

Reviewers Guide For
Hylebos Waterway Natural Resource Damage Settlement Proposal Report
Appendix H
“Natural Resources Damage Allocation of Injuries to Natural Resources
in the Hylebos Waterway”

The Commencement Bay Natural Resource Trustees have issued for public review and comment a proposal for settling natural resource damage liability relating to the Hylebos Waterway. The Trustees are using a process called habitat equivalency analysis to quantify their natural resource damages claim in terms of required compensatory habitat restoration quantified by the environmental currency discounted service acre-years (DSAYs). The settlement proposal, titled Hylebos Waterway Natural Resource Damage Settlement Proposal Report, includes a proposed scheme for allocating the DSAY liability, detailed in Appendix H “Natural Resources Damage Allocation of Injuries to Natural Resources in the Hylebos Waterway” (Allocation Report). The proposal allocates liability among Hylebos Waterway sites, rather than individual parties. Liability is based upon evidence indicating that activities at a site were connected with hazardous substance contamination of waterway sediments. In response to several inquires and requests for information, the Trustees have prepared this paper to aid reviewers of the Allocation Report.

The Allocation Report includes five appendices plus a list of references:

Appendix 1 SOC Distribution Maps - Individual maps showing the distribution of each of the contaminants (substances of concern, or SOCs) associated with natural resource injuries and showing the location of contaminant footprints

Appendix 2 Site Activity Report - An allocation database report identifying for each site the site name; map segment and reference number; dates for initiation and ending of activities where available; and notes regarding the activities. For each site there is a listing of activities and associated contaminants with additional details as available, plus comments and citations to supporting reference documents.

Appendix 3 Site Contamination Report - An allocation database report identifying for each site the evidence regarding contamination by each contaminants and the matrix (e.g., soil, groundwater, etc.) or pathway in which the contamination was detected. Where the matrix consists of a sediment footprint, the footprint identifier is provided.

Appendix 4 Trigger Report - An allocation database report listing each site for which liability is triggered, identifying the contaminants for which the site is responsible and the site activities associated with the contaminants.

Appendix 5 Regression Analysis for Applied Distribution Factors - A description of the analysis underlying the mass loading allocation methodology’s division of liability between waterway segments.

The Allocation Report describes the background of the allocation, how candidate allocation sites were identified and liability triggered, and identifies the source and nature of the information evaluated. Liability is allocated for each contaminant using one of three approaches:

- Allocation of a contaminant footprint to a single site. This approach was used for most contaminant footprints. Table 3-1 lists the contaminant footprints allocated to single sites, sorted by site name, and sorted by contaminant.
- Allocation of liability by mass loading analysis within waterway segments. This approach was followed to allocate liability for polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs). Tables 3-3 and 3-4 list the PCB and PAH liability allocations to sites per segment.
- Allocation of a contaminant footprint adjacent to multiple sites by mass loading analysis. This approach was followed for twenty-eight contaminant footprints. Table 3-5 lists contaminant footprints allocated using this approach.

After following these three allocation approaches, some contaminant footprints remain unallocated due to a lack of information clearly tying the contamination to a particular site or group of sites. Those footprints are classified as Type I Unresolved (not adjacent to any particular site), and Type II Unresolved (adjacent to a site with no evidence showing a connection to the contamination). These sites are listed in Tables 3-6 and 3-7, respectively.

The liability allocated to a site, and the information supporting the allocation, can be determined by reviewing the Allocation Report in the following fashion.

Identify Site

Sites allocated liability were those found to satisfy a three-part trigger test. 1) There had to be a pathway for contaminants released at the site to reach the waterway. 2) There had to be evidence of an activity at the site that was a likely source of a contaminant or which resulted in the release of a chemical likely to exacerbate the impact of a contaminant. 3) There also had to be evidence of site contamination as a result of a permit violation, surface water contamination, groundwater contamination, soil or sediment contamination and/or a sediment footprint in very close proximity to the site.

