pathway.	Revised designs for the maintenance pathway in this area are provided on Sheet C7.1. This design assures unobstructed drainage across the road.
4.	Culverts should be placed during construction under the paths/roads in all areas where there is a potential for impounding water. A note should be added on the construction documents.	Notes 6 and 7 on Sheet C8 address the need to install culverts on these roads if they are found to impound water.
5.	Provide revised grading plan that addresses items 1 through 4 above.	Sheets C3 through C6 of Appendix E have been modified to address Items 1 through 4.

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Sheet	Comment	Resolution
		4.3.2.4 (page 4-48) and Section 7.3.3.1 (page 7-59) of the NRMP.
	The Sheet C6 grading plan shows proposed contours for re-grading the SW portion of the mitigation site. These contours do not continue onto Sheet C5. Provide revise sheet.	The grading plan has been revised.
C8	Provide revised sheet with a note added to the plans to include culverts at the low spots if needed to eliminate ponding.	Notes were added to Sections 6 and 7 indicating that culverts must be placed beneath gravel paths and maintenance roads as needed to prevent upslope ponding of water.
	On Section 3, design to ensure the perforated pipes do not sink into the substrate and become blocked.	A note was added to Section 3 requiring sub-grade preparation at wetland crossings be suitable to support culverts.
TE1	There is no discussion on dewatering except in the NRMP text on page 7-50. Sheet C2 (Appendix E) shows the discharge point located along a ditch, which is slated to be recontoured. Provide revised sheet with additional details to manage potential erosion and amend text in NRMP if necessary.	Note 9 specifies that the drainage ditch of concern be lined with geotextile fabric to prevent erosion or turbidity.
	If it is determined that Area 1 should have a sedimentation pond submit revised sheet showing the pond.	A sedimentation pond in Area 1 is not required.
	Page 7-47 of the text discusses major construction activities limited to a period from October 31 to March 31 to avoid winter bald eagles. Provide revised sheet correcting error regarding construction window to avoid winter bald eagles.	Changes noting the timing of construction relative to wintering bald eagles have been made (see page 7-51 of the NRMP and Note 11 on Sheet TE1).
L7 and L8	Provide revised sheets to show plant pattern layout areas for each phase.	Planting layout patterns were added to Sheets L7 and L8.
L9	Provide revised sheet with a note added to the plans so that ponded areas or areas that are anticipated to be ponded shortly after planting will be planted with plugs representative of the seed mix specified. Add Hydro seeding specs.	A note to the planting schedule for emergent wetland specifies that plant plugs or containerized stock are to be used flooded areas below elevation 44 in the west basin and 41 in the east basin. Hydroseed Mix specifications are shown on Sheet L10.

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Sheet	Comments	Resolution
	spalls.	C8.1.
C6	Provide revised sheet clarifying whether the dark hatched area in the vicinity of Wetlands R9a, R10, R11, A10, and A11 will be graded and revegetated.	Sheets L4 and L5 in Appendix B indicate where undesirable vegetation (primarily blackberry) is present and will be removed. As explained in the NRMP (pages 5-70 and 5-71) clearing and grubbing of soil in some upland areas would be employed.
C7	Show how will water get to Wetland 44a if the TESC channel is removed. Show flow monitoring locations on the stormwater management plan.	Portions of the TESC Channel will be converted to a replacement drainage channel following embankment construction Flow monitoring locations for Wetland 44 are shown on Sheet C7. Flow monitoring for Wetland 37 occurs at flow dispersal trenches (Sheets C5 and C6).
C8	Clarify how the drainage channel discharge structure controls flow to the wetland. Address how often these structures will be monitored and how modifications be made if a problem is identified. Provide information in note on revised sheet.	Sheet 8.1 shows flow diversion structures and flow dispersion trenches that will be used to convey water to downslope wetlands. The details show how the discharge structures control flow to the downslope wetlands and how modifications can be made to the structures to alter flow rates if needed. Adaptive management and monitoring standards for wetlands are described in the NRMP and elsewhere in the Water Quality Certification (see Condition d1g). Ecology will be provided with hydrologic data on a monthly basis and in an annual report. Following the adaptive management approach, if necessary, contingency measures (e.g. adjustments of flow volumes) will be recommended. Upon review and approval by the Corps and Ecology the Port will implement them.
L1	Provide revised sheet to allow for phased planting to provide shading for western red cedar and the western hemlock.	A note on the plant schedule specifies phasing of conifer trees. Section 4.3.2.2 (page 4-44) identifies the need for phased planting of conifer trees.

