ASU Seawater Disposal Log

Discharge GPS:
Latitude:
Longitude:

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
13	7	6.3

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) SM4500-O G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
05/23/24	ASU	955	7.75	34.67	19,190	12.0	8.22	3.4	2.0	648.9	498.9	72.5	77.7	9.0	92.0	2140.3		267		Sample at grate located corner driveway
Mean			7.75	34.67	19,190	12.00	8.22	3.4	2.0	649	499	73	78	9.0	92	2140	#DIV/0!	267	#DIV/0!	
Std. Dev.			#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
n=			1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	

Big Island Abalone Corporation Seawater Disposal Log

Discharge GPS:
Latitude: 19° 42'47.88"N
Longitude: 156° 2'41.73"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
293	24	4

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		(2400)	(unit)	(PSU)	(mg/L)	(˚C)	(mg/L)	(mg/L)	(mg/L)	(µg N/L)	(µg N/L)	(µg P/L)	(µg P/L)	(ratio)	(µg N/L)	(µg Si/L)	(mg/L)	(mV)	(kgal/day)	
			SM4500-H+	SM2520-B			G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
03/03/11	BIA #1	950	8.16	34.68	19,196	25.27	5.30	3.8	2.0	115		38		3.0					6367	
05/19/11	BIA #1	1250	8.28	34.79	19,257	18.83	6.16	5.6	2.0	337		68		5.0					7518	
09/01/11	BIA #1	1112	8.56	34.38	19,030	14.33	13.39	6.9	2.0	303		41		7.4					8787	
12/08/11	BIA #1	1040	8.44	34.44	19,063	13.36	11.50	7.0	2.0	287		49		5.9					9097	
02/29/12	BIA #1	1045	8.27	34.81	19,268	16.13	7.74	4.0	2.0	505	233	63	47	8.0	34.0	718			9254	
05/31/12	BIA #1	844	7.99	34.61	19,157	15.94	7.70	5.2	2.0	432	268	77	53	5.6	43.0	1105			9900	
08/02/12	BIA #1	818	7.93	34.59	19,146	15.19	7.48	4.4	2.1	393	177	66	48	6.0	1.0	987			10185	
11/15/12	BIA #1	811	7.83	34.32	18,996	12.87	9.17	2.7	2.0	433	234	75	59	5.8	26.8	1327			10823	
02/20/13	BIA #1	908	7.83	34.83	19,279	14.53	7.81	6.4	2.2	587	296	79	65	7.4	43.0	917			10842	
05/16/13	BIA #1	805	7.86	34.73	19,223	16.70	7.79	7.1	2.8	442	161	81	36	5.5	67.6	1018			10666	
09/04/13	BIA #1 (composite)	813	7.75	34.17	18,913	13.12	8.95	5.0	2.6	3221	3117	308	337	10.5	54.0	934			10833	Problem with recirculation system
12/11/13	BIA #1	807	7.69	34.22	18,941	14.20	7.30	5.4	2.0	1131	933	129	128	8.8	54.4	1128			10097	
02/26/14	BIA #1	812	7.84	34.54	19,118	12.18	8.32	4.8	2.0	336	105	60	42	5.6	55.7	552			11619	
06/19/14	BIA #1	1116	8.39	34.51	19,102	17.16	9.63	3.7	3.8	395	80	58	31	6.8	69.5	610			11170	
09/04/14	BIA #1	821	7.97	34.59	19,146	16.94	7.59	6.3	2.8	557	159	58	22	9.5	58.6	317			11238	
12/17/14	BIA #1	845	7.83	35.04	19,395	11.87	9.60	4.8	2.0	1029	730	47	29	21.8	33.8	583			10958	
03/18/15	BIA #1	848	7.91	34.60	19,151	13.33	9.75	4.7	2.1	2110	45	302	713	7.0	226.6	40			9461	
06/18/15	BIA #1	829	7.94	34.36	19,019	13.05	9.69	4.3	2.0	223	64	46	36	4.9	18.9	529			8851	
08/20/15	BIA #1	816	7.89	34.50	19,096	12.38	9.20	4.8	2.0	1218	1088	59	131	20.6	37.5	967			9185	
12/02/15	BIA #1	832	8.02	34.83	19,279	14.72	8.48	4.4	2.0	601	457	69	58	8.7	22.7	1412			9554	
02/18/16	BIA #1	820	7.91	34.68	19,196	10.33	10.06	4.8	2.0	2583	2526	389	405	6.6	40.0	1969			9054	
06/01/16	BIA #1	8:22	7.84	34.21	18,936	14.11	8.62	4.8	2.0	241	115	47	37	5.2	39.4	1213			8816	
09/07/16	BIA #1	801	8.08	34.21	18,936	15.57	7.20	4.3	2.0	345	145	47	37	7.3	49.7	1632			10030	
12/01/16	BIA #1	812	7.66	34.39	19,035	10.63	8.89	4.3	2.0	279	162	52	43	5.3	73.5	1058			10628	
03/09/17	BIA #1	814	7.73	34.57	19,135	7.93	9.37	5.6	2.0	172	104	38	29	4.5	31.7	723			10573	
05/25/17	BIA #1	816	7.92	34.59	19,146	11.46	8.28	5.1	2.0	211	76	50	34	4.2	39.1	753			10786	
08/31/17	BIA #1	817	7.77	34.27	18,969	11.62	9.44	7.6	2.0	256	92	52	38	4.9	41.3	1021			10383	
12/07/17	BIA #1	901	7.95	34.95	19,345	10.50	9.30	5.2	2.0	193	107	45	35	4.3	31.9	1022			9599	
03/08/18	BIA #1	852	8.13	34.49	19,091	12.90	8.36	14.7	2.0	237	63	41	28	5.8	53.7	566			9557	
06/14/18	BIA #1	827	8.00	35.13	19,445	16.34	9.10	12.8	2.0	231	34	38	20	6.1	38.7	565			9616	
09/12/18	BIA #1	831	7.94	34.30	18,985	13.61	9.22	11.4	4.2	440	97	81	48	5.4	91.5	1283			8824	
12/12/18	BIA #1	829	7.90	34.87	19,301	12.07	8.64	13.9	2.0	306	83	44	14	6.9	1.6	982			9887	
03/07/19	BIA #1	842	7.70	34.90	19,318	10.74	10.02	11.0	2.0	242	145	54	39	4.5	34.6	1126			8730	
06/13/19	BIA #1	832	7.76	34.65	19,179	12.61	9.99	11.8	2.1	274	129	56	39	4.9	20.0	1228			9036	
09/18/19	BIA #1	902	8.02	35.04	19,395	14.44	9.48	6.8	2.0	255	126	52	39	4.9	24.3	1032			9815	
11/01/19	BIA #1	834	7.99	34.83	19,279	12.97	9.64	3.2	2.0	252	155	40	35	6.3	19.6	1223			8853	
03/12/20	BIA #1	840	7.90	34.92	19,329	13.80	9.00	4.6	2.0	233	73	51	33	4.6	42.9	744			8539	
06/18/20	BIA #1	850	7.93	37.02	20,491	13.54	9.84	4.5	2.9	1308	1176	82	72	16.0	43.2	1044			7941	
09/03/20	BIA #1	843	7.94	35.45	19,622	13.99	8.45	5.9		416	119	50	40	8.4	61.5	648	0		8640	BOD - N/A - equipment failure
11/19/20	BIA #1	827	7.85	35.44	19,616	16.6	7.89	3.6	2.5	1647	1490	160	156	10.3	27.6	1104	0		7940	
03/17/21	BIA #1	839	7.94	35.72	19,771	12.9	9.06	4.9	2.6	291	114	42	42	6.9	95.1	878			7446	
05/19/21	BIA #1	834	7.88	35.64	19,727	12.4	9.29	6.6	3.1	388	169	46	49	8.5	119.7	1043			6711	
08/26/21	BIA #1	818	7.83	35.36	19,572	12.7	9.00	4.9	3.2	490	193	107	79	4.6	5.3	1096			6292	
12/02/21	BIA #1	823	7.86	34.78	19,251	11.1	8.81	6.0	3.3	732	465	87	65	8.4	3.9	875			5219	
03/03/21	BIA #1	857	7.83	34.50	19,096	13.1	8.90	8.0	2.1	366	130	70	44	5.3	29.4	1050			4970	
05/19/22	BIA #1	823	7.85	34.48	19,085	14.2	8.91	5.5	2.8	305	130	74	58	4.1	17.2	1340			4916	
08/31/22	BIA #1	828	7.88	34.36	19,019	11.8	9.04	10.8	2.7	607	261	79	53	7.7	84.4	1288			5052	
12/08/22	BIA #1	828	7.78	34.53	19,113	9.1	9.59	4.6	2.0	386	187	118	106	3.3	29.0	1051			5251	
02/08/23	BIA #1	847	7.84	34.51	19,102	10.2	9.73	10.0	2.4	562	246	63	58	8.9	166.5	766			4905	
05/12/23	BIA #1	853	7.73	34.29	18,980	13.2	9.55	4.5	2.0	849	654	116	123	7.3	144.9	1221			4760	
08/30/23	BIA #1	849	7.84	34.49	19,091	12.3	9.66	6.9	2.0	413	99	49	39	8.4	144.6	856				
11/02/23	BIA #1	841	7.95	34.44	19,063	12.8	9.17	8.2	2.8	484	137	73	50	6.6	41.1	1076		96.8		
02/15/24	BIA #1	826	7.72	34.53	19,113	10.8	9.02	15.4	2.9	514	121	88	57	5.8	45.2	912		153.5		back area flooded
05/16/24	BIA #1	846	7.81	34.50	19,096	11.8	9.54	5.2	2.0	365	146	50	43	7.3	60.9	1050		141.8		Lots of flooding all over back algae area.

Big Island Abalone Corporation Seawater Disposal Log

Discharge GPS:
Latitude: 19° 42'47.88"N
Longitude: 156° 2'41.73"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
293	24	4

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H+	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
Mean			7.93	34.71	19,215	13.45	8.94	6.5	2.3	584	364	80	78	7.1	52.8	972	0	131	8783	
Std. Dev.			0.18	0.48	266	2.69	1.20	3.0	0.5	597	597	67	115	3.5	43.4	325	0	30	1955	
n=			54	54	54	54	54	54	53	54	50	54	50	54	50	50	2	3	50	

Big Island Abalone Corporation Seawater Disposal Log

Discharge GPS:
Latitude: 19° 42'50"N
Longitude: 156° 2'46"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
14	10	7

