ATTACHMENT 1

TROPHIC TRACE OUTPUT FILE

TrophicTrace

Version 3.04 (November, 2003)

Gobas Model is used for
DDE : Organic
PCBs (Total) : Organic

BCF approach is used for
Copper : Metal
Mercury : Metal
Selenium : Metal

Environment: ***Rhine Channel 1***

Water Temperature, C:	16.8	16.8	18.2	18.2
TOC in Sediment, %:	1	1.6	1.6	1.95
Particulate OC, mg/L:	0.06	0.06	0.06	0.06
Dissolved OC, mg/L:	1.2	1.2	1.2	1.2

Use this button to plot selected fuzzy numbers from the sheet

Ecological Risk

Summary for Mammals:

Mammal	Chemical of Concern	NOAEL Toxicity Quotient	LOAEL Toxicity Quotient
Harbor Seal : Rhine	Copper : Metal	2.54E-03	1.76E-03
		5.09E-03	3.52E-03
		1.02E-02	7.05E-03
		1.53E-02	1.06E-02
	Mercury : Metal	7.36E-03	4.71E-03
		1.47E-02	9.42E-03
		2.94E-02	1.88E-02
		4.42E-02	2.83E-02
	Selenium : Metal	8.43E-03	6.60E-03
		1.69E-02	1.32E-02
		3.37E-02	2.64E-02
		5.06E-02	3.96E-02
	DDE : Organic	2.01E-03	4.01E-04
		4.48E-03	8.95E-04
		6.03E-03	1.21E-03
		1.48E-02	2.96E-03
	PCBs (Total) : Organic	3.65E-01	3.65E-02
		1.97E+00	1.97E-01
		2.82E+00	2.82E-01
		6.48E+00	6.48E-01

Summary for Avian:

Bird	Chemical of Concern	NOAEL TQ	LOAEL TQ	NOAEL TQ for Eggs	LOAEL TQ for Eggs
Brown Pelican : Rhine	Copper : Metal	8.24E-04	6.25E-04		
		1.65E-03	1.25E-03		
		3.30E-03	2.50E-03		
		4.95E-03	3.75E-03		
	Mercury : Metal	1.09E-01	1.09E-02		
		2.19E-01	2.19E-02		
		4.38E-01	4.38E-02		
		6.57E-01	6.57E-02		
	Selenium : Metal	1.60E-03	8.17E-04		
		3.19E-03	1.63E-03		
		6.38E-03	3.27E-03		
		9.58E-03	4.90E-03		
	DDE : Organic	1.96E-01	1.96E-02	7.66E-01	2.87E-01
		4.38E-01	4.38E-02	1.71E+00	6.40E-01
		5.59E-01	5.59E-02	2.18E+00	8.17E-01
		1.37E+00	1.37E-01	5.36E+00	2.01E+00
	PCBs (Total) : Organic	2.24E-03	9.79E-04	5.41E-01	2.40E-01
		1.21E-02	5.29E-03	2.92E+00	1.30E+00
		1.64E-02	7.14E-03	3.95E+00	1.75E+00
		3.76E-02	1.64E-02	9.08E+00	4.03E+00
Cormorant : Rhine	Copper : Metal	3.64E-02	2.76E-02		
		7.28E-02	5.52E-02		
		1.46E-01	1.10E-01		
		2.18E-01	1.66E-01		
	Mercury : Metal	4.84E+00	4.84E-01		
		9.67E+00	9.67E-01		
		1.93E+01	1.93E+00		
		2.90E+01	2.90E+00		
	Selenium : Metal	7.05E-02	3.61E-02		
		1.41E-01	7.22E-02		
		2.82E-01	1.44E-01		
		4.23E-01	2.17E-01		
	DDE : Organic	4.12E-01	4.12E-02	1.09E+00	4.09E-01
		9.18E-01	9.18E-02	2.43E+00	9.12E-01
		1.17E+00	1.17E-01	3.10E+00	1.16E+00
		2.88E+00	2.88E-01	7.63E+00	2.86E+00
	PCBs (Total) : Organic	8.92E-02	3.89E-02	4.87E-01	2.16E-01
		4.82E-01	2.10E-01	2.63E+00	1.17E+00
		6.50E-01	2.83E-01	3.55E+00	1.57E+00
		1.49E+00	6.51E-01	8.15E+00	3.62E+00

Summary for Fish:

Fish	Chemical of Concern	NOAEL TQ	LOAEL TQ	NOAEL TQ for Eggs	LOAEL TQ for Eggs
Arrow Goby : Example					
	Copper : Metal				
		7.43E-01	3.16E-01		
		1.49E+00	6.32E-01		
		2.97E+00	1.26E+00		
	Mercury : Metal	4.46E+00	1.90E+00		
	Selenium : Metal				
		6.31E-02	6.31E-03		
		1.41E-01	1.41E-02		
		1.80E-01	1.80E-02		
	DDE : Organic	4.42E-01	4.42E-02		
		5.78E-02	1.18E-02		
		3.12E-01	6.38E-02		
		4.20E-01	8.57E-02		
	PCBs (Total) : Organic	9.65E-01	1.97E-01		
Killifish : Rhine					
	Copper : Metal				
		7.43E-01	3.16E-01		
		1.49E+00	6.32E-01		
		2.97E+00	1.26E+00		
	Mercury : Metal	4.46E+00	1.90E+00		
	Selenium : Metal				
		3.42E-02	3.42E-03		
		7.62E-02	7.62E-03		
		9.73E-02	9.73E-03		
	DDE : Organic	2.39E-01	2.39E-02		
		7.22E-02	1.48E-02		
		3.90E-01	7.97E-02		
		5.27E-01	1.08E-01		
	PCBs (Total) : Organic	1.21E+00	2.47E-01		
Diamond Turbot : Rhine					
	Copper : Metal				
		7.43E-01	3.16E-01		
		1.49E+00	6.32E-01		
		2.97E+00	1.26E+00		
	Mercury : Metal	4.46E+00	1.90E+00		
	Selenium : Metal				
		9.70E-02	9.70E-03		
		2.16E-01	2.16E-02		
		2.79E-01	2.79E-02		
	DDE : Organic	6.87E-01	6.87E-02		
		9.50E-02	1.94E-02		
		5.13E-01	1.05E-01		
		7.02E-01	1.43E-01		
	PCBs (Total) : Organic	1.61E+00	3.30E-01		

