ATTACHMENT 2
DATA REQUEST NO. 6

REVISED TABLES 5.6-8 THROUGH 5.6-13
(ABUNDANCE AND BIOMASS DATA FOR 1997 FOR UNITS 1, 2, 3, AND 4)

RESPONSE TO DATA REQUESTS
MARCH 8, 2001

ATTACHMENT 2
DATA REQUEST NO. 6

REVISED TABLES 5.6-8 THROUGH 5.6-13
(ABUNDANCE AND BIOMASS DATA FOR 1997 FOR UNITS 1, 2, 3, AND 4)

Attachment 2 provides revised copies of Tables 5.6-8 through 5.6-13. These tables present abundance and biomass data for 1997 – 1999 for Units 1, 2, 3, and 4. A typographical error is corrected in the footnote to accurately restate the biomass units in kilograms.

TABLE 5.6-8

ABUNDANCE AND BIOMASS OF FISH IMPINGEMENT DURING HEAT TREATMENT AND NORMAL OPERATIONS AT ESGS UNITS 1 AND 2 INTAKE STRUCTURES (1999)[1]

Species (Latin Name)	Units 1 and 2 Heat Treatment		Units 1 and 2 Monitored Normal Operations		Units 1 and 2 Extrapolated Normal Operations		Units 1 and 2 Combined Normal Operations and Heat Treatment	
	Abundance[2]	Biomass[3]	Abundance[2]	Biomass[3]	Abundance[2]	Biomass[3]	Abundance[2]	Biomass[3]
Fish								
Cheilotrema saturnum	33	6.774	-	-	-	-	33	6.744
Porichthys notatus	-	-	1	0.052	31	1.588	31	1.588
Paralabrax clathratus	25	8.357	-	-	-	-	25	8.357
Xenistius californiensis	24	1.678	-	-	-	-	24	1.678
Umbrina roncador	21	3.588	-	-	-	-	21	3.588
Atherinops affinis	8	0.120	-	-	-	-	8	0.120
Phanerodon furcatus	7	1.698	-	-	-	-	7	1.698
Paralabrax nebulifer	5	4.070	-	-	-	-	5	4.070
Embiotoca jacksoni	4	1.969	-	-	-	-	4	1.969
Rhacochilus vacca	2	0.843	-	-	-	-	2	0.843
Anisotremus davidsonii	1	0.134	-	-	-	-	1	0.1334
Balistes polylepis	1	2.000	-	-	-	-	1	2.000
Chromis punctipinnis	1	0.104	-	-	-	-	1	0.104
Hermosilla azurea	1	0.478	-	-	-	-	1	0.478
Myliobatis californica	1	7.000	-	-	-	-	1	7.000
Rhacochilus toxotes	1	0.596	-	-	-	-	1	0.596
Survey Totals	**135**	39.401	1	0.052	31	1.588	166	40.997
Number of species	**15**		1		1		16	
Invertebrates								
Cancer antennarius	2	0.008	11	1.640	336	50.086	338	50.094
Polyorchi penicillata	-	-	1	0.500	31	15.270	31	15.270
Lysmata californica	10	0.022	-	-	-	-	10	0.022

TABLE 5.6-8
(CONTINUED)

Species (Latin Name)	Units 1 and 2 Heat Treatment		Units 1 and 2 Monitored Normal Operations		Units 1 and 2 Extrapolated Normal Operations		Units 1 and 2 Combined Normal Operations and Heat Treatment	
	Abundance[2]	**Biomass[3]**	**Abundance[2]**	**Biomass[3]**	**Abundance[2]**	**Biomass[3]**	**Abundance[2]**	**Biomass[3]**
Invertebrates								
Panilirus interruptus	10	5.420	-	-	-	-	10	5.420
Pachygrapsus crassipes	4	0.010	-	-	-	-	4	0.010
Parastichopus sp.	1	0.068	-	-	-	-	1	0.068
Survey Totals[1,2,& 3]	**27**	**5.528**	**12**	**2.140**	**366**	**65.356**	**393**	**70.884**
Total Species	**5**		**2**				**6**	

Note: Extrapolation based on flow data, using a multiplier (30.54) based on the number of sample days and monthly flow information.