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H+	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
03/03/11	BIA #2	957	7.90	34.63	19,168	17.79	7.37	3.5	2.0	379		78		4.9					1924	
05/19/11	BIA #2	1231	7.94	34.72	19,218	19.64	6.47	3.0	2.0	379		69		5.5					2420	
09/01/11	BIA #2	1121	7.89	34.76	19,240	17.95	7.93	23.0	2.9	633		99		6.4					2989	
12/08/11	BIA #2	1053	7.92	34.62	19,163	17.41	7.97	1.2	7.5	927		126		7.4					3136	
02/29/12	BIA #2	1059	7.98	34.48	19,085	17.26	7.87	3.3	2.0	444	231	63	54	7.0	60.0	1153			3168	
05/30/12	BIA #2	822	7.85	34.63	19,168	17.05	7.50	3.8	2.0	482	282	70	62	6.9	58.8	1265			3256	
08/02/12	BIA #2	826	7.86	34.76	19,240	17.82	6.52	1.5	2.0	408	393	64	41	6.4	12.0	1185			3410	
11/15/12	BIA #2	819	7.83	34.72	19,218	17.41	7.91	3.0	2.0	623	297	73	57	8.5	55.7	1287			3578	
02/20/13	BIA #2	921	7.80	35.03	19,389	17.60	7.38	7.0	3.3	522	233	78	50	6.7	38.1	1155			3572	
05/16/13	BIA #2	813	7.87	34.84	19,284	18.55	6.68	4.2	2.3	453	234	76	35	6.0	44.0	1175			3434	
09/04/13	BIA #2	819	7.80	34.53	19,113	18.38	6.46	3.5	2.0	411	275	75	56	5.5	39.0	1205			3287	
12/11/13	BIA #2	817	7.79	34.33	19,002	17.52	6.90	2.4	2.0	479	368	70	66	6.8	35.0	1186			3083	
02/26/14	BIA #2	818	7.85	34.84	19,284	14.32	8.34	4.2	2.0	386	184	59	42	6.5	35.1	930			3542	
06/19/14	BIA #2	1139	8.31	34.64	19,174	15.64	9.24	4.2	2.0	327	138	67	47	4.9	34.5	1192			3269	
09/04/14	BIA #2	830	7.91	34.51	19,102	14.78	7.69	3.7	2.0	428	152	51	28	8.4	28.7	785			3139	
12/17/14	BIA #2	850	7.82	34.51	19,102	12.62	8.75	4.4	2.0	1005	634	51	35	19.7	32.2	662			3108	
03/18/15	BIA #2	902	7.75	34.62	19,163	15.57	8.70	4.7	2.3	697	65	92	1093	7.6	417.1	40			2792	
06/18/15	BIA #2	835	7.84	33.54	18,565	16.41	8.52	4.3	2.0	336	211	61	55	5.5	26.3	956			2569	
08/20/15	BIA #2	824	7.80	33.80	18,709	17.28	7.70	5.3	2.4	461	136	50	55	9.3	64.2	1139			2643	
12/02/15	BIA #2	838	7.98	34.75	19,234	14.46	8.76	4.5	2.0	531	399	73	65	7.3	25.3	1419			2815	
02/18/16	BIA #2	827	7.78	33.35	18,460	16.02	8.42	4.3	2.4	451	294	76	59	6.0	40.5	1299			2792	
06/01/16	BIA #2	829	7.76	34.26	18,963	17.52	7.50	3.8	2.0	352	258	65	45	5.5	21.7	1261			2719	
09/07/16	BIA #2	809	7.95	34.08	18,864	15.96	7.87	4.2	2.0	633	415	94	66	6.7	29.2	2186			2969	
12/01/16	BIA #2	818	7.79	34.52	19,107	15.01	8.03	3.2	2.0	387	232	55	47	7.0	113.6	1174			3050	
03/09/17	BIA #2	822	7.83	33.04	18,288	14.13	7.75	4.5	2.0	401	213	54	39	7.4	48.6	1048			2969	
05/25/17	BIA #2	822	7.88	34.60	19,151	15.03	7.04	5.0	2.0	316	200	66	44	4.8	32.3	1103			3030	
08/31/17	BIA #2	822	7.86	34.34	19,008	15.43	7.89	5.8	2.0	386	185	66	51	5.8	48.0	1238			2926	
12/07/17	BIA #2	907	7.86	34.50	19,096	14.51	7.57	12.0	2.0	359	201	59	43	6.1	91.3	1151			2799	
03/08/18	BIA #2	858	7.82	33.79	18,703	12.42	8.15	13.0	2.0	418	298	72	60	5.8	69.4	1455			2890	
06/14/18	BIA #2	831	7.93	34.82	19,273	16.90	9.36	13.5	2.0	377	197	58	32	6.5	75.7	976			2868	
09/12/18	BIA #2	837	7.83	34.39	19,035	17.27	8.03	14.9	2.0	470	226	78	52	6.1	133.4	1180			2646	
12/12/18	BIA #2	834	7.82	34.81	19,268	13.87	6.27	7.2	2.0	608	276	75	35	8.1	2.6	1522			2918	
03/07/19	BIA #2	849	7.69	35.07	19,412	15.09	8.20	12.2	2.0	412	260	65	45	6.4	52.4	1290			2667	
06/13/19	BIA #2	839	7.78	34.67	19,190	16.93	8.12	5.1	2.3	442	225	68	44	6.5	76.8	1182			2708	
09/18/19	BIA #2	908	7.92	35.09	19,423	16.98	8.21	12.7	2.0	404	250	68	48	5.9	56.5	1176			2897	
11/01/19	BIA #2	842	7.95	35.05	19,401	16.13	8.35	3.3	2.0	391	255	54	47	7.3	73.8	1259			2489	
03/12/20	BIA #2	848	7.87	35.49	19,644	16.58	8.00	13.5	2.0	375	220	64	46	5.9	52.7	1079			2647	
06/18/20	BIA #2	855	7.90	37.10	20,535	16.74	8.07	4.0	2.5	524	415	69	53	7.6	48.1	1222			2495	
09/03/20	BIA #2	848	7.87	35.70	19,760	16.32	7.35	3.1		506	328	59	53	8.6	81.8	1400	0		2598	BOD - N/A - equipment failure
11/19/20	BIA #2	833	7.83	35.40	19,594	16.2	7.96	2.7	2.0	755	572	88	83	8.6	35.8	1320	0		2414	
03/17/21	BIA #2	844	7.87	35.74	19,782	16.5	7.88	4.2	2.0	378	236	49	48	7.7	82.2	1093			2334	
05/19/21	BIA #2	839	7.82	35.60	19,705	16.5	7.92	4.6	2.2	391	234	45	52	8.6	87.1	1215			2161	
08/26/21	BIA #2	824	7.74	35.34	19,561	17.1	7.80	3.7	3.4	458	241	55	32	8.4	5.5	1266			1952	
12/02/21	BIA #2	828	7.86	34.89	19,312	15.1	8.10	3.1	2.2	486	341	63	54	7.7	22.9	1329			1581	
03/03/22	BIA #2	903	7.73	34.63	19,168	15.0	8.07	5.3	2.3	600	351	104	60	5.7	81.1	1810			1544	
05/19/22	BIA #2	828	7.83	34.59	19,146	17.9	7.66	3.4	2.0	403	207	49	40	8.3	49.6	1110			1583	
08/31/22	BIA #2	833	7.86	34.76	19,240	16.0	8.04	6.0	2.0	500	285	68	56	7.4	90.5	1333			1540	
12/08/22	BIA #2	833	7.84	34.73	19,223	15.7	8.08	3.7	2.0	479	253	65	50	7.4	43.8	1189			1566	
02/08/23	BIA #2	853	7.86	34.55	19,124	17.3	7.83	4.6	2.0	388	240	53	50	7.3	82.4	989			1449	
05/12/23	BIA #2	858	7.77	34.50	19,096	18.1	7.77	7.2	2.0	566	257	66	61	8.6	132.2	1158			1378	
08/30/23	BIA #2	854	7.81	34.61	19,157	17.3	7.89	2.2	2.0	420	273	49	45	8.6	76.4	1141				
11/02/23	BIA #2	847	7.99	34.60	19,151	17.5	7.81	4.2	2.0	412	243	48	43	8.6	44.1	1062		159.9		
02/15/24	BIA #2	830	7.80	34.76	19,240	15.4	8.07	6.5	2.0	522	257	58	42	9.0	56.9	1098		179.4		
05/16/24	BIA #2	857	7.83	34.53	19,113	14.6	8.37	3.6	2.0	470	316	55	54	8.6	58.6	1392		208.7		

Big Island Abalone Corporation Seawater Disposal Log

Discharge GPS:
Latitude: 19° 42'50"N
Longitude: 156° 2'46"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
14	10	7

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H+	SM2520-B			G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
Mean			7.86	34.69	19,200	16.31	7.85	5.6	2.2	477	270	67	70	7.2	62.1	1189	0	183	2674	
Std. Dev.			0.09	0.61	337	1.48	0.63	4.1	0.8	135	99	15	148	2.1	58.7	281	0	25	597	
n=			54	54	54	54	54	54	53	54	50	54	50	54	50	50	2	3	50	

Big Island Abalone Corporation Seawater Disposal Log

Discharge GPS:
Latitude: 19° 42'50"N
Longitude: 156° 2'46"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
12	6	7

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H+	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
03/03/11	BIA #3	1005	7.98	34.68	19,196	20.96	6.64	3.0	2.0	301		66		4.6					675	
05/19/11	BIA #3	1224	7.99	34.89	19,312	20.89	6.36	2.6	2.0	402		85		4.7					853	
09/01/11	BIA #3	1132	8.01	34.81	19,268	19.82	7.28	4.6	2.0	353		51		6.9					1056	
12/08/11	BIA #3	1059	7.94	34.72	19,218	18.90	7.55	5.0	2.0	410		70		5.9					1109	
02/29/12	BIA #3	1107	7.99	34.95	19,345	18.64	7.34	3.1	2.0	413	288	58	65	7.1	75.0	1260			1120	
05/30/12	BIA #3	828	7.93	34.68	19,196	19.09	7.38	3.5	2.0	389	209	59	50	6.6	50.0	913			1148	
08/02/12	BIA #3	831	7.96	34.90	19,318	19.82	6.95	1.8	2.0	368	213	75	53	4.9	48.0	865			1204	
11/15/12	BIA #3	826	7.91	35.06	19,406	19.48	7.35	3.5	2.0	508	244	76	62	6.7	54.4	1030			1262	
02/20/13	BIA #3	924	7.84	35.05	19,401	19.19	6.92	3.4	2.0	415	252	78	56	5.3	44.0	885			1260	
05/16/13	BIA #3	816	7.90	34.86	19,295	20.10	6.55	4.1	2.0	387	184	66	47	5.8	67.1	950			1210	
09/04/13	BIA #3	822	7.87	34.57	19,135	20.04	5.84	3.8	3.1	400	221	72	54	5.6	70.2	1068			1154	
12/11/13	BIA #3	820	7.78	34.35	19,013	19.12	6.20	4.7	2.0	371	222	60	58	6.2	49.5	1047			1083	
02/26/14	BIA #3	820	7.87	34.74	19,229	19.00	6.65	4.9	2.0	396	207	71	55	5.6	54.8	976			1244	
06/19/14	BIA #3	1142	7.83	34.58	19,140	17.81	6.92	3.5	2.0	410	278	80	76	5.1	53.2	1935			1145	
09/04/14	BIA #3	832	7.91	34.74	19,229	19.96	7.19	3.7	2.0	427	204	67	51	6.3	75.8	1024			1097	
12/17/14	BIA #3	852	7.85	35.15	19,456	19.40	6.97	5.1	2.0	505	226	65	49	7.8	41.1	975			1087	
03/18/15	BIA #3	904	7.79	34.57	19,135	19.84	7.07	3.8	2.0	785	36	57	826	13.9	157.9	39			979	
06/18/15	BIA #3	839	7.92	34.44	19,063	20.28	7.38	3.9	2.0	305	188	41	47	7.4	16.9	846			900	
08/20/15	BIA #3	8.28	7.90	34.86	19,295	20.73	6.67	4.2	2.0	376	206	46	42	8.2	19.7	965			925	
12/02/15	BIA #3	842	8.03	34.90	19,318	19.24	7.26	4.3	2.0	332	226	55	46	6.1	66.0	1003			987	
02/18/16	BIA #3	833	7.88	34.50	19,096	18.91	7.52	4.1	2.0	353	210	60	48	5.9	33.5	885			981	
06/01/16	BIA #3	833	7.87	34.41	19,046	19.63	7.12	3.5	2.0	297	215	53	36	5.7	22.5	970			956	
09/07/16	BIA #3	913	8.18	34.70	19,207	20.50	6.82	4.4	2.0	482	303	73	57	6.6	37.7	1484			1041	
12/01/16	BIA #3	823	7.95	34.74	19,229	18.57	7.18	4.5	2.0	279	206	51	43	5.4	35.5	1209			1067	
03/09/17	BIA #3	825	7.96	34.66	19,185	19.29	6.46	5.7	2.0	288	177	50	38	5.7	51.9	843			1038	
05/25/17	BIA #3	825	7.95	34.48	19,085	20.65	5.95	5.6	2.0	262	152	58	41	4.5	52.6	739			1059	
08/31/17	BIA #3	827	7.95	34.59	19,146	21.33	6.18	4.7	2.0	310	160	61	48	5.1	67.9	796			1023	
12/07/17	BIA #3	911	7.98	35.18	19,473	21.09	5.65	12.1	2.0	256	145	52	37	4.9	60.1	660			981	
03/08/18	BIA #3	904	7.94	34.82	19,273	18.74	6.64	14.6	2.0	286	166	54	43	5.3	74.0	786			1014	
06/14/18	BIA #3	836	7.95	35.01	19,378	20.98	8.34	12.7	2.0	314	164	53	35	6.0	44.1	742			1006	
09/12/18	BIA #3	844	7.94	34.58	19,140	21.79	6.43	5.4	2.0	297	179	54	40	5.5	69.4	859			928	
12/12/18	BIA #3	839	7.96	35.03	19,389	19.60	4.75	4.5	2.0	355	195	52	26	6.8	1.6	921			1023	
03/07/19	BIA #3	853	7.86	35.09	19,423	19.62	7.10	13.3	2.0	273	168	54	39	5.0	39.6	814			937	
06/13/19	BIA #3	845	7.99	34.75	19,234	21.30	6.83	5.4	2.0	295	173	57	35	5.2	36.6	863			950	
09/18/19	BIA #3	911	7.98	35.19	19,478	21.46	6.84	5.9	2.0	325	187	56	38	5.8	42.4	886			1015	
11/01/19	BIA #3	847	7.97	35.15	19,456	18.42	7.39	2.8	2.0	349	254	55	51	6.3	45.8	1211			870	
03/12/20	BIA #3	852	7.99	35.68	19,749	19.81	7.05	13.2	2.0	230	154	45	37	5.1	35.3	727			931	
06/18/20	BIA #3	859	7.99	37.06	20,513	20.54	6.95	3.5	2.0	279	189	51	37	5.5	50.5	838			878	
09/03/20	BIA #3	851	7.97	35.74	19,782	21.39	6.23	3.0		328	182	41	39	8.0	26.7	791	0		912	BOD - N/A - equipment failure
11/19/20	BIA #3	837	7.98	35.39	19,589	20.7	7.30	5.3	2.0	416	203	47	39	8.9	26.0	846	0		848	
3/177/21	BIA #3	848	8.00	35.77	19,799	20.4	7.38	4.3	2.0	260	150	37	33	7.0	51.4	707			822	
05/19/21	BIA #3	841	7.95	35.56	19,683	21.0	7.33	3.1	2.0	241	137	26	27	9.3	23.3	660			762	
08/26/21	BIA #3	827	7.83	35.39	19,589	19.0	7.33	3.7	2.0	365	234	43	35	8.6	1.7	1073			686	
12/02/21	BIA #3	832	7.93	34.96	19,351	19.1	7.35	2.2	2.0	381	239	45	39	8.5	11.9	1061			555	
03/03/22	BIA #3	907	7.87	34.68	19,196	17.4	7.85	3.5	2.0	410	266	72	54	5.7	24.9	1279			543	
05/19/22	BIA #3	831	7.88	34.59	19,146	18.2	6.96	4.3	2.0	350	228	44	40	7.9	12.2	1096			558	
08/31/22	BIA #3	836	7.93	34.85	19,290	18.6	7.70	3.0	2.0	367	242	37	33	10.0	4.7	952			541	
12/08/22	BIA #3	836	7.99	34.78	19,251	21.6	7.17	4.9	2.0	349	131	34	20	10.4	36.5	625			549	
02/08/23	BIA #3	856	7.94	34.55	19,124	20.4	7.34	4.2	2.0	287	159	43	39	6.7	59.5	690			508	
05/12/23	BIA #3	901	7.88	34.58	19,140	21.8	7.25	5.9	2.0	277	133	32	30	8.6	65.7	652			483	
08/30/23	BIA #3	858	7.89	34.67	19,190	21.0	7.44	3.4	2.0	352	181	39	35	9.1	70.6	786				
11/02/23	BIA #3	854	8.06	34.75	19,234	21.2	7.29	2.2	2.0	348	182	36	33	9.7	26.2	788		186.3		
02/15/24	BIA #3	833	7.93	34.93	19,334	20.5	7.31	3.3	2.0	313	155	35	26	9.1	24.6	6679		185.2		
05/16/24	BIA #3	901	7.96	34.62	19,163	21.3	7.34	3.3	2.0	302	149	31	31	9.8	30.6	669		208.9		

