WASHINGTON STATE DEPARTMENT OF ECOLOGY

RESPONSIVENESS SUMMARY

RESPONSES TO PUBLIC COMMENTS
RECEIVED DURING THE
90-DAY FORMAL COMMENT PERIOD FOR THE

FORMER DUPONT WORKS CLEANUP SITE

LOCATED IN PIERCE COUNTY, WASHINGTON

July 2003

The attached document, known as a Responsiveness Summary, has been written to provide the public with the Washington State Department of Ecology's responses to all the comments and questions that were received. Both written and verbal public comments were received during the formal comment period for the draft cleanup action plan, remedial investigation/risk assessment/feasibility study (RI/RA/FS), and proposed consent decree between Ecology, Weyerhaeuser Company and E.I. DuPont de Nemours and Company for the work to be conducted at the Former DuPont Works site. This Responsiveness Summary is a compilation of the specific questions received, followed by Ecology's response.

The Washington State Department of Ecology (Ecology) held a public comment period on the major documents for the former DuPont Works Site located in DuPont Washington, Pierce County. Under the terms of the Model Toxics Control Act Cleanup Regulations (Chapter 173-340 WAC), a 90-day public comment period was held from January 22 to April 23, 2003. The Model Toxics Control Act (MTCA) regulations specify a 30-day public comment period, however more time was provided from the outset due to the large number of lengthy documents that were available for review and comment. The following documents were available for review and comment:

1. Draft Final Remedial Investigation Report, dated January 2003
2. Draft Final Human Health and Ecological Risk Assessment, dated January 2003
3. Draft Final Feasibility Study, date January 2003
4. Draft Final Cleanup Action Plan, dated January 2003, and
5. Draft Final Consent Decree (not dated)

The above listed documents were available for review at the Department of Ecology's Southwest Regional Office, Pierce County Library - Lakewood Branch, DuPont City Hall, the Department of Ecology web page, and electronic copies on compact disk were also available free of charge. Printed copies of the documents were also provided to the DuPont Toxics Citizen Oversight Project, a citizen group that received Ecology grant funds to enhance public involvement activities.

The Remedial Investigation report represents the former DuPont Works Site in its current environmental condition, after many years of prior investigation and interim cleanup activities. The Human Health and Ecological Assessment evaluates the risk to people and to the environment from the contamination at the site. The Feasibility Study evaluates various cleanup actions to address the contamination and thereby reducing the risk to acceptable levels or eliminating the risk entirely. A preferred cleanup action or actions for the Site are proposed by the companies (Weyerhaeuser Company and E. I. DuPont de Nemours and Company (DuPont)) in the Feasibility Study. The Cleanup Action Plan is Ecology's decision document on what actions shall be taken at the Site to adequately protect human health and the environment. The Consent Decree is the legal agreement between Ecology and the Companies that will be entered into State Superior Court, for the implementation of the Cleanup Action Plan.

During the 90-day public comment period, an informational workshop meeting was held at DuPont City Hall on February 12, 2003. Approximately 20 members of the public attended the workshop and were provided with a brief overview of the above listed documents and an opportunity to ask question and provide input to Ecology and the companies. A public meeting (hearing) was held on March 12th at DuPont City Hall with about 15 members of the public attending. As with the public workshop, a brief overview was provided by Ecology and an opportunity for the public to ask questions and make comments. When possible, immediate responses were provided by staff from Ecology or the companies and their representatives. Notes were taken during the two public meetings and are reflected in the Responsiveness Summary. A taped transcript was not made at either gathering. During the public comment period, Ecology received 3 letters and 6 different individuals sent e-mails. Responses to comments and answers to questions are provided in this Responsiveness Summary. Based on public input, various changes (additions, deletions, and corrections) were made to most of the documents. The changes to the documents have been evaluated and are not considered to be significant. The overall cleanup actions that were originally proposed have remained unchanged.

If you have any questions regarding this Responsiveness Summary, would like to be included on Ecology's Former DuPont Works site mailing list, or have questions regarding the Former DuPont Works site, please call Ecology's designated project manager. The project manager is Mike Blum, and he can be reached by telephone at 360-407-6262. His mailing and e-mail addresses are:

Mike Blum
Department of Ecology - Southwest Regional Office
P O Box 47775
Olympia, WA 98504-7775
e-mail: mblu461@ecy.wa.gov

If you would like to review more detailed documents related to the site than those in the information repositories, please contact Ecology's regional records center at (360) 407-6365 to schedule an appointment. Information repositories have been set up at the three following locations:

Ecology Southwest Regional Office
300 Desmond Drive
Lacey, WA 98504-7775

Lakewood Library
6300 Wildaire Road SW
Lakewood, WA 98499-1321
(253) 582-6040

www.ecy.wa.gov/programs/tcp/sites/weyer/weyerhaeuser.htm

Ecology would like to thank West Shore Corporation NW and Pioneer Technologies, Inc. for their assistance and cooperation in drafting this document. Ecology appreciates the time and effort spent by the public to review and comment on the documents as well as attending one or both of the public meetings. Ecology hopes that this Responsiveness Summary is beneficial to you, the public.

The following format is being used in this Responsiveness Summary:

Comment # (a numbered list of comments. For some oral comments or letters, they are broken down into separate comments)
Commenter: (the commenter's name)
Comment Type: (oral comments, e-mails, and letters - including primary technical review or editorial comments)
Document: (identifies whether the comment/question relates to a specific document)
Location in Document: (if related to a specific document, the page or section number is noted here)
Comment: (these are the comments, questions or statements made by members of the public to Ecology)
Response: (this is the response, or answer, or acknowledgement by Ecology of statements made by the public)
Responder: (this identifies who is the responder or responders)
Change to the Document(s): (this identifies if any changes are being made to the documents and specific locations)

Here are some acronyms which will be found in the Responsiveness Summary:
CAP - Cleanup Action Plan
CD - Consent Decree
CL - cleanup level
CLARC - Cleanup Levels and Risk Calculations under the Model Toxics Control Act
COPCs - contaminants of potential concern
CPF - cancer potency factor
DCAP - draft Cleanup Action Plan
DNT - dinitrotoluene
DTCOP or DToxCop - DuPont Toxics Citizen Oversight Project
Ecology - Washington State Department of Ecology
EPA - U.S. Environmental Protection Agency
EU - evaluation unit
FS - Feasibility Study
gpm - gallons per minute
HHRA - Human Health Risk Assessment
HRA - Heritage Research Associates, Inc
IEUBK - Integrated Exposure Uptake Biokinetic model
IRIS - Integrated Risk Information System under the Environmental Protection Agency
ISR - interim source removal
mg/kg - milligrams per kilogram (equivalent to parts per million)
mm - millimeter (one thousandth of a meter)
MOA - Memorandum of Agreement
MTCA - Model Toxics Control Act
MSU - miscellaneous small remediation unit
MW - monitor well
NA - Not Applicable
NGRR - narrow gauge railroad
OS - open space
PA - placement area
PLP - potential liable person or party
ppb - parts per billion
ppm - parts per million
RA - Risk Assessment
RI - Remedial Investigation

RL - remediation level
RU - remediation unit
TPH - total petroleum hydrocarbon
ug/l or µg/l - micrograms per liter (equivalent to parts per billion)
um (or µm) - micrometer (micron or one millionth of a meter)
WSNW - West Shore Corp. Northwest (consulting company representing Weyerhaeuser and DuPont companies)

Comment # 1

Commenter: Ed Kenney
Comment Type: Public Workshop Comment
Document: Not Applicable (NA)
Location in Document: NA
Comment: How big is the clean area by the guard gate?
Response: About 27 acres
Responder: Jeff King (West Shore Corporation, NW (WSNW))
Change to the Document(s): No

Comment # 2

Commenter: Ed Kenney
Comment Type: Public Workshop Comment
Document: NA
Location in Document: NA
Comment: How many tons of soil has gone to Arlington?
Response: Approximately 72,000 tons of mixed contaminated soil to either the Waste Management Landfill in Arlington, Oregon or, if petroleum-impacted soil, to TPS Technologies in Tacoma. Arlington received 16,000 tons and TPS Technologies received 56,000 tons.
Responder: Jeff King (WSNW)
Change to the Document(s): No

Comment # 3

Commenter: Ed Kenney
Comment Type: Public Workshop Comment
Document: NA
Location in Document: NA
Comment: Mr. Kenney asked a question regarding archaeological sites (the exact question was not recorded) and he asked how large of an area is the 72-PI 404 Burial site?
Response: This is a sensitive archaeological site and in the 404 Burial Site, we've found graves in the past. There are 15 to 16 graves still missing. Weyerhaeuser is giving the burial area and a buffer to the Tribe. It will be capped and left in place and no one will work in that area. The Burial site is about three-fourths of an acre. All three historical locations (Burial site, Shell Midden site, and 1833 Fort site) total about 5 acres. The shell Midden is two-thirds larger on the Quadrant side than it shows on this map.
For the historical/cultural protection, a team of archaeologists are working at the site. HRA is now working there and as the soil is scraped, they will follow the scraper looking for artifacts, European or Native American. We (the companies) have hired tribal monitors from the Tribe as well as a Tribal archaeologist.
Responders: Jeff King (WSNW) and Mike Blum (Washington State Department of Ecology (Ecology))
Change to the Document(s): No

Comment # 4

Commenter: Ed Kenney
Comment Type: Public Workshop Comment
Document: NA
Location in Document: NA
Comment: Is there a monitoring well near the Burning Ground? (Area 31)
Response: There used to be, but they were closed due to no DNT in the water.

Seep #1 in Puget Sound is still active. It comes out at the force of about 5 fire hydrants. It shows low concentrations of DNT, but far below marine surface water quality levels. Groundwater monitoring is continuing at the site. There used to be 27 wells and now only 5 are left that show any DNT. These wells are down-gradient from where DNT was first found in the soil. One more monitoring well will be installed. Sampling used to be done quarterly, but is now being done on an annual basis.
Responders: Jeff King and Mike Blum
Change to the Document(s): No

Comment # 5

Commenter: Carl Nadler
Comment Type: Public Workshop Comment
Document: NA
Location in Document: NA
Comment: Where does the City get their water?
Response: Bell Hill wells and reservoir, located upgradient (upstream) from the DNT groundwater contamination (shown on map).
Responder: Mike Blum
Change to the Document(s): No

Comment # 6

Commenter: Ed Kenney
Comment Type: Public Workshop Comment
Document: NA
Location in Document: NA
Comment: How much soil was actually washed? Does it go back on golf course as contaminated soil?
Response: 30,000 tons were washed and 2,500 tons of it went off site. All that stayed on site was tested to make sure it was under the approved remediation levels. It will be put in the placement areas of the golf course and capped
Responder: Brad Grimsted (PIONEER Technologies Corporation)
Change to the Document(s): No

Comment # 7

Commenter: Greg Glass
Comment Type: Public Workshop Comment
Document: NA
Location in Document: NA
Comment: Did DuPont ever manufacture shot?
Response: No shot was manufactured at DuPont. Also, no military munitions were made on the site.
Responders: Mike Blum and Jeff King
Change to the Document(s): No

Comment # 8

Commenter: Ed Kenney
Comment Type: Public Workshop Comment
Document: NA
Location in Document: NA
Comment: Do you have any new samples of the dock area? What about other cleanup outside the consent decree boundary?

Response: No, we are in compliance. However, the documents only deal with the area inside the Consent Decree. Outside is to come later. There were some old magazines (storage bunkers for explosives before being shipped off-site.) located outside the Consent Decree area and those have been cleaned up.
The only other place is near the mouth of the creek, where there was an above ground storage tank by the old powerhouse. Tanks were removed in 1987 and the sludge was taken out. Some contamination is still there and Ecology will work with the companies to address the contamination. Maybe digging in that area will make it worse. It is an ecologically sensitive area and we will deal with it later.
Responders: Mike Blum and Jeff King
Change to the Document(s): No

Comment # 9

Commenter: Bonnie Gee
Comment Type: Public Workshop Meeting Comment
Document: NA
Location in Document: NA
Comments:
a.) DOE went through years of analysis and came up with choices and the company made choices, you come up with cap and cover. They (the companies) pay the bill, but you don't work for them, so no collusion.
b.) Do you have data on other sites and how effective and do they have same water structure as this, similar geology?
c.) What do you know about migration along the water flow, is arsenic migration going to affect the area? Will arsenic leach? What I thought I understood is that arsenic can go upstream.
d.) Are there plants you can use to get rid of the contamination?
e.) Is there a problem on the Glacier side?
Responses:
a.) Comment noted
b.) I (Mike Blum) did go see a site in Anaconda Montana, a former smelter. It has similar contaminants - lead and arsenic. It seems to be working for that location. A few miles away at Tacoma Commencement Bay, arsenic is found in the Hybelos waterway. Site (log sort yard) was scraped and capped and monitored. Metal concentrations dropped to non-detect.
c.) The lead and arsenic at the DuPont site do not leach. They stay bound in the soil and that is why scraping is so effective. Even if it did leach, the groundwater flow is to the northwest, away from the City wells.
It depends on the specific type of arsenic. One of the reasons we had 27 monitoring wells is to check arsenic in water. There is no arsenic in this groundwater. We did various soil leaching tests and found that little to no arsenic or lead leachability.
d.) Brake ferns will absorb arsenic but then you have to deal with the fronds. Don't know if it does much for metals. Using plants for remediation is not a proven technology. In my experience, it is not effective on a site this large. I'm (Dan Alexanian) not comfortable telling the public we have planted lots of trees and it is safe and effective. The golf course will have trees planted in it. The root ball areas will have extra clean soil put around them so the cap will not be compromised.
e.) They are mining down 20 feet, I don't think so.
Responders: Mike Blum and Dan Alexanian (Washington State Department of Ecology)
Change to the Document(s): No

Comment # 10

Commenter: Penny Coffey
Comment Type: Public Workshop Meeting Comment
Document: NA
Location in Document: NA

Comment: What is the reason for burning the buildings?
Response: There may have been explosive material inside the buildings, some DNT or something down in the cracks. They needed to get rid of the contamination. Sympathetic detonations were done around foundations to make sure everything was gone. It also helped break up the concrete foundations. A few foundations may be left for historical purposes.
Responder: Mike Blum
Change to the Document(s): No

Comment # 11

Commenter: Colleen Evans
Comment Type: Public Workshop Meeting Comment
Document: NA
Location in Document: NA
Comment: What is the flexibility with the developer and the City? What if they can't get commercial in there, will industrial be allowed?
Response: If the City and landowner said we want to switch to industrial, they would come to Ecology and ask if it is still protective for that proposed land use? We would say yes because they are going to an industrial use which is less restrictive than commercial. If they went the other way and wanted residential, then we would say no.
In 1996 we were working with the City on the EIS and the City was concerned about land use issues and Ecology was concerned about the cleanup. The cleanup issues took precedence over land use.
Responder: Mike Blum
Change to the Document(s): No

Comment # 12

Commenter: Colleen Evans
Comment Type: Public Workshop Meeting Comment
Document: NA
Location in Document: NA
Comment: Dust is a concern. With lead in the dust, do they monitor air quality and are they required to spray water?
Response: Workers wear personal air monitors and there have been no exceedances.
We (the companies) were concerned as well and didn't want to spread the contamination. We take safety very seriously. When we saw that houses were being built next to the site, we took an area of 250 feet from the boundary line and took perimeter air samples 24 hours a day. We are about ready to publish the report on that. We have been very successful keeping dust down to where there is no visible dust at all.
We (the companies) have budgeted around half a million dollars for dust control.
We (the companies) have learned that we need to pre-soak the ground a few hours before the scraping begins. It can be wet on the surface and dust a foot below it. You will see trucks down there in the wee hours of the morning.
If you hear the companies working and you see dust, call the companies or Ecology to report it.
Responders: Jeff King, Bob Martin (Weyerhaeuser Company) and Mike Blum
Change to the Document(s): No

Comment # 13

Commenter: Bonnie Gee
Comment Type: Public Workshop Meeting Comment
Document: NA

Location in Document: NA
Comment: Will you be publishing the results of this monitoring?
Response: It becomes public information when the report is finished.
Part of the Consent Decree we hope to get signed, requires quarterly reporting, and dust monitoring is part of it.
I (Mike Blum) forgot to mention that there will be archaeologists on site as the work is done. They will be there to see if anything is found. The scrapers will take off one foot lifts of soil and the archaeologists will follow along to the side of the scrapers to see if there are any artifacts. HRA is the archaeological firm being used at the site. The Nisqually Tribe has also hired an archaeologist to spend 24 hours a week on site. They will also have tribal monitors during the excavation activities.
There will be three crews and each will have an archaeologist and, if possible, a tribal monitor. If something is found, they will move on to another area.
There has been progress with the National Historic District.
Responders: Jeff King, Bob Martin, and Mike Blum
Change to the Document(s): No

Comment # 14

Commenter: Roger Westman
Comment Type: Public Workshop Meeting Comment
Document: NA
Location in Document: NA
Comment: With a golf course comes a clubhouse. With that comes an access road, construction, sewers, underground utilities…where will those buildings and roads be?
Classification called commercial, what kind of commercial are we talking about, businesses, and retail, what is meant by commercial?
Response: Office and business park.
The City Comp Plan is controlled by the City, determining road construction.
As part of the cleanup action, Ecology is only dealing with the construction of the golf course itself. Ecology has nothing to do with the building of a clubhouse or roads.
We (the companies) plan to construct concurrently with the golf course, an access road and parking lot and we aren't sure yet about plans for permanent or temporary clubhouses.
Responders: Mike Blum and Bob Martin
Change to the Document(s): No

Comment # 15

Commenter: Roger Westman
Comment Type: Public Workshop Meeting Comment
Document: NA
Location in Document: NA
Comment: Where is the clubhouse going to be?
Responses: Bob Martin showed the planned area on a map.
This is a Quadrant issue but from Ecology's viewpoint, it is covered through the City.
We (Weyerhaeuser) are currently working with the City and planning engineers and doing traffic studies to see what the impact will be for golf course traffic on McNeill.
We (City of DuPont) called it a business and technology park, but you call it commercial. It isn't commercial in the sense that it will be retail.
Responders: Bob Martin, Mike Blum, and Dennis Clarke (City of DuPont)
Change to the Document(s): No

Comment # 16

Commenter: Bob Printz
Comment Type: Public Workshop Meeting Comment
Document: NA
Location in Document: NA
Comment: I thought a lot of traffic would come down from Hoffman Hill, and all come down from McNeill?
Response: Discussed layout on map: Perimeter road south of Old Fort Lake, along fence line. It will be 35 mph. It is the hope of the City that traffic will use this road more than McNeill.
Responder: Dennis Clarke
Change to the Document(s): No

Comment # 17

Commenter: DuPont Toxics Citizen Oversight Project (DTCOP)
Comment Type: Primary Technical Review Comments (Letter received)
Document: NA
Location in Document: NA
Comment: Elevated ground water concentrations for DNT continue to be reported over 7 years after completion of the most recent Interim Source Removal (ISR) cleanup actions for known source areas of DNT (1992 to 1995). In addition there have been notable peaks and valleys in the observed levels but there are no clear trends apparent. The fact that on going elevated levels continue to be observed several years after the ISRs with no clear downward trend implies an on going source(s) as yet un-remediated may still exist.

Using the average estimated aquifer flow rate (reported in the FS for the purpose of pump and treat evaluation as ranging from 3,500 gpm to 7,000 gpm) of 5,250 gpm and, for illustration purposes, the value of observed DNT from the existing monitoring wells of 0.25ug/l (mid range based on the presented RI data although we understand the most recent data show increased levels) yields an annual DNT discharge from the site of about 5.8 pounds of DNT. If the most recent site groundwater monitoring data reflects higher levels then higher overall site DNT discharge would also be indicated proportionately.

There is no analysis or discussion presented in the documents regarding this issue and what type or size of source would be necessary to produce the observed effect of elevated DNT levels. It is apparent that if shallow sources associated with the soils to be scraped exist they would be removed during the planned remediation, but any material which has migrated into deeper soils or is buried deeper than the excavation depths would not necessarily be detected in the planned confirmation monitoring. Therefore we recommend that this issue be evaluated further in the context of the additional planned monitoring activities and periodic WDOE reviews after the remedial action has been completed, as discussed further below.

Response: DNT source removal occurred from 1991 to 1995 when DNT impacted soils were disposed of off-Site. Areas where there are remaining potential DNT sources are in the northwestern third of the site in areas where manufacturing or storage occurred. With the exception of placement areas, the remaining top 1 foot of soil will be excavated and moved to placement areas. The soil will be removed using a deliberative process and if any signs of DNT (or other) sources are identified they will be investigated and dealt with appropriately. Signs of DNT impacted soils would include signs of buried material, drums or DNT crystals. It is believed that this approach will be effective in identifying any remaining source areas.

Data from 34 rounds of combined pre-RI and RI groundwater sampling at 30 well locations indicate that low DNT concentrations have been consistently detected in 6 of 30 Site groundwater monitoring locations. The concentrations of DNT in groundwater have not fluctuated greatly.

Because the majority of detected DNT concentrations are consistently low, are not affecting surface water, and the aquifer is currently not used as a drinking water source, Natural Restoration has been selected as the remedial alternative. Ecology agreed to the selection of this alternative by issuing a "No Active Remedial Action" letter for Site groundwater.

Groundwater monitoring will be required at the Site until DNT concentrations below drinking water standards are obtained in four consecutive sampling rounds. Monitoring will take place for DNT at a minimum of five locations. The wells that will be monitored as part of the cleanup action are monitoring wells MW-3, MW-6, MW-19, and MW-22 and a new monitoring well installed down gradient of RI Area 25 and the Seep too. Groundwater wells will continue to be sampled annually each March.

An analysis was performed in 1997 to determine when the peak DNT concentrations were found in groundwater. Ecology reviewed this information and agreed to annual monitoring in March of each year based on those data.

The highest DNT concentration ever detected in an on-Site well was 3.8 ug/L in MW-27 in January of 1995. This concentration is less than ½ of the MTCA surface water criterion for DNT which is 9.1 ug/L. If any of the results from future sampling of these wells is greater than 3.8 ug/L Ecology will meet with Weyerhaeuser and DuPont to discuss the results.

Responder: Washington State Department of Ecology (Ecology)
Change to the Document(s): Yes. Change to the CAP (Cleanup Action Plan) and FS concerning compliance monitoring for groundwater and the fact that the Companies will meet with Ecology if the results are greater than 3.8 ug/L. Modified Section 6.6.3 of CAP and Section 8.4 of FS.

Comment # 18

Commenter: DTCOP-2
Comment Type: Primary Technical Review Comments (Letter received)
Document: NA
Location in Document: NA
Comment: Discussion of natural restoration for the aquifer system in the documents is limited to a statement that this will occur. There is no basis for this conclusion presented, and it appears overstated without further justification provided in the documents. The reports do not provide an estimated restoration timeframe for ground water, which under the natural attenuation (no action) alternative will be accomplished largely through the high flushing capacity of the ground water at the site. Given a high aquifer flushing capacity, continuing elevated DNT concentrations in ground water during compliance monitoring, without a confirmed downward trend, would be inconsistent with all significant DNT sources already having been removed.

At a minimum the basis for this conclusion should be developed and an approach developed to evaluating it further in the context of the required future WDOE periodic reviews. We are not recommending a comprehensive fate and transport modeling approach to this topic at this time. However we do recommend that the subject be evaluated and discussed to address the questions raised in these comments.

Degradation of TNT to DNT in soils could also be implicated as a secondary source of DNT. Ecology should identify a timeframe and trigger levels to address the implementation of contingent actions should significant DNT levels continue to be observed. Since property development activities in possible source areas may make further investigations difficult or impossible, the schedule for such development activities should also be considered in selecting the timeframe for further investigations or groundwater evaluations.

We note that the network of groundwater monitoring locations for the site is not comprehensive and we

recognize that in an aquifer system of this nature (high volumes of flow and rapid flow velocities) it is difficult to monitor at a high level of precision. The new monitoring well in its proposed location (relative to DNT contaminated soils formerly removed) may provide meaningful information on this issue.

Recognizing that the assumption that natural restoration will be effective, along with the currently relatively low observed levels, at the site is key to the selected option of no active groundwater remediation being implemented, it is important to address the issues raised in the preceding paragraphs.

As a result we suggest a thorough groundwater quality assessment of the DNT occurrences and trends 2 years after completion of the scraping project. If there is no clear downward trend after a few years of additional monitoring then the implication would be that an ongoing source exists, at which point additional contingent actions as discussed below should be considered. If an ongoing source exists its nature could result in pulsing or ebbing and flowing of contaminant releases (e.g.: a deteriorating drum exposed to increased or fluctuating levels of water percolation resulting from scraping or construction activity could result in releases occurring intermittently).

The timing of such a groundwater quality assessment (not necessarily limited to DNT analyses alone) should take into consideration the condition of the site and recent site activity. It is not clear what effect, if any, changes in site surface conditions will create in groundwater quality. In general it can be expected that during and immediately following construction activity elevations in groundwater contaminants will potentially be observed. Conversely as site development continues and larger areas are effectively covered with impervious surfaces such as buildings, roads and parking lots the potential exists to reduce mobilization of contaminants by reducing the potential for leaching. These issues should be considered in the groundwater quality assessment process.

Response: See Response to Comment 17. Also, Ecology agrees with much of issues and questions raised. To ensure that groundwater contamination doesn't get worse, Ecology conducts a 5-year review of sites once they reach the end of the planned cleanup action, which help to ensure the cleanup remains protective of human health and the environment. Ecology will evaluated groundwater data both during and especially following the soil scraping process. Weyerhaeuser and DuPont companies maintain long-term liability for contamination left on site. If contamination levels rise after the cleanup is conducted (on-site deposition, cap and cover), the companies will have to work with Ecology to resolve the problems. It remains to be seen whether groundwater contaminant concentrations increase or decrease with the planned cleanup action. The companies, with on-going Ecology oversight, will be monitoring groundwater. The planned cleanup action is designed to address lead and arsenic-impacted soil. Confirmational soil sampling will be conducted, following the soil scraping, to ensure the cleanup is adequate.
Responder: Ecology
Change to the Document(s): No

Comment # 19

Commenter: DTCOP-3
Comment Type: Primary Technical Review Comments (Letter received)
Document: NA
Location in Document: NA
Comment: Whereas we do not take issue with the determination of impracticability of aquifer restoration by pump and treat mechanisms for this aquifer system, we do believe that contingency planning is appropriate to address the DNT issue should elevated levels continue to be seen with no downward trend. Future contingency actions should consider steps such as:
Additional groundwater monitoring and data analysis to more accurately identify problem areas and groundwater quality trends.

Further focused source investigation based on the results of additional monitoring to identify source areas and land development impacts (positive or negative).
Source removal actions if discrete sources are identified.
Focused pump and treat efforts to address limited localized groundwater problem areas.
It is possible that a determination could be made by WDOE in the future that elevated groundwater levels exist but not at levels severe enough to warrant further remediation efforts or that alternatives for further action are impractical. Such a determination would be based on a satisfactory determination by the PLPs and a thorough assessment of current site groundwater quality information.

Response: See Response to Comment 17. Also, groundwater concentrations of dinitrotoluene (DNT) have been pretty consistent over time. The concentration are low, but 5 monitoring wells routinely exceed the drinking water standard. If problems arise, such as groundwater contaminant concentrations rise unexpectedly, Ecology has the right to require the companies to conduct further investigation or cleanup actions. There are also re-openers in the proposed Consent Decree between Ecology and the companies.
Responder: Ecology
Change to the Document(s): No

Comment # 20

Commenter: DTCOP-4
Comment Type: Primary Technical Review Comments (Letter received)
Document: NA
Location in Document: NA
Comment: Ground water compliance monitoring is proposed based on one sampling event per year per monitoring well. We understand that the available ground water monitoring database will be used to identify the season of peak DNT concentrations in ground water, and that compliance monitoring samples will be collected only in that identified season. Given the length of the available record and variability in ground water DNT concentrations, seasonal patterns or trends for DNT still appear uncertain at this time.

We recommend that Ecology require quarterly ground water monitoring for DNT at the 6 compliance monitoring wells for the first two years. If those additional data identify trends, that would be very helpful in the groundwater quality assessment process or if the data confirm the identification of the season with highest DNT levels, further ground water sampling could focus on that season. If not, Ecology can adapt the schedule for ground water sampling to provide broader seasonality data (e.g., by continuing quarterly sampling or invoking a rotating season schedule of sampling every 3 or 5 quarters).