Appendix E - Auburn Wetland Mitigation

Sheet	Comment	Resolution
C5	Provide revised sheet with note saying that if hummocks remain in place options for removing reed canary grass will be evaluated.	The hummocks (consisting of piles of soil from previous grading on the site) and associated reed canary grass will be removed. Control of reed canary grass throughout the mitigation project is discussed in Section

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Sheet	Comment	Response
L5.1	Provide revised sheet with note that says that if 8 th Avenue South is not needed for access it will be revegetated.	Note 6 provides the required language regarding S. 8 th Avenue access.
L5.2	Provide revised sheet with note indicating that any irrigation installed in the field shall be shown on the As-Built Report.	Note 2 on Sheet L5.5 provides the required language regarding the installation of temporary irrigation.
L6	Areas that are cleared and revegetated should be planted at a higher density than enhancement areas. Densities or quantities should be stated on the plan. A performance standard of 280 trees per acre is proposed for the buffer. In cases where some forest vegetation is present, the Port shall supplement the existing trees with enhancement plantings to achieve this density. Clarify in NRMP how survival monitoring will be performed in these areas to differentiate these two types of areas.	The planting schedule was revised to showing installation of 280 trees per acre. Section 4.3 of the NRMP describes the monitoring requirements for vegetation. In areas where existing vegetation is supplemented with enhancement plantings, the survival of newly installed plants will be measured.
	Provide revised plan detail/notes to allow for use of phased planting in areas that lack suitable shade or soil moisture. Discuss in text of NRMP.	A note on the plant schedule specifies phasing of conifer trees. Section 4.3.2.2 (page 4-44) and Page 5-75 of the NRMP identifies the need for phased planting of conifer trees.
	On tree planting and staking detail, the plan needs to state when the stakes will be removed. If it is determined that staking is not necessary then remove the stake details. Provide revised sheet.	Details showing the staking of plants have been removed from Sheet L6.
P2	Provide revised sheet showing approximate locations of the sandbags and the abutments to be removed. Provide note on TESC controls that will be in place for the timber removal in order to minimize sediment mobilization.	Sheet P2 has been revised to show sandbags and silt fences that isolate creek water from the abutments to be removed (see Note 3).

Appendix D - Replacement Drainage Channels and Restoration of Temporarily Impacted Wetlands

Sheet	Comments	Resolution
C3	Clarify how hydrologic support will be provided to Wetland 11 and Wetland 9 after construction.	Notes 4 and 5 describe how hydrologic support will be provided to the wetlands after construction.
C5	Provide revised plan sheet with details regarding flow spreaders and	Locations of flow diversion structures and flow dispersal trenches are shown on Sheets C5 and C6. Details of these features are shown on Sheet

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Sheet	Comment	Response
TE4	equipment should not be driven in the streambed except where necessary to complete construction.	added to Sheets TE1 - TE4.
TE2	Provide revised sheet showing details for stream diversion structure and flow dispersion structure.	Details regarding stream diversion and flow dispersion structure are shown on Sheets TE5 and TE6.
	Provide revised sheet showing detail for the flexible by-pass pipe. Note that pipe should not be trenched in.	The sheet has been revised to indicate the by-pass pipe is to be placed on the ground surface. Sheets TE5 and TE 6 indicate the diversion and dispersal structures associated with the pipe.
	Indicate on plan sheet direction of sump discharge water with note that it is pumped to a treatment pond. Provide specific pond. Provide revised sheet.	The sump pump will discharge turbid water to tanks for off-site treatment, therefore there are no treatment ponds specified.
TE5	On the live stake detail, specify the density of staking (inches on center). Provide revised sheet.	Specifications for willow cuttings are provided in Detail 3, and they will be planted 12-inches on center.
L1.1	Provide revised sheet with note that says that if S. 157 th Place is determined not to be needed for access purposes it will be revegetated.	Note 8 includes the required language regarding S. 157 th Street access. .
L2	Provide revised sheet with note that says if S. 160 th Street is not needed for access it will be revegetated.	Note 8 includes the required language regarding S. 160 th Street access.
L3	It is unclear how much of this area will be cleared. Provide revised sheet with correct cross-hatching in wetland.	The sheet has been modified to show areas where patches of undesirable vegetation will be removed (primarily blackberry). Clearing and grading will occur where the replacement drainage channels will be constructed.
L5	Clarify why some of Wetland R11 shown as revegetated and others are not. Provide revised sheet with note indicating that the Corps of Engineers is requiring that the sewer easement will not be revegetated.	All of wetland R11 will be enhanced. Note 9 indicates the Corps of Engineers' requirement that enhancement plantings not be added to the sewer easement (which is not part of the mitigation project). Following construction, disturbed areas of this easement (if any) will be hydroseeded.
	Provide revised sheet correcting hatching error for the replacement drainage channels buffer areas that will be graded. This area should be in darker (cleared and revegetated areas) hatch.	The sheet has been modified. Notes 7 and 8 were added to provide the required clarification regarding clearing and grading of the replacement drainage channels.