Big Island Abalone Corporation Seawater Disposal Log

Discharge GPS:
Latitude: 19° 42'50"N
Longitude: 156° 2'46"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
12	6	7

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H+	SM2520-B			G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
Mean			7.93	34.91	19,321	19.97	6.97	4.9	2.0	354	195	54	58	6.8	44.8	1027	0	193	939	
Std. Dev.			0.07	0.45	247	1.09	0.60	2.9	0.2	87	47	14	111	1.9	25.8	857	0	13	210	
n=			54	54	54	54	54	54	53	54	50	54	50	54	50	50	2	3	50	

Big Island Abalone Corporation Seawater Disposal Log

Discharge GPS:
Latitude: 19° 42'51"N
Longitude: 156° 2'46"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
14	12	7

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		(2400)	(unit)	(PSU)	(mg/L)	(˚C)	(mg/L)	(mg/L)	(mg/L)	(µg N/L)	(µg N/L)	(µg P/L)	(µg P/L)	(ratio)	(µg N/L)	(µg Si/L)	(mg/L)	(mV)	(kgal/day)	
			SM4500-H+	SM2520-B			G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
03/03/11	BIA #4	1014	7.94	34.57	19,135	14.36	7.91	2.5	2.0	412		70		5.9					1561	
05/19/11	BIA #4	1214	8.03	34.91	19,323	19.83	6.69	2.9	2.0	354		56		6.3					1960	
09/01/11	BIA #4	1138	7.95	34.83	19,279	18.10	7.91	4.0	2.0	392		54		7.3					2416	
12/08/11	BIA #4	1104	7.94	34.76	19,240	17.52	7.75	1.3	11.8	1565		241		6.5					2534	
02/29/12	BIA #4	1109	7.93	34.99	19,367	17.07	7.62	3.2	6.4	701	392	77	53	9.1	33.0	1113			2560	
05/30/12	BIA #4	833	7.92	34.70	19,207	17.57	7.71	2.6	2.0	411	263	58	50	7.1	39.5	1171			2635	
08/02/12	BIA #4	839	7.94	34.84	19,284	18.44	7.40	1.8	2.0	376	262	65	51	5.8	17.0	1084			2758	
11/15/12	BIA #4	830	7.94	35.02	19,384	18.65	7.72	2.5	2.0	470	261	62	49	7.6	30.3	1079			2895	
02/20/13	BIA #4	927	7.86	35.05	19,401	17.90	7.26	1.9	2.0	401	274	59	49	6.8	39.0	1067			2890	
05/16/13	BIA #4	820	7.94	34.85	19,290	18.82	7.01	13.2	2.2	345	223	61	46	5.6	25.4	1122			2780	
09/04/13	BIA #4	826	7.87	34.56	19,129	19.33	6.21	3.5	2.0	496	237	80	56	6.2	47.1	1068			2666	
12/11/13	BIA #4	823	7.78	34.90	19,318	18.42	6.90	2.7	2.0	370	241	95	53	3.9	23.4	1127			2500	
02/26/14	BIA #4	823	7.87	34.80	19,262	17.73	7.87	2.3	2.0	443	246	78	59	5.7	22.6	1106			2873	
06/19/14	BIA #4	1145	7.85	34.58	19,140	18.83	6.29	3.1	2.8	413	252	85	66	4.9	32.7	1623			2655	
09/04/14	BIA #4	835	7.92	34.75	19,234	18.17	7.23	3.7	2.0	472	275	86	65	5.5	60.0	1248			2553	
12/17/14	BIA #4	857	7.77	35.02	19,384	16.98	7.50	5.1	2.0	527	305	68	67	7.7	42.7	1288			2526	
03/18/15	BIA #4	907	7.71	34.63	19,168	17.98	7.64	3.0	2.8	745	54	83	1125	9.0	225.4	62			2267	
06/18/15	BIA #4	844	7.76	34.55	19,124	18.42	7.40	4.0	2.2	505	253	114	86	4.4	24.1	1033			2087	
08/20/15	BIA #4	832	7.74	34.80	19,262	18.41	6.96	4.0	2.0	504	289	76	68	6.6	73.7	1275			2147	
12/02/15	BIA #4	832	8.02	34.83	19,279	14.72	8.48	4.4	2.0	601	457	69	58	8.7	22.7	1412			2286	
02/18/16	BIA #4	835	7.77	34.48	19,085	17.43	7.48	4.5	2.3	470	275	82	52	5.8	47.5	1081			2263	
06/01/16	BIA #4	838	7.74	34.43	19,057	17.78	7.28	2.8	2.0	388	184	68	46	5.7	42.4	1229			2204	
09/07/16	BIA #4	818	7.96	34.68	19,196	17.44	7.26	3.6	2.0	666	459	112	76	6.0	18.8	2097			2410	
12/01/16	BIA #4	827	7.87	34.71	19,212	16.74	7.67	1.3	2.0	362	250	63	55	5.7	60.9	1323			2479	
03/09/17	BIA #4	829	7.91	34.61	19,157	16.79	6.76	4.7	2.0	375	253	64	51	5.8	81.9	1168			2415	
05/25/17	BIA #4	829	7.88	34.51	19,102	17.58	6.08	5.4	2.0	440	243	82	60	5.4	87.5	1139			2464	
08/31/17	BIA #4	831	7.84	34.69	19,201	18.97	6.51	3.4	2.0	454	228	72	51	6.3	89.0	1077			2379	
12/07/17	BIA #4	915	7.89	35.12	19,439	18.05	5.91	6.1	2.0	403	235	67	46	6.0	102.5	1037			2274	
03/08/18	BIA #4	908	7.87	34.71	19,212	17.01	6.86	4.1	2.0	415	231	64	54	6.5	101.9	1053			2345	
06/14/18	BIA #4	839	7.85	35.02	19,384	18.66	8.53	4.8	2.0	429	240	61	41	7.0	88.2	1053			2327	
09/12/18	BIA #4	848	7.87	34.57	19,135	19.88	7.07	4.9	2.0	404	229	71	54	5.7	93.6	1081			2147	
12/12/18	BIA #4	842	7.91	35.03	19,389	18.59	5.04	4.2	2.0	449	230	68	36	6.6	2.6	1071			2369	
03/07/19	BIA #4	900	7.70	35.11	19,434	17.62	7.30	4.2	2.0	355	240	56	44	6.3	64.5	1112			2163	
06/13/19	BIA #4	850	7.88	34.74	19,229	18.95	7.04	3.4	2.0	362	247	60	44	6.0	69.6	1195			2197	
09/18/19	BIA #4	914	7.92	35.17	19,467	18.67	7.59	3.7	2.0	394	276	79	62	5.0	42.0	1262			2352	
11/01/19	BIA #4	850	7.97	35.20	19,484	17.82	7.86	2.1	2.0	399	289	64	56	6.3	52.5	1298			2024	
03/12/20	BIA #4	855	7.56	35.68	19,749	16.86	7.81	3.2	2.0	378	272	67	56	5.7	62.6	1225			2146	
06/18/20	BIA #4	902	7.89	37.07	20,519	17.59	7.41	4.0	2.4	462	290	76	56	6.0	108.0	1264			2021	
09/03/20	BIA #4	854	7.89	35.73	19,777	18.57	6.68	4.2		512	285	50	54	10.2	100.8	1180	0		2108	BOD - N/A - equipment failure
11/19/20	BIA #4	840	7.81	35.42	19,605	17.7	7.40	4.1	2.0	573	311	72	61	8.0	88.7	1292	0		1958	
03/17/21	BIA #4	852	7.86	35.73	19,777	17.9	7.45	5.2	2.0	533	253	67	60	8.0	184.3	1121			1891	
05/19/21	BIA #4	844	7.82	35.61	19,711	17.8	7.54	4.4	2.0	358	255	48	53	7.5	95.0	1183			1749	
08/26/21	BIA #4	829	7.77	35.37	19,578	18.1	7.47	4.7	2.0	448	275	56	49	8.0	46.1	1234			1583	
12/02/21	BIA #4	836	7.89	34.92	19,329	17.7	7.52	3.1	2.0	439	282	60	52	7.3	49.8	1276			1283	
03/03/22	BIA #4	911	7.88	34.77	19,246	19.2	7.41	3.5	2.0	399	210	40	52	10.0	56.4	984			1252	
05/19/22	BIA #4	836	7.88	34.61	19,157	19.7	7.39	5.6	2.0	374	189	51	37	7.3	46.0	858			1282	
08/31/22	BIA #4	840	7.89	34.86	19,295	18.5	7.51	3.5	2.0	381	255	44	40	8.6	42.4	948			1249	
12/08/22	BIA #4	839	7.88	34.81	19,268	16.6	7.81	3.8	2.0	457	297	51	46	8.9	42.4	1349			1271	
02/08/23	BIA #4	859	7.83	34.58	19,140	15.8	7.92	3.8	2.0	495	326	74	71	6.7	99.9	1367			1176	
05/12/23	BIA #4	906	7.78	34.69	19,201	18.3	7.59	2.3	2.0	384	258	46	49	8.4	84.2	1142			1119	
08/30/23	BIA #4	902	7.79	34.65	19,179	17.0	7.77	10.2	3.0	686	310	72	51	9.5	139.6	1304				
11/02/23	BIA #4	857	7.97	34.70	19,207	18.0	7.53	1.3	2.0	427	289	50	57	8.6	47.8	1198		162.3		
02/15/24	BIA #4	835	7.85	34.83	19,279	16.9	7.73	2.9	2.0	420	282	49	43	8.6	38.7	1137		160.2		
05/16/24	BIA #4	903	7.87	34.68	19,196	18.7	7.48	3.9	2.0	424	226	41	44	10.2	59.1	1011		193.6		

