UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

OFFICE OF
AIR, WASTE AND TOXICS

Mr. William Ernst
Company Energy & Environmental Affairs
The Boeing Company
P.O. Box 3707
MC 1W-12
Seattle, Washington 98124-2207

Mr. Michael Gleason
Company Energy & Environmental Affairs
The Boeing Company
P.O. Box 3707
MC 1W-12
Seattle, Washington 98124-2207

Re: Final Decision and Response to Comments for Boeing Plant 2 Sediments, Duwamish Sediment Other Area and Southwest Bank, Boeing Plant 2, Seattle/Tukwila, Washington, Resource Conservation and Recovery Act (RCRA) Docket No. 1092-01-22-3008(h) EPA ID No. WAD 00925 6819

Dear Mr. Ernst and Mr. Gleason:

This letter is to notify The Boeing Company (Boeing) that the U.S. Environmental Protection Agency, Region 10 (EPA) has issued its Final Decision and Response to Comments for Plant 2 Sediments containing the final remedy for the Duwamish Sediment Other Area and Southwest Bank (DSOA) and other Plant 2 sediment areas, pursuant to the above referenced Order. This Final Decision is for Lower Duwamish Waterway sediments associated with the Plant 2 facility only. The uplands areas of the facility will require submission by Boeing of the required Uplands Corrective Measures Study (CMS) of alternatives followed by the issuance of a Statement of Basis by EPA and a formal public participation process before a Plant 2 Uplands Final Decision may be issued. The Final Decision and Response to Comments for Boeing Plant 2 Sediments are enclosed.

EPA has selected the preferred alternatives described in the Statement of Basis: North 2 (N2) for the northern area, and South 4 (S4) for the southern area, along with the single alternatives developed for the other much smaller sediment areas. Note that N2 was described in the Boeing *Corrective Measures Alternatives Evaluation for the Duwamish Sediment Other Area and Southwest Bank Alternatives Evaluation Report* (DSOA CMS) (Boeing 2011) as Alternative N1. EPA chose to identify this alternative as N2 (and correspondingly to identify DSOA CMS alternative N2 as N1) to be consistent with the rationale for the way the four southern area alternatives were organized. EPA has selected the alternatives for the northern and southern areas, respectively, that utilize variable depth dredging to remove all contaminated sediment and slope material above state Sediment Quality Standards and then replace them with clean backfill, as described in detail in Boeing Plant 2 Sediments DSOA and Southwest Bank Statement of Basis and DSOA CMS.

The public was provided an opportunity to comment on the proposed sediments corrective action in the Statement of Basis from March 28th until May 29, 2011. All of the comments and EPA responses are contained in the enclosed Final Decision and Response to Comments for Boeing Plant 2 Sediments. This letter and enclosed Final Decision and Response to Comments will be provided to the public via the Region 10 Lower Duwamish Waterway and the Boeing Plant 2 webpages.

We appreciate your efforts to complete cleanup at this high-priority RCRA facility. Should you have questions, please don't hesitate to call me at 206-553-4166 or email me at Blocker.Shawn@epa.gov .

Sincerely,

Shawn Blocker
Project Coordinator
RCRA Corrective Action and Permits Team

Enclosure

cc: Hideo Fujita, Ecology – NWRO
Brad Helland, Ecology – NWRO
James Rasmussen – DRCC
Glen St. Amant – Muckleshoot Tribe
Allison O'Sullivan – Suquamish Tribe
Denise Taylor – Suquamish Tribe
Jessica Winter – NOAA
Heather Trim – People for Puget Sound
Jeannie Hale- The Seattle Community Council Federation.

FINAL DECISION AND RESPONSE TO COMMENTS
Boeing Plant 2 Sediments
Duwamish Sediment Other Area and Southwest Bank
Seattle/Tukwila Washington

INTRODUCTION

On March 28, 2011, the United States Environmental Protection Agency, Region 10 (EPA) issued a Statement of Basis ("SOB") for Corrective Action for Sediments adjacent to the Boeing Plant 2 facility, referred to as the Boeing Plant 2 Sediments, or Plant 2 Sediment, including the Duwamish Sediment Other Area (DSOA) and Southwest Bank. The Statement of Basis was issued pursuant to the Administrative Order on Consent 1092-01-22-3008(h) of the Resource Conservation and Recovery Act (RCRA) issued January 18, 1994. The Statement of Basis discussed sediment corrective action alternatives, applicable law and cleanup standards and proposed corrective measures for Lower Duwamish Waterway sediments and bank material associated with the Boeing Plant 2 facility. The Statement of Basis did not in any way address corrective measures for Plant 2 facility upland areas. They will be addressed in a separate Statement of Basis and Final Decision in the future. A public comment period was held from March 28th until May 29th, 2011, with a public meeting on April 27th, 2011, at the South Park Community Center in Seattle, Washington.

SELECTED MEDIA CLEANUP LEVELS

The recommended corrective action for all Plant 2 sediment areas is excavation to a target depth to remove all contaminated sediments that exceed the Sediment Quality Standards (SQS) of the Washington State Sediment Management Standards (SMS), followed by backfilling with clean material. The clean backfill material must meet Final Media Cleanup Levels (FMCLs) which consist of one of four values: 1) Target Media Cleanup Levels (TMCLs); 2) natural background values; 3) SQS in limited circumstances; or 4) the Practical Quantitation Limit (PQL) for a specific contaminant.

TMCLs were calculated in the Boeing *Target Media Cleanup Levels Technical Memorandum* (Boeing 2010) as approved by EPA. They are risk-based concentrations that are calculated for direct contact exposures and as soil values to prevent leaching to groundwater in concentrations that could pose an unacceptable risk to aquatic species and humans who consume LDW seafood.

Natural background values are derived from two sources: 1) the OSV Bold survey ("Bold background")(EPA, 2008) values; and the 2) the *Ecology State-Wide Natural Background for Metals in Soil* ("Soil background ")(October 1994). Upon comparison, the Bold Survey values were less stringent that the Soil background values for the constituents listed below where background values are used.

SQS numerical criteria were promulgated for the protection of benthic invertebrates, such as clams or oysters. They correspond to sediment quality that will result in no adverse affects on such biological resources. SQS numerical criteria are not human health related values. Any cleanup level based on SQS will be designated as "less than" in the table below since any concentration detected at the SQS requires evaluation to determine if further corrective action is needed.

PQLs represent the concentration that can be reliably measured within specified limits during routine laboratory operating conditions. Concentrations that are below the PQL are not considered reliable, or are not detectable. For PCBs, the only hazardous constituent for which the PQL is the FMCL, PCB concentrations must be below a PQL that is at a minimum 0.03 ppm.

The TMCLs are the starting value for determining FMCLs. MTCA requires that all final cleanups achieve natural background levels where risk-based concentrations (TMCLs) are more stringent than background. Therefore, wherever TMCLs are more stringent than natural background, the natural background value is used. SQS values are used only when 1) the TMCL is less stringent than the SQS, or 2) the TMCL statistically equivalent and the TMCL may be slightly biased. In no instance may the FMCL exceed the SQS.