Response: See Response to Comment 17. Groundwater sampling originally occurred on a quarterly basis - once every 3 month. That data was evaluated and Spring was chosen as the time of year with potentially the highest concentrations. As noted earlier, the concentrations are relatively stable, without a lot of variability over the year. Groundwater monitoring is new being conducted on an annual basis, with sampling occurring in the Spring.
Responder: Ecology
Change to the Document(s): No

Comment # 21

Commenter: DTCOP-5
Comment Type: Primary Technical Review Comments (Letter received)
Document: NA
Location in Document: NA

Comment: An oral cancer potency factor of 0.68 $(mg/kg\text{-}day)^{-1}$ for mixed DNT is listed in Ecology's CLARC manual. That oral CPF is used in the reports to calculate a screening value of 0.13 ug/L for ground water based on a drinking water exposure pathway (e.g., see DCAP Table 4-1). In an apparent omission, the CLARC manual does not use the oral cancer potency factor for mixed DNT to calculate a cancer risk-based cleanup level for soils. Unless there is a strong rationale (e.g., an explanation given in the IRIS file) for why the oral cancer potency factor should not apply to ingested soils as well as ingested drinking water, the CPF of 0.68 $(mg/kg\text{-}day)^{-1}$ should be used to calculate cleanup levels and remediation levels for DNT in soils based on cancer risks, and the text and tables revised accordingly. The default MTCA Method B cleanup level for soils would be 1.5 ppm.
Response: A cleanup level for dinitrotoluene (DNT) in soil of 1.5 mg/kg is presented in the Risk Assessment (RA) report (see Table 2-3). Ecology has approved a site-specific cleanup level for total DNT (i.e., 2,4-DNT + 2,6-DNT) of 3.0 mg/kg. This value will be added to Table 4-1 of the DCAP. It should be noted that there is only one remaining location on-Site where the DNT cleanup level is exceeded and that location will be excavated as an MSU.
Responder: Ecology
Change to the Document(s): Yes. Modify the table in the Cleanup Action Plan (CAP) by adding the DNT cleanup level. Modified Table 4-1 of the CAP.

Comment # 22

Commenter: DTCOP-6
Comment Type: Primary Technical Review Comments (Letter received)
Document: NA
Location in Document: NA
Comment: The HHRA evaluations of soils data for the 4 open space exposure (remediation) units demonstrate that the targeted acceptable risk levels for human health are exceeded in all 4 units (see HHRA Table 4-7). The selected cleanup alternative for all 4 open space remediation units is No Action; see DCAP section 6.1.3. (The justification statement at DCAP section 6.1.3 states incorrectly that these areas meet cleanup standards for the protection of human health, contrary to the HHRA results). Since acceptable risk levels are exceeded, and under the No Action proposal potential soil exposures would not be further controlled (e.g., by access restrictions or soil capping), it seems that the MTCA threshold requirement for protectiveness (see WAC 173-340-360(2)) is not met. This requires more discussion by Ecology, including the representativeness of the data, the degree of exceedance of acceptable risk levels, and the possibility for comparatively focused cleanup actions (small areas), community interests, and applicability of the threshold requirement for protectiveness of human health at these open space units.
Response: Text will be added to the Feasibility Study (FS) which will discuss each Open Space remediation unit (RU) and the selected remedy.

The OS-1 RU is adjacent (i.e., south of) to Sequalitchew Creek. There are three locations where the lead concentrations exceed the ecological screening level and these three locations will be added to the list of Miscellaneous Small Units (MSUs) and excavated.

There are several locations in OS-2 and OS-3 RUs where the arsenic or lead concentrations exceed the open space cleanup or remediation levels. These exceedances are associated with former roads, hot spots, or are included in the Sequalitchew Creek NGRR MSUs. The exceedances that are not included in the Sequalitchew Creek NGRR MSU will be added to the MSU list and excavated.

The OS-4 RU is the open space surrounding Old Fort Lake. There are no lead exceedances but, there are four locations that have arsenic concentrations marginally above the area background concentration of 32 mg/kg. This open space unit requires special consideration as to the ecological impacts associated with cleaning up existing contamination at low concentrations vs. impacts to the local ecology or, in this case, the lake if no action was

taken. The area surrounding the lake has steep slopes and any soil excavation would result in the removal of all vegetation in the excavation area. The removal of vegetation would also remove the existing habitat and increase the potential for surface water runoff impacts to the lake. Haul roads and other impacts would also be necessary to gain access to where the exceedances are located and, along with those potential impacts listed above, could cause slope stability issues. Erosion control would be used in these areas but some impacts are likely. These potential impacts, coupled with the low contaminant concentrations, indicate that the greater harm to the environment would be to proceed with active remediation. Thus for the greater net environmental benefit, no action is a positive approach for this area.
Responder: Ecology
Change to the Document(s): Yes. Add text to the Feasibility Study. Modify the MSU (Miscellaneous Small Remediation Unit) figures in the FS and the CAP. Added text to CAP, page 6-1, Section 6.1.3 and to page 6-3, Section 6.3.4. Added text to FS, page 8-2, Section 8.2.

Comment # 23

Commenter: DTCOP-7
Comment Type: Primary Technical Review Comments (Letter received)
Document: draft CAP
Location in Document: NA
Comment: Our discussions with Ecology and the companies during this comment period clarified and confirmed our understanding that the proposed cleanup approach is intended to be a "mass excavation" approach, without attempts to fine-tune areas of surficial soils to be scraped based on the available site characterization data. Implementation of such a "mass excavation" approach simplifies many aspects of the proposed cleanup actions, requiring primarily only that appropriate compliance monitoring data show that the depth of scraping was adequate to meet the cleanup criteria. Thus, even if statistical data evaluations show that a given RU exceeds applicable criteria only because the "x2" or "10 percent" statistical criteria are exceeded (see HHRA Chapter 4), we understand that soils over the entire unit will be excavated.

This clarification is critical to an accurate understanding of the planned cleanup action as several statements in the documents could be interpreted as invoking an approach to cleanup other than "mass excavation" and caused us some confusion in our initial reading of the documents; this was only clarified after meetings and discussion with WDOE and the PLP representatives. Some examples which we noted are:

In section 6.2.1 of the DCAP the text states that excavations will be performed "in impacted areas as delineated by the RI sample data or by additional sample data", suggesting that areas to be excavated will be determined by the details of characterization data.

This statement is repeated in section 7.2.2 of the FS, where a description of the use of analytical field screening is also presented: "Where necessary, field-screening samples will be collected to guide the cleanup action and allow for more cost-effective excavation of the impacted soil".

In section 3.3 of the FS, the following statement occurs regarding actual soil volumes to be scraped: "Volumes reported below are pre-remedy estimates. The actual amount of soil excavated during the cleanup action will increase or decrease based on...actual field sampling data obtained during the cleanup action..." This suggests that sampling data could be used to decrease areas of excavation.

In section 8.2 of the FS, the preferred alternative is discussed. That text describes actions for the non-PA areas within golf course RUs as follows: "Any soils in these areas that are above the commercial remediation levels used in the RA will be excavated and placed within the PAs".

These descriptions (and perhaps other similar statements) appear to be at odds with the simpler approach of a "mass excavation". We recommend that text revisions be made as needed to present a consistent description of the "mass excavation" approach.
Response: Text revisions will be made as needed to present a consistent description of the "mass excavation" approach.
Responder: Ecology
Change to the Document(s): Yes. Modifications to the text in the RA/FS and CAP. Modified text in CAP, page 6-1, Section 6.2.1 and in the FS, page 3-2, Section 3.3, and page 8-1, Section 8.2.

Comment # 24

Commenter: DTCOP-8
Comment Type: Primary Technical Review Comments (Letter received)
Document: NA
Location in Document: NA
Comment: Chapter 3 of the FS provides estimates of volumes of soil for remediation based on detailed evaluations of site data. This discussion may not be intended to provide soil volume estimates that apply to the selected preferred alternative using a "mass excavation" approach, but there are no other volume (or area) estimates in the documents that do apply to the preferred alternative. Therefore the Chapter 3 information presentations such as the identification of only 263 out of 336 acres of commercial RUs as requiring soil excavation are confusing (see FS Table 3-1).

For clarity, we recommend that the FS provide information on the total areas that are proposed to be scraped under the preferred alternative and provide a discussion of any and all areas not to be excavated and the rationale for their omission. Thus, areas already addressed by ISR actions may not be included (although the completeness of those actions may need to be reviewed if any of the cleanup levels or remediation levels used to make the original decisions is revised downward). Similarly, the acreages within designated placement areas of the golf course RUs may not have to be excavated (they will effectively be capped in place). Some historic areas will also be capped in place without soil excavation.

This information could be presented simply for all of the areas where excavation is planned in a summary table.
Response: Text and/or a table will be added to the FS to clarify the total areas that are proposed to be scraped under the preferred alternative.
Responder: Ecology
Change to the Document(s): Yes. Created a new figure for the FS that will be included in Chapter 3 as Figure 3-1, and added text to page 3-4, Section 3.5.

Comment # 25

Commenter: DTCOP-9
Comment Type: Primary Technical Review Comments (Letter received)
Document: Risk Assessment
Location in Document: NA
Comment: The HHRA, section ES.4.2 states that except for the industrial land use area, soil remediation levels were calculated using the equations in WAC 173-340-740 (unrestricted land use soil cleanup standards). That section of the MTCA cleanup regulation specifies an acceptable cancer risk level of 1×10^{-6}. However, as noted in HHRA section 3.5.2.4 (see page 3-8), and in HHRA Appendix E tables, the commercial and golf course land use scenarios involving adult rather than child exposures actually use an acceptable cancer risk level of 1×10^{-5} (equal to the industrial land use value in WAC 173-340-745) for calculating site-specific cleanup levels or remediation levels.

We believe that the MTCA cleanup regulation as revised and amended (Feb 12, 2001 version) requires use of the 1 x 10^{-6} acceptable cancer risk level for all non-industrial exposure scenarios, even if only adults are involved. (As noted in HHRA Appendix C, section C.2, Attachment #1, previous Ecology guidance may have differed). Ecology should confirm the MTCA requirements in this regard and their application to the DuPont Site. Use of the stricter acceptable cancer risk level would result in lowering calculated cleanup or remediation levels by a factor of 10. (See HHRA Appendix E tables; for example, the cancer-risk based remediation level for soil arsenic for commercial and golf course worker scenarios would be 61 ppm divided by 10, or 6.1 ppm - which would default to MTCA's assumed background concentration of 20 ppm). We note that WAC 173-340-357(c) states that the acceptable risk level for remediation levels shall be the same as that used for the cleanup level.

We also note that the HHRA actually uses the 1 x 10^{-6} acceptable cancer risk level to identify EUs that need to be addressed in the FS (see Tables 4-6 and 4-8). It states in section 4.2.2 (page 4-1) the following MTCA risk-based criterion: "The human health risk level for individual constituents may not exceed...a cancer risk of one-in-a-million (1E-06) for historical, open space, golf course, and commercial EUs". This approach, which we believe matches the requirements under the current MTCA cleanup regulation, is not consistent with the approach for calculating cleanup levels and remediation levels using a 1 x 10^{-5} acceptable cancer risk level.

Response: Ecology has previously approved site-specific remediation levels (see Appendix C of the Risk Assessment) for the Site. These remediation levels will be used during the course of the cleanup. These remediation levels are based on site-specific exposure scenarios and are protective of the reasonably maximum exposed (RME) individual as stipulated in MTCA. In addition, the application of these remediation levels will not result in an exceedance of the cumulative risk level of 1E-05 which is consistent with the old and new versions of MTCA (see WAC 173-340-708).

The Risk Assessment will be updated so that the individual analyte cancer risks are compared to a risk level of 1E-05 for the commercial, golf course, and industrial exposure scenarios and 1E-06 for open space and historical exposure scenarios.
Responder: Ecology
Change to the Document(s): Yes. Change to be made to the Risk Assessment. Updated RA page 4-1, Section 4.2.2; page 4-2, Section 4.3; page 4-3, Section 4.4.1; and modified the shading in Table 4-6.

Comment # 26

Commenter: DTCOP-10
Comment Type: Primary Technical Review Comments (Letter received)
Document: Risk Assessment
Location in Document: NA
Comment: Our reading of the reports leads us to believe that site-specific remediation levels were developed with an assumption that they replaced, or "took precedence over", MTCA (default) cleanup levels. This is not consistent with our understanding of the role of remediation levels under MTCA (see especially WAC 173-340-355 - "Remediation levels are not the same as cleanup levels" - and 173-340-708(10)). Cleanup levels must be established for every site (WAC 173-340-355(2)); remediation levels establish concentrations above which certain specified (often more costly) actions will be applied, but some actions - including containment (e.g., consolidation and capping) and institutional controls - are required to address any hazardous substances exceeding the cleanup levels. (See the examples in WAC 173-340-355). Where an alternate RME scenario is used to derive remediation levels, they generally define the concentrations below which only institutional controls (to maintain the alternate RME scenario exposures as reasonable, excluding others) are required.

Cleanup versus remediation levels does not appear to us to be a matter of "either/or", but rather a question of "both". The mixing of cleanup and remediation levels (and the implicit dropping of some of the applicable,

underlying cleanup levels) in the summary tables in the reports seems to us confusing. We believe the presentation would be much clearer if all of the cleanup levels were first identified and summarized, followed by the site-specific remediation levels being used to identify specific components of the proposed cleanup actions.

Response: Cleanup levels (i.e., method B cleanup levels and soil-to-groundwater cleanup levels) are presented in Chapter 2 of the RA. Chapter 2 of the RA identifies constituents of potential concern for the subsequent evaluation by comparing the maximum detected site concentrations to these cleanup levels. In some cases the MTCA cleanup levels were modified based on site-specific information (as allowed under MTCA). This information included site-specific leaching studies and other information and has been approved by Ecology.

All of the levels that will be used to evaluate compliance sample results are remediation levels, with the exception of arsenic in open space and historical areas where the area-wide background concentration will be used. Site-specific remediation levels were developed using site-specific or land-use specific information to develop alternative reasonable maximum exposure scenarios (RME). These values are remediation levels because they are either based on non-residential future land uses (which require institutional controls) or because they are associated with engineering controls.

The documents will be reviewed and care will be taken to ensure that the terms CL and RL are used correctly.
Responder: Ecology
Change to the Document(s): Yes. Changes to be made to the RA. Updated page 3-1, Section 3.2.

Comment # 27

Commenter: DTCOP-11
Comment Type: Primary Technical Review Comments (Letter received)
Document: Risk Assessment
Location in Document: NA
Comment: There are actually two golf course worker scenarios used for calculation of site-specific remediation levels in the golf course land use RUs. The first one is equivalent to the commercial worker scenario in the parameter values chosen, and is used to define soil contaminant levels that need to be consolidated and capped in the golf course placement areas. The second one uses lower soil contact rate and exposure frequency parameter values and is used to calculate remediation levels for removal and offsite disposal of more highly contaminated soils (see HHRA Appendix C, section C.2, Attachment #1; see also FS Appendix H).

Only the results for the first golf course exposure scenario are included in many of various summary tables of cleanup levels and remediation levels (e.g., see HHRA Table ES-1 and Table 3-7; DCAP Table 4-1 includes both). However, in many places in the text, discussions of the golf course worker scenario and calculated golf course remediation levels actually refer to the second description whose results are not included in the summary tables. This resulted in some unnecessary confusion. We recommend that both golf course exposure scenarios, suitably labeled, be included in all of the summary tables so that text references can be made clearer.
Response: Two golf course worker scenarios were identified in the documents. The golf course worker scenario in the RA does not take into account engineering controls. The second golf course worker scenario in the FS takes into account engineering controls (i.e., the implementation of the cap/cover remedy). This remedial alternative was selected in the FS after evaluating a variety of alternatives. It is not appropriate to choose a remedial alternative as part of the RA. Therefore, the second golf course worker scenario will remain in the FS and will not be discussed in the RA. The documents will be reviewed to ensure that this rationale is implemented consistently throughout all of the documents.
Responder: Ecology
Change to the Document(s): Yes. Changes to be made to the RA. Added text to page 3-3, Section 3.5.1.2.

Comment # 28

Commenter: DTCOP-12
Comment Type: Primary Technical Review Comments (Letter received)
Document: Risk Assessment
Location in Document: NA
Comment: Evaluations of all soils data over a depth interval as broad as 1 to 15 feet are too broad to reflect realistic exposure scenarios. Soil contamination levels of potential concern may frequently be diluted by the inclusion of additional data not reflecting a similar probability of soil contact; for example, a contaminated 1 to 2 foot layer exceeding established cleanup levels may be "statistically diluted" to appear much lower. We recommend that the discussions of results for data from the broad 1 to 15 foot depth interval be characterized as generally descriptive rather than as a detailed exposure assessment. It can be noted that the ultimate decisions on depths of soil excavation will be made based on sampling results for small, surficial depth intervals (6 inches; see DCAP section 6.6.2) during compliance monitoring.
Response: We agree with the comment and the documents will be modified to characterize discussions of results for data from the broad 1 to 15 foot depth interval as generally descriptive.
Responder: Ecology
Change to the Document(s): Yes. Changes to be made to the RA. Added text to page 4-2, Section 4.3.

Comment # 29

Commenter: DTCOP-13
Comment Type: Primary Technical Review Comments (Letter received)
Document: Risk Assessment
Location in Document: NA
Comment: The HHRA screens detected contaminants at the site to identify constituents of possible concern for the soil-to-ground water pathway. The results (see HHRA section 2.5.2.1 and Tables 2-3 through 2-6) identify a list of constituents for this pathway. The HHRA states that remediation options for these COPCs are presented in the FS. However, only one constituent is actually discussed in the FS for ground water. The FS at section 1.4.3 states only that the RI and RA identify only one constituent exceeding drinking water standards (DNT).

A brief discussion should be added to the FS presenting the rationale for dismissing the list of constituents in HHRA Table 2-6 and the soil-to-ground water pathway. Presumably this rationale will be based on ground water monitoring results; the locations of monitoring wells versus soil locations with constituents above soil-to-ground water criteria values should be included in the discussion.
Response: The list of constituents in the RA Table 2-6 were not dismissed in the FS. In fact, with the exception of cadmium, all instances where constituent concentrations exceeded the soil-to-groundwater criteria were identified as MSUs. Locations where the cadmium concentration exceeded the soil-to-groundwater criteria were not designated as MSUs since this contaminant has not been detected in groundwater, occurs in very low concentrations, has an average/mean concentration that is below the cleanup level, has a low number of exceedances (less than 5%) of the cleanup level in comparison to the number of detections and/or samples collected, and have no known source associated with activities at the Site.
Responder: Ecology
Change to the Document(s): No

Comment # 30

Commenter: DTCOP-14
Comment Type: Primary Technical Review Comments (Letter received)
Document: NA
Location in Document: NA

Comment: USEPA has issued guidance for the IEUBK lead model stating that soils data used with the model should be obtained through chemical analysis of the <250 um (<0.25 mm) particle size fraction. We have already provided you with reference information from USEPA Region 10 staff, and a citation to an EPA website, on this issue. The concentrations for lead (and arsenic) are generally assumed to increase as the particle size fraction of soils decreases. For the DuPont site, the FS provides size-fraction data that confirm this increase in concentration with smaller particle sizes (see FS Appendix C for lead, especially Table C-3; for even more detailed arsenic data, see FS Appendix D). The result of using data from the standard MTCA analyses of <2mm soil particles in the lead model, as at the DuPont site, instead of EPA-recommended <0.25 mm data, is that exposures and risks are biased low. Calculated soil cleanup or remediation levels using the IEUBK model that are met using <2mm soil lead data could in fact be exceeded using <0.25 mm data for the same samples.

The current MTCA cleanup regulation requirement to analyze the <2mm size fraction of soils (see WAC 173-340-740(7) (a)) is thus inconsistent with EPA guidance for use of the IEUBK model. This issue has already been raised with the Ecology policy section (e.g., in connection with the Area Wide Task Force process, which also addresses soil contamination by lead and arsenic). We believe Ecology needs to make a policy decision on how to incorporate EPA's guidance for using the IEUBK model under MTCA. In fact, similar scientific (exposure assessment) issues are raised for the soil ingestion pathway for constituents other than lead, including arsenic, since the primary question is what particle sizes of soils (and dusts) is being ingested.

The relationship between soil particle sizes and lead concentrations has been established scientifically; we have site-specific information for the DuPont Site. At a minimum, this information should be used to provide an uncertainty discussion for the IEUBK results as applied to compliance with site-specific cleanup or remediation levels for soil (i.e., bringing together the EPA guidance and the FS Appendix C results). The HHRA would in fact be improved if a general section on uncertainty was added, so that Ecology could make risk management decisions based on a more complete characterization of the state of knowledge.

We also recommend that Ecology carefully consider the available information on lead concentrations by particle size and EPA's guidance for the IEUBK model in reviewing and approving the detailed sampling and analytical protocols for compliance monitoring of soil cleanup actions. The uncertainties in the current HHRA regarding lead risks because soil lead data represent the <2mm size fraction would be of little consequence if compliance monitoring data were collected based on analysis of the <0.25 mm fraction.

Response: The current site remediation levels for lead were established based on two years of work focused on developing, reviewing, and certifying the IEUBK model by Ecology, the Companies, outside experts, and the SAB. The results of this work are the Ecology approved site-specific remediation levels. Any change to these levels would require a similar time frame and would not begin until EPA formally requires this approach at hazardous waste sites. Ecology has determined that the benefit of a timely cleanup outweighs the potential benefit of potentially modifying remediation levels based on this new guidance.

A general uncertainty section will be added to the RA.
Responder: Ecology
Change to the Document(s): Yes. Changes to be made to the Risk Assessment. Chapter 5 added to the RA.

Comment # 31

Commenter: DTCOP-15
Comment Type: Primary Technical Review Comments (Letter received)
Document: NA
Location in Document: NA
Comment: Development of the proposed cleanup plan for the DuPont Site has proceeded over a period of many years. The reports include as attachments a number of documents completed some time ago (see especially the

HHRA, Appendix C materials) that provide supporting information. Those materials are very helpful in understanding the development of various aspects of the proposed cleanup plan. However, because the attached materials are dated, they are in some respects no longer consistent with or representative of the rest of the information presented in the reports. For example, summaries of DNT data from ground water monitoring wells are not current with the complete database provided in the RI report, and the exposure parameters used to calculate TPH soil cleanup levels are not consistent with the exposure parameters ultimately used for the rest of the HHRA evaluations and development of other cleanup and remediation levels.

We recommend that a general statement be added to reflect an understanding that some of the details in the appended materials are inconsistent because of the time at which they were originally prepared, but that those inconsistencies do not affect the selection of the preferred cleanup alternative. In addition footnotes could be placed wherever appropriate to clarify this question. Issues affecting the calculation of cleanup or remediation levels (still listed in the summary tables, e.g. Table 4-1 of the DCAP) are of somewhat more concern, but may still be addressed in ways that do not require rewriting the appendix materials (e.g., to note that soil TPH remediation was accomplished to concentrations well below the original calculated cleanup levels).
Response: A general statement will be added to the RA to communicate that some of the details in appendix C are inconsistent because of the time at which they were originally prepared, but that those inconsistencies do not affect the selection of the preferred cleanup alternative.
Responder: Ecology
Change to the Document(s): Yes. Changes to be made to Risk Assessment. Chapter 5 added to the RA.

Comment # 32

Commenter: DTCOP-16
Comment Type: Primary Technical Review Comments (Letter received)
Document: NA
Location in Document: NA
Comment: The elevated regional soil arsenic concentrations are the result of releases from the former Tacoma Copper Smelter, as determined from regional soil sampling studies under the Tacoma Smelter Plume site investigations. The background concentration for soil arsenic as determined from sampling near the DuPont Site (32 ppm) therefore represents an area background rather than a natural background value (see WAC 173-340-200 definitions), as noted at HHRA section ES 4.4.

Under MTCA, natural background but not area background concentrations can be used to constrain soil cleanup levels (see WAC 173-340-740(5) (c), 173-340-700(6) (d), and 173-340-705(6)). If cleanup of portions of a site below area background levels would result in recontamination, cleanup actions may be delayed but not eliminated (see WAC 173-340-360(4)(d)); under those circumstances, the remedial action shall be considered an interim action until cleanup levels are attained.

The DuPont Site reports use the 32 ppm "background" concentration for soil arsenic as a cleanup level or remediation level (e.g., see DCAP Table 4-1); compliance with that criterion is assumed to establish completion of a final cleanup action with respect to soil arsenic for specified RUs. This appears to be inconsistent with the MTCA cleanup regulation provisions related to the two types of background concentrations, and could affect the selected cleanup levels for soil arsenic. Ecology should review the application of these sections of the MTCA cleanup regulation to the DuPont Site.
Response: Comment Noted. Ecology approved the use of the 32 mg/kg (i.e., ppm) as the area background concentration for arsenic in 1996. In the approval letter, Ecology stated: "So, what does that 32 ppm determination mean in terms of site cleanup decisions? Ecology will not require any soil cleanup to be more stringent than 32 ppm irrespective of land use" (Letter from Mike Blum to Vern Moore and Jack Frazier, March 11, 1996). This letter will be added to Appendix C of the RA
Responder: Ecology

Change to the Document(s): Yes. Letter to be added to Appendix C of the Risk Assessment. Text added to Chapter 5.

Comment # 33

Commenter: DTCOP-17
Comment Type: Primary Technical Review Comments (Letter received)
Document: Risk Assessment
Location in Document: NA
Comment: We recognize that the companies and Ecology have had long discussions regarding ecological risk assessment and the development of criteria for protection of the environment. The HHRA identifies lead as the only constituent of concern for ecological risks and establishes a criterion value of 118 ppm lead in soil (see HHRA section 3.4; see WAC 173-340, Table 749-3). In HHRA Appendix A the exclusion of arsenic, the other widespread soil contaminant at the DuPont site, as a constituent for ecological evaluation is explained as follows: "Human health standards for arsenic are protective of ecological organisms. Therefore, remediating arsenic contamination to meet human health standards will ensure protection for ecological receptors". In this statement it is unclear to us whether the human health standards for arsenic being referred to be the typical Method B values, defaulting to assumed natural background of 20 ppm, or the higher remediation levels proposed for the DuPont Site (DCAP Table 4-1).

We recommend that the discussion in HHRA Appendix A regarding the exclusion of arsenic as a constituent for ecological risk assessment be expanded somewhat for clarity. Following the approach used for lead, and assuming that surficial soil arsenic would be present as arsenic V (unsaturated, aerobic conditions) for example, it might be sufficient to note that the MTCA Table 749-3 value for wildlife of 132 ppm is higher than any of the proposed soil arsenic remediation levels based on protection of human health, and that arsenic may therefore be eliminated.
Response: The discussion in Appendix A in the RA focusing on the exclusion of arsenic as a constituent of ecological concern will be expanded.
Responder: Ecology
Change to the Document(s): Yes. Changes to be made to the Risk Assessment. Text added to page A-3, Section A-6.

Comment # 34

Commenter: DTCOP-18
Comment Type: Primary Technical Review Comments (Letter received)
Document: Feasibility Study
Location in Document: NA
Comment: Were any constituents detected at the DuPont Site eliminated as COPCs, or assigned to a No Action alternative, because they were not known to be associated with historic site activities? Some comments in the text (e.g., see FS section 7.6.1) suggested to us that certain detected constituents (particularly at MSUs) were eliminated from further consideration using a criterion requiring historic association with site activities. Since the MTCA definition of facility (equivalently, site) includes places where "hazardous substances...have come to be located" (WAC 173-340-200), Ecology should (in the DCAP) discuss and provide the policy rationale for elimination of any constituents from further consideration because they are not known to have been associated with historic site activities.
Response: Yes, cadmium was eliminated (see Section 8.3, page 8-3 of the FS and section 6.3.2 on page 6-3 of the DCAP). No action is appropriate for small occurrences of cadmium since this contaminant has not been detected in groundwater, occurs at very low concentrations, has an average/mean concentration that is below the cleanup level, has a low number of exceedances (less than 5%) of the cleanup level in comparison to the number of detections and/or samples collected, and has no known source associated with activities at the Site.

Responder: Ecology
Change to the Document(s): No

Comment # 35

Commenter: DTCOP-19
Comment Type: Primary Technical Review Comments (Letter received)
Document: NA
Location in Document: NA
Comment: Compliance monitoring sampling for soils is described in DCAP section 6.6.2. Composite sampling (5-to-1) is proposed for MSUs. Discrete sampling (point sampling) is proposed for cells within each of the larger RUs. We recommend that Ecology adopt a small composite sampling approach for the cells (approximately one-half acre in size) in the larger RUs, with composition ratios of no more than 5-to-1. Detailed sampling protocols (e.g., random sampling versus center of cell and along four diagonals, etc.) can be identified in later compliance monitoring sampling and analysis plans. Remediation results will be made for each cell on an all-or-none basis. In the balancing between representativeness and detectability of remaining contamination (more locations are better) and possible dilution of results, we favor better representativeness. The exposure scenarios in the risk evaluations involve long-term exposures for which average rather than peak concentrations are of primary interest. If there are "hot spots" with higher concentrations remaining, they are more likely to be found with 5 sampling locations rather than 1.

The DCAP (see section 6.2.2) proposes not to perform any statistical data evaluations, but rather proposes to simply compare single results to applicable cleanup or remediation levels (Composite sampling techniques will also provide only a single analytical result). This constitutes an alternate statistical method for evaluating compliance under MTCA. The DCAP should include a discussion and rationale for this alternate statistical approach (compare to the Everett Smelter Site FCAP, which similarly involved decisions on a very large number of decision units).
Response: Composite sampling (5 to 1) will be used to evaluate compliance. Text will be added to the CAP indicating Ecology's approval of this method.
Responder: Ecology
Change to the Document(s): Yes. Changes to be made to the FS and CAP. Text was added to FS - page 7-2, Section 7.2.2 and to the CAP - page 6-6, Section 6.6.2.