Big Island Abalone Corporation Seawater Disposal Log

Discharge GPS:
Latitude: 19° 42'51"N
Longitude: 156° 2'46"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
14	12	7

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H+	SM2520-B			G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
Mean			7.86	34.92	19,326	17.89	7.32	3.9	2.3	471	265	70	75	6.9	63.9	1165	0	172	2169	
Std. Dev.			0.08	0.43	241	1.08	0.62	1.9	1.5	177	60	28	152	1.5	41.4	244	0	19	484	
n=			54	54	54	54	54	54	53	54	50	54	50	54	50	50	2	3	50	

Blue Ocean Mariculture LLC Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'20.94"N
Longitude: 156° 3'19.02"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
29	16	8

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		(2400)	(unit)	(PSU)	(mg/L)	(˚C)	(mg/L)	(mg/L)	(mg/L)	(µg N/L)	(µg N/L)	(µg P/L)	(µg P/L)	(ratio)	(µg N/L)	(µg Si/L)	(mg/L)	(mV)	(kgal/day)	
			SM4500-H+	SM2520-B			G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
10/21/10	Kona Blue Composite	945	8.16					0.8	2.0	151	13.6	16	4.7	9.4	39	38.1			705	
02/10/11	KPH (SE)	944	8.18	35.00	19,373	25.09	5.73	1.8	2.0	222		29		7.7					854	
05/18/11	KPH (SE)	927	8.20	34.89	19,312	26.20	6.58	4.6	2.0	109		20		5.5					1326	
09/14/11	KPH (SE)	910	8.08	34.87	19,301	26.50	6.37	1.9	2.0	204		22		9.3					1308	
12/07/11	KPH (SE)	1018	7.97	34.85	19,290	25.12	6.37	0.9	2.0	162		38		4.3					525	
03/08/12	KPH (SE)	815	8.01	34.89	19,312	24.03	5.03	1.6	2.0	151	25	46	22	3.3	54	67			408	
06/06/12	BOM (SE)	844	8.18	34.94	19,340	25.50	5.92	2.0	2.0	189	16	26	10	7.3	41	53			453	
08/09/12	BOM (SE)	908	8.11	35.29	19,533	26.66	6.48	2.3	2.0	356	37	65	36	5.5	133	90			416	
11/21/12	BOM (SE)	1007	8.21	35.47	19,633	25.89	6.02	2.1	2.8	88	46	15	12	5.9	51	53			522	
02/28/13	BOM (SE)	929	8.09	35.43	19,611	24.40	6.29	3.7	2.0	319	24	54	25	5.9	63	44			690	
05/30/13	BOM (SE)	859	8.16	35.02	19,384	27.03	4.80	4.2	2.0	193	31	18	14	10.7	52	52			486	
09/05/13	BOM (SE)	901	8.10	34.87	19,301	27.04	5.96	4.1	2.0	264	17	48	19	5.5	33.0	63			531	
12/18/13	BOM (SE)	931	8.13	35.01	19,378	25.82	5.64	5.7	2.1	154	14	18	11	8.6	15.0	85			656	
03/06/14	BOM (SE)	851	8.09	34.88	19,306	25.23	5.50	4.6	2.0	237	17	27	13	8.9	53.0	59			393	
06/19/14	BOM (SE)	857	8.04	34.61	19,157	26.42	6.75	3.8	2.0	263	23	80	18	3.3	24.1	83			614	
09/25/14	BOM (SE)	905	8.14	35.14	19,450	28.15	4.27	3.9	2.0	251	27	24	5	10.5	25.9	11			668	
12/18/14	BOM (SE)	955	8.00	35.38	19,583	25.65	6.80	2.9	2.0	244	32	47	33	5.2	82.7	3			290	
03/12/15	BOM (SE)	1122	8.12	34.75	19,234	25.56	6.50	2.3	2.0	283	39	104	44	2.7	77.7	141			410	
06/05/15	BOM (SE)	950	8.04	34.57	19,135	27.10	6.65	4.1	2.0	300	78	30	30	9.9	36.8	1483			309	
09/10/15	BOM (SE)	947	8.08	34.93	19,334	26.98	6.27	3.5	2.0	372	117	17	23	22.1	64.9	499			275	
12/09/15	BOM (SE)	910	8.10	34.20	18,930	25.39	6.32	3.5	2.0	352	64	92	63	3.8	140.8	391			411	
02/25/16	BOM (SE)	1007	8.19	34.56	19,129	24.52	7.06	7.8	3.1	612	27	192	139	3.2	183.4	142			944	
06/01/16	BOM (SE)	1053	8.22	34.41	19,046	26.68	5.41	5.5	2.0	131	16	39	14	3.3	1.0	217			746	
08/26/16	BOM (SE)	839	8.36	34.20	18,930	26.21	6.41	4.5	2.0	401	77	53	6	7.6	51.0	694			943	
12/01/16	BOM (SE)	1003	8.08	34.86	19,295	24.61	5.99	5.4	2.0	231	29	74	63	3.1	151.4	361			1107	
03/09/17	BOM (SE)	901	8.06	34.41	19,046	24.20	5.18	4.2	2.0	325	41	49	30	6.7	170.2	293			909	
05/24/17	BOM (SE)	848	8.08	34.65	19,179	24.71	5.05	5.0	2.0	145	33	20	10	7.3	39.7	253			1217	
08/24/17	BOM (SE)	903	8.01	34.23	18,947	23.98	5.42	5.0	2.0	245	110	36	14	6.8	39.8	610			819	
12/07/17	BOM (SE)	937	8.10	35.27	19,522	24.14	4.51	10.0	2.0	154	50	22	13	7.0	34.4	323			1241	
03/08/18	BOM (SE)	1018	8.07	34.99	19,367	23.83	5.83	12.2	2.0	126	7	20	12	6.4	49.5	147			1109	
05/08/18	BOM (SE)	941	8.12	34.50	19,096	25.64	5.62				15		10		45.3	265				1st BAP sampling
06/14/18	BOM (SE)	1056	7.88	35.11	19,434	24.45	5.89	18.6	6.3	652	76	179	112	3.7	414.2	436			463	
07/12/18	BOM (SE)	919	8.13	34.69	19,201	26.06	6.22				103		30		27.3	376				monthly BAP testing
08/13/18	BOM (SE)	939	8.13	34.57	19,135	25.01	5.82				89		15		21.1	430				monthly BAP testing
09/10/18	BOM (SE)	847	8.05	34.60	19,151	25.76	6.25	6.3	2.0	204	70	48	35	4.2	57.9	452			1177	
10/11/18	BOM (SE)	905	8.11	34.78	19,251	25.80	4.93				57		18		30.5	395				monthly BAP testing
11/02/18	BOM (SE)	902	8.04	34.71	19,212	25.01	6.23				87		16		32.5	516				monthly BAP testing
12/13/18	BOM (SE)	834	8.12	34.99	19,367	24.55	5.78	3.9	2.0	144	39	19	9	7.6	17.0	293			1315	
01/15/19	BOM (SE)	923	8.17	34.74	19,229	23.86	6.14				32		20		40.8	320				monthly BAP testing
02/13/19	BOM (SE)	944	7.78	35.56	19,683	23.10	6.60				48		170		418.9	298				monthly BAP testing
03/01/19	BOM (SE)	913	8.17	34.64	19,174	24.32	6.50	3.7	2.0	90	6	18	12	5.1	32.2	93			1031	
04/25/19	BOM (SE)	903	8.05	35.24	19,506	25.88	6.37				1		6		5.4	120				monthly BAP testing
05/07/19	BOM (SE)	949	8.08	35.50	19,650	25.58	6.26				3		18		48.3	108				monthly BAP testing
06/05/19	BOM (SE)	903	8.14	35.69	19,755	25.51	6.39	5.4	2.0	157	46	34	18	4.6	10.9	227			745	
07/17/19	BOM (SE)	841	7.84	35.57	19,688	25.97	6.66				42		20		190.1	360				monthly BAP testing
08/23/19	BOM (SE)	1414	7.96	35.14	19,450	25.95	6.04				85		47		186.8	530				monthly BAP testing
09/12/19	BOM (SE)	916	8.05	34.89	19,312	25.09	7.32	3.7	2.0	229	93	33	19	6.9	54.1	544			1222	
10/16/19	BOM (SE)	911	7.93	35.28	19,528	25.81	6.25				82		17		16.4	498				monthly BAP testing
11/06/19	BOM (SE)	916	8.06	35.41	19,600	25.67	6.22	2.9	2.1	1031	64	209	21	4.9	20.6	421			1056	
12/17/19	BOM (SE)	844	8.05	34.86	19,295	25.70	6.39				43		28		80.0	296				monthly BAP testing
01/09/20	BOM (SE)	929	7.68	34.97	19,356	24.52	6.85				49		62		528.8	262				monthly BAP testing
02/04/20	BOM (SE)	944	8.15	35.43	19,611	23.88	6.20				50		12		15.2	294				monthly BAP testing
03/11/20	BOM (SE)	855	8.10	35.91	19,877	24.51	6.16	5.8	2.0	150	-12	29	18	5.3	49.2	104			1461	

Discharge GPS:
Latitude: 19°43'20.94"N
Longitude: 156° 3'19.02"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
29	16	8