CA Halibut : Rhine	Copper : Metal				
	Mercury : Metal	7.43E-01	3.16E-01		
		1.49E+00	6.32E-01		
		2.97E+00	1.26E+00		
		4.46E+00	1.90E+00		
	Selenium : Metal				
	DDE : Organic	7.18E-02	7.18E-03		
		1.60E-01	1.60E-02		
		2.27E-01	2.27E-02		
		5.59E-01	5.59E-02		
	PCBs (Total) : Organic	9.87E-02	2.02E-02		
		5.33E-01	1.09E-01		
		7.94E-01	1.62E-01		
		1.83E+00	3.73E-01		

Parameters

Mammals Parameters:

Mammal	Body Weight, kg	Ingest. Rate, kg/day	Site Use Factor	Diet	% in Diet	Chemical	Conc. in Diet, mg/kg
Harbor Seal : Rhine	82	13	0.05	CA Halibut : Rhine	50	Copper : Metal	2.89E-01
							5.78E-01
							1.16E+00
							1.73E+00
					50	Mercury : Metal	7.43E-03
							1.49E-02
							2.97E-02
							4.46E-02
						Selenium : Metal	5.00E-03
							1.00E-02
							2.00E-02
							3.00E-02
	82	13	0.05		50	DDE : Organic	8.62E-03
							1.92E-02
							2.73E-02
							6.71E-02
					50	PCBs (Total) : Organic	9.38E-03
							5.06E-02
							7.55E-02
							1.73E-01
	82	13	0.05	Diamond Turbot : Rhine	50	Copper : Metal	2.89E-01
							5.78E-01
							1.16E+00
							1.73E+00
					50	Mercury : Metal	7.43E-03
							1.49E-02
							2.97E-02
							4.46E-02
						Selenium : Metal	5.00E-03
							1.00E-02
							2.00E-02
							3.00E-02
	82	13	0.05		50	DDE : Organic	1.16E-02
							2.60E-02
							3.35E-02
							8.25E-02
					50	PCBs (Total) : Organic	9.02E-03
							4.87E-02
							6.67E-02
							1.53E-01

Chemical Parameters for Mammals:

Chemical of Concern	CAS	Mammal	Average Daily Dose, mg/kg-day	NOAEL TRV, mg/kg-day	LOAEL TRV, mg/kg-day
Copper : Metal	7440-50-8	Harbor Seal : Rhine	4.58E-02	1.80E+01	2.60E+01
			9.16E-02	1.80E+01	2.60E+01
			1.83E-01	1.80E+01	2.60E+01
			2.75E-01	1.80E+01	2.60E+01
Mercury : Metal	7439-97-6	Harbor Seal : Rhine	1.18E-03	1.60E-01	2.50E-01
			2.36E-03	1.60E-01	2.50E-01
			4.71E-03	1.60E-01	2.50E-01
			7.07E-03	1.60E-01	2.50E-01
Selenium : Metal	7782-49-2	Harbor Seal : Rhine	7.92E-04	9.40E-02	1.20E-01
			1.58E-03	9.40E-02	1.20E-01
			3.17E-03	9.40E-02	1.20E-01
			4.75E-03	9.40E-02	1.20E-01
DDE : Organic	72-55-9	Harbor Seal : Rhine	1.61E-03	8.00E-01	4.00E+00
			3.58E-03	8.00E-01	4.00E+00
			4.82E-03	8.00E-01	4.00E+00
			1.19E-02	8.00E-01	4.00E+00
PCBs (Total) : Organic	1336-36-3	Harbor Seal : Rhine	1.46E-03	4.00E-03	4.00E-02
			7.87E-03	4.00E-03	4.00E-02
			1.13E-02	4.00E-03	4.00E-02
			2.59E-02	4.00E-03	4.00E-02

Avian Parameters:

Bird	Body Weight, kg	Ingest. Rate, kg/day	Site Use Factor	Diet	% in Diet	Chemical	Conc. in Diet, mg/kg
Brown Pelican : Rhine	3.4	0.76	0.03	Killifish : Rhine	100	Copper : Metal	1.73E-01
							3.47E-01
							6.93E-01
							1.04E+00
	3.4	0.76	0.03		100	Mercury : Metal	4.46E-03
							8.92E-03
							1.78E-02
							2.67E-02
	3.4	0.76	0.03		100	Selenium : Metal	3.00E-03
							6.00E-03
							1.20E-02
							1.80E-02
	3.4	0.76	0.03		100	DDE : Organic	2.46E-03
							5.49E-03
							7.00E-03
							1.72E-02
	3.4	0.76	0.03		100	PCBs (Total) : Organic	4.12E-03
							2.22E-02
							3.00E-02
							6.90E-02