The FMCLs are as follows:

Constituent	SQS	Proposed value in Statement of Basis	TMCL	Background (S/B)[1]	PQL	FMCL
PCBs[2]	12 ppm OC	0.00006	0.00006	na	0.03	0.03
Cadmium	5.1	0.77	4	0.77/0.9	na	<5.1
Lead	450	250	250	24/21.6	na	250
Chromium[3]	260	0.22	1.2	none/67.6	na	67.6
Copper	390	36	80	36/49.9	na	49.9
Mercury[4]	0.41	0.07	1.5	0.07/0.2	na	<0.41
Silver	6.1	3.7	170	none/0.3	na	<6.1
Zinc	410	85	1,400	85/94.6	na	<410
Arsenic	51	20	20	20/13.6	na	13.6

All concentrations in mg/kg (ppm)

1 - Background values are from the Ecology State-Wide Natural Background for Metals in Soil ("Soil Background ") (October 1994), the "S" column, or from the OSV Bold Study ("Bold Background"), (EPA, 2008) identified in the "B" column.

2- SQS values are based on parts per million total organic carbon, the other PCB values are based on total PCBs without organic carbon normalization.

3 - The Chromium values in the statement of basis values are based on hexavalent chromium, whereas the SQS and background values are based on total chromium. This distinction is discussed in depth in the text.

4 - Mercury values are based on elemental mercury.

PCBs: In the SOB, EPA proposed a concentration level for the backfill material based on the TMCL document that was protective of human health that was below the PQL. As discussed above, the PQL

represents the lowest concentration that can be reliably measured. Therefore, EPA has selected 0.03 ppm as the FMCL to ensure protection of human health.

Cadmium: The proposed TMCL for the backfill material in the Statement of Basis was based on the State Soil Background value. The calculated TMCL of 4 ppm was based on a site specific soil to protect groundwater for aquatic species value. Since the TMCL value is statistically equivalent to the SQS, EPA has selected the promulgated SQS value as the FMCL.

Lead: The proposed TMCL for the backfill material for lead was 250 ppm based on the human health direct contact value using MCTA Method A. Direct contact is a likely pathway for the sediments as a result of shellfish harvesting or recreational beach play. The 250 ppm TMCL value is selected as the FMCL.

Chromium: The proposed TMCL for the backfill material for chromium was 0.22 ppm. This value and the calculated TMCLs are based on chromium VI analysis, not the more commonly occurring total chromium analysis. A source of chromium VI has never been identified in the sediments. The Bold Background is based on total chromium. For this reason, a total chromium FMCL is selected as the FMCL.

Copper: The proposed TMCL for the backfill material for copper was 36 ppm in Statement of Basis, derived from the Soil Background value. The calculated soil to protect groundwater value for human health was 80 ppm. This value included attenuation factors, since the constituent travels from the soil, through the groundwater, into the waterway, and ultimately up the food chain. Sediment values would not necessary contain such attenuation factors. Because of this, the 80 ppm value could be biased high, and may not be protective for human health. To ensure that the copper FMCL is protective, EPA has selected the background sediment concentration from the Bold Survey. This value is slightly higher than the value proposed of 36 ppm, but EPA believes that data from the Bold Survey more accurately represents sediment concentrations than the state-wide soil value.

Mercury: The proposed TMCL for the backfill material for elemental mercury was 0.07 ppm. The calculated human health and ecological TMCLs are less stringent than the SQS, and therefore the SQS is selected as the FMCL for this action.

Silver: The proposed TMCL for the backfill material for silver was 3.7 ppm based on a draft TMCL document submitted to EPA with errors in calculation that EPA did not recognize prior to issuance of the Statement of Basis. A corrected calculated value, which is contained in the EPA approved TMCL submittal is 170 ppm. The calculated human health and ecological TMCLs are less stringent the SQS, and therefore the SQS is selected as the FMCL for this action.

Zinc: The proposed TMCL for the backfill material for zinc was 85 ppm. The calculated human health and ecological TMCLs are less stringent the SQS, and therefore the SQS is selected as the FMCL for this action.

Arsenic: In the TMCLs, EPA proposed 20 ppm as the concentration level for the backfill material for arsenic. As with copper and silver, this value is based on soil and includes attenuation factors. For this reason, calculated soil values could be biased high and may not be protective. To ensure that the arsenic FMCL is protective, EPA selected the background sediment concentration from the Bold Survey as 13.6 ppm as statistically equivalent to 20 ppm and consistent with the methodology for some other metals above.

SELECTED CORRECTIVE MEASURES

North Area Alternative

This alternative is a variable-depth dredge and backfill design based on the interpretation of the geospatial analysis. EPA identified this alternative as North Area Alternative 2 (N2), whereas Boeing identified this as North Area Alternative 1 in the DSOA CMS Alternatives Evaluation Report. Over most of the area, elevated concentrations of PCBs are confined to the 2 to 5 foot depth. In a few areas adjacent to the channel, elevated concentrations of PCBs extend down to 15 feet below the existing surface. The minimum proposed dredge cut over the entire North Area would be 2 feet with deeper dredge cuts in areas where concentrations of PCBs are above the SQS at depth. All North Area sediments with hazardous constituent concentrations above the SQS would be removed.

After dredging, the area will be backfilled with clean sand to return the surface to the existing grade. Backfill within ten feet of the navigation channel and within the channel itself would not exceed -19 feet Mean Low Low Water (MLLW) in order to maintain the authorized channel depth.

The total estimated dredge volume for Alternative N2 is 114,000 cubic yards. The sediment that would be removed would be disposed of at an appropriate permitted upland disposal facility. No capping would be required under this alternative.

South Area Alternative

This alternative was identified as South Area Alternative 4 (S4) in both the EPA Statement of Basis and in the Boeing DSOA CMS Alternatives Evaluation Report. This alternative combines a variable-depth dredge to as low as 20 feet with a backfill of clean sand that meets FMCLs. In approximately 50 percent of the South Area, concentrations of PCBs are confined to the 2 to 6 foot depth. The minimum proposed dredge cut over the entire South Area would be 2 feet with deeper dredge cuts in areas where there are concentrations of PCBs above the SQS at depth. Based on available data, all South Area sediments with hazardous constituent concentrations above the SQS would be removed except in up to four locations.

At each of these four locations the proposed dredge cuts are four feet deeper than the deepest sample analyzed. Based on the observed contaminant concentrations in other borings, removing four feet of additional material should remove all material above SQS. If the proposed dredging does not remove all contaminants above the SQS, EPA has determined that the presence of minimal concentrations of contaminants at least 20 feet below the surface does not present any significant risk to human health or the environment and a sediment cap would not be required.

After dredging, the areas will be backfilled with clean sand to return them to the existing grade. Backfill within ten feet of the navigation channel and within the channel itself would not exceed -19 feet MLLW in order to maintain the authorized channel depth.

The estimated total dredge volume for South Area Alternative S4 is 86,000 cubic yards. Dredged sediment would be disposed of at an appropriate permitted upland disposal facility. No capping would be required.

Other Areas

Only one potential remedy, excavation of all material contaminated above SQS, is proposed for these areas. The amount of material proposed for removal in these areas is less than 7% of the total volume of contaminated sediments addressed by this Statement of Basis. These other areas are identified as the Southwest Bank, the 2-40's Underbuilding Area, Slip 4 (Boeing area only), and the North Bank.

Post Construction Monitoring

All of the corrective action alternatives include post construction monitoring. Groundwater and stormwater will be sampled semi-annually to ensure Plant 2 is not the source of any sediment recontamination. The clean sediment surface will also be monitored for at least 10 years. If contamination is revealed in the groundwater or stormwater, Plant 2 releases would have to be controlled and recontamination from Plant 2 sources would have to be addressed. This work would be performed under CERCLA or MTCA as part of the LDW-wide process. If Plant 2 sediments become recontaminated and Boeing can demonstrate that the contaminants did not originate from Plant 2, this recontamination would be addressed by the responsible parties for these releases.

