

**WASHINGTON STATE DEPARTMENT OF ECOLOGY  
RESPONSE TO PUBLIC COMMENTS**

**BP Cherry Point Refinery  
1560A Marble Valley Road  
Blaine, Washington 99101**

**NPDES Permit No. WA0022900  
February 9, 2012**

Ecology published notice of an opportunity to comment on the renewal of NPDES Permit No. WA 002290-0 in the Ferndale Record on April 13, 2011 and the Bellingham Herald on April 14, 2011. The proposed permit will allow the BP Cherry Point Refinery (BP) to discharge treated process wastewater and stormwater to the Strait of Georgia and Terrell Creek. In the notice, Ecology invited public review of the proposed order and provided a 60-day public comment period. The deadline for submittal of written comments was June 13, 2011. A public meeting and hearing was held for this action on June 2, 2011. Seven people provided comments at the hearing. Ecology received written comments from seven entities and individuals.

Comments were received from:

Kathy Berg  
Lionel Klifoff, Washington State Department of Natural Resources  
Lee First  
Lynne Pendleton  
Doug Ericksen, Washington State Senate  
Sam Crawford, Whatcom County Council  
Wendy Steffensen, RE Sources  
Rachel Vasak, Nooksack Salmon Enhancement Association  
Elizabeth Daly, BP Cherry Point Refinery  
San Juan County Council  
Frank Holmes, Western States Petroleum Association  
BP Cherry Point Refinery  
Katelyn Kinn, Puget Soundkeeper Alliance  
RE Sources/Sierra Club/Friends of the Earth/Fred Felleman

We included all of the comments received in this document. We summarized the comments, where appropriate, to save time and space. The original comments comprise part of the legal record for this permit. The record is available for public review at Ecology's Industrial Section office in Lacey, WA. Anyone interested in reading the full text of the comments or in obtaining a copy of a particular comment should call or e-mail Liem Nguyen in Lacey at (360) 407-6955 or [liem.nguyen@ecy.wa.gov](mailto:liem.nguyen@ecy.wa.gov).

Comments appear in regular text, followed by Ecology's response in italicized text. Ecology will send a copy of this response to comments to each individual who provided comments and those people attending the public meeting/hearing.

**Comment from Kathy Berg (1.)**

1. Since when does Terrell Creek flow into Lummi Bay?

*This statement was an error in the public notice. Terrell Creek flows to Birch Bay.*

**Comments from Lionel Klikoff, Washington Department of Natural Resources (2.-20.)**

2. Overall this is a well crafted permit that adheres to Ecology guidelines and policies for NPDES permits.

*Comment noted.*

3. The discharge limits in the permit ought to reflect acceptable loadings into Puget Sound. Only until the impacts of loadings from industrial sites, wastewater treatment plants, and stormwater to the Puget Sound ecosystem are clearly understood, will the plight of the Puget Sound be understood.

*Ecology is currently conducting a number of toxic loading studies to evaluate water quality and the impact of discharges into Puget Sound. The toxic loading studies will help Ecology to pinpoint the areas in Puget Sound where water quality is impaired. Ecology addresses water quality impairments through the establishment of a total maximum daily load (TMDL) in which waste loads are allocated to waste dischargers and individual permit limits are determined based on the waste load allocations. Until a TMDL is established for the Cherry Point area, we will continue to rely on federal effluent guidelines and the Water Quality Standards to establish effluent limits for individual dischargers.*

4. The stormwater part of the permit is deficient. Use of benchmark values is not well developed. Under what kinds of precipitation events will water quality standards be exceeded? How important are first flush water quality shifts at a refinery? Are the proposed mixing zones real?

*Benchmarks were originally introduced in EPA's Multi-Sector General Permit in 1995. Since then, most states have adopted the use of benchmarks to determine if stormwater from a facility merits further monitoring or action. Ecology's benchmarks were derived*

*from a number of sources including: secondary wastewater treatment regulations, federal effluent limitation guidelines, data from the National Urban Runoff Program, sampling data from specific industry sectors, water quality criteria, and field observations.*

*It is difficult to determine under what kinds of precipitation events water quality standards will be exceeded. Industrial facilities are required to apply Best Management Practices to their stormwater to prevent or minimize the potential for water quality standard exceedances. Stormwater discharges are required to be monitored and compared to benchmarks. The purpose of a benchmark is to identify a level of pollution below which it is very unlikely that water quality standards will be violated. Pollutant concentrations above a benchmark trigger additional monitoring and corrective action.*

*First flush can be significant when there is a long antecedent dry period before a storm event and/or there is a distinct storm front at the onset of the storm. However, these are not generally found to be consistent runoff characteristics in Western Washington.*

*Ecology can authorize mixing zones around treated wastewater discharges to meet water quality standards. A facility must apply AKART prior to Ecology's authorization of a mixing zone. Ecology may authorize a mixing zone if it determines or expects that any pollutant will not meet a water quality criterion after application of technology-based methods of control, prevention, and treatment.*

*The mixing zones for the stormwater outfalls at BP were removed from the permit and fact sheet. The results from monitoring these stormwater outfalls will be compared to the benchmarks included in the permit. If the sampling results are above a benchmark, the permit requires BP to take actions to investigate and correct any stormwater contamination. At this time, there is no reason to authorize mixing zones for the stormwater outfalls at BP.*

5. The Fact Sheet states that stormwater discharges must meet water quality criteria yet benchmarks are used to assess stormwater discharges. The Fact Sheet also acknowledges that the pollutant concentrations in the discharge exceed water quality criteria despite using technology-based controls.

*Benchmarks are intended to be indicators. They are used to determine if a stormwater discharge merits further monitoring and corrective action. Discharges that do not exceed benchmark values are not likely to violate water quality standards.*

*The passage in the fact sheet the commenter is referring to concerns the discharge at BP's process water outfall, 001. There are a couple of metals in the discharge at Outfall 001 that exceed water quality standards despite using technology based controls. Ecology has determined that BP is applying AKART to this wastewater. Therefore, a mixing zone was authorized for this discharge to meet water quality standards.*

*Please see the response to Comment #4 regarding mixing zones.*

6. Ecology relies upon poorly understood stormwater mixing zones rather than requiring detailed monitoring of stormwater discharges at first flush when water quality levels are changing dramatically. There are no requirements in the permit to support the notion that the proposed mixing zones will not result in damage to the ecosystem and/or cause loss of sensitive habitat. Most troubling is the lack of attention to accumulative effects of the loadings of untreated stormwater discharges.

*Please see the response to Comment #4 regarding stormwater mixing zones.*

*Evaluating and mitigating cumulative effects of stormwater discharges is a challenge. Because of the many inputs and sources of pollution, this evaluation cannot be done on an individual permit basis.*

*Ecology uses TMDLs to analyze cumulative stormwater impacts in threatened or impaired water bodies. Please see the response to Comment #3 regarding TMDLs.*

7. Monitoring ought to reach out beyond EPA guidelines and specific water quality standards to include the possible presence of endocrine disruptors.

*Ecology is currently conducting a study of pharmaceuticals, personal care products, and other endocrine disruptors in Puget Sound. Endocrine disruptors are also being evaluated as part of the Persistent, Bioaccumulative, Toxics (PBT) Strategy in the state. These efforts will provide valuable information to Ecology staff once they are completed and help to determine future monitoring requirements in individual permits.*

8. The permit ought to require full characterization of the biota, water quality, and sediment at the points of discharge to the extent that the effects of the discharge can be modeled at the end of this permit cycle.

*This kind of characterization would be extremely complex and costly. Any data collected from such a study would be very difficult to interpret, let alone use as inputs to a model. There is a large amount of variability in natural systems and you would have to account for influences not related to the discharge. Instead, Ecology relies on monitoring for specific chemicals and whole effluent toxicity testing to detect potential impacts to aquatic species.*

9. The permit seems to be written with little concern for the Cherry Point Reserve; notably absent are requirements to assess impacts to the biota and their environment.

*A number of the management actions in the Cherry Point Aquatic Reserve Management Plan are addressed in the permit including conditions to ensure ongoing compliance with water quality standards, sediment monitoring, and herring toxicity testing. The fact sheet was revised to include a section about the Cherry Point Aquatic Reserve and the Management Plan.*

10. The delay in issuing a renewal permit for a facility as large and complex as the BP Cherry Point refinery is difficult to understand. An application was submitted in 2004, but approximately seven years later a draft permit is forthcoming.

*The delay was a result of the Department's limited resources.*

11. It is unclear from the Fact Sheet how many times the facility was inspected during the last permit cycle; only one inspection is noted. Ecology fails to inspect industrial facilities sufficiently often to determine if stormwater BMPs are being adequately followed.

*Ecology conducts two Class 1 and one Class 2 compliance inspections annually at BP. A Class 1 is a walk-through inspection to visually check the wastewater treatment system and stormwater outfalls, including stormwater BMPs. A Class 2 is a combination of a Class 1 and taking samples at Outfall 001 and at the industrial stormwater outfalls. Twenty Class 1 inspections and 10 Class 2 inspections were conducted at BP during the last permit cycle. This information was added to the fact sheet.*

12. A comment on timeliness: the Treatment Efficiency Study Plan and Engineering Report were submitted to Ecology on June 4, 2002 and were not approved until January 6, 2006.

*The delay was a result of the Department's limited resources.*

13. The requirement for dioxin testing is noted with approval.

*Comment noted.*

14. In the wastewater characterization section, both mg/L and ug/L are used. For the public's understanding, easily comparable units ought to be used.

*Conventional pollutants like BOD and TSS that are found at higher levels in the effluent are typically represented in units of mg/L. Metals and other toxic pollutants that are detected at very low levels in the effluent are typically represented in units of ug/L. We try to present wastewater characterization information in the same units of measure as the Water Quality Standards for ease of comparison.*

15. The Fact Sheet relies upon a discussion of EPA refinery guidelines (2004) for concluding that because with conventional treatment no additional removal of metals is necessary. Lacking is a discussion of what additional treatment might afford to reduction in metals discharge. That is not AKART according to Ecology guidelines. The proposed permit limits for total chromium and hexavalent chromium are a step in the right direction.

