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STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

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MEMORANDUM

April 29, 1985

To: Dick Cunningham

From: Bill Yake BY

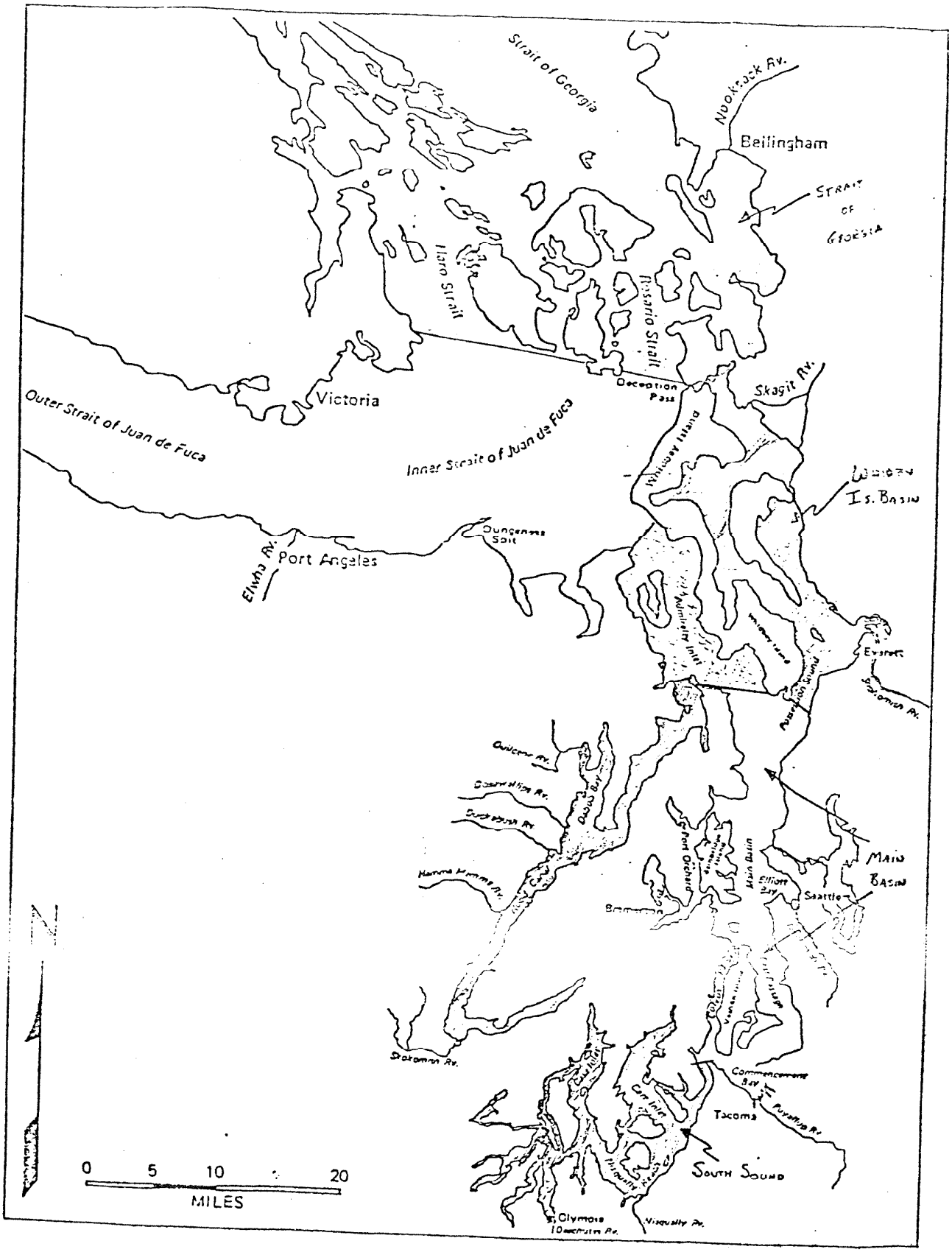
Subject: Compilation of Puget Sound "Toxic Hot Spot" Information on Puget Sound

Attached is a compilation of information on a number of "toxic hot spots" in Puget Sound. Information tabulated includes location, contaminant types and concentrations, biological impacts, suspected sources, contaminant pathways, and whether the sources are historical or on-going.