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Sheet	Comment	Response
		the flow dispersion structure used to introduce creek water back into the channel are provided on Sheet TE6.
C5	Provide revised sheet if log orientation at 42+00 changes. Note 2. Provide revised sheet with note. Discuss disposal of solid wastes in next of NRMP or in an Appendix. Provide information on how hazardous materials will be managed if discovered during the course of constructing the mitigation site.	There were no changes to the orientation of the log located at Station 42+00. Note 2 was revised to indicate that waste materials are to be removed and disposed of in approved off-site locations. Monitoring of mitigation sites during acquisition, demolition and construction phases for waste materials is discussed on page 4-38 of the NRMP.
C7	Provide revised sheet with note that details how project areas will be accessed. Also provide details on how access locations will be restored after the work has been completed.	A note on Sheet C7 (Note 2) indicates that Sheets TE1 through TE4 show where construction access is available. Notes on these sheets detail how access areas are to be restored, and that wetland and stream impacts must be minimized.
C8	On Section 2, the coir lift is shown on the section but is not present on the plan. Provide revised sheet. On Section 3, the logs on the plan view are not present on the section. Provide revised sheet. On Section 5, the log shown on the plan view is not present on the section. The coir lift shown on the section is not shown on the plan. Provide revised sheet. On Section 6, the log shown on the plan view is not present on the section. Provide revised sheet.	References to coir lifts have been added to plans on Sheet C5 and C9. Logs have been added to the cross section. Logs were added to Section 5 on Sheet C8 and coir lifts were added to the plan view on Sheet C5. Logs were added to Section 6.
C9	In typical detail of coir fabric lifts, develop a specification for the quantity of willow cutting. Provide revised sheet.	Specifications for willow cuttings were included in Detail 2. They are to be placed 12-inches on center.
C10	Provide revised sheet and include note on sheet that indicates that the geotextile fabric will be biodegradable. If this is discussed in text, then text must become part of final plan set.	Notes regarding biodegradable geotextile fabric were added to all details with buried logs.
TE1-	Provide revised sheets adding note in notes section that states that	Notes regarding limitations to operating equipment in the stream have been

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	anchored using cable or hemp.	specifications are provided in Details 1-4, Sheet C8.
	On the swale section provide revised sheet showing that swale area will be seeded.	Sheet C7, Section 2 specifies that the swale will be hydroseeded.
C8	Provide revised sheet that shows steel anchors for all the logs in the stream channel with note that hemp rope anchors are expected to remain in place for 3-5 years.	This sheet has been revised to meet this requirement (see Note 2) and detail 1 on sheet TE2.
TE1	Provide revised sheet with note on how the ditches will be blocked to prevent sediment migration.	Sheet TE1 has been revised to show this requirement (see Note 15).
	Provide schedule or table that shows the sequence in which the different elements of the mitigation will be installed. (This applies to the Auburn site as well.)	The construction sequencing for mitigation is detailed in the NRMMP in Sections, 5.1.4, 5.2.2.10, 5.3.1.10, and 7.4.9.
L2	Revise sheet to show how young plants will be protected from sun exposure until they are well enough established to withstand exposure to the sun.	Sheet L2 is now Sheet L5. A note addresses concerns about sun exposure and specifies phasing. Section 4.3.2.2 (page 4-44) of the NRMMP and Page 5-38 of the NRMMP also identify the need for phased planting of conifer trees.
	Revise Note 6 to state that except where needed to protect roots of conifers, care must be taken not to seed mulch collars.	Sheet L2 is now Sheet L5. A note was added to Details 2 and 3 specifying that hydroseed would not be applied to any mulch circles.
	Revise sheet to remove staking notes and details from sheet.	The information previously provided on Sheet L2 is now on Sheet L5. The required revisions regarding the staking of trees have been made.

Appendix B - Miller Creek In-stream and Buffer Enhancements

Sheet	Comment	Response
C3	Revise sheet to show construction access points and add a note to the plans to minimize wetland and stream impacts. Provide note detailing how access points will be restored.	Note 5 indicates that Sheets TE1 through TE4 identify construction access locations. Sheets TE1 through TE4 show construction access locations and provide additional notes that details how access areas will be restored, and that wetland and stream impacts minimized.
C4	Note 5. Add note to see sheet TE2 and add more details detailing how the channel will be de-watered during re-grading.	Note 5 on Sheet C4 references Sheets TE2 and TE5 where details on how the channel will be dewatered during construction are provided. Details on

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<p>points;</p> <ul style="list-style-type: none"> • a planting plan showing species, densities, sizes, and approximate locations of plants, as well as plant sources and the time of planting; • habitat features (snags, large woody debris, etc) and their locations; • drawings in the report shall clearly identify the boundaries of the project; • locations of sampling and monitoring sites; and • any changes to the plan that occurred during construction. <p>The As-Built Report shall include detailed plans showing locations of all monitoring transects and locations. All vegetation sampling and analysis shall employ statistically valid sampling and analysis procedures during each of the monitoring events. Monitoring reports shall show all sampling locations, discuss trends and changes, discuss success in achieving performance standards or other implementation difficulties, provide remedies to address implementation problems, and set forth a timeline for their resolution. Supporting data and calculations shall be maintained by the contractor and made available to Ecology upon request.</p> <p>iv) The As Built Report shall be sent to Ecology's Federal Permit Manager, SeaTac Third Runway within sixty (60) days of completing the mitigation site.</p> <p>v) Any proposed changes to the wetland mitigation and monitoring protocol established in the NRMP and as revised by this Order, must be approved in writing by Ecology prior to implementation of any changes.</p>	<p>Table 5.1-7 (page 5-22), Table 5.2-8 (page 5-106), Table 5.2-16 (page 5-124), Table 5.3-4 (page 5-144), Section 7.4.8 (page 7-75), and Appendix N (page N-35).</p> <p>Requirements for statistically valid sampling techniques for vegetation monitoring are identified in Tables 5.2-12 (page 5-39), 5.3-6 (page 5-150), and 7.7-1 (page 7-86). Appendix L (page L-10) describes methods for vegetation sampling that will be used in the monitoring program.</p>	
Appendix A - Miller Creek Relocation and Floodplain Enhancement		
C3	<p>Note 13. Provide revised sheet showing design of irrigation system and discuss irrigation plan in NRMP (timing, amounts of water, etc.)</p>	<p>A design for the temporary irrigation system is shown on Sheets L1 through L3. The operation of this system is described on page 5-37 of the NRMP.</p>
C4	<p>Provide revised sheet C4 showing no work in streams. Provide revised Grading plan C-129 showing no work in streams.</p>	<p>No in-stream work is shown on sheets C3.1 or 3.3. On Sheet 3.3, silt fences and outfall details indicate that no in-stream work is planned.</p>
C7	<p>Provide revised sheet with note detailing how woody debris will be</p>	<p>Details for woody debris placement are on Sheet C8. Anchoring details and</p>