To review the analysis relating to a particular site, reviewers should refer first to Attachments 1 and 2, immediately following the initial narrative portion of the overall settlement proposal report. Attachment 1 contains data showing the DSAYs per contaminant allocated to each site, plus a total DSAY allocation figure. Attachment 2 identifies the location of each site by map segment and reference number. Figure 2-2 in the Allocation Report shows the different map segments and reference numbers for all allocation sites.

A site may consist of more than one tax parcel when the parcels have experienced similar use with respect to substances of concern. Table 2-3 in the Allocation Report identifies the tax

parcel numbers and acreage associated with each site. (Subsequent references to tables and document sections all refer to the Allocation Report.) All sites listed in Table 2-3 were determined to satisfy the first part of the trigger test, the pathway requirement.

Identify Allocation Results and Methodology

The results of the approaches described above that the trustees employ to allocate liability are displayed in Tables 3-1, 3-3, 3-4 and 3-5. Footprint allocation figures appear in one or more of these tables for each allocation site.

Tables 3-1 and 3-1a show contaminant footprints allocated to a single site. The data are sorted by waterway segment and site in Table 3-1. The same data are displayed in Table 3-1a, sorted by contaminant. Most of the DSAY liability for a site is based on these unique footprint figures.

Many sites contributed to PCB and PAH contamination of waterway sediments and were allocated a share of the liability for these contaminants through the mass loading allocation approach. Following the allocation rules adopted for these contaminants, sites allocated a portion of the liability are assigned a share of the liability associated with the segment in which the site is located plus a share of one or two adjoining segments. These results are displayed in Tables 3-3 and 3-4. The analysis followed in determining the distribution of liability between segments is described in section 3.4.2, and in Appendix 5 to Appendix H.

Some discrete contaminant footprints are apparently connected to activities at two or more sites. For these, liability is allocated among the related sites using a mass loading approach comparable to that used for PCBs and PAHs. Table 3-5 contains the results of applying this approach.

Identify Related Site Activity

The second factor in the liability trigger test is the existence of an activity conducted on the site that is a likely source of a contaminant or that resulted in the release of a chemical likely to exacerbate the impact of a contaminant. The Site Activity Report, Appendix 2 of Appendix H, lists the information the Trustees have regarding activities on each of the allocation sites that are associated with contaminants. Note that the last line of text in the box above the rows of data in the Site Activity Report serves as the column headings for the rows of data that follow. For example the listing for the Jones Chemical site appears in part as follows (following page):

JONES CHEMICAL		
Initiation of Activities:	End of Activities	Notes:
1/1/75		Jones Chemicals operated at least in 1975 until present. Sometime later, the facility was used for the repackaging of chlorine and ammonia, production of bleach from res
Activity	SOC's	Start Date
ASR GENERATION/STORAGE	- AS, BBPH, BEPH, CD, CU, DMPH, DOPH, HG, NI, PAH, PB, PCB, ZN	
<u>Comments:</u> Reference indicates the presence of "one pile of auto refuse on the property at the North end."		
<u>Reference:</u> Herold, Mike, 9/16/91, Ref. ID. 185		
EXPOSED OILY FLOORS OR RAGS	- PAH	11/3/92
<u>Comments:</u> Facility inspector reported a noticeable oil sheen surrounding a 55 gallon drum which was directly outside the elementary neutralization tank.		
<u>Reference:</u> Rushing, Nicky and Lee Bagley, 11/3/92, Ref. ID. 184		

The first entry consists of:

Activity: ASR Generation/Storage
SOCs: AS, BBPH, BEPH, CD, CU, DMPH, DOPH, HG, NI, PAH, PB, PCB, ZN
Start Date: [No data]
Comments: Reference indicates the presence of "one pile of auto refuse on the property at the North end."
Reference: Herold, Mike, 9/16/91, Ref. ID. 185

The Site Activity Report lists generation and/or storage of auto shredder residue (ASR) as the activity, with associated contaminants (SOCs) consisting of arsenic, butylbenzyl phthalate, bis(2-ethylhexyl) phthalate, cadmium, copper, dimethyl phthalate, di-n-octyl phthalate, mercury, nickel, polycyclic aromatic hydrocarbon, lead, polychlorinated biphenyl and zinc. The comments explain the evidence of the activity. The document source for the data is listed as reference number 185. A reference list at the end of Appendix H provides more information identifying the reference documents. Copies of most reference documents are available at the document repositories, or on the Supporting Documents CD-ROMs.