This information has been pulled together as an aid in our annual planning process. It is the kind of information which may prove to be particularly useful in light of our impending involvement in two Puget Sound Initiative projects: pollutant loading and contaminant pathways. I also believe it is the kind of information which might serve to aid in the further development of a comprehensive, cross-program approach to dealing with the problems of acute sediment contamination.

BY:cp

cc: Art Johnson



Strait of Georgia
Nooksack Rv.
Bellingham
Strait of Georgia
Haro Strait
Rosario Strait
Deception Pass
Skagit Rv.
Victoria
Outer Strait of Juan de Fuca
Inner Strait of Juan de Fuca
Whidbey Island
Whidbey Is. Basin
Dungeness Spit
Elwha Rv.
Port Angeles
Admiralty Inlet
Whidbey Island
Everett
Possession Sound
Stokomish Rv.
Quilcene Rv.
Dosewallips Rv.
Duckabush Rv.
Dabob Bay
Hamma Hamma Rv.
Port Orchard
Main Basin
Elliott Bay
Seattle
Main Basin
Bremerton
Stokomish Rv.
Commencement Bay
Puyallup Rv.
Tacoma
South Sound
Nisqually Reach
Nisqually Rv.
Olympia
Deschutes Rv.
N
0 5 10 20
MILES

Pattern of "hot spot" contamination.

Hot spot number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	Percent Occurrence	Ranking
Contaminant																							
Arsenic									X			X		X				X	X	X		29%	3
Copper									X			X		X		X	X	X	X			33%	2
Zinc							X		X			X		X			X	X	X			33%	2
Lead			X		X	X	X		X				X				X					33%	2
Mercury	X				X	X	X															19%	4
Chlorinated volatiles																					X	5%	5
Hexachlorobutadiene																					X	5%	5
High weight PNAs		X	X	X	X	X	X	X			X	X			X							48%	1
Cresols																X						5%	5
Phenols																X						5%	5
PCBs			X		X	X	X		X	X												29%	3
Sources																							
NPDES permitted																						(36%)	
Municipal			X	X																		10%	4
Industrial	X										X	X				X					?	21%	3
CSO						X																5%	5
Unpermitted																						(62%)	
Spills/dumping							?	X	?	?	X	?	?	?			X				X	33%	1
Industrial non-point							?					?	?				?	X	X	X	?	26%	2
Other non-point													?									2%	6
Landfill leachate																			X			5%	5
Dredge disposal				X																		5%	5
Unknown							?								X							(7%)	
Pathway																							
Direct	X		X	X	X	X	X	X			X	X		?		X	X	X	X	X	?	71%	1
Groundwater component							?				X	?						?	X		X	21%	3
Unknown		X							X	X			X		X							24%	2
Timing																							
Historical	X	X	X				X				X									X	X	33%	2
Ongoing				X	X	X	X	X		X		X		X		X	X	X	X			57%	1
Unknown									X				X		X							14%	3

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Toxic "Hot Spots" in Puget Sound - A Tabulation of Relevant Information

Number	Location	Contaminant/Concentrations[a]	Documented Biological Impacts	Suspected Type of Source(s)	Contamination Pathways	Historical or Ongoing[b]
	Strait of Georgia					
	Bellingham Bay					
1	Whatcom Waterway	Hg - up to 37 ppm		Chlor-alkali plant - wastewater dischg.	Historical point source possible groundwater pathway	Historical
	Whidbey Island Basin					
	Everett Harbor					
2	East Waterway	PNAs				Historical
	Main Basin					
	Shilshole					
3	N. Trunk Sewer Outfall	Pb - >120 ppm PCBs - 350 to 750 ppb High PNAs - >24 ppm		Municipal sewer outfall	Historical point source	Historical
4	S. of West Pt. Outfall	High PNAs - 12 to 24 pm	Possible reduction in sensitive benthic organisms	Municipal primary outfall	Current point source	Ongoing
	Elliot Bay					
5	4-Mile Rock	Pb - up to 230 ppm Hg - up to 2.2 ppm High PNAs - up to 28 ppm PCBs - up to 1,500 ppb		Multiple original sources	Dredge spoil disposal	Ongoing
6	Denny Way CSO	Pb - >120 ppm Hg - 0.8 to 1.6 ppm High PNAs - >24 ppm PCBs - up to 3,000 ppb	Severe depletion of sensitive benthic organisms	Combined sewer overflow	Current point source	Ongoing
7	Harbor Island	Pb - up to 30 ppm Zn - up to 4,800 ppm Hg - up to 7.7 ppm High PNAs - up to 325 ppm PCBs - up to 3,700 ppb		Lead smelter Ship repair & constr. Other unknown sources	Requires investigation	Historical Ongoing
8	W. of Harbor Island	High PNAs - up to 115 ppm		Wood treating - creosote	Spills and dumping	Ongoing