Comment # 36

Commenter: DTCOP-20
Comment Type: Primary Technical Review Comments (Letter received)
Document: NA
Location in Document: NA
Comment: Ecology has noted that the screening for contaminants of potential concern included an evaluation of possible fish consumption exposures and risks using representative tribal (subsistence) fish consumption rates that are higher than MTCA default values. Those results are not presented in the HHRA. They should be added (e.g., in section 2.5 and Appendix C). We understand that the results showed no significant risks and would not in any event affect the selected approach for ground water remediation (e.g., natural attenuation) at the DuPont site.
Response: Fish consumption is an incomplete exposure pathway, and therefore, was not evaluated in the RA. Ecology performed an evaluation of this pathway and that evaluation is appended to this responsiveness summary.
Responder: Ecology
Change to the Document(s): No. Copy of March 24, 2003 letter from Ecology to Nisqually Indian Tribe added to this Responsiveness Summary.

Comment # 37

Commenter: DTCOP-21
Comment Type: Primary Technical Review Comments (Letter received)
Document: NA
Location in Document: NA
Comment: Neither the CAP nor the Consent Decree reference the Memorandum of Agreement (MOA 2000) between Weyerhaeuser Company, Weyerhaeuser Real Estate Company, Nisqually Point Defense Fund, Committee for the Preservation of the Nisqually Mission Historical Site, Nisqually Delta Association and the DuPont Historical Society. This MOA was developed during negotiations that ran through the year 2000. The MOA 2000 develops a framework for the establishment of a National Historic District along the banks of the Sequalitchew Creek. That agreement grew out of dialog between the PLP's, the City of DuPont and a variety of citizen groups regarding the preservation of historic resources in and around the Consent Decree Area. The MOA 2000 provides specific provisions which impact, to some measure, the scope and location of cleanup activities. We therefore believe it is important that this agreement be referenced in both the Consent Decree and the Cleanup Action Plan.
Response: The MOA is outside the scope of this cleanup project and will come into effect after the cleanup is completed. It will be referenced in the CAP.
Responder: Ecology
Change to the Document(s): Yes. Changes to be made to CAP. Text added to page 2-3, Section 2.6.

Comment # 38

Commenter: DTCOP-22
Comment Type: Primary Technical Review Comments (Letter received)
Document: draft CAP
Location in Document: Section 2.6, Figure 2.1
Comment: In Section 2.6 of the DCAP, reference is made to historical resources in the Consent Decree Area, and four are listed. The DCAP then proceeds to explain that the 3 sites comprise 4 acres (which 3 are being referred to is not defined): this is confusing. Is this discrepancy reflective of all recent agreements on preservation of buffers on the three sites indicted on Figure 2.1? The MOA 2000 allows for a one acre Methodist/Episcopal Mission site. Is that the acre which is not included? That seems to be the case, given the statement in that same section that the "size and location" of the Mission Site is not known.

The site itself was in fact identified and was long ago marked by the first private citizen to own the property (a former Hudson's Bay Company employee), and a series of memorials, ever more substantial, have been maintained ever since to mark that place. We request that the location of that marker be indicated on Figure 2.1, and that this discrepancy be clearly resolved in the final documents.

Earlier in the cleanup process, there was an unfortunate incident where the concrete and bronze marker that memorializes the Methodist/Episcopal Mission site was temporarily removed. While it has been returned to something close to its original location, we have received numerous expressions of concern that the exact location of that mark be accurately reestablished, mapped and documented in a manner which will assure it will not be lost during the cleanup process.

Understanding that the area where the marker sits is not intended to be included in the mass excavation efforts, it still seems to us a reasonable concern that heavy equipment operation in the area might (once again) disturb the marker. We would therefore request that the exact latitude and longitude of the marker be recorded in the DCAP, and that the spot be indicated on Figure 2.1. We would also request that the State Office of Historic Preservation be asked to confirm that the marker location they have recorded from earlier investigations

corresponds with the relocated marker coordinates. We would also note that we have heard again from citizens interested in historic preservation that there is still potential for further archeological investigation around that site. We are therefore forwarding a request that a non-invasive preliminary investigation be allowed to build on the site studies conduced by Guy Moura in 1989. This would certainly assist in accurately replacing that marker.
Response: The three sites referred to in the DCAP are the shell Fort Nisqually Cemetery (45PI404); Shell Midden (45PI72); and 1833 Fort Nisqually Site (45PI55). The location of the Methodist Mission monument will be added to the figures but, the boundary will not be defined as this will be done after the cleanup is complete. No work is planned within 250 feet of the Methodist Mission marker.
Responder: Ecology
Change to the Document(s): Yes. Changes to be made to the RA and CAP. Text was added to the RA: page ES-1, Section ES-2, Section ES-3.1, Figure ES-2 and Chapter 2, page 2-1, Section 2.2.3 and Figure 2-2. Text was also added to the CAP, page 2-3, Section 2.6, and Figure 2-1.

Comment # 39

Commenter: DTCOP-23
Comment Type: Primary Technical Review Comments (Letter received)
Document: NA
Location in Document: NA
Comment: Future land uses discussed in section 1.5 of the Feasibility Study describe land use areas divided at Sequalitchew Creek, with only industrial uses to the north, and commercial, historical and recreational uses to the south. We would point out that the Methodist/Episcopal Mission Site is to the north of Sequalitchew creek (in the area designated for industrial land use). According to the MOA 2000 Weyerhaeuser has committed to commemorate that site, and connect that memorial to other Historic District sites by a trail system. Additionally Weyerhaeuser has agreed to allow a historic preservation organization to purchase a one acre or greater site in commemoration of the Mission. We therefore believe this section should reflect those agreements.

We also would appreciate more discussion addressing remediation measures around (and over) historic sites. In particular it would be appropriate to clarify in this discussion the appropriateness of the cleanup levels to be applied to the historic sites in relation to their land use and surrounding land uses.
Response: Additional text will be added to the FS to clarify remediation measures around historical sites. Note that flexibility needs to be maintained when working in these areas to balance the needs of the cleanup with the protection of cultural resources.
Responder: Ecology
Change to the Document(s): Yes. Changes to be made to FS. Text was added to page 8-3, Section 8.2.

Comment # 40

Commenter: DTCOP-1
Comment Type: Editorial Comments (Letter received)
Document: draft CAP
Location in Document: NA
Comment: See DCAP language at section 4.4.5. The concentrations of all identified hazardous substances will not be below the cleanup levels or remediation levels after the proposed actions are complete, as stated. For example, some soil results for the open space remediation units exceed those values, but no action is proposed for all open space units. Ground water DNT concentrations may continue to exceed the 0.13 ug/L screening level for some time (no projected time for compliance is provided).
Response: The text will be modified to ensure consistency.
Responder: Ecology

Change to the Document(s): Yes. Changes to be made to the CAP. Sentence on page 4-3, Section 4.4.5 was deleted.

Comment # 41

Commenter: DTCOP-2
Comment Type: Editorial Comments (Letter received)
Document: draft CAP
Location in Document: NA
Comment: See DCAP language at section 4.3. Remediation levels do not "take precedence" over cleanup levels, as stated. See WAC 173-340-355(2) and (3). Where remediation levels are developed that exceed cleanup levels, some action (e.g., continuing institutional controls, or long-term containment) is still needed to address remaining contamination between the cleanup levels and remediation levels. Establishing a remediation level does not replace the underlying cleanup level.
Response: The referenced sentence in section 4.3 will be modified.
Responder: Ecology
Change to the Document(s): Yes. Changes to be made to the CAP. Sentence on page 4-2, Section 4-3 was deleted.

Comment # 42

Commenter: DTCOP-3
Comment Type: Editorial Comments (Letter received)
Document: draft CAP and RA
Location in Document: Section 6.1.3 of DCAP, Tables 4-4, 4-7, and 4-8 in RA
Comment: See DCAP statement at section 6.1.3 that the open space remediation units "currently meet cleanup standards for the protection of human health". This statement is inconsistent with the results presented in the HHRA report that none of the open space RUs is in compliance (e.g., see Table 4-4 of the HHRA, as well as Tables 4-7 and 4-8).
Response: Text in this section will be updated. See response to comment number 22.
Responder: Ecology
Change to the Document(s): Yes. Changes to be made to the CAP and FS. Added text to CAP page 6-3, Section 6.3.4 and to page 6-1, Section 6.1.3. Added text to FS, page 8.2, Section 8.2

Comment # 43

Commenter: DTCOP-4
Comment Type: Editorial Comments (Letter received)
Document: RI and FS
Location in Document: Page 3-18 RI, pages 1-3, and 7-18 FS.
Comment: The reports include conflicting statements regarding time trends for DNT in ground water monitoring wells. For example, see pages 1-3 and 7-18 in the draft FS report and page 3-18 in the draft RI report. Given the variability in DNT concentrations at individual wells over time, any time trends are not obvious. Any conclusions regarding time trends should be supported by proper statistical data evaluations (see, for example, Statistical Methods for Environmental Pollution Monitoring by R.O. Gilbert, Van Nostrand Reinhold 1987 for applicable non-parametric trend tests).
Response: Conclusions regarding trends will be removed from the documents (FS & CAP).
Responder: Ecology
Change to the Document(s): Yes. Changes to be made to the RI and FS. Text was modified in RI, page 3-18, Section 3.2.3 and in the FS page 7-21, Section 7.12.

Comment # 44

Commenter: DTCOP-5
Comment Type: Editorial Comments (Letter received)
Document: RA
Location in Document: Table 4-6
Comment: See HHRA report, Table 4-6. The table appears to be missing a line for exposure unit OS1.
Response: A line for OS-1 will be added to Table 4-6.
Responder: Ecology
Change to the Document(s): Yes. Change to be made to RA. A line was added to Table 4-6 in the RA.

Comment # 45

Commenter: DTCOP-6
Comment Type: Editorial Comments (Letter received)
Document: draft CAP
Location in Document: Section 5.6.1.
Comment: See DCAP language at section 5.6.1. Removal of contaminated soils from the site would eliminate potential (onsite) exposure pathways to the contaminated soils. However, consolidation and containment (with a cap/cover system) serve to control rather than eliminate the soil exposure pathways. The golf course maintenance worker scenario estimates exposures based on continued (limited) soil contact. Long-term inspection and maintenance of the containment system will continue to control potential soil exposures. Control rather than elimination is a better description, since disruption of the cap/cover could still result in exposure to contaminated soils. Use of the term control is consistent with the requirement, as noted in section 5.6.1, for long-term maintenance of the containment system. The elimination of an exposure pathway, on the other hand, would require no long-term actions.
Response: Text will be modified in the DCAP to address this comment.
Responder: Ecology
Change to the Document(s): Yes. Change to be made to the CAP. Modified text on page 5-4, Section 5.6.1.

Comment # 46

Commenter: DTCOP-7
Comment Type: Editorial Comments (Letter received)
Document: draft CAP
Location in Document: section 6.2.2
Comment: See DCAP language at section 6.2.2 regarding glacial kettles (and also see FS at page 7-3). This statement seems to indicate that surface soils may be directly pushed into glacial kettles outside of the placement areas. We assume that if possibly contaminated surface soils are placed into a glacial kettle, and that glacial kettle is outside of a designated placement area, that the kettle would in effect become another placement area and a cap/cover would be installed. We suggest that the process of filling any onsite glacial kettles be described in more detail to avoid any misinterpretation.
Response: The text will be modified to clarify that soil will only be pushed into glacial kettles if they are already designated PAs.
Responder: Ecology
Change to the Document(s): Yes. Change to be made to the FS and CAP. Modified text in CAP, page 6-2, Section 6.2.2 and in the FS, page 7-3, Section 7.2.3.

Comment # 47

Commenter: DTCOP-8
Comment Type: Editorial Comments (Letter received)
Document: draft CAP

Location in Document: Section 6.6.1
Comment: See DCAP language at section 6.6.1 regarding cap/cover depth as a human health barrier. The second golf course worker exposure scenario (for calculation of remediation levels above which soils would be taken offsite rather than left in the placement areas) assumes some limited contact with contaminated materials below the human health barrier. If the barrier is constructed based on the "maximum depth in which a golf course worker is expected to excavate", then no contact with contaminated soils below the barrier would occur. This minor inconsistency should be resolved.
Response: This is not an inconsistency. In all likelihood, there will not be any worker exposure to contaminated soil in placement areas. It was determined by Ecology, however, that to be conservative some exposure was possible under extreme conditions. This degree of limited exposure was included in the calculations for setting the remediation level. This comment highlights the conservative (i.e., health protective) exposure assumptions that were used to derive the golf course worker remediation levels.
Responder: Ecology
Change to the Document(s): No

Comment # 48

Commenter: DTCOP-9
Comment Type: Editorial Comments (Letter received)
Document: FS
Location in Document: Table C-3.
Comment: Under the column for Area 40 (Packhouse) data, the entry for total lead is given as 30,000 mg/kg. This appears to be a typo. It is inconsistent with the concentrations by size fractions, entered in the same data block. See the text on page C-6, which indicates the 30,000 mg/kg value should perhaps be 3,000 mg/kg.
Response: The noted typo will be corrected.
Responder: Ecology
Change to the Document(s): Yes. Change to be made to the FS. Modified text in Appendix C, page C-26.

Comment # 49

Commenter: DTCOP-10
Comment Type: Editorial Comments (Letter received)
Document: FS
Location in Document: Pages ES-2 and 1-2.
Comment: There appears to be a minor inconsistency in the figures given at these two locations for the volume of soils removed during Interim Source Removal actions (72,000 tons versus 63,393 tons).
Response: The inconsistency in Interim Source Removal Volumes will be corrected.
Responder: Ecology
Change to the Document(s): Yes. Change to be made to the FS. Modified text in FS, page ES-1, Section ES.3, and page 1-2, Section 1.3.

Comment # 50

Commenter: DTCOP-11
Comment Type: Editorial Comments (Letter received)
Document: FS
Location in Document: ES-3, Figure 1-3, Figure 6-2
Comment: How many small MSUs are there? The text at FS page ES-3 states that there are 49, while FS Fig 1-3 shows more than 70. Have some of the MSUs shown on Figure 1-3 already been cleaned up, accounting for the smaller count given in the text? See also DCAP Figure 6-2 which shows a smaller number of MSUs than FS Figure 1-3, and a different system of identifying labels.
Response: The number of MSUs will be corrected.

Responder: Ecology
Change to the Document(s): Yes. Change to be made to the FS and CAP. Text in FS, page ES1-3, Chapter 1 Figure 1-3; and CAP Figure 6-2 and text in CAP.

Comment # 51

Commenter: DTCOP-12
Comment Type: Editorial Comments (Letter received)
Document: FS
Location in Document: Page 3-1.
Comment: The figure given for acres of open space land uses - 12.9 acres - appears to be in error. Compare the figure of 73.21 acres (including 22.35 acres of Old Fort Lake) given in Table 2-1 of the HHRA report.
Response: The figure in the FS will be corrected.
Responder: Ecology
Change to the Document(s): Yes. Change to be made to the RA and FS. Acreages were modified. Changes in FS include: page 3-1, Section3.2; page 3-3, Section 3.4.1; and Figure 3-1 (new figure). In the RA changes include: page 2-1, Section 2.2.1 and page 2-5, Section 2.2.3 Table 2-4.

Comment # 52

Commenter: DTCOP-13
Comment Type: Editorial Comments (Letter received)
Document: FS
Location in Document: Page 3-2 in section 3.4, second paragraph.
Comment: The paragraph discusses excavation depths. In the second sentence, the term "actual lateral extent" appears to refer to depths rather than lateral (horizontal) extent, and should be reworded.
Response: This sentence will be reworded.
Responder: Ecology
Change to the Document(s): Yes. Change to be made to the FS. Page 3-2, Section 3.4 was modified.

Comment # 53

Commenter: DTCOP-14
Comment Type: Editorial Comments (Letter received)
Document: FS
Location in Document: Page 4-3 and elsewhere
Comment: With discussion of obtaining permits as part of implementability. Under MTCA, it is not necessary to obtain permits, only to demonstrate substantive compliance with permit conditions that would otherwise be required.
Response: Comment noted.
Responder: Ecology
Change to the Document(s): No

Comment # 54

Commenter: Lorraine Overmyer, DuPont Historic Society
Comment Type: E-mail comment
Document: NA
Location in Document: NA
Comment: During our review of the Toxic Waste Cleanup Plan, we found several statements that are of concern to us.
The statement "the Mission Site has not been located" is contradictory to all of the findings by a number of people who have been working on this project for a many years. Both Archaeologist Lee Stillson and Guy

Morua did studies for an earlier Weyerhaeuser report and stated they believed the Mission site was located on the north side of the creek. In addition, much research has been done by members of the Nisqually Point Defense Group, The Committee For The Preservation of The Nisqually Mission, headed by Dr. James Edgren, The Nisqually Delta Association, and The DuPont Historical Society.
On a site tour, Lee Stillson found fragments of brick in the area of the Mission marker, believed to be from the Mission chimney.
When the Weyerhaeuser Company removed the marker placed on the site by the Washington State Historical Society in 1927 for storage during cleanup of the area, they stated the site was marked on a map and that the monument was returned to the location where it now stands.
Our other concern is the statement in Section 1.5 of the Feasibility Study which describes land use areas. This states the land north of the creek will be designated for industrial use, while the area south of the creek will be used for historical, recreation and commercial activities. In that we believe the Mission site is located on the north side of the creek, this statement gives us great concern.
Response (E-mail): In terms of the Mission site, I think the dispute is over the exact/specific location, not the general location (or being pretty close). I believe everyone agrees that the Mission was located on the north side of the Sequalitchew Creek and "generally" in the area where the marker was placed and is again today. It's the level of precision that is in dispute, as I understand it.

In terms of that area north of the creek being designated for industrial land use, it will be Weyerhaeuser Real Estate (Quadrant) who will get to wrestle with the issue of the mission site and future uses - not Ecology and maybe not Weyerhaeuser Co. You and/or James Edgren and/or others should probably talk with Greg Moore with Quadrant about future land use/development in that area. No further cleanup work is planned or needed in that area north of the creek. There was no cleanup (soil removal) in the vicinity of the mission marker. Most of the cleanup north of the creek and within Parcel 1 was in the area of the Burning Ground and along the railroad corridors.
Responder: Mike Blum (Ecology)
Change to the Document(s): No

Comment # 55

Commenter: Dennis Clarke, Planning Director, City of DuPont
Comment Type: Letter received
Document: NA
Location in Document: NA
Comment: Thank you for the opportunity to comment on the above referenced documents. We appreciate the work of Ecology and the companies in preparing, reviewing, publishing and supporting complete and very readable documents. Your information workshops along with the one sponsored by your grant recipient, DToxCop, was very helpful to our Planning Agency, who reviewed the documents as well. The City remains concerned that a separate schedule needs to be worked out to cap the old rail line corridor down the entire length of the Sequalitchew Creek Canyon, not just for the portion within the consent decree area. Our concern is that this area should receive priority treatment and be done ahead of other work, since it doesn't need a grow-in period as the golf course cap does to be effective. This area is important to the City because the consent area currently limits public access to Puget Sound at its only practical access point.
Response: Whereas it isn't likely that special considerations can be made to release portions of the property within the consent decree prior to public review of the closure documents, Ecology will attempt to work with the Companies on this issue.
Responder: Ecology
Change to the Document(s): No

Comment # 56

Commenter: Cal Page
Comment Type: Letter received
Document: NA
Location in Document: NA
Comment: I have been a DuPont resident for the past six years and have regularly participated in the many briefing sessions held on site. Prior to retirement, I was employed in several capacities as a professional microbiologist, college professor, pharmaceutical research management and as CEO of domestic and off-shore technology oriented companies. These responsibilities have provided an intimate knowledge of toxicological procedures as well as ecological impacts of a wide variety of waste products.
I have been particularly impressed with the program and execution of Weyerhaeuser Company and the E.I. duPont de Nemours Company. They have been open, cooperative and concerned while working well with regulatory representatives. It is, therefore, with great pleasure that I recommend approval of this project at the earliest possible date.
As a sidelight, I am very familiar with the ecological/toxicological properties of the primary contaminants associated with the clean-up of the former DuPont Munitions factory. Besides my technical career, I had personal association with both materials while being one of ten farm children in Minnesota.
First, our old farm house, our playing blocks, our kitchen furniture, and our cribs were coated with one or more coats of lead-based paint. Second, during the dust storms and grasshopper plagues of the mid-1930 era, we protected our crops by spreading a poison bran mixture which stopped the hopper invasion. I worked on this project for about three summers along with my father and brothers. The active ingredient was arsenic.
In both 'instances, the lead and arsenic exposure concentrations were significantly higher than levels of these two materials found in soils in and around DuPont. My parents lived into the upper 80 years, and no child was injured by this exposure even though many were young enough to be considered at risk. Currently seven of us are still alive and all are over seventy years of age. From all of this, my conclusion is that the planned Decree is excellent but it also represents significant and unnecessary overkill. The costs and delays associated with this project to date are inexcusable. The Department of Ecology should consider the risk- benefit ratios during any and all controversies during the completion of this project and err on the side of financial justice.
Response: Comments noted.
Responder: Ecology
Change to the Document(s): No

Comment # 57

Commenter: Nancy Hanrahan
Comment Type: E-mail received
Document: NA
Location in Document: NA
Comment: My concern about the Dupont cleanup site is that I have a client who is very ill and she has been working in the new State Farm Insurance Building. I am wondering if her illness could be environmentally caused. She has been diagnosed with fibromyalgia, but as we know, that diagnoses covers a lot of territory. Ten or 15 years ago I came upon this site while looking for waterfront property. I was driving around Dupont and came to a dead end with a cyclone fence, a tower with a huge siren on top of the tower. I parked; a guard of some kind appeared and as we chatted he told me that the trees along the freeway were covered in dynamite dust and if one fell down the whole area would go up in explosion. He said that all the dirt in the area was laced with dynamite. Secondly, I was wondering if dynamite can be a source for Perchlorate contamination of the water table and water sources.
Response (e-mail response): I am the Ecology project manager for the Weyerhaeuser-DuPont cleanup site. I was forwarded your e-mail and I will respond to it.

What the "guard" told you was totally wrong. The trees are not covered with dynamite or any other contaminants associated with the former DuPont Works site. The dirt in the area is also not laced with dynamite. If a tree fell down, it would just go crash, not boom. The freeway is about one mile or more away from the former DuPont Works cleanup site. There is contamination at the site; the remaining contaminants are mostly lead and arsenic.

There are not any off-site impacts beyond the chain link fence that surrounds the 636 acre site. The area where the State Farm building was erected was not impacted by any activities of the former DuPont Works plant and like the freeway, quite a distance from the cleanup site.

From your description "I was driving around Dupont and came to a dead end with a cyclone fence, a tower with a huge siren on top of the tower." Was that in the Village of DuPont, or just past the Village down the main drag through the town? If so, I believe that tower with the siren on top was part of the former Civil Defense System and possibly related to the DuPont Works site, in case there were emergencies/explosions at the plant.

I recently heard from a knowledgeable person that Perchlorate has been tested for at other similar commercial explosives plant and was not found. The municipal water supply wells for the City of DuPont are located up-gradient from the cleanup site and are clean. The cleanup site has low levels of DNT (dinitrotoluene) in groundwater but there is no possibility of that contamination getting into the City Wells located on Bell Hill area.

I am sorry your client is ill and has fibromyalgia, but I do not believe there is any connection to the former DuPont Works cleanup site. A friend has had fibromyalgia and got relief with therapeutic massage. Not sure what else she did, but I haven't heard her talking about it for quite a while.
Responder: Mike Blum (Ecology)
Change to the Document(s): No

Comment # 58

Commenter: Brenda Leech
Comment Type: E-mail received
Document: NA
Location in Document: NA
Comment: Information re: how Steilacoom is affected by the DuPont contamination. A helicopter was recently hovering over my property at a very low level. I was able to clearly see a man leaning out taking photos. I have a natural spring running the center of my property and approx 50 yards from my home and very near my children's play areas. Is this an area targeted for monitoring? Is there a concern that our soil may be contaminated? Please let me know why the helicopter "hung around" so long and what they were assessing/evaluating.

Response (e-mail response): I am the Ecology project manager for the DuPont - Weyerhaeuser cleanup project. There are no impacts, either groundwater or soil (or windblown dust) from the DuPont cleanup site into Steilacoom.

The soil contamination remaining at the site is primarily lead and arsenic. The groundwater under part of the site has been impacted by dinitrotoluene (DNT), a compound used in making dynamite. The concentrations are low, but some are above the drinking water standards. The drinking water for DuPont comes from wells up-gradient and from a deeper aquifer. The slightly contaminated groundwater at DuPont flows directly west towards Puget Sound. The groundwater contamination is located south of Sequalitchew Creek. From where you live on Starling St, you are quite a distance (5 miles) from the former DuPont Works explosives site. No impacts from soil or groundwater in Steilacoom.

In terms of the helicopter over your property, I have no idea who that was or what they were doing. 2/13/2003

I did ask someone at Ecology about the helicopter issue. She had gotten some complaints/calls about them and from what she has found out; they seem to be related to security at Ft Lewis and the railroad. You might call the public affairs office at Ft Lewis and ask them.

One other thing to mention. There is a study going on with the Tacoma Pierce County Health Department to look at impact of arsenic from the old Asarco Smelter that was located in Ruston. Arsenic has been found in soils as far south as Steilacoom and DuPont as well as far north as Maury and Vashon Island and south King County. Results of the Pierce County study are on-going and results have not been released, as far as I know.

Responder: Mike Blum (Ecology)
Change to the Document(s): No

Comment # 59

Commenter: R. D. Gale
Comment Type: E-mail received
Document: NA
Location in Document: NA
Comment: The house site we are now considering for purchase is a few blocks from the fence line of the Dupont works site. There is a new phase of houses opening up on the other side of Center ST. I am wondering if it would be safer to live at the new phase because of the cleanup that will go on at the works site.
Would you live and have your children live, a few blocks from the Dupont works site as it is being cleaned.
The Olympia, Tumwater area is another area we are considering purchasing a home in. Do you know of any ecological problems in these areas that we should be aware of?
I am also wondering what the Lead levels that were found near North West Landing are.
How far was the Dupont works site cleaned before the development near it began? Is the ground water in North West Landing safe and separate from the water on the site?
Response (e-mail response): I don't believe it will be less safe being closer to the DuPont Works site during the cleanup. Based on their (Weyerhaeuser and DuPont companies) past quality performance in cleanup at the site and attention to safety, and of course the oversight of the Department of Ecology, I would have no fear of living with my family a few blocks from the DuPont Works site as it is being cleaned up. The concern is wind-blown dust during excavation and scraping of the contaminated top layer of soil. That has not been a problem in the past. I am unaware of any overall ecological problems in the Olympia/Tumwater area. There are location specific problems due to leaking underground storage tank (LUST) or contamination from prior practices at some business and industries, as well as probably some residential properties. You can look at the Ecology databases of LUST sites as well as our Confirmed and Suspected Contaminated Sites list at the following web address: http://www.ecy.wa.gov/programs/tcp/sites/sites.html Look at the Confirmed and Suspected Contaminated Sites Report and the UST/LUST list. The lead levels in soil surrounding the DuPont Works site, but not at the cleanup site, ranged from less than 6.4 parts per million to 57 parts per million. The soil-lead cleanup standard is 250 parts per million. Higher lead concentrations were found at the cleanup site itself. A one foot deep layer of contaminated topsoil by about 300 feet wide was removed from the southern fence line prior to that new section of homes being built. A lot of other cleanup work has occurred over the past 11 years, primarily removal of the higher concentrations of lead and arsenic in soil around the facility. The drinking water for the City of DuPont, which includes all of the Northwest Landing development, is clean. The production wells are in the Bell Hill area and are up-gradient from the groundwater contamination at the cleanup site and have not and will not be impacted in the future. Responder: Mike Blum (Ecology)
Change to the Document(s): No

Comment # 60

Commenter: Drew Crook, Lacey Museum
Comment Type: Letter received
Document: NA
Location in Document: NA
Comment: I was pleased to receive the January 2003 update on the Former DuPont Works. Thank you for keeping me on the mailing list. As a historian, I have a great interest in the heritage of the DuPont area.
What a heritage that is! Native Americans, Hudson's Bay Company employees, American settlers, US soldiers, and DuPont Company workers have all lived on the Former DuPont Works site. Their story reveals much about the development of the region.
I urge the Washington State Department of Ecology, the E.I. DuPont de Nemours Company, and the Weyerhaeuser Company to make a maximum effort during the Former DuPont Works site cleanup process to identify and preserve cultural resources that might be found. These archaeological materials could have unique and significant historical value. They are irreplaceable.
Response: Comment Noted
Responder: Ecology
Change to the Document(s): No

ATTACHMENTS TO THE RESPONSIVENESS SUMMARY:

1. Letters from the public
2. E-mails from the public
3. Letter from Ecology to Nisqually Indian Tribe, dated March 24, 2003 (w/ attachments)

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
P.O. Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

March 24, 2003

The Honorable John Simmons, Chairman
Nisqually Indian Tribe
4820 She-Nah-Num Drive SW
Olympia, WA 98513

Dear Chairman Simmons,

RE: Discharge of Dinitrotoluene-Impacted Groundwater to Puget Sound is Not a Risk

I hope this letter finds you in good health and good spirits. This letter and the enclosures are to answer a question you asked me during the tour of the Weyerhaeuser-DuPont cleanup site a number of months ago. Your question related to the discharge of dinitrotoluene-contaminated groundwater to Puget Sound and human health concerns regarding the consumption of fish and shellfish from that area at rates typical of Native American diets. This is a long letter, as there are lots of issues to cover and explain. In brief, the answer is that the discharge does not present a risk.