Cormorant : Rhine	1.3	0.385	1	Killifish : Rhine	50	Copper : Metal	5.78E+00
							1.16E+01
							2.31E+01
							3.47E+01
					50	Mercury : Metal	1.49E-01
							2.97E-01
							5.94E-01
							8.92E-01
						Selenium : Metal	1.00E-01
							2.00E-01
							4.00E-01
							6.00E-01
	1.3	0.385	1		50	DDE : Organic	8.20E-02
							1.83E-01
							2.33E-01
							5.74E-01
					50	PCBs (Total) : Organic	1.37E-01
							7.41E-01
							1.00E+00
							2.30E+00
	1.3	0.385	1	Arrow Goby : Example	50	Copper : Metal	5.78E+00
							1.16E+01
							2.31E+01
							3.47E+01
					50	Mercury : Metal	1.49E-01
							2.97E-01
							5.94E-01
							8.92E-01
						Selenium : Metal	1.00E-01
							2.00E-01
							4.00E-01
							6.00E-01
	1.3	0.385	1		50	DDE : Organic	1.52E-01
							3.38E-01
							4.32E-01
							1.06E+00
					50	PCBs (Total) : Organic	1.10E-01
							5.93E-01
							7.97E-01
							1.83E+00

Chemical Parameters for Birds:

Chemical of Concern	CAS	Bird	Average Daily Dose, mg/kg-day	NOAEL TRV, mg/kg-day	LOAEL TRV, mg/kg-day	Biomag. Factor	NOAEL TRV for eggs, mg/kg	LOAEL TRV for eggs, mg/kg
Copper : Metal	7440-50-8	Brown Pelican : Rhine	3.87E-02	4.70E+01	6.20E+01			
			7.75E-02	4.70E+01	6.20E+01			
			1.55E-01	4.70E+01	6.20E+01			
			2.32E-01	4.70E+01	6.20E+01			
		Cormorant : Rhine	1.71E+00	4.70E+01	6.20E+01			
			3.42E+00	4.70E+01	6.20E+01			
			6.84E+00	4.70E+01	6.20E+01			
			1.03E+01	4.70E+01	6.20E+01			
Mercury : Metal	7439-97-6	Brown Pelican : Rhine	9.96E-04	9.10E-03	9.10E-02			
			1.99E-03	9.10E-03	9.10E-02			
			3.99E-03	9.10E-03	9.10E-02			
			5.98E-03	9.10E-03	9.10E-02			
		Cormorant : Rhine	4.40E-02	9.10E-03	9.10E-02			
			8.80E-02	9.10E-03	9.10E-02			
			1.76E-01	9.10E-03	9.10E-02			
			2.64E-01	9.10E-03	9.10E-02			
Selenium : Metal	7782-49-2	Brown Pelican : Rhine	6.70E-04	4.20E-01	8.20E-01			
			1.34E-03	4.20E-01	8.20E-01			
			2.68E-03	4.20E-01	8.20E-01			
			4.02E-03	4.20E-01	8.20E-01			
		Cormorant : Rhine	2.96E-02	4.20E-01	8.20E-01			
			5.92E-02	4.20E-01	8.20E-01			
			1.18E-01	4.20E-01	8.20E-01			
			1.78E-01	4.20E-01	8.20E-01			

DDE : Organic	72-55-9	Brown Pelican : Rhine	5.50E-04	2.80E-03	2.80E-02	2.80E+01	3.00E+00	8.00E+00
			1.23E-03	2.80E-03	2.80E-02	2.80E+01	3.00E+00	8.00E+00
			1.57E-03	2.80E-03	2.80E-02	2.80E+01	3.00E+00	8.00E+00
			3.85E-03	2.80E-03	2.80E-02	2.80E+01	3.00E+00	8.00E+00
		Cormorant : Rhine	3.46E-02	8.40E-02	8.40E-01	2.80E+01	3.00E+00	8.00E+00
			7.71E-02	8.40E-02	8.40E-01	2.80E+01	3.00E+00	8.00E+00
			9.85E-02	8.40E-02	8.40E-01	2.80E+01	3.00E+00	8.00E+00
			2.42E-01	8.40E-02	8.40E-01	2.80E+01	3.00E+00	8.00E+00
PCBs (Total) : Organic	1336-36-3	Brown Pelican : Rhine	9.20E-04	4.10E-01	9.40E-01	2.80E+01	7.10E+00	1.60E+01
			4.97E-03	4.10E-01	9.40E-01	2.80E+01	7.10E+00	1.60E+01
			6.71E-03	4.10E-01	9.40E-01	2.80E+01	7.10E+00	1.60E+01
			1.54E-02	4.10E-01	9.40E-01	2.80E+01	7.10E+00	1.60E+01
		Cormorant : Rhine	3.66E-02	4.10E-01	9.40E-01	2.80E+01	7.10E+00	1.60E+01
			1.98E-01	4.10E-01	9.40E-01	2.80E+01	7.10E+00	1.60E+01
			2.66E-01	4.10E-01	9.40E-01	2.80E+01	7.10E+00	1.60E+01
			6.12E-01	4.10E-01	9.40E-01	2.80E+01	7.10E+00	1.60E+01

Chemical Parameters for Fish:

Chemical of Concern	CAS	Fish	NOAEL-based CBR, mg/kg	LOAEL-based CBR, mg/kg	Biomag. Factor	NOAEL TRV for eggs, mg/kg lipid	LOAEL TRV for eggs, mg/kg lipid
Copper : Metal	7440-50-8	Arrow Goby : Example					
		Killifish : Rhine					
		Diamond Turbot : Rhine					
		CA Halibut : Rhine					
Mercury : Metal	7439-97-6	Arrow Goby : Example	2.00E-01	4.70E-01			
			2.00E-01	4.70E-01			
			2.00E-01	4.70E-01			
			2.00E-01	4.70E-01			
		Killifish : Rhine	2.00E-01	4.70E-01			
			2.00E-01	4.70E-01			
			2.00E-01	4.70E-01			
			2.00E-01	4.70E-01			
		Diamond Turbot : Rhine	2.00E-01	4.70E-01			
			2.00E-01	4.70E-01			
			2.00E-01	4.70E-01			
			2.00E-01	4.70E-01			
		CA Halibut : Rhine	2.00E-01	4.70E-01			
Selenium : Metal	7782-49-2	Arrow Goby : Example					
		Killifish : Rhine					
		Diamond Turbot : Rhine					
		CA Halibut : Rhine					

DDE : Organic	72-55-9	Arrow Goby : Example	2.40E+00	2.40E+01			
			2.40E+00	2.40E+01			
			2.40E+00	2.40E+01			
			2.40E+00	2.40E+01			
		Killifish : Rhine	2.40E+00	2.40E+01			
			2.40E+00	2.40E+01			
			2.40E+00	2.40E+01			
			2.40E+00	2.40E+01			
		Diamond Turbot : Rhine	2.40E+00	2.40E+01			
			2.40E+00	2.40E+01			
			2.40E+00	2.40E+01			
			2.40E+00	2.40E+01			
		CA Halibut : Rhine	2.40E+00	2.40E+01			
PCBs (Total) : Organic	1336-36-3	Arrow Goby : Example	1.90E+00	9.30E+00			
			1.90E+00	9.30E+00			
			1.90E+00	9.30E+00			
			1.90E+00	9.30E+00			
		Killifish : Rhine	1.90E+00	9.30E+00			
			1.90E+00	9.30E+00			
			1.90E+00	9.30E+00			
			1.90E+00	9.30E+00			
		Diamond Turbot : Rhine	1.90E+00	9.30E+00			
			1.90E+00	9.30E+00			
			1.90E+00	9.30E+00			
			1.90E+00	9.30E+00			
		CA Halibut : Rhine	1.90E+00	9.30E+00			

Gobas Model Parameters

Bioaccumulation in Fish:

Fish	Chemical of Concern	Use in Risk Assess-ment	Calculated Cf, ug/kg (wet weight)	Measured Cf, ug/kg (wet weight)	Conc. for Risk Assessment, ug/kg (wet weight)
Arrow Goby : Example	DDE : Organic	Calculated	1.52E+02		1.52E+02
			3.38E+02		3.38E+02
			4.32E+02		4.32E+02
			1.06E+03		1.06E+03
	PCBs (Total) : Organic	Calculated	1.10E+02		1.10E+02
			5.93E+02		5.93E+02
			7.97E+02		7.97E+02
			1.83E+03		1.83E+03
Killifish : Rhine	DDE : Organic	Calculated	8.20E+01		8.20E+01
			1.83E+02		1.83E+02
			2.33E+02		2.33E+02
			5.74E+02		5.74E+02
	PCBs (Total) : Organic	Calculated	1.37E+02		1.37E+02
			7.41E+02		7.41E+02
			1.00E+03		1.00E+03
			2.30E+03		2.30E+03
Diamond Turbot : Rhine	DDE : Organic	Calculated	2.33E+02		2.33E+02
			5.19E+02		5.19E+02
			6.71E+02		6.71E+02
			1.65E+03		1.65E+03
	PCBs (Total) : Organic	Calculated	1.80E+02		1.80E+02
			9.74E+02		9.74E+02
			1.33E+03		1.33E+03
			3.07E+03		3.07E+03

CA Halibut : Rhine	DDE : Organic	Calculated	1.72E+02		1.72E+02
			3.84E+02		3.84E+02
			5.46E+02		5.46E+02
			1.34E+03		1.34E+03
	PCBs (Total) : Organic	Calculated	1.88E+02		1.88E+02
			1.01E+03		1.01E+03
			1.51E+03		1.51E+03
			3.47E+03		3.47E+03

Fish Parameters:

Fish	Site	Trophic Level	Lipid Percent	Weight, g	Site Use Factor
Arrow Goby	Example	Forage	1.5	2	1
			1.5	2	1
			1.5	2	1
			1.5	2	1
Killifish	Rhine	Forage	1.5	5	1
			1.5	5	1
			1.5	5	1
			1.5	5	1
Diamond Turbot	Rhine	Forage	5.5	100	1
			5.5	100	1
			5.5	100	1
			5.5	100	1
CA Halibut	Rhine	Piscivorous	5.5	200	1
			5.5	200	1
			5.5	200	1
			5.5	200	1

Fish Diets:

Fish	Site	Diet	Diet Percent	Chemical	Conc., ug/kg
Arrow Goby	Example	Benthic Polychaete : Polyc	50	DDE : Organic	1.13E+02
					2.52E+02
					2.92E+02
					7.19E+02
				PCBs (Total) : Organic	8.42E+01
					4.54E+02
					5.61E+02
					1.29E+03
		Benthic Crustacean : Amp	50	DDE : Organic	2.13E+02
					4.76E+02
					5.52E+02
					1.36E+03
				PCBs (Total) : Organic	1.59E+02
					8.58E+02
					1.06E+03
					2.44E+03
Killifish	Rhine	Pelagic Crustacean : Cope	100	DDE : Organic	7.83E+01
					1.75E+02
					2.03E+02
					4.98E+02
				PCBs (Total) : Organic	1.43E+02
					7.74E+02
					9.57E+02
					2.20E+03

Diamond Turbot	Rhine	Benthic Crustacean : Amp	50	DDE : Organic	2.13E+02
					4.76E+02
					5.52E+02
					1.36E+03
				PCBs (Total) : Organic	1.59E+02
					8.58E+02
					1.06E+03
					2.44E+03
		Benthic Polychaete : Polyc	50	DDE : Organic	1.13E+02
					2.52E+02
					2.92E+02
					7.19E+02
				PCBs (Total) : Organic	8.42E+01
					4.54E+02
					5.61E+02
					1.29E+03
CA Halibut	Rhine	Killifish : Rhine	50	DDE : Organic	8.20E+01
					1.83E+02
					2.33E+02
					5.74E+02
				PCBs (Total) : Organic	1.37E+02
					7.41E+02
					1.00E+03
					2.30E+03
		Arrow Goby : Example	50	DDE : Organic	1.52E+02
					3.38E+02
					4.32E+02
					1.06E+03
				PCBs (Total) : Organic	1.10E+02
					5.93E+02
					7.97E+02
					1.83E+03

Bioaccumulation Rates in Fish:

Fish	Chemical	Qw	Ql	K1	K2	Kd	Ke	Kg
Arrow Goby : Example	DDE : Organic	2.12E+00	2.12E-02	1.06E+03	2.18E-02	6.20E-02	1.24E-02	3.47E-02
		2.12E+00	2.12E-02	1.06E+03	2.18E-02	6.20E-02	1.24E-02	3.47E-02
		2.12E+00	2.12E-02	1.06E+03	2.18E-02	6.74E-02	1.35E-02	3.47E-02
		2.12E+00	2.12E-02	1.06E+03	2.18E-02	6.74E-02	1.35E-02	3.47E-02
	PCBs (Total) : Organic	2.12E+00	2.12E-02	1.06E+03	3.54E-02	6.36E-02	1.27E-02	3.47E-02
		2.12E+00	2.12E-02	1.06E+03	3.54E-02	6.36E-02	1.27E-02	3.47E-02
		2.12E+00	2.12E-02	1.06E+03	3.54E-02	6.92E-02	1.38E-02	3.47E-02
		2.12E+00	2.12E-02	1.06E+03	3.54E-02	6.92E-02	1.38E-02	3.47E-02
Killifish : Rhine	DDE : Organic	3.68E+00	3.68E-02	7.35E+02	1.51E-02	5.40E-02	1.08E-02	2.89E-02
		3.68E+00	3.68E-02	7.35E+02	1.51E-02	5.40E-02	1.08E-02	2.89E-02
		3.68E+00	3.68E-02	7.35E+02	1.51E-02	5.87E-02	1.17E-02	2.89E-02
		3.68E+00	3.68E-02	7.35E+02	1.51E-02	5.87E-02	1.17E-02	2.89E-02
	PCBs (Total) : Organic	3.68E+00	3.68E-02	7.35E+02	2.46E-02	5.55E-02	1.11E-02	2.89E-02
		3.68E+00	3.68E-02	7.35E+02	2.46E-02	5.55E-02	1.11E-02	2.89E-02
		3.68E+00	3.68E-02	7.35E+02	2.46E-02	6.03E-02	1.21E-02	2.89E-02
		3.68E+00	3.68E-02	7.35E+02	2.46E-02	6.03E-02	1.21E-02	2.89E-02
Diamond Turbot : Rhine	DDE : Organic	2.22E+01	2.22E-01	2.22E+02	1.25E-03	3.45E-02	6.89E-03	1.58E-02
		2.22E+01	2.22E-01	2.22E+02	1.25E-03	3.45E-02	6.89E-03	1.58E-02
		2.22E+01	2.22E-01	2.22E+02	1.25E-03	3.75E-02	7.49E-03	1.58E-02
		2.22E+01	2.22E-01	2.22E+02	1.25E-03	3.75E-02	7.49E-03	1.58E-02
	PCBs (Total) : Organic	2.22E+01	2.22E-01	2.22E+02	2.02E-03	3.54E-02	7.08E-03	1.58E-02
		2.22E+01	2.22E-01	2.22E+02	2.02E-03	3.54E-02	7.08E-03	1.58E-02
		2.22E+01	2.22E-01	2.22E+02	2.02E-03	3.85E-02	7.70E-03	1.58E-02
		2.22E+01	2.22E-01	2.22E+02	2.02E-03	3.85E-02	7.70E-03	1.58E-02
CA Halibut : Rhine	DDE : Organic	3.36E+01	3.36E-01	1.68E+02	9.44E-04	3.11E-02	6.21E-03	1.38E-02
		3.36E+01	3.36E-01	1.68E+02	9.44E-04	3.11E-02	6.21E-03	1.38E-02
		3.36E+01	3.36E-01	1.68E+02	9.44E-04	3.38E-02	6.75E-03	1.38E-02
		3.36E+01	3.36E-01	1.68E+02	9.44E-04	3.38E-02	6.75E-03	1.38E-02
	PCBs (Total) : Organic	3.36E+01	3.36E-01	1.68E+02	1.53E-03	3.19E-02	6.38E-03	1.38E-02
		3.36E+01	3.36E-01	1.68E+02	1.53E-03	3.19E-02	6.38E-03	1.38E-02
		3.36E+01	3.36E-01	1.68E+02	1.53E-03	3.47E-02	6.94E-03	1.38E-02
		3.36E+01	3.36E-01	1.68E+02	1.53E-03	3.47E-02	6.94E-03	1.38E-02