*The Permit Writer's Manual recommends that a permit writer examine a development document and available treatment technologies for a particular category of discharger and make a determination that the federal effluent limitations are AKART. For effluent guidelines over 10 years old, the permit writer should compare production processes, pollutants generated, and treatment efficiencies at the facility and with those in the development document and the treatability database. The permit writer should also review the design and treatment efficiencies of the facility's wastewater units.*

*For BP's permit, Ecology followed the evaluation process above. We reviewed the petroleum refining portion of EPA's Technical Support Document for the 2004 Effluent Guidelines Program Plan. This document updates the original development document for the refinery federal effluent guidelines. It discusses metals removal in detail and concludes that metal concentrations in refinery final effluents are below treatable levels,*

*meaning they are not cost effective to treat at the concentrations found. In our evaluation of BP's final effluent, we came to the same conclusion.*

*Economic reasonableness is a key factor in determining AKART.*

16. Ecology is commended for including herring larval and topsmelt testing in the bioassay requirements, but herring embryo temperature tolerance testing is not included.

*Ecology conducted a temperature tolerance study on herring embryos in clean sea water. The results of this study are discussed in the final report on Pacific herring test development and validation. The report can be found at the following link:*

[www.ecy.wa.gov/biblio/1110086.html](http://www.ecy.wa.gov/biblio/1110086.html).

17. Characterization of the biota near the discharge points ought to be required.

*Benthic abundance is one of three confirmatory chronic biological tests in the Sediment Management Standards for determining toxicity in sediment. However, the benthic infaunal abundance test will not be required because it is very difficult to find an appropriate reference for a high velocity, 300+ feet deep, and shell-covered area in the Strait of Georgia. Because Neanthes arenaceodentata have a good ability to adapt to high organic matter, the permit was revised to require the Microtox chronic effects test be performed during the next sediment sampling event.*

18. Ecology ought to require more extensive sediment analyses. At the minimum, the sediment ought to be characterized at the beginning and end of the permit cycle for a large facility like this.

*Ecology's Sediment Unit recommends that sediment sampling be conducted at large industrial facilities every 10 years (or every other permit cycle) unless there have been significant changes in the effluent or significant spill violations. The last sediment study conducted at BP was in 2006. The permit was changed to require submittal of a sediment study plan in the fall of 2014. If the sediment study occurs in late summer/fall of 2015 then the results of the study can be evaluated in 2016 when the permit is up for renewal.*

19. Coordination of the characterization of the benthic community with sediment characterization would be an important addition to the permit.

*Please see the response to Comment #17.*

20. The permit designates that the first fall storm event is one that occurs after October 1. There is no justification for that position. The first storm event after October 1 may occur after several storm events in September and is not likely to be representing the first flush of the season. It is unclear what happens if it rains on the weekend or after 5:00 PM. Surely for a complex facility like the BP Cherry Point refinery personnel are available to conduct the necessary stormwater monitoring and review of BMPs at all times.

*The stormwater monitoring requirements in the BP permit were written to be consistent with Ecology's Industrial Stormwater General Permit (ISWGP). The ISWGP defines the dry season as July through September. The wet season is defined as October 1<sup>st</sup> through June 30<sup>th</sup> in statute, RCW 90.48.555.*

*The ISWGP does not require sampling outside of regular business hours. The sampling requirements were changed in the 2010 ISWGP to give permittees more flexibility and encourage the collection of samples. The environmental staff at the refinery are trained to collect stormwater samples and review stormwater BMPs. The staff's working hours are 8:00 a.m. to 5:00 p.m. Monday – Friday.*

#### **Comments from Lee First (21.-23.)**

21. The draft permit omits the discharge limit for fecal coliform which was present in the previous permit. This parameter was removed from BP's permit because the facility's sanitary wastewater is now being sent to the Birch Bay wastewater treatment plant. However, a fecal limit should remain in the permit because sanitary wastewater is not the only source of fecal coliform coming from the facility. Regardless of the source of fecal coliform, the bacteria is harmful to shellfish. A discharge limit for fecal coliform should be included in the permit.

*Permit Condition S1.A. was revised to include weekly fecal coliform monitoring at Outfall 001. Ecology will evaluate the data to determine the potential to exceed the water quality standard.*

22. The draft permit includes a construction stormwater pH benchmark value of 8.5 standard units. This is consistent with the current construction stormwater general permit. However, the construction general stormwater permit specifies that exceeding the 8.5 benchmark should be followed up by either preventing the water from entering storm sewer systems or adjusting the pH in the water until it is in the range of 6.5 to 8.5. To

protect water quality, the pH benchmark should include the same range that is present in the construction stormwater general permit.

*Ecology chose to remove coverage for stormwater discharges from construction activities from this permit. These discharges are generally short term and different enough from normal refinery operations that we decided they were better addressed by Ecology's Construction Stormwater General Permit. The language in the fact sheet was also revised to reflect this decision.*

*BP will need to continue to apply for coverage under the general permit for stormwater discharges from future construction projects.*

23. The draft permit requires sampling at all discharge locations from construction sites at least once a week. However, the permit does not contain any construction discharge monitoring report requirements. The current construction general stormwater permit requires permittees to submit monitoring data to Ecology on a monthly basis. BP should be required to sample construction stormwater and submit discharge monitoring reports to Ecology on a monthly basis.

*Please see the response to Comment #22.*

#### **Comments from Lynne Pendleton (24.-25.)**

24. One of the goals of the Clean Water Act is to eliminate the discharge of pollutants by 1985. BP has done a good job for the most part keeping their discharges well below the limits Ecology has set for them. BP has demonstrated that the limits have become almost meaningless. Limits were meant to force better operation and more innovation. I ask that Ecology impose limits on BP that reflect the reality of BP's performance. These limits should not impose a punishment, rather they should reflect reality and be placed at what is currently achievable.

*Strictly applying statistically-derived, performance-based limits punishes good performers and rewards bad performers. The permit includes conditions that require BP to properly operate and maintain its wastewater treatment system and to evaluate and implement measures to reduce pollution. These conditions require BP to maintain or improve upon its superior wastewater treatment system performance as recorded during the last permit cycle.*

25. The herring are in decline and reached an all time low of 774 tons in 2010. Herring at Cherry Point are a key component of the food chain providing essential food for migrating water fowl and salmon. Toxicity test for acute and chronic impacts on herring are necessary. We are glad that these tests appear in the permit to gather information about the potential effects of BP's discharge on herring. We would like to see Ecology fast track the validation of these tests so that they can be used in compliance monitoring as soon as possible.

*The last of the three herring protocols, the larval survival and growth test, has been validated and approved for regulatory use. The final report on Pacific herring test development and validation can be found at the following link:*

[www.ecy.wa.gov/biblio/1110086.html](http://www.ecy.wa.gov/biblio/1110086.html).

**Comments from State Senator Doug Ericksen, representing the 42<sup>nd</sup> Legislative District (26.)**

26. Thank you to the Department of Ecology for working cooperatively with BP during this permit discharge activity. I think it is important to work together and realize the balance that we need to achieve between environmental protection and the need to have industrial manufacturing at Cherry Point for the economic vitality of our region here in northwest Washington. I think it's very important that we also recognize the work that BP has been doing the past few years with us in Olympia again in association with the Department of Ecology working on abatement and oil spill response activities.

*Comments noted.*

**Comments from Sam Crawford, Whatcom County Council (27.)**

27. The BP Cherry Point facility has been a good neighbor in Whatcom County and they have a proven track record as a steward of the environment and as a community leader. BP is important to the economic welfare of Whatcom County with over 800 direct employees and another 500 contract jobs. BP's compliance record has been extremely good and I'm confident they will follow the requirements of the permit to the letter.

I take the quality of our local environment very seriously. I feel the draft permit and fact sheet strike a good balance between environmental protection and allowing BP to responsibly operate an important industrial facility. I believe this draft permit does a good job of capturing the appropriate safeguards for the beautiful Cherry Point shoreline

and the proposed treatment and monitoring protocols sufficiently address and protect the environmental elements of the Terrell Creek and Strait of Georgia water bodies.

*Comments noted.*

**Comments from Wendy Steffensen, RE Sources (28.-32.)**

28. BP is doing a good job based on their present permit. BP is generally meeting all of their limits and doing so with large margins. I thank Ecology for adding some important components to the permit including herring testing, dioxin testing, and groundwater monitoring.

We need to recognize that Cherry Point is not just an industrial area, it's a sensitive area. It's an important ecosystem and it is home to the Cherry Point herring and a lot of migratory water fowl and salmon. For that reason, we need to look at this permit with a little more scrutiny.

*Comments noted.*

29. The limits in the permit are so high that BP could meet them in their sleep. I would like to see those limits lowered to meet reality as well.

*Please see the response to Comment #24.*

30. In regards to groundwater monitoring and dioxin testing, I would like to see some more triggers put into the permit. Right now, BP is doing a lot of monitoring and testing but what happens when those results come in?

*It is difficult to predict what actions might need to be taken until we can review and evaluate the results of this monitoring and testing. The data may show that no further action is required or trigger one of a number of possibilities: additional monitoring or testing, remediation, an AKART study, treatment, etc. Each of these scenarios also have several variables -- e.g., the parameters and frequency for additional monitoring and at which wells. Any necessary follow up action will be required in a future permit or under another mechanism such as an administrative order.*

31. There are acute and chronic tests being done now. It looks like the test species are not the most sensitive species being used. For compliance monitoring, I ask that we start using the most sensitive species. I am very pleased that herring tests have been added

and I would like to see this being used for compliance monitoring as soon as we can make sure it is a viable test and we wouldn't be getting a lot of false positives. This is not about punishing BP, it's about protecting our waters and having a viable industry at the same time.

*The acute and chronic toxicity test species were changed in the permit to saltwater species. The changes include switching to Topsmelt, which was identified as the most sensitive species in the acute WET testing conducted during the last permit term.*

*Also, please see the response to Comment #25.*

32. There is about 28,000 pounds of oil and grease that is discharged per year at BP. We don't know exactly what it is. I'm sure a lot of it is biological. I think we need to get really clear on what is being discharged so we know what kind of effect the effluent is causing to the ecosystem.

*It is misleading to state that BP discharges 28,000 lbs of oil and grease each year. Oil and grease measurements are the result of an extraction of non-polar hydrocarbons from the wastewater. The oil and grease test gives an indication of oil extractables in the effluent but also include components of naturally-occurring biological materials like algae which are also present in the wastewater.*

*The oil and grease test is the EPA-approved test for the NPDES program. Ecology is evaluating the use of other tests, such as NWTPH-D<sub>x</sub>, that may provide a better indication of petroleum materials in a wastewater discharge.*

**Comments from Rachel Vasak, Nooksack Salmon Enhancement Association (33.)**

33. The Nooksack Salmon Enhancement Association works throughout Whatcom County to restore self-sustaining and wild salmon runs. I've been working in Terrell Creek in the interest of salmon and the freshwater component of that since 2000. We conducted a habitat assessment in the creek that generated some serious concerns about degraded habitat on the portion of BP property just upstream of Jackson Road. I and the staff that I work with were very amazed and happy with the support that BP offered.