Identify Site Contamination

The third factor in the trigger test is reasonable evidence that the contaminant was present on site or was released to the waterway as a result of site activities. The evidence that the Trustees have for each site is listed in the Site Contamination Report, Appendix 3 of Appendix H. For each contaminant there is listed the contaminated matrix or pathway, available data about the concentration and quantity, comments explaining the contamination evidence and a reference to the document in which the evidence is found. Appendix 4 of Appendix H, the Trigger Report, lists each site and contaminant where the three factors that trigger allocation are satisfied.

Allocation of DSAYs

Appendix H allocates to sites liability for discrete contaminant footprints or a share of footprint liability, and/or a share of the liability associated with PCBs and PAHs in specific waterway segments. The attached Table RG-1 identifies the number of DSAYs attributable to

each discrete footprint and shows the sites allocated liability for those footprints. The liability allocation for PCBs and PAHs is determined by combining the information in Tables 3-3 and 3-4 with the data in the attached Table RG-2. Tables 3-3 and 3-4 identify the liability percentages per waterway segment for PCBs and PAHs for each site. Table RG-2 shows the DSAY numbers per waterway segment for these contaminants. Multiplying the segment percentages for a site from Tables 3-3 and 3-4 times the corresponding segment DSAY numbers for PCBs and PAHs in Table RG-2 gives the DSAYs for those two contaminants allocated to the site. Adding those DSAYs to the DSAYs assigned to a site in Table RG-1 gives the total DSAY allocation for the site.

The following illustrates this process, using the Murray Pacific site as an example.

Table RG-1 shows the following unique footprints allocated to the Murray Pacific site:

Substance of Concern	Footprint Number	Allocation Percentage	Allocated DSAYs
Arsenic	AS10	25%	0.675
Copper	CU5	100%	0.111
Antimony	SB4	15%	1.269
Zinc	ZN9	100%	0.122
Subtotal			2.177

PAH liability allocated to the Murray Pacific site is determined by the following:

Waterway Segment	Allocation Percentage (from Table 3-4)	Segment DSAYs (from Table RG-2)	Allocated DSAYs
2	0.58%	127.25	0.738
3	3.39%	99.26	3.365
4	0.67%	148.09	0.992
Subtotal			5.095

The above DSAY allocation figures for arsenic (0.675), copper (0.111), antimony (1.269), zinc (0.122) and PAHs (5.095), and the sum of them (7.272), are also reflected on Attachment 1 to the overall settlement proposal report.

Following similar steps, reviewers can determine the data used, the source of the data, the allocation approaches followed, and the results of applying the approaches for any site. Where

multiple parties are potentially responsible for a site, the Trustees have not attempted to develop and apply an approach for allocating the site's liability among those parties. However, the Trustees hope that by explaining the allocation they have performed and by providing the information they have compiled it both will assist parties in reaching agreement on how to divide liability for individual sites and will encourage all parties to reach a prompt resolution with the Trustees of their liability.

Table RG--1. Allocation of Discounted Service Acre Years (DSAYs) by Footprint and Site in Hylebos Waterway