Bioaccumulation in Invertebrates:

Invertebrate	Diet Pathway	Lipid Percent	Chemical of Concern	Use in Risk Assess-ment	Calc. Conc., ug/kg (wet weight)	Measur. Conc., ug/kg (wet weight)	Conc. for Risk Assessment, ug/kg (wet weight)
Benthic Polychaete : Polychaete	Sediment	1.461	DDE : Organic	Calculated	1.13E+02		1.13E+02
					2.52E+02		2.52E+02
		1.461			2.92E+02		2.92E+02
					7.19E+02		7.19E+02
		1.461	PCBs (Total) : Organic	Calculated	8.42E+01		8.42E+01
					4.54E+02		4.54E+02
		1.461			5.61E+02		5.61E+02
					1.29E+03		1.29E+03
Benthic Crustacean : Amphipod	Sediment	2.759	DDE : Organic	Calculated	2.13E+02		2.13E+02
					4.76E+02		4.76E+02
		2.759			5.52E+02		5.52E+02
					1.36E+03		1.36E+03
		2.759	PCBs (Total) : Organic	Calculated	1.59E+02		1.59E+02
					8.58E+02		8.58E+02
		2.759			1.06E+03		1.06E+03
					2.44E+03		2.44E+03
Pelagic Crustacean : Copepod	Water	5.14	DDE : Organic	Calculated	7.83E+01		7.83E+01
					1.75E+02		1.75E+02
		5.14			2.03E+02		2.03E+02
					4.98E+02		4.98E+02
		5.14	PCBs (Total) : Organic	Calculated	1.43E+02		1.43E+02
					7.74E+02		7.74E+02
		5.14			9.57E+02		9.57E+02
					2.20E+03		2.20E+03

Chemicals Parameters:

Chem. of Concern	Type	CAS	Log(Kow)	Log(Koc)	BSAF	Cancer Slope Factor, 1/(mg/kg-day)	Ref. Dose, mg/kg-day	Sed. Conc., ng/g (dry weight)	Water Conc. type	Water Conc., ng/L	Diss. Water Conc., ng/L
DDE	Organic	72-55-9	6.51E+00	6.40E+00	5.025	0.34	5.00E-04	3.00E+01	Dissolved	6.12E-01	4.71E-01
			6.51E+00	6.40E+00	5.025	0.34	5.00E-04	5.49E+01		1.37E+00	1.05E+00
			6.51E+00	6.40E+00	5.025	0.34	5.00E-04	6.37E+01		1.58E+00	1.22E+00
			6.51E+00	6.40E+00	5.025	0.34	5.00E-04	9.79E+01		3.90E+00	2.99E+00
PCBs (Total)	Organic	1336-36-3	6.30E+00	6.20E+00	2.203	2	2.00E-05	5.10E+01	Dissolved	1.66E+00	1.40E+00
			6.30E+00	6.20E+00	2.203	2	2.00E-05	2.26E+02		8.98E+00	7.55E+00
			6.30E+00	6.20E+00	2.203	2	2.00E-05	2.79E+02		1.11E+01	9.33E+00
			6.30E+00	6.20E+00	2.203	2	2.00E-05	4.01E+02		2.55E+01	2.14E+01

BCF Approach Parameters

Bioconcentration in aquatic species:

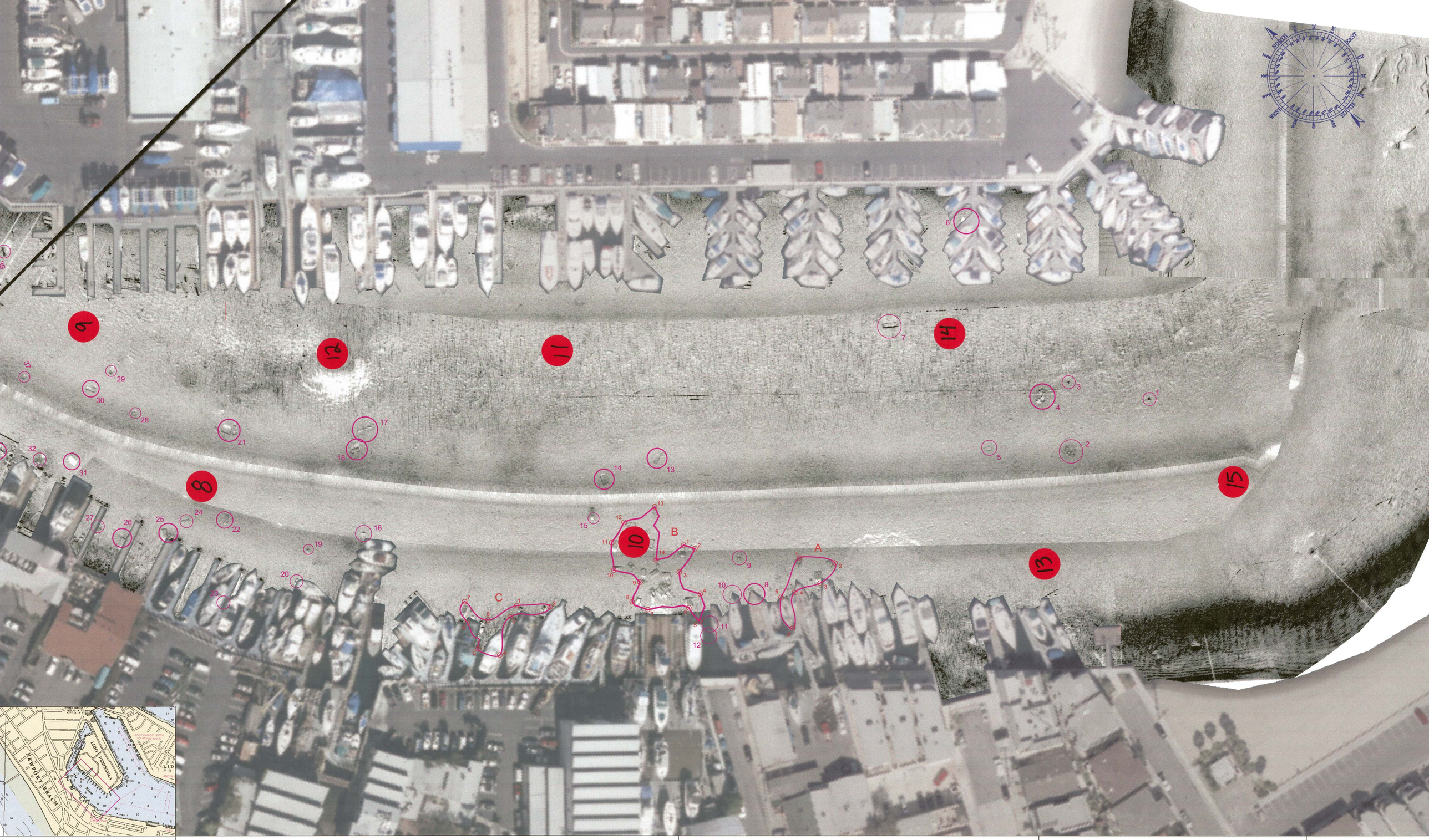
Species	Chemical of Concern	Use in Risk Assess-ment	Calculated Cf, ug/kg (wet weight)	Measured Cf, ug/kg (wet weight)	Conc. for Risk Assessment, ug/kg (wet weight)
Arrow Goby : Example	Copper : Metal	Calculated	5.78E+03		5.78E+03
			1.16E+04		1.16E+04
			2.31E+04		2.31E+04
			3.47E+04		3.47E+04
	Mercury : Metal	Calculated	1.49E+02		1.49E+02
			2.97E+02		2.97E+02
			5.94E+02		5.94E+02
			8.92E+02		8.92E+02
	Selenium : Metal	Calculated	1.00E+02		1.00E+02
			2.00E+02		2.00E+02
			4.00E+02		4.00E+02
			6.00E+02		6.00E+02
Killifish : Rhine	Copper : Metal	Calculated	5.78E+03		5.78E+03
			1.16E+04		1.16E+04
			2.31E+04		2.31E+04
			3.47E+04		3.47E+04
	Mercury : Metal	Calculated	1.49E+02		1.49E+02
			2.97E+02		2.97E+02
			5.94E+02		5.94E+02
			8.92E+02		8.92E+02
	Selenium : Metal	Calculated	1.00E+02		1.00E+02
			2.00E+02		2.00E+02
			4.00E+02		4.00E+02
			6.00E+02		6.00E+02
Diamond Turbot : Rhine	Copper : Metal	Calculated	5.78E+03		5.78E+03
			1.16E+04		1.16E+04
			2.31E+04		2.31E+04
			3.47E+04		3.47E+04
	Mercury : Metal	Calculated	1.49E+02		1.49E+02
			2.97E+02		2.97E+02
			5.94E+02		5.94E+02
			8.92E+02		8.92E+02
	Selenium : Metal	Calculated	1.00E+02		1.00E+02
			2.00E+02		2.00E+02
			4.00E+02		4.00E+02
			6.00E+02		6.00E+02
CA Halibut : Rhine	Copper : Metal	Calculated	5.78E+03		5.78E+03
			1.16E+04		1.16E+04
			2.31E+04		2.31E+04
			3.47E+04		3.47E+04
	Mercury : Metal	Calculated	1.49E+02		1.49E+02
			2.97E+02		2.97E+02
			5.94E+02		5.94E+02
			8.92E+02		8.92E+02
	Selenium : Metal	Calculated	1.00E+02		1.00E+02
			2.00E+02		2.00E+02
			4.00E+02		4.00E+02
			6.00E+02		6.00E+02