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	<p>401 WATER QUALITY CERTIFICATION CONDITION</p> <p>sixty (60) days after the issuance by the U.S. Army Corps of Engineers of the Section 404 required for construction of the Master Plan Update projects. This condition applies only to property currently owned by the Port.</p> <p>g) The performance standards in Table 5.3-6 of the NRMP (July 31, 2001) allow for monitoring of the surface water in Wetland 30. The evaluation approach states that shallow groundwater monitoring wells will be used. The evaluation approach shall be changed to provide that surface water depths are measured monthly during the period from December through April, and the monitoring results compared to pre-construction data.</p>
<p>7. Wetland, Stream and Riparian Mitigation Monitoring and Reporting:</p>	
<p>a)</p>	<p>Monitoring of all wetland mitigation sites identified in the December 2000 NRMP and the June 2001 Auburn Grading and Planting Plan, as revised below, shall be incorporated into the Final NRMP submitted to Ecology.</p> <p>i) Monitoring shall be completed at least yearly for a fifteen (15) year period with initial monitoring starting after the first growing season after installation of plants. If at any point during the monitoring period the results of monitoring show that the success criteria established in the plan are not being met, Ecology may require corrective action, additional monitoring, and additional mitigation.</p> <p>ii) The Port shall prepare and submit annual monitoring reports to Ecology's Federal Permit Manager, SeaTac Third Runway, Northwest Regional Office, 3190 160th Avenue SE, Bellevue, WA 98008-5452 no later than December 31st of each year following the first year of the mitigation site work. Each year's monitoring report shall include photographic documentation of the project taken from permanent reference points. The Port shall identify and incorporate permanent reference points into the Final NRMP.</p> <p>iii) As-Built Report: An as-built report documenting the final design of all wetland mitigation sites shall be prepared when the initial planting is completed. The report shall include the following:</p> <ul style="list-style-type: none"> • final site topography; • photographs of the area taken from established permanent reference
	<p>The November 2001 NRMP incorporates the condition language of D7 in Section 4.3 (page 4-35). Tables 5.2-16 (page 5-124) and 5.2-12 (page 5-114) identify the monitoring schedules for the mitigation sites described in the NRMP.</p> <p>Section 4.3.1.2 (page 4-38) of the NRMP identifies reporting requirements that meet this condition. Maps locating permanent reference points that will be subjected to monitoring are shown in Appendix I.</p> <p>Requirements for as-built drawings (i.e., "Record Drawings") and reports are described in Section 4.3.1.2 (page 4-39) and in the implementation section of describing each mitigation area in the NRMP. All mitigation sites where grading will occur will have a topographic survey of final contours. This requirement is described in the implementation section of each mitigation area and is referred to as "record drawings", as identified in</p>

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RESOLUTION	
	<p>401 WATER QUALITY CERTIFICATION CONDITION Michael Bailey (Hart Crowser) to Jim Thomson (HINTB) on wetland hydrology and proposed drainage swale design (October 20, 2000)).</p>
d)	<p>The Port shall monitor hydrologic conditions of wetlands remaining in and adjacent to the borrow sites. Hydrologic monitoring using piezometers and shallow hand dug soil pits in undisturbed wetlands associated with Borrow Site Three shall be conducted with sufficient frequency to determine wet season trends. Special emphasis shall be given to the area near where the drainage swale discharges into Wetland 29, to provide an early indication of hydrologic duress to plants in the wetland. The Port shall provide to Ecology bi-monthly hydrologic during the wet seasons, November through May, before construction and for at least three (3) years after completion. Maps of sample locations and vegetation in the surrounding areas, observation of stressed vegetation, any adaptive management implemented in the surrounding areas, comparison to baseline data, and conclusions shall be documented and submitted to Ecology on a monthly basis during that period. At the end of each water year the Port shall complete and submit to Ecology a trends analysis with proposed contingency measures identified and a schedule for completion of the proposed contingency measures.</p>
e)	<p>The wetland protection swale shall be inspected and maintained at a minimum frequency of two (2) times per year. Swale maintenance shall include adjustment of flow control weir boards to provide appropriate flows to Wetland 29, and removal of vegetation or fill in the swale which may interfere with the seepage collection and diversion functions of the swale. The weir shall be calibrated so that flow rates can be observed at any time.</p>
f)	<p>Increased Buffer Area: In order to protect the hydrologic functions, and hydrology supporting Wetlands 29, 30, B5, B6, B7, and B9, all areas up slope of the wetlands within the property shall be included in the wetland buffer. Additionally, the Port shall ensure protection of hydrology to Wetlands 29, 30, B5, B6, B7, and B9 from future development. The wetland protection swale shall also be included in a restrictive covenant, with 25 foot buffers on either side of the swale. Those areas are depicted in Attachment D (Revised), Borrow Area 3 Wetland Buffer. A restrictive covenant shall be drafted for this additional buffer area. The restrictive covenant shall be consistent with other restrictive covenants established for this project. The Port shall record the restrictive covenants with King County no later than</p>
	<p>Hydrology monitoring in Borrow Area 3 is described in Section 5.3.3.4 (page 5-152).</p>
	<p>The required inspection and maintenance of the swale are identified in Section 5.3.3.6 (page 5-153).</p>
	<p>Appendix G provides restrictive covenant language and a map for the buffers for Wetlands 29, 30, B5, B6, B7, and B9 that is consistent with the certification requirements. This buffer also encompasses Wetland B10.</p>

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5. Borrow Site One		
	<p>The performance standards for Borrow Site One in Table 5.3-6 of the NRMP (July 31, 2001) allow for monitoring of the wetland hydrology. The evaluation approach shall compare the shallow groundwater data collected to data collected pre-construction. Wetlands 48, B15, 32, B12, B4, and B1 shall be evaluated using this approach. The Port shall provide to Ecology bi-monthly hydrologic monitoring during the wet seasons, November through May, for at least three (3) years after completion. Maps of sample locations and vegetation in the surrounding areas, observation of stressed vegetation, any adaptive management implemented in the surrounding areas, comparison to baseline data, and conclusions shall be documented and submitted to Ecology on a monthly basis during that period. At the end of each water year the Port shall complete and submit to Ecology a trends analysis with proposed contingency measures identified and a schedule for completion of the proposed contingency measures.</p>	<p>Section 5.3.3.4 (page 5-152) lists the performance standards for Borrow Site 1 which were revised to meet this requirement</p>
6. Borrow Site Three		
a)	<p>The site plan from Hart Crowser titled Post Reclamation Topographic detail Borrow Area 3 Wetland Protection Swale HNTB revision (June 15, 2001 Draft) shows a flow dispersal trench overlapping with a small portion of Wetland 29. The flow dispersal trench shall not be constructed so that it is in the wetland.</p>	<p>Figures in Appendix H show the drainage swale is constructed outside of the Wetland 29 boundary.</p>
b)	<p>The wetland protection swale shall be lined (with HDPE or other similar liner material) where necessary to minimize infiltration of captured seepage water through the bottom of the swale (as described in Hart Crowser 2000b Sea-Tac Airport Third Runway - Borrow Area 3 Preservation of Wetlands; memorandum from Michael Kenrick and Michael Bailey (Hart Crowser) to Jim Thomson (HNTB) on wetland hydrology and proposed drainage swale design (October 20, 2000)).</p>	<p>Figures in Appendix H show that the drainage swale in Borrow Area 3 is lined with a 30 mil. HDPE liner that is protected by 8-inch quarry spalls.</p>
c)	<p>Excess water from the stormwater overflow structure shall be diverted away from the wetland protection swale to a stormwater detention pond (as described in Hart Crowser 2000b Sea-Tac Airport Third Runway - Borrow Area 3 Preservation of Wetlands; memorandum from Michael Kenrick and</p>	<p>Figures provided in Appendix H show how excess water will be diverted away from wetlands, as required by this condition.</p>

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b)	The plan shall use the same goals and performance standards as the NRMP approved by this Order.	The goals and performance standards shown in the NRMP are listed in Table 6 of the Wetland A17 Report.
c)	The plan shall evaluate the feasibility of improving the hydrologic connection of the Wetland A17 Complex to Miller Creek via "Water D", including but not limited to removing the underground pipe. If it is feasible to improve the hydrologic connection of the Wetland A17 Complex to Miller Creek via "Water D", the Port shall include a plan for improving the connection in its submittal	The wetland restoration plan for Wetland A17 includes removing three culverts and road fill associated with driveways in order to hydrologically connect Wetland A17 (refer to page 2-1 of the Wetland A17 Report, Section 5.2 of the NRMP, and Appendix B of the NRMP.
d)	Homes, driveways, concrete, fill, septic systems and other unsuitable material with be removed from Wetlands A17b/c/d, in a manner that meets the treatment protocol established for the Miller Creek restoration in the NRMP.	Removal of homes, driveways, concrete, fill, septic systems and other unsuitable material will be removed from Wetland A17 (page 2-1 in the Wetland A17 Report, Section 5.2.1 (page 5-64) of the NRMP, and Appendix B of the NRMP.
e)	The plan shall develop a buffer restoration and re-vegetation plan for this area that meets the treatment protocol for the Miller Creek restoration in the NRMP. This shall include the removal of invasive species, and replanting of appropriate native species.	Tables 6, 7, 8, 9 and Sheets L5.1 through L5.6 in the Wetland A17 Report identify buffer restoration and re-vegetation plans. Protocols that describe invasive species management and planing are the same as those included in the NRMP.
f)	The plan shall evaluate the potential for wetland restoration, creation and enhancement within this new mitigation zone. This shall include evaluation of the reconnection of Wetlands A17b and A17c by removal of the road between them and removal of the road that separates Wetlands A17a and A17b. Ecology recognizes the need for an access road to the TRACON facility between Wetlands A17c and A17d.	Wetland restoration activities that are planned for Wetland A17 are listed on page 2-1 and Table 4 (page 2-4) of the Wetland A17 Report.
g)	The buffer shall be joined with the buffer on Miller Creek to the south.	Appendix B (Sheets L5.1 through L5.4) and Figure 5.2-1 of the NRMP show the Wetland A17 buffer joined with the buffer along Miller Creek.
h)	A restrictive covenant shall be drafted for this additional mitigation area. The restrictive covenant shall be consistent with other restrictive covenants established for this project. The Port shall record the restrictive covenants with King County no later than sixty (60) days after the issuance by the U.S. Army Corps of Engineers of the Section 404 required for construction of the Master Plan Update projects.	Restrictive covenant language for the Wetland A17 restoration area is provided in Appendix G of the NRMP.