SUBSTANCE OF CONCERN	FOOTPRINT NUMBER	SITE	ALLOCATION PORTION	Discounted Service Acre Years	
Silver	AG1	UNRESOLVED TYPE II	100%	0.434	
	AG2	SOUND REFINING		1.052	
	AG3	UNRESOLVED TYPE II		1.515	
Arsenic	AS1	WASSER WINTERS	100%	0.117	
	AS2	MANKE LUMBER	100%	1.817	
	AS3	UNRESOLVED TYPE I		0.187	
	AS4	TACOMA BOATBUILDING	100%	1.651	
	AS5	TACOMA BOATBUILDING	100%	1.852	
	AS6	DUNLAP TOWING	100%	1.116	
	AS7	GENERAL METALS OF TACOMA	100%	0.012	
	AS8	ELF ATOCHEM	100%	5.097	
	AS9	GENERAL METALS OF TACOMA	100%	1.038	
	AS10	MURRAY PACIFIC	25%	0.675	
	AS10	US GYPSUM	75%	2.026	
	AS11	SOUND REFINING	100%	2.777	
	AS12	TAYLOR WAY PROPERTIES	100%	0.562	
	AS13	SOUND REFINING	100%	2.791	
	AS14	OCCIDENTAL	100%	0.010	
	AS15	OCCIDENTAL	100%	0.014	
AS16	AK-WA SHIPBUILDING	100%	2.790		
Butylbenzyl Phthalate	BBPH1	UNRESOLVED TYPE II	100%	0.045	
	BBPH2	UNRESOLVED TYPE II		1.463	
	BBPH3	UNRESOLVED TYPE I		0.090	
	BBPH4	UNRESOLVED TYPE I		0.180	
	BBPH5	UNRESOLVED TYPE II		5.100	
	BBPH6	UNRESOLVED TYPE I		0.974	
	BBPH7	GENERAL METALS OF TACOMA		5.634	
	BBPH8	DON OLINE AUTOFLUFF SITE		40%	10.881
	BBPH8	GENERAL METALS OF TACOMA		19%	5.168
	BBPH8	JONES CHEMICAL		1%	0.272
	BBPH8	MODUTECH MARINE		40%	10.881
	BBPH9	UNRESOLVED TYPE II		0.163	
	BBPH10	UNRESOLVED TYPE I		0.471	
	BBPH11	UNRESOLVED TYPE I		0.345	
	BBPH12	UNRESOLVED TYPE II		20.072	
	BBPH13	UNRESOLVED TYPE I		0.168	
	BBPH14	UNRESOLVED TYPE II		0.188	
	BBPH15	UNRESOLVED TYPE II		0.855	
	BBPH16	UNRESOLVED TYPE I		0.614	
	BBPH17	UNRESOLVED TYPE I		0.181	
BBPH18	UNRESOLVED TYPE I	0.068			
BBPH19	UNRESOLVED TYPE II	0.119			
BBPH20	UNRESOLVED TYPE II	1.564			
bis (2-Ethylhexyl) Phthalate	BEPH1	UNRESOLVED TYPE I	100%	0.187	
	BEPH2	UNRESOLVED TYPE II		0.095	
	BEPH3	GENERAL METALS OF TACOMA		5.194	

	BEPH4	UNRESOLVED TYPE II		0.017
	BEPH5	JONES CHEMICAL	100%	2.491
	BEPH6	DON OLINE AUTOFLUFF SITE	100%	1.076
	BEPH7	MODUTECH MARINE	100%	0.902
	BEPH8	UNRESOLVED TYPE II		5.693
	BEPH9	UNRESOLVED TYPE II		0.028
	BEPH10	UNRESOLVED TYPE II		0.103
	BEPH11	UNRESOLVED TYPE II		1.642
Cadmium	CD1	GENERAL METALS OF TACOMA	100%	0.041
	CD2	GENERAL METALS OF TACOMA	100%	0.216
	CD3	DON OLINE AUTOFLUFF SITE	100%	0.720
	CD4	SOUND REFINING	100%	0.294
Chromium	CR1	TACOMA BOATBUILDING	100%	0.389
	CR2	GENERAL METALS OF TACOMA	100%	0.028
	CR3	GENERAL METALS OF TACOMA	100%	0.247
	CR4	ELF ATOCHEM	25%	0.065
	CR4	US GYPSUM	75%	0.196
	CR5	UNRESOLVED TYPE II		0.364
	CR6	TAYLOR WAY PROPERTIES	100%	1.328
	CR7	UNRESOLVED TYPE II		5.502
	CR8	OCCIDENTAL	100%	0.024
	CR9	OCCIDENTAL	100%	0.171
	CR10	UNRESOLVED TYPE II		0.125
	CR11	AK-WA SHIPBUILDING	100%	2.680
Copper	CU1	JONES & GOODELL BOATBUILDING	100%	1.485
	CU2	TACOMA BOATBUILDING	100%	5.140
	CU3	US GYPSUM	100%	1.534
	CU4	DON OLINE AUTOFLUFF SITE	50%	0.934
	CU4	MODUTECH MARINE	50%	0.934
	CU5	MURRAY PACIFIC	100%	0.111
	CU6	BUFFELEN	100%	2.858
	CU7	SOUND REFINING	100%	4.495
	CU8	TAYLOR WAY PROPERTIES	100%	0.415
	CU9	OCCIDENTAL	100%	0.047
	CU10	OCCIDENTAL	100%	0.014
	CU11	OCCIDENTAL	100%	0.127
	CU12	AK-WA SHIPBUILDING	100%	15.991
Dichloro-diphenyl dichloroethane	DDD1	UNRESOLVED TYPE I		0.310
	DDD2	ELF ATOCHEM	100%	2.913
	DDD3	ELF ATOCHEM	100%	0.407
	DDD4	UNRESOLVED TYPE II		0.846
	DDD5	UNRESOLVED TYPE II		3.002
Dichloro-diphenyl dichloroethylene	DDE1	UNRESOLVED TYPE I		0.347
	DDE2	UNRESOLVED TYPE I		0.228
	DDE3	UNRESOLVED TYPE I		0.405
	DDE4	ELF ATOCHEM	100%	3.313
	DDE5	UNRESOLVED TYPE I		0.098
	DDE6	UNRESOLVED TYPE II		3.308
Dichloro-diphenyl trichloroethane	DDT1	UNRESOLVED TYPE II		0.021