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H+	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
04/01/20	BOM (SE)																			No sampling - COVID-19
05/21/20	BOM (SE)	1051	8.08	35.79	19,810	26.03	6.33				-5		6		132.2	114				monthly BAP testing
06/26/20	BOM (SE)	25.51	8.02	35.63	19,722	25.51	6.84	5.2	2.5	240	17	39	9	6.1	110.1	216			890	
07/14/20	BOM (SE)	951	7.86	33.80	18,709	25.23	6.97				62		83		286.4	347				monthly BAP testing
08/25/20	BOM (SE)	901	7.95	35.86	19,849	24.46	6.77				88		90		27.8	456				monthly BAP testing
09/16/20	BOM (SE)	933	8.01	35.51	19,655	25.19	5.20	3.1		255	30	23	27	11.0	48.8	196	0		1298	BOD - N/A - equipment failure
10/14/20	BOM (SE)	936	7.99	35.30	19,539	25.5	7.13				59		17		79.3	299				monthly BAP, ongoing constrution to reconfigure sump flow
11/04/20	BOM (SE)	1108	7.99	35.38	19,583	25.1	6.85				97		14		104.5	460				monthly BAP testing
12/02/20	BOM (SE)	833	7.98	35.48	19,639	25.4	7.02	3.5	2.0	301	43	25	19	12.2	88.7	228	0		938	
01/14/21	BOM (SE)	907	8.03	35.87	19,854	24.5	6.93				64		11		50.5	294				monthly BAP testing
02/11/21	BOM (SE)	955	8.07	35.73	19,777	24.8	7.33				23		9		43.8	222				monthly BAP testing
03/25/21	BOM (SE)	1101	7.99	35.76	19,794	25.0	7.04	2.9	2.0	206	5	16	11	13.3	68.4	79			879	
04/13/21	BOM (SE)	927	8.01	35.53	19,666	24.9	7.01				11		13		62.6	78				monthly BAP testing
05/06/21	BOM (SE)	1016	7.95	35.58	19,694	23.7	6.68	5.2	2.46	427	62	99	103	4.3	189.4	376			875	
06/22/21	BOM (SE)	1006	7.84	35.70	19,760	22.5	6.97				126		23		31.0	700				monthly BAP testing
07/01/21	BOM (SE)	1401	7.89	35.90	19,871	25.4	7.04				21		12		56.6	215				monthly BAP testing
08/13/21	BOM (SE)	924	7.76	35.39	19,589	23.3	7.69	4.3	3.1	456	123	43	28	10.6	102.9	562			1221	
09/07/21	BOM (SE)	930	7.45	35.38	19,583	21.1	7.86				198		59		326.4	836				monthly BAP testing
10/19/21	BOM (SE)	1402	7.88	35.54	19,672	25.2	6.57				282		11		42.6	43				monthly BAP testing
11/30/21	BOM (SE)	1141	8.02	35.04	19,395	25.5	6.78				45		21		70.8	281				monthly BAP testing
12/08/21	BOM (SE)	916	8.04	35.05	19,401	25.3	6.85	4.8	2.0	276	29	21	15	12.9	87.4	190			1049	
01/27/22	BOM (SE)	1008	8.05	33.60	18,598	22.7	7.10				140		39		2.6	1303				monthly BAP testing
02/03/22	BOM (SE)	905	7.98	34.86	19,295	23.7	7.10				57		8		73.2	321				monthly BAP testing
03/09/22	BOM (SE)	843	8.00	34.94	19,340	24.9	6.97	2.2	2.0	248	25	17	11	14.7	78.2	184			1370	
04/12/22	BOM (SE)	1022	7.97	34.86	19,295	24.2	7.14				50		21		51.1	320				monthly BAP testing
05/10/22	BOM (SE)	917	7.97	34.52	19,107	23.9	7.23				71		24		46.7	310				monthly BAP testing
06/15/22	BOM (SE)	939	7.87	34.39	19,035	23.5	6.71	6.8	2.5	727	126	93	62	7.9	252.3	616			1790	
07/21/22	BOM (SE)	1012	7.94	34.84	19,284	25.5	6.82				36		39		49.3	256				monthly BAP testing
08/05/22	BOM (SE)	917	7.90	34.79	19,257	24.7	6.90	4.5	2.0	272	66	24	13	11.1	76.3	384			973	
09/08/22	BOM (SE)	953	7.98	34.88	19,306	25.3	6.78				64		63		320.2	416				monthly BAP testing
10/12/22	BOM (SE)	1009	7.99	34.78	19,251	25.9	6.83				45		13		60.0	293				monthly BAP testing
11/16/22	BOM (SE)	941	8.02	34.82	19,273	26.1	7.38				31		12		75.1	238				monthly BAP testing
12/08/22	BOM (SE)	1032	7.97	34.86	19,295	22.5	6.65	5.4	2.0	259	120	24	16	10.6	21.2	719			1892	
01/17/23	BOM (SE)	924	8.00	34.88	19,306	24.1	7.11				46		31		105.3	279				monthly BAP testing
02/03/23	BOM (SE)	1101	8.03	34.58	19,140	23.7	7.04	5.3	2.0	259	68	32	25	8.2	89.2	356			1718	
03/10/23	BOM (SE)	1047	8.08	34.74	19,229	23.8	6.94				9		11		25.1	132				monthly BAP testing
04/21/23	BOM (SE)	923	7.80	34.60	19,151	24.2	6.74				44		22		35.7	301				monthly BAP testing
05/05/23	BOM (SE)	1109	8.04	34.56	19,129	24.9	6.61	5.2	3.3	387	49	80	86	4.9	288.7	288			1418	
06/30/23	BOM (SE)	916	8.00	34.80	19,262	26.2	6.82				8		13		40.8	125				monthly BAP testing
07/12/13	BOM (SE)	1458	7.95	34.52	19,107	26.4	6.86				10		40		61.1	119				monthly BAP testing
08/04/23	BOM (SE)	1013	8.04	34.16	18,908	25.8	6.74				65		14		29.9	554				monthly BAP testing
09/07/23	BOM (SE)	836	7.78	34.72	19,218	26.3	6.19	11.6	3.9	778	20	91	58	8.6	405.5	132		-91.9		
10/26/23	BOM (SE)	1208	8.04	34.72	19,218	26.4	6.80	3.4	2.0	178	26	13	9	13.6	31.7	198				
11/14/23	BOM (SE)	912	8.03	34.71	19,212	25.3	7.09				56		20		51.7	402				monthly BAP testing
12/19/23	BOM (SE)	1123	7.79	34.98	19,362	24.3	7.04				62		110		387.2	355		183.0		monthly BAP testing
01/11/24	BOM (SE)	1406	8.04	34.90	19,318	25.1	6.77				14		23		53.2	111		178.6		monthly BAP testing
02/08/24	BOM (SE)	1132	8.07	34.89	19,314	24.5	6.86	4.4	2.0	212	31	20	11	10.9	23.9	207		190.5		
03/13/24	BOM (SE)	949	8.02	34.13	18,891	24.6	7.18				71		23		64.4	703		209.0		monthly BAP testing
04/02/24	BOM (SE)	1511	8.04	34.99	19,367	23.4	6.66				33		34		72.8	195		178.5		monthly BAP testing
05/10/24	BOM (SE)	918	8.03	35.02	19,384	25.3	7.30	2.8	2.0	189	12	17	11	11.3	61.0	160		246.3		
06/26/24	BOM (SE)	918	7.89	34.91	19,323	26.2	7.04				14		18		57.4	147		253.4		monthly BAP testing
Mean			8.02	34.99	19,369	25.08	6.42	4.7	2.2	288	52	49	29	7.4	91.6	308	0	168	903	

Blue Ocean Mariculture LLC Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'20.94"N
Longitude: 156° 3'19.02"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
29	16	8

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H+	SM2520-B			G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
Std. Dev.			0.13	0.47	262	1.15	0.69	3.0	0.7	183	44	44	29	3.6	102.8	245	0	109	406	
n=			94	93	93	93	93	52	51	52	90	52	90	52	90	90	2	7	51	

Blue Ocean Mariculture LLC Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'20.49"N
Longitude: 156° 3'21.26"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
29	16	8

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H+	SM2520-B			G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
12/07/11	KPH Hatchery	1012	8.16	34.93	19,334	24.22	7.01	6.4	9.0	1232		65		19.0					175	
03/08/12	KPH Hatchery																			Not in use, no sample taken
06/06/12	BOM (Hatchery)																			Not in use, no sample taken
08/09/12	BOM (Hatchery)																			Not in use, no sample taken
11/21/12	BOM (Hatchery)																			Not in use, no sample taken
02/28/13	BOM (Hatchery)																			Not in use, no sample taken
05/30/13	BOM (Hatchery)																			Not in use, no sample taken
09/05/13	BOM (Hatchery)	857	7.38	34.74	19,229	26.61	6.78	6.8	2.0	698	9	76	10	9.2	147.8	68			176.8	
12/18/13	BOM (Hatchery)																			Not in use, no sample taken
03/06/14	BOM (Hatchery)																			Not in use, no sample taken
06/19/14	BOM (Hatchery)	851	7.75	34.63	19,168	26.26	6.84	4.4	2.6	396	5	65	15	6.1	210.9	87			219.4	
09/25/14	BOM (Hatchery)	902	8.10	35.01	19,378	28.07	4.08	2.5	2.0	175	5	26	5	6.9	55.2	10			238.6	
12/18/14	BOM (Hatchery)	950	7.76	35.46	19,627	25.66	6.40	3.9	2.0	343	5	32	3	10.6	87.8	2			117.7	
03/12/15	BOM (Hatchery)																			Not in use, no sample taken
06/05/15	BOM (Hatchery)	945	8.11	26.94	14,912	27.05	7.79	3.7	2.0	457	277	26	60	17.8	48.3	4563			100.4	
09/10/15	BOM (Hatchery)																			Not in use, pipes rerouted to SE trench
12/09/15	BOM (Nursery)	906	7.87	34.21	18,936	26.06	6.77	7.1	3.8	814	50	213	39	3.8	162.0	276			134.9	Pipes rerouted back to nursery area
02/25/16	BOM (Nursery)	1002	7.95	34.81	19,268	24.76	9.32	9.4	3.7	503	31	106	48	4.8	115.2	102			309.7	
06/01/16	BOM (Nursery)																			No flow, system shut down
08/26/16	BOM (Nursery)	834	8.04	34.72	19,218	19.42	7.40	3.2	2.1	703	410	107	67	6.6	88.5	1729			290.3	
12/01/16	BOM (Nursery)	959	7.72	34.75	19,234	20.09	7.66	5.6	3.0	616	169	41	30	15.2	411.9	856			341.2	
03/09/17	BOM (Nursery)	858	8.01	34.52	19,107	24.76	5.85	6.1	3.4	273	7	35	12	7.9	99.8	85			280.1	
05/24/17	BOM (Nursery)	843	7.29	34.67	19,190	25.70	5.89	5.7	2.7	889	5	42	11	21.2	774.8	60			374.0	
08/24/17	BOM (Nursery)																			No flow, system shut down
12/07/17	BOM (Nursery)	933	7.48	35.34	19,561	25.60	4.68	5.9	5.3	1299	1	51	13	25.5	1558.0	47			377.0	Reconfigured sump into lazy river
03/08/18	BOM (Nursery)	1014	7.69	34.99	19,367	24.12	6.60	9.0	4.9	620	0	51	16	12.2	362.3	47			366.5	
05/15/18	BOM (Nursery)																			No BAP Sample in May, system shut down
06/21/18	BOM (Nursery)	1033	8.07	35.40	19,594	27.28	6.30	13.1	3.5	540	7	22	4	24.8	217.5	65			160.5	
07/12/18	BOM (Nursery)	909	7.54	34.66	19,185	27.03	6.74				3		30		241.1	50				monthly BAP testing
08/13/18	BOM (Nursery)	936	7.75	34.58	19,140	27.46	5.63				12		5		191.1	3				monthly BAP testing
09/10/18	BOM (Nursery)	843	8.12	34.63	19,168	28.25	6.02	11.4	2.0	89	2	15	4	6.1	12.7	68			399.9	
10/11/18	BOM (Nursery)	901	7.62	34.83	19,279	21.46	6.07				178		54		192.1	840				monthly BAP testing
11/02/18	BOM (Nursery)	859	7.18	34.71	19,212	27.97	7.08				11		29		1660.0	47				monthly BAP testing
12/13/18	BOM (Nursery)																			No flow, system shut down till 2019
01/15/19	BOM (Nursery)																			No flow, system shut down till Feb. 2019
02/13/19	BOM (Nursery)	917	8.02	35.44	19,616	24.15	6.89				1		3		116.7	33				monthly BAP testing
03/01/19	BOM (Nursery)	909	7.63	34.61	19,157	24.36	8.65	7.0	9.9	501	4	90	42	5.6	113.8	28			342.9	
04/25/19	BOM (Nursery)	859	7.60	35.23	19,500	26.01	6.75				1		18		249.8	24				monthly BAP testing
05/07/19	BOM (Nursery)	1145	8.00	35.07	19,412	26.34	7.65				1		15		262.9	33				monthly BAP testing
06/05/19	BOM (Nursery)	859	8.02	35.75	19,788	26.78	6.91	4.6	2.0	198	2	33	16	5.9	95.0	8			253.7	
07/17/19	BOM (Nursery)	837	7.79	35.56	19,683	27.34	6.92				0		5		150.9	18				monthly BAP testing
08/23/19	BOM (Nursery)	1410	7.74	35.23	19,500	28.91	8.23				1		17		297.6	46				monthly BAP testing
09/12/19	BOM (Nursery)	912	7.82	34.93	19,334	28.07	6.84	4.1	2.0	371	3	21	8	17.9	337.0	46			414.5	
10/16/19	BOM (Nursery)																			No Flow, system shut down till early 2020
11/06/19	BOM (Nursery)																			No Flow, system shut down till early 2020
12/17/19	BOM (Nursery)																			No Flow, system shut down till early 2020
01/09/20	BOM (Nursery)	921	8.18	34.89	19,312	25.85	5.69				0		7		25.9	273				monthly BAP testing
02/04/20	BOM (Nursery)	940	7.41	35.59	19,699	21.78	6.35				126		37		534.0	545				monthly BAP testing, high water level, white stringy algae (?)
03/11/20	BOM (Nursery)	850	7.46	35.84	19,838	19.00	7.34	9.6	5.9	1048	188	173	87	6.1	546.1	805			494.6	
04/01/20	BOM (Nursery)																			No sampling - COVID-19
05/21/20	BOM (Nursery)																			No Flow, system shut down
06/26/20	BOM (Nursery)																		0.0	No Flow, system shut down
07/14/20	BOM (Nursery)																			No Flow, system shut down
08/25/20	BOM (Nursery)	857	7.35	35.90	19,871	26.91	7.49				2		13		824.0	29				monthly BAP testing
09/16/20	BOM (Nursery)	923	7.37	35.64	19,727	25.92	5.31	3.5		1750	6	64	42	27.3	1126.8	79	0		433.5	BOD - N/A- equipment failure
10/14/20	BOM (Nursery)																			No flow, system shut down due to sump flow construction
11/04/20	BOM (Nursery)																			No flow, system shut down due to sump flow construction
12/02/20	BOM (Nursery)																		0.0	No Flow, system shut down