1. Source of table is from NPDES (1999).
2. Abundance is measured in numbers of individuals.
3. Biomass is measured in kilograms.

TABLE 5.6-9

ABUNDANCE AND BIOMASS OF FISH IMPINGEMENT DURING HEAT TREATMENT AND NORMAL OPERATIONS AT ESGS UNITS 3 AND 4 INTAKE STRUCTURES (1999)[1]

Species (Latin Name)	Units 3 and 4 Heat Treatment		Units 3 and 4 Monitored Normal Operations		Units 3 and 4 Extrapolated Normal Operations		Units 3 and 4 Combined Normal Operations and Heat Treatment	
	Abundance[2]	Biomass[3]	Abundance[2]	Biomass[3]	Abundance[2]	Biomass[3]	Abundance[2]	Biomass[3]
Fish								
Anisotremus davidsonii	310	179.020	-	-	-	-	310	179.020
Sardinops sagax	250	11.180	-	-	-	-	250	11.180
Xenistius californiensis	124	7.260	2	0.030	55	0.818	179	8.078
Paralabrax clathratus	126	50.410	-	-	-	-	126	50.410
Cheilotrema saturnum	87	21.760	-	-	-	-	87	21.760
Umbrina roncador	30	7.856	-	-	-	-	30	7.856
Heterostichus rostratus	-	-	1	0.028	27	0.764	27	0.764
Porichthys notatus	-	-	1	0.063	27	1.719	27	1.719
Paralabrax nebulifer	16	7.092	-	-	-	-	16	7.092
Scomber japonicus	15	1.006	-	-	-	-	15	1.006
Embiotoca jacksoni	14	6.318	-	-	-	-	14	6.318
Rhacochilus vacca	14	6.790	-	-	-	-	14	6.790
Chromis punctipinnis	13	0.828	-	-	-	-	13	0.828
Atherinopsis californiensis	12	0.800	-	-	-	-	12	0.800
Medialuna californiensis	12	5.050	-	-	-	-	12	5.050
Rhacochilus toxotes	12	6.620	-	-	-	-	12	6.620
Hypsoblennius gilberti	10	0.040	-	-	-	-	10	0.040
Scorpaena guttata	3	0.678	-	-	-	-	3	0.678
Menticirrhus undulatus	2	1.333	-	-	-	-	2	1.333
Atractoscion nobilis	1	0.799	-	-	-	-	1	0.799
Cephaloscyllium ventriosum	-	-	1	2.500	1	2.500	1	2.500
Heterodontus francisci	1	5.520	-	-	-	-	1	5.520
Rhinobatos productus	1	4.500	-	-	-	-	1	4.500
Triakis semifasciata	1	8.000	-	-	-	-	1	8.000
Survey Totals	**1054**	**332.860**	**5**	**2.621**	**110**	**5.801**	**1164**	**338.661**
Total Species	**21**		**4**		**4**		**24**	

TABLE 5.6-9
(CONTINUED)

Species (Latin Name)	Units 3 and 4 Heat Treatment		Units 3 and 4 Monitored Normal Operations		Units 3 and 4 Extrapolated Normal Operations		Units 3 and 4 Combined Normal Operations and Heat Treatment	
	Abundance[2]	**Biomass[3]**	**Abundance[2]**	**Biomass[3]**	**Abundance[2]**	**Biomass[3]**	**Abundance[2]**	**Biomass[3]**
Invertebrates								
Cancer antennarius	1	0.037	1032	94.850	28153	2587.508	28154	2587.545
Thetys vagina	-	-	2032	91.500	6096	274.500	6096	274.500
Cancer anthonyi	1127	25.250	4	0.300	109	8.184	1236	33.434
Panulirus interruptus	28	15.640	2	0.500	55	13.640	83	29.280
Navanax inermis	3	0.015	2	0.007	55	0.191	58	0.206
Octopus bimaculatus/ bimaculoides	10	9.250	1	1.200	27	32.736	37	41.986
Portunus xantusii	-	-	1	0.018	27	0.491	27	0.491
Pyromaia tuberculata	18	0.056	-	-	-	-	18	0.056
Heptacarpus palpator	10	0.015	-	-	-	-	10	0.015
Penaeus californiensis	1	0.023	-	-	-	-	1	0.023
Survey Totals	**1198**	**50.286**	**3074**	**188.375**	**34522**	**2917.250**	**35720**	**2967.536**
Total Species	**8**		**7**				**10**	

Note: Extrapolation based on flow data, using a multiplier (30.54) based on the number of sample days and monthly flow information.

1. Source of table is from NPDES (1999).
2. Abundance is measured in numbers of individuals.
3. Biomass is measured in kilograms.

TABLE 5.6-10

ABUNDANCE AND BIOMASS OF FISH IMPINGEMENT DURING HEAT TREATMENT AND NORMAL OPERATIONS AT ESGS UNITS 1 AND 2 INTAKE STRUCTURES (1998)[1]

	Units 1 and 2 Heat Treatment		Units 1 and 2 Monitored Normal Operations		Units 1 and 2 Extrapolated Normal Operations		Units 1 and 2 Combined Normal Operations and Heat Treatment	
Species	**Abundance[2]**	**Biomass[3]**	**Abundance[2]**	**Biomass[3]**	**Abundance[2]**	**Biomass[3]**	**Abundance[2]**	**Biomass[3]**
Invertebrates								
Cancer antennarius	-	-	2	0.550	28	7.633	28	7.633
Octopus bimaculatus/ bimaculoides	-	-	1	2.000	14	27.758	14	27.758
Survey Totals Total Species	0 0	0	3 2	2.550	42	35.391	42 2	35.391

Note:

- No heat treatments occurred at Units 1 and 2 during the survey year.
- Extrapolation based on flow data, using a multiplier (30.54) based on the number of sample days and monthly flow information.

1. Source of table is from NPDES (1998).
2. Abundance is measured in numbers of individuals.
3. Biomass is measured in kilograms.

TABLE 5.6-11

ABUNDANCE AND BIOMASS OF FISH IMPINGEMENT DURING HEAT TREATMENT AND NORMAL OPERATIONS AT ESGS UNITS 3 AND 4 INTAKE STRUCTURES (1998)[1]

Species (Latin Name)	Units 3 and 4 Heat Treatment		Units 3 and 4 Monitored Normal Ops		Units 3 and 4 Extrapolated Normal Ops		Units 3 and 4 Combined NO and HT	
	Abundance[2]	Biomass[3]	Abundance[2]	Biomass[3]	Abundance[2]	Biomass[3]	Abundance[2]	Biomass[3]
Fish								
Aterinepsis californiensis	978	94.550	10	0.472	216	10.174	1194	104.724
Seriphus politus	1027	13.920	1	0.036	222	0.776	1049	14.696
Xenistius californiensis	1031	15.840	-	-	-	-	1031	
Sardinops sagax	185	11.250	1	0.037	22	0.798	207	12.048
Anisotremus davidsonii	204	92.322	-	-	-	-	204	92.322
Cheilotrema saturnum	155	13.260	1	0.150	22	3.233	177	16.493
Oxyjulis californica	66	18.386	-	-	-	-	66	18.386
Peprillus simillimus	1	0.333	3	1.309	65	28.215	66	28.548
Embiotica jacksoni	25	0.281	1	0.042	22	0.905	47	1.186
Paralabrax clathratus	46	7.500	-	-	-	-	46	7.500
Heterostichus rostratus	44	1.306	-	-	-	-	44	1.306
Hyperprosopon argenteum	38	11.890	-	-	-	-	38	11.890
Genyonemus lineatus	29	26.130	-	-	-	-	29	26.130
Porichthys notatus	7	3.228	1	0.374	22	8.061	29	11.289
Heterodontus francisci	3	0.107	1	0.032	22	0.690	25	0.797
Pleuronichthys verticalis	3	0.590	1	0.318	22	6.854	25	7.444
Menticirrhus undulatus	2	0.800	1	0.285	22	6.143	24	6.943
Atherinops affinis	-	-	1	0.040	22	0.862	22	0.862
Pleuronichthys ritteri	-	-	1	0.195	222	4.203	22	4.203
Chromis punctipinnis	21	0.260	-	-	-	-	21	0.260
Scorpaena guttata	21	5.660	-	-	-	-	21	5.660

TABLE 5.6-11
(CONTINUED)

Species (Latin Name)	Units 3 and 4 Heat Treatment		Units 3 and 4 Monitored Normal Ops		Units 3 and 4 Extrapolated Normal Ops		Units 3 and 4 Combined NO and HT	
	Abundance[2]	**Biomass[3]**	**Abundance[2]**	**Biomass[3]**	**Abundance[2]**	**Biomass[3]**	**Abundance[2]**	**Biomass[3]**
Atractoscion nobilis	18	2.445	-	-	-	-	18	2.445
Rhacochilus toxotes	18	6.372	-	-	-	-	18	6.372
Scomber japonicus	9	0.935	-	-	-	-	9	0.935
Urolophus halleri	5	3.700	-	-	-	-	5	3.700
Umbrina roncador	4	0.236	-	-	-	-	4	0.236
Paralabrax nebulifer	3	1.580	-	-	-	-	3	1.580
Scorpaenichthys marmoratus	3	1.271	-	-	-	-	3	1.271
Damalichthys vacca	2	0.911	-	-	-	-	2	0.911
Platyrhinoidis triseriata	2	0.012	-	-	-	-	2	0.012
Engraulis mordaxi	1	0.095	-	-	-	-	1	0.095
Girella nigricans	1	0.082	-	-	-	-	1	0.082
Medialuna californiensis	1	0.033	-	-	-	-	1	0.033
Myliobatis californica	1	0.070	-	-	-	-	1	0.070
Paralichthys californicus	1	0.040	-	-	-	-	1	0.040
Sebastes auriculatus	1	0.461	-	-	-	-	1	0.461
Sphoeroides annulatus	-	-	1	0.050	1	0.050	1	0.050
Shyraena argentea	1	0.018	-	-	-	-	1	0.018
Survey Totals **Total Species**	**3957** **35**	**335.874**	**24** **13**	**3.340**	**497**	**70.964**	**4454** **38**	**406.838**
Invertebrates								
Cancer antennarius	10	0.030	194	6.050	4182	130.405	4192	130.435
Cancer anthonyi	842	47.150	15	0.380	323	8.191	1165	55.341
Lysmata californica	53	0.077	-	-	-	-	53	0.077
Octopus bimaculatus/bimaculoides	4	2.070	1	0.220	22	4.742	26	6.812
Pachygrapsus crassipes	30	0.331	-	-	-	-	30	0.331

TABLE 5.6-11
(CONTINUED)

Species (Latin Name)	Units 3 and 4 Heat Treatment		Units 3 and 4 Monitored Normal Ops		Units 3 and 4 Extrapolated Normal Ops		Units 3 and 4 Combined NO and HT	
	Abundance[2]	**Biomass[3]**	**Abundance[2]**	**Biomass[3]**	**Abundance[2]**	**Biomass[3]**	**Abundance[2]**	**Biomass[3]**
Panulirus interruptus	9	7.000	-	-	-	-	9	7.000
Portunus xantusii	12	0.046	1	0.034	22	0.733	34	0.779
Pyromaia tuberculata	-	-	1	0.012	22	0.259	22	0.259
Strongylocentrotus purpuratus	1	0.001	-	-	-	-	1	0.001
Survey Totals	**961**	**56.705**	**212**	**6.696**	**4570**	**144.329**	**5531**	**201.034**
Total Species	**8**		**5**				**9**	

Notes:

- Extrapolation based on flow data, with 237.1 operating days of flow calculated from monthly flow information.
- Note: Extrapolation based on flow data, using a multiplier (30.54) based on the number of sample days and monthly flow information.

1. Source of table is from NPDES (1998).
2. Abundance is measured in numbers of individuals.
3. Biomass is measured in kilograms.

TABLE 5.6-12

ABUNDANCE AND BIOMASS OF FISH AND INVERTEBRATE IMPINGEMENT DURING HEAT TREATMENT AT ESGS UNITS 1 AND 2 AND UNITS 3 AND 4 INTAKE STRUCTURES (1997)[1]