	DDT2	ELF ATOCHEM	100%	9.400
	DDT3	UNRESOLVED TYPE II		0.225
	DDT4	UNRESOLVED TYPE II		0.230
	DDT5	UNRESOLVED TYPE II		0.052
	DDT6	UNRESOLVED TYPE II		0.169
	DDT7	UNRESOLVED TYPE II		4.412
2,4-dimethyl phenol	DMP1	UNRESOLVED TYPE I		0.278
	DMP2	DUNLAP TOWING	100%	0.076
	DMP3	UNRESOLVED TYPE II		0.062
	DMP4	UNRESOLVED TYPE II		0.104
	DMP5	UNRESOLVED TYPE II		0.187
	DMP6	UNRESOLVED TYPE I		0.070
dimethylphthalate	DMPH1	UNRESOLVED TYPE I		0.059
	DMPH2	UNRESOLVED TYPE II		11.684
	DMPH3	UNRESOLVED TYPE II		0.132
	DMPH4	UNRESOLVED TYPE I		0.209
	DMPH5	UNRESOLVED TYPE I		0.162
	DMPH6	UNRESOLVED TYPE II		0.135
	DMPH7	UNRESOLVED TYPE II		4.856
	DMPH8	UNRESOLVED TYPE II		0.144
	DMPH9	DON OLINE AUTOFLUFF SITE	50%	1.217
	DMPH9	MODUTECH MARINE	50%	1.217
	DMPH10	UNRESOLVED TYPE II		0.211
	DMPH11	UNRESOLVED TYPE II		0.639
	DMPH12	UNRESOLVED TYPE II		0.078
Di-n-octyl phthalate	DOPH1	UNRESOLVED TYPE I		0.384
	DOPH2	UNRESOLVED TYPE II		0.161
	DOPH3	GENERAL METALS OF TACOMA	100%	0.071
	DOPH4	UNRESOLVED TYPE II		0.200
	DOPH5	GENERAL METALS OF TACOMA	100%	1.097
	DOPH6	UNRESOLVED TYPE I		0.132
	DOPH7	DON OLINE AUTOFLUFF SITE	100%	0.092
	DOPH7	HYLEBOS MARINA	0%	0.000
	DOPH8	DON OLINE AUTOFLUFF SITE	100%	0.190
	DOPH9	UNRESOLVED TYPE II		0.097
	DOPH10	UNRESOLVED TYPE II		1.382
	DOPH11	UNRESOLVED TYPE II		1.076
Hexachlorobenzene	HCB1	ELF ATOCHEM	100%	1.414
	HCB2	UNRESOLVED TYPE I		0.323
	HCB3	UNRESOLVED TYPE I		0.168
	HCB4	UNRESOLVED TYPE I		0.289
	HCB5	UNRESOLVED TYPE I		0.095
	HCB6	OCCIDENTAL	100%	37.154
	HCB7	UNRESOLVED TYPE I		0.205
Hexachlorobutadiene	HCBD1	UNRESOLVED TYPE I		1.685
	HCBD2	UNRESOLVED TYPE I		0.881
	HCBD3	UNRESOLVED TYPE I		1.928
	HCBD4	UNRESOLVED TYPE II		1.967
	HCBD5	UNRESOLVED TYPE II		0.912
	HCBD6	ELF ATOCHEM	95%	13.511