As background, I had mentioned that the groundwater contains low levels of dinitrotoluene (DNT), a compound that was used in the making of explosives at the former DuPont Works site. Soil known to contain elevated concentrations of DNT have been removed from the site, as part of earlier interim cleanup actions. DNT is consistently detected in five on-site groundwater monitoring wells, one former industrial production well, and in one of two visible groundwater seeps that discharge directly into Puget Sound. These locations are located downgradient, in terms of ground water flow direction, from areas where DNT had been found in soil. Many of the other monitoring wells on site have either non-detectable or sporadic detections of DNT but at very low concentrations. The concentrations of DNT in groundwater are low, but so are the drinking water standards. I have included a table from a February 13, 2003 memo which provides the results of prior groundwater and seep sampling results over the past 14 years. It also includes the most recent sampling data from March 2002. Here are a few facts for comparison purposes:

1. The Washington State Model Toxics Control Act (MTCA) groundwater cleanup standard for DNT is 0.129 parts per billion (ppb);
2. The detected groundwater concentrations of DNT over the past six years have ranged from 0.05 ppb to 0.76 ppb.
3. The detected groundwater concentrations of DNT since 1988 have ranged from 0.05 ppb to 3.8 ppb.
4. Of the 30 groundwater sampling locations, seven have consistently shown low concentrations of DNT, as noted above.
5. There have been 34 rounds of groundwater sampling over the past 14+ years.

Drinking water for the historic village of DuPont and the Northwest Landing development comes from supply wells located upgradient of DNT groundwater contamination and are free of DNT.

The Washington State marine surface water quality standard for DNT is 9.1 ppb, which is based on EPA's National Toxics Rule. That marine standard is based on protection of human health through consumption of fish and shellfish. The Washington State marine surface water quality DNT standard for the protection of marine organisms is 1,360 ppb. DNT does not tend to bioaccumulate in fish or shellfish. Here are a few facts about the two marine water quality standards:

1. The 9.1 ppb marine water quality standard is based on 70 years of potential exposure, a one in one million cancer risk, and consumption of 6.5 grams of fish and shellfish per day. That consumption rate is not typical of the average Northwest "coastal" Native American. For reference, one pound equals 454 grams and a nickel weighs 5 grams.
2. The 1,360 ppb marine water quality standard is based on protection of marine organisms themselves, not human consumption of those organisms.
3. The Port Gamble S'Klallam Tribe has adopted marine surface water quality standards for waters within their Reservation boundary. Their marine water quality standard is based on a fish and shellfish consumption rate of 146 grams per day, or about 1/3 of a pound per day. The Department of Ecology used the Port Gamble S'Klallam Tribe's water quality standard to evaluate the potential risk to Nisqually Tribal members who might catch fish and harvest shellfish in the DuPont area. I have enclosed a copy of the document entitled "Port Gamble S'Klallam Tribe Water Quality Standards for Surface Water. Adopted 8/13/02". The DNT risk level the Port Gamble S'Klallam Tribe Water Quality Standard is based on is the prevention of a cancer risk in excess of one-in-one million.

I presented your question to one of Ecology's toxicologists (who specializes in human health issues) and to a professional engineer (with water quality expertise). The toxicologist provided me a copy of the adopted Port Gamble S'Klallam Tribe's Water Quality Standards for Surface Water (enclosed). As noted above, their standards are based on higher fish and shellfish consumption rates. The Port Gamble S'Klallam Tribe's water quality criteria for 2,4-DNT, consumption of fish and shellfish (marine organisms) is 0.41 ppb. The Tribe's water quality criteria apply to surface waters of the Port Gamble S'Klallam Reservation. While those specific standards do not apply to the waters of Puget Sound near the former DuPont Works cleanup site, Ecology has chosen to use them for comparison purposes. Those tribe's standards, and the underlying assumptions related to fish and shellfish consumption rates, best address your question. The groundwater monitoring location at DuPont closest to Puget Sound and used for comparison purposes is Seep #1. Seep #1 is only visible at low tide.

The Port Gamble S'Klallam Tribe's water quality standard for DNT is higher than concentrations found in Seep #1, which ranged from non-detection (below 0.02 ppb) to 0.27 ppb. Seep #1 was sampled 25 times, during 34 groundwater sampling events starting in October 1988. DNT was detected 21 of the 25 samples. The average DNT concentration for the 25 sampling events is 0.1214 ppb. If you compare the Tribe's standard of 0.41 ppb to all the groundwater and seep samples collected since 1988, less than 10% are at or above the standard. One other point to make is that DNT concentrations found in groundwater are higher than the concentration that would likely be found in Puget Sound, due to dilution. I am not suggesting that dilution is the solution, but rather that dilution of DNT groundwater concentrations reduces the overall risk to human health.

Here are a few more facts to point out, to help clarify some of the information above:

1. The maximum concentration of DNT detected (0.27 ppb) in Seep #1 is 34% less that the applicable risk-based value - Port Gamble S'Klallam Tribe's standard of 0.41 ppb.

2. The average concentration of DNT detected in Seep #1 is about 70% lower than the risk-based value of 0.41 ppb. (How was the "average concentration of DNT" determined? If a sample was submitted to the laboratory and DNT was not detected, then ½ of the detection limit was used in calculating the average DNT concentration, to be conservative. For example, in October 1997, DNT in Seep #1 sample was not detected above 0.03 parts per billion, so 0.015 ppb was used for that sampling event when figuring the overall average, rather than 0.0 ppb. You will see the laboratory data sheet (Table 1 enclosed) shows 0.03U for the seep #1 sample in October 1997. The "U" stands for undetected. On Table 1, you will also note the total DNT concentration is in units noted as "µg/l". That term, µg/l, is "micrograms per liter" which is equivalent to parts per billion.)
3. The risk-based value is based on one of two common isomers (forms) of DNT, specifically 2,4-DNT, which is toxic and a potential human carcinogen. The other isomer is 2,6-DNT, which is also a potential human carcinogen, but is less toxic. The data collected at the DuPont site is based on total DNT, which is a mixture of the two isomers (2,4 DNT and 2,6-DNT). The March 2002 groundwater sampling data indicated only 2,6 - DNT; the 2,4 - DNT isomer was not detected.

The Washington State Department of Ecology wants to ensure the cleanup being conducted at the former DuPont Works site is protective of all peoples of the State, which includes members of the Nisqually Nation. As I noted at the beginning of this letter, the low level of DNT-contaminated groundwater discharging to Puget Sound does not exceed risk-based criteria that is protective of tribal members who for 70 years might eat fish or shellfish from near the former DuPont Works cleanup site.

I realize I have included a lot of details in this letter. If you have any questions regarding this letter, I can be reached at (360)407-6262 during normal business hours. If it is more convenient for you to call me (or to meet) in the evening or on the weekend, leave me a message at work and I will provide you with my home phone number.

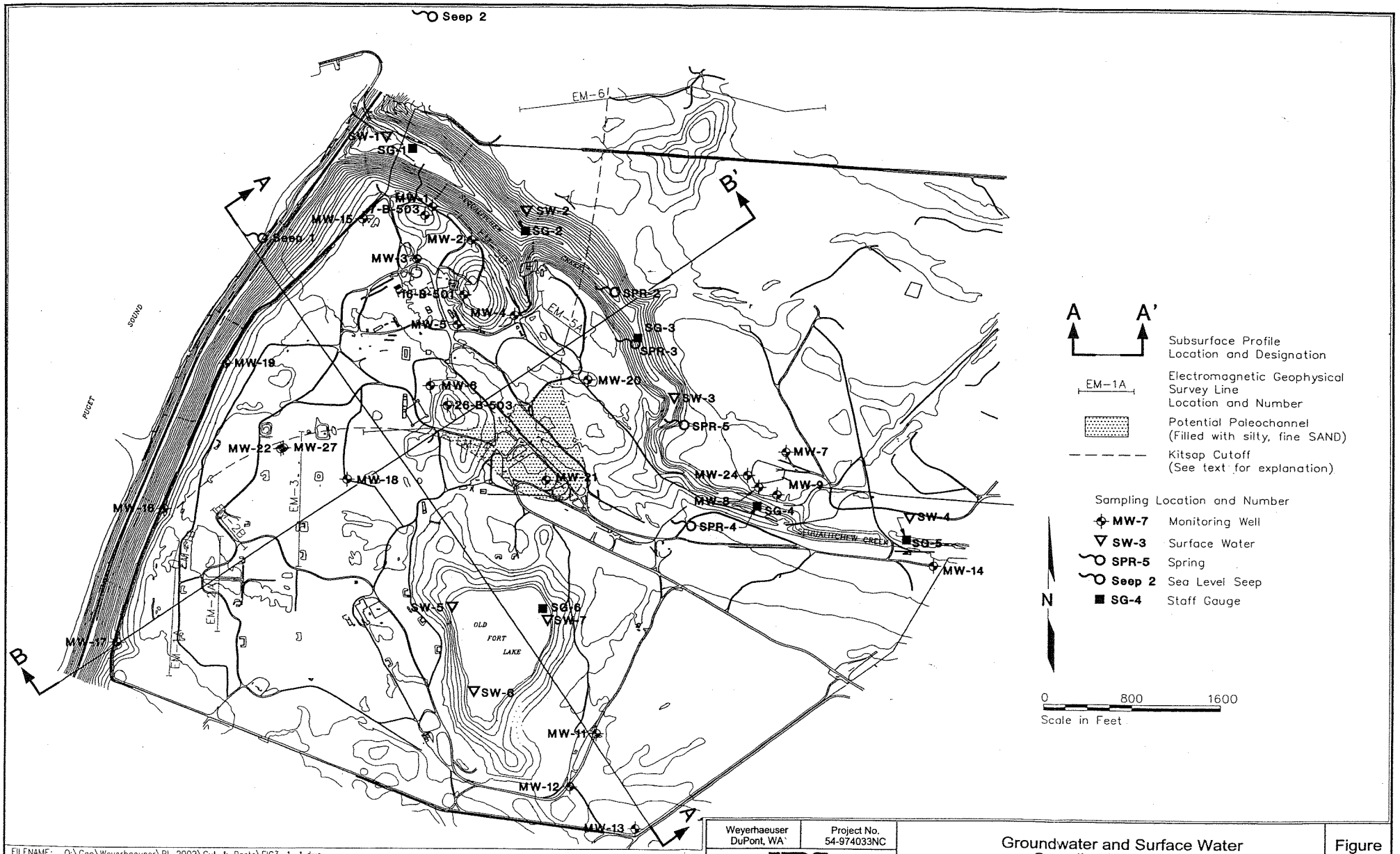
Sincerely,

Mike Blum

Mike Blum
Project Manager
Toxics Cleanup Program

ENCLOSURES
1) Map of groundwater sampling locations
2) Table 1: Summary of Total DNT Data for Groundwater
3) Port Gamble S'Klallam Tribe Water Quality Standards for Surface Waters. Adopted 8/13/02
4) Figure A: Seep data for total Dinitrotoluene (DNT) at DuPont site

cc: Bill Tobin, Attorney for the Nisqually Tribe
Bob Martin, Weyerhaeuser Company
Ron Buchanan, DuPont Company
Jeff King, West Shore Corp NW
Penny Drost, City of DuPont - Mayor
Tom Laurie, Ecology - Intergovernmental Relations
Dan Alexanian, Ecology



Weyerhaeuser DuPont, WA	Project No. 54-974033NC	Groundwater and Surface Water Sampling Location Plan	Figure 3.1-1
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EDIT DATE: 03/11/02 AT: 11:01

Table 1
SUMMARY OF TOTAL DNT DATA FOR GROUNDWATER

	TOTAL DINITROTOLUENE CONCENTRATION IN µg/L																																			
	PRE-RI								RI																													
LOCATION	Oct-88		Jan-89		Nov-89		Aug-90		Mar-92		Jun-92		Sep-92		Oct-92		Dec-92		Jan-93		Apr-93		Jul-93		Oct-93		Jan-94		Apr-94		Jul-94		Oct-94	
MW-1	0.05	U	0.05	U	0.05	U	0.05	U	0.02	U	0.02	U	0.02	U			0.02	U																		
MW-2	0.08	J	0.05	J					0.02	U	0.05		0.05				0.05																			
MW-3	0.32		0.12				0.32		0.16		0.16		0.23				0.14				0.13		0.10		0.31		0.56		0.22		0.09		0.21	
MW-4	0.04	J	0.05	U					0.02	U	0.02	U	0.02	U			0.02	U																		
MW-5	0.10		0.07	J					0.02	U	0.02	U	0.04				0.03																			
MW-6	0.37		0.05	U			0.26	J	0.02	U	0.23		0.41				0.15				0.16		0.11		0.27		0.28		0.39		0.17		0.22	J
MW-7	0.05	U	0.05	U					0.02	U	0.02	U	0.02	U			0.02	U																		
MW-8	0.07	J	0.21				0.19		0.17		0.10		0.17				0.04	J			0.09	J	0.06		0.08		0.02	U	0.11		0.08		0.04	
MW-9	0.05	U	0.05	U					0.02	U	0.11		0.02	U			0.03																			
MW-11	0.05	U	0.05	U					0.02	U	0.02	U	0.02	U			0.02	U																		
MW-12	0.05	U	0.05	U					0.02	U	0.02	U	0.02	U			0.02	U																		
MW-13	0.05	U	0.05	U			0.05	U	0.02	U	0.02	U	0.02	U			0.03	J																		
MW-14	0.05	U	0.05	U					0.02	U	0.02	U	0.02	U			0.02	U																		
MW-15			0.09	J	0.05	U	0.10	J	0.02	U	0.08						0.16		0.07		0.05	J	0.04		0.09		0.02	U	0.11		Dry		Dry			
MW-16	0.04	J	0.05	U	0.05	U			0.02	UJ	0.02	U	0.02	U			0.02	U																		
MW-17			0.05	U	0.06	U	0.05	U	0.02	U	0.02	U	0.02	U			0.02	U																		
MW-18					0.05	U	0.05	U	0.02	U	0.02	J	0.02	U			0.02	U																		
MW-19					0.40		0.41		0.25	J	0.19		0.41		0.52		0.22				0.17		0.14		0.10		0.29		0.63		0.27		0.20	J
MW-20									0.02	U	0.02	U	0.02	U			0.02	U																		
MW-21									0.02	U	0.02	U	0.02	U			0.02	J																		
MW-22									0.78		0.31		0.36		0.49		0.27				0.21		0.18		0.12		0.15		0.49		0.21		0.26	
MW-23									0.02	U	0.02	U	0.02	U			0.02	U																		
MW-24									0.02	U	0.05	J	0.05				0.04	J																		
MW-25											0.02	U	0.02	U			0.02	U	0.02	U																
MW-26											0.02	U	0.02	U			0.02	U	0.02	U																
MW-27									0.39		0.22		Dry				0.23		0.19		0.14		0.11		Dry		0.56		0.27		Dry		Dry	
7-B-503											0.04	UJ																								
Seep-1					0.18		0.10		0.02	U	0.02	U	0.13				0.08				0.15		0.07		0.14		0.07		0.18		0.09		0.10	
Seep-2					0.05	U	0.05	U	0.02	U	0.02	U	0.02	U			0.02	U																		
SPR-2	0.05	U	0.04	J																																
SPR-3	0.05	U	0.05	U					0.02	U			0.02	U			0.02	U																		
SPR-4	0.05	U	0.05	U					0.02	U	0.02	U	0.02	U			0.02	U																		
W-1																																				
W-2																																				
W-3																									0.02	U										

Notes:

Blanks indicate no analysis

U: not detected at associated reporting limit concentration

J: estimated concentration

NS: Not sampled in accordance with Ecology agreement for interim sampling dated March 6, 1998

Analyses through March 1999 performed by MultiChem Analytical Services Inc.; analyses performed by Sound Analytical Services, Inc. in March 2000 and 2001; analyses performed by Severn Trent Services STL Sacramento in 2002.

Total DNT equals sum of 2,4-DNT and 2,6-DNT concentrations with 1/2 detection limits used for nondetects.

Table 1
SUMMARY OF TOTAL DNT DATA FOR GROUNDWATER

	TOTAL DINITROTOLUENE CONCENTRATION IN µg/L																
									RI								
LOCATION	Jan-95	Apr-95	Jul-95	Oct-95	Jan-96	Apr-96	Jul-96	Oct-96	Jan-97	Apr-97	Jul-97	Oct-97	Mar-98	Mar-99	Mar-00	Mar-01	Mar-02
MW-1																	
MW-2																	
MW-3	0.13	0.16	0.19	0.25	0.14	0.09	0.04	0.11	0.14	0.56	0.16	0.15	0.16 J	0.07	Dry	0.06 U	0.072
MW-4																	
MW-5																	
MW-6	0.44	0.26	0.50	0.31	0.38	0.27	0.35	0.27	0.43	0.39	0.33	0.23	0.33	0.08	0.38	0.06 U	0.14 J
MW-7																	
MW-8	0.21	0.12	0.19	0.13	0.18	0.17	0.07	0.08	0.12	0.13	0.12	0.11	NS	NS	NS	NS	NS
MW-9																	
MW-11																	
MW-12																	
MW-13																	
MW-14																	
MW-15	0.16	0.16	Dry	Dry	0.10	0.09	Dry	Dry	0.03	0.08	Dry	Dry	NS	NS	NS	NS	NS
MW-16																	
MW-17																	
MW-18																	
MW-19	0.43	0.42	0.29	0.46	0.50	0.40	0.16	0.22	0.32	0.90	0.43	0.36	0.37	0.07	0.44	0.06 U	0.42
MW-20																	
MW-21																	
MW-22	0.52	0.35	0.46	0.27	0.42	0.87	0.23	0.11	0.52	0.53	0.24	0.17	0.39	0.05	0.30	0.06 U	0.76
MW-23																	
MW-24																	
MW-25																	
MW-26																	
MW-27	3.8	0.68	Dry	Dry	0.41	Dry	Dry	Dry	1.7	Dry	Dry	Dry	NS	NS	NS	NS	NS
7-B-503																	
Seep-1	0.20	0.22	0.20	0.08	0.14	0.12	0.08	0.14	0.25	0.27	0.02 U	0.03 U	NS	NS	NS	NS	NS
Seep-2																	
SPR-2																	
SPR-3																	
SPR-4																	
W-1		0.19			0.24	0.21	0.11	0.13	0.18	0.65	0.18	0.13	NS	NS	NS	NS	NS
W-2		0.27			0.27	0.20	0.15	0.18	0.23	0.60	0.25	0.17	0.22	0.07	0.24	0.06 U	NS
W-3					0.02 U												

Notes:

Blanks indicate no analysis

U: not detected at associated reporting limit concentration

J: estimated concentration

NS: Not sampled in accordance with Ecology agreement for interim sampling dated March 6, 1998

Analyses through March 1999 performed by MultiChem Analytical Services Inc.; analyses performed by Sound Analytical Services, Inc. in March 2000 and 2001; analyses performed by Severn Trent Services STL Sacramento in 2002.

Total DNT equals sum of 2,4-DNT and 2,6-DNT concentrations with 1/2 detection limits used for nondetects.

PORT GAMBLE S'KLALLAM TRIBE
WATER QUALITY STANDARDS
FOR SURFACE WATERS

Adopted 8/13/02

Resolution No. 02-A-088

TABLE OF CONTENTS

1. INTRODUCTION

(1) The Port Gamble S'Klallam Tribal Council hereby establishes these water quality standards covering the surface waters of the Port Gamble S'Klallam Reservation. These standards shall provide a mechanism for managing and regulating the quality and use of said waters by establishing the water quality goals for specific waterbodies, and providing a legal basis for regulatory controls.

(2) These standards have been adopted pursuant to Sections 303 and 518 of the Clean Water Act and the Port Gamble Tribal Constitution as adopted on September 7, 1939. These standards shall serve to protect the public health and welfare, enhance the quality of waters of the Port Gamble S'Klallam Reservation, and serve the purposes of the Clean Water Act.

(3) The purposes of these water quality standards are to restore, maintain and protect the chemical, physical, biological, and cultural integrity of the surface waters of the Port Gamble S'Klallam Reservation; to promote the health, social welfare, and economic well-being of the Port Gamble S'Klallam Tribe, its people, and all the residents of the Port Gamble S'Klallam Reservation; to achieve a level of water quality that provides for all cultural uses of the water, the protection and propagation of fish and wildlife, for recreation in and on the water, and all existing and designated uses of the water; to promote the holistic watershed approach to management of tribal waters; and to provide for protection of threatened and endangered species.

(4) These standards are designed to establish the uses for which the surface waters of the Port Gamble S'Klallam Reservation shall be protected, to prescribe water quality standards (narrative and numeric) to sustain the designated uses, and to protect existing water quality.

(5) The water use and quality criteria set forth herein are established in conformance with water uses of the surface waters of the Port Gamble S'Klallam Reservation and in consideration of the natural water quality potential and limitations of the same.

2. DEFINITIONS

The following definitions are intended to facilitate the use of these Standards.

"Acute toxicity" is a relatively short-term lethal or other adverse effect to an organism caused by pollutants, and usually defined as occurring within 4 days for fish and large invertebrates and shorter times for smaller organisms.

"Appropriate reference site or region" means a site on the same waterbody or within the same basin or eco-region that has similar habitat conditions and which is expected to represent the water quality and biological community attainable within the area(s) of concern.

"Aquatic species" means any plant or animal which lives at least part of their life cycle in water.

"Background conditions" means the biological, chemical, and physical conditions of a water body, outside and up-gradient of the area of influence of the point source discharge, nonpoint source, or instream activity under consideration. For example, in rivers and streams background sampling locations would be upstream from the source or activity, but not upstream from other inflows. If several sources to any water body exist, background sampling would be undertaken immediately upstream from each source.

"Best management practices (BMP)" means physical, structural, and/or managerial practices that, when used singularly or in combination, prevent or reduce pollution.

"Bioaccumulation" means the process by which a compound is taken up by and accumulates in an aquatic organism, from water, food, and sediments.

"Biological assessment" is an evaluation of the biological condition of a water body using surveys of aquatic community structure, function, diversity, presence or absence, or other direct measurements of resident biota in surface waters.

"Biological criteria" means numerical values or narrative expressions that describe the biological integrity or aquatic communities inhabiting waters of a given designated aquatic life use. Biological criteria serve as an index of aquatic community health.

"Carcinogen" means any substance or agent that produces or tends to produce cancer in humans. For implementation of these Standards, the term carcinogen will apply to substances on the EPA lists of A (known human), B (probable human), and C (possible human) carcinogens.

"Ceremonial and spiritual water use" means activities involving Native American spiritual and cultural practices which may involve primary and secondary contact with water and consumption of water. This shall include uses of a waterbody to fulfill cultural, traditional, spiritual, or religious needs of the Port Gamble S'Klallam Tribe, as approved by the Port Gamble S'Klallam Tribal Council.

"Chronic toxicity" means a fairly long-term adverse effect to an organism (when compared to the life span of the organism) caused by or related to changes in feeding, growth, metabolism, reproduction, a pollutant, genetic mutation, etc. Short-term test methods for detecting chronic toxicity may be used.

"Constructed wetlands" means those wetlands intentionally created from non-wetland sites for the sole purpose of wastewater or stormwater treatment.

"Created wetlands" means those wetlands intentionally created from non-wetland sites to produce or replace natural wetland habitat.

"Critical conditions" means the physical, chemical, and biological characteristics of the receiving water and point source discharge, nonpoint source, or instream activity that interact

to produce the greatest potential adverse impact on aquatic biota and existing or designated water uses.

"Cultural water use" means those water uses necessary to support and maintain the way of life of the Port Gamble S'Klallam including, but not limited to: use for instream flow, habitat for fisheries and wildlife, and preservation of habitat for berries, roots, medicines and other vegetation significant to the values of the Port Gamble S'Klallam Tribe.

"CWA" means the federal Clean Water Act (33 USC 1251 et seq.), as amended.

"Damage to the ecosystem" means any demonstrated or predicted stress to aquatic or terrestrial organisms or communities of organisms which the Department of Natural Resources concludes may interfere with the health or survival success or natural structure and functioning of such populations. This stress may be due to alteration in habitat or changes in water temperature, chemistry, or turbidity, or other causes. In making a determination regarding ecosystem damage, the Department shall consider the cumulative effects of pollutants or incremental changes in habitat which may create stress over the long term.

"Designated use" means a use that is specified in water quality standards as a goal for a waterbody segment, whether or not it is currently being attained.

"Department" means the Port Gamble S'Klallam Tribe's Department of Natural Resources.

"EPA" means the United States Environmental Protection Agency.

"Existing uses" means all uses actually attained in the water body on or after November 28, 1975, whether or not they are explicitly stated as designated uses in the water quality standards or presently exist.

"Fecal coliform" means that portion of the coliform group which is present in the intestinal tracts and feces of warm-blooded animals as detected by the product of acid or gas from lactose in a suitable culture medium within twenty-four hours at 44.5 plus or minus 0.2 degrees Celsius.

"Geometric mean" means either the nth root of a product of n factors, or the antilogarithm of the arithmetic mean of the logarithms of the individual sample values.

"Hardness" means a measure of the calcium and magnesium salts present in water. For the purpose of these Standards, hardness is measured in milligrams per liter and expressed as calcium carbonate ($CaCO_3$).

"Intermittent stream" means a waterway which flows only at certain times of the year or does not flow continuously.

"Mean detention time" is the mean amount of time that water remains in a basin. The time is computed by dividing a reservoir's mean annual minimum total storage by the thirty-day, ten-year, low flow from the reservoir.

"µg/L" means micrograms per liter.

"mg/L" means milligrams per liter.

"Migration or translocation" means any natural movement of an organism or community of organisms from one locality to another locality.

"Mixing zone" means that portion of water body adjacent to a point source discharge where mixing results in the dilution of the effluent with the receiving water.

"Natural conditions" means surface water quality that was present before human-caused pollution. When assessing natural background conditions in the headwaters of a disturbed watershed it may be necessary to use the natural background conditions of a neighboring or similar watershed as a reference condition.

"Near Instantaneous and Complete Mix" means no more than a 10 percent difference in bank-to-bank concentrations within a longitudinal distance not greater than 2 stream/river widths.

"Nonpoint source" means pollution that enters any waters from any dispersed land-based or water-based activities, including but not limited to, atmospheric deposition; surface water runoff from agricultural lands, urban areas or forest lands; subsurface or underground sources; or discharges from boats or marine vessels not otherwise regulated under the National Pollutant Discharge Elimination System program.

"NPDES" means National Pollutant Discharge Elimination System, the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of the CWA.

"ppm" means parts per million.

"Permit" means a document issued pursuant to tribal code or federal laws (such as NPDES, CWA, Section 401; CWA, Section 404) specifying the waste treatment and control requirements and waste discharge conditions.

"Persistent pollutant" means a pollutant which is slow to or does not decay, degrade, transform, volatilize, hydrolyze, or photolyze.

"Person" means any individual or group or combination thereof acting as a unit, however associated; any organization of any kind, whether organized for profit or not, and regardless of the form in which it does business, whether as a sole proprietorship, partnership, joint venture, trust, unincorporated association, corporation, government, including any part, subdivision, or

agency of any of the foregoing, or otherwise; and any combination of individuals or organizations in whatever form, and the plural as well as the singular number.

"pH" means the negative logarithm of the hydrogen ion concentration.

"Point source" means any discernible, confined and discrete conveyance, including, but not limited to, any pipe, ditch, channel, sewer, tunnel, conduit, well, discrete fissure, container, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged.

"Pollutant" includes dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water.

"Pollution" includes such contamination, or other alteration of the physical, chemical or biological properties, of any waters of the Community, including change in temperature, taste, color, turbidity, or odor of the waters, or such discharge of any liquid, gaseous, solid, radioactive, or other substance into any waters of the Community as will or is likely to create a nuisance or impair any beneficial use of such waters.

"Port Gamble S'Klallam Reservation" means all lands and tidelands acquired for the use and benefit of the Port Gamble S'Klallam Tribe, as set forth by Secretary of Interior Proclamation on June 16, 1938 and such other lands as are now or may be designated in the future as Port Gamble S'Klallam reservation land by the United States.

"Primary contact recreation" means activities where a person would have direct contact with water to the point of complete submergence, including but not limited to skin diving, swimming and water skiing.

"Receiving waters" means any water course or water body that receives treated or untreated wastewater.

"Resident aquatic community" means aquatic life expected to exist in a particular habitat when water quality standards for a specific eco-region, basin, or water body are met. This shall be established by accepted biomonitoring techniques.

"Secondary contact recreation" means activities where a person's water contact would be limited (wading or fishing) to the extent that bacterial infections of eyes, ears, respiratory, or digestive systems or urogenital areas would normally be avoided.

"Standards" means the Water Quality Standards for Surface Waters of the Port Gamble S'Klallam Reservation as set forth within this regulation.

"Stormwater" means that portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a stormwater drainage system into a defined surface waterbody, or a constructed infiltration facility.

"Surface waters of the Port Gamble S'Klallam Reservation" includes lakes, rivers, ponds, streams (including intermittent and ephemeral streams), wetlands, and all other surface waters and water courses, including marine waters, of the Port Gamble S'Klallam Reservation.