Blue Ocean Mariculture LLC Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'20.49"N
Longitude: 156° 3'21.26"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
29	16	8

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H+	SM2520-B			G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
01/14/21	BOM (Nursery)																			No Flow, system shut down
02/11/21	BOM (Nursery)																			No Flow, system shut down
03/25/21	BOM (Nursery)	1055	8.01	35.85	19,843	24.1	7.02	3.6	2.0	280	40	20	15	13.8	52.8	230			294.3	
04/13/21	BOM (Nursery)	931	7.94	35.58	19,694	22.8	7.30				92		17		98.1	380				monthly BAP testing
05/06/21	BOM (Nursery)	1021	7.92	2.03	1,124	25.5	7.92	1.2	2.0	1192	1167	174	180	6.8	132.7	21132			291.8	
06/22/21	BOM (Nursery)																			No Flow, system shut down
07/01/21	BOM (Nursery)																			No Flow, system shut down
08/13/21	BOM (Nursery)	920	7.22	35.41	19,600	27.0	7.40	10.5	>9.53	2038	5	85	33	23.9	1068.0	42			409.3	need BOD retest
08/25/21	BOM (Nursery)	835	7.26	35.55	19,677	26.3	8.05	5.3	5.1	751	7	91	33	8.2	301.5	25				resample
09/07/21	BOM (Nursery)	933	7.07	35.48	19,639	26.9	8.37				5		26		284.0	16				monthly BAP testing, sump level high
10/19/21	BOM (Nursery)																			No flow, sump dry
11/30/21	BOM (Nursery)	1144	7.27	35.10	19,428	26.8	7.54				5		19		1267.6	32			351.2	monthly BAP
12/08/21	BOM (Nursery)																			No flow, sump dry
01/27/22	BOM (Nursery)																			No flow, sump dry
02/03/22	BOM (Nursery)	902	7.89	34.87	19,301	25.1	7.42				5		4		231.2	25				monthly BAP testing
03/09/22	BOM (Nursery)	851	7.07	34.93	19,334	25.3	8.63	9.7	7.7	1034	6	105	80	9.8	763.6	39			457.8	
04/12/22	BOM (Nursery)																			No flow, sump dry
05/10/22	BOM (Nursery)	920	7.83	34.56	19,129	21.1	8.27				164		64		653.3					monthly BAP testing
06/15/22	BOM (Nursery)																		0.0	No flow, sump dry
07/21/22	BOM (Nursery)																			No flow, sump dry
08/05/22	BOM (Nursery)																		0.0	No flow, sump dry
09/08/22	BOM (Nursery)																			No flow, sump dry
10/12/22	BOM (Nursery)	1012	7.81	34.87	19,301	27.2	7.30				16		3		445.0	69				monthly BAP testing
11/16/22	BOM (Nursery)	944	7.56	34.87	19,301	22.7	8.38				142		38		196.0	615				monthly BAP testing
12/08/22	BOM (Nursery)																		0.0	No flow, sump dry
01/17/23	BOM (Nursery)	921	8.00	34.89	19,312	25.2	7.39				23		6		173.2	49				monthly BAP testing
02/03/23	BOM (Nursery)	1104	7.63	34.56	19,129	25.3	8.89	12.5	>8.9	893	2	50	24	17.8	498.8	83			574.0	
03/10/23	BOM (Nursery)																			No flow, sump dry
04/21/23	BOM (Nursery)																			No flow, sump dry
05/05/23	BOM (Nursery)																			No flow, sump dry
06/30/23	BOM (Nursery)	919	7.22	34.80	19,262	26.0	8.59				13		23		718.0	83				monthly BAP testing
07/12/23	BOM (Nursery)	1502	7.13	34.62	19,163	26.6	8.16				7		105		1041.5	45				monthly BAP testing
08/04/23	BOM (Nursery)																			No flow, sump dry
09/07/23	BOM (Nursery)	829	7.77	34.76	19,240	26.2	8.22	8.1	3.0	488	28	124	91	3.9	168.5	51		41.4		
10/26/23	BOM (Nursery)	1212	7.60	34.84	19,284	27.1	7.68	12.3	3.1	637	30	25	9	25.1	310.4	21				
11/14/23	BOM (Nursery)	915	7.64	34.92	19,329	26.5	7.41				9		5		296.4	48				monthly BAP testing
12/19/23	BOM (Nursery)																			No flow, sump dry
01/11/24	BOM (Nursery)	1409	7.54	35.00	19,373	25.2	8.95				9		36		861.0	43		21.0		monthly BAP testing
02/08/24	BOM (Nursery)	1136	7.70	35.04	19,395	25.2	5.32	5.5	2.7	538	61	67	32	8.0	193.5	76		-103.6		
03/13/24	BOM (Nursery)																			No flow, sump dry
04/02/24	BOM (Nursery)																			No flow, sump dry
05/10/24	BOM (Nursery)	921	7.82	35.01	19,378	25.4	7.89	5.4	3.3	666	14	36	12	18.3	386.6	103		246.0		
06/26/24	BOM (Nursery)	921	8.01	34.93	19,334	26.3	6.71				14		20		13.6	53		108.9		monthly BAP testing
Mean			7.69	34.22	18,940	25.39	7.14	6.6	3.7	721	66	72	31	12.3	396.1	706	0	63	262	
Std. Dev.			0.32	4.80	2,658	2.28	1.08	3.1	2.3	467	181	51	33	7.4	402.9	3093	#DIV/0!	128	159	
n=			50	50	50	50	50	28	25	28	49	28	49	28	49	48	1	4	32	

Blue Ocean Mariculture LLC Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'21.50"N
Longitude: 156° 3'21.65"W