PORT OF SEATTLE MASTER PLAN UPDATE IMPROVEMENTS.

Summary of changes to the Natural Resources Mitigation Plan made to comply with the Water Quality Certification #1996-4-02325, September 21, 2001.

401 WATER QUALITY CERTIFICATION CONDITION	RESOLUTION
<p>Ecology.</p> <p>Violation of any term of the restrictive covenants shall be considered a violation of this Order.</p>	
<p>D3. Submittal of a Revised Mitigation Plan</p> <p>The Port shall submit to Ecology for its review and written approval a revised NRMP which includes the changes or additions required by this Order for review and written approval no later than December 31, 2001. The revised NRMP shall include revised plan sheets that address the corrections required in Attachment B</p> <p>If, after revision of the NRMP required by this Order, the Port submits a further revised NRMP to the U.S. Army Corps of Engineers for review, the Port shall simultaneously submit the same revised NRMP to Ecology for its review and written approval. No fill shall be placed in waters of the state until the revised NRMP submitted to the U.S. Army Corps of Engineers has been approved by Ecology.</p> <p>A Final NRMP shall be prepared and submitted to Ecology within three months after a Section 404 permit has been issued by the U.S. Army Corps of Engineers.</p>	<p>A revised NRMP was submitted to Ecology in November 2001.</p>
<p>D4. Mitigation for Temporary Impacts</p> <p>a) The wetland/riparian zone comprised of Wetlands A17b/c/d (Wetland A17 Complex) and "Water D" shall be added to the wetland and buffer restoration/enhancement on Miller Creek. This area is depicted in Attachment C titled "Wetland A17 Complex". A 100-foot buffer shall be placed to envelop this system. Wetlands A17b/c/d comprise a total of 2.64 acres and "Water D" totals 0.16 acres for a combined total of 2.80 acres (not including the buffer). The buffer shall be averaged, similar to the buffer on Miller Creek. The buffer area may include location of the airport detection system (ADS) to the extent that its footprint has been minimized to the extent practicable.</p>	<p>A report (Miller Creek Riparian Corridor and Instream Enhancement Project, Wetland A17 Restoration, Seattle Tacoma International Airport Master Plan Update Improvements Parametrix 2001) (hereafter referred to as the "Wetland A17 Report") describes the additional mitigation required for temporary wetland impacts. It was submitted to Ecology on November 8, 2001. The contents of the report and mitigation requirements of this condition have been incorporated into the NRMP (Section 4, Section 5.2, and Appendix B).</p>

PORT OF SEATTLE MASTER PLAN UPDATE IMPROVEMENTS.

Summary of changes to the Natural Resources Mitigation Plan made to comply with the Water Quality Certification #1996-4-02325, September 21, 2001.

401 WATER QUALITY CERTIFICATION CONDITION		RESOLUTION
o)	Yacca Farm Mitigation Site- Revised Table 5.1-7 of the NRMP (July 31, 2001) Final performance standards shall have a note added that reads: "Observable surface flow must be present in the created channel at all times."	A condition requiring the presence of surface flow in Miller Creek was added to Table 5.1-7 (page 5-22).
p)	Contingency measures and additional monitoring of the mitigation areas shall be required by Ecology if wetland monitoring reveals that vegetation establishment or wildlife use of the wetland is not sufficient to meet the success standards. Additional monitoring may be required beyond the fifteen (15) year period if mitigation success is not achieved within the fifteen (15) year monitoring period.	Section 4.3.1 (page 4-36) has been revised to reflect the requirements of this condition.
q)	The wetland mitigation planting plan shall be field inspected by Parametrix, Inc. or another qualified wetland consulting firm during construction and planting to ensure proper installation.	Section 4.3.1.1 (pages 4-36 through 4-38) identifies the required field inspection requirements.
r)	The boundaries of the mitigation area and buffers shall be permanently marked with stakes at least every 100 feet or with construction fencing. The marking shall include signage that clearly indicates that mowing and fertilizer/pesticide applications are prohibited within mitigation areas.	Section 4.3.2.5 (page 4-49) describes fencing and signage requirements. Appendix P indicates for each mitigation project the specific fencing and signage plan.
s)	Ecology and the U.S. Army Corps of Engineers shall be notified a minimum of three days in advance of field monitoring work by the Port. Ecology or its designee shall be allowed access to all mitigation sites for the entire monitoring period.	This requirement is identified on page 4-37 and on the data sheets contained in Appendix I.
D2. Restrictive Covenants:		
The Port Shall place restrictive covenants on the deeds for the following mitigation sites: Miller Creek Mitigation Area; Miller Creek/Lora Lake/Vacca Farm Wetland and Floodplain Mitigation Area; Tyee Valley golf Course Mitigation Area; Auburn Wetland Mitigation Area; and Des Moines Creek Mitigation Area (June 28, 2001, Foster, Pepper and Shefelman). The Port shall record the restrictive covenants with King County no later than sixty (60) days after the issuance by the U.S. Army Corps of Engineers of the Section 404 required for construction of the Master Plan update projects.		Restrictive Covenants and maps are provided in Appendix G.
Any Changes to the restrictive covenants shall require written approval by		