	HCBD6	GENERAL METALS OF TACOMA	5%	0.711
	HCBD7	UNRESOLVED TYPE I		1.113
	HCBD8	UNRESOLVED TYPE I		0.511
	HCBD9	UNRESOLVED TYPE I		1.002
	HCBD10	UNRESOLVED TYPE II		12.469
	HCBD11	UNRESOLVED TYPE II		0.043
	HCBD12	UNRESOLVED TYPE I		0.105
	HCBD13	OCCIDENTAL	100%	99.397
Mercury	HG1	JONES & GOODELL BOATBUILDIN	100%	0.564
	HG2	JONES & GOODELL BOATBUILDIN	100%	0.009
	HG3	UNRESOLVED TYPE I		0.014
	HG4	UNRESOLVED TYPE I		4.929
	HG5	UNRESOLVED TYPE I		0.520
	HG6	GENERAL METALS OF TACOMA	100%	1.776
	HG7	GENERAL METALS OF TACOMA	100%	0.322
	HG8	ELF ATOCHEM	100%	6.894
	HG9	HYLEBOS MARINA	100%	1.396
	HG10	DON OLINE AUTOFLUFF SITE	100%	0.238
	HG11	UNRESOLVED TYPE I		0.312
	HG12	UNRESOLVED TYPE I		0.101
	HG13	UNRESOLVED TYPE I		0.773
	HG14	3138 MARINE VIEW DR	100%	1.621
	HG15	3138 MARINE VIEW DR	100%	4.799
	HG16	OCCIDENTAL	100%	0.040
	HG17	OCCIDENTAL	100%	1.577
	HG18	UNRESOLVED TYPE I		0.430
dimethylphthalate	MDCB1	UNRESOLVED TYPE II		0.969
	MDCB2	UNRESOLVED TYPE II		0.793
	MDCB3	UNRESOLVED TYPE I		0.156
	MDCB4	UNRESOLVED TYPE II		2.997
	MDCB5	UNRESOLVED TYPE II		0.678
	MDCB6	GENERAL METALS OF TACOMA	100%	0.056
	MDCB7	GENERAL METALS OF TACOMA	100%	2.033
dimethylphthalate (continued)	MDCB8	UNRESOLVED TYPE II		0.901
	MDCB9	UNRESOLVED TYPE II		3.468
	MDCB10	UNRESOLVED TYPE II		0.266
	MDCB11	UNRESOLVED TYPE II		1.583
	MDCB12	UNRESOLVED TYPE II		1.483
	MDCB13	UNRESOLVED TYPE I		0.931
	MDCB14	UNRESOLVED TYPE II		0.971
	MDCB15	OCCIDENTAL	100%	1.343
Nickel	NI1	DON OLINE AUTOFLUFF SITE	100%	0.638
	NI2	OCCIDENTAL	100%	0.191
	NI3	OCCIDENTAL	100%	0.076
	NI4	OCCIDENTAL	100%	0.071
Lead	PB1	TACOMA BOATBUILDING	100%	0.912
	PB2	US GYPSUM	100%	1.184
	PB3	DON OLINE AUTOFLUFF SITE	100%	0.681
	PB4	SOUND REFINING	100%	0.727
	PB5	TAYLOR WAY PROPERTIES	100%	0.230
	PB6	UNRESOLVED TYPE II		4.591