Seawater DIsposal Trench Dimensions

L (ft)	W (ft)	D (ft)
4	4	2

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H+	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
09/05/13	BOM Ice Machine	852	7.49	34.22	18,941	21.10	4.50	2.0	2.0	623	598	102.6	103.4	6.1	7.9	2336			1.4	
12/18/13	BOM Ice Machine	936	7.54	34.71	19,212	19.24	5.52	3.3	2.0	790	565	89	86	8.8	38.6	14822			1.5	
03/06/14	BOM Ice Machine	906	7.45	41.13	22,766	16.52	5.79	1.1	2.0	630	569	98	96	6.4	12.4	2233			2.6	
06/19/14	BOM Ice Machine																		3.9	No Sample
09/25/14	BOM Ice Machine																		7.0	No Sample
12/18/14	BOM Ice Machine	1000	7.51	34.90	19,318	20.87	4.86	1.7	2.0	692	603	109	105	6.4	3.7	2385			8.3	
03/12/15	BOM Ice Machine	1130	7.52	34.46	19,074	21.15	5.45	2.7	2.0	1260	1000	131	204	9.6	57.9	4536			8.8	
06/05/15	BOM Ice Machine	1114	7.70	34.40	19,041	22.54	6.47	3.0	2.0	608	586	97	94	6.3	6.8	2168			8.7	
09/10/15	BOM Ice Machine	1015	7.72	26.96	14,923	0.61	19.26	2.6	2.0	408	433	53	56	7.8	1.3	1373			5.9	
12/09/15	BOM Ice Machine	923	7.95	32.27	17,862	8.10	12.71	3.8	2.0	621	548	111	85	5.6	32.0	1950			11.7	
02/25/16	BOM Ice Machine	1013	7.71	32.99	18,260	20.75	6.19	3.5	2.0	672	629	126	121	5.4	6.8	2299			26.9	
06/01/16	BOM Ice Machine	1044	7.49	38.74	21,443	9.30	6.09	3.4	2.0	650	635	98	100	6.6	1.1	2567			15.2	
08/26/16	BOM Ice Machine	828	7.96	34.51	19,102	35.38	4.50	3.7	2.0	1011	951	163	145	6.2	3.9	3967			25.1	
12/01/16	BOM Ice Machine	950	7.49	34.20	18,930	20.95	5.45	2.5	2.0	637	595	102	91	6.3	10.1	2486			29.5	
03/09/17	BOM Ice Machine	853	7.66	36.12	19,993	9.59	6.28	2.8	2.0	668	636	103	100	6.5	15.9	3025			24.2	
05/24/17	BOM Ice Machine	838	7.62	35.83	19,832	15.93	4.80	3.8	2.0	649	540	98	94	6.6	7.2	2758			32.5	
08/24/17	BOM Ice Machine	859	7.59	35.88	19,860	20.87	4.65	4.5	2.0	641	619	101	90	6.3	6.8	2873			35.2	
12/07/17	BOM Ice Machine	927	7.61	31.56	17,469	7.59	6.90	3.1	2.0	564	545	92	87	6.1	6.9	2433			27.2	
03/08/18	BOM Ice Machine	1009	7.59	34.80	19,262	10.10	6.87	12.2	2.0	629	595	99	97	6.4	66.3	2812			25.6	
05/15/18	BOM Ice Machine	1203	7.52	35.56	19,683	14.97	6.27				934		84		2.2	2713				1st BAP sampling
06/14/18	BOM Ice Machine	1103	7.49	28.44	15,742	-1.71	9.30	4.7	2.0	513	503	83	68	6.2	0.6	2329			19.6	
07/12/18	BOM Ice Machine	901	7.52	35.63	19,722	13.94	6.17				619		103		-2.7	3023				monthly BAP testing
08/13/18	BOM Ice Machine	923	7.52	35.32	19,550	13.14	6.11				633		87		4.4	2849				monthly BAP testing
09/10/18	BOM Ice Machine	1001	7.50	35.52	19,661	8.83	7.46	3.2	2.0	576	567	93	89	6.2	3.1	2638			23.4	
10/11/18	BOM Ice Machine	857	7.60	35.57	19,688	15.27	6.30				598		90		15.0	2748				monthly BAP testing
11/02/18	BOM Ice Machine	854	7.51	34.62	19,163	20.43	5.19				568		83		1.1	2686				monthly BAP testing
12/13/18	BOM Ice Machine	827	7.72	33.96	18,797	18.44	5.35	3.6	2.0	577	534	88	84	6.5	1.6	2630			21.6	
01/15/19	BOM Ice Machine	919	7.63	34.76	19,240	18.05	5.96				554		102		5.1	2856				monthly BAP testing
02/13/19	BOM Ice Machine	914	7.48	35.14	19,450	21.37	5.56				572		89		5.6	2771				monthly BAP testing
03/01/19	BOM Ice Machine	905	7.45	36.76	20,347	17.59	6.08	14.0	2.4	773	692	99	95	7.8	9.0	3012			1.9	
04/25/19	BOM Ice Machine	855	7.27	36.25	20,065	20.45	5.47				607		91		0.5	2990				monthly BAP testing
05/07/19	BOM Ice Machine	956	7.60	40.66	22,506	24.35	5.82				503		82		6.1	2940				monthly BAP testing
06/05/19	BOM Ice Machine	854	7.52	35.80	19,816	21.73	5.94	3.1	2.0	581	563	91	89	6.4	0.5	2857			16.6	
07/17/19	BOM Ice Machine	831	7.36	35.61	19,711	21.08	5.05				574		89		1.2	2765				monthly BAP testing
08/23/19	BOM Ice Machine	1419	7.83	35.64	19,727	36.64	4.99				635		94		5.9	2621				monthly BAP testing
09/12/19	BOM Ice Machine	906	7.72	49.60	27,454	13.20	6.84	3.5	2.0	616	6006	99	98	6.2	12.1	2652			22.5	
10/16/19	BOM Ice Machine	905	7.58	35.22	19,495	19.93	5.34				479		86		5.2	2539				monthly BAP testing
11/20/19	BOM Ice Machine	1422	7.53	35.37	19,578	23.08	5.47	2.5	2.0	888	588	101	94	8.8	1.9	2566			21.6	
12/17/19	BOM Ice Machine	839	7.65	35.96	19,904	18.52	5.49				629		95		3.0	2808				monthly BAP testing
01/09/20	BOM Ice Machine	917	7.63	38.14	21,111	14.42	5.91				634		91		-2.2	2867				monthly BAP testing
02/04/20	BOM Ice Machine	935	7.58	38.08	21,078	16.58	5.62				629		98		-4.6	2722				monthly BAP testing
03/11/20	BOM Ice Machine	940	7.70	22.52	12,465	15.83	10.60	11.3	2.8	552	299	92	72	6.0	-19.2	1431			23.8	algae chunks from discharge pipe flowing into sample
04/01/20	BOM Ice Machine																			No sampling - COVID-19
05/21/20	BOM Ice Machine	1046	7.66	35.81	19,821	15.90	6.17				584		91		11.7	2682				monthly BAP testing
06/26/20	BOM Ice Machine	833	7.76	36.17	20,020	47.74	3.09	3.1	2.0	684	616	90	89	7.6	8.8	2834			0.2	Double checked temp before leaving
07/14/20	BOM Ice Machine	1002	7.57	47.50	26,292	14.64	9.04				876		166		9.4	3890				collected from tower
08/25/20	BOM Ice Machine	908	7.60	41.46	22,949	8.99	10.50				722		120		6.8	3123				monthly BAP testing, collected from tower
09/16/20	BOM Ice Machine	938	7.63	39.93	22,102	9.43	10.67	2.8		711	662	100	106	7.1	-6.0	3067	0		3.9	BOD - N/A- equipment failure; collected from tower
10/14/20	BOM Ice Machine	942	7.40	59.66	33,022	-2.0	4.06				1053		193		8.6	4914				monthly BAP testing, collected from tower
11/04/20	BOM Ice Machine	1112	7.30	72.70	40,240	4.1	3.52				1274		296		11.7	5882				monthly BAP testing, collected from tower
12/02/20	BOM Ice Machine	838	7.53	37.76	20,901	5.0	8.99	1.5	2.0	661	654	106	95	6.2	6.4	2867	0		3.3	
01/14/21	BOM Ice Machine	912	7.52	40.50	22,417	-1.6	5.13				754		111		4.8	3197				monthly BAP testing, collected from tower
02/11/21	BOM Ice Machine	959	7.57	39.56	21,897	5.3	4.95				674		97		1.6	3039				monthly BAP testing, collected from tower
03/25/21	BOM Ice Machine	1105	7.37	39.80	22,030	22.6	3.07	3.9	2.0	666	631	94	99	7.1	2.2	3058			4.3	
04/13/21	BOM Ice Machine	950	7.42	39.15	21,670	23.7	6.24				575		89		11.6	2975				monthly BAP testing

Blue Ocean Mariculture LLC Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'21.50"N
Longitude: 156° 3'21.65"W

Seawater DIsposal Trench Dimensions

L (ft)	W (ft)	D (ft)
4	4	2

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H+	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
05/06/21	BOM Ice Machine	1030	7.47	40.52	22,428	3.2	9.39	3.6	2.0	693	669	87	93	8.0	24.8	3117			1.2	
06/22/21	BOM Ice Machine	1002	7.61	39.43	21,825	-0.9	7.57				710		101		6.0	3219				monthly BAP testing
07/01/21	BOM Ice Machine	1357	7.48	43.02	23,812	-0.3	8.45				700		139		6.6	3261				monthly BAP testing
08/13/21	BOM Ice Machine	929	7.41	41.52	22,982	-0.2	7.29	3.6	2.0	790	701	100	101	7.9	2.9	2922			8.0	
09/07/21	BOM Ice Machine	927	7.54	40.94	22,661	-0.7	6.41				713		137		6.1	2993	0			monthly BAP testing
10/19/21	BOM Ice Machine	1358	7.60	39.37	21,792	2.3	7.16				652		113		5.1	3316				monthly BAP testing
11/30/21	BOM Ice Machine	1148	7.44	38.44	21,277	0.8	7.72				649		96		4.3	3199				monthly BAP testing
12/08/21	BOM Ice Machine	912	7.45	40.39	22,356	-0.4	8.13	4.9	2.0	732	651	100	72	7.3	17.8	3307			5.3	
01/27/22	BOM Ice Machine	1011	7.57	39.61	21,925	7.0	6.19				681		123		7.8	3413				monthly BAP testing
02/03/22	BOM Ice Machine	908	7.48	39.51	21,869	-0.8	8.26				676		97		8.6	3270				monthly BAP testing
03/09/22	BOM Ice Machine	847	7.48	39.80	22,030	-0.7	8.55	2.0	2.0	723	668	100	101	7.2	22.2	3315			4.5	
04/12/22	BOM Ice Machine	1019	7.50	41.00	22,694	1.8	4.78				694		111		0.6	3472				montly BAP testing, new sampling location inside container
05/10/22	BOM Ice Machine	925	7.34	56.18	31,096	12.8	4.48				985		172		7.0	4210				monthly BAP testing.
06/15/22	BOM Ice Machine	943	7.22	55.65	30,803	7.1	5.02	6.3	2.0	1145	952	148	141	7.7	-1.7	4391			20.3	
07/21/22	BOM Ice Machine	1016	7.44	56.46	31,251	0.3	4.72				1155		187		4.0	4554				monthly BAP testing
08/05/22	BOM Ice Machine	922	7.36	56.44	31,240	8.8	4.23	4.6	2.0	1110	1162	149	153	7.4	9.3	4615			7.4	
09/08/22	BOM Ice Machine	958	7.42	55.17	30,537	-0.9	4.67				1043		171		13.1	4696				monthly BAP testing
10/12/22	BOM Ice Machine	1005	7.44	55.91	30,947	-1.1	5.92				1063		181		5.5	4945				monthly BAP testing
11/16/22	BOM Ice Machine	937	7.43	56.93	31,511	-1.8	5.04				981		160		7.4	4560				monthly BAP testing
12/08/22	BOM Ice Machine	1037	7.37	56.88	31,484	-1.7	6.18	3.6	2.0	987	951	145	152	6.8	6.1	4594			14.9	
01/17/23	BOM Ice Machine	928	7.40	56.38	31,207	-1.4	6.75				972		147		6.4	4357				monthly BAP testing
02/03/23	BOM Ice Machine	1109	7.37	55.91	30,947	-1.0	5.60	3.2	2.0	1024	954	163	159	6.3	23.9	4214			5.2	
03/10/23	BOM Ice Machine	1052	7.49	45.74	25,318	0.2	5.32				811		129		5.9	3502				monthly BAP testing
04/21/23	BOM Ice Machine	928	7.36	45.53	25,201	1.0	5.15				768		132		30.1	3444				monthly BAP testing
05/05/23	BOM Ice Machine	1115	7.47	52.86	29,259	-0.8	6.03	3.0	2.0	937	895	124	135	7.5	45.3	4212			14.3	
06/30/23	BOM Ice Machine	923	7.41	57.70	31,938	-1.4	5.41				969		154		11.2	4231				monthly BAP testing
07/12/23	BOM Ice Machine	1506	7.27	55.11	30,504	-1.0	5.67				941		148		14.1	4027				monthly BAP testing
08/04/23	BOM Ice Machine	1017	7.43	56.58	31,318	-0.9	6.22				951		159		9.1	4445				monthly BAP testing
09/07/23	BOM Ice Machine	844	7.43	56.81	31,445	-1.2	6.24	3.3	2.0	1020	914	136	143	7.5	2.7	4087		34.4		
10/26/23	BOM Ice Machine	1216	7.43	54.47	30,150	-1.0	6.20	9.1	2.0	1120	946	135	141	8.3	4.3	4076				
11/14/23	BOM Ice Machine	919	7.42	56.38	31,207	-1.0	5.50				964		157		23.8	4196				monthly BAP testing
12/19/23	BOM Ice Machine	1129	7.51	43.27	23,950	1.2	5.95				702		102		8.9	3113		129.6		monthly BAP testing
01/11/24	BOM Ice Machine	1414	7.46	54.68	30,266	-1.2	5.00				965		157		6.4	4093		136.1		monthly BAP testing
02/08/24	BOM Ice Machine	1141	7.43	55.43	30,681	-1.4	6.41	6.0	2.0	1088	957	120	127	9.0	0.2	4109		114.7		
03/13/24	BOM Ice Machine	954	7.47	55.63	30,792	-0.9	5.14				973		160		11.4	4346		165.0		monthly BAP testing
04/02/24	BOM Ice Machine	1517	7.58	45.51	25,190	0.0	5.33				778		98		4.9	3329		144.8		monthly BAP testing
05/10/24	BOM Ice Machine	927	7.46	56.44	31,240	-0.9	5.96	5.0	2.0	1066	1061	142	156	7.5	11.3	4271		157.8		
06/26/24	BOM Ice Machine	925	7.38	56.96	31,528	-1.3	5.23				897		157		16.6	4113		122.0		monthly BAP testing
Mean			7.52	41.40	23,005	10.72	6.38	4.0	2.0	736	781	107	114	6.9	9.0	3364	0	126	14	
Std. Dev.			0.14	9.29	5,172	10.62	2.26	2.7	0.1	191	617	23	38	0.9	12.5	1537	0	41	10	
n=			81	81	81	81	81	39	38	39	81	39	81	39	81	81	3	8	40	

Cyanotech Corporation Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'34.12"N
Longitude: 156° 3'18.49"W

Seawater Disposal Trench Dimensions
L (ft) W (ft) D (ft)