PUBLIC PARTICIPATION ACTIVITIES

A public comment period was held from March 28th until May 29th, 2011. A public meeting was held on April 27th, 2011, at the South Park Community Center. Comments were received from a variety of organizations and individuals and are presented in Attachment 1.

FUTURE ACTIONS

Based on the selected remedies, Boeing will prepare and submit a Corrective Measures Implementation (CMI) Work Plan for the Duwamish Sediment Other Area and Southwest Bank within 60 days of issuance of this decision. Once in an approvable form, the Plan will go through a 30 day stakeholder review period. At the end of the stakeholder review period, the plan will be modified, if necessary, and approved. In addition to the CMI Work Plan, Boeing will complete all permitting and other requirements as necessary to complete the implementation of the CMI Work Plan.

DECLARATIONS

Based on the administrative record compiled for this corrective action, I have determined that the selected remedy to be ordered at the Boeing Plant 2 Duwamish Sediment Other Area and Southwest Bank is appropriate and will be protective of human health and the environment.

Richard Albright, Director
Office of Air, Waste and Toxics
EPA Region 10

August 8, 2011 Date

ATTACHMENT 1

RESPONSE TO COMMENTS

Below are the comments received from the public during the public comment period. Included with each comment is EPA's response. The comments are divided into two categories - summary comments and specific comments. Summary comments represent those similar comments received by multiple entities; where multiple parties provided the same input. Specific comments are those that should be addressed individually.

SUMMARY COMMENTS

COMMENT 1: Paraphrase "We support the selection of Alternatives N2 and S4 for the Boeing Plant 2 Duwamish Sediment Other Area and Southwest Bank". Mr. Jack Tomkinson, Seattle, Mr. Mark Stoner, Seattle, Ms. Kate Kaemerle, Seattle, Ms. Jennifer Clarke, Seattle, The Duwamish River Cleanup Coalition, The Muckleshoot Indian Tribe, The Seattle Community Council Federation, Julieta M. and Adolfo Montana, South Park, Concepcion Rojo, South Park.

EPA RESPONSE: Comment noted.

COMMENT 2: Paraphrase "We/I are concerned with the possibility of suspended sediments moving around and contaminating other areas of the waterway during the remediation." Ms. Jennifer Clarke, Seattle, The Duwamish River Cleanup Coalition, The Muckleshoot Indian Tribe, The Seattle Community Council Federation.

EPA RESPONSE: EPA completely agrees, and will require aggressive monitoring, pre, during, and post construction, coupled with best management practices and cutting edge technologies to ensure minimal impact to sediments outside of the Plant 2 DSOA boundaries.

COMMENT 3: Paraphrase "Source control for the entire Duwamish and Green River must be completed to ensure that remedies downstream are not recontaminated." The Duwamish River Cleanup Coalition, The Muckleshoot Indian Tribe, The Seattle Community Council Federation

EPA RESPONSE: Source control for the Duwamish and Green River is being performed by the Washington State Department of Ecology.

SPECIFIC COMMENTS

COMMENT 1.

"Dear Mr. Blocker,

The Habitat Program has conducted a technical review of the above-referenced Statement of Basis. As you know, the Muckleshoot Indian Tribe's Usual and Accustomed Fishing Grounds includes all of the aquatic area that is the focus of the Boeing Plant 2 sediment cleanup. This portion of the Duwamish River encompasses important locations where the Tribe exercises its federally-adjudicated fishing rights. Adequate cleanup of this site is a necessary step for the protection of the health of tribal fishers

exercising their treaty rights in this area and for the protection of the aquatic ecosystem, which contributes to the health of the fishery itself.

Upon general review of the document, we do not disagree with EPA's comparison of the presented cleanup alternatives or with EPA's selection of a preferred alternative for both the North and South Areas of the site. We do, however, want to emphasize the need for close coordination and consultation in advance with us regarding construction timing, equipment utilized for remediation, and potential impacts to Tribal fishing in the area. These potential impacts are cumulative with the impacts related to the numerous other activities that will be simultaneously occurring in the same portion of the River, including the South Park Bridge project, and other sediment cleanups nearby (e.g., Jorgensen Forge).

We, therefore, request an opportunity to meet soon with EPA and Boeing to discuss how to ensure that an adequate coordination program is developed and implemented in advance of finalizing details related to the cleanup, and how to ensure that appropriate construction methods and timing are utilized. This will be important to help assure that unnecessary impacts to Tribal fisheries in the area are avoided or minimized.

We look forward to an expeditious and adequate cleanup of the Duwamish River to protect its current and future uses. Thank you for the opportunity to comment on this very important activity. Please feel free to contact me at (253) 876-3130 to schedule additional meetings or with any questions or concerns.

Glen R. St. Amant
Habitat Program Manager
Muckleshoot Indian Tribe
Fisheries Division
39015 - 172nd Avenue SE .
Auburn, Washington 98092-9763"

EPA RESPONSE: EPA agrees that close coordination is paramount to ensure the Muckleshoot Indian Tribes' usual and accustomed fishing rights are not impinged upon. As always, EPA looks forward to including the Muckleshoot Indian Tribe, along with other Tribes with interests, in coordination meetings going forward.

COMMENT 2:

"Dear Mr. Blocker:

Boeing Plant 2 is identified as Seattle's most hazardous toxic waste site on the Duwamish River, located on the east bank of the Duwamish Waterway at 7755 East Marginal Way South in Seattle, Washington. It is documented that Boeing Plant 2 became a major aircraft manufacturing plant during World War II, relying upon PCBs and other toxic chemicals from large electricity generators and transformers. PCBs were also used by Boeing in paints and caulking at Plant 2.

Already some of the Boeing Plant 2 old building has been demolished; and now restoration of the site is vital. The Boeing Company must further proceed with removal of the contaminated mud from the river, as well as in the upland areas below the old facility. For Boeing to proceed with the EPA's guidelines for the river's cleanup and restoration at the Plant 2 site will finally address the most contaminated site on

the Duwamish River.

The Seattle Community Council Federation is aware of the EPA's *Statement of Basis* describing the cleanup options for the sediments and shoreline at Boeing Plant 2. In effect, EPA will monitor the cleanup for removal of toxic sediments from PCBs, metals, carcinogenic polycyclic aromatic hydrocarbons (cPAHS) and phthalates. Capping for isolating the contamination is not enough. Rather cleanup options should include removal of all contaminated sediments above the state sediment quality standard, followed by backfill with clean material, namely, N2 and S4: Dredge and Backfill: both the dredging of sediments up to 20 feet deep(excavation) of the sediments and then backfill with at least two feet of clean material.

(1) We understand that after the Duwamish cleanup, the groundwater and stormwater will be checked twice a year to make sure that no more contamination is coming from Boeing Plant 2. The sediments will be checked at least 10 years. We understand and support EPA guidelines in this regard.

(2) We understand that Boeing will conduct the cleanups under EPA oversight: that the EPA's target cleanup levels for Boeing Plant 2 sediments will protect tribal fishers and other people who might eat fish and shellfish from the Duwamish. We look forward to EPA choosing the most protective values for the target cleanup levels in its Final Decision and Response to Comments.

The Seattle Community Council Federation realizes that the U.S. Environmental Protection Agency and the Washington State Department of Ecology must address the impacts of poisonous contamination on fish and shellfish, food consumption, recreation, and land use concerns from neighbors of South Park, Georgetown, West Seattle, and other Seattle neighborhoods.

The Federation recommends that the Environmental Protection Agency pursue the critical dredging, capping, monitoring treatment of sediments, and natural recovery of identified waste sites on the Duwamish River.

Due to the many issues relating to the Duwamish River Cleanup, the Federation requests updated information. We want to be informed and would appreciate receiving a copy of your actual cleanup plan, final decision and response to comment. Community involvement will only help to ensure preservation of the Duwamish River that meets the needs of all concerned. Thank you for considering our views.

Sincerely,

Jeannie Hale

Jeannie Hale, President
3425 West Laurelhurst Drive NE
Seattle, Washington 98105
206-525-5135 / fax 206-525-9631
jeannieh@serv.net "

EPA RESPONSE: Comment noted, and EPA will ensure that the Federation is provided the opportunity to review and comment on the final implementation plan.

COMMENT 3:

"To Whom It May Concern:

I was not able to attend the public meeting on April 27, 2011. Perhaps the question of who will foot the bill for this cleanup was already answered. However, if not, I would appreciate an answer to that question.

My comment would be that we taxpayers are already paying for things not of our making. If this is one of those issues I would like my opposition to any taxes going to a Boeing clean up be voiced through this e-mail.

Boeing, who is already profiting by taking away jobs from our country to countries where workers are paid less, is already making a profit by using slave labor, by using our taxes for Boeing cleanup is shameful. Hardworking Americans, with yet another uncalled for and unwanted and unnecessary tax on them, will be hit with another hammer. The only winner in this fight for workers rights and human rights will be Boeing and other Corporations which are not serving any entities other than their own.

Thank You,

Dorothy Chambless
4205 SW Spokane
Seattle, WA 98116
(206)932-2178
mejiacham@aol.com"

EPA RESPONSE: The entire cleanup cost is being paid for by the Boeing Corporation. No federal tax money will be used in this cleanup.

COMMENT 4:

"To: Shawn Blocker, Environmental Protection Agency (EPA)

Cc: Duwamish River Cleanup Coalition/Technical Advisory Group (DRCC/TAG)

From: Jennifer Clarke

Subject: Cleanup Plans for Boeing Plant 2

Like the Duwamish River Cleanup Coalition, I support the EPA's selection of cleanup options N2 and S4, for the north bank and south bank, respectively, of the Duwamish River around the region of the waterway adversely affected by Boeing Plant 2. When doing background reading on the cleanup options, I was personally surprised to find that I preferred removal of sediments by dredging, compared to containment by caps and natural recovery options. I usually favor natural cycles and systems that rely on ecosystem functions to restore degraded landscapes, but with regard to the Lower Duwamish Waterway, there is simply too much at stake to rely on such unpredictable and long-term processes.

Nevertheless, I believe that the effects and repercussions of dredging should be publically acknowledged straightaway. Dredging will adversely affect several environments. First of all, sediment within the Duwamish River will be upset, and cleanup efforts will need to be extremely cautious in order to minimize the dispersal of these contaminated materials. When these sediments are suspended in the waterway, they will further degrade the water quality, having negative consequences on the biota in the Duwamish. Furthermore, I imagine that the area where new, clean sediments are taken from to provide the backfill for the Duwamish waterway will be affected. Shawn Blocker explained that these sediments might come from an area where sediments are abundant, perhaps even in excess of natural levels. Mr. Blocker's suggestion reminds me how sediments are sometimes captured and stored behind dams, and the idea of taking excess sediments from these locations—provided that the sediments were uncontaminated, of course—seems like a viable way to improve both environments (the Duwamish waterway and the reservoirs encountering excess sedimentation). However, it may be possible that the removal of sediments from other environments will adversely affect those settings, as sediments are suspended as they are taken for relocation to the Duwamish River. Additionally, if these sediments are taken from environments where sediment is not abundant or above natural levels, these locations may be harmed as the substrate surface is altered, which may impact the dynamics of local ecosystems. Finally, as the sediments surrounding Boeing Plant 2 will be taken to a landfill, the contaminated sediments are relocated. I think there is something concerning about handing these contaminated sediments off for permanent placement in a landfill. This action is against my personal belief in how we, as humans, should live on the earth. I believe that we should instead be cleaning and treating the sediment. Mr. Blocker made it clear that the costs for doing so would be outrageously high, but I believe that is the price that we (including Boeing and other responsible parties) need to pay for originally degrading the Duwamish waterway. I do not necessarily feel that these sediments need to be brought back to the Duwamish, but I do not believe they should be left contaminated or deposited in a landfill. Instead, I think that these sediments need to be cleaned and somehow returned to the world's natural systems.

The realities of the potential effects of dredging should not be ignored or downplayed. I believe that it is wise to openly include all effects—positive and negative—of each cleanup option in accessible public documents and mention these same facts during public meetings and conversations. Though I know some of the potential adverse effects of dredging, I still prefer this method of cleanup for the Duwamish waterway as I feel it is the best option to guarantee the successful restoration of the Duwamish River for human safety and the health of the ecosystem.

By now, it should be apparent that I am concerned with the overall state of the environment in the Duwamish waterway, areas where new sediments may be derived from, and locations where contaminated sediments are considered being sent. In relation, I am largely concerned with the status of the environment as a whole. Accordingly, I question the standards that are being set for cleanup levels. Making the river safe for human recreation and the consumption of fish and shellfish is an excellent goal. However, I feel as though the Duwamish should be cleaned to a point where levels of polychlorinated biphenyl (PCB) contaminants are low enough to protect the vitality of the waterway's aquatic and terrestrial life. In this way, I feel that cleanup levels for toxic metals are adequate, but cleanup goals for PCBs are too focused on anthropocentric wellbeing. Instead, I think PCB cleanup levels should be set to ensure the safety of animal life in the Duwamish. I feel that the improved health of the Duwamish River ecosystem as a whole should be the goal for restoration and cleanup activities along the waterway. I think that a continued, self-sufficient, and healthy waterway—beneficial for wildlife and human subsistence activities alike—should be the ultimate goal for the Duwamish

waterway and current cleanup efforts. I encourage the cleanup efforts to go beyond the necessary and mandated actions and levels, and instead clean the waterway and adhere to standards better than and above those required by state and federal law.

I know that some of my suggestions are costly, and likely thus inconceivable, outrageous, and unrealistic, but I believe we should be keeping the health of the environment as a whole in mind when creating plans to cleanup the Lower Duwamish River. In an ideal world, cleanup costs would not be a factor in determining which restoration actions communities and agencies chose. As it is, we should do all that we can to ensure the fullest restoration of the Duwamish possible, as that should be the most important goal of the entire cleanup process."

EPA RESPONSE: As outlined in the public meeting, it is not practical to treat these specific sediments due to the mix of contaminants within the sediments and the shear volume of material, over 230,000 cubic yards. A total of 24 different constituents have been detected in the sediments, to include PCBs, metals, SVOCs, and dioxin. The last constituent, dioxin, would require incineration in a plasma incinerator, with the nearest one located in Utah. To treat these contaminants would require a three stage treatment process followed by incineration, which would include the transportation costs to Utah. The treatment alone would exceed the current projected cost of the entire project.

COMMENT 5: The following comment is provided in its original Spanish, and then translated and responded to:

"Hola soy Juan y mi Niña es Elizabeth de 8 anos estudia en la escuela Concord y deseamos que ella y todo sus compañeros están en un ambiente sano seguro libere de cualquier contaminación

Deseamos que el rio Duwamish se limpie de basura despidieron residuos y toda contaminación. Así tendremos un ambienté sano y el hábitat del rio crecerán sanos pues de muchas personas es una fuerte de alimentación.

Gracias- Tanira y Juan yani_carmen2@yahoo.com"

"Hi! My name is Juan. My daughter, Elizabeth, who's eight years old, goes to Concord School. We wish that Elizabeth and all of her classmates live on a healthy and safe environment, free of all contamination.

We want the Duwamish River to be cleaned up from trash, residues, and all kinds of contamination. This is the only way we will be able to have a healthy hábitat and environment. This is very important because the River is a food source for many people. "

Thanks!

Janira and Juan

EPA RESPONSE: Comment noted.

COMMENT 6: Due to the length and complexity of the comment, EPA will provide a response at the end of each section, as necessary.

"May 26, 2011

Mr. Shawn Blocker
U.S. EPA Region 10
1200 6th Avenue, Suite 900, AWT -121
Seattle WA 98101
Dear Mr. Blocker:

The Duwamish River Cleanup Coalition/Technical Advisory Group (DRCC/TAG) was founded in 2005 by the member organizations of the Duwamish River Cleanup Coalition (DRCC), the Environmental Protection Agency's (EPA) Community Advisory Group (CAG) for the Lower Duwamish Waterway Superfund Site (the Site). DRCC/TAG provides technical support and public education, outreach and involvement services to the DRCC member organizations, the communities affected by the Superfund site, other Duwamish River stakeholders, and the general public.

DRCC/TAG is EPA's Technical Assistance Grant (TAG) recipient for the Duwamish River Superfund Site and is the recipient of an EPA Technical Assistance Services to Communities (TASC) Consulting grant for the Boeing Plant 2 RCRA site. DRCC/TAG and its TASC consultant have reviewed the Statement of Basis for Proposed Corrective Action: Duwamish Sediment Other Area and Southwest Bank, Boeing Plant 2 (SOB), and has the following comments on the SOB and proposed cleanup action.

Note: "DSOA" as used in this document refers to the Duwamish Sediment Other Area as well as the Southwest Bank and smaller areas to be included in the RCRA cleanup, unless otherwise noted.

Overview

EPA has proposed a cleanup plan for the RCRA DSOA at the Boeing Plant 2 site on the Lower Duwamish Waterway (LDW). Under the proposed plan, DSOA sediments contaminated above the Sediment Quality Standards (SQS) would be excavated or dredged and transported off site for proper disposal. Excavated and dredged areas will be backfilled with clean fill which meets the Target Media Cleanup Levels (TMCL) for polychlorinated biphenyls (PCBs), metals, and other constituents of concern. The cleanup focuses on areas where PCBs are present in the river bottom and bank. EPA has opted to consider the DSOA as two distinct cleanup areas, the North and South areas. Of the cleanup alternatives considered in the SOB, EPA believes the proposed plan provides the best overall protection of human health and the environment, based on information presented in previous investigations and studies. Each of the alternatives not selected included the construction of an engineered cap to cover sediments with contaminant concentrations above the SQS.

General Comments

The areas of major concern to DRCC/TAG, the Community Advisory Group (DRCC), and impacted community members who attended the Public Meeting and submitted comments to DRCC/TAG include:

- Dredging technology and operations should be selected that best prevent spread of contamination;

- Final selection of dredging technology and control methods must include public review;

- Spillage and suspension of sediments during dredging must be highly controlled in order to ensure that toxic materials do not drift onto beaches in the South Park or Georgetown neighborhoods;

- The fishing families and neighborhoods of the Duwamish River are "Environmental Justice" communities disproportionately burdened by multiple pollution sources and health stressors – EPA must take these cumulative burdens into consideration when developing cleanup plans;

- Control of potential sources of recontamination from *all* directions in order to ensure long term protectiveness of the remedy;

- Continued control of Boeing Plant 2 groundwater to prevent contamination of LDW sediments;

- Performance of the remedy to ensure long-term protectiveness in a seismically active area;

- Cleanup design and specifications no less stringent than the conceptual design presented in the SOB;

- Dredging and excavation depths no shallower than shown in the SOB to ensure that remaining materials at depth are no higher than the SQS;

- Confirmation sampling/testing performed prior to backfilling;

- Backfill specified to be certified PCB-free, clean quarry sand from a local quarry with metals concentrations no higher than local natural background;

- Institutional controls to protect backfill from disturbance, without restricting seafood harvesting;

- Assurances that Boeing retains proportional responsibilities under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) cleanup, irrespective of its participation in the Boeing Plant 2 RCRA cleanup;

EPA RESPONSE: All of the above comments will be addressed in the Corrective Measures Implementation (CMI) Work Plan, which will be available for stakeholder review and comment, with the exception of Duwamish wide/Green River wide source control, which will be addressed by the Washington State Department of Ecology.

1. Additional Conditions for Long-term Protectiveness

The proposed remedy for the DSOA will only be protective if certain conditions are met:

- Potential upriver, downriver and upland sources on both sides of the LDW must be identified and controlled to prevent recontamination of the DSOA. Until source control is achieved in adjacent and contributing areas of the LDW, upstream and downstream areas will continue to be potential sources of

recontamination to the DSOA. The pattern of PCB contamination on the Southwest Bank indicates that an upriver source may have been superimposed on the local sources, as a result of the alignment change in the LDW at that location. The net deposition of sediments in the DSOA indicates that the proposed remedy will be effective *if* recontamination is prevented. In addition, nearby, uncontrolled upland sources could potentially recontaminate the DSOA. While the SOB would absolve Boeing of liability for recontamination if it can show that it was not responsible, the resulting recontamination would still undermine the effectiveness of the remedy, and should be addressed in order to ensure that the cleanup is successful.

- Tidal effects must be considered when defining what is "upgradient."

- Boeing must be not indemnified from any future liability for the riverwide CERCLA cleanup, including shared responsibility for cleanup of recontamination at Boeing Plant 2.

EPA RESPONSE: See the first response, and Boeing is not indemnified from future responsibility of recontamination of the sediments if they are demonstrated as the liable party.

2. Cleanup Design Matching Specifications of SOB

EPA's selected alternatives (N2 and S4) as described in the SOB are protective, but the specific remedial plans and specifications of the Remedial Design (RD) will need to be publicly reviewed to ensure that the plans adhere to the SOB and do not introduce any modifications that could affect the protectiveness of the remedy. In particular, the dredging plan should show contours at or below those on Figure 6 of the SOB. In addition, the cleanup contractors' Quality Assurance (QA)/Quality Control (QC) plan should assure the public that the design plans and specifications will be met. The QA/QC plan should provide for independent verification of contractor compliance.

EPA RESPONSE: All of the above comments will be addressed in the Corrective Measures Implementation Work Plan, which will be available for stakeholder review and comment.

3. Dredging Technology and Techniques Preventing Spread of Contamination

The public must be provided with the opportunity to review and comment on the sediment removal method selected for the site. A conventional clamshell dredge is not recommended for use below the waterline because of the potential to spread contaminated sediments. Environmental bucket and hydraulic dredges should be evaluated for use at the site. Prior to final selection of a dredging or excavation technology, a full sediments characterization should be conducted, including definition of sediment particle size distribution, degree of consolidation, shear strength and in-situ percent solids (or moisture content), in accordance with the U.S. Army Corps of Engineers' "Technical Guidelines for Environmental Dredging of Contaminated Sediments." In addition, sequencing of site cleanup needs to be considered and reviewed. DRCC/TAG recommends that excavation and backfill above the waterline be conducted first, and that containment with silt curtains, coffer dams, and Best Management Practices (BMPs) during excavation below the waterline be evaluated based on the removal technology selected, in order to ensure that contamination from the site is not suspended into the water column or to nearby public beaches. Tidal flows should be considered in setting dredging hours so that as much of the excavation as possible takes place at the lowest tides. Finally, where erosion barriers are disturbed

during cleanup, they should be replaced to equal or better pre-excavation conditions and habitat should be incorporated, where feasible.

EPA RESPONSE: All of the above comments will be addressed in the Corrective Measures Implementation Work Plan, as necessary, which will be available for stakeholder review and comment.

4. On-site Groundwater Contaminated with VOCs and Metals

A plume of groundwater contaminated with volatile and semi-volatile organic compounds (VOCs and SVOCs) exists under the Boeing Plant 2 site, and is the subject of a separate cleanup/containment action. If the plume migration is not fully controlled, it could extend to and further contaminate the Duwamish River. VOCs and SVOCs in groundwater could also increase the solubility of PCBs in groundwater and lead to greater PCB contamination in the LDW sediments. The VOC plume originating at the Electronics Manufacturing Facility (EMF) originates east of Boeing Plant 2 at another Boeing facility that is being addressed under CERCLA. The Boeing DSOA action needs to be coordinated with cleanup of this potential source of recontamination, and verification of complete cleanup of the EMF plume should be a requirement of completion of the DSOA cleanup. DRCC/TAG and the public should be periodically updated on the status of these efforts.

5. PCB Cleanup Levels for the DSOA are More Stringent than the SQS

DRCC/TAG is concerned that the excavation of PCBs to the SQS of 12,000 ppb normalized for organic carbon content (OC) could be mistakenly used as a precedent for setting cleanup goals in other areas of the LDW. In other areas of the LDW, a non-detect standard, or a physical difference between older and more recent sediments, may provide a more reasonable metric of what should be removed and what can remain. DRCC/TAG notes that the cleanup level for surface sediments at the DSOA is far more stringent than the SQS of 12,000 ppb-OC PCB: the cleanup level is the Target Media Cleanup Level (TMCL) of 0.06 ppb-OC PCB, a difference of more than five orders of magnitude, while the SQS standard denotes the excavation boundary, not the cleanup level. DRCC/TAG is concerned that the SQS excavation boundary could be misapplied as a cleanup level in other parts of the LDW.
DRCC/TAG notes that the comparison of PCB concentrations in figures in the SOB can be deceiving due to changes in the designations color coding scales. For example, in Figure 3, "Green" indicates concentrations are less than 130 ppb-dry weight, but in Figure 6 it indicates concentrations are less than the SQS. A comparison of the sediment contamination in Figures 3 and 6 indicates that the average concentration of remaining sediments will be well below the SQS.

DRCC/TAG considers the selected corrective action appropriate for the DSOA, but notes that it may not be appropriate for areas of the LDW to be addressed under CERCLA. The selected remedy under CERCLA should stand on its own merits. Notably, the CERCLA action should not mistakenly consider the Boeing Plant 2 action as precedence for sediment removal to the SQS for PCBs in other areas where another alternative may be more appropriate. For example, lower cleanup levels and/or capping may be appropriate in other areas of the DSOA. As explained in the SOB, the SQS for PCBs in the LDW is not protective of human health and is not the cleanup level for the DSOA. The TMCL for PCBs in the DSOA is more stringent than the SQS. The protectiveness of the remedy for the DSOA arises primarily from the thickness of clean backfill that will be placed, and the lack of erosion in the DSOA. The clean backfill will meet the TMCL requirement and therefore is expected to be protective of human health and the environment.

6. Certified PCB-Free Backfill

The remedial design should specify that the clean backfill will be "certified PCB-free," have metals concentrations less than or equal to natural background concentrations, and not be based on the metals TMCLs. The protectiveness of the selected corrective action is largely due to the clean backfill replacing the excavated sediments. This specification for the backfill is also important for detecting any recontamination of the sediments onsite.

7. Institutional Controls to Protect Backfill and Public Health

Institutional controls necessary to prevent disturbance of the backfill should be defined to ensure long term protectiveness. Institutional controls would ensure that underlying sediments are handled properly and not spread during construction projects such as installation of fiberoptic cables or construction of a new South Park Bridge, and provide that any necessary excavations are backfilled with clean sand meeting the specifications of this remediation project. Institutional controls are needed for both the North and South cleanup areas.

Traditional clamming activities would not affect the remedy and therefore do not need to be restricted in the DSOA. Indeed, the remedy must be protective of tribal shellfish harvesting rights. Additional Institutional Controls are necessary during dredging/removal operations to notify nearby communities and river users of the potential for contaminated sediment plumes and risks of contact with sediment in the river and along nearby shorelines. Signage, community outreach and education, and a real-time notification system for any spillage or escapement of contamination sediments should be required as Institutional Controls and described in the SOB.

8. Engineered Cap vs. Cleanup Backfill

The SOB proposes that sediments be excavated to 20 feet, where sediments would meet the SQS for PCBs, and be covered to the original grade with clean backfill (i.e., the selected alternatives). At this site, the proposed alternative is superior to engineered cap in ensuring long-term protectiveness. The backfill is expected to be sufficiently thick and the DSOA is an area of net deposition so, barring direct disturbance by dredging or construction activities, natural erosion will not affect the long term protectiveness. The capping alternatives would be less protective in the DSOA because of the potential for seismic activity at the site. The LDW lies within a seismic zone, which could produce earthquakes large enough to compromise an engineered cap. If liquefaction of the underlying sediments should occur, the denser cap materials (i.e., large stones or boulders) are more likely to mix into the underlying sediments and rupture the barrier provided by the cap. Less mixing would be expected for a sufficiently think layer of backfill (i.e., the selected alternative), which has a density more similar to the underlying sediments and is therefore expected to result in less mixing and disturbance.

9. Confirmation Sampling Prior to Backfilling

DRCC/TAG noted four locations, two at cross section 35+50.00 and two at cross section 38+50.00, where no sample below the SQS for PCBs exists. DRCC/TAG recommends that samples be collected from these areas to identify the depth at which PCBs are below the SQS. In addition, confirmation sampling should be performed prior to backfilling to ensure that dredging activities have not elevated

contamination levels in the sediments, and that no sediments above the SQS remain at depth in the DSOA.

10. Boeing CERCLA Cleanup Responsibility

The SOB states that cleanup of the DSOA under RCRA will absolve Boeing from responsibility under RCRA for future cleanup of DSOA recontamination *that is not caused* by Boeing. It is essential to clarify that the RCRA SOB does not absolve Boeing from its responsibility for cleanup of its contribution to comingled releases under CERCLA in the rest of the LDW, and that Boeing's responsibility for cleanup outside of the DSOA and/or any responsibility for future CERCLA cleanup within the DSOA is not affected or diminished by this RCRA order.

11. Contaminated Sediments Disposal

Appropriate consideration should be given to the selection of a disposal facility for contaminated soil and dredge spoils to ensure that the contamination is not transferred from one community to another. Local options for disposal and treatment need to be considered and publicly reviewed in order to prevent or minimize the transference of contaminated materials to another location.

EPA RESPONSE TO 4-11: All of the above comments will be addressed in the Corrective Measures Implementation Work Plan, as necessary, as well as this Remedy Selection document. As mentioned earlier, the CMI Work Plan will be available for stakeholder review and comment.

Specific Comments

1. Page 36, first paragraph, first complete sentence:

"During implementation of any of the alternatives, risks to workers (including potential volatilization of PCBs during sediment dredging and handling) will be minimized by implementation of a Health and Safety Plan..." DRCC/TAG recommends that the Health and Safety plan be prepared by a Certified Industrial Hygienist or other credentialed environmental professional, who monitors compliance with the plan during operations.

EPA RESPONSE: This requirement is stipulated under the Order.

2. Page 36, second paragraph, third sentence:

"Among the alternatives, it can be anticipated that those with greater dredging volume may run a higher risk of contaminant re-suspension." Suction dredging, which works like a large pool cleaner and has a high hydraulic volume, runs a low risk of sediment re-suspension if solids-liquids separation is sufficiently efficient. However, DRCC/TAG agrees that other environmental dredging methods with a low risk of solids re-suspension may be equally or more appropriate in the LDW setting, and is aware that some of the other equally appropriate methods may be better suited to the specific sediment characteristics at the site (subject to thorough sediment characterization). The important point is that the dredging method selected must minimize the short-term impacts associated with dredging contaminated sediments to the maximum extent possible. Thank you for the opportunity to review the Draft Statement of Basis for the Boeing Plant 2 DSOA and South Bank. Please let us know if you have any questions

about our comments above. We look forward to working with you through implementation of the RCRA Corrective Action.

Sincerely,

James Rasmussen

Coordinator"

EPA RESPONSE: Comment noted, and as mentioned earlier, suspended sediment control is a priority of EPA as well.

COMMENT 7: As with Comment #6, Due to the length and complexity of the comment, EPA will provide a response at the end of each section, as necessary

May 27, 2011
9L-22-N410-WDE-088

HAND DELIVERED

Shawn Blocker
U.S. Environmental Protection Agency
1200 Sixth Avenue, Suite 900, AWT-121
Seattle, Washington 98101

Subject: Duwamish Sediment Other Area and Southwest Bank Corrective Measure Statement of Basis Comments, Boeing Plant 2, Seattle/Tukwila, Washington, EPA ID No. WAD 00925 6819, RCRA Docket No. 1092-01-22-3008(h)

Dear Mr. Blocker:

The Boeing Company has reviewed the US Environmental Protection Agency's (EPA) Statement of Basis prepared to support the Agency's Decision on the March 2011 DSOA and Southwest Bank Corrective Measure Alternatives Study (DSOA CMS). Boeing in large measure agrees with and finds correct EPA's documentation of the facts and issues represented in the Statement of Basis.

We believe, however, that several critical factors warrant your further attention, as it will be important to establish a clear and complete public record in support of EPA's Final Decision on its proposed alternatives. We understand the Statement of Basis as released by EPA will remain in the record as is. We suggest the following clarifications be provided in the record.

Boeing finds the discussion of TMCLs and points of compliance, which occurs in multiple parts of the Statement of Basis, to be very confusing. Our comments are listed here in no particular order.

1. Points of Compliance. In various documents in recent years, EPA has used 10 cm, 45 cm, and now 60 cm as the sediment point of compliance. We believe the following to be the correct and appropriate usage of the depth limits at Plant 2:

a.The biologically active zone for benthic organisms for their exposure to contamination is the biologically active zone of 10 cm. Therefore, the SMS standards are applicable to the upper 10 cm for protection of benthic organisms. This is consistent with requirements that EPA gave Boeing for the DSOA CMS.

b. Several recent documents, such as the T117 EE/CA, have used 45 cm as a potential zone for human exposure during activities such as clamming. The limit is not based on where clams feed, as they are surface feeders, but rather the limit is based on how deep a human would potentially dig to capture a clam. Therefore, 45 cm is a possible point of compliance for the protection of humans during certain beach activities. At EPA request, Boeing used 45 cm in the DSOA CMS specific to surfaces above 0 MLLW. The 45 cm depth limit was not applied to SMS criteria, but rather was the zone where human exposure could occur; i.e., at mudlines above 0 MLLW and down to depths of 45 cm.

c. Specific to Plant 2, a minimum of 2 ft (or ~60 cm) of clean fill will be placed throughout the DSOA in subtidal and intertidal areas. Placing a clean fill that contains no detectable PCBs establishes for the DSOA Corrective Measure a minimum of 2 ft (or ~60 cm) of clean exposure, thereby ensuring protection of both benthic infauna and human exposures. The depth of 60 cm was selected based on a desire to return the site elevations to pre-cleanup elevations, and to be protective of human health and the environment.

EPA RESPONSE: The point of compliance (60 cm in clamming areas, 45 cm otherwise) was first discussed with Boeing in 2008. This point of compliance was memorialized in the EPA to Boeing letter entitled *Comments on the Draft Duwamish Sediment Other Area and Southwest Bank Interim Measures Alternatives Evaluation* (EPA, August 27, 2010) and further memorialized in Appendix H of the final *Duwamish Sediment Other Area and Southwest Bank Interim Measure Evaluation* (Boeing, March 2011).

2. Sediments and soils terminology. State law establishes that sediments extend to MHHW, which at Plant 2 is approximately +12 ft MLLW. Above this level, the bank materials are considered soils. EPA has used this distinction on other projects and at Plant 2. It remains a useful distinction and should be made clear in the record accompanying the Statement of Basis.

EPA RESPONSE: Comment noted and EPA agrees with this interpretation.

3. Sediment TMCLs for Human Health Exposure. Using the term "TMCL," as related to sediments, in the Statement of Basis is misleading and confusing. Neither Boeing nor, to our understanding, EPA have developed sediment TMCLs for a human health pathway at Plant 2. Through Boeing's formal dispute with EPA over the TMCL Technical Memorandum, Boeing and EPA resolved, among other things, the tribal fish consumption rate's relevance to the human health pathway. The tribal consumption rate has had a major impact on the development of Plant 2 groundwater TMCLs and on vadose soil TMCLs to protect groundwater. However, Boeing and EPA did not establish TMCLs for protection of human

health based on a sediment to fish pathway because it was an issue being resolved as part of the Lower Duwamish Waterway Superfund Site process. EPA's comments on Boeing's 2008 proposed TMCL Technical Memorandum, and EPA's revised TMCL Technical Memorandum, delivered to Boeing in September 2010, also did not establish sediment TMCLs for protection of human health. In its revised TMCL Technical Memorandum, EPA established the following:

- a sediment TMCL for PCBs to protect human health through fish consumption has not been developed, but if it were developed would likely to be below background concentrations of PCBs in Puget Sound,
- EPA does not set cleanup levels below background, and
- the proposed sediment Corrective Measure at Plant 2 includes a minimum of 2 ft (~60 cm) of clean fill throughout the DSOA, which will have no detectable PCBs.

Therefore, the proposed DSOA Corrective Measure will protect human health (including tribal consumption), even though a specific numeric TMCL value has not been set. Boeing believes it is critical that the Statement of Basis record clarifies this. Likewise, it is critical that the Statement of Basis either drop the soil TMCLs included in Table 2 or clearly indicate that they are inapplicable to sediments and applicable only to soils in the vadose zone. Along the bank at Plant 2, the vadose zone is limited to those areas above the MHHW mark (or +12 ft MLLW).