	PB7	OCCIDENTAL	100%	3.478
	PB8	OCCIDENTAL	100%	0.066
	PB9	OCCIDENTAL	100%	0.053
Pentachlorophenol	PCP1	OCCIDENTAL	100%	0.093
	PCP2	UNRESOLVED TYPE I		0.453
	PCP3	NO ALLOCATION		207.562
1,4-dichlorobenzene	PDCB1	OCCIDENTAL	100%	0.280
Antimony	SB1	WASSER WINTERS	100%	1.133
	SB2	JONES & GOODELL BOATBUILDIN	25%	0.594
	SB2	MANKE LUMBER	75%	1.782
	SB3	DUNLAP TOWING	10%	2.043
	SB3	ELF ATOCHEM	10%	2.043
	SB3	GENERAL METALS OF TACOMA	10%	2.043
	SB3	MANKE LUMBER	5%	1.021
	SB3	TACOMA BOATBUILDING	65%	13.279
	SB4	ELF ATOCHEM	10%	0.846
	SB4	MURRAY PACIFIC	15%	1.269
	SB4	US GYPSUM	75%	6.345
	SB5	HYLEBOS MARINA	100%	0.164
	SB6	MODUTECH MARINE	100%	0.691
	SB7	CASCADE TIMBER (YARD #1)	20%	1.863
	SB7	JOSEPH SIMON & SONS	20%	1.863
	SB7	TAYLOR WAY PROPERTIES	60%	5.589
	SB8	UNRESOLVED TYPE II		5.248
	SB9	UNRESOLVED TYPE I		0.331
	SB10	UNRESOLVED TYPE II		2.089
	SB11	OCCIDENTAL	100%	0.394
Antimony (Continued)	SB12	AK-WA SHIPBUILDING	50%	3.452
	SB12	OCCIDENTAL	50%	3.452
Tributyltin	TBT1	UNRESOLVED TYPE I		0.714
	TBT2	JONES & GOODELL BOATBUILDIN	100%	2.120
	TBT3	LONE STAR NORTHWEST	0%	0.000
	TBT3	TACOMA BOATBUILDING	95%	10.126
	TBT3	WEYERHAEUSER	0%	0.000
	TBT3	DUNLAP TOWING	0%	0.000
	TBT3	MANKE LUMBER	5%	0.533
	TBT4	UNRESOLVED TYPE I		0.017
	TBT5	UNRESOLVED TYPE II		0.462
	TBT6	UNRESOLVED TYPE I		0.648
	TBT7	UNRESOLVED TYPE II		1.338
	TBT8	OLINE PROPERTIES	0%	0.000
	TBT8	HYLEBOS MARINA	100%	0.730
	TBT9	UNRESOLVED TYPE I		0.243
	TBT10	UNRESOLVED TYPE II		18.051
	TBT11	UNRESOLVED TYPE I		0.238
	TBT12	UNRESOLVED TYPE II		3.077
	TBT13	AK-WA SHIPBUILDING	95%	8.408
	TBT13	MARINE VIEW DR #1	0%	0.000
	TBT13	OLE & CHARLIE'S MARINA	5%	0.443

1,2,4-trichlorobenzene	TCB1	UNRESOLVED TYPE I		0.187
	TCB2	UNRESOLVED TYPE I		0.192
	TCB3	UNRESOLVED TYPE II		0.616
	TCB4	UNRESOLVED TYPE II		0.780
	TCB5	OCCIDENTAL	100%	10.144
	TCB6	UNRESOLVED TYPE I		0.641
Zinc	ZN1	JONES & GOODELL BOATBUILDING	100%	0.241
	ZN2	TACOMA BOATBUILDING	100%	1.883
	ZN3	TACOMA BOATBUILDING	100%	1.977
	ZN4	DUNLAP TOWING	100%	0.016
	ZN5	GENERAL METALS OF TACOMA	100%	2.113
	ZN6	ELF ATOCHEM	100%	0.039
	ZN7	US GYPSUM	100%	1.651
	ZN8	DON OLINE AUTOFLUFF SITE	100%	1.057
	ZN9	MURRAY PACIFIC	100%	0.122
	ZN10	UNRESOLVED TYPE I		0.284
	ZN11	SOUND REFINING	100%	1.981
	ZN12	TAYLOR WAY PROPERTIES	100%	0.427
	ZN13	OCCIDENTAL	100%	0.097
	ZN14	OCCIDENTAL	100%	0.050
	ZN15	OCCIDENTAL	100%	0.072
	ZN16	AK-WA SHIPBUILDING	100%	7.368