Within two years we were able to fix about 3000 feet of habitat that essentially fixed a very substantial salmon fish passage barrier. This was a wonderful example of a cooperative working relationship in the Terrell Creek watershed. BP took several steps

further by continuing to provide funding every year to add to the restoration of repair to that section of the creek. We are very grateful for BP's proactive efforts to support salmon and watershed restoration in the area.

*Comments noted.*

**Comments from Liz Daly, BP Cherry Point Refinery (34.)**

34. I wanted to add one thing to Rachel Vasak's presentation. The stormwater discharges from the BP refinery flow into Terrell Creek.

*Comment noted.*

**Comments from San Juan County Council (35.)**

35. The genetically unique Cherry Point herring stocks are critical as food items to many species in San Juan County. We specifically support the NPDES permit's herring toxicity testing (both acute and chronic) and request that the NPDES permit require best efforts to mitigate any impacts to the Cherry Point herring.

*The herring testing requirements in the permit include a toxicity response investigation if significant toxicity is found. The investigation is intended to identify possible causes and preventive measures for controlling or eliminating the toxicity.*

**Comments from Frank Holmes, Western States Petroleum Association (36.-37.)**

36. The Operations and Maintenance Manual requirements have been expanded to include multiple operating, maintenance, and pollution prevention procedures Ecology wishes to review and approve in hard copy form whenever such changes are incorporated into the manual. Most modern refineries use various electronic systems to track, maintain, and change hundreds of operating and maintenance procedures on a semi-continuous basis. Trying to pull all the changes and procedures into a single hard copy document for review and approval by Ecology is a substantial and never-ending undertaking that is inconsistent with modern day electronic data systems. The permit should be reworded to allow procedures to be included by reference to the electronic systems in which they are properly stored and maintained.

*Condition S4. was revised to make the proposed change.*

37. Permit Condition S4. Includes various requirements that are already covered and addressed by the pollution prevention section of the permit. These redundant requirements should be removed from the permit.

*Condition S4. was changed to remove the redundant requirements.*

38. The table in Section 5 Permit Condition S13., Construction Stormwater Pollution Prevention, refers to weekly requirements for sites <1 acre with no de-minimus disturbance area. This could potentially be inferred to apply to turning over a hand trowel's worth of dirt. WSPA believes that the requirements for <1 acre should be removed from the permit to be consistent with other state general and construction stormwater permits.

Most "construction" work in a typical refinery occurs entirely within areas that discharge through NPDES permitted process outfalls. These outfalls have limits that are already protective of human health and the environment and meet water quality standards. Primary NPDES outfalls should be removed from the construction stormwater section of the permit as these areas are already covered under the primary outfall conditions.

*Please see the response to Comment #22.*

#### **Comments from Western States Petroleum Association and BP (38.-42.)**

39. Permit Condition S4. states that the permittee must submit prior notice, if possible, at least 10 days before the date of a bypass. When critical equipment breaks down at a facility, it is common that all efforts are made to immediately restore the system service and maintain the highest possible standards of treatment. The proposed permit requirement will unnecessarily delay critical equipment repairs and has the potential for adverse impacts on system performance. The permit should make clear that emergency maintenance is not subject to the 10-day pre-notification requirement.

Many facilities have redundant equipment designs to allow for maintenance without impacting treatment system performance. The permit should be clear that bypass of redundant equipment does not constitute a bypass.

*S4.B. was revised to add the suggested language.*

40. WSPA and BP are requesting that the herring chronic toxicity testing be removed from the permit and that the herring acute toxicity testing is included only as a study with no related compliance elements such as the development and implementation of a TI/RE. While WSPA and BP recognize the importance of and supports research surrounding herring populations at Cherry Point, such research is not appropriate for inclusion for compliance in an NPDES permit.

*Ecology believes that it is appropriate to retain the herring toxicity testing in the permit to better understand the potential impacts from BP's effluent on sensitive herring populations in the area. Condition S9. was revised to clarify that this testing is not effluent characterization or compliance testing.*

41. WSPA and BP support the use of EPA-approved Whole Effluent Toxicity test methods for NPDES compliance purposes. Currently, there are no EPA approved tests using herring. In their draft guidance, "Protocol for EPA Approval of New Methods or Alternate Test Procedures for Whole Effluent Toxicity" (EPA-821-B-98-004), EPA states that they consider it unnecessary to conduct WET tests with resident or indigenous species because it has been demonstrated that the Agency-approved test species are appropriate for the NPDES program.

*The herring test protocols were developed and validated by Western Washington University's Shannon Point Marine Center and the Department of Ecology in accordance with criteria taken from EPA's draft guidance. These herring tests are now useful in many of the same ways as the EPA tests because they achieve consistent responses from herring and can measure toxicity.*

*EPA's draft guidance considers it generally unnecessary to substitute a native species for a standard test species just because the substitute species is native, but does not address the situation where the native species is in sharp decline. Ecology wants to use the most sensitive test available to determine the impact of BP's discharge on the aquatic environment, especially in an area where herring stocks have been vastly reduced.*

42. WSPA and BP encourage the use of recommended, validated chronic EPA test methodologies for compliance obligations. It is our understanding that the herring survival and growth test is still undergoing research and development. When sufficiently developed and ready to undergo validation, WSPA and BP may be willing to partner with Ecology on a research project outside the NPDES permit, to assess whether one of the EPA-approved short-term chronic methods and the Pacific herring survival and growth

test show roughly equivalent sensitivity to a series of reference toxicants and a sample from a petroleum refinery effluent.

*The herring larval survival and growth test has been validated. Please refer to the final report on the Pacific herring test development and validation:*  
[www.ecy.wa.gov/biblio/1110086.html](http://www.ecy.wa.gov/biblio/1110086.html).

*Condition S9. was revised to include a pairing of the acute and chronic herring tests with standard EPA tests. This change will help to meet two goals. One goal is screening effluent samples for toxicity to Pacific herring and investigating the cause if toxicity is found. The species used in the EPA tests are more readily available than herring outside of the herring spawning period and the toxicity response procedures are worked out in detail in for the EPA tests.*

*The other goal is to discover the extent to which the standard EPA toxicity tests can be used to protect herring. The permit requirements seek to establish the relative sensitivity of herring tests and analogous EPA tests in the hopes that the EPA tests can substitute for the herring tests long term. Effectively monitoring effluents and controlling toxicity requires more frequent testing than is possible using herring test organisms.*

**Comments from BP Cherry Point Refinery (43.-64.)**

43. WAC 173-205-050(1)(d) states that for effluent characterization and compliance monitoring, the department shall use toxicity tests published in 40 CFR Part 136, in EPA toxicity test manuals, or those methods approved by the department considering criteria that include a description of the test method and interlaboratory comparisons of the method. We agree with EPA policy in the draft guidance, “Protocol for EPA Approval of New Methods or Alternate Test Procedures for Whole Effluent Toxicity” (EPA-821-B-98-004), that states that Alternate Test Procedures must meet the physical and chemical parameters and test acceptability criteria of the approved method and demonstrate precision and sensitivity equal to or greater than that demonstrated by the unmodified Agency-approved test procedures in side-by-side tests.

*The herring toxicity testing required in the permit is not for effluent characterization or compliance monitoring. It is to screen effluent samples for toxicity to Pacific herring and for investigating toxicity if it is found. Condition S9. was revised to make this clear.*

44. Toxicity testing using indigenous herring stocks presents a unique set of challenges which preclude use of such stocks for compliance testing. One significant limitation of these protocols is that gametes and embryos are only available for approximately 6 months of the year. Gametes and embryos must be field collected. These organisms are not commercially available and are not likely to be in the foreseeable future. Organisms are currently being obtained from outside the State of Washington and the importation requires the acquiescence of the Department of Fish and Wildlife (the permitting agency). There is no guarantee that this understanding/agreement will continue into the future and the potential exists that these organisms may not be available.

*The permit addresses the seasonal availability of herring gametes and embryos. Herring toxicity testing is only required during the herring spawning period. The main constraint on availability during the herring spawning season was budgetary. We had plenty of herring for testing in 2005 when we had a contract with USGS and plenty of herring in 2007 when we had a contract with WDFW. Even in years without funding to pay for herring, we managed to get more than enough to meet the proposed permit requirement of testing twice during the spawning period. Commercial fishing in the area is well established and could also be used as a supplier.*

*Herring larval testing has been conducted by a number of facilities for over 10 years now. WDFW is fully aware of this testing and there have been no problems. We do not anticipate any problems in the future.*

45. The indigenous herring stocks often perform erratically in laboratory tests. It has been our experience that it is not unusual for mortality in the controls to be higher than in the actual test concentrations.

*All toxicity tests have the potential for organisms in a non-toxic control to do less well than in a non-toxic test concentration due to random chance. All things being equal, this will happen 50% of the time. If a toxicant produces hormesis (a stimulatory response to a toxicant at a non-toxic concentration), then test organism performance in those concentrations might be better than the control more than 50% of the time.*

*If we assume that the comment is about meeting control performance criteria involving survival, this was not true in the laboratory tests performed according to the final methods resulting from the Pacific herring protocol development and validation. A commercial lab had difficulty with the herring larval 10-day survival and growth test method, but method deficiencies were corrected and the test was shortened to 7days. For*

*more details, please refer to the final report and its references at the following link:  
[www.ecy.wa.gov/biblio/1110086.html](http://www.ecy.wa.gov/biblio/1110086.html).*

46. WAC 173-205-050(1)(e) states that WET testing for effluent characterization or compliance monitoring shall be performed by laboratories accredited by the department for the specific toxicity test. Ecology has not accredited any labs for herring testing and the number of laboratories that have the capability to perform herring toxicity testing is extremely limited. With Nautilus Environmental closing its Tacoma facility, the number of laboratories that can perform the acute toxicity test decreased from three to two.

*WET testing for effluent characterization or compliance monitoring must be performed at accredited labs. Condition S9. was revised to make it clear that the herring toxicity testing in the permit is not effluent characterization or compliance monitoring.*

*Ecology's Lab Accreditation Unit does intend to accredit labs for herring testing in the future.*

47. BP requests that the requirement to monitor COD be removed because COD is not part of the suite of parameters normally monitored in stormwater, nor does it have a benchmark value. The 2009 Industrial Stormwater General Permit requires COD monitoring for only a few specified categories of dischargers and petroleum refineries are not within those categories.