Toxic "Hot Spots" in Puget Sound - A Tabulation of Relevant Information
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Number	Location	Contaminant/Concentrations[a]	Documented Biological Impacts	Suspected Type of Source(s)	Contamination Pathways	Historical or Ongoing[b]
	Main Basin (cont)					
	Duwamish					
9	Nr. Florida Street Storm Drain	PCBs - up to 3,100 ppb Zn, As, Pb, Cu - very high		Wood treating? Other discharges by way of storm drain	Unpermitted discharges? Spills & dumping to storm drainage?	Unknown
10	Near Slip 4	PCBs - up to 3,700 ppb		Power Co. by way of storm drains	Unpermitted discharges? Spills & dumping to storm drainage	Unknown
11	Eagle Harbor	High PNAs - up to 308 ppm	Toxicity to wide variety of organisms, contamination of shellfish, fish pathology	Wood treating - creosote	Point discharge (historical), contaminated groundwater seepage, probably major spills	Probably historical
	Commencement Bay					
	South Shore					
12	Ruston	Suspected metals - Cu, As, Zn, Pb - very high	(c)	Copper smelter	Point sources, others require investigation	Ongoing?
	City Waterway					
13	Head of Waterway	Pb - up to 810 ppm	(c)	Uncertain - perhaps storm drains, metal plating	Unknown	Unknown
14	Middle of Waterway	Cu - up to 2,100 ppm As - up to 200 ppm Zn - up to 2,100 ppm	(c)	Possibly shipbuilding	Sandblasting slag? Anti-fouling paint?	Ongoing
15	Mouth of Waterway	High PNAs - up to 23 ppm	(c)	Uncertain - fires?	Unknown	Unknown

Toxic "Hot Spots" in Puget Sound - A Tabulation of Relevant Information
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Number	Location	Contaminant/Concentrations(a)	Documented Biolocical Impacts	Suspected Type of Source(s)	Contamination Pathways	Historical or Ongoing(b)
16	St. Paul Waterway North of Mouth	Cu Phenols Organics Cresols	(c)	Pulp mill	Point source discharge	Ongoing
17	Sitcum Waterway	Pb - up to 1,900 ppm Cu - up to 2,100 ppm Zn - up to 3,200 ppm	(c)	Ore off-loading	Ore spillage	Ongoing
18	Blair Waterway Middle of WW	As - up to 385 ppm Zn - up to 135 ppm Cu - up to 130 ppm	(c)	Smelter slag/log sort yard runoff	Stormwater runoff from sort yards using slag, possible groundwater pathway	Ongoing
19	Hylebos Waterway Head of WW	As - up to 180 ppm Zn - up to 350 ppm Cu - up to 210 ppm	(c)	Smelter slag/log sort yard runoff, slag by-product dump, sort yard waste dump	As above, plus leachate from both dumps to Hylebos Creek	Ongoing, one dump removed
20	Near Head of WW	High PNAs - up to about 350 ppm	(c)	Aluminum smelter	Runoff from wet scrubber sludges	Primarily historical
21	Near Mouth of WW	Chlorinated volatile organics Hexachlorobutadiene	(c)	Chemical company	Past practices/spills/ groundwater pathway	Primarily historical

(a) Concentrations given on a dry-weight basis.
(b) "Ongoing" includes sources which may have been curtailed within the last year.
(c) Information on biological impacts at Commencement Bay hot spots should be available approximately June 1985 when WDOE-administered Superfund investigation reports are published.