"Temperature" means water temperature expressed in degrees Celsius (° C).

"Threatened or endangered species (listed species)" means any species of fish, wildlife, or plant which has been determined to be endangered or threatened under section 4 of the Endangered Species Act. Listed species are found in 50 CFR 17.11.-17.12.

"Toxicity" means acute or chronic toxicity.

"Toxicity test" means a test using selected organisms to determine the acute or chronic effects of a chemical pollutant or whole effluent.

"Toxic pollutant" means those pollutants, or combinations of pollutants, which after discharge and upon exposure, ingestion, inhalation or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will, on the basis of information available to EPA or the Department of Natural Resources , cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction) or physical deformations, in such organisms or their offspring.

"Tribal Council" means the governing body of the Port Gamble S'Klallam Tribe.

"Tribe" means the Port Gamble S'Klallam Tribe.

"Turbidity" means the clarity of water expressed as nephelometric turbidity units (NTU) and measured with a calibrated turbidimeter.

"Wastes" include sewage, industrial wastes, and all other liquid, gaseous, solid, radioactive, or other substances which will or may cause pollution or tend to cause pollution of any water body.

"Water quality" means the chemical, physical, biological, and cultural characteristics of a waterbody.

"Wetland" means any area that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

"Wildlife habitat" means the waters of the Port Gamble S'Klallam Reservation used by, or that directly or indirectly provide food support to, fish, other aquatic life, and wildlife for any life history stage or activity.

"Zone of initial dilution" means the region of initial mixing surrounding or adjacent to the outfall pipe or diffuser port, in which dilution is caused by the momentum and buoyancy of the discharge.

3. GENERAL CONDITIONS

The following conditions shall apply to the water quality criteria and classifications set forth herein.

(1) All surface waters of the Port Gamble S'Klallam Reservation shall be free from pollutants in concentrations or combinations that do not protect the most sensitive use of the water body.

(2) Whenever the natural conditions of surface waters of the Port Gamble S'Klallam Reservation are of a lower quality than the criteria assigned, the Department may determine that the natural conditions shall constitute the water quality criteria, following the procedures set forth in Section 4.

(3) At the boundary between waters of different classifications, the more stringent water quality criteria shall prevail. When a distinction cannot be made among surface water, wetlands, groundwater, or sediments, the applicable standards shall depend on which existing or designated use is, or could be, adversely affected. If existing or beneficial uses of more than one resource are affected, the most protective criteria shall apply.

(4) In brackish water of estuaries, where the fresh and marine water quality criteria differ for the same designated uses, the aquatic life criteria apply as follows:

(a) For waters in which the salinity is equal to or less than one part per thousand 95 percent or more of the time, the applicable criteria are the fresh water criteria.

(b) For waters in which the salinity is equal to or less than ten parts per thousand 95 percent or more of the time, the applicable criteria are the marine water criteria.

(c) For waters in which the salinity is between one and ten parts per thousand, the applicable criteria are the more stringent of the fresh water or marine water criteria.

(5) The Department may revise criteria on a Reservation-wide or waterbody-specific basis as needed to protect aquatic life and human health and other existing and designated uses and to increase the technical accuracy of the criteria being applied. The Department shall formally adopt any revised criteria following public review and comment.

4. SITE-SPECIFIC CRITERIA

(1) The Department will, in its discretion, establish a site-specific water quality criterion that modifies a water quality criterion set out in Section 19:

(a) In a permit, certification, or approval as described in (b) of this section; or

(b) In regulation as described in (3) of this section.

(2) If the Department finds that a natural condition of a waterbody is demonstrated to be of lower quality than a water quality criterion for the use classes in Section 18 and that the natural condition will fully protect designated uses in Sections 19 and 20, the natural condition constitutes the applicable water quality criterion. Upon application or on its own initiative, the Department will determine whether a natural condition of a waterbody should be approved as a site-specific water quality criterion in a permit, certification, or approval issued by the Department. Before making the determination, the Department will issue public notice of a proposed approval under this subsection and provide opportunity for public comment. If a natural condition of a waterbody varies with time, the natural condition will be determined to be the prevailing highest quality natural condition of the waterbody measured during an annual, seasonal, or shorter time period before discharge or operation, or as the actual natural condition of the waterbody measured concurrent with discharge or operation. The Department will, in its discretion:

(a) Determine a natural condition for one or more seasonal or shorter time periods to reflect variable ambient conditions; and

(b) Require additional or continuing monitoring of natural conditions.

(3) Upon application, or on its own initiative, the Department will, in its discretion, set site-specific criteria in regulation if the Department finds that the evidence reasonably demonstrates that the site-specific criterion will fully protect designated uses in Section 18 and that:

(a) For reasons specific to a certain site, a criterion in Section 19 is more stringent or less stringent than necessary to ensure full protection of the corresponding use class; or

(b) A criterion would be better expressed in terms different from those used in Section 19.

(4) The Department will set a site-specific criterion under (3) of this section for the aquatic life use classes only if the Department finds that the evidence is sufficient to reasonably demonstrate that:

(a) The species or habitats present, or expected to be present under natural conditions, are more sensitive or less sensitive to a substance than indicated by the criterion, and a site-specific criterion is required to prevent adverse effects or to alleviate an unnecessarily restrictive general criterion; or

(b) The natural characteristics of the receiving environment would increase or reduce the biological availability or the toxicity of a substance, or otherwise alter the substance, and a site-specific criterion is required to prevent adverse effects or to alleviate unnecessarily restrictive general criterion.

(5) An applicant seeking a site-specific criterion under this section shall provide all information that the Department determines is necessary to modify an existing criterion. The Department will, in a timely manner, request and review for completeness, information submitted under this subsection. In all cases, the burden of proof is on the applicant seeking a site-specific criterion.

5. NARRATIVE CRITERIA

All surface waters of the Port Gamble S'Klallam Reservation shall be free from substances attributable to point source discharges, nonpoint sources, or instream activities in accordance with the following:

(1) Floating Solids, Oil and Grease: All waters shall be free from visible oils, scum, foam, grease, and other floating materials and suspended substances of a persistent nature resulting from other than natural causes.

(2) Color: True color-producing materials resulting from other than natural causes shall not create an aesthetically undesirable condition; nor should color inhibit photosynthesis or otherwise impair the existing and designated uses of the water.

(3) Odor and Taste: Water contaminants from other than natural causes shall be limited to concentrations that will not impart unpalatable flavor to fish, or result in offensive odor or taste arising from the water, or otherwise interfere with the existing and designated uses of the water.

(4) Nuisance Conditions: Nutrients or other substances from anthropogenic causes shall not be present in concentrations which will produce objectionable algal densities or nuisance aquatic vegetation, result in a dominance of nuisance species, or otherwise cause nuisance conditions.

(5) Turbidity: Turbidity shall not be at a level to potentially impair designated uses or aquatic biota.

(6) Bottom Deposits: All surface waters of the Port Gamble S'Klallam Reservation shall be free from anthropogenic contaminants that may settle and have a deleterious effect on the aquatic biota or that will significantly alter the physical and chemical properties of the water or the bottom sediments.

6. ANTIDEGRADATION POLICY

(1) Existing uses and the level of water quality necessary to protect the existing uses shall be maintained and protected. Where designated uses of the water body are impaired, there shall be no lowering of water quality with respect to the pollutant or pollutants which are causing or contributing to the impairment.

(2) Where the quality of the waters exceeds levels necessary to support propagation of fish and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the Tribe finds, after the Tribe's intergovernmental coordination and public participation provisions have been met, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the Tribe shall assure water quality adequate to fully protect existing uses. Further, the Tribe shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all approved, cost-effective, and reasonable best management practices for nonpoint source control.

(3) Outstanding resource waters. Waters meeting one or more of the following criteria shall be considered for outstanding resource water designation:

(a) Outstanding national or Tribal resource;

(b) Documented critical habitat for populations of culturally significant, threatened or endangered species;

(c) Waters of exceptional recreational, ceremonial, cultural, or ecological significance; or

(d) Waters supporting priority species as determined by the Tribe.

(4) Where waters constitute an outstanding resource water, the water quality and uses shall be maintained and protected and pollutants that will reduce the existing quality thereof shall not be allowed to enter such waters. To accomplish this the Department may require water quality controls, maintenance of natural flow regimes, protection of instream habitats, and pursuit of land use practices protective of the watershed.

(5) In those cases where potential water quality impairments associated with thermal discharge are involved, the Antidegradation Policy and implementing methods shall be consistent with Section 316 of the Clean Water Act, as amended.

7. TOXIC SUBSTANCES

(1) Toxic substances shall not be introduced into waters of the Port Gamble S'Klallam Reservation in concentrations which have the potential either singularly or cumulatively to adversely affect existing and designated water uses, cause acute or chronic toxicity to the most sensitive biota dependent upon those waters, or adversely affect public health, as determined by the Department.

(2) The Department shall employ or require chemical testing, acute and/or chronic toxicity testing, and biological assessments, as appropriate, to evaluate compliance with subsection (1) of this section. Where necessary the Department shall establish controls to ensure that aquatic communities and the existing and designated beneficial uses of waters are being fully protected.

(3) Criteria for toxic, and other substances not listed shall be determined with consideration of *USEPA Quality Criteria for Water, 1986*, and other relevant information as appropriate.

(4) Risk-based criteria for carcinogenic substances shall be applied such that the upper-bound excess cancer risk is less than or equal to one in one million, which means the probability of one excess cancer per one million people exposed.

(5) The aquatic organism consumption rate utilized in determining the human health criteria shall be 142.4 grams per day. A more accurate rate may be substituted following the completion of a statistical survey of Tribal members.

(6) Criteria for metals shall be applied as dissolved values.

(7) The criteria in the following table shall be applied to surface waters of the Port Gamble S'Klallam Reservation for the protection of aquatic life and human health. Aquatic life criteria (chronic and acute) and human health criteria based on consumption of organisms only shall apply to all surface waters. In addition to these criteria, human health criteria based on consumption of both water and organisms shall apply to all surface waters whose designated uses include domestic water supply.

Water Quality Criteria for Toxic Pollutants

The concentration for each compound listed in this table is a criterion for aquatic life or human health protection. Selecting values for regulatory purposes will depend on the most sensitive beneficial use to be protected and the level of protection necessary for aquatic life and human health as specified within this table. All concentrations, except asbestos, are micrograms per liter (µg/L).

Compound Name (or Class)	Carcinogen	Freshwater		Saltwater		Human Health Criteria	
		Acute[a] Criteria	Chronic[b] Criteria	Acute[a] Criteria	Chronic[b] Criteria	Water &[c] Organisms	Organisms Only[d]
Acenaphthene	NO					115	122
Acrolein	NO					33	36
Acrylonitrile	YES					0.02	0.03
Aldrin	YES	3.0e		1.3e		0.000006	0.000006
Aluminum (pH 6.5 - 9.0 only)	NO	750	87				
Ammonia, total	NO	f	g	233	35		
Anthracene	NO					3,350	4,920
Antimony	NO					13	197
Arsenic	YES	340h	150h	69h	36h	0.005h	0.006h
Asbestos	YES					7 MFLi	
Benzene	YES					0.88	3.3
Benzidine	YES					0.00002	0.00002
Benz(a)Anthracene	YES					0.0015	0.0022
Benzo(a)Pyrene	YES					0.0015	0.0022
Benzo(b)Fluoranthene,	YES					0.0015	0.0022
Benzo(k)Fluoranthene	YES					0.0015	0.0022
BHC-Alpha Lindane	YES					0.0005	0.0006
BHC-Beta Lindane	YES					0.0018	0.0021
BHC-Gamma Lindane	YES	0.95e		0.16e		0.0026	0.0029
Bis-2-ethylhexyl phthalate	YES					0.24	0.27
Bromoform	YES					3.5	17
Butylbenzyl Phthalate	NO					230	240
Cadmium	NO	2.0j	0.25j	40	8.8		
Carbon Tetrachloride	YES					0.12	0.20

Compound Name (or Class)	Carcinogen	Freshwater		Saltwater		Human Health Criteria	
		Acute[a] Criteria	Chronic[b] Criteria	Acute[a] Criteria	Chronic[b] Criteria	Water &[c] Organisms	Organisms Only[d]
Chlordane	YES	2.4e	0.0043	0.09e	0.004	0.0001	0.0001
Chloride	NO	860,000	230,000				

Compound Name (or Class)	Carcinogen	Freshwater		Saltwater		Human Health Criteria	
		Acute[a] Criteria	Chronic[b] Criteria	Acute[a] Criteria	Chronic[b] Criteria	Water &[c] Organisms	Organisms Only[d]
Chlorine	NO	19	11	13	7.5		
Chlorobenzene	NO					400	950
Chlorodibromomethane	YES					0.33	1.6
Chloroform	YES					4.5	21
Chloroisopropyl Ether (Bis 2)	NO					1,200	8,000
Chloromethyl Ether (Bis)	YES					0.00015	0.0035
Chloronaphthalene, 2-	NO					180	190
Chlorophenol, 2-	NO					17	18
Chlorpyrifos	NO	0.083	0.041	0.011	0.0056		
Chromium (Hex)	NO	16	11	1100	50		
Chromium (Tri)	NO	570j	74j				
Chrysene	YES					0.0015	0.0022
Copper	NO	13j	9j	4.8	3.1		
Cyanide	NO	22	5.2	1.0	1.0	650	9,800
DDT, 4,4'-	YES	1.1e	0.001	0.13e	0.001	0.000027	0.000027
DDT Metabolite (DDE, 4,4'-)	YES					0.000027	0.000027
DDT Metabolite (DDD, 4,4'-)	YES					0.000038	0.000038
Demeton	NO		0.1		0.1		
Dibenzo(a,h)Anthracene	YES					0.0015	0.0022
Dibutyl Phthalate	NO					480	550
Dichlorobenzene, 1,2- (o)	NO					640	800
Dichlorobenzene, 1,3- (m)	NO					95	120
Dichlorobenzene, 1,4- (p)	NO					95	120
Dichlorobenzidine, 3,3-	YES					0.0034	0.0035
Dichlorobromomethane	YES					0.45	2.1
Dichlorodifluoromethane	NO					5,500	26,000
Dichloroethane, 1,2-	YES					0.35	4.5

Compound Name (or Class)	Carcinogen	Freshwater		Saltwater		Human Health Criteria	
		Acute[a] Criteria	Chronic[b] Criteria	Acute[a] Criteria	Chronic[b] Criteria	Water &[c] Organisms	Organisms Only[d]
Dichloroethylene, 1,2-trans-	NO					630	6,200
Dichloroethylene, 1,1-	YES					0.042	0.15
Dichlorophenol, 2,4-	NO					27	36
Dichloropropane, 1,2-	NO					0.41	1.8
Dichloropropylene, 1,3-	NO					9.2	77
Dieldrin	YES	0.24e	0.056	0.71e	0.0019	0.0000066	0.0000066
Diethyl Phthalate	NO					4,500	5,400
Dimethyl Phenol, 2,4-	NO					91	105
Dimethyl Phthalate	NO					98,000	140,000
Dinitrophenol, 2,4-	NO					63	660
Dinitrophenol, 2-, Methyl 4,6-	NO					9.8	35
Dinitrotoluene, 2,4-	YES					0.088	0.41
Dioxin (2,3,7,8-TCDD)	YES					.0000000006	.0000000006
Diphenylhydrazine, 1,2-	YES					0.016	0.025
Endosulfan-Alpha	NO	0.22e	0.056	0.034e	0.0087	10	11
Endosulfan-Beta	NO	0.22e	0.056	0.034e	0.0087	10	11
Endosulfan Sulfate	NO					10	11
Endrin	NO	0.086e	0.036	0.037e	0.0023	0.037	0.037
Endrin Aldehyde	NO					0.037	0.037
Ethylbenzene	NO					950	1,300
Fluoranthene	NO					17	17
Fluorene	NO					450	660
Guthion	NO		0.01		0.01		
Heptachlor	YES	0.52e	0.0038	0.053e	0.0036	0.0000097	0.0000098
Heptachlor Epoxide	YES	0.52e	0.0038	0.053e	0.0036	0.0000048	0.0000048
Hexachlorobenzene	YES					0.000035	0.000035
Hexachlorobutadiene	YES					0.38	2.3
Hexachlorocyclopentadiene	NO					190	790
Hexachloroethane	YES					0.35	0.40

Compound Name (or Class)	Carcinogen	Freshwater		Saltwater		Human Health Criteria	
		Acute[a] Criteria	Chronic[b] Criteria	Acute[a] Criteria	Chronic[b] Criteria	Water &[c] Organisms	Organisms Only[d]
Indeno (1,2,3-cd) Pyrene	YES					0.0015	0.0022
Iron	NO		1,000			300	
Isophorone	YES					28	120
Lead	NO	65j	2.5j	210	8.1		
Malathion	NO		0.1		0.1		
Manganese	NO					50	100
Mercury	NO	1.4	0.77m	1.8	0.94m	0.002	0.002
Methoxychlor	NO		0.03		0.03	40	
Methyl Bromide	NO					39	185
Methylene Chloride	YES					4.4	73
Mirex	NO		0.001		0.001		
Nickel	NO	470j	52j	74	8.2	160	210
Nitrates	NO					10,000	
Nitrobenzene	NO					15	85
Nitrosodimethylamine, N-	YES					0.00069	0.37
Nitrosodi-n-Propylamine, N-	NO					0.0046	0.062
Nitrosodiphenylamine, N-	YES					0.67	0.74
Nitrosopyrrolidine, N-	YES					0.016	4.3
Parathion	NO	0.065	0.013				
PCB-1016	YES		0.014		0.03	0.000008	0.000008
PCB-1221	YES		0.014		0.03	0.000008	0.000008
PCB-1232	YES		0.014		0.03	0.000008	0.000008
PCB-1242	YES		0.014		0.03	0.000008	0.000008
PCB-1248	YES		0.014		0.03	0.000008	0.000008
PCB-1254	YES		0.014		0.03	0.000008	0.000008
PCB-1260	YES		0.014		0.03	0.000008	0.000008
Pentachlorobenzene	NO					0.18	0.19
Pentachlorophenol	YES	19n	15n	13	7.9	0.16	0.37
Phenol	NO					19,000	210,000
Phosphorus Elemental	NO				0.1		
Pyrene	NO					330	490

Compound Name (or Class)	Carcinogen	Freshwater		Saltwater		Human Health Criteria	
		Acute[a] Criteria	Chronic[b] Criteria	Acute[a] Criteria	Chronic[b] Criteria	Water &[c] Organisms	Organisms Only[d]
Selenium	NO		5.0	290	71		

Compound Name (or Class)	Carcinogen	Freshwater		Saltwater		Human Health Criteria	
		Acute[a] Criteria	Chronic[b] Criteria	Acute[a] Criteria	Chronic[b] Criteria	Water &[c] Organisms	Organisms Only[d]
Silver	NO	3.4j		1.9			
Sulfide - Hydrogen Sulfide	NO		2.0		2.0		
Tetrachloroethane, 1,1,2,2,-	YES					0.13	0.49
Tetrachloroethylene	YES					0.28	0.40
Thallium	NO					0.25	0.28
Toluene	NO					4,000	9,200
Toxaphene	YES	0.73	0.0002	0.21	0.0002	0.000034	0.000034
Trichlorobenzene, 1,2,4-	NO					38	43
Trichloroethane, 1,1,2-	YES					0.47	1.9
Trichloroethylene	YES					1.6	3.7
Trichlorophenol, 2,4,6-	YES					0.27	0.30
Vinyl Chloride	YES					1.9	24
Zinc	NO	120	120j	90	81		

Footnotes for Table

a. Acute criteria: EPA CWA § 304(a) Criteria Maximum Concentration (CMC). The threshold value at or below which there should be no unacceptable effects to freshwater or marine aquatic organisms and their uses if the one-hour average concentration does not exceed that CMC value more than once every three years on average.

b. Chronic criteria: EPA CWA § 304(a) Criteria Continuous Concentration (CCC). The threshold value at or below which there should be no unacceptable effects to freshwater or marine aquatic organisms and their uses if the four-day average concentration does not exceed that CCC value more than once every three years on the average.

c. Water and Organisms: Values represent the maximum ambient water concentration for consumption of both contaminated water and fish or other aquatic organisms.

d. Organisms Only: Values represent the maximum ambient water concentration for consumption of fish or other aquatic organisms.

e. The acute values shown are final acute values (FAV) which by the 1980 Guidelines are instantaneous values, as contrasted with a CMC which is a one-hour average.

f. Acute Criterion: The one-hour average concentration of total ammonia nitrogen (in mg N/L) does not exceed, more than once every three years on the average, the CMC (acute criterion) calculated using the following equations.

Where salmonid fish are present:

$$CMC = \frac{0.275}{1+10^{7.204-pH}} + \frac{39.0}{1+10^{pH-7.204}}$$

Or where salmonid fish are not present:

$$CMC = \frac{0.411}{1+10^{7.204-pH}} + \frac{58.4}{1+10^{pH-7.204}}$$

g. Chronic Criterion: The thirty-day average concentration of total ammonia nitrogen (in mg N/L) does not exceed, more than once every three years on the average, the CCC (chronic criterion) calculated using the following equations.

When fish early life stages are present:

$$CCC = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}}\right) \bullet MIN\left(2.85, 1.45 \bullet 10^{0.028(25-T)}\right)$$

When fish early life stages are absent:

$$CCC = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}}\right) \bullet 1.45 \bullet 10^{0.028 \bullet (25-MAX(T,7))}$$

In addition, the highest four-day average within the 30-day period should not exceed 2.5 times the CCC.

h. The aquatic life criteria refer to the trivalent form only. The human health criteria refer to the inorganic form only.

i. MFL = Million fibers per liter, with fiber length >10 microns.

j. Freshwater aquatic life criteria for these metals are expressed as a function of total hardness (mg/l $CaCO_3$) according to the following equations. The factors for the equations are

provided in the following matrix. Values in the above table correspond to a hardness of 100 mg/l.

Acute criterion = $\exp\{m_A[\ln(\text{hardness})]+b_A\}$
Chronic criterion = $\exp\{m_C[\ln(\text{hardness})]+b_C\}$

Metal	Factors for Calculating Metals Criteria					
	m_A	b_A	m_C	b_C	Conversion Factors	
					Acute	Chronic
Cadmium	1.0166	-3.924	0.7409	-4.719	0.944*	0.909*
Chromium (III)	0.8190	3.7256	0.8190	0.6848	0.316	0.860
Copper	0.9422	-1.700	0.8545	-1.702	0.960	0.960
Lead	1.273	-1.460	1.273	-4.705	0.791*	0.791*
Nickel	0.8460	2.255	0.8460	0.0584	0.998	0.997
Silver	1.72	-6.52	N/A	N/A	0.85	N/A
Zinc	0.8473	0.884	0.8473	0.884	0.978	0.986

Note to the table: The term "exp" represents the base e exponential function.

* The conversion factors (CF) for cadmium and lead are hardness dependent and can be calculated for any hardness [see limitations in 40 CFR 131.36(c)(4)] using the following equations:

Cadmium Acute CF = 1.136672-[(ln hardness) (0.041838)]
Cadmium Chronic CF = 1.101672-[(ln hardness) (0.041838)]
Lead (Acute and Chronic) CF = 1.46203-[(ln hardness) (0.145712)]

k. This letter is not used as a footnote.

l. This letter is not used as a footnote.

m. If the ambient concentration of total mercury exceeds 0.012 µg/l more than once in a 3-year period in the ambient water, the edible portion of aquatic species of concern must be analyzed to determine whether the concentration of methyl mercury exceeds the FDA action level (1.0 mg/kg). If the FDA action level is exceeded, the Tribe must notify the EPA Region 10 Regional Administrator, initiate a site specific criterion or a revision of its mercury criterion so as to protect designated uses, and take other appropriate action, such as issuance of a fish consumption advisory for the affected area.

n. Freshwater aquatic life criteria for pentachlorophenol are expressed as a function of pH, and are calculated as follows (Values in the table correspond to a pH of 7.8):

Acute criterion = exp(1.005(pH)-4.830)
Chronic criterion = exp(1.005(pH)-5.290)

8. RADIOACTIVE SUBSTANCES

(1) Radioisotope concentrations in all waters shall not exceed concentrations which result in a significant hazard to humans or harm to aquatic life.

(2) Concentrations of radioactive materials for all waters shall not exceed the following:

(a) Gross Alpha Particle Activity - 15 pCi/L
(b) Gross Beta Particle Activity - 50 pCi/L
(c) Tritium - 20,000 pCi/L
(d) Strontium 90 - 8 pCi/L
(e) Radium 226 & 228 - 5 pCi/L
(f) Radium 226 - 3 pCi/L
(g) Radon - 300 pCi/L

9. BIOLOGICAL CRITERIA

(1) Surface waters of the Port Gamble S'Klallam Reservation shall be of sufficient quality to support aquatic biota without detrimental changes in the resident aquatic communities.

(2) Surface waters of the Port Gamble S'Klallam Reservation shall be free from substances, whether attributable to point source discharges, nonpoint sources, or instream activities, in concentrations or combinations which would impair the structure or limit the function of the resident aquatic community as it naturally occurs.

(3) The structure and function of the resident aquatic community shall be measured by biological assessment methods approved by the Department.

(4) Determination of impairment or limitation of the resident aquatic community shall be based on a comparison with the aquatic community found at an appropriate reference site or region.

10. WILDLIFE CRITERIA

Surface waters of the Port Gamble S'Klallam Reservation shall be of sufficient quality to protect and support all life stages of resident and/or migratory wildlife species which live in, on, or near the waters of the Port Gamble S'Klallam Reservation.

11. WETLANDS

(1) All wetlands within the boundaries of the Port Gamble S'Klallam Reservation which are not constructed wetlands shall be subject to the Narrative Criteria (section 5), Antidegradation (section 6), and Narrative Toxic Substances Criteria (section 7(1)) provisions within these Standards.

(2) Wetlands shall not be used in lieu of stormwater treatment, except as specified by number 5 below. Stormwater shall be treated before discharge to a wetland.

(3) Point and nonpoint sources of pollution shall not cause destruction or impairment of wetlands except where authorized under section 404 of the CWA.

(4) Wetlands shall not be used as repositories or treatment systems for wastes from human sources, except as specified by number 5, below.

(5) Wetlands intentionally created from non-wetland sites for the sole purpose of wastewater or stormwater treatment (constructed wetlands) are not considered "surface waters of the Port Gamble S'Klallam Reservation " and are not subject to the provisions of this section.

12. MIXING ZONES

Mixing zones are defined as limited areas or volumes of water where initial dilution of a point source discharge takes place, and where numeric water quality criteria can be exceeded. Mixing zones are not permitted in waters of the Port Gamble S'Klallam Reservation.

13. IMPLEMENTATION

(1) The requirements of these water quality standards shall be met for all waters of the Community. No person shall engage in any activity that violates or causes the violation of these standards. All discharges from point sources, all instream activities and all activities which generate nonpoint source pollution shall be conducted so as to comply with these Standards. Compliance shall be determined by the Department.

(2) All permits issued or reissued, and all activities undertaken by the Tribe, the U.S. Environmental Protection Agency, the Bureau of Indian Affairs, the U.S. Army Corps of Engineers, the Federal Energy Regulatory Commission (FERC), state agencies, or any other government agencies or commissions shall be conditioned in such a manner as to authorize only activities that will not cause violations of these Standards. Permits may be subject to modification by the permitting authority whenever it appears to the Department and/or the permitting authority that the activity violates water quality standards.

(3) Best management practices shall be applied so that when all appropriate combinations of individual best management practices are utilized, violation of water quality criteria shall be prevented. If a person is applying all best management practices appropriate or required by

the Department and a violation of water quality criteria occurs, the person shall modify existing practices or apply further water pollution control measures, selected or approved by the Department, to achieve compliance with water quality criteria. Best management practices established in permits, orders, rules or directives shall be reviewed and modified by the Department, as appropriate, to achieve compliance with water quality criteria.

(4) Activities which cause pollution of stormwater shall be conducted so as to comply with the water quality standards. The primary means to be used for requiring compliance with the standards shall be through best management practices required in waste discharge permits, rules, orders, and directives issued by the Department for activities which generate stormwater pollution.

(5) Sample collection, preservation, and analytical procedures to determine compliance with these standards shall conform to the guidelines of 40 CFR, Part 136. If guidance does not exist, procedures shall conform with other methods accepted by the scientific community and deemed appropriate by the Department.

14. ENFORCEMENT

These Standards shall be enforced through all methods available to the Department including, but not limited to: issuance of permits; regulatory orders; court actions; review and approval of plans and specifications; evaluation of compliance with best management practices and all reasonable methods of prevention, control, and treatment of wastes prior to discharge; and coordination with other departments and regulatory agencies.

15. ALLOWANCE FOR COMPLIANCE SCHEDULES

(1) NPDES permits, and orders and directives of the Department issued under tribal authority, for existing discharges or activities may include a schedule for achieving compliance with water quality criteria contained in these Standards. Such schedules of compliance shall be developed to ensure final compliance with all water quality criteria in the shortest practicable time, but not to exceed five years. Decisions regarding whether to issue schedules of compliance will be made on a case-by-case basis by the permitting agency and must be approved by the Department. Schedules of compliance may not be issued for new discharges or activities. Schedules of compliance may be issued to allow for:

(a) Construction of necessary treatment capability;

(b) Implementation of necessary best management practices;

(c) Implementation of additional best management practices for sources determined not to meet water quality criteria following implementation of an initial set of best management practices; and

(d) Completion of necessary water quality studies.