*COD monitoring was removed from the permit. We added turbidity monitoring and a turbidity benchmark instead.*

48. BP recognizes that the permit uses TSS as a surrogate for turbidity and agrees with Ecology that TSS is a better benchmark than turbidity for stormwater from a refinery. BP proposes to retain the TSS benchmark but recommends 30 mg/L. The EPA Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity specifies a benchmark of 100 mg/L for most industries and finds that this benchmark is protective of aquatic life. The Industrial Stormwater General Permit (ISWGP) imposes a 30 mg/L TSS effluent limit for stormwater discharges to 303(d)-listed waters if they are listed due to sediment quality. The fact sheet for the ISWGP states that this limitation is based upon best professional judgment determination that stormwater discharges with less than 30 mg/L TSS will not cause or contribute to a violation of sediment management standards.

*The TSS benchmark was changed to 30 mg/L. TSS is comparable to turbidity but does not lend itself to direct conversion under all circumstances. Turbidity monitoring and a turbidity benchmark were added to the permit to provide a more direct basis for determining compliance with water quality standards. Also, turbidity sampling can be conducted in the field as an immediate indicator of stormwater contamination.*

49. The permit holds BP responsible for Praxair's compliance with the pre-treatment and monitoring requirements in this condition. BP is willing to accept that responsibility provided that BP can rely on monitoring data provided by Praxair to show compliance. Without adding wording to Condition S1.G., BP would have to duplicate Praxair's monitoring.

*The permit was changed to make it clear that Praxair, not BP, is responsible for complying with the pretreatment and monitoring requirements in their state waste discharge permit.*

50. BP requests that wording be added to Condition S3.D. to describe the conditions under which the results of additional monitoring must be reported to Ecology. This requirement is incorporated by reference in Condition G11.

*Condition S3.D. was revised to clarify the conditions under which additional monitoring must be reported to Ecology.*

51. BP has extensive comments on Condition S4., *Operation and Maintenance*, because the language in the draft permit conflicts with the terms of WAC 173-240-150, imposes new monitoring and recordkeeping requirements that are not needed to protect water quality, and conflicts with various other conditions in the permit. These comments are shown on a redlined draft permit with footnotes that state the rationale for the proposed revisions.

*Ecology revised Condition S4. to include some of the proposed changes but not all of them. WAC 173-220-150(g) requires a Permittee to at all times properly operate and maintain any facilities or systems of control installed to achieve compliance with the terms and conditions of the permit. In addition to WAC 173-240-150, this regulation is the basis for the O&M manual requirements.*

52. BP requests that wording be added to Condition S7.B. that states that the Permittee shall be considered in compliance with all permit requirements for acute whole effluent

toxicity so long as the requirements in S7.D. are being met to the satisfaction of the Department.

*Ecology corrected several errors in the references to other subsections in S7.B. With these changes, the wording states that the Permittee will be considered in compliance with the requirements of the acute whole effluent toxicity by meeting the requirements of S7.D.*

53. BP requests that the reports of acute and chronic toxicity compliance test results be submitted to Ecology within 60 days after completion of the test rather than 60 days after each sample date.

*Conditions S7. and S8. were revised to incorporate the suggested wording.*

54. BP proposes to move the echinoderm chronic toxicity test from Condition S9.B. to Condition S8.

*The echinoderm chronic toxicity test was moved to Condition S8. The echinoderm embryo-larval development test was added as the invertebrate species so that the results can be used to meet testing requirements in the section on herring testing.*

55. BP requests that Ecology include an anomalous results paragraph to Condition S8. to give Ecology and BP the flexibility to discard non-representative test data.

*The anomalous test results paragraph was added to Condition S8.*

56. BP requests that the requirement to update the engineering report in Condition S10. be conditioned on the results of the treatment efficiency study. The purpose of a treatment efficiency study is to determine whether the treatment works has adequate capacity to handle changes in the volume or composition of the influent. An engineering report should be required only if the study shows that changes to the treatment facility are needed.

*The engineering report is where the results of the treatment efficiency study are discussed and evaluated. If a new study is conducted, the engineering report needs to be updated.*

57. BP requests that Condition S13. be revised to not regulate construction stormwater routed to the wastewater treatment plant and discharged through Outfall 001. There is no reason to subject stormwater to the requirements of this condition if that stormwater goes

through treatment processes designed in part to capture suspended solids and organic compounds. The 2010 Construction Stormwater General Permit recognizes this principle by exempting from coverage construction activities that discharge all stormwater and non-stormwater to ground water, sanitary sewer or combined sewer,... CSWGP Condition S1.B(2).

*Please see the response to Comment #22.*

58. BP requests that a sentence be added to Condition S13., *Construction Stormwater*, to state that BMPs selected from the Stormwater Management Manual for Western Washington are deemed to satisfy AKART for construction stormwater.

*Please see the response to Comment #22.*

59. BP requests that the general monitoring requirements in Condition S13. be revised to be consistent with the Construction Stormwater General Permit. The proposed revisions are shown on the redlined draft permit.

*Please see the response to Comment #22.*

60. BP requests that the pH monitoring requirements in Condition S13. be revised to be consistent with the Construction Stormwater General Permit. The proposed revisions are shown on the redlined draft permit.

*Please see the response to Comment #22.*

61. BP requests that the requirement to sample the final effluent (Outfall 001) for chlorinated dioxin and furans be deleted from the permit. There is no point in sampling dioxin in the final effluent when the sole source of dioxin in the final effluent is regeneration of the catalytic reformer units and the concentration of dioxin in the final effluent is even more dilute than from the reformers.

*This monitoring is necessary to demonstrate that the final effluent meets water quality standards for dioxin and furan.*

62. BP requests that the Condition S15., Groundwater Monitoring, refer to the wastewater ponds as being lined with native clay instead of being unlined.

*Condition S15. was revised to remove the word “unlined”.*

63. BP requests that the use of “must” in several conditions of the draft permit be changed to “shall”. The proposed changes are shown on the redlined draft permit.

*The word “shall” was replaced by “must” in the permit for a mandatory requirement. This change was made in the Water Quality Program industrial NPDES boilerplate. In common usage, “shall” does not mean required to and “must” does.*

64. BP proposed a number of minor changes to the draft permit to correct typos and grammatical errors, remove redundancies, clarify a requirement, align a submittal deadline with a DMR submittal deadline, or to add references to other permit conditions. The proposed changes are shown on the redlined draft permit.

*The permit was revised to make the proposed changes.*

**Comments from Puget Soundkeeper Alliance (65.-90.)**

65. Puget Soundkeeper Alliance (PSA) is very concerned about the effects of BP’s discharges of toxic pollutants to the Strait of Georgia and its declining herring population and nearby Marine Protected Areas, critical nearshore habitat, approved commercial shellfish areas and recreational shellfish beaches, as well as the refinery discharges of industrial stormwater to Terrell Creek and its impacts on Coastal Cutthroat, Coho Salmon, and ESA listed Steelhead.

*Comments noted.*

66. The draft permit’s treatment of stormwater discharges to Terrell Creek is totally unacceptable. The draft permit appears to loosely use the Industrial Stormwater General Permit (ISWGP) as a model for conditions on these discharges with the addition of an unsupported mixing zone in Terrell Creek.

*Please see the responses to Comments #4 and #5.*

67. The draft permit fails to include requirements comparable to those in the ISWGP. The ISWGP requires the preparation of a stormwater pollution prevention plan with highly specified requirements including mandatory best management practices, quarterly discharge monitoring, and prescribed responses to benchmark exceedances.

*The permit does include stormwater requirements comparable to the Industrial Stormwater General Permit. Condition S1.C.3. requires quarterly monitoring for new stormwater outfalls (004, 005, and 007). Condition S1.C.4. requires specific actions in response to monitoring results above benchmark values. Condition S12. requires BP to update their Pollution Prevention Plan. This plan is a compilation of other previous pollution prevention plans including BP's stormwater pollution prevention plan, solid waste control plan, and spill plan. Condition S12. requires that BP follow Standard Operating Procedures (SOPs), BMPs, and work practices developed and updated from previous stormwater pollution prevention plans. Ecology added language to Condition S1.C., Condition S12., and Appendix C to better align with the requirements in the Industrial Stormwater General Permit.*

68. The stormwater sampling frequency in the draft permit is inadequate – allowing annual monitoring for Outfalls 002 and 003 based on samples collected years ago. Stormwater is highly variable and eight to twelve samples are regarded as the minimum necessary to characterize discharge quality. The ISWGP requires all permittees to monitor all parameters quarterly from the start of the permit term and allows a reduction of monitoring only after consistent attainment of benchmarks is demonstrated.

*Ecology revised the stormwater requirements in Condition S1.C.3., adding turbidity, copper, and zinc monitoring and benchmarks and changing the benchmark for TSS. We increased the frequency of monitoring to quarterly at Outfalls 002 and 003 to recharacterize the discharges in light of these changes.*

69. The draft permit lacks the careful wording and specificity of the ISWGP's requirements for SWPPP and BMP implementation. The draft permit includes Appendix C, but this is a weak facsimile of the ISWGP's Condition S3. Is Appendix C even an enforceable part of the draft permit? The draft permit has no requirements comparable to ISWGP Condition S8., which specifies adaptive management responses to benchmark exceedances, including reporting requirements and culminating with the requirement to implement treatment BMPs.

*Please see the response to Comment #67 and yes, Appendix C is an enforceable part of the permit.*

70. Outfall 006 drains 7 acres of industrial refinery area near the dock and nearly half of the 25 samples of this discharge since 2004 have shown TSS concentrations that would

exceed the benchmark. Under the ISWGP, treatment BMPs would already have been required for this discharge.

*The onshore sump at the dock collects industrial stormwater that is pumped to the wastewater treatment plant. During high intensity rainfall events, this onshore sump may be bypassed to prevent overflowing the sump, resulting in a discharge of industrial stormwater to Outfall 006. BP has made improvements in this area to remove the non-industrial stormwater that drains to the sump. These changes have reduced the bypasses of the onshore sump.*

*Ecology will evaluate sampling results for any future discharges at Outfall 006 and require corrective action if necessary.*

71. The use of benchmarks in an individual permit is inappropriate and legally indefensible. Benchmarks are a tool of convenience for general permits and PSA objects strongly to their use in individual permits. There is no reason that Ecology cannot appropriately derive numeric effluent limitations for the stormwater discharges for this particular facility. Ecology must do a reasonable potential analysis to ensure that discharges do not cause or contribute to violations of the water quality standards.