Table RG--2. Discounted Service Acre Years by SOC and Waterway Segment for Hylebos Waterway

PARAMETERS	Symbol	SEGMENTS					All Combined	pct of total
		1	2	3	4	5		
Total Acres		52.64	42.29	28.17	48.79	173.39	345.26	
Acres Not Remediated		43.57	9.78	21.12	41.09	118.07	233.62	
Acres To Be Remediated		9.07	32.51	7.05	7.70	55.31	111.64	
		Discounted Service Acre Years						
Silver	Ag	0.00	0.35	0.09	1.05	1.52	3.00	0.12
Arsenic	As	5.40	8.46	1.95	5.91	2.81	24.53	1.01
Butylbenzyl Phthalate	BBPH	8.88	18.39	14.11	21.28	2.84	65.50	2.69
bis (2-Ethylhexyl) Phthalate	BEPH	1.14	6.84	1.99	5.69	1.77	17.43	0.71
Cadmium	Cd	0.00	0.26	0.72	0.29	0.00	1.27	0.05
Chromium	Cr	0.39	0.48	0.42	1.33	8.50	11.12	0.46
Copper	Cu	6.58	1.23	5.22	4.87	16.18	34.08	1.40
Dichloro-diphenyl dichloroethane	DDD	0.31	3.32	0.00	0.85	3.00	7.48	0.31
Dichloro-diphenyl dichloroethylene	DDE	0.98	3.41	0.00	0.00	3.31	7.70	0.32
Dichloro-diphenyl trichloroethane	DDT	0.00	9.65	0.23	0.22	4.41	14.51	0.59
diethylphthalate	DEPH	22.50	18.62	19.40	27.83	91.76	180.12	7.39
2,4-dimethyl phenol	DMP	0.29	0.13	0.29	0.07	0.00	0.78	0.03
dimethylphthalate	DMPH	12.27	4.97	2.58	0.63	0.30	20.74	0.85
Di-n-octyl phthalate	DOPH	0.44	1.60	0.28	2.25	0.30	4.88	0.20
Hexachlorobenzene	HCB	0.00	1.74	0.17	0.38	37.36	39.65	1.63
Hexachlorobutadiene	HCBD	7.27	10.15	5.79	13.62	99.40	136.23	5.59
Mercury	Hg	6.04	9.91	1.03	0.87	8.47	26.31	1.08
dimethylphthalate	mDCB	4.91	7.35	3.12	0.93	2.31	18.63	0.76
Nickel	Ni	0.00	0.00	0.64	0.00	0.34	0.98	0.04
Polycyclic Aromatic Hydrocarbons	PAHs	150.17	127.25	99.26	148.09	540.67	1065.44	43.68
Lead	Pb	0.91	0.92	0.95	0.96	8.19	11.92	0.49
Polychlorinated biphenyls	PCBs	26.98	65.69	37.79	86.71	184.49	401.65	16.47
Pentachlorophenol	PCP	23.82	18.67	20.13	28.59	116.89	208.11	8.53
1,4-dichlorobenzene	pDCB	0.00	0.00	0.00	0.00	0.28	0.28	0.01
Antimony	Sb	11.01	16.28	6.71	14.15	9.39	57.53	2.36
Tributyltin	TBT	13.39	2.84	16.16	2.82	11.93	47.15	1.93
1,2,4-trichlorobenzene	TCB	0.00	0.38	0.00	0.00	12.18	12.56	0.51
Zinc	Zn	3.91	3.61	1.90	2.37	7.59	19.38	0.79
Total DSAYs by Segment		307.58	342.51	240.94	371.76	1176.18	2438.96	100.00