Species (Latin Name)	Units 1 and 2		Units 3 and 4		Total		% Comp.	
	Abundance[2]	Biomass[3]	Abundance[2]	Biomass[3]	Abundance[2]	Biomass[3]	Abundance[2]	Biomass[3]
Fish								
Aterinepsis californiensis	7	1.257	6723	687.915	6730	689.172	32.07	40.29
Seriphus politus	13	1.097	4829	124.028	4842	125.125	23.07	7.32
Xenistius californiensis	10	0.564	2826	150.836	2836	151.400	13.51	8.85
Hyperprosopon argenteum	2	0.144	1262	68.951	1264	69.095	6.02	4.04
Genyonemus lineatus	-	-	1174	64.760	1174	64.760	5.59	3.79
Sardinops sagax	8	0.578	1149	27.066	1157	27.644	5.51	1.62
Engraulis mordax	7	0.153	952	13.607	959	13.760	4.57	0.80
Leuresthes tenuis	-	-	484	7.800	484	7.800	2.31	0.46
Paralabrax clathratus	40	1.466	436	180.488	476	181.954	2.27	10.64
Atherinops affinis	-	-	240	8.329	240	8.329	1.14	0.49
Cheilotrema saturnum	1	0.108	128	20.459	129	20.567	0.61	1.20
Chromis punctipinnis	19	0.728	83	7.370	102	8.098	0.49	0.47
Umbrina roncador	1	0.420	87	11.475	88	11.895	0.42	0.70
Myliobatis californica	2	0.850	76	189.240	78	190.090	0.37	11.11
Paralabrax nebulifer	7	0.276	53	19.9633	60	20.239	0.29	1.18
Damalichthys vacca	2	0.459	56	15.593	58	16.052	0.28	0.94
Anisotremus davidsonii	-	-	48	18.879	48	18.879	0.23	1.10
Scorpaena guttata	1	0.599	38	12.660	39	13.259	0.19	0.78
Cymatogaster aggregata	-	-	30	0.607	30	0.607	0.14	0.04
Rhacochilus toxotes	-	-	27	12.096	27	12.096	0.13	0.71
Phanerodon furcatus	9	0.410	17	1.057	26	1.467	0.12	0.09
Embiotoca jacksoni	5	0.925	16	5.674	21	6.599	0.10	0.39

TABLE 5.6-12
(CONTINUED)

Species (Latin Name)	Units 1 and 2		Units 3 and 4		Total		% Comp.	
	Abundance[2]	Biomass[3]	Abundance[2]	Biomass[3]	Abundance[2]	Biomass[3]	Abundance[2]	Biomass[3]
Atractoscion nobilis	-	-	17	3.995	17	3.995	0.08	0.23
Medialuna californiensis	-	-	15	5.263	15	5.263	0.07	0.31
Peprillus simillimus	-	-	14	0.488	14	0.488	0.07	0.03
Oxyjulis californica	6	0.181	3	0.253	9	0.434	0.04	0.03
Rhinobatos productus	-	-	8	7.844	8	7.844	0.04	0.46
Menticirrhus undulatus	-	-	7	2.374	7	2.374	0.03	0.14
Halichoeres semicinctus	1	0.375	5	1.764	6	2.139	0.03	0.13
Paralichthys californicus	-	-	6	5.630	6	5.630	0.03	0.33
Urolophus halleri	-	-	6	3.221	6	3.221	0.03	0.19
Girella nigricans	-	-	5	3.960	5	3.960	0.02	0.23
Pleuronichthys ritteri	1	0.088	4	0.298	5	0.386	0.02	0.02
Scomber japonicus	-	-	5	0.612	5	0.612	0.02	0.04
Hypsoblennius gilberti	2	0.020	1	0.007	3	0.027	0.01	0.00
Trachurus symmetricus	-	-	3	0.581	3	0.581	0.01	0.03
Scorpaenichthys marmoratus	1	2.636	1	0.510	2	3.146	0.01	0.18
Sebastes auriculatus	2	0.205	-	-	2	0.205	0.01	0.01
Heterodontus francisci	-	-	1	2.6990	1	2.690	0.00	0.16
Mustelus californicus	-	-	1	1.200	1	1.200	0.00	0.07
Paralabrax maculatofasciatus	-	-	1	0.020	1	0.20	0.00	0.00
Platyrhinoidis triseriata	-	-	1	0.841	1	0.841	0.00	0.05
Sebastes rastrelliger	-	-	1	0.373	1	0.373	0.00	0.02
Sphyraena argenta	-	-	1	0.046	1	0.046	0.00	0.00
Stereolepsis gigas	-	-	1	6.100	1	6.100	0.00	0.36
Survey Totals **Total Species**	147 22	13.539	20841 44	1696.923	20988 45	1710.462		
Invertebrates								
Lysmata californica	2704	14.400	177	0.363	2881	14.763	36.45	9.46
Pisaster ochraceus	76	3.757	2132	21.460	2208	25.217	27.94	16.16

TABLE 5.6-12
(CONTINUED)

Species (Latin Name)	Units 1 and 2		Units 3 and 4		Total		% Comp.	
	Abundance[2]	Biomass[3]	Abundance[2]	Biomass[3]	Abundance[2]	Biomass[3]	Abundance[2]	Biomass[3]
Cancer anthonyi	223	37.370	1138	25.385	1351	64.755	17.09	40.21
Pyromaia tuberculata	-	-	704	1.750	704	1.750	8.91	1.12
Cancer antennarius	53	10.550	221	3.530	274	14.080	3.47	9.02
Pachygrapsus crassipes	13	0.178	193	1.396	206	1.576	2.61	0.01
Cancer gracilis	6	0.307	90	1.032	96	1.339	1.21	0.86
Betaeus longidactylus	56	0.096	-	-	56	0.096	0.71	0.06
Octopus bimacul(atus)/loides	16	2.334	19	12.150	35	14.484	0.44	9.28
Panulirus interruptus	4	0.194	24	17.020	28	17.2154	0.35	11.03
Heptacarpus palpator	4	0.004	11	0.082	15	0.086	0.19	0.06
Cancer amphioetus	-	-	12	0.060	12	0.060	0.15	0.04
Portunus xantusii	-	-	10	0.083	10	0.083	0.13	0.05
Loxorhynchus grandis	-	-	6	2.034	6	2.034	0.08	1.30
Parastichopus californicus	5	0.239	1	0.031	6	0.270	0.08	0.17
Navanax inermis	-	-	5	0.041	5	0.041	0.06	0.03
Alpheus sp.	4	0.004	-	-	4	0.004	0.05	0.00
Parastichopus parvimensis	-	-	4	0.124	4	0.124	0.05	0.08
Cancer productus	-	-	2	0.095	2	0.095	0.03	0.06
Cancer jordani	-	-	1	0.004	1	0.004	0.01	0.00
Survey Totals	**3164**	**69.433**	**4740**	**86.640**	**7904**	**156.073**		
Total Species	**12**		**18**		**20**			

Notes:

- Extrapolation based on flow data, with 237.1 operating days of flow calculated from monthly flow information.
- Note: Extrapolation based on flow data, using a multiplier (30.54) based on the number of sample days and monthly flow information.

1. Source of table is from NPDES (1998).
2. Abundance is measured in numbers of individuals.
3. Biomass is measured in kilograms.

TABLE 5.6-13

AVERAGE NUMBER OF FISH AND ASSOCIATED BIOMASS FOR THE SEVEN MOST ABUNDANT FISH IMPINGED COMPARED TO CURRENT FISHING IMPACTS[1]

Species (Latin Name)	Average Impinged/Year[3]	Average Biomass/Year (kg)[3]	Number of Fish Caught Per Fishing Industry			Percent (%) Impinged Commercially
			Commercial Take[4]	Standing Crop[5]	Sport Fishing[6]	
Atherinopsis californiensis	2645	583	564,096	none	none	0.10%
Seriphus politus	2047	112	none	≈100,000,000	none	>0.01%
Xenisitius californiensis	1357	130	unknown	unknown	unknown	unknown
Hyperprosopon argenteum	434	35	49,260	≈100,000,000	none	>0.04%
Genyonemus Lineatus	420	66	163,434	none	none	0.04%
Engraulis mordax	320	37	11,520,040	none	none	>0.01%
Sardinops sagax	161	9	130,443,236	none	none	>0.01%

1 Table provides an average of impinged fish species at the ESGS for years 1997, 1998, and 1999; the numbers are correlated to statistics on commercially important species.
2 Most dominant species that comprise 96% of all species impinged.
3 Data extrapolated to reflect total flow per year.
4 Standing crop = number of individuals estimated in Santa Monica Bay.
5 Sport landing = number of individuals caught at the sport landing.