*Ecology believes that the use of benchmarks for stormwater discharges is appropriate under this permit. This approach is consistent with the way similar industrial stormwater discharges are addressed across the State.*

72. Ecology's establishment of mixing zones for stormwater outfalls 002-007 in Terrell Creek is unsupported and impermissible. First of all, the permit does not require AKART to be applied to the stormwater discharges. Generally, for industrial stormwater, AKART is represented by the strict conditions of the ISWGP. Ecology has made no facility-specific AKART determination for stormwater here and the conditions of the draft permit are less stringent than those of the ISWGP. Second, there is no consideration of critical conditions in the establishment of the mixing zones in Terrell Creek. Third, there is no supporting information that clearly indicates the mixing zone would not have reasonable potential to cause a loss of sensitive or important habitat, substantially interfere with the existing or characteristic uses of the water body, result in damage to the ecosystem, or adversely affect public health [WAC 173-201A-400(4)].

*Please see the response to Comment #4.*

73. Footnote d. to Condition S1.A. concerning monitoring frequencies for COD and ammonia should state that the monitoring frequency will increase as specified if BP exceeds these effluent limitations. Allusions to future actions that Ecology may take, especially in some unspecified or informal manner is not an adequate substitute for such specificity. See *Puget Soundkeeper Alliance v. Ecology*, PCHB 02-162, Order Granting Partial Summary Judgment (6/6/03) at XXXIV-XXXVII.

*There are a number of situations where an effluent limit has been exceeded that were not considered representative of the discharge -- e.g., unusually heavy rainfall, power outage, and faulty sampling equipment. Ecology left this open to be able to review the circumstances of an exceedance before making the decision on an appropriate response.*

74. PSA objects to the hexavalent chromium effluent limitations. If all detectable samples of chromium in the BP effluent have been within the range of 5 to 11 ug/, why is it that Ecology's best professional judgment is that the effluent limitation be 50 ug/L. 50 ug/L appears to be an arbitrarily high number. Wouldn't a limitation of 12 ug/L be more appropriate and consistent with the CWA's goal of eliminating toxic discharges?

The 50 ug/L combined with increased flow is apparently the basis for the increase in the hexavalent chromium loading limit from 2 to 2.1 lbs/day. PSA objects to this increase and to the semi-annual frequency of the chromium monitoring requirements. The frequency should be increased to at least monthly to ensure that increases in toxic discharges are likely to be detected if and when they occur.

*Much of the hexavalent chromium data is non-detect and it is therefore difficult to use statistical approaches to derive a limit based upon performance. Also, chromium is a contaminant in crude and depending on the source of the crude, the concentrations can vary. Ecology decided it was simpler to apply the marine acute water quality standard for hexavalent chromium as the concentration limit at the end of pipe. We believe this limit is protective.*

*The mass-based effluent limitation was changed to 2.0 lbs/day.*

75. The draft permit omits the discharge limit for fecal coliform which was present in the previous permit. A fecal coliform discharge limit should remain in the permit because wastewater was not the only source of fecal coliform coming from the facility. If BP is not required to monitor fecal coliform levels in the facility's discharges, protection of shellfish harvesting in that area is far from guaranteed.

*Please see the response to Comment #21.*

76. PSA notes that the draft permit's effluent limitations for daily maximum and monthly average loading for ammonia, BOD, COD, oil and grease, phenolics, sulfide, and TSS are all far above actual loading levels calculated for discharges since 2005. If this limits are to be set so high, what in the permit ensures that BP will do its best to minimize pollutant discharge levels, i.e., implement AKART?

PSA encourages Ecology to recalculate these technology-based limits to reflect actual facility performance to serve the goals of state law and the CWA to use the NPDES to continually ratchet down pollutant discharges. How are these high levels of loading consistent with the state's efforts to restore Puget Sound and the Cherry Point herring population?

*Please see the response to Comment #24.*

*State law does not explicitly state that AKART is effluent limitations based on demonstrated performance where performance is better than the federal effluent guidelines. The permit contains numerical effluent limitations, whole effluent toxicity limitations, and narrative conditions to prevent and control the discharge of pollutants from the BP refinery. The permit requires BP to operate and maintain its existing wastewater treatment system, the historic performance of which satisfies AKART, and to identify and implement opportunities to further reduce pollution through source control.*

77. Condition S1.C.2. requires BP to prevent the discharge of stormwater contaminated by oil products "as identified by an oil sheen". This is unclear. What is prohibited? Where and when is BP supposed to look for this sheen?

*The discharge of crude, synthetic or processed oil, or oil-containing products as identified by an oil sheen is prohibited. BP must check for a visible sheen in the stormwater during inspections. If a visible sheen is observed, BP must investigate for a possible oil source, make sure that BMPs are being followed and are appropriate, and take corrective action as necessary. BP conducts visual inspections at the retention dam upstream of each stormwater outfall.*

78. Condition S1.G.2. concerns the treatment of Praxair wastewater. It is unclear whether the average monthly and daily maximum limits are enforceable conditions of the draft

permit. Is BP violating the permit if the wastewater it accepts from Praxair exceeds these limits? Who is responsible for the monitoring of this waste stream? Are these monitoring requirements supplemental to those in Praxair's permit, or are they just a recitation of what the permit requires?

*Please see the response to Comment #49.*

79. PSA objects to the provision allowing Ecology to waive the written report requirement in Condition S3.E.4. If this waiver provision is to be included, it should specify conditions in which a waiver request will be considered and the means by which the waiver will be made.

*It is difficult to predict what the conditions might be when a waiver request is considered. There are so many possibilities. There are minor cases of non-compliance when a verbal explanation is sufficient. Oftentimes, we don't waive the written report but extend the timeframe for submittal. Ecology left this open to be able to make decisions on a case-by-case basis.*

80. S6.B. should be changed to authorize non-routine and unanticipated discharges only via administrative order. It is inappropriate and unlawful for the permit to allow these discharges on an informal say-so, without any opportunity for public involvement. This would amount to an impermissible modification of permit conditions without following modification procedures.

*This condition does not modify limits or permit requirements. It authorizes discharges relatively uncontaminated wastewater that is not anticipated. The discharge still has to meet the permit limits in S1. and any other limits or requirements that we impose. Ecology reviews each discharge event as described in Condition S6.A. to ensure it will meet the limitations in the permit.*

81. Conditions S7A. and B. are confusing and unclear about what would be a violation of the effluent limit for acute toxicity. These provisions seem to clearly state that test results showing a statistically significant difference between the control and ACEC would be a permit violation. This is consistent with WAC 173-205-070(1). However, the last sentence of the second paragraph of S7.B. appears to relieve the permittee of any violation if the permittee meets the requirements of subsection E. S7.E. is the sampling and reporting requirements. Doesn't failing the test show that the discharge violates

water quality standards and a maximum daily discharge limitation per WAC 173-205-070(1)(d)?

If the reference is mistaken and should be instead to S7.D., PSA's concern remains. The S7.D. requirement for conducting more tests, and if failures continue, to submit a toxicity identification/reduction evaluation plan cannot magically make the discharge non-toxic and compliant with the maximum daily discharge limitation.

*Ecology corrected several errors in the references to other subsections in S7.B. With these changes, the wording states that the Permittee will be considered in compliance with the requirements of the acute whole effluent toxicity by meeting the requirements of S7.D.*

*A Permittee is out of compliance only if toxicity persists and they do not complete the follow up requirements such as conducting additional testing and preparing a TI/RE plan. If it is not clear what is causing the toxicity, then it can't be fixed. A toxicity identification/reduction evaluation plan requires the Permittee to investigate the cause of the toxicity and then to control or eliminate the toxicity through efforts such as changes in plant operation, replacement of a toxic material, or improvement in best management practices.*

82. The fact sheet states that Ecology may require additional chronic toxicity characterization if BP makes process or material changes. The draft permit should specify the additional chronic toxicity testing and limitations that will apply.

*The fact sheet was in error. Ecology will require additional chronic toxicity characterization if BP makes changes to processes, materials, or treatment that could result in an increase to effluent toxicity (WAC 173-305-060). Ecology will review the proposed changes and tailor the toxicity characterization requirements accordingly. The results of the effluent characterization will be evaluated to determine if a reasonable potential for chronic toxicity exists and a WET limit is required.*

83. On page 38 of the fact sheet, Ecology essentially admits that BP's discharges have the reasonable potential to impair the Cherry Point herring's beneficial use of the receiving waters. The draft permit should include an actual enforceable herring toxicity testing effluent limitation instead of the mere monitoring and response requirement found in Condition S9. This requirement is yet rendered vague and further inappropriate by S9.B.4. and 5. which merely recite Ecology's ability to order BP to take additional

measures instead of specifying what is required in the given circumstances. If BP's discharge is found toxic to herring, this should be considered a permit violation.

*Whole effluent toxicity testing, including herring toxicity testing, is used to determine if toxicity exists. If toxicity is found, Ecology is interested in what might be causing the toxicity and eliminating it. BP will be considered to be out of compliance with their permit if toxicity persists and they do not complete the follow up requirements – including additional testing and submittal of a toxicity investigation plan.*

*WAC 173-205-050(1)(d) limits the tests which may be required for effluent characterization and compliance testing to tests published in 40 CFR 136, contained in EPA toxicity test manuals, or approved by Ecology for meeting a set of criteria. The herring tests at this point in time have not been adopted by EPA but meet most of the criteria for Ecology approval in WAC 173-205-050(1)(d). Until the herring tests meet all of the criteria, they cannot be used for compliance monitoring.*

84. Condition S10. should affirmatively require a wastewater treatment efficiency study if BP proposes substantial refinery alterations that could cause a material change in the influent to the wastewater treatment system. This condition leaves the requirement for such a study to Ecology's discretion and provides inadequate assurance that facility changes will be appropriately addressed.

*Condition S10. was revised to state that Ecology will require a wastewater treatment efficiency study if BP proposes substantial refinery alterations that could cause a material change in the influent to the wastewater treatment system.*

85. PSA does not understand why the sediment sampling and analysis plan is due only in 2016. The fact sheet indicates that the 2006 sediment monitoring revealed exceedances of sediment chemistry and cleanup screening level standards. What in the permit addresses these exceedances? It seems sensible to require, at a minimum, additional monitoring at the beginning of the permit term to see whether source identification and control are warranted.