(2) For the period of time during which compliance with water quality criteria is deferred, interim limitations and/or other conditions may be formally established, based on the best professional judgment of the permitting agency and the Department.

(3) Prior to establishing a schedule of compliance, the permitting agency shall require the permittee to evaluate the possibility of achieving water quality criteria via non-construction changes (e.g. facility operation, pollution prevention).

16. SHORT-TERM MODIFICATIONS

(1) The criteria established in these standards may be modified for a specific water body on a short-term basis in order to respond to emergencies, to accommodate essential activities, or to otherwise protect the public health and welfare, even though such activities may result in a temporary reduction of water quality conditions below those criteria established by this regulation. Such modifications shall be issued in writing by the Department, subject to such terms and conditions as may be prescribed.

(2) Short-term modifications shall be kept as short as feasible.

(3) In no case will any degradation of water quality or aquatic habitat be allowed if this degradation could interfere with, or becomes injurious to, existing water uses or causes long-term harm to the environment or cultural resources. No short-term modification may be issued where it could adversely impact threatened or endangered species or their critical habitat.

(4) A request for a short-term modification shall be made, in writing, to the Department. Such requests shall be made at least thirty days prior to the start of the activity impacting water quality, unless the modification is in response to an emergency requiring immediate attention in which case notification shall be provided within twenty-four hours of the response decision.

(5) Aquatic application of all pesticides shall require a short-term modification be granted prior to application. These modifications shall include, at a minimum, the following conditions:

(a) Such pesticide application shall be in accordance with all federal, tribal and local regulations; and

(b) Such application shall be in accordance with label provisions promulgated by EPA under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended (7 U.S.C. 136, et seq.); and

(c) Such application shall not result in conditions injurious to indigenous aquatic biota, wildlife, humans, cultural resources, or other existing or designated uses of the water body; and

(d) Public notice, including identification of the pesticide, applicator, location where the pesticide will be applied, proposed timing and method of application, and any water use restrictions shall be provided by the applicator; and

(e) The Department shall be notified at least three business days prior to pesticide application; and

(f) Any additional conditions required by the Department.

(6) In the event of any fish kills or other harm to indigenous aquatic dependent resources, the Department shall be notified within 24 hours.

17. PUBLIC INVOLVEMENT

From time to time, but at least once every three years, the Department shall hold public hearings for the purpose of reviewing the water quality standards and, as appropriate, modifying and adopting standards. The Department will issue public notice of proposed changes and provide opportunity for public comment. Public participation, including time periods for public notice and commenting, will follow federal regulations for public participation in programs under the Clean Water Act defined in 40 CFR Part 25.

18. DESIGNATED USES

Water quality standards regulations require the Port Gamble S'Klallam Tribe to specify appropriate water uses to be achieved and protected. Section 131.10 of 40 CFR requires that Tribe take into consideration the use and value of water for public water supplies; protection and propagation of fish, shellfish, and wildlife; recreation in and on the water; agricultural, industrial, and other purposes including navigation. The Tribe must also take into consideration the water quality standards of downstream waters, and ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters.

(1) The designated uses for which the fresh surface waters of the Port Gamble S'Klallam Reservation are to be protected include, but are not limited to, the following:

(a) Domestic Water Supply. Surface waters which are suitable or intended to become suitable for drinking water supplies.

(b) Agricultural Water Supply. Surface waters which are suitable or intended to become suitable for the irrigation of crops or as drinking water for livestock.

(c) Recreational and Cultural Use. Surface waters which are suitable or intended to become suitable for prolonged intimate contact by humans or for activities where

the ingestion of small quantities of water is likely to occur. Such waters include, but are not restricted to, those used for swimming, wading, fishing, boating, or for ceremonial or cultural purposes.

(d) Aquatic Life Uses.

(i) Salmon Spawning, Egg Incubation, and Fry Emergence. Surface waters used or naturally suitable as habitat for salmon spawning, egg incubation, and fry emergence.

(ii) Salmon Rearing. Surface waters used or naturally suitable as habitat for salmon rearing.

(iii) Cold Water Biota. Surface waters used or naturally suitable as habitat for all life cycles of naturally-occurring aquatic organisms which have optimal growing temperatures below 18° C.

(2) The designated uses for which the marine surface waters of the Port Gamble S'Klallam Reservation are to be protected include, but are not limited to, the following:

(a) Aquatic Life Uses.

(i) Salmonid and other fish migration, rearing, spawning, and harvesting.

(ii) Shellfish and crustacean spawning, rearing, and harvesting.

(b) Recreational and Cultural Use. Surface waters which are suitable or intended to become suitable for prolonged intimate contact by humans or for activities where the ingestion of small quantities of water is likely to occur. Such waters include, but are not restricted to, those used for swimming, wading, fishing, boating, or for ceremonial or cultural purposes.

19. SPECIFIC WATER QUALITY CRITERIA FOR USE CLASSIFICATIONS

(1) Domestic Water Supply. Waters designated for domestic water supply are subject to the following criteria:

(a) Turbidity. Turbidity shall not exceed 1 NTU (Nephelometric turbidity unit) over natural background levels when the natural background turbidity is 10 NTU or less, or have more than a 10 percent increase in turbidity when the natural background level is more than 10 NTU. Natural background turbidity for implementing this criteria is to represent the 90th percentile value of the annual average turbidity.

(b) pH. pH shall be within the range of 6.5 to 8.5, with a human caused variation within this range of less than 0.5 units over any 24 hour period.

(c) Alkalinity. Alkalinity should generally be maintained within the range of 50 to 120 mg/L. Variations outside this range are to be avoided where practical alternatives exist.

(d) Bacterial Waste. Livestock, pet, and human sewage are not allowed to drain or be discharged into surface waters of the Port Gamble S'Klallam Reservation unless controlled or treated with best management practices or waste treatment technology appropriate and approved by the Department or the U.S. Environmental Protection Agency.

(2) Agricultural Water Supply. Waters designated for agricultural water supply are subject to the following criteria:

(a) Electrical Conductivity. Electrical conductivity is not to exceed an arithmetic mean of 700 microsiemens per centimeter during periods when the surface water is used an agricultural water supply, based on a minimum of three samples.

(b) Total Suspended Solids. The concentration of total suspended solids is not to exceed an arithmetic mean of 75 mg/L during periods when the surface water is used an agricultural water supply, based on a minimum of three samples.

(c) pH. pH shall be within the range of 6.5 to 8.5, with a human caused variation within this range of less than 0.5 units over any 24 hour period.

(d) Bacterial Waste. Livestock, pet, and human sewage are not allowed to drain or be discharged into surface waters of the Port Gamble S'Klallam Reservation unless controlled or treated with best management practices or waste treatment technology appropriate and approved by the Department or the U.S. Environmental Protection Agency.

(3) Recreational and Cultural Use.

(a) Waters designated for recreational and cultural use shall not contain concentrations of *E. coli* bacteria exceeding a 30-day geometric mean of 126 per 100 ml, based on a minimum of 5 samples.

(4) Aquatic Life Uses. Waters designated for specific aquatic life uses are subject to the following criteria.

(a) Salmon Spawning, Egg Incubation, and Fry Emergence.

(i) pH. pH shall be within the range of 6.5 to 8.5, with a human caused variation within this range of less than 0.5 units over any 24 hour period.

(ii) Dissolved Oxygen. Dissolved oxygen shall exceed a 7-day average of 11 mg/L, and shall exceed 9.0 mg/L at all times during periods when salmon spawning, egg incubation, and fry emergence are occurring.

(iii) Temperature. The 7-day average of the daily maximum temperatures is not to exceed 13° C in streams designated for this use during periods when salmon spawning, egg incubation, and fry emergence are occurring. The 7-day mean temperature is not to exceed 10° C

(iv) Turbidity. Turbidity shall not exceed 5 NTU over natural background levels when the natural background turbidity is 50 NTU or less, or have more than a 10 percent increase in turbidity when the natural background level is more than 50 NTU. Natural background turbidity for implementing this criteria is to represent the 90th percentile value of the annual average turbidity.

(b) Salmon Rearing.

(i) pH. pH shall be within the range of 6.5 to 8.5, with a human caused variation within this range of less than 0.5 units over any 24 hour period.

(ii) Dissolved Oxygen. Dissolved oxygen shall exceed a 7-day average of 8.5 mg/L, and shall exceed 7.0 mg/L at all times.

(iii) Temperature. The 7-day average of the daily maximum temperatures is not to exceed 16° C in streams designated for this use. The 7-day mean temperature is not to exceed 15° C

(iv) Turbidity. Turbidity shall not exceed 5 NTU over natural background levels when the natural background turbidity is 50 NTU or less, or have more than a 10 percent increase in turbidity when the natural background level is more than 50 NTU. Natural background turbidity for implementing this criteria is to represent the 90th percentile value of the annual average turbidity.

(c) Cold Water Biota.

(i) pH. pH shall be within the range of 6.5 to 8.5, with a human caused variation within this range of less than 0.5 units over any 24 hour period.

(ii) Dissolved Oxygen. Dissolved oxygen shall exceed 8.0 mg/L at all times. When natural conditions prevent attainment of the numeric dissolved oxygen criterion, all human-caused conditions and activities considered cumulatively cannot lower dissolved oxygen levels by more than an additional 0.2 mg/L.

(iii) Temperature. The 7-day average of the daily maximum temperatures is not to exceed 16° C in streams designated for this use. The 7-day mean temperature is not to exceed 15° C

(iv) Turbidity. Turbidity shall not exceed 5 NTU over natural background levels when the natural background turbidity is 50 NTU or less, or have more than a 10 percent increase in turbidity when the natural background level is more than 50 NTU. Natural background turbidity for implementing this criteria is to represent the 90th percentile value of the annual average turbidity.

(d) Salmonid and other fish migration, rearing, spawning, and harvesting (marine waters).

(i) pH. pH shall be within the range of 7.0 to 8.5, with a human caused variation within this range of less than 0.5 units over any 24 hour period.

(ii) Dissolved Oxygen. Dissolved oxygen shall exceed 6.0 mg/L. When natural conditions, such as upwelling, occur, causing the dissolved oxygen to be depressed near or below 6.0 mg/L, natural dissolved oxygen may be degraded by no more than 0.2 mg/L by human-caused activities.

(iii) Temperature. The 7-day average of the daily maximum temperatures is not to exceed 16° C.

(iv) Turbidity. Turbidity shall not exceed 5 NTU over natural background levels when the natural background turbidity is 50 NTU or less, or have more than a 10 percent increase in turbidity when the natural background level is more than 50 NTU. Natural background turbidity for implementing this criteria is to represent the 90th percentile value of the annual average turbidity.

(e) Shellfish and crustacean spawning, rearing, and harvesting.

(i) pH. pH shall be within the range of 7.0 to 8.5, with a human caused variation within this range of less than 0.5 units over any 24 hour period.

(ii) Dissolved Oxygen. Dissolved oxygen shall exceed 6.0 mg/L. When natural conditions, such as upwelling, occur, causing the dissolved oxygen to be depressed near or below 6.0 mg/L, natural dissolved oxygen may be degraded by no more than 0.2 mg/L by human-caused activities.

(iii) Temperature. The 7-day average of the daily maximum temperatures is not to exceed 16° C.

(iv) Turbidity. Turbidity shall not exceed 5 NTU over natural background levels when the natural background turbidity is 50 NTU or less, or have more than a 10 percent increase in turbidity when the natural background level is more

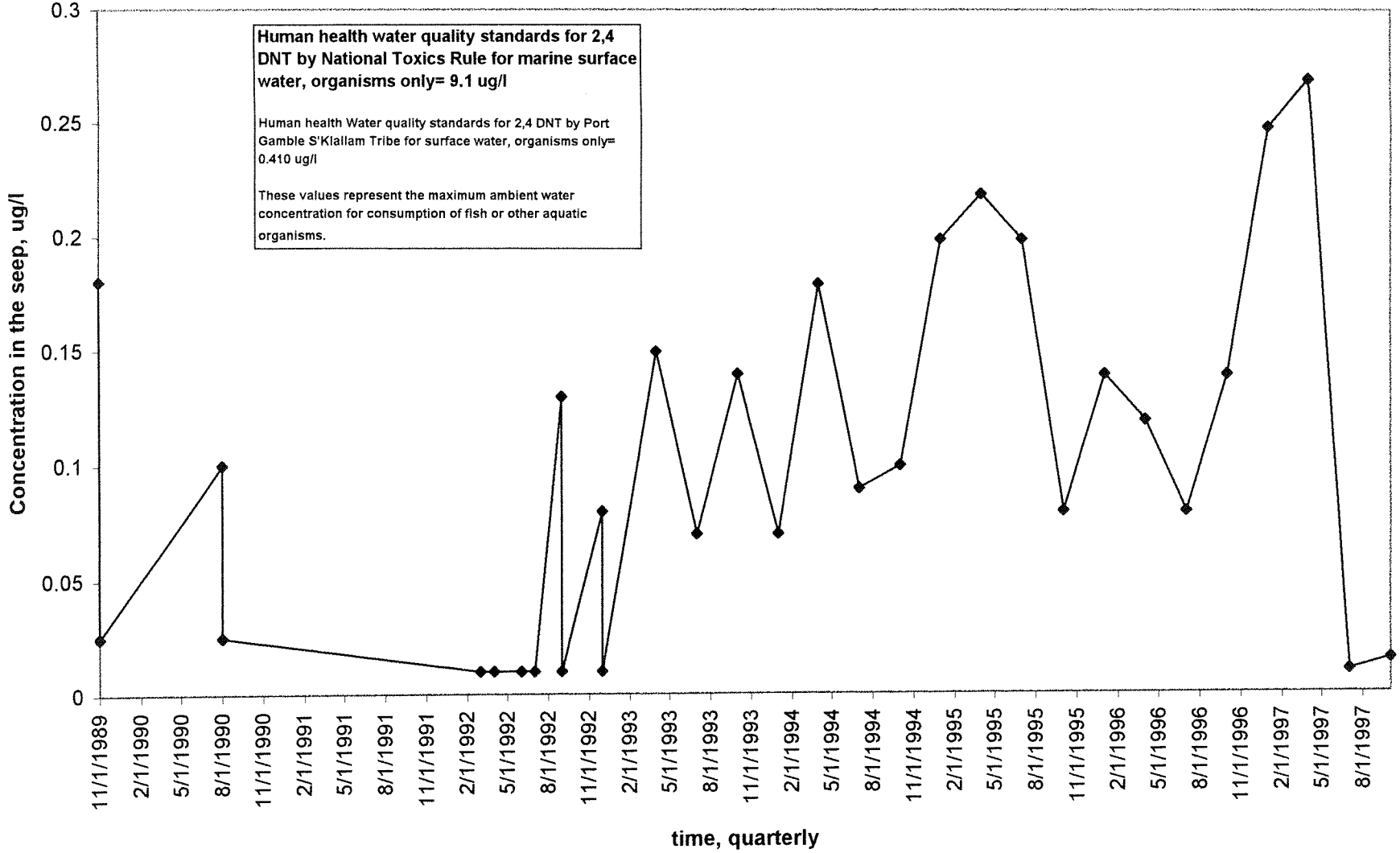
than 50 NTU. Natural background turbidity for implementing this criteria is to represent the 90th percentile value of the annual average turbidity.

(v) Fecal coliform organism levels shall both not exceed a geometric mean value of 14 colonies / 100 mL, and not have more than 10 percent of all samples obtained for calculating the geometric mean value exceeding 43 colonies / 100 mL.

20. GENERAL CLASSIFICATIONS

All surface waters of the Port Gamble S'Klallam Reservation shall be designated, at a minimum, for the protection of cold water biota and for recreational and cultural uses, unless a Use Attainability Analysis has first been performed in accordance with water quality standards regulations at 40 CFR 131.10(g). All fresh surface waters not specifically classified shall be designated for cold water biota and for recreational and cultural uses. All marine surface waters not specifically classified shall be designated for salmonid and other fish migration, rearing, spawning, and harvesting; shellfish and crustacean spawning, rearing, and harvesting; and recreational and cultural uses. All waters must be of sufficient quality to ensure that downstream uses are fully protected. All surface waters of the Port Gamble S'Klallam Reservation shall also be designated for the uses of aesthetics, and wildlife habitat. Water quality criteria for those uses will be generally satisfied by implementation of the General Conditions in Section 3, and the Narrative Criteria in Section 5.

Figure A: Seep data for total Dinitrotoluene (DNT) at DuPont site.



Blum, Mike (ECY)

From: Dennis Clarke
Sent: Wednesday, April 23, 2003 5:02 PM
To: Blum, Mike (ECY)
Subject: Comment on consent decree, cleanup action plan,RI/RA/FS

Mr. Blum,

Thank you for the opportunity to comment on the above referenced documents. We appreciate the work of Ecology and the companies in preparing, reviewing, publishing and supporting complete and very readable documents. Your information workshops along with the one sponsored by your grant recipient, DToxCop, was very helpful to our Planning Agency, who reviewed the documents as well. The City remains concerned that a separate schedule needs to be worked out to cap the old rail line corridor down the entire length of the Sequalitchew Creek Canyon, not just for the portion within the consent decree area. Our concern is that this area should receive priority treatment and be done ahead of other work, since it doesn't need a grow in period as the golf course cap does to be effective. This area is important to the City because the consent area currently limits public access to Puget Sound at its only practical access point.

Thank you for your consideration of these matters.

Dennis Clarke
Planning Director
City of DuPont

Blum, Mike (ECY)

From: Lorraine Overmyer |

Sent: Wednesday, April 23, 2003 4:20 PM

To: Blum, Mike (ECY)

Subject: Toxic Waste Cleanup Project

Department of Ecology
Unit Supervisor for Toxic Waste Cleanup Program

Attention Mike Blum:

During our review of the Toxic Waste Cleanup Plan, we found several statements that are of concern to us.

The statement "the Mission Site has not been located" is contradictory to all of the findings by a number of people who have been working on this project for a many years. Both Archaeologist Lee Stillson and Guy Morua did studies for an earlier Weyerhaeuser report and stated they believed the Mission site was located on the north side of the creek. In addition, much research has been done by members of the Nisqually Point Defense Group, The Committee For The Preservation of The Nisqually Mission, headed by Dr. James Edgren. The Nisqually Delta Association and The DuPont Historical Society.

On a site tour, Lee Stillson found fragments of brick in the area of the Mission marker, believed to be from the Mission chimney.

When the Weyerhaeuser Company removed the marker placed on the site by the Washington State Historical Society in 1927 for storage during cleanup of the area, they stated the site was marked on a map and that the monument was returned to the location where it now stands.

Our other concern is the statement in Section 1.5 of the Feasibility Study which describes land use areas. This states the land north of the creek will be designated for industrial use, while the area south of the creek will be used for historical, recreation and commercial activities. In that we believe the Mission site is located on the north side of the creek, this statement gives us great concern.

Lorraine Overmyer
DuPont Historic Society

Blum, Mike (ECY)

From: Duerr, Miriam
Sent: Thursday, February 06, 2003 9:03 AM
To: NANCY HANRAHAN
Cc: Blum, Mike (ECY)
Subject: RE: Dupont WA. Cleanup

Nancy, sorry for the confusion. We provided a more specific web address, but the Olympian chose not to print it. Here is the correct link:

http://www.ecy.wa.gov/programs/tcp/sites/weyer/weyerhaeuser.htm

Please let me know if this works for you and if you need any other info. Good luck!

Miriam Duerr, Public Involvement
SWRO Toxics Cleanup Program
(360) 407-6265

-----Original Message-----
From: NANCY HANRAHAN
Sent: Monday, February 03, 2003 9:38 PM
To: ECY RE HSIO
Subject: Dupont WA. Cleanup

The Daily Olympian ran a article on 1-28-03 on the front page of their paper and I can not find any information in your website. Article was titled "State has deal on Dupont site cleanup. Please tell me how I can follow this action. Nancy Hanrahan.

From: Duerr, Miriam
Sent: Wednesday, February 12, 2003 2:02 PM
To: Blum, Mike (ECY)
Subject: FW: Dupont WA. Cleanup

Here's that e-mail I was telling you about. I have not responded.

-----Original Message-----
From: NANCY HANRAHAN
Sent: Thursday, February 06, 2003 7:02 PM
To: Duerr, Miriam
Subject: Re: Dupont WA. Cleanup

Dear Ms. My concern about the Dupont cleanup site is that I have a client who is very ill and she has been working in the new State Farm Insurance Building. I am wondering if her illness could be environmentally caused. She has been diagnosed with fibromyalgia, but as we know, that diagnoses covers a lot of territory. 10 or or 15 years ago I came upon this site while looking for waterfront property. I was driving around Dupont and came to a dead end with a cyclone fence, a tower with a huge siren on top of the tower. I parked; a guard of some kind appeared and as we chatted he told me that the trees along the freeway were covered in dynamite dust and if one fell down the whole area would go up in explosion. He said that all the dirt in the area was laced with dynamite. Secondly, I was wondering if dynamite can be a source for perchlorate contamination of the water table and water sources. Thank you for your prompt response. Nancy Hanrahan

From: Duerr, Miriam
Sent: Wednesday, February 12, 2003 2:02 PM
To: Blum, Mike (ECY)
Subject: FW: Dupont WA. Cleanup

Here's that e-mail I was telling you about. I have not responded.

-----Original Message-----
From: I NANCY HANRAHAN
Sent: Thursday, February 06, 2003 7:02 PM
To: Duerr, Miriam
Subject: Re: Dupont WA. Cleanup

Dear Ms. My concern about the Dupont cleanup site is that I have a client who is very ill and she has been working in the new State Farm Insurance Building. I am wondering if her illness could be environmentally caused. She has been diagnosed with fibromyalgia, but as we know, that diagnoses covers a lot of territory. 10 or or 15 years ago I came upon this site while looking for waterfront property. I was driving around Dupont and came to a dead end with a cyclone fence, a tower with a huge siren on top of the tower. I parked; a guard of some kind appeared and as we chatted he told me that the trees along the freeway were covered in dynamite dust and if one fell down the whole area would go up in explosion. He said that all the dirt in the area was laced with dynamite. Secondly, I was wondering if dynamite can be a source for perchlorate contamination of the water table and water sources. Thank you for your prompt response. Nancy Hanrahan

Blum, Mike (ECY)

From: Blum, Mike (ECY)

Sent: Wednesday, February 12, 2003 4:26 PM

To: NANCY HANRAHAN

Subject: RE: Dupont WA. Cleanup

Hello Nancy Hanrahan,
I am the Ecology project manager for the Weyerhaeuser-DuPont cleanup site. I was forwarded your e-mail and I will respond to it.
What the "guard" told you was totally wrong. The trees are not covered with dynamite or any other contaminants associated with the former DuPont Works site. The dirt in the area is also not laced with dynamite. If a tree fell down, it would just go crash, not boom. The freeway is about one mile or more away from the former DuPont Works cleanup site. There is contamination at the site, the remaining contaminants are mostly lead and arsenic.
There are not any off-site impacts beyond the chain link fence that surrounds the 636 acre site. The area where the State Farm building was erected was not impacted by any activities of the former DuPont Works plant and like the freeway, quite a distance from the cleanup site.
From your description "I was driving around Dupont and came to a dead end with a cyclone fence, a tower with a huge siren on top of the tower." Was that in the Village of DuPont, or just past the Village down the main drag through the town? If so, I believe that tower with the siren on top was part of the former Civil Defense System and possibly related to the DuPont Works site, in case there were emergencies/explosions at the plant.
I recently heard from a knowledgeable person that perchlorate has been tested for at other similar commercial explosives plant and was not found. The municipal water supply wells for the City of DuPont are located upgradient from the cleanup site and are clean. The cleanup site has low levels of DNT (dinitrotoluene) in groundwater but there is no possibility of that contamination getting into the City Wells located on Bell Hill area.
I am sorry your client is ill and has fibromyalgia, but I do not believe there is any connection to the former DuPont Works cleanup site. A friend of mine has/had fibromyalgia and got relief with therapeutic massage. Not sure what else she did, but I haven't heard her talking about it for quite a while.

Mike Blum

Ecology project manager
(360)407-6262
mblu461@ecy.wa.gov

-----Original Message-----

Blum, Mike (ECY)

From: NANCY_HANRAHAN
Sent: Wednesday, February 12, 2003 6:16 PM
To: Blum, Mike (ECY)
Subject: Re: Dupont WA. Cleanup

Thanks Mike; that relieves my anxiety. Nancy Hanrahan

Blum, Mike (ECY)

To: Blum, Mike (ECY)

Subject: FW: Ansers to your questions re: the former DuPont Works site and the Northwest Landing development

-----Original Message-----
From: Blum, Mike (ECY)
Sent: Monday, April 14, 2003 9:51 AM
To: 'R. Gale'
Subject: Ansers to your questions re: the former DuPont Works site and the Northwest Landing development

Hello Ms Gale,
Here are some answers:

The house site we are now considering for purchase is a few blocks from the fence line of the Dupont works site. There is a new phase of houses opening up on the other side of Center ST. I am wondering if it would be safer to live at the new phase because of the cleanup that will go on at the works site. I don't believe it will be less safe being closer to the DuPont Works site during the cleanup.

Would you live and have your children live, a few blocks from the Dupont works site as it is being cleaned ? Based on their (Weyerhaeuser and DuPont companies) past quality performance in cleanup at the site and attention to safety, and of course the oversight of the Department of Ecology, I would have no fear of living with my family a few blocks from the DuPont Works site as it is being cleaned up. The concern is wind-blown dust during excavation and scraping of the contaminated top layer of soil. That has not been a problem in the past.

The Olympia, Tumwater area is another area we are considering purchasing a home in. Do you know of any ecological problems in these areas that we should be aware of? I am unaware of any overall ecological problems in the Olympia/Tumwater area. There are location specific problems due to leaking underground storage tank (LUST) or contamination from prior practices at some business and industries, as well as probably some residential properties. You can look at the Ecology databases of LUST sites as well our Confirmed and Suspected Contaminated Sites list at the following web address: http://www.ecy.wa.gov/programs/tcp/sites/sites.html
Look at the Confirmed and Suspected Contaminated Sites Report and the UST/LUST list.

I am also wondering what the Lead levels that were found near North West Landing are.

The lead levels in soil surrounding the DuPont Works site, but not at the cleanup site, ranged from less than 6.4 parts per million to 57 parts per million. The soil-lead cleanup standard is 250 parts per million. Higher lead concentration were found at the cleanup site itself.

How far was the Dupont works site cleaned before the development near it began? Is the ground water in North West Landing safe and separate from the water on the site? A one foot deep layer of contaminated topsoil by about 300 feet wide was removed from the southern fence line prior to that new section of homes being built. A lot of other cleanup work has occurred over the past 11 years, primarily removal of the higher concentrations of lead and arsenic in soil around the facility. The drinking water for the City of DuPont, which includes all of the Northwest Landing development, is clean. The production wells are in the Bell Hill area and are upgradient from the groundwater contamination at the cleanup site and have not and will not be impacted in the future.

I believe that answers the questions you had in several e-mail. Call or write again if you have more questions or concerns.

Mike Blum

Department of Ecology - Toxics Cleanup Program

407-6262

-----Original Message-----
From: R. Gale ɔm]
Sent: Saturday, April 12, 2003 3:13 PM
To: Blum, Mike (ECY)
Subject: Re: Robbie - did you receive my e-mail? I did not receive one from you.

I am also wondering what the Lead levels that were found near North West Landing are.

Robbie

>From: "Blum, Mike (ECY)"

>To: R. GALE
>Subject: Robbie - did you receive my e-mail? I did not receive one from you.
>Date: Fri, 11 Apr 2003 11:53:31 -0700
>
>I got an auto-reply that the message delivery failed yesterday. Please let me know if you got

my e-mail from yesterday or today's e-mail.
>Thanks
>Mike Blum
>360-407-6262
>
>-----Original Message-----
>From: Blum, Mike (ECY)
>Sent: Thursday, April 10, 2003 3:22 PM
>To: 'rdgale@
>Subject: Cleanup and risk
>
>
>Hello Ms Gale,
>Here is some info on the Weyerhaeuser-DuPont cleanup site and some information (the attachment and the lower link below) related to the impacts
>from the former ASARCO smelter in Ruston (near Tacoma). Hope these help.
>
> T he link to the Ecology web page about the former DuPont Works site is below (copy and paste into you web browser):
>http://www.ecy.wa.gov/programs/tcp/sites/weyer/weyerhaeuser.htm
>
>and, I would read the Fact Sheet and maybe parts of the draft Cleanup Action Plan about the DuPont Works cleanup
>
>Call me or write if you have more questions.
>Mike Blum
>360-407-6262
>mblu461@ecy.wa.gov
>
>-----Original Message-----
>From: Gibbs, Molly
>Sent: Thursday, April 10, 2003 10:12 AM
>To: Blum, Mike (ECY)
>Subject: link to Risk Assessment question
>
>Here is the link to the Ecology web page about the Tacoma Smelter Plume (TSP) site and its off-site impacts. You probably need to copy and paste it
>into your web browser.
>
>http://www.ecy.wa.gov/programs/tcp/sites/tacoma_smelter/tsp_Community_info/tsp_communit
>>tsp_community_info.htm>
>
>Questions 8, 9, 11 and 12 address risk assessment regarding arsenic, to be found in the TSP (Tacoma Smelter Plume) Question and Answers document (the first one on that web page) .
>
>Another brochure piece (draft) is attached.
>
>Molly Gibbs
>Public Involvement Coordinator
>Department of Ecology

>Southwest Regional Office
>PO Box 47775
>Olympia, WA 98504
>(360) 407-6179
>mgib461@ecy.wa.gov

Blum, Mike (ECY)

From: Blum, Mike (ECY)
Sent: Monday, April 14, 2003 2:52 PM
To: 'R. Gale'
Subject: You are very welcome. Multiple e-mails is not a problem. Take care. Mike Blum - - Dept of Ecology

-----Original Message-----
From: R. Gale [mailto:rdgale@
Sent: Monday, April 14, 2003 11:23 AM
To: Blum, Mike (ECY)
Subject: Thank You

Thank you for you help and quick responce. I appologize for several e-mails. I thought of questions at different times as I studied the material. If I had thought about it, I'd have drafted them for one email.

Robbie Gale

Blum, Mike (ECY)

From: Brenda_Leech@(

Sent: Wednesday, February 12, 2003 10:43 PM

To: Blum, Mike (ECY)

Subject: Re: FW: DuPont and Steilacoom

Thanks - will do. That is surprising as it was a colorful civilian vs the Apache that frequent our residential skies. Hmmm.

Kind regards,

Brenda Leech
Home Loan Consultant

800-240-5698, Ext. 238

"Blum, Mike (ECY)" <MBLU461@ECY.WA.GOV> wrote:

> Brenda
> Thanks for letting me know about the underscore. I did ask someone else at Ecology about the helicopter issue. She had gotten some complaints/calls about them and from what she has found it, they seem to be related to security at Ft Lewis and the railroad. You might call the public affairs office at Ft Lewis and ask them.
> Mike Blum
> -----Original Message-----
> **From:** Blum, Mike (ECY)
> **Sent:** Tuesday, February 11, 2003 5:20 PM
> **To:** 'brendaleech@
> **Subject:** FW: DuPont and Steilacoom
>
> -----Original Message-----
> **From:** Blum, Mike (ECY)
> **Sent:** Monday, February 10, 2003 5:56 PM
> **To:** 'brendaleech@(
> **Subject:** RE: DuPont and Steilacoom
>
> Hello Ms. Leech,
> I am the Ecology project manager for the DuPont - Weyerhaeuser cleanup project. There are no impacts, either groundwater or soil (or windblown dust) from the DuPont cleanup site into Steilacoom. The soil contamination remaining at the site is primarily lead and arsenic. The groundwater under part of the site has been impacted by dinitrotoluene (DNT), a compound used in making dynamite. The concentrations are low, but some are above the drinking water standards. The drinking water for DuPont comes from wells upgradient and from a deeper aquifer. The slightly contaminated groundwater at DuPont flows directly west towards Puget Sound. The groundwater contamination is located south of Sequalitchew Creek. From where you live on Starling St, you a quite a distance (5 miles) from the former DuPont Works explosives site. No impacts from soil or groundwater in Steilacoom.
>
> In terms of the helicopter over your property, I have no idea who that was or what they were doing.

One other thing to mention. There is a study going on with the Tacoma Pierce County Health Department to look at impact of arsenic from the old Asarco Smelter that was located in Ruston. Arsenic has been found in soils as far south as Steilacoom and DuPont as well as far north as Maury and Vashon Island and south King County. Results of the Pierce County study are on-going and results have not been released, as far as I know. You can check out the Ecology web page at http://www.ecy.wa.gov/programs/tcp/sites/tacoma_smelter/ts_hp.htm under the Tacoma Smelter Plume project. There is an "underscore" after **tacoma** and after **ts**.
One other thing. We are having an informational workshop on Wednesday night (2/12/03) from 7 to 9 PM at the DuPont City Hall. Stop by if you are interested. A second public meeting is happening on 3/12/03, same time and place.

Hope the above information helps. Call or write if you have other questions or concerns.

Mike Blum
(360)407-6262
mblu461@ecy.wa.gov

-----Original Message-----
From: Dumar, Laurie
Sent: Monday, February 10, 2003 10:36 AM
To: 'brendaleech@‹
Cc: Blum, Mike (ECY)
Subject: Dupont

Hello Ms. Leech:

I am forwarding your message to Mike Blum, (360) 407-6262, the lead contact for the Dupont Works cleanup site. He should be able to assist you or provide a more appropriate contact.

Also, here is a link to more information about the site:
http://www.ecy.wa.gov/programs/tcp/sites/weyer/weyerhaeuser.htm

Have a good day!

Laurie Dumar
Dept. of Ecology
Phone: 360.407.6606
Fax: 360.407.6989

-----Original Message-----
From: brendaleech@‹
Sent: Saturday, February 08, 2003 10:39 AM
To: Dumar, Laurie
Subject: Public feedback on publications section of the Ecology website

Feedback provider:

Brenda Leech,

1311 Starling Street
Steilacoom, WA
98388

affiliation: Citizen

Feedback:

search (option selection):
not found

search comments:
Information re: how Steilacoom is affected by the DuPont contamination. A helicopter was recently hovering overing my property at a very low level. I was able to clearly see a man leaning out taking photos. I have a natural spring running the center of my property and approx 50 yards from my home and very near my children's play areas. Is this an area targeted for monitoring. Is there a concern that our soil may be contaminated? Please let me know why the helicopter "hung around" so long and what they were assessing/evaluating.

layout (option selection):
bad

layout comments:
Organize by city within respective county. Query responses should ref date, not just general topic.

general comments:

Blum, Mike (ECY)

From: Blum, Mike

Sent: Wednesday, January 29, 2003 5:14 PM

To: BILL AND ROSEMARY HEAPS

Subject: Some response to your comments, questions and concerns - DuPont Works Cleanup

Hello Bill and Rosemary Heaps,
Thank you for your comments and questions. I will add them to the comments we receive during the 90-day comment period. All the comments received will be responded to in a document called a Responsiveness Summary and made available to all commenters. I will also respond directly to your comments and concerns here. My numbers (answers/responses) match yours (questions/comments).

1. Most of the contamination found at the site is generally immobile and non-leachable ("dormant"). One contaminant that is not is dinitrotoluene (DNT), which is a component of dynamite. That contaminant has gotten into the groundwater, but has not and will not affect the drinking water supplies for DuPont (which includes the entire Northwest Landings development). Low levels of DNT are migrating in groundwater to Puget Sound, but at concentrations that are not harmful to marine organisms or people who eat them (fish, shellfish, etc.). The known locations on site with DNT-impacted soils have already been removed from the site and taken to a hazardous waste landfill. The heavy metals on the site (lead and arsenic) are generally immobile and will not and have not impacted groundwater. The other soil contaminants at the site such as petroleum products and mercury have mostly been removed from the site. Any residual contaminants, other than lead and arsenic, will be removed from the site during the final cleanup action. Lead and arsenic-contaminated soil are the major pollutants remaining on site. The air has not been impacted.

2. The danger of excavating lead and arsenic-contaminated soil is the potential for the generation of wind blown dust. Weyerhaeuser and DuPont companies (and more specifically their contractors) have done an excellent job in the past controlling dust generation and should continue to do so in the future. Ecology will ensure that. During the final cleanup action, which includes a mass scraping of the top foot of soil over about 350 acres of the site, there are air monitors set up both around the perimeter of the work area and on the workers themselves to ensure dust is controlled. The method employed is spraying the area with water to moisten the soil, thereby controlling dust. Water trucks spray the areas being scraped as well as the haul roads on the site used to transport the contaminated soil from one location to the designated disposal or placement areas. Again, most of the remaining contaminated soil will be consolidated on-site and capped with protective barrier layers. Only a small percentage of remaining contaminated soil is scheduled to be hauled off-site. Most of the heavily contaminated soils have already been removed from the property, over the past 10 years or so.

3. The contaminated soil will be excavated and deposited in "placement areas" on the property. Those areas total approximately 90 acres which is within the footprint of the 187-acre golf course. The contaminated soil will be capped with 6 inches of gravel, then 12 inches of clean soil, then additional topsoil and then turf. The gravel prevents burrowing animals and insects/worms from digging down to the contaminated soil and bringing it back

up to the surface. It also serves as a "warning layer" should golf course workers dig through the top soil and 12 inch soil layers. The 12 inch layer serves as a human health barrier. In interviewing golf course managers, they rarely dig 18 inches into established golf courses. Things such as irrigation lines will be located above the contaminated layer and/or buried deeper but in clean backfill (for irrigation water mains). There is really no need to dig through the cap layers. The contaminated soil layer will be contoured prior to the two engineered capping layers being installed. The golf course construction company will then place the topsoil and turf layer on top. They will not be doing the contouring. The lead and arsenic-contaminated soil has been thoroughly tested and it does not leach (dissolve) and is therefore not a risk to groundwater. That is why Ecology is proposing a permeable cap. The contaminants are not mobile. The property will have a deed restriction so the buyer of the golf course knows what they are buying and the restrictions on what they can do or not do with the property, which will include restrictions against violating the engineered cap over the contaminated soil. The lead and arsenic will not be taken up (absorbed) by the vegetation (grass, shrubs, trees, etc.) that will be planted on the golf course. Golfers will also not be at risk..... even the really bad golfers will be safe from exposure.

Hope that answers your questions. Ecology will be holding two public meetings at the DuPont City Hall from 7:00 to 9:00 PM. One will be on February 12 and the second one on March 12. Please come.

If I can answer any other questions you have, or you have questions about my responses/answers above, please send another e-mail or give me a call.

Mike Blum, Ecology's Project Manager
(360)407-6262
mblu461@ecy.wa.gov

You can also find copies of the five documents that are subject to the 90-day comment period at the web address below. We are currently having trouble with some of the documents (people are getting error messages saying they have been denied access), but that should be resolved by Friday.

www.ecy.wa.gov/programs/tcp/sites/weyer/weyerhaeuser.htm

-----Original Message-----
From: ECY Exchange Admin
Sent: Tuesday, January 28, 2003 8:28 AM
To: Blum, Mike
Subject: FW: Public Comment DuPont Works Cleanup

-----Original Message-----
From: BILL AND ROSEMARY HEAPS
Sent: Monday, January 27, 2003 8:16 PM
To: ECY Exchange Admin

Subject: Public Comment DuPont Works Cleanup

Please forward this message on to Mr. Mike Blum at Ecology.

To Mr. Mike Blum, Ecology Dupont Works Cleanup Site Manager.

My wife and I have lived in Northwest Landing in our Bay Colony condominium since November 2000. We appreciate being able to comment on things like this cleanup that affect our city. Our questions and comments are as follows:

1. It appears that this contamination has been somewhat dormant since shutdown of DuPont Works in the 1970s. Is that a correct assumption, or has some things like the local ground water or atmosphere been affected by lead/chemical poisoning?

2. Having lived in Bakersfield, CA and over in Richland, WA, we are aware of the dangers of excavating and disposing of contaminated soil with Valley Fever spores or waste products of the making of the atomic bomb and plutonium missile triggers. What are the dangers in excavating and disposing of this contaminated soil? My wife is especially concerned with the material becoming a threat to us as it becomes airborne or deposited on our roads or property while being excavated or shipped.

3. We are also not convinced that the capping the proposed golf course site with a layer of dirt and the golf course itself is a safe process. While in Richland, we were warned about blowing tumbleweed off the Hanford Site that contained nuclear contamination. Government officials there went so far as to paint these weeds with a color according to the possible contaminating element. Is the lead/chemical deposits liable to leach into the golf course trees and bushes and pose a threat to golfers or the surrounding area?

Wm. (Bill) and Rosemary Heaps

Blum, Mike (ECY)

From: HEAPS

Sent: Wednesday, January 29, 2003 8:38 PM

To: ECY Exchange Admin; Blum, Mike

Subject: Re: Some response to your comments, questions and concerns - DuPont W orks Cl...

Guess I need to go through the postmaster again for this reply to Mike Blum. The email on the message I am replying to must be an in house ECY mail.

Thanks for the response Mike. My wife and I expect to make one of the DuPont meetings.

Bill and Rosemary Heaps

DuPont Toxics Citizen Oversight Project
PO Box 7444
Olympia, WA 98507

April 23, 2003

Mr. Mike Blum
Unit Supervisor, Toxics Cleanup Program
Washington State Department of Ecology
Southwest Regional Office
PO Box 47775
Olympia, WA 98504-7775

Re: Review Comments Draft Final Site Cleanup Documents for the DuPont Works Site

Dear Mr. Blum,

The DuPont Toxics Citizens Oversight Project (DTCOP) is hereby providing formal comments regarding the proposed cleanup actions at the former DuPont Works site. The DTCOP is the recipient of a Public Participation Grant from the Department of Ecology and has utilized those funds to obtain assistance from technical experts in completing this review. Our technical consultants for this project, John Littler P.E. and Greg Glass, have provided the DTCOP with input resulting in the comments discussed below. The scope of this assistance has included the following objectives:

1. To help the community understand the documents and site proposals.

2. To provide support for citizen participation in alerting Ecology to issues of concern for the community.

3. To provide an independent technical review of the documents.

4. To assist in the approval of a reasonable and sufficient site cleanup to meet community needs.

As you know the grant funding has provided resources to provide input at several earlier stages of the project. Although there are a number of significant issues which this letter addresses in the following comments, it is appropriate to acknowledge at this time that many of the comments and concerns arising from our review of earlier cleanup proposals have been addressed in the most recent documents provided for review.

During this review process the following documents were reviewed:

- Draft Final Remedial Investigation Report for the Former DuPont Works Site, Pioneer Technologies Corporation, January 2003.

- Draft Final Human and Ecological Health Risk Assessment for the Former DuPont Works Site, Pioneer Technologies Corporation, January 2003.

- Draft Final Feasibility Study for the Former DuPont Works Site, West Shore Corporation, January 2003.

- Draft Final Cleanup Action Plan for the Former DuPont Works Site, West Shore Corporation NW and Pioneer Technologies Corporation, January 2003

- Draft Consent Decree

- Interim Source Removal Actions: On Site Stockpiles Report at the Former DuPont Works Site, Pioneer Technologies Corporation and West Shore Corporation January 28, 2001.

- Draft Interim Corrective Actions Report Foundations, Narrow Gauge Railroad and Hot Spots at the Former DuPont Works Site, Pioneer Technologies Corporation, West Shore Corporation and URS, Inc., April 22 2002.

In addition several meetings with WDOE staff, representatives of the PLPs and the community took place including:

- WDOE Informational Workshop on February 12th at DuPont City Hall.

- Meeting with WDOE staff on March 5th to discuss preliminary comments.

- Meeting with PLPs and WDOE on March 12th to discuss preliminary comments.

- WDOE Public Hearing on March 12th at DuPont City Hall.

- A Community Forum hosted by DTCOP on March 19th.

The discussions held with WDOE and PLP representatives were very helpful in providing clarification regarding several of the following comments. Most of the discussion at the public meetings focused on questions related to clarification of issues, rather than actual community concerns as was the case at earlier project stages.

Our comments are organized into 2 groups. The first group is Primary Technical Review Comments and is the most significant, addressing the following types of issues: technical, MTCA policy and consistency, risk assessment, groundwater

questions and final site cleanup methodologies. The second group is Editorial Comments addressing a number of document inconsistencies most suitable for consideration as editorial in nature and which we believe are largely the result of meshing information from a number of complex site documents, including technical reports and memoranda and policy determinations, produced over the past 10 years.

Please note that the second group does not represent an exhaustive review for editorial quality and consistency, but this group of comments has been provided to assist in eliminating inconsistencies as the final documents are produced. We recommend that a comprehensive editorial review to address items of this nature be completed by the authors of the reports before final publication.

As many of these comments are not limited in their scope to any single document they are not presented on a document by document basis.

Primary Technical Review Comments.

1. Elevated ground water concentrations for DNT continue to be reported over 7 years after completion of the most recent Interim Source Removal (ISR) cleanup actions for known source areas of DNT (1992 to 1995). In addition there have been notable peaks and valleys in the observed levels but there are no clear trends apparent. The fact that on going elevated levels continue to be observed several years after the ISRs with no clear downward trend implies an on going source(s) as yet unremediated may still exist.

   Using the average estimated aquifer flow rate (reported in the FS for the purpose of pump and treat evaluation as ranging from 3,500 gpm to 7,000 gpm) of 5,250 gpm and, for illustration purposes, the value of observed DNT from the existing monitoring wells of 0.25ug/l (mid range based on the presented RI data although we understand the most recent data show increased levels) yields an annual DNT discharge from the site of about 5.8 pounds of DNT. If the most recent site groundwater monitoring data reflects higher levels then higher overall site DNT discharge would also be indicated proportionately.

   There is no analysis or discussion presented in the documents regarding this issue and what type or size of source would be necessary to produce the observed effect of elevated DNT levels. It is apparent that if shallow sources associated with the soils to be scraped exist they would be removed during the planned remediation, but any material which has migrated into deeper soils or is buried deeper than the excavation depths would not necessarily be detected in the planned confirmation monitoring. Therefore we recommend that this issue be evaluated further in the context of the additional planned monitoring activities and periodic WDOE

reviews after the remedial action has been completed, as discussed further below.

2. Discussion of natural restoration for the aquifer system in the documents is limited to a statement that this will occur. There is no basis for this conclusion presented, and it appears overstated without further justification provided in the documents. The reports do not provide an estimated restoration timeframe for ground water, which under the natural attenuation (no action) alternative will be accomplished largely through the high flushing capacity of the ground water at the site. Given a high aquifer flushing capacity, continuing elevated DNT concentrations in ground water during compliance monitoring, without a confirmed downward trend, would be inconsistent with all significant DNT sources already having been removed.

   At a minimum the basis for this conclusion should be developed and an approach developed to evaluating it further in the context of the required future WDOE periodic reviews. We are not recommending a comprehensive fate and transport modeling approach to this topic at this time. However we do recommend that the subject be evaluated and discussed to address the questions raised in these comments.

   Degradation of TNT to DNT in soils could also be implicated as a secondary source of DNT. Ecology should identify a timeframe and trigger levels to address the implementation of contingent actions should significant DNT levels continue to be observed. Since property development activities in possible source areas may make further investigations difficult or impossible, the schedule for such development activities should also be considered in selecting the timeframe for further investigations or groundwater evaluations.

   We note that the network of groundwater monitoring locations for the site is not comprehensive and we recognize that in an aquifer system of this nature (high volumes of flow and rapid flow velocities) it is difficult to monitor at a high level of precision. The new monitoring well in its proposed location (relative to DNT contaminated soils formerly removed) may provide meaningful information on this issue.

   Recognizing that the assumption that natural restoration will be effective, along with the currently relatively low observed levels, at the site is key to the selected option of no active groundwater remediation being implemented, it is important to address the issues raised in the preceding paragraphs.

   As a result we suggest a thorough groundwater quality assessment of the DNT occurrences and trends 2 years after completion of the scraping project. If there is no clear downward trend after a few years of additional monitoring then the implication would be that an ongoing source exists, at which point additional contingent actions as discussed below should be considered. If an ongoing source exists its nature could result in pulsing or ebbing and flowing of

contaminant releases (e.g.: a deteriorating drum exposed to increased or fluctuating levels of water percolation resulting from scraping or construction activity could result in releases occurring intermittently).

The timing of such a groundwater quality assessment (not necessarily limited to DNT analyses alone) should take into consideration the condition of the site and recent site activity. It is not clear what effect, if any, changes in site surface conditions will create in groundwater quality. In general it can be expected that during and immediately following construction activity elevations in groundwater contaminants will potentially be observed. Conversely as site development continues and larger areas are effectively covered with impervious surfaces such as buildings, roads and parking lots the potential exists to reduce mobilization of contaminants by reducing the potential for leaching. These issues should be considered in the groundwater quality assessment process.

3. Whereas we do not take issue with the determination of impracticablity of aquifer restoration by pump and treat mechanisms for this aquifer system, we do believe that contingency planning is appropriate to address the DNT issue should elevated levels continue to be seen with no downward trend. Future contingency actions should consider steps such as:

   a. Additional groundwater monitoring and data analysis to more accurately identify problem areas and groundwater quality trends.

   b. Further focused source investigation based on the results of additional monitoring to identify source areas and land development impacts (positive or negative).

   c. Source removal actions if discrete sources are identified.

   d. Focused pump and treat efforts to address limited localized groundwater problem areas.

   It is possible that a determination could be made by WDOE in the future that elevated groundwater levels exist but not at levels severe enough to warrant further remediation efforts or that alternatives for further action are impractical. Such a determination would be based on a satisfactory determination by the PLPs and a thorough assessment of current site groundwater quality information.

4. Ground water compliance monitoring is proposed based on one sampling event per year per monitoring well. We understand that the available ground water monitoring database will be used to identify the season of peak DNT concentrations in ground water, and that compliance monitoring samples will be collected only in that identified season. Given the length of the available record and variability in ground water DNT concentrations, seasonal patterns or trends for DNT still appear uncertain at this time.

We recommend that Ecology require quarterly ground water monitoring for DNT at the 6 compliance monitoring wells for the first two years. If those additional data identify trends, that would be very helpful in the groundwater quality assessment process or if the data confirm the identification of the season with highest DNT levels, further ground water sampling could focus on that season. If not, Ecology can adapt the schedule for ground water sampling to provide broader seasonality data (e.g., by continuing quarterly sampling or invoking a rotating season schedule of sampling every 3 or 5 quarters).

5. An oral cancer potency factor of 0.68 $(mg/kg\text{-}day)^{-1}$ for mixed DNT is listed in Ecology's CLARC manual. That oral CPF is used in the reports to calculate a screening value of 0.13 ug/L for ground water based on a drinking water exposure pathway (e.g., see DCAP Table 4-1). In an apparent omission, the CLARC manual does not use the oral cancer potency factor for mixed DNT to calculate a cancer risk-based cleanup level for soils. Unless there is a strong rationale (e.g., an explanation given in the IRIS file) for why the oral cancer potency factor should not apply to ingested soils as well as ingested drinking water, the CPF of 0.68 $(mg/kg\text{-}day)^{-1}$ should be used to calculate cleanup levels and remediation levels for DNT in soils based on cancer risks, and the text and tables revised accordingly. The default MTCA Method B cleanup level for soils would be 1.5 ppm.

6. The HHRA evaluations of soils data for the 4 open space exposure (remediation) units demonstrate that the targeted acceptable risk levels for human health are exceeded in all 4 units (see HHRA Table 4-7). The selected cleanup alternative for all 4 open space remediation units is No Action; see DCAP section 6.1.3. (The justification statement at DCAP section 6.1.3 states incorrectly that these areas meet cleanup standards for the protection of human health, contrary to the HHRA results). Since acceptable risk levels are exceeded, and under the No Action proposal potential soil exposures would not be further controlled (e.g., by access restrictions or soil capping), it seems that the MTCA threshold requirement for protectiveness (see WAC 173-340-360(2)) is not met. This requires more discussion by Ecology, including the representativeness of the data, the degree of exceedance of acceptable risk levels, and the possibility for comparatively focused cleanup actions (small areas), community interests, and applicability of the threshold requirement for protectiveness of human health at these open space units.

7. Our discussions with Ecology and the companies during this comment period clarified and confirmed our understanding that the proposed cleanup approach is intended to be a "mass excavation" approach, without attempts to fine-tune areas of surficial soils to be scraped based on the available site characterization data. Implementation of such a "mass excavation" approach simplifies many aspects of the proposed cleanup actions, requiring primarily only that appropriate compliance monitoring data show that the depth of scraping was adequate to meet

the cleanup criteria. Thus, even if statistical data evaluations show that a given RU exceeds applicable criteria only because the "x2" or "10 percent" statistical criteria are exceeded (see HHRA Chapter 4), we understand that soils over the entire unit will be excavated.

This clarification is critical to an accurate understanding of the planned cleanup action as several statements in the documents could be interpreted as invoking an approach to cleanup other than "mass excavation" and caused us some confusion in our initial reading of the documents; this was only clarified after meetings and discussion with WDOE and the PLP representatives. Some examples which we noted are:

- In section 6.2.1 of the DCAP the text states that excavations will be performed "in impacted areas as delineated by the RI sample data or by additional sample data", suggesting that areas to be excavated will be determined by the details of characterization data.

- This statement is repeated in section 7.2.2 of the FS, where a description of the use of analytical field screening is also presented: "Where necessary, field-screening samples will be collected to guide the cleanup action and allow for more cost-effective excavation of the impacted soil".

- In section 3.3 of the FS, the following statement occurs regarding actual soil volumes to be scraped: "Volumes reported below are pre-remedy estimates. The actual amount of soil excavated during the cleanup action will increase or decrease based on...actual field sampling data obtained during the cleanup action...". This suggests that sampling data could be used to decrease areas of excavation.

- In section 8.2 of the FS, the preferred alternative is discussed. That text describes actions for the non-PA areas within golf course RUs as follows: "Any soils in these areas that are above the commercial remediation levels used in the RA will be excavated and placed within the PAs".

These descriptions (and perhaps other similar statements) appear to be at odds with the simpler approach of a "mass excavation". We recommend that text revisions be made as needed to present a consistent description of the "mass excavation" approach.

8. Chapter 3 of the FS provides estimates of volumes of soil for remediation based on detailed evaluations of site data. This discussion may not be intended to provide soil volume estimates that apply to the selected preferred alternative using a "mass excavation" approach, but there are no other volume (or area) estimates in the documents that do apply to the preferred alternative. Therefore the Chapter 3 information presentations such as the identification of only 263 out of 336 acres of commercial RUs as requiring soil excavation are confusing (see FS Table 3-1).

For clarity, we recommend that the FS provide information on the total areas that are proposed to be scraped under the preferred alternative and provide a discussion of any and all areas not to be excavated and the rationale for their omission. Thus, areas already addressed by ISR actions may not be included (although the completeness of those actions may need to be reviewed if any of the cleanup levels or remediation levels used to make the original decisions are revised downward). Similarly, the acreages within designated placement areas of the golf course RUs may not have to be excavated (they will effectively be capped in place). Some historic areas will also be capped in place without soil excavation.

This information could be presented simply for all of the areas where excavation is planned in a summary table.

9. The HHRA, section ES.4.2 states that except for the industrial land use area, soil remediation levels were calculated using the equations in WAC 173-340-740 (unrestricted land use soil cleanup standards). That section of the MTCA cleanup regulation specifies an acceptable cancer risk level of 1×10^{-6}. However, as noted in HHRA section 3.5.2.4 (see page 3-8), and in HHRA Appendix E tables, the commercial and golf course land use scenarios involving adult rather than child exposures actually use an acceptable cancer risk level of 1×10^{-5} (equal to the industrial land use value in WAC 173-340-745) for calculating site-specific cleanup levels or remediation levels.

We believe that the MTCA cleanup regulation as revised and amended (Feb 12, 2001 version) requires use of the 1×10^{-6} acceptable cancer risk level for all non-industrial exposure scenarios, even if only adults are involved. (As noted in HHRA Appendix C, section C.2, Attachment #1, previous Ecology guidance may have differed). Ecology should confirm the MTCA requirements in this regard and their application to the DuPont Site. Use of the stricter acceptable cancer risk level would result in lowering calculated cleanup or remediation levels by a factor of 10. (See HHRA Appendix E tables; for example, the cancer-risk based remediation level for soil arsenic for commercial and golf course worker scenarios would be 61 ppm divided by 10, or 6.1 ppm - which would default to MTCA's assumed background concentration of 20 ppm). We note that WAC 173-340-357(c) states that the acceptable risk level for remediation levels shall be the same as that used for the cleanup level.

We also note that the HHRA actually uses the 1×10^{-6} acceptable cancer risk level to identify EUs that need to be addressed in the FS (see Tables 4-6 and 4-8). It states in section 4.2.2 (page 4-1) the following MTCA risk-based criterion: "The human health risk level for individual constituents may not exceed...a cancer risk of one-in-a-million (1E-06) for historical, open space, golf course, and commercial EUs". This approach, which we believe matches the requirements under the current MTCA cleanup regulation, is not consistent with the approach

for calculating cleanup levels and remediation levels using a 1×10^{-5} acceptable cancer risk level.

10. Our reading of the reports leads us to believe that site-specific remediation levels were developed with an assumption that they replaced, or "took precedence over", MTCA (default) cleanup levels. This is not consistent with our understanding of the role of remediation levels under MTCA (see especially WAC 173-340-355 - "Remediation levels are not the same as cleanup levels" - and 173-340-708(10)). Cleanup levels must be established for every site (WAC 173-340-355(2)); remediation levels establish concentrations above which certain specified (often more costly) actions will be applied, but some actions - including containment (e.g., consolidation and capping) and institutional controls - are required to address any hazardous substances exceeding the cleanup levels. (See the examples in WAC 173-340-355). Where an alternate RME scenario is used to derive remediation levels, they generally define the concentrations below which only institutional controls (to maintain the alternate RME scenario exposures as reasonable, excluding others) are required.

    Cleanup versus remediation levels does not appear to us to be a matter of "either/or", but rather a question of "both". The mixing of cleanup and remediation levels (and the implicit dropping of some of the applicable, underlying cleanup levels) in the summary tables in the reports seems to us confusing. We believe the presentation would be much clearer if all of the cleanup levels were first identified and summarized, followed by the site-specific remediation levels being used to identify specific components of the proposed cleanup actions.

11. There are actually two golf course worker scenarios used for calculation of site-specific remediation levels in the golf course land use RUs. The first one is equivalent to the commercial worker scenario in the parameter values chosen, and is used to define soil contaminant levels that need to be consolidated and capped in the golf course placement areas. The second one uses lower soil contact rate and exposure frequency parameter values and is used to calculate remediation levels for removal and offsite disposal of more highly contaminated soils (see HHRA Appendix C, section C.2, Attachment #1; see also FS Appendix H).

    Only the results for the first golf course exposure scenario are included in many of various summary tables of cleanup levels and remediation levels (e.g., see HHRA Table ES-1 and Table 3-7; DCAP Table 4-1 includes both). However, in many places in the text, discussions of the golf course worker scenario and calculated golf course remediation levels actually refer to the second description whose results are not included in the summary tables. This resulted in some unnecessary confusion. We recommend that both golf course exposure scenarios, suitably labeled, be included in all of the summary tables so that text references can be made clearer.

12. Evaluations of all soils data over a depth interval as broad as 1 to 15 feet are too broad to reflect realistic exposure scenarios. Soil contamination levels of potential concern may frequently be diluted by the inclusion of additional data not reflecting a similar probability of soil contact; for example, a contaminated 1 to 2 foot layer exceeding established cleanup levels may be "statistically diluted" to appear much lower. We recommend that the discussions of results for data from the broad 1 to 15 foot depth interval be characterized as generally descriptive rather than as a detailed exposure assessment. It can be noted that the ultimate decisions on depths of soil excavation will be made based on sampling results for small, surficial depth intervals (6 inches; see DCAP section 6.6.2) during compliance monitoring.

13. The HHRA screens detected contaminants at the site to identify constituents of possible concern for the soil-to-ground water pathway. The results (see HHRA section 2.5.2.1 and Tables 2-3 through 2-6) identify a list of constituents for this pathway. The HHRA states that remediation options for these COPCs are presented in the FS. However, only one constituent is actually discussed in the FS for ground water. The FS at section 1.4.3 states only that the RI and RA identify only one constituent exceeding drinking water standards (DNT).

    A brief discussion should be added to the FS presenting the rationale for dismissing the list of constituents in HHRA Table 2-6 and the soil-to-ground water pathway. Presumably this rationale will be based on ground water monitoring results; the locations of monitoring wells versus soil locations with constituents above soil-to-ground water criteria values should be included in the discussion.

14. USEPA has issued guidance for the IEUBK lead model stating that soils data used with the model should be obtained through chemical analysis of the <250 um (<0.25 mm) particle size fraction. We have already provided you with reference information from USEPA Region 10 staff, and a citation to an EPA website, on this issue. The concentrations for lead (and arsenic) are generally assumed to increase as the particle size fraction of soils decreases. For the DuPont site, the FS provides size-fraction data that confirm this increase in concentration with smaller particle sizes (see FS Appendix C for lead, especially Table C-3; for even more detailed arsenic data, see FS Appendix D). The result of using data from the standard MTCA analyses of <2mm soil particles in the lead model, as at the DuPont site, instead of EPA-recommended <0.25 mm data, is that exposures and risks are biased low. Calculated soil cleanup or remediation levels using the IEUBK model that are met using <2mm soil lead data could in fact be exceeded using <0.25 mm data for the same samples.

    The current MTCA cleanup regulation requirement to analyze the <2mm size fraction of soils (see WAC 173-340-740(7) (a)) is thus inconsistent with EPA guidance for use of the IEUBK model. This issue has already been raised with the Ecology policy section (e.g., in connection with the Area Wide Task Force

process, which also addresses soil contamination by lead and arsenic). We believe Ecology needs to make a policy decision on how to incorporate EPA's guidance for using the IEUBK model under MTCA. In fact, similar scientific (exposure assessment) issues are raised for the soil ingestion pathway for constituents other than lead, including arsenic, since the primary question is what particle sizes of soils (and dusts) is being ingested.

The relationship between soil particle sizes and lead concentrations has been established scientifically; we have site-specific information for the DuPont Site. At a minimum, this information should be used to provide an uncertainty discussion for the IEUBK results as applied to compliance with site-specific cleanup or remediation levels for soil (i.e., bringing together the EPA guidance and the FS Appendix C results). The HHRA would in fact be improved if a general section on uncertainty was added, so that Ecology could make risk management decisions based on a more complete characterization of the state of knowledge.

We also recommend that Ecology carefully consider the available information on lead concentrations by particle size and EPA's guidance for the IEUBK model in reviewing and approving the detailed sampling and analytical protocols for compliance monitoring of soil cleanup actions. The uncertainties in the current HHRA regarding lead risks because soil lead data represent the <2mm size fraction would be of little consequence if compliance monitoring data were collected based on analysis of the <0.25 mm fraction.

15. Development of the proposed cleanup plan for the DuPont Site has proceeded over a period of many years. The reports include as attachments a number of documents completed some time ago (see especially the HHRA, Appendix C materials) that provide supporting information. Those materials are very helpful in understanding the development of various aspects of the proposed cleanup plan. However, because the attached materials are dated, they are in some respects no longer consistent with or representative of the rest of the information presented in the reports. For example, summaries of DNT data from ground water monitoring wells are not current with the complete database provided in the RI report, and the exposure parameters used to calculate TPH soil cleanup levels are not consistent with the exposure parameters ultimately used for the rest of the HHRA evaluations and development of other cleanup and remediation levels.

We recommend that a general statement be added to reflect an understanding that some of the details in the appended materials are inconsistent because of the time at which they were originally prepared, but that those inconsistencies do not affect the selection of the preferred cleanup alternative. In addition footnotes could be placed wherever appropriate to clarify this question. Issues affecting the calculation of cleanup or remediation levels (still listed in the summary tables, e.g. Table 4-1 of the DCAP) are of somewhat more concern, but may still be addressed in ways that do not require rewriting the appendix materials (e.g., to

note that soil TPH remediation was accomplished to concentrations well below the original calculated cleanup levels).

16. The elevated regional soil arsenic concentrations are the result of releases from the former Tacoma Copper Smelter, as determined from regional soil sampling studies under the Tacoma Smelter Plume site investigations. The background concentration for soil arsenic as determined from sampling near the DuPont Site (32 ppm) therefore represents an area background rather than a natural background value (see WAC 173-340-200 definitions), as noted at HHRA section ES 4.4.

    Under MTCA, natural background but not area background concentrations can be used to constrain soil cleanup levels (see WAC 173-340-740(5) (c), 173-340-700(6) (d), and 173-340-705(6)). If cleanup of portions of a site below area background levels would result in recontamination, cleanup actions may be delayed but not eliminated (see WAC 173-340-360(4)(d)); under those circumstances, the remedial action shall be considered an interim action until cleanup levels are attained.

    The DuPont Site reports use the 32 ppm "background" concentration for soil arsenic as a cleanup level or remediation level (e.g., see DCAP Table 4-1); compliance with that criterion is assumed to establish completion of a final cleanup action with respect to soil arsenic for specified RUs. This appears to be inconsistent with the MTCA cleanup regulation provisions related to the two types of background concentrations, and could affect the selected cleanup levels for soil arsenic. Ecology should review the application of these sections of the MTCA cleanup regulation to the DuPont Site.

17. We recognize that the companies and Ecology have had long discussions regarding ecological risk assessment and the development of criteria for protection of the environment. The HHRA identifies lead as the only constituent of concern for ecological risks and establishes a criterion value of 118 ppm lead in soil (see HHRA section 3.4; see WAC 173-340, Table 749-3). In HHRA Appendix A the exclusion of arsenic, the other widespread soil contaminant at the DuPont site, as a constituent for ecological evaluation is explained as follows: "Human health standards for arsenic are protective of ecological organisms. Therefore, remediating arsenic contamination to meet human health standards will ensure protection for ecological receptors". In this statement it is unclear to us whether the human health standards for arsenic being referred to are the typical Method B values, defaulting to assumed natural background of 20 ppm, or the higher remediation levels proposed for the DuPont Site (DCAP Table 4-1).

    We recommend that the discussion in HHRA Appendix A regarding the exclusion of arsenic as a constituent for ecological risk assessment be expanded somewhat for clarity. Following the approach used for lead, and assuming that surficial soil arsenic would be present as arsenic V (unsaturated, aerobic conditions) for

example, it might be sufficient to note that the MTCA Table 749-3 value for wildlife of 132 ppm is higher than any of the proposed soil arsenic remediation levels based on protection of human health, and that arsenic may therefore be eliminated.

18. Were any constituents detected at the DuPont Site eliminated as COPCs, or assigned to a No Action alternative, because they were not known to be associated with historic site activities? Some comments in the text (e.g., see FS section 7.6.1) suggested to us that certain detected constituents (particularly at MSUs) were eliminated from further consideration using a criterion requiring historic association with site activities. Since the MTCA definition of facility (equivalently, site) includes places where "hazardous substances...have come to be located" (WAC 173-340-200), Ecology should (in the DCAP) discuss and provide the policy rationale for elimination of any constituents from further consideration because they are not known to have been associated with historic site activities.

19. Compliance monitoring sampling for soils is described in DCAP section 6.6.2. Composite sampling (5-to-1) is proposed for MSUs. Discrete sampling (point sampling) is proposed for cells within each of the larger RUs. We recommend that Ecology adopt a small composite sampling approach for the cells (approximately one-half acre in size) in the larger RUs, with compositing ratios of no more than 5-to-1. Detailed sampling protocols (e.g., random sampling versus center of cell and along four diagonals, etc.) can be identified in later compliance monitoring sampling and analysis plans. Remediation results will be made for each cell on an all-or-none basis. In the balancing between representativeness and detectability of remaining contamination (more locations are better) and possible dilution of results, we favor better representativeness. The exposure scenarios in the risk evaluations involve long-term exposures for which average rather than peak concentrations are of primary interest. If there are "hot spots" with higher concentrations remaining, they are more likely to be found with 5 sampling locations rather than 1.

    The DCAP (see section 6.2.2) proposes not to perform any statistical data evaluations, but rather proposes to simply compare single results to applicable cleanup or remediation levels (Composite sampling techniques will also provide only a single analytical result). This constitutes an alternate statistical method for evaluating compliance under MTCA. The DCAP should include a discussion and rationale for this alternate statistical approach (compare to the Everett Smelter Site FCAP, which similarly involved decisions on a very large number of decision units).

20. Ecology has noted that the screening for contaminants of potential concern included an evaluation of possible fish consumption exposures and risks using representative tribal (subsistence) fish consumption rates that are higher than MTCA default values. Those results are not presented in the HHRA. They

should be added (e.g., in section 2.5 and Appendix C). We understand that the results showed no significant risks and would not in any event affect the selected approach for ground water remediation (e.g., natural attenuation) at the DuPont site.

21. Neither the CAP nor the Consent Decree reference the Memorandum of Agreement (MOA 2000) between Weyerhaeuser Company, Weyerhaeuser Real Estate Company, Nisqually Point Defense Fund, Committee for the Preservation of the Nisqually Mission Historical Site, Nisqually Delta Association and the DuPont Historical Society. This MOA was developed during negotiations that ran through the year 2000. The MOA 2000 develops a framework for the establishment of a National Historic District along the banks of the Sequalitchew Creek. That agreement grew out of dialog between the PLP's, the City of DuPont and a variety of citizen groups regarding the preservation of historic resources in and around the Consent Decree Area. The MOA 2000 provides specific provisions which impact, to some measure, the scope and location of cleanup activities. We therefore believe it is important that this agreement be referenced in both the Consent Decree and the Cleanup Action Plan.

22. In Section 2.6 of the DCAP, reference is made to historical resources in the Consent Decree Area, and four are listed. The DCAP then proceeds to explain that the 3 sites comprise 4 acres (which 3 are being referred to is not defined): this is confusing. Is this discrepancy reflective of all recent agreements on preservation of buffers on the three sites indicted on Figure 2.1? The MOA 2000 allows for a one acre Methodist/Episcopal Mission site. Is that the acre which is not included? That seems to be the case, given the statement in that same section that the "size and location" of the Mission Site is not known.

The site itself was in fact identified and was long ago marked by the first private citizen to own the property (a former Hudson's Bay Company employee), and a series of memorials, ever more substantial, have been maintained ever since to mark that place. We request that the location of that marker be indicated on Figure 2.1, and that this discrepancy be clearly resolved in the final documents.

Earlier in the cleanup process, there was an unfortunate incident where the concrete and bronze marker that memorializes the Methodist/Episcopal Mission site was temporarily removed. While it has been returned to something close to its original location, we have received numerous expressions of concern that the exact location of that mark be accurately reestablished, mapped and documented in a manner which will assure it will not be lost during the cleanup process.

Understanding that the area where the marker sits is not intended to be included in the mass excavation efforts, it still seems to us a reasonable concern that heavy equipment operation in the area might (once again) disturb the marker. We would therefore request that the exact latitude and longitude of the marker be recorded in the DCAP, and that the spot be indicated on Figure 2.1. We would also request

that the State Office of Historic Preservation be asked to confirm that the marker location they have recorded from earlier investigations corresponds with the relocated marker coordinates. We would also note that we have heard again from citizens interested in historic preservation that there is still potential for further archeological investigation around that site. We are therefore forwarding a request that a non-invasive preliminary investigation be allowed to build on the site studies conduced by Guy Moura in 1989. This would certainly assist in accurately replacing that marker.

23. Future land uses discussed in section 1.5 of the Feasibility Study describe land use areas divided at Sequalitchew Creek, with only industrial uses to the north, and commercial, historical and recreational uses to the south. We would point out that the Methodist/Episcopal Mission Site is to the north of Sequalitchew creek (in the area designated for industrial land use). According to the MOA 2000 Weyerhaeuser has committed to commemorate that site, and connect that memorial to other Historic District sites by a trail system. Additionally Weyerhaeuser has agreed to allow a historic preservation organization to purchase a one acre or greater site in commemoration of the Mission. We therefore believe this section should reflect those agreements.

We also would appreciate more discussion addressing remediation measures around (and over) historic sites. In particular it would be appropriate to clarify in this discussion the appropriateness of the cleanup levels to be applied to the historic sites in relation to their land use and surrounding land uses.

Editorial Comments.

1. See DCAP language at section 4.4.5. The concentrations of all identified hazardous substances will not be below the cleanup levels or remediation levels after the proposed actions are complete, as stated. For example, some soil results for the open space remediation units exceed those values, but no action is proposed for all open space units. Ground water DNT concentrations may continue to exceed the 0.13 ug/L screening level for some time (no projected time for compliance is provided).

2. See DCAP language at section 4.3. Remediation levels do not "take precedence" over cleanup levels, as stated. See WAC 173-340-355(2) and (3). Where remediation levels are developed that exceed cleanup levels, some action (e.g., continuing institutional controls, or long-term containment) is still needed to address remaining contamination between the cleanup levels and remediation levels. Establishing a remediation level does not replace the underlying cleanup level.

3. See DCAP statement at section 6.1.3 that the open space remediation units "currently meet cleanup standards for the protection of human health". This

statement is inconsistent with the results presented in the HHRA report that none of the open space RUs is in compliance (e.g., see Table 4-4 of the HHRA, as well as Tables 4-7 and 4-8).

4. The reports include conflicting statements regarding time trends for DNT in ground water monitoring wells. For example, see pages 1-3 and 7-18 in the draft FS report and page 3-18 in the draft RI report. Given the variability in DNT concentrations at individual wells over time, any time trends are not obvious. Any conclusions regarding time trends should be supported by proper statistical data evaluations (see, for example, Statistical Methods for Environmental Pollution Monitoring by R.O. Gilbert, Van Nostrand Reinhold 1987 for applicable non-parametric trend tests).

5. See HHRA report, Table 4-6. The table appears to be missing a line for exposure unit OS1.

6. See DCAP language at section 5.6.1. Removal of contaminated soils from the site would eliminate potential (onsite) exposure pathways to the contaminated soils. However, consolidation and containment (with a cap/cover system) serve to control rather than eliminate the soil exposure pathways. The golf course maintenance worker scenario estimates exposures based on continued (limited) soil contact. Long-term inspection and maintenance of the containment system will continue to control potential soil exposures. Control rather than elimination is a better description, since disruption of the cap/cover could still result in exposure to contaminated soils. Use of the term control is consistent with the requirement, as noted in section 5.6.1, for long-term maintenance of the containment system. The elimination of an exposure pathway, on the other hand, would require no long-term actions.

7. See DCAP language at section 6.2.2 regarding glacial kettles (and also see FS at page 7-3). This statement seems to indicate that surface soils may be directly pushed into glacial kettles outside of the placement areas. We assume that if possibly contaminated surface soils are placed into a glacial kettle, and that glacial kettle is outside of a designated placement area, that the kettle would in effect become another placement area and a cap/cover would be installed. We suggest that the process of filling any onsite glacial kettles be described in more detail to avoid any misinterpretation.

8. See DCAP language at section 6.6.1 regarding cap/cover depth as a human health barrier. The second golf course worker exposure scenario (for calculation of remediation levels above which soils would be taken offsite rather than left in the placement areas) assumes some limited contact with contaminated materials below the human health barrier. If the barrier is constructed based on the "maximum depth in which a golf course worker is expected to excavate", then no contact with contaminated soils below the barrier would occur. This minor inconsistency should be resolved.

9. See FS Table C-3. Under the column for Area 40 (Packhouse) data, the entry for total lead is given as 30,000 mg/kg. This appears to be a typo. It is inconsistent with the concentrations by size fractions, entered in the same data block. See the text on page C-6, which indicates the 30,000 mg/kg value should perhaps be 3,000 mg/kg.

10. See FS pages ES-2 and 1-2. There appears to be a minor inconsistency in the figures given at these two locations for the volume of soils removed during Interim Source Removal actions (72,000 tons versus 63,393 tons).

11. How many small MSUs are there? The text at FS page ES-3 states that there are 49, while FS Fig 1-3 shows more than 70. Have some of the MSUs shown on Figure 1-3 already been cleaned up, accounting for the smaller count given in the text? See also DCAP Figure 6-2 which shows a smaller number of MSUs than FS Figure 1-3, and a different system of identifying labels.

12. See FS page 3-1. The figure given for acres of open space land uses - 12.9 acres - appears to be in error. Compare the figure of 73.21 acres (including 22.35 acres of Old Fort Lake) given in Table 2-1 of the HHRA report.

13. See FS page 3-2 in section 3.4, second paragraph. The paragraph discusses excavation depths. In the second sentence, the term "actual lateral extent" appears to refer to depths rather than lateral (horizontal) extent, and should be reworded.

14. See FS page 4-3 (and elsewhere) with discussion of obtaining permits as part of implementability. Under MTCA, it is not necessary to obtain permits, only to demonstrate substantive compliance with permit conditions that would otherwise be required.

15. See FS page 7-3, the last sentence of the paragraph under the heading Cap Construction. If additional areas of the golf course Remediation Units, outside the designated Placement Areas, are given a cap/cover system to contain contaminated soils, this would in effect just result in an enlargement of the designated Placement Areas. We assume that the circumstances under which additional small, non-contiguous Placement Areas would be created are limited; long-term management of the containment system will likely be easier if the number and locations of Placement Areas are kept from proliferating.

16. See FS page 7-11 at section 7.4 and Table 7-5. The alternatives scores appear to range from 1 to 4 rather than 1 to 5, as stated. As in any detailed ranking or evaluation methodology, it is possible to raise questions about some of the details. For example, from the point of view of area residents, it is very likely that the most favored alternative for long-term effectiveness and permanence would be offsite disposal of all soils contaminated above cleanup levels, even though Table 7-5 shows that alternative to be marginally less preferred than the wet screening

alternative. Nevertheless, the outcome of the overall detailed evaluation process resulting in the proposed onsite consolidation and containment approach appears reasonable.

17. See FS at pages 7-7 and 7-15 (and elsewhere). The evaluation criteria for perimeter dust monitoring data (e.g., allowable concentrations for airborne particulate arsenic and lead), and the acceptable calculated risk levels, should be identified no later than the implementation work plans for the cleanup actions. Corrective actions in case of exceedances of those criteria should also be identified. Such evaluation criteria have been used at the Tacoma Smelter and Everett Smelter sites, among others.

18. See FS pages 7-7 and 7-15. The text on page 7-7 should indicate that perimeter dust monitoring will be required for activities along the southern and eastern boundaries, as stated on page 7-15.

19. See FS table 8-1. The best estimate costs for the miscellaneous small units table (at bottom) are outside the range of low-to-high estimated costs. The high cost and best estimate cost columns may be transposed.

20. See DCAP sections 6.3.6 and 6.3.7 and Figure 6-3. Figure 6-3 shows a set of discontinuous NGRR segments that are identified as (remaining) MSUs to be addressed by final cleanup actions - either cap/cover in place or consolidate into placement areas and then cap/cover. We assume, as indicated by the text at section 6.3.7, that all other NGRR segments not shown on Figure 1-3 have already been remediated during ISR actions. Are there any segments of the total NGRR system at which no action will have been taken by completion of the cleanup actions? If so, on what basis was that decision made? We assume that even if a short segment of the NGRR system has soil sampling data whose evaluations show no exceedances of cleanup levels/remediation levels, the mass excavation approach will still result in soils being consolidated into the placement areas (or capped in place). The best assumption from historical information appears to be that (lead arsenate) herbicides were probably applied throughout the NGRR system.

21. See FS page 8-2 under the Open Space RUs text. The discussion of open space Remediation Units states that there are 3 such units. The DCAP and HHRA reports identify 4 open space units; apparently the subdivision of South Sequalitchew Creek into OS-2 and OS-3 is not reflected in the FS text at page 8-2. (Compare HHRA Table 2-1 and DCAP Figure 6-1).

    See FS page 8-2 under the Commercial RUs text. "Following the excavation of these soils, the resulting surface soils will be sampled and if found to be statistically above the remediation level for the golf course land use, re-excavated". The reference to remediation level for the golf course land use should be changed to refer to commercial land use (the type of RUs addressed in

this paragraph). The proposed approach to evaluation of soils compliance monitoring data (see DCAP at section 6.6.2) does not involve calculation of the typical MTCA statistics; the word "statistical" should be removed from the quoted sentence on FS page 8-2 for consistency and to avoid misinterpretation. The sentence as revised would read: "Following the excavation of these soils, the resulting surface soils will be sampled and if found to be above the remediation level for the commercial land use, re-excavated".

We note that the term re-excavated implies actually digging up areas already dug up and filled for a second time, rather than digging further, and found this terminology unclear. Therefore we suggest discussing this step in terms of additional excavation.

22. One of the main rationales for identifying MSUs, given the proposed mass excavation approach, is to locate and identify soils that could have higher concentrations of arsenic or lead, or contain other contaminants, resulting in selection of offsite disposal actions for cleanup (see DCAP section 6.3). A preliminary estimate of the total volume and number of truck loads of soils to be handled by offsite disposal should be given in the DCAP.

23. DCAP section 3.1.1 and Figure 6-2 have different lists of contaminants associated with the MSUs. This inconsistency should be resolved. If any identified contaminants of potential concern have been dropped from the DCAP discussion because they have been fully addressed by prior ISR actions, those contaminants should be listed and so identified (in text, figure legends, or tables as appropriate).

24. See DCAP section 3.4. What data were used to characterize Puget Sound background sediments? NOAA has used data collected very near the site (Nisqually Reach) to characterize background values. See Meador, James P. et al., 1994. NOAA Technical Memorandum NMFS-NWFSC-16, National Status and Trends Program. National Benthic Surveillance Project: Pacific Coast, Analysis of Elements in Sediment and Tissue, Cycles I to V (1984-88).

25. See summary tables for cleanup levels and remediation levels (e.g., DCAP Table 4-1 and HHRA Table ES-1). The soil mercury values of 24 ppm are variously noted as being based on agreement with Ecology or site-specific exposure factors approved by Ecology. We note that the standard default Method B soil cleanup level for mercury under MTCA, based on direct contact exposures (ingestion) and non-carcinogenic risks, is also 24 ppm (see Ecology's CLARC manual). Calculations of risk-based remediation levels using adjusted exposure parameters would result in a value higher than 24 ppm. Our discussions with Ecology and the companies suggested that the listed 24 ppm values for mercury might reflect soil-to-ground water pathway calculations. The basis for the listed 24 ppm values should be reviewed and correctly given in the table notes. (See HHRA Appendix C.4 which discusses mercury. Our impression is that the default human health cleanup level of 24 ppm was screened to determine if it would also be protective

of ground water, and was found to be protective. The referenced Mercury Cleanup Levels Summary Report is not attached and therefore could not be reviewed. If our impression is correct, then the listed 24 ppm cleanup level would actually be the default human health criterion).

26. See DCAP section 6.3.5 discussing MSUs of historic importance. We understand the primary objective for proposed cleanup actions at these locations to be preservation of potentially important historic and cultural artifacts. Installation of a cap/cover system would meet that objective. The use of excavation and consolidation approaches, given the possible presence of artifacts, seems to have a potential for undue disturbance; how it meets the primary objective, or the constraints under which it may be used, warrants somewhat more detailed description.

27. There is confusing language in the documents regarding how confirmational monitoring and archeological monitoring will take place at the MSUs. After discussion with WDOE and the PLPs we understand that all the same procedures are to be applied at the MSUs as for other RUs. Therefore we recommend that this be clarified in the appropriate discussions regarding MSUs.

Summary.

In prior reviews of documents for the Former DuPont Works Site we have identified major issues and concerns. Over the past several years many of these concerns have been successfully addressed through modifications to the remedial approach for the site.

While many of the comments presented in this letter are still significant in terms of substance and the need for clarification we anticipate, if our understandings as discussed above are correct, that most of the comments will be addressed simply through appropriate clarifications or future contingency planning regarding the actions to be implemented.

It is our sincere hope that these comments and the input provided over the past 8 years by the DTCOP and its consultants has been helpful in bringing this important remediation project to completion. Thank you for the opportunity to provide input at this stage of the project.

Sincerely Yours,

Tom Skjervold

Ed Kenney

Calvin A. Page
1837 Palisade Boulevard
DuPont, WA 98327

April 14, 2003

Mr. Mike Blum
Washington State Dept. of Ecology
P.O. Box 4775
Olympia, WA 98504

Re: DuPont Consent Decree

Ladies and Gentlemen:

I have been a DuPont resident for the past six years and have regularly participated in the many briefing sessions held on site. Prior to retirement, I was employed in several capacities as a professional microbiologist, college professor, pharmaceutical research management, and as CEO of domestic and off-shore technology oriented companies. These responsibilities have provided an intimate knowledge of toxicological procedures as well as ecological impacts of a wide variety of waste products.

I have been particularly impressed with the program and execution of Weyerhaeuser Company and the E.I. duPont de Nemours Company. They have been open, cooperative and concerned while working well with regulatory representatives. It is, therefore, with great pleasure that I recommend approval of this project at the earliest possible date.

As a sidelight, I am very familiar with the ecological/toxicological properties of the primary contaminants associated with the clean-up of the former DuPont Munitions factory. Besides my technical career, I had personal association with both materials while being one of ten farm children in Minnesota.

First, our old farm house, our playing blocks, our kitchen furniture, and our cribs were coated with one or more coats of lead-based paint. Second, during the dust storms and grasshopper plagues of the mid-1930 era, we protected our crops by spreading a poison bran mixture which stopped the hopper invasion. I worked on this project for about three summers along with my father and brothers. The active ingredient was arsenic.

In both instances, the lead and arsenic exposure concentrations were significantly

higher than levels of these two materials found in soils in and around DuPont. My parents lived into the upper 80 years, and no child was injured by this exposure even though many were young enough to be considered at risk. Currently seven of us are still alive and all are over seventy years of age.

From all of this, my conclusion is that the planned Decree is excellent but it also represents significant and unnecessary over-kill. The costs and delays associated with this project to date is inexcusable. The Department of Ecology should consider the risk-benefit ratios during any and all controversies during the completion of this project and err on the side of financial justice.

Respectfully submitted,

Calvin A. Page, PhD

cc: Mr. Bob Martin , Weyerhaeuser Company
DuPont City Council
Mr. Jeff King, DuPont Company

CITY OF LACEY

Shaping our community together

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February 18, 2003

Mike Blum, Site Manager
Ecology Southwest Regional Office
Toxics Cleanup Program
P.O. Box 47775
Olympia, WA 98504-7775

Dear Mr. Blum,

I was pleased to receive the January 2003 update on the Former DuPont Works. Thank you for keeping me on the mailing list. As a historian, I have a great interest in the heritage of the DuPont area.

What a heritage that is! Native Americans, Hudson's Bay Company employees, American settlers, US soldiers, and DuPont Company workers have all lived on the Former DuPont Works site. Their story reveals much about the development of the region.

I urge the Washington State Department of Ecology, the E.I. DuPont de Nemours Company, and the Weyerhaeuser Company to make a maximum effort during the Former DuPont Works site cleanup process to identify and preserve cultural resources that might be found. These archaeological materials could have unique and significant historical value. They are irreplaceable.

Sincerely,

Drew W. Crooks

Drew W. Crooks
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