PORT OF SEATTLE MASTER PLAN UPDATE IMPROVEMENTS.

Summary of changes to the Natural Resources Mitigation Plan made to comply with the Water Quality Certification #1996-4-02325, September 21, 2001.

RESOLUTION	
<p>401 WATER QUALITY CERTIFICATION CONDITION</p> <p>where the hydrology is being replaced through inputs from the replacement drainage channel. Emergent non-invasive plants provide a better indicator for general plant species trends over time than trees and shrubs because typically their root structures are shallower, and subsequently respond to hydrologic changes more quickly. The Port shall amend the monitoring condition in Table 5.2-12 to read: "Wetland indicator status (WIS) of the dominant noninvasive plant species shall not differ from pre-project conditions during or at the end of the monitoring period. Each vegetative strata (trees, shrubs and emergents) shall be assessed separately, and have separate conclusions. Statistically valid sampling procedures will be employed to monitor these potential changes, in all areas where there is a potential to change the post construction hydrology (down slope of the embankment, and the borrow sites). WIS status of the vegetation will be calculated as described in the 1987 USACE or Washington State Department of Ecology delineation manuals."</p>	<p>described in Appendix L.</p>
<p>k) In all areas where soil saturation is being monitored the performance standards shall include the following conditions: "Other wetlands with predominantly mineral soils shall have groundwater within the upper 10 inches from at least March to mid-April in years of normal rainfall."</p>	<p>This monitoring and performance requirement is discussed on page 5-114. Additional details on the sampling methods to complete this monitoring are provided in Appendix L.</p>
<p>l) Soils stockpiled for mitigation purposes for over one year require the reintroduction of naturally occurring microbes, prior to use in mitigation sites. This shall be accomplished through introduction of soils microbial inoculants, or through introduction of well decomposed organic matter.</p>	<p>Requirements for adding microbial inoculants and/or well-decomposed organic matter to stockpiled soil are identified on page 5-120 and 7-74.</p>
<p>m) The Port shall redevelop the sample data sheets to meet all the monitoring requirements set forth this order.</p>	<p>Appendix I contains sample data sheets that reflect the monitoring requirements of the <i>Water Quality Certification</i>.</p>
<p>n) Auburn Mitigation Site- Emergent marsh plants shall be planted with rhizomes 12" on center (o.c.) instead of the 18" o.c. currently specified. Areas that are designated for hydroseeding that have visible surface water at the time of planting those areas shall be planted with plugs. Routine maintenance, such as, weeding, removal of non-native species, and watering, shall occur at least twice a year in all areas and more often in areas if needed. The maintenance crew shall be overseen by a wetland biologist to assist with identifying invasive species and identifying problem areas.</p>	<p>Planting of the emergent plant communities in the Auburn mitigation site are described in Section 7.3.4.3 (page 7-67). The planting design reflects the required conditions.</p> <p>Routine maintenance activities, procedures, and oversight are described in Sections 4.3.2.1 (page 4-44) and 7.7.1 (page 7-84).</p>

PORT OF SEATTLE MASTER PLAN UPDATE IMPROVEMENTS.

Summary of changes to the Natural Resources Mitigation Plan made to comply with the Water Quality Certification #1996-4-02325, September 21, 2001.

RESOLUTION	
	<p>401 WATER QUALITY CERTIFICATION CONDITION</p> <p>confines of the contingency measures identified in the NRMP. All contingency measures shall be implemented in a manner such that they do not exceed state water quality standards.</p>
g)	<p>The Port shall monitor hydrologic conditions of all wetlands downslope of the Third Runway embankment in the Miller, Walker and Des Moines Creek sub-basins. Hydrologic monitoring using piezometers and shallow hand dug soil pits in undisturbed wetlands downslope of the Third Runway embankment shall be conducted with sufficient frequency to determine wet season trends. The Port shall immediately begin conducting twice-monthly hydrologic monitoring during the wet season, November through May, and shall continue such monitoring for at least three (3) years after completion. Maps of sample locations and vegetation in the surrounding areas, observation of stressed vegetation, any adaptive management implemented in the surrounding areas, comparison to baseline data, and conclusions shall be documented and submitted to Ecology on a monthly basis during that period. At the end of each water year, the Port shall complete a trends analysis with proposed contingency measures identified and a schedule for completion of proposed contingency measures.</p>
h)	<p>Existing wetland and mitigated wetland boundaries (including all areas down slope of the Third Runway embankment, Vacca farm, the borrow sites, and the Auburn mitigation site) shall be delineated at years five (5), ten (10), and fifteen (15). A licensed survey crew shall survey the wetland points established. The delineation map and comparisons to previous delineation maps shall be furnished to Ecology by December 31st for each of the years in which a delineation is conducted. If the delineation shows the wetland boundaries have decreased then additional in-basin mitigation may be required by Ecology.</p>
i)	<p>Final performance standards for the replacement drainage channel shall read: "Construct the replacement channel to convey all storm events equal to or less than the 100-year, 24-hour design storm and seepage water collected by the embankment drains layer and adjacent areas." (Revised Performance Standards, Table 5.2-12 NRMP)</p>
j)	<p>Revised Table 5.2-12 of the NRMP (July 31, 2001) proposes a performance standard that monitors the change in plant species in undisturbed wetlands.</p>
	<p>This requirement is identified on page 4-36. Hydrologic monitoring requirements are also outlined in Tables 5.1-7, 5.2-12, 5.2-13, 5.2-16, 5.2-17, 5.3-2, 5.3-3, 7.5-1, and 7.7-1. Appendix L summarizes the hydrology data collected by the Port to date.</p>
	<p>This requirement is identified on pages 4-39, page 4-40, and in Appendix L (page L-5).</p>
	<p>Table 5.2-12 (page 5-114) identifies that the channels must convey the 100-year, 24-hour storm plus the seepage water that emanates from the embankment.</p>
	<p>This monitoring and performance requirement is discussed on page 5-114. Additional details on the sampling methods to complete this monitoring are</p>

PORT OF SEATTLE MASTER PLAN UPDATE IMPROVEMENTS.

Summary of changes to the Natural Resources Mitigation Plan made to comply with the Water Quality Certification #1996-4-02325, September 21, 2001.

401 WATER QUALITY CERTIFICATION CONDITION		RESOLUTION
D1. Required Mitigation:		
a)	The Port shall increase the duration of monitoring from ten (10) to fifteen (15) years.	The increase in the duration of the monitoring from 10 to 15 years is described in Section 4.3 (pages 4-35 and 4-39) and in the monitoring section for each mitigation project. The following tables were modified to reflect the 15 year monitoring requirement: Tables 5.1-7, 5.1-8, 5.1-13, 5.2-3, 5.2-9, 5.2-12, 5.2-13, 5.2-16, 5.2-17, 5.2-18, 5.3-2, 5.3-3, 7.5-1, and 7.7-1
b)	Table 4.2-1 of the NRMP (July 31, 2001) outlines the performance standards for vegetation cover by vegetation zone and monitoring year. A note shall be added to the table that states: "Invasive plant species cover will be monitored during all monitoring years."	Information previously provided in Table 4.2-1 is now in Table 4.3-1 (page 4-42). Invasive plant species cover will be monitored during all monitoring years.
c)	In addition to the non-native invasive species listed in Table 4.2-2 of the NRMP (July 31, 2001), hedge bindweed (<i>Convolvulus sepium</i>), giant knotweed (<i>Polygonum sachalinense</i>) and evergreen blackberry (<i>Rubus laciniatus</i>) shall be monitored and controlled in the mitigation sites.	The listed species were added to Table 4.3-2 (page 4-48).
d)	All performance standards addressing cover of non-native plants shall read: "Cover of non-native invasive species will be no greater than 10% in any year in newly planted or enhanced areas."	The required standard for invasive plant coverage was added to Tables 5.1-7, 5.2-3, 5.2-12, 5.2-16, 5.3-2 and 7.7-1.
e)	Table 5.1-7 of the NRMP (July 31, 2001) states that shade cloth will be placed over the new channel. The Port shall provide a map of the location for the shade cloth, details on how it will be installed, and a schedule of installation and removal.	Section 5.1.1.6 (page 5-20) and footnote "d" in Table 5.1-7 (page 5-26) identify use of shade cloth for the stream relocation. Installation of the shade cloth is shown on Sheet L6 (Appendix A). The cloth will be installed between stations 2+00 and 13+00 on the relocated segment of Miller Creek (Sheet C2 Appendix A indicates the location of these stations).
f)	The Port shall provide Ecology with written documentation of the implementation of any of the contingency measures and adaptive management measures set forth in the NRMP. Temporary erosion and sedimentation measures approved by Ecology shall remain in effect for all adaptive management measures or contingency measures implemented. Any problems identified throughout the mitigation sites shall be immediately corrected. Implementation of corrective actions shall be done within the	This requirement has been added to Section 4.3.2 (pages 4-43 and 4-44). The requirement that contingency measures meet State Water Quality Standards is identified on page 4-49.

Kenny, Ann

From: Jim Kelley [jkelley@parametrix.com]
Sent: Wednesday, December 19, 2001 10:45 AM
To: Kenny, Ann
Cc: Stockdale, Erik; Klw@shanwil.com
Subject: Revised NRMP



401-Conditions
Matrix-NRMP.doc...

Ann,

Attached is a matrix that identifies how the NRMP was revised to address the requirements of the 401 Certification.

Jim

Jim Kelley jkelley@parametrix.com
Parametrix, Inc.
Main: 425-822-8880 FAX: 425-889-8808
Direct: 425-828-4202 extn 3315

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