To summarize this point, by conveying that 60 cm of cleanup fill is a point of compliance for SMS and then using the term TMCL when referring to the sediment cleanup, Boeing believes the Statement of Basis is misleading. To clarify the applicability of SMS, TMCLs, and clean fill requirements, Boeing includes the below revised Table 2. We believe the following table accurately reflects the various standards applicable to the project as well as the agreements made in the recently-completed TMCL development process for Plant 2.

Proposed Table 2 for the Record

CLEANUP STANDARD FOR PROPOSED REMEDY

Constituent	SQS Value[2] (Applicable to sediments and bank soils below MHHW [+12 MLLW])	Soil TMCL[3] (Applicable to bank soils above +12 MLLW)	Clean Fill Requirements (Applicable to upper 60 cm of fill through DSOA sediments up to +12 ft MLLW)
Total PCBs	12 mg/kg-OC or 130 µg/kg dry wt	No detectable PCBs (PQL = 30 µg/kg)	No detectable PCBs (PQL = 30 µg/kg)
Cadmium	5.1 mg/kg	4 mg/kg	5.1 mg/kg
Lead	450 mg/kg	250 mg/kg	450 mg/kg
Chromium[1]	260 mg/kg	1.2 mg/kg	260 mg/kg
Copper	390 mg/kg	80 mg/kg	390 mg/kg
Mercury	0.41 mg/kg	1.5 mg/kg	0.41 mg/kg
Silver	6.1 mg/kg	170 mg/kg	6.1 mg/kg
Zinc	410 mg/kg	1,400 mg/kg	410 mg/kg
Narrative	All other marine SMS constituents will be below SQS.	All other Soil TMCLs for this pathway (vadose soil to fish consumption) will also be met	All other marine SMS constituents will be below SQS.

Notes:

1 The soil TMCL for Chromium is applicable to Chromium(VI) only; the SMS value is for total Chromium.

2. In the DSOA CMS, EPA directed that the Point of Compliance for sediments is 10 cm for sediments whose mudlines are below 0-ft MLLW and 45 cm for sediment whose mudlines are between 0 and 12-ft MLLW, where 12-ft MLLW represents the MHHW limit for sediments at Plant 2.

3. The Point of Compliance for soil is throughout the vadose zone, defined at Plant 2 as above +8 ft MLLW; however, at the bank the vadose zone is limited due to surface water intrusion and only exists above +12 MLLW. These TMCLs are based on a pathway from vadose zone soil to groundwater to surface water to fish.

EPA RESPONSE: See Selected Cleanup Media Levels in the Final Decision and Response to Comments for the discussion regarding the selection of Cleanup Media Levels.

Other topics benefiting from clarifications in the record

General: The order in which the north area alternatives are discussed throughout the Statement of Basis is reversed from that presented in the DSOA CMS. This could lead to confusion of the reviewer. Boeing suggests the record indicate that EPA has renamed the north alternatives in the Statement of Basis.

EPA RESPONSE: Comment noted and reflected in the Final Decision and Response to Comments.

Executive Summary, page 4, second paragraph and elsewhere: In several places in the Statement of Basis, EPA alleges "Plant 2 sediments have the largest volumes of high concentrations of PCBs in the LDW (in hundreds of parts per million (ppm or mg/kg))." This text overstates and mischaracterizes Plant 2 sediment data. There are only two small areas in the DSOA where PCB concentrations exceed 100 ppm. The average concentration of PCBs that will be removed as part of the DSOA Corrective Measure is approximately 0.8 ppm.

EPA RESPONSE: EPA does not agree with Boeing's interpretation and no changes will be made in The Statement of Basis or in the Duwamish Sediment Other Area and Southwest Bank Alternatives Evaluation Report.

Executive Summary, page 4, third paragraph: The target depth of the two alternatives is not 20 feet as stated. Instead, the maximum target dredge depth is 20 feet deep, and in the North Area the deepest excavation is 16 feet.

EPA RESPONSE: Comment noted.

Facility Background, page 7, second paragraph: Boeing did not own or operate "large electricity generators" at Plant 2. We request the text "electricity generators" be deleted.

EPA RESPONSE: Comment noted. The "Facility Background" section was cut and pasted directly From the Duwamish Sediment Other Area and Southwest Bank Corrective Measures Alternative Evaluation Report. Boeing can correct this error in the Corrective Measures Implementation Work Plan to be submitted in the future. No changes will be made in The Statement of Basis or in the Duwamish Sediment Other Area and Southwest Bank Alternatives Evaluation Report.

Regulatory Framework and Cleanup Levels, page 11, second paragraph, and elsewhere: Boeing maintains that material amounts of PCBs have not migrated beyond the boundaries of the Plant 2 DSOA. This position was sustained in Boeing's and EPA's 2002 Formal Dispute regarding the boundaries of the DSOA and in the Agency's 2003 decision, which left the matter to the Duwamish CERCLA process for further investigation efforts. EPA has not and, in Boeing's view, cannot

demonstrate contaminants from Plant 2 have migrated in material amounts beyond the boundaries of the Plant 2 DSOA.

EPA RESPONSE: EPA does not agree with Boeing's interpretation and no changes will be made in The Statement of Basis or in the Duwamish Sediment Other Area and Southwest Bank Alternatives Evaluation Report.

Regulatory Framework and Cleanup Levels, page 13, first paragraph, line 7: To be most accurate regarding Slip 4, Boeing requests revising the sentence "The other selected LDW EAAs are: ... (contaminated sediments generally in the western portion are addressed..." to read "The other selected LDW EAAs are: ... (contaminated sediments generally in the southwestern portion of Slip 4 on Boeing property are addressed ... ."

EPA RESPONSE: Comment noted. No changes will be made in The Statement of Basis or in the Duwamish Sediment Other Area and Southwest Bank Alternatives Evaluation Report.

Regulatory Framework and Cleanup Levels, page 13, second paragraph: Given the recent discovery of the very high concentrations of PCBs in Jorgenson Bank fill material, EPA's indication that releases from Jorgenson are "minor" as compared to releases from Plant 2 is misleading. At this point, EPA lacks sufficient information to distinguish the releases from the two properties and the comparison EPA draws is unsubstantiated.

EPA RESPONSE: EPA does not agree with Boeing's interpretation and no changes will be made in The Statement of Basis or in the Duwamish Sediment Other Area and Southwest Bank Alternatives Evaluation Report.

Potential Recontamination from Stormwater, page 32, second paragraph, line 6: Because several sources of PCBs have entered the Plant 2 and Jorgensen Forge storm systems, the sentence that currently reads, "Property-line outfalls located on the Jorgensen Forge property (Figure 7) just beyond the Plant 2 southern boundary, which contained significant PCB contamination from Plant 2, have also been addressed," should be changed to "Property-line outfalls located on the Jorgensen Forge property (Figure 7) just beyond the Plant 2 southern boundary, which contained significant PCB contamination from several sources including Plant 2, have also been addressed."

EPA RESPONSE: Comment noted. No changes will be made in The Statement of Basis or in the Duwamish Sediment Other Area and Southwest Bank Alternatives Evaluation Report.

Boeing appreciates your attention to these requested clarifications in the record. Please don't hesitate to contact Mike Gleason or me if you have any questions.

Sincerely,

Will Ernst
Plant 2 Project Coordinator
Environmental Remediation
M/C 1W-12; 425.891.7724; 206.544.7297 (fax);