Benthic Polychaete : Polychaete	Copper : Metal	Calculated	5.78E+03		5.78E+03
			1.16E+04		1.16E+04
			2.31E+04		2.31E+04
			3.47E+04		3.47E+04
	Mercury : Metal	Calculated	1.49E+02		1.49E+02
			2.97E+02		2.97E+02
			5.94E+02		5.94E+02
			8.92E+02		8.92E+02
	Selenium : Metal	Calculated	1.00E+02		1.00E+02
			2.00E+02		2.00E+02
			4.00E+02		4.00E+02
			6.00E+02		6.00E+02
Benthic Crustacean : Amphipod	Copper : Metal	Calculated	5.78E+03		5.78E+03
			1.16E+04		1.16E+04
			2.31E+04		2.31E+04
			3.47E+04		3.47E+04
	Mercury : Metal	Calculated	1.49E+02		1.49E+02
			2.97E+02		2.97E+02
			5.94E+02		5.94E+02
			8.92E+02		8.92E+02
	Selenium : Metal	Calculated	1.00E+02		1.00E+02
			2.00E+02		2.00E+02
			4.00E+02		4.00E+02
			6.00E+02		6.00E+02
Pelagic Crustacean : Copepod	Copper : Metal	Calculated	5.78E+03		5.78E+03
			1.16E+04		1.16E+04
			2.31E+04		2.31E+04
			3.47E+04		3.47E+04
	Mercury : Metal	Calculated	1.49E+02		1.49E+02
			2.97E+02		2.97E+02
			5.94E+02		5.94E+02
			8.92E+02		8.92E+02
	Selenium : Metal	Calculated	1.00E+02		1.00E+02
			2.00E+02		2.00E+02
			4.00E+02		4.00E+02
			6.00E+02		6.00E+02

Chemicals Parameters:

Chemical of Concern	Type	CAS	BCF	Log(Koc) or Kd	Cancer Slope Factor, 1/(mg/kg-day)	Ref. Dose, mg/kg-day	Sed. Conc., ng/g (dry weight)	Water Conc. Type	Water Conc., ng/L	Diss. Water Conc., ng/L
Copper	Metal	7440-50-8	1000	3.5	-666	-6.66E+02	2.25E+05	Dissolved	5.78E+03	5.78E+03
			1000	3.5	-666	-6.66E+02	6.54E+05		1.16E+04	1.16E+04
			1000	3.5	-666	-6.66E+02	7.68E+05		2.31E+04	2.31E+04
			1000	3.5	-666	-6.66E+02	9.57E+05		3.47E+04	3.47E+04
Mercury	Metal	7439-97-6	30000	4.9	-666	-6.66E+02	2.40E+03	Dissolved	5.00E+00	4.95E+00
			30000	4.9	-666	-6.66E+02	9.00E+03		1.00E+01	9.91E+00
			30000	4.9	-666	-6.66E+02	1.06E+04		2.00E+01	1.98E+01
			30000	4.9	-666	-6.66E+02	1.43E+04		3.00E+01	2.97E+01
Selenium	Metal	7782-49-2	10000	3.6	-666	-6.66E+02	1.27E+03	Dissolved	1.00E+01	1.00E+01
			10000	3.6	-666	-6.66E+02	2.36E+03		2.00E+01	2.00E+01
			10000	3.6	-666	-6.66E+02	2.63E+03		4.00E+01	4.00E+01
			10000	3.6	-666	-6.66E+02	3.12E+03		6.00E+01	6.00E+01

APPENDIX E
RESULTS OF SIDE SCAN SONAR SURVEY



COLOR CODE

GRAPHIC BAR SCALE

40 0 40 80

SCALE: 1" = 40'

LOCATION:	RHINE CHANNEL (1 OF 2) NEWPORT BEACH, CA
SURVEY FOR:	ORANGE COUNTY COASTKEEPER
SURVEY BY:	GAHAGAN & BRYANT ASSOCIATES, INC.
SURVEY DATES:	AUG 04, 2004
PLOT DATE:	AUG 30, 2004

NOTES:

1. SURVEY VESSEL: "WALTER G"
2. SURVEY EQUIPMENT:
   HORIZONTAL: TSS POS/MV.
   VERTICAL: RESON SEABAT 8101.
3. SOUNDING ARE MEASURED IN FEET AND TENTHS AND REFER TO MLLW AS DETERMINED FROM BM "GRANITE PEDESTAL", ELEVATION 8.57' MLLW.
4: THE STATIONING AND HORIZONTAL POSITION ARE BASED ON STATE PLANE COORDINATES REFERENCED TO NAD 83 CALIFORNIA ZONE 6 IN FEET.

DESIGNED BY:

DRAWN BY:

CHECKED BY:

PERMITTEE: SPECIFICATION NUMBER:

COLOR CODE

GRAPHIC BAR SCALE

40 0 40 80

SCALE: 1" = 40'

LOCATION:	RHINE CHANNEL (2 OF 2) NEWPORT BEACH, CA
SURVEY FOR:	ORANGE COUNTY COASTKEEPER
SURVEY BY:	GAHAGAN & BRYANT ASSOCIATES, INC.
SURVEY DATES:	AUG 04, 2004
PLOT DATE:	AUG 30, 2004

NOTES:

1. SURVEY VESSEL: "WALTER G"
2. SURVEY EQUIPMENT:
   HORIZONTAL: TSS POS/MV.
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3. SOUNDING ARE MEASURED IN FEET AND TENTHS AND REFER TO MLLW AS DETERMINED FROM BM "GRANITE PEDESTAL", ELEVATION 8.57' MLLW.
4: THE STATIONING AND HORIZONTAL POSITION ARE BASED ON STATE PLANE COORDINATES REFERENCED TO NAD 83 CALIFORNIA ZONE 6 IN FEET.

DESIGNED BY:

DRAWN BY:

CHECKED BY:

PERMITTEE: SPECIFICATION NUMBER: