



BP Cherry Point Refinery
4519 Grandview Road
Blaine, Washington 98230
Telephone 360 371-1500

August 15, 2011

Ken Koch
Water Quality Program
Washington State Department of Ecology
P.O. Box 47600
Olympia, WA 98504-7600

Subject: Comments on Listing of Grid Cell 4812217G5_SW (Strait of Georgia) as Category 5 – Public Comment Period ending August 16, 2011 for 2010 Water Quality Assessment

Dear Ken Koch,

BP Cherry Point Refinery (refinery) is submitting this response letter to recommend a category designation change on the proposed 303[d] impaired water body list. The 2010 Water Quality Assessment (303[d]) proposes that sediment Grid Cell 4812217G5_SW (Strait of Georgia; Figure 1) be listed in Category 5 (polluted) based on 2001 bioassay results exceeding the cleanup screening level (CSL) (Attachment 1). This grid cell is located near the end of the BP Cherry Point Refinery pier in Blaine, Washington, where an outfall discharges treated effluent. This outfall is managed by National Pollutant Discharge Elimination System (NPDES) Permit No. WA-002290-0.¹ Sediment chemistry and bioassay tests have been conducted in 2000, 2001, and 2006, in accordance with Ecology discussions, state guidance, and BP's NPDES permit.

We believe that the proposed 2010 303(d) listing for Grid Cell 4812217G5_SW to be incorrect and that the listing should be Category 1 (meets standards) for three reasons:

1. This grid cell was identified as Category 1 (sediment that meets tested standards) in 2004 and 2008 (Attachment 1), and no new data has been collected since 2006. The 2010 listing should be based on new data, but instead is using 10-year old data (2001 toxicity data).
2. The 2001 results (CSL toxicity exceedances at three locations) were affected by an abundance of shell fragments and by elevated sulfide and ammonia in test sediments. The 2006 field study was conducted to confirm these effects (RETEC 2007).
3. Re-characterization of this area in 2006 included chemistry and toxicity testing at six locations (re-occupied three locations from 2001). Five of these locations passed for all endpoints evaluated. One sample exceeded the SQS for the amphipod endpoint, and passed for the other two endpoints. This re-characterization effort, in support of the NPDES permit, was conducted in close coordination with Ecology (Liem Nguyen) and is documented in the 2006 sediment characterization report (RETEC 2007).

Sampling Chronology

Surface sediment studies were conducted in 1974, 1982, 1987, 1988, and 1989 as part of the refinery's NPDES permit requirements. In all studies except the 1988 study, chemical concentrations, if detected, were below SQS criteria. In the 1988 study, measured constituents were

¹ The coordinates for Outfall No. 001 given in the original NPDES permit are Latitude 48°51'39" N and Longitude 122°45'26" W.

below SQS criteria with the exception of four analytes (mercury and three high molecular weight PAHs). Chemical and toxicity testing in 1992 revealed elevated PAHs and one toxicity endpoint failure. These results were attributed to the flaking of coal-tar epoxy from the pier pilings.

In 2000 all sediment samples passed the chemical and/or biological criteria. In 2001, sediment toxicity testing was conducted on samples SS-01 through SS-04 (Figure 2). Biological effects were observed in SS-02, SS-03, and SS-04 above CSL criteria. Sulfide concentrations and shell fragment percentages were elevated in each of these samples, and ammonia was elevated in samples SS-02 and SS-03. Sulfide and ammonia are common confounding factors that can contribute to increased toxicity. The chemical and biological exceedances observed during the 2000/2001 sampling programs did not fit the trend established in sampling programs of the previous 10 years, wherein only minor SQS exceedances occurred (RETEC 2007)².

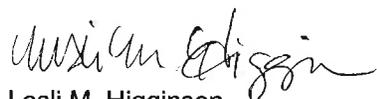
Because the presence of shells, and not the chemical quality of effluent, was believed to be responsible for the 2001 bioassay failures, sample locations were re-characterized in 2006 on six sieved (shells removed) sediment samples. Sediment toxicity tests on these sediment samples had a single SQS failure for the amphipod test at station SS-02 (Figure 2). This station had a high percentage of fines (36 percent), and the interstitial sulfide and ammonia measured during the toxicity test exceeded published thresholds. The amphipod *Rhepoxynius abronius* is sensitive to both high percent fines and elevated sulfide. These confounding factors likely played a role in this failure, particularly because this sample had the lowest total polycyclic aromatic hydrocarbon (PAH) concentration of the under-pier samples (7.1 mg/kg dw). Toxicity tests for the sieved sediment samples with elevated sulfide concentrations in porewater (>10 ppm), were also conducted on a replicate sample in which sulfides were controlled. When controlling for sulfides, all stations including SS-02 passed SMS biological criteria (RETEC 2007).

Table 1 provides the history of bioassay testing from 2000 to 2006 at the re-occupied stations in this grid cell. It shows passing results in 2006 for those samples exceeding the CSL in 2001 (the data for which this grid cell is being proposed as Category 5). All of these toxicity data are included in Ecology's Environmental Information Management system database.

Recommendations

We believe that the most recent data (2006) should be used for making sediment quality assessments, given that the 2001 data used in this proposed 303(d) listing are over 10 years old and that the newer (2006) data from re-occupied stations show minimal toxicity exceedances. Grid cell 4812217G5_SW should be listed as Category 1. The sediment in this grid cell will be analyzed periodically as part of BP's NPDES permit renewal process. There have been no new data collected since 2006 that would warrant a change from the 2008 303(d) designation as Category 1 (Attachment 1).

Yours sincerely,



Lesli M. Higginson
Senior Environmental Engineer
BP Cherry Point Refinery

cc: Anne Fitzpatrick, AECOM
AECOM Project File: 60190830, Task 4.2

² In addition, BP, AECOM (then RETEC) and Ecology site managers met in late 2006 to review and discuss these sample results. One outcome of this meeting was verbal consensus that the presence of substantial shell fragments was the primary cause of the bioassay failures.

Tables and Figures:

Table 1. SMS Sediment Chemistry and Toxicity Evaluation By Year

Figure 1. Site Location Map, Cherry Point Refinery, Blaine, WA

Figure 2. 2006 Sieved Sample Sediment Toxicity Test Results

Attachment:

Attachment 1. Map and listing narrative for grid cell 48122I7G5_SW from Ecology's 2010 Water Quality Assessment webpage, assessed June 27, 2011.

Reference:

RETEC 2007. 2006 Sediment Characterization Report. Cherry Point Refinery, Blaine, Washington. Prepared for BP Cherry Point Refinery. RETEC Project No. BPG02-18971-600. April 6, 2007.

Table 1. SMS Sediment Chemistry and Toxicity Evaluation By Year

Sample Station	Test	2000	2001	2006 (Sieved)
SS-01	Chemistry	CSL	CSL	NT ^d
	Amphipod ^a	Pass	Pass	NT ^d
	Polychaete ^b	NA	Pass	NT ^d
	Larval ^c	NA	Pass	NT ^d
	Bioassay Total	Pass	Pass	NT ^d
SS-02	Chemistry	Pass	CSL	SQS
	Amphipod	Pass	SQS	SQS^e
	Polychaete	NA	Pass	Pass
	Larval	NA	CSL	Pass
	Bioassay Total	Pass	CSL	SQS^e
SS-03	Chemistry	CSL	CSL	CSL
	Amphipod	Pass	Pass	Pass
	Polychaete	NA	CSL	Pass
	Larval	NA	CSL	Pass
	Bioassay Total	Pass	CSL	Pass
SS-04	Chemistry	CSL	CSL	CSL
	Amphipod	Pass	Pass	Pass
	Polychaete	NA	Pass	Pass
	Larval	NA	CSL	Pass
	Bioassay Total	Pass	CSL	Pass
SS-05	Chemistry	Pass	CSL	CSL
	Amphipod	NT	NT	Pass
	Polychaete	NT	NT	Pass
	Larval	NT	NT	Pass
	Bioassay Total	NT	NT	Pass
SS-07	Chemistry	Pass	Pass	Pass
	Amphipod	NT	NT	Pass
	Polychaete	NT	NT	Pass
	Larval	NT	NT	Pass
	Bioassay Total	NT	NT	Pass
SS-13	Chemistry	NT	Pass	NT ^d
	Amphipod	NT	Pass	NT ^d
	Polychaete	NT	Pass	NT ^d
	Larval	NT	Pass	NT ^d
	Bioassay Total	NT	Pass	NT ^d
SP-09	Chemistry	Pass	NC	Pass
	Amphipod	NT	NC	Pass
	Polychaete	NT	NC	Pass
	Larval	NT	NC	Pass
	Bioassay Total	NT	NC	Pass

Bold = CSL or SQS exceedances of MTCA Sediment Management Standards

NA = not acceptable test; failed performance criteria

NT = not tested

NC = not collected

Notes:

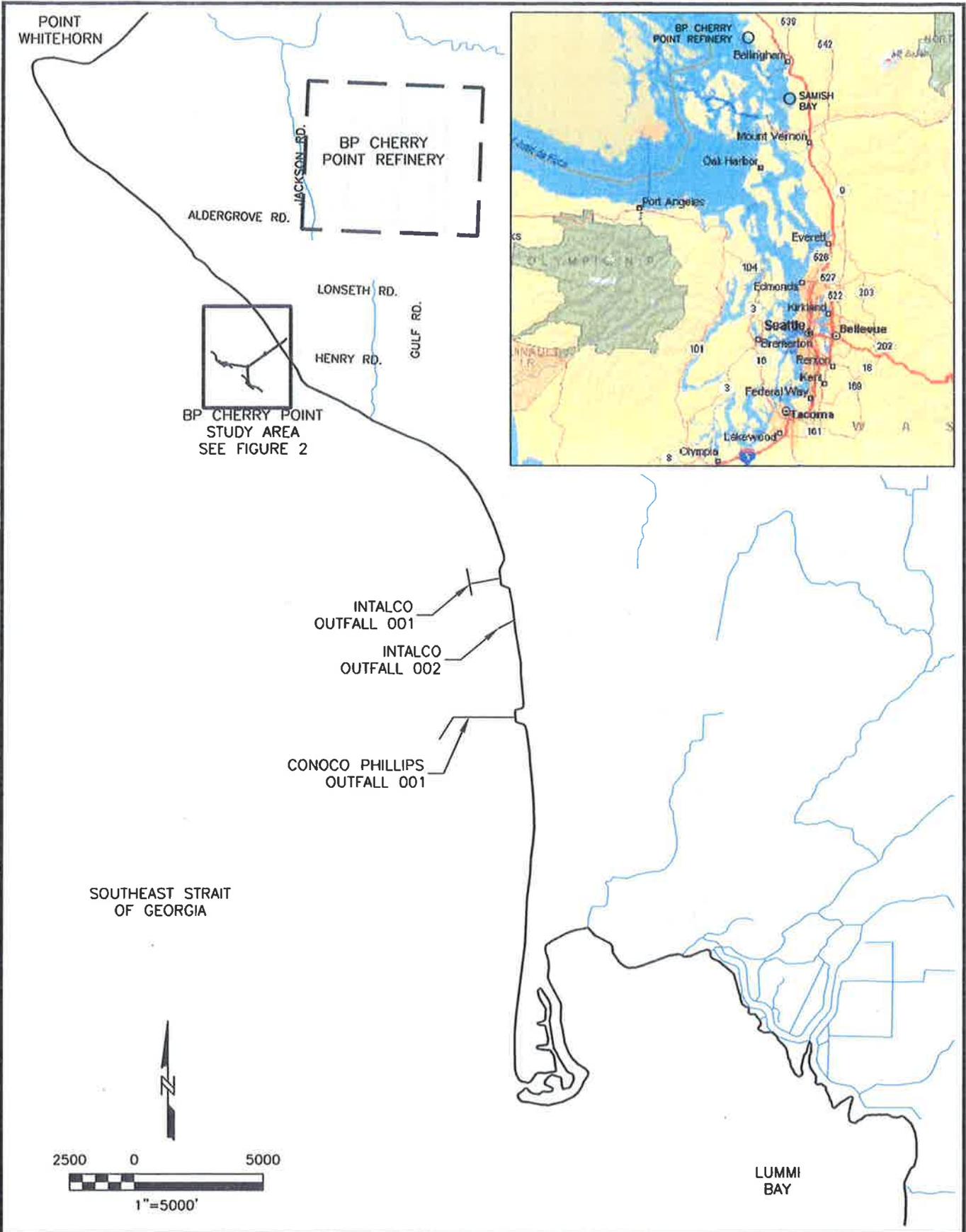
1. Criteria evaluations for all sediment toxicity tests were based on test sediment versus the reference sample auto-selected by SEDQUAL.
2. Bioassay test results over-ride chemistry results.
 - a 10-day amphipod (*Rhepoxynius abronius*)
 - b 48-hour larval normality (*Mytilus galloprovincialis*)
 - c 20-day growth polychaete growth (*Neanthes arenaceodentata*)
 - d Decision for no testing in 2006 made because 2001 station passed chemical and/or biological criteria.
 - e Sample SS-02 contained high ammonia and sulfide levels and 36% fines. When the sieved sample was controlled for sulfide, the bioassay passed.

CSL = cleanup screening level; SQS = sediment quality standard; SS = surface sediment sampling station 0 to 10 cm

Attachment 1

Map and listing narrative for grid cell 48122I7G5_SW from Ecology's 2010 Water Quality Assessment webpage, assessed June 27, 2011

File: G:\PROJECTS\CADD\444\archive\BP-Cherry Point\189715060-072711.dwg Layout: FIGURE 1-1 User: oliveriam Plotted: Jul 27, 2011 - 9:29am Xref's:



BP CHERRY POINT SEDIMENT
303 (d) COMMENT LETTER

60190830-4.2

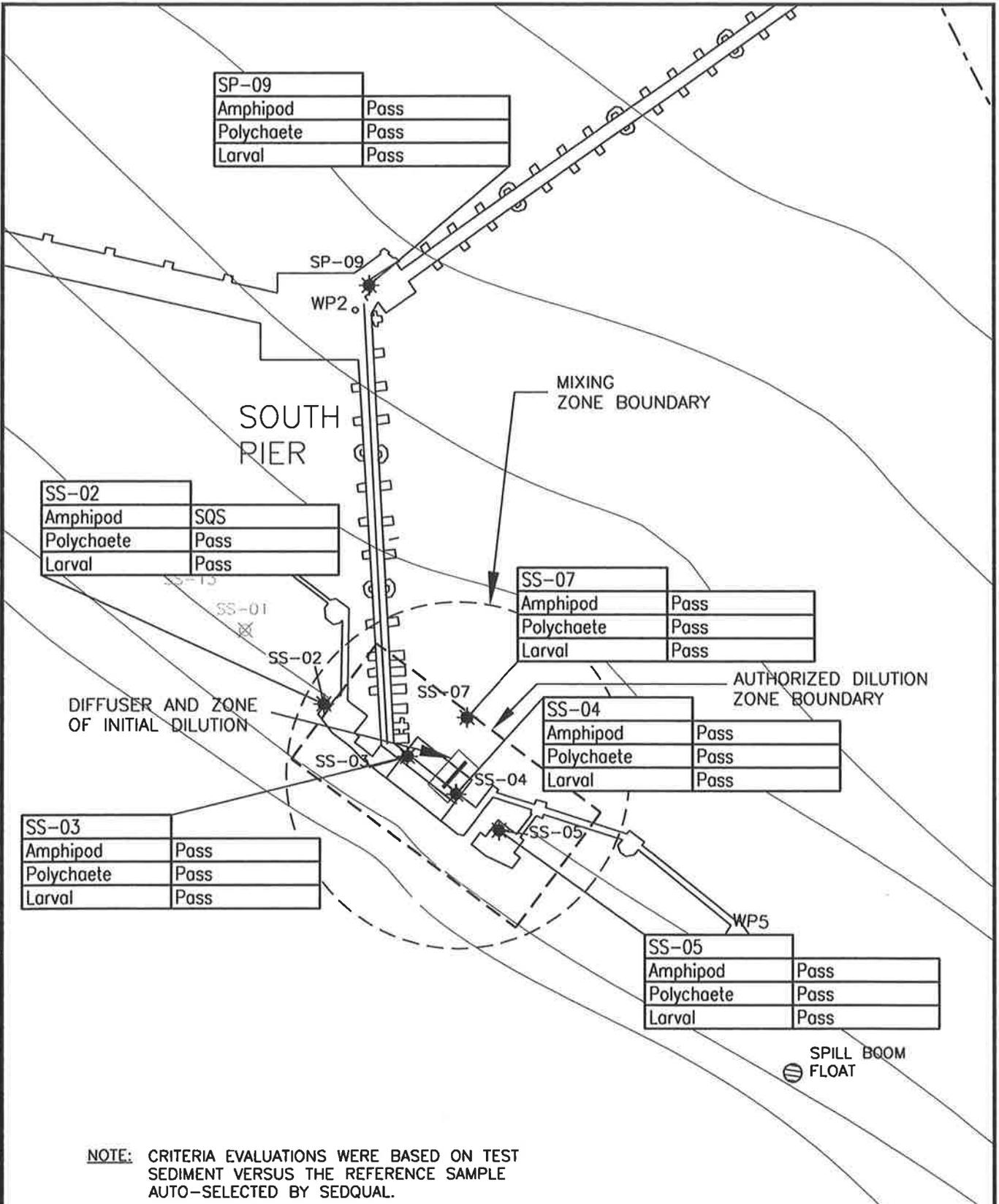
SITE LOCATION MAP
CHERRY POINT REFINERY, BLAINE, WA

DATE: 7/27/11

DRWN: MO/SEA

FIGURE 1

File: G:\PROJECTS\CADD\AAAarchive\BP-Cherry Point\189715078.dwg Layout: FIGURE 4-4 User: oliveriom Plotted: Jul 27, 2011 - 9:35am Xref's:



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BP CHERRY POINT SEDIMENT 303 (d) COMMENT LETTER 60190830-4.2		2006 SIEVED SAMPLE SEDIMENT TOXICITY TEST RESULTS	
DATE: 7/27/11	DRWN: MO/SEA	FIGURE 2	



Water Quality Assessment for Washington

Details For Listing 502708

[Listing Policy](#)

Listing ID: 502708	Proposed Category: 5 [?]
Medium: Sediment	2008 Category: 1
Parameter: Sediment Bioassay [?]	2004 Category: 1
CAS Number: None	On 1998 303(d) List?: N
Waterbody Name: STRAIT OF GEORGIA	On 1996 303(d) List?: N
Waterbody Type: Marine	County: Whatcom
Waterbody Class: None	Township/Range/Section: None
Collection Date: 10/11/2001	Grid Cell: 4812217G5_SW
WRIA: 1 - Nooksack	Grid Cell Latitude: 48.86249
PSAA: San Juan Islands	Grid Cell Longitude: 122.75749
WASWIS: None	LLID: None
WASWIS Upper Route: None	LLID Upper Route: None
WASWIS Lower Route: None	LLID Lower Route: None

Basis:

Data from the Department of Ecology's Environmental Information Management (EIM) system samples
H=ARCOCP01*SS-04*SS-04*10/11/2001
M=ARCOCP01*SS-03*SS-03*10/11/2001
L=ARCOCP01*SS-02*SS-02*10/11/2001
indicate a total of 5 points for 3 samples collected on or before October 11 2001
exceeds the Sediment Management Standards CSL bioassay criterion.

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