*Please see the response to Comment #18.*

*Per the Sediment Management Standards, sediment bioassay results override chemical results [WAC 173-204-310(2)]. During the 2006 sediment sampling event, stations that*

*had chemical exceedances passed the confirmatory bioassays, therefore no further action was required.*

86. The pollution prevention requirements in Condition S12. are loosely written and full of discretion for the permittee. For instance, S12.B. requires updating plan requirements “as necessary” without any definition of this term and S12.E. “encourages” BP to employ continuous improvement principles.

*Condition S12.B. was revised to clarify when updating the plan is necessary. S12.E. was revised to be more directive.*

87. The biannual stormwater inspections required in Condition S12. are insufficient and short of stormwater management regulatory standards. The ISWGP requires monthly stormwater inspections.

*The permit was changed to require monthly visual inspections of the stormwater outfalls.*

88. The draft permit’s treatment of construction stormwater regulation is inadequate and impermissible in manners similar to that concerning industrial stormwater regulation. Ecology should either require coverage of construction activities under the Construction Stormwater General Permit or include in this individual permit site-specific AKART and water quality-based conditions, including numeric effluent limitations.

*Please see the response to Comment #22.*

89. PSA objects to the presumption of compliance language in S13.3. This language comes from RCW 90.48.555 and is applicable only to general permits. It is entirely inappropriate to include this statement in an individual permit. It is inconsistent with the 40 CFR 122.44(d) requirement that Ecology perform an actual reasonable potential analysis for discharges authorized by this permit.

*Please see the response to Comment #22.*

90. For the same reasons given for industrial stormwater, the use of benchmarks for construction stormwater in this permit is inappropriate. The use of benchmarks in Ecology’s general permits as templates for regulation of stormwater discharges in individual permits is extremely problematic and probably unlawful.

*Please see the response to Comment #22.*

**Comments from RE Sources/Sierra Club/Friends of the Earth/Fred Felleman (91.-107.)**

91. The Cherry Point herring are in decline and have reached an all time low of 774 tons in 2010. Herring at Cherry Point are a key component of the food chain, providing essential food for migrating waterfowl and salmon.

Toxicity tests for acute and chronic effects on herring are necessary. We are very glad that these tests appear in the permit to gather information about the potential effect of BPs discharge on herring. We would like to see Ecology fast-track the validation of these tests so that they can be used in compliance monitoring as soon as possible.

*Please see the response to Comment #25.*

92. Cherry Point is partially bordered by the Department of Natural Resources Aquatic Reserve. While the existence of the aquatic reserve does not impose any new limitations on the facility, its existence highlights the sensitivity of the area and the coordination required by all agencies to protect this valuable resource. The existence of the Aquatic Reserve, as well as some of the proposed management actions which specifically address contaminated effluent discharge, should be referenced in the permit. Some relevant management actions pertain to ballast water, sediment monitoring, and biological testing of cumulative discharges from the Cherry Point industries.

*Please see the response to Comment #9.*

*References to the Cherry Point Aquatic Reserve and proposed management actions will be included in the fact sheets for future permits. This information is not typically included in a permit.*

*Ballast water is outside the scope of this permit. This permit covers discharges from the BP refinery not from ships or vessels that dock at the refinery.*

*Biological testing of cumulative discharges from Cherry Point industries is not something that should be addressed in an individual permit. The Shannon Point Marine Center did do herring toxicity tests on ambient water samples from the Cherry Point Reach. Please refer to the final report on the Pacific herring test development and validation: [www.ecy.wa.gov/biblio/1110086.html](http://www.ecy.wa.gov/biblio/1110086.html)*

93. At present, the amount of oil and grease that is discharged to the Georgia Strait is approximately 28,000 pounds per year. It is not known, however what constituents make

up the oil and grease fraction. We do not know whether they are lipids from microorganisms or bioaccumulative petroleum aromatic hydrocarbons, or something in between. It is important to identify the components of the oil and grease fraction so that we can more easily ascertain how problematic their discharge may be.

To that end, we ask that testing of the oil and grease fraction be improved to elucidate its chemical constituents. Ecology has already started side-by-side comparisons of the O&G and WTPH-D methods, and these need to be further refined. The methodology for TPH should give valuable information on petroleum hydrocarbons, and greatly minimize any potentially interference from biological materials. We note that the revised method NWTPH-D<sub>x</sub> includes a clean-up procedure specifically designed to remove, “nonpetroleum based organic interferences, i.e. biogenic interferences”. Please add the condition that testing of TPH and O&G will co-occur such that new standards for TPH and O&G can be instituted within 5 years.

*Please see the response to Comment #32.*

*Over the last several years, Ecology has been analyzing samples of BP’s effluent using both the oil and grease test and the NWTPH-D<sub>x</sub> test. We will continue to collect data to determine if a correlation can be made between the two tests to develop effluent limits for NWTPH-D<sub>x</sub> to monitor discharges for petroleum contaminants.*

94. Note that herring embryos can be affected by PAH fractions in the parts per billion range; sublethal effects have been detected as low as 0.4 ppb and ultraviolet light exacerbates toxicity over normal laboratory lighting (Carls et al 1999, Barron et al 2003). Data from the refineries show that total petroleum hydrocarbon (TPH) test fraction discharged is in the hundreds of ppb range. The average of BP’s discharges was 320 ppb TPH and that of the 5 Washington State refineries combined was 821 ppb. While not all of the TPH will be PAH, a significant fraction might be. It is imperative that Ecology further elucidate the identity of the TPH fraction; please implement studies which do so.

*Early life stages of herring are sensitive to PAHs. Condition S9. requires chronic toxicity testing of the final effluent using herring embryos. This permit condition also requires BP to chemically analyze each sample of effluent used in the herring toxicity testing. The chemical analysis includes testing the effluent for PAHs.*

95. In the limited amount of samples where split samples of Oil & Grease and TPH were conducted by Ecology and BP, and where concentrations were determined, Ecology values were always higher than BP’s (ranging from 2 to 6 times higher). The fact that

Ecology's results were always higher raises the question as to whether there is a systematic bias in BP's data. In order to resolve this issue, an additional testing program on split samples should be instituted for oil and grease. Analysis of any bias in split samples for other parameters should also be assessed, and corrected if needed.

*We discussed this comment with our Manchester Lab. There are a number of factors that could account for the difference in Ecology's and BP's results. Ecology's reporting limits (RL) are based on the amount of sample received. If samples are less than 1 liter, the RL goes up accordingly. Another possibility is a difference in sample collection techniques. Before questioning BP's results, our lab would want to review BP's QA/QC sample results.*

*At the next inspection, we will make sure we collect more than a liter of sample, review sampling techniques, and have our lab review BP's QA/QC sample results.*

96. It is not clear that all of the methods for priority pollutants in the priority pollutant screening will detect the specified pollutants. Please verify for all methods that the wastewater sample is unfiltered and digested, such that any pollutants adhering onto biological material can be detected.

*BP is required to use test methods that are approved by EPA for wastewater discharge monitoring under the NPDES program. These test methods are listed in 40 CFR Part 136 together with test procedure descriptions and references.*

97. Per the Clean Water Act goals, the discharge of toxic pollutants into navigable waterways is to be eliminated. In order to eliminate the discharge of pollutants, we must start to reduce them. We are pleased to see that the average monthly limit for phenolic compounds has decreased from 8.1 to 7.6 pounds per day and hexavalent chromium from 0.9 to 0.050 mg/l day. Unfortunately, the limit on a pound per day basis for hexavalent chromium has increased from 2.0 to 2.1 pounds per day. The amount of allowable hexavalent chromium should be lowered back to 2.0 pounds per day.

*The mass-based limit for hexavalent chromium was changed to 2.0 pounds per day.*

98. The effort in this permit to hold the amounts of toxics discharged into the Georgia Strait is laudable. We believe, however, that the limits themselves should be lowered, in order to make some real progress towards elimination of pollution into our navigable waterways. Ecology, as part of the Puget Sound Partnership process of recovering the Sound by 2020, should be issuing permits that reduce the inputs into the Sound, not keeping it the same.

A summary of BP's effluent data from 5/2005-4-2011 submitted to Ecology on Discharge Monitoring Reports is shown below:

**Monthly Average Values in pounds/day**

<b>Parameter</b>	<b>Limits</b>	<b>Median (50%) Discharge</b>	<b>95% Discharge</b>	<b>Highest amount (100%) discharge</b>
Ammonia	870	71 (8% of 870)	297 (34% of 870)	359 (41% of 870)
Biological Oxygen Demand	1240	251 (20% of 1240)	490 (40% of 1240)	566 (46% of 1240)
Chemical Oxygen Demand	8540	3060 (36% of 8540)	4092 (48% of 8540)	4693 (55% of 8540)
Oil & Grease	360	79 (22% of 360)	135 (37% of 360)	181 (50% of 360)
Phenolics	8.1	2.1 (26% of 8.1)	3.2 (40% of 8.1)	5 (62% of 8.1)
Sulfide	6.7	0.7 (11% of 6.7)	1.4 (22% of 6.7)	2.1 (31% of 6.7)
TSS	990	561 (57% of 990)	849 (86% of 990)	1065 (108% of 990)

**Daily Maximum Values in pounds/day, unless otherwise noted**

<b>Parameter</b>	<b>Limits w/o storm allocation</b>	<b>Median (50%) Discharge</b>	<b>95% Discharge</b>	<b>Highest amount (100%) discharge</b>
Ammonia	1910	243 (13% of 1910)	683 (36% of 1910)	1146 (60% of 1910)
Biological Oxygen Demand	2260	502 (20% of 2260)	1205 (53% of 2260)	1637 (72% of 2260)

Chemical Oxygen Demand	16610	5170 (31% of 16610)	11514 (54% of 16610)	11518 (69% of 16610)
Oil & Grease	680	168 (24% of 680)	399 (59% of 680)	470 (50% of 680)
Oil & Grease mg/L	15	4 (27% of 15)	12 (82% of 15)	13.8 (92% of 15)
Phenolics	16.7	4.2 (25% of 16.7)	8.8 (52% of 16.7)	10.4 (62% of 16.7)
Sulfide	14.7	1.6 (11% of 14.7)	4.6 (31% of 14.7)	6.6 (45% of 14.7)
TSS	1570	1146 (73% of 1570)	2134 (136% of 1570)	2985 (190% of 1570)

Over the last five years, the amount of ammonia discharged is well below the limits. The median is 13% of the limit and the maximum amount discharged is 36% of the allowed maximum limit. The case for the monthly average is even more startling. The maximum amount was 41% of that value and the median amount was 8% of that value.

The maximum daily amount of sulfide discharged is also well below the limits, where the median is 11% of the limit and the maximum amount of ammonia discharged is 45% of the allowed maximum limit. The monthly average values run from 31% of the maximum for the highest value and 11% for the median value.

The monthly average values for BOD, COD, O&G, and phenolics for highest value ranged from 46-62%, or roughly one half of the maximum allowed. The median amount for these parameters 20-36% or roughly one third of the maximum allowed. Clearly there is room to reduce the limits for these parameters, in order to bring them more into line with practice.

Limits which are so much higher than what the facility is discharging do not offer any incentives for the facility to continue improving their operations. More reasonable limits might be set within the range of 90% to 115% of effluent discharge in order to realize the technology forcing purpose behind the limits.

The values for TSS are higher than the other parameters. This may mean that the limits for TSS are set correctly, in alignment with the EPA standards for cracking subcategory of petroleum refining. Alternately, poor settling of TSS in either process or stormwater

may account for the inordinately high level of TSS discharged compared to the other parameters.

We believe that a survey of all refinery discharges is warranted prior to the re-issuance of the BP permit. Ecology should compare refinery discharges among all refineries to limits, including where stormwater allocation applies, and use this information with the aim of raising the bar at all refineries. BP may be able to improve its TSS levels and other refineries may be able to lower their discharges by learning something from BP. The overall goal should be to lower limits across the board for refineries because these lower limits are technologically achievable and lowered limits will ensure that refineries continue to innovate and tighten up their process control.

*Please see the response to Comment #24.*

*EPA conducted extensive studies of the U.S. refineries to establish the federal effluent guidelines. EPA studied the refinery industry again in 1996 and 2004, reviewing treatment technologies, pollutants discharged, pollutant loadings, and water quality impacts. In preparing this permit, Ecology compared current information for the BP refinery with the data that formed the basis for the effluent guidelines and the data from the 1996 and 2004 studies.*

*Ecology has made an engineering judgement that the federal effluent guidelines in combination with the other NPDES permit conditions meet the requirements of AKART for the BP refinery. Ecology has applied New Source Performance Standards to all crude throughput increases since 1984. This makes the refinery limitations more stringent than those in other states.*

99. We note the following contributions also should be monitored: 1) contributions from inert gas wash water and 2) the totality of nitrogen discharge, over and above that of ammonia.

Gas wash water: In order to keep the volatile gases inside oil tankers and barges from exploding after discharging their cargo, international regulations under SOLAS (Safety of Life At Sea) require such ships to be equipped with inert gas systems. These systems pump gases either from the ships main engines or from separate generators in to the void space of the cargo hold. There are currently no regulations or monitoring nationally or internationally of these discharges that are known to be highly acidic and retain the combustion byproducts associated with the generators.

It is imperative that Ecology account for all the discharges associated with the regular increases in throughput refineries seek during their NPDES permit review. We ask that

Ecology develop and implement a monitoring plan for this gas wash water. Furthermore, given the well-documented sensitivity of herring to PAHs (Carls et al 1999) the extent of this material impacting the Cherry Point herring spawning beds is critical to determine as well.

Nitrogen: Nitrogen is implicated in the phenomenon of harmful algae blooms (HAB), which degrade water quality, and may lead to fish and bird kills. These blooms are occurring more frequently in the Pacific Northwest. (Canada.com 2008, esciencenews.com 20090, Mapes, 2009). Management of nutrient inputs such as Nitrogen, Ammonia, and Phosphorus can lead to significant reduction in HABs. BP's permit should monitor all nutrient inputs, to understand the composition and minimize risk associated with HABs occurring from nutrient pollution.

*Ecology needs to do more research on gas wash water. It appears that this wash water is discharged to a ship's oily ballast water in the cargo hold. Although there are provisions in BP's permit to accept and treat oily ballast water from crude tankers docking at the refinery, BP rarely takes ballast into the wastewater treatment system. It also appears that the characteristics of gas wash water are similar to that of wastewaters from different processes within a refinery and the wash water will be adequately treated in the refinery's wastewater treatment system.*

*Ecology is currently conducting nutrient studies in Puget Sound. These studies will provide valuable information to Ecology staff once they are completed and help to determine future monitoring requirements in individual permits.*

100. The report for the 2002 Cherry Point WWTP Treatment Efficiency Study highlighted several important facts about the study: 1) The study was to include 3 wet weather and 3 dry weather tests; only one of the wet weather tests was thought to represent a typical wet season; the other two were too dry, 2) One of the studies showed an increase in TSS and the others were widely divergent in their removal capability in primary and tertiary systems; and 3) the TSS effluent value in the only "normal" wet weather study was approximately 3x the other 2 wet weather studies. The 2002 TES thus illustrates the problem that BP is having controlling TSS. The Treatment Efficiency Study that may be required per section S10. should be required, and should specifically not only look at the combined effect of new and old discharges, but at limitations and solutions to reducing TSS.

*The wet season during TES #3 and 4 was drier than normal. Rainfall totaled only 60% of the region's average winter rainfall. Only TES #5 was considered to be typical of wet*

*weather in Western Washington. The TSS in the effluent from the Stormwater Surge Pond in TES #5 was 3 times the TSS levels in the storm pond effluent during TES #3 and 4. The storm pond effluent is discharged to the clarification ponds (tertiary treatment) for additional suspended solids settling. The performance of the tertiary treatment system is discussed in more detail below.*

*The two tables below show the reduction (or increase) in TSS for the six TES sampling events across the primary and tertiary treatment systems.*

**Total Suspended Solids Average (ppm)**

<b>Primary Treatment System</b>	<b>TES #1</b>	<b>TES #2</b>	<b>TES #3</b>	<b>TES #4</b>	<b>TES #5</b>	<b>TES #6</b>
API Separator Influent	73	120	54	90	49	68
Tank 323 Effluent	42	52	45	42	34	72
% Reduction	41.1	57.7	16.8	53.4	30.6	5.8 increase

<b>Tertiary Treatment System</b>	<b>TES #1</b>	<b>TES #2</b>	<b>TES #3</b>	<b>TES #4</b>	<b>TES #5</b>	<b>TES #6</b>
Clarifier Effluent	14	18	46	70	11	14
Final Effluent (sample location #4)	12	8	8	6	9	15
% Reduction	14.3	55.6	82.3	91.5	18.8	7.1 increase

*A number of process variables can affect TSS removal from wastewater and stormwater, including influent water quality, pH, flow rates, chemical dosages, and solids loadings. TSS removal efficiency can vary from one sample event to the next depending upon these factors. TSS removal should be evaluated on a case-by-case basis and compared to acceptable industry standards.*

*If there is not a significant amount of suspended solids in the influent to settle under forces of gravity, as in the primary and tertiary treatment systems, then the percent of TSS removal is low.*

*The pH level was lower than normal due to an upset in the primary treatment system and elevated in the tertiary treatment system due to increased algae activity during TES #6. These pH levels could have contributed to the increase in TSS.*

*A well designed and operated API separator should achieve TSS concentrations down to 50-200 mg/L.*

*The function of the two clarification ponds in the refinery's tertiary treatment system is to remove suspended solids from the biological system's clarifier effluent. When the*

*suspended solids levels in the clarifier effluent are already low, the amount of settleable suspended solids carried into the ponds is minimal. This was the case for TES #1, 2, 5, and 6.*

*An acceptable TSS concentration in effluent from settling ponds is <20 ppm. The TSS final effluent average is approximately 10 ppm.*

*BP added a secondary oil water separation system and made changes to units in the biological treatment system to optimize treatment. BP installed an induced gas flotation system in 2007 and replaced parts on the floating aerators and secondary clarifier in 2009.*

101. Outfall 006 drains 7 acres of refinery property near the dock; this property is industrial in nature and any stormwater that does not get routed back to the wastewater system gets discharged without treatment to the Strait of Georgia. From 2004-2010, there have been 25 instances where grab samples have been taken to characterize the industrial stormwater. Of the 25 discharges, 11 exceeded the 25 ppm TSS benchmark. Additional treatment is needed at Outfall 006 to ensure that overflows do not deliver excess pollutants. Note, under the industrial stormwater general permit this facility would have had to implement additional BMPs to control its stormwater pollution at Outfall 006 long ago. Ecology should add a requirement for improving industrial stormwater treatment at Outfall 006.

*Please see the response to Comment #70.*

102. Data from Outfall 003 shows that there were 2 events within the last permit cycle that discharged water from the stormwater holding pond to Terrell Creek. These were large events, discharging 7.02 and 2.73 million gallons, and TSS was above the 25 ppm benchmark for all samples. While the 2 events may seem small, the overall volume discharged into Terrell Creek is very large. The impact of these events on Terrell Creek has not been discussed. Ecology should direct BP to conduct modeling studies to assess the impact of usual stormwater inflow and pollutants, as well as high flow events on the health of Terrell Creek. These studies should also be field-verified.

*BP has made changes at the wastewater treatment plant (WWTP) to improve hydraulic performance and decrease the potential for pumping stormwater from the Stormwater Surge Pond to Outfall 003 during high flow storm conditions. The improvements included piping modifications to remove bottlenecks in the hydraulics at the WWTP and an increase in the size of the impellers on the final effluent pumps. These changes enable*

*the refinery to move final effluent more quickly from the final holding pond to make room for the extra stormwater.*

*Ecology will closely review any future discharges to Outfall 003 and require follow up action as necessary.*

103. Outfalls 002 and 003 are monitored once per year, whereas Outfalls 004, 005, and 007 are monitored quarterly. Outfall 002, in particular, should be monitored at least quarterly, since it drains 108 acres, and the largest percentage of area with industrial stormwater activity.

*Please see the response to Comment #68.*

104. Note that Ecology's Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria, publication 95-80, revised in December 2008 states the following: *If the effluent itself is freshwater, freshwater species will typically be used for acute WET testing regardless of receiving water salinity.*

Since the receiving water for the BP Cherry Point Refinery is saline, the use of freshwater organisms seems mixed, at best. It is understood that 100% effluent will be, by default, freshwater. The response of freshwater organisms, however, may be different than saltwater organisms. Interestingly, topsmelt was used in 7 out of the 55 survival tests. In those 55 tests, acute toxicity per WAC 173-205-020 was demonstrated in 17 tests, with a disproportionately higher percentage of failure when topsmelt were used versus when the freshwater organisms were used.

Acute failure rates were 10% for *Daphnia magna* (2/19), 34% for Fathead minnow (10/29), and 71% for Topsmelt (5/7). Topsmelt is clearly the more sensitive species and its use should be required in all acute toxicity tests, wherever possible. Where salinity concerns disallow the use of topsmelt, fathead minnow should be used instead of daphnia. Supporting the use of the most sensitive species, is this statement from the Department of Ecology Water Quality Program Permit Writers manual, 92-109, revised in November 2010: *If one species was clearly the most sensitive during effluent characterization, then the rotation schedule should use the most sensitive species for all monitoring. In discussion of toxicity and its effects, the different test organisms should be addressed separately instead of toxicity effects being averaged out, where the insensitivity of one species can mask the sensitivity of another species.*

*The acute and chronic test species were changed in Conditions S7. and S8. to saltwater species. Topsmelt was included as one of the acute species.*

*Because WAC 173-205-050(1)(a) also requires testing with an invertebrate, mysid acute testing is required in the permit. In previously required acute testing, all species showed significant sensitivity to BP's effluent. The lowest rate of acute toxicity (*Daphnia magna*) was 26% of the BP samples between 1990 and 2004. Table 2 of the final report on the Pacific herring test development and validation ([www.ecy.wa.gov/biblio/1110086.html](http://www.ecy.wa.gov/biblio/1110086.html)) shows a close tie between topsmelt and Pacific herring in acute sensitivity to industry effluents. It is too soon to declare any acute test species more sensitive to BP effluent than another. Because each test result is evaluated separately for regulatorily significant toxicity, test results are not averaged anyway.*

105. In the proposed permit, Ecology has imposed an "acute toxicity limit" which simply means that there should be no toxicity at the "Acute Toxicity Effluent Concentration" or 3.6% of effluent. This standard feels meaningless; it does not reduce toxicity, it merely imposes additional testing on BP. Please describe how the toxicity limit will reduce toxicity of the effluent.

*The decision to require an acute toxicity limit is based upon performance of a test species in 100% effluent with no dilution. Using this approach, Ecology is working towards the complete elimination of acute toxicity. Failing to comply with a WET limit triggers additional testing and possibly other enforcement actions such as development and implementation of a TI/RE plan and corrective actions to eliminate or control the toxicity. BP's costs and liability are higher.*

106. The calculated effluent concentrations at the mixing zones do not appear to be correct. According to Ecology's permit writer's handbook, the flow to determine the mixing zone should be equal to the highest daily flow expected. The number 8.4 MGD is proposed, but its derivation is not sourced. As well, the number used to obtain the mixing zone for chronic toxicity should be the highest expected monthly average, after taking into account all of the additional proposed wastewater inputs. The number 4.4 MGD is proposed, but its derivation is also not given. It is also not clear why the value of 4.0 MGD is used to model human health instead of the proposed 4.4 MGD. Unfortunately, we have not found any direction in guidance as to what flow value should be assigned to calculate the available dilution for human health criterion.

*The mixing zone guidance in the Permit Writer's Manual recommends using flows from the season in which the critical condition or worst case scenario is likely to occur. This*

*season is defined as July – September. Ecology calculated acute, chronic (human health non-carcinogen), and chronic (human health carcinogen) dilution factors using flows from the months of July through September 2002 through 2005. The table below shows the derivation of these flows:*

<i>Data from DMRs</i>	<i>Final Effluent Flow (MGD)</i>		<i>Annual Flow Average (MGD)</i>
	<i>Daily Max</i>	<i>Monthly Ave</i>	
<i>Month-Year</i>			
<i>July-2002</i>	7.8	3.5	
<i>August-2002</i>	4.4	3.0	
<i>September-2002</i>	3.8	3.1	3.6
<i>July-2003</i>	5.0	2.8	
<i>August-2003</i>	6.4	3.4	
<i>September-2003</i>	5.1	3.4	3.9
<i>July-2004</i>	4.8	3.4	
<i>August-2004</i>	6.2	3.8	
<i>September-2004</i>	6.4	4.1	4.1
<i>July-2005</i>	5.5	3.7	
<i>August-2005</i>	8	4.4	
<i>September-2005</i>	8.4	3.9	4.4
<i>Highest flow at critical condition</i>	8.4	4.4	4.0

- *Acute boundary: the **highest daily maximum** effluent flow of 8.4 MGD*
- *Chronic boundary: the **highest monthly average** effluent flow of 4.4 MGD*
- *Human Health boundary: the **annual average** effluent flow of 4.0 MGD*

107. A February 2008 ENSR report on mixing zones stated that the daily maximum, average monthly maximum and annual average flow are 9.82, 6.36, and 4.10 MGD, respectively. When flow is restricted to the months of July through September, the values are 8.4, 4.4 and 4.0 MGD. The restriction to these months only makes sense if the only concern to the ecosystem is temperature effect on salmon. Clearly this is not the case. Georgia Strait is home to a myriad of species, some of which are more sensitive than others, and most of which we have no information about. As well, the Cherry Point pacific herring population holds and spawns at Cherry Point in April—outside of the time when Ecology deems the critical condition!

*The 2008 ENSR Mixing Zone Study used flows based on whole years (to account for the herring spawning period) from 2002 through 2006. Tables 3-1 and 3-2 in the report*

*show the derivation of the flows used to determine the acute and chronic mixing zone boundaries. The flows used were:*

- *Acute boundary: the **highest daily maximum** effluent flow of 9.82 MGD*
- *Chronic boundary: the **highest monthly average** effluent flow of 6.36 MGD*
- *Human Health boundary: the **annual average** effluent flow of 4.1 MGD*

*Ecology reviewed the 2008 ENSR mixing zone analysis and determined that the proposed dilution factors (acute 31, chronic 114, and chronic human health 156) from the analysis were acceptable. However, Ecology decided to retain the acute dilution factor of 28 for Outfall 001 from the current NPDES permit per WAC 173-201A-400, which requires that the size of mixing zone to be minimized.*

*Ecology applied the dilution factors at Outfall 001 in the draft NPDES permit as follows:*

<i>Criteria</i>	<i>Acute</i>	<i>Chronic</i>
<i>Aquatic Life</i>	<i>28</i>	<i>114</i>
<i>Human Health, Carcinogen</i>		<i>156</i>
<i>Human Health, Non-carcinogen</i>		<i>156</i>

*The fact sheet was revised to discuss the input parameters used in the 2008 ENSR Mixing Zone Analysis and to include the new dilution factors. A new appendix was added to the fact sheet (Appendix J) showing the input variables used in the mixing zone analysis, including the higher flows. Ecology performed a new reasonable potential to exceed analysis (RPTE) using the new dilution factors. The revised RPTE spreadsheet was included in Appendix I.*

108. The 2008 ENSR mixing zone report makes some valid corrections to Ecology's original findings. They added the factor of ½ to some Ecology calculations to account for the discharge of effluent both into and with the current and they used the dominant current direction in their modeling. The former change had the effect of lowering the dilution factor, whereas the latter had the effect of raising the dilution factor. We agree that these are both important considerations. ENSR further argues, however, that there is no need to account for the diffuser discharge in opposite direction of the ambient current. This is clearly a specious argument, because the diffuser does discharge both into and away from the current.

*The BP diffuser has six ports pointing to the Northwest (NW) and 7 ports pointing to the Southeast (SE). The mixing zone guidance in Ecology's Permit Writer's Manual*

*recommends that for an opposing port diffuser, all ports may be assumed to be on the same side of the diffuser as long as the merging of opposite ports occurs within a short distance. The Visual Plumes model run, Scenario 7 in the 2008 ENSR Mixing Zone Study shows that the plumes from opposing ports merge rapidly before reaching the acute zone boundary. This information supports the assumption that all ports being on the same side was correct.*

*The predominant direction of currents in the receiving water at the BP diffuser is NW and SE which are parallel to the diffuser ports' orientation. This is presented in the 2001 ENSR Effluent Plumes Model Study and is reproduced in the 2008 ENSR Mixing Zone Study. So the assumption that all ports are in the same direction as the ambient currents is appropriate.*

*The factor of 1/2 was applied to the dilution factors estimated with currents parallel to the diffuser ports.*

*The 2008 ENSR Mixing Zone Study uses a multiple density profile and then selects the one that gives the most restrictive dilution factor. Ecology's analysis uses only a single density profile. The ambient current velocity used in the 2008 ENSR study is specific to the BP outfall, whereas, Ecology's ambient current velocity is from the vicinity but not at the outfall. The site specific current speeds are 20% higher than those used by Ecology. The dilution factor differences can be attributed to differences in these ambient characteristics.*

109. We ask that the high flow numbers be used in all cases, these should include the highest flow already calculated, plus the additional flows from the processes that will be added to wastewater flow during the permit period. Regardless, the most critical conditions should be used in modeling. We believe that the dilution factor should thus be recalculated to higher concentrations and that these higher concentrations be used in WET tests.

In regard to the mixing zone, we ask for the following: 1) Recalculate the dilution factors using the highest flows, the dominant current apportioned per its usual time, any subordinate currents apportioned per their usual time, and the fact that effluent will be both discharged into and away from the ports, and 2) Recalculate the ACEC and CCEC to account for the lower dilution factor and use these higher concentrations in WET tests.

*Ecology used flows from January 2007 through October 2011 to recalculate dilution factors at the mixing zone boundaries. The flows used were:*

- *Acute boundary – the **highest daily maximum** effluent flow of **10.5 MGD***
- *Chronic boundary – the **highest monthly average** effluent flow of **6.4 MGD***
- *Human Health boundary – the **annual average** effluent flow of **4.6 MGD***

*The permit was changed to include the new acute and chronic dilution factors, ACEC, and CCEC as follows:*

<i>Criteria</i>	<i>Acute</i>	<i>Chronic</i>	<i>ACEC</i>	<i>CCEC</i>
<i>Aquatic Life</i>	<i>28</i>	<i>110</i>		
<i>Human Health, Carcinogen</i>		<i>136</i>		
<i>Human Health, Non-carcinogen</i>		<i>136</i>		
<i>Acute Toxicity Testing</i>			<i>3.6%</i>	
<i>Chronic Toxicity Testing</i>				<i>0.9%</i>

110. We believe the following are worthy of pollution prevention effort and suggest that they be considered: 1) Lining of wastewater and stormwater treatment ponds, 2) Increasing the removal efficiency of TSS in the wastewater and stormwater treatment trains, 3) Evaluation of potential to remove mercury, a persistent bioaccumulative toxin, copper, a highly toxic metal to fish, and dioxin from the wastewater treatment stream, and 4) assessment and prevention of coal dust on treatment ponds. The latter may become necessary if SSA Marine builds its proposed coal terminal adjacent to BP.

*The first four items were included in the permit as pollution prevention opportunities to consider during the next permit term. Assessment of coal dust on the treatment ponds is outside the scope of the BP permit.*