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H+	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
03/02/11	Cyanotech #2 Bug Removal				0														40	No Sample
05/11/11	Cyanotech #2 Bug Removal	1351	6.66	34.17	18,913	19.57	6.43	8.2	4.5	1252		193		6.5					170	
09/28/11	Cyanotech #2 Bug Removal	1247	6.36	34.39	19,035	15.80	8.04	2.4	5.2	1805		366		4.9					184	
12/07/11	Cyanotech #2 Bug Removal	1330	5.98	33.88	18,753	18.68	7.64	62.6	9.9	2721		961		2.8					124	
02/16/12	Cyanotech #2 Bug Removal	1515	6.79	33.52	18,554	17.87	7.42	13.0	7.6	2663	2038	534	344	5.0	26	2531			68	
05/30/12	Cyanotech #2 Bug Removal	1226	6.50	34.31	18,991	18.02	7.90	4.2	3.8	1206	962	165	140	7.3	38	2445			232	
09/20/12	Cyanotech #2 Bug Removal	1436	7.62	34.44	19,063	17.91	7.66	5.3	11.1	1685	1339	228	180	7.4	39	2652			270	
12/05/12	Cyanotech #2 Bug Removal	1329	6.40	33.87	18,747	17.26	7.46	4.8	7.9	1386	520	553	438	2.5	267	5927			108	
03/20/13	Cyanotech #2 Bug Removal	1225	7.04	33.60	18,598	15.81	10.46	5.6	7.6	1715	1283	223	186	7.7	95	2695			64	
05/30/13	Cyanotech #2 Bug Removal	1311	6.74	34.25	18,958	18.92	7.46	8.1	7.5	1982	1265	286	206	6.9	0	2605			247	
09/05/13	Cyanotech #2 Bug Removal	1332	6.19	33.54	18,565	21.49	6.13	5.8	13.4	1240	844	211	158	5.9	7	2505			296	
12/18/13	Cyanotech #2 Bug Removal	1407	6.36	35.30	19,539	18.04	7.35	54.3	14.6	968	976	428	161	2.3	60	2363			199	
03/06/14	Cyanotech #2 Bug Removal	1355	6.31	34.15	18,902	16.79	8.01	21.8	11.8	2528	952	650	149	3.9	63	2447			134	
06/19/14	Cyanotech #2 Bug Removal	1423	6.35	34.24	18,952	17.83	7.57	14.7	7.3	1605	694	298	197	5.4	129	3144			291	
10/01/14	Cyanotech #2 Bug Removal	1447	6.48	34.36	19,019	19.44	7.40	11.9	5.8	1298	639	179	119	7.2	113	2374			301	
12/24/14	Cyanotech #2 Bug Removal	1337	6.59	34.52	19,107	17.28	7.47	36.2	19.0	2350	1100	398	192	5.9	46	2667			301	TSS weight due to bugs
03/16/15	Cyanotech #2 Bug Removal	1337	6.10	34.50	19,096	15.86	8.63	20.6	6.8	2071	873	290	163	7.1	54	2245			65	
06/04/15	Cyanotech #2 Bug Removal	1323	6.46	34.11	18,880	17.66	8.42	8.5	7.1	909	960	92	145	9.9	129	2294			199	
09/02/15	Cyanotech #2 Bug Removal	1000	8.17	9.99	5,530	28.70	0.87	109.6	33.8	6786	232	1505	571	4.5	3165	4038				Invalid sample, lots of algal scum on surface, not discharging
09/09/15	Cyanotech #2 Bug Removal	1354	6.22	34.04	18,842	18.42	8.41	6.8	8.8	1753	1097	191	131	9.2	197	2414			202	Resample during effluent discharge
12/02/15	Cyanotech #2 Bug Removal	1522	8.88	0.16	89	29.40	7.13	1.5	2.1	1528	1223	270	235	5.7	165	2988			204	small trickle of discharge
02/24/16	Cyanotech #2 Bug Removal	1414	6.91	33.72	18,664	16.87	8.05	26.8	8.6	1798	1054	299	202	6.0	143	2574			218	TSS weight due to bugs
06/08/16	Cyanotech #2 Bug Removal	1350	6.96	33.56	18,576	15.45	9.54	8.6	9.6	2288	658	280	141	8.2	29	2695			282	
09/07/16	Cyanotech #2 Bug Removal	1417	7.23	33.66	18,631	17.47	8.11	21.8	11.7	4514	1541	1178	224	3.8	261	4231			254	TSS weight due to bugs
11/30/16	Cyanotech #2 Bug Removal	1421	6.42	34.08	18,864	17.01	7.30	41.3	18.2	3146	290	391	278	8.0	1886	2781			216	TSS weight due to bugs
03/15/17	Cyanotech #2 Bug Removal	1408	6.59	34.05	18,847	18.77	5.47	54.5	8.0	2626	1082	406	188	6.5	316	2500			228	TSS weight due to bugs
05/18/17	Cyanotech #2 Bug Removal	1523	6.65	34.03	18,836	18.75	4.87	140.5	14.6	3503	1900	939	628	3.7	443	2779			277	TSS weight due to bugs & algae
08/24/17	Cyanotech #2 Bug Removal	1405	7.56	33.66	18,631	17.18	4.97	72.4	12.8	5178	3647	919	663	5.6	7	2313			321	TSS weight due to bugs & algae
12/07/17	Cyanotech #2 Bug Removal	1418	6.45	35.00	19,373	14.36	3.87	10.5	4.3	585	810	91	112	6.4	50	2246			221	
03/08/18	Cyanotech #2 Bug Removal	1344	7.75	34.35	19,013	9.76	7.97	4.2	2.4	808	611	113	106	7.2	88	2279			227	
06/20/18	Cyanotech #2 Bug Removal	1352	7.30	28.14	15,576	14.19	7.90	39.2	17.8	2150	762	695	445	3.1	190	6712			252	
09/26/18	Cyanotech #2 Bug Removal	1417	6.21	33.61	18,603	17.30	5.41	12.4	8.6	1054	668	513	417	2.1	149	2637			245	
12/13/18	Cyanotech #2 Bug Removal	1043	7.20	33.90	18,764	19.04	6.27	77.4	16.9	3108	2211	863	537	3.6	0	2496			267	TSS weight due to algae
03/07/19	Cyanotech #2 Bug Removal	1335	6.19	34.78	19,251	17.83	8.03	8.9	5.8	1031	691	208	146	5.0	86	2430			250	
06/05/19	Cyanotech #2 Bug Removal	1315	6.39	35.33	19,556	18.44	8.17	17.1	9.2	1573	742	676	625	2.3	34	2625			208	
09/18/19	Cyanotech #2 Bug Removal	1326	6.63	34.44	19,063	17.94	7.96	12.0	7.5	927	704	259	180	3.6	5	2452			153	
11/01/19	Cyanotech #2 Bug Removal	1332	7.37	36.02	19,937	18.85	8.39	451.0	23.5	88	1800	3108	545	0.0	399	2311			168	TSS weight due to lots of algae
03/11/20	Cyanotech #2 Bug Removal	1331	6.50	34.98	19,362	17.73	7.77	39.6	12.6	1546	825	424	329	3.6	88	2722			87	TSS weight due to bugs & algae
06/18/20	Cyanotech #2 Bug Removal	1344	7.10	18.80	10,406	18.91	8.64	36.9	19.0	2469	1216	1083	393	2.3	237	2368			196	
09/03/20	Cyanotech #2 Bug Removal	1332	7.81	35.03	19,389	19.37	6.43	12.3		1701	907	197	163	8.6	251	2428	0		283	BOD-equip. failure; TSS-bugs removed from sample
12/02/20	Cyanotech #2 Bug Removal	1313	7.53	35.34	19,561	17.3	8.24	12.7	4.7	2044	698	483	99	4.2	52	2195	0		98	
03/17/21	Cyanotech #2 Bug Removal	1301	9.84	0.82	454	26.4	8.40	177.0	21.8	12	21	2111	1591	0.0	6852	21065			73	effluent is solid green, no bugs, BOD >21.8
03/25/21	Cyanotech #2 Bug Removal	1305	7.45	34.35	19,013	21.7	7.61	114.2	53.7	3443	914	371	301	9.3	2358	3319				resample
05/28/21	Cyanotech #2 Bug Removal	1247	7.34	34.43	19,057	20.9	7.74	20.7	17.7	1952	751	171	134	11.4	838	2750			158	
08/26/21	Cyanotech #2 Bug Removal	1243	7.40	34.82	19,273	18.4	8.26	9.1	15.2	1668	682	199	114	8.4	266	2295			151	
12/08/21	Cyanotech #2 Bug Removal	1304	7.35	33.93	18,781	18.7	8.28	26.2	9.7	1499	629	196	133	7.6	509	2597			43	
03/03/22	Cyanotech #2 Bug Removal	1303	7.65	32.67	18,083	22.1	7.04	21.0	22.4	3003	1148	319	121	9.4	751	3312			37	
05/19/22	Cyanotech #2 Bug Removal	1256	8.12	33.99	18,814	20.9	7.84	52.1	18.6	1779	1374	223	201	8.0	307	2479			141	
09/08/22	Cyanotech #2 Bug Removal	1023	8.18	33.19	18371	19.0	7.87	29.4	8.6	2307	1069	345	199	6.7	362	3157			258	
12/08/22	Cyanotech #2 Bug Removal	1024	7.34	32.78	18144	18.8	8.39	27.4	13.2	1868	763	211	118	8.9	256	3475			87	
02/08/23	Cyanotech #2 Bug Removal	1128	7.48	33.29	18426	17.7	8.57	15.2	11.4	1794	760	177	162	10.2	773	2619			52	
05/18/23	Cyanotech #2 Bug Removal	1036	7.54	33.34	18454	19.6	8.00	9.3	10.8	2162	833	221	177	9.8	806	2768			154	
09/07/23	Cyanotech #2 Bug Removal	1001	8.57	0.57	316	28.8	7.98	115.8	49.6	7350	7	833	390	8.8	3432	21126		77.9		
12/07/23	Cyanotech #2 Bug Removal	933	10.10	4.39	2430	26.0	1.97	362.0	84.3	36880	133	7902	7148	4.7	24030	18584		196.8		
02/15/24	Cyanotech #2 Bug Removal	1007	8.33	0.39	216	25.1	8.06	0.8	2.0	1405	1306	151	159	9.3	7	20571		460.4		no bugs or algae in outflow

Cyanotech Corporation Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'34.12"N
Longitude: 156° 3'18.49"W

Seawater Disposal Trench Dimensions
L (ft) W (ft) D (ft)

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H+	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
05/16/24	Cyanotech #2 Bug Removal	1011	9.40	2.00	1107.02	29.2	1.79	540.0	113.0	23040	414	5737	71	4.0	144	20051		-192.4		dark green algae concentrate, BOD > 113
Mean			7.18	29.76	16,178	19.21	7.25	55.0	16.0	3123	973	733	407	6.0	981	4505	0	136	186	
Std. Dev.			0.93	10.77	6,306	3.83	1.78	104.4	19.3	5593	591	1319	983	2.7	3457	5267	0	271	82	
n=			55	55	56	55	55	55	54	55	52	55	52	55	52	52	2	3	50	

Discharge GPS:
Latitude: 19°43'29.04"N
Longitude: 156° 3'19.11"W

Seawater Disposal Trench Dimensions
L (ft) W (ft) D (ft)

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H+	SM2520-B			G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
03/08/11	Cyanotech #3 (SW Sump)	1405	7.64	34.34	19,008	11.58	7.78	2.3	2.0	630		106		5.9					220	
05/05/11	Cyanotech #3 (SW Sump)	903	7.70	34.75	19,234	14.35	5.35	3.1	2.0	612		99		6.2					994	
09/01/11	Cyanotech #3 (SW Sump)	919	7.70	34.22	18,941	12.69	6.97	3.0	2.0	689	534	110	97	6.3					1436	
12/07/11	Cyanotech #3 (SW Sump)	1031	7.43	29.44	16,295	12.41	8.51	8.3	14.2	1338		450		3.0					1122	
02/16/12	Cyanotech #3 (SW Sump)	1518	6.75	32.82	18,166	15.05	8.52	6.3	4.0	885	548	152	122	5.8	37	3100			598	
05/30/12	Cyanotech #3 (SW Sump)	1215	7.18	34.01	18,825	18.22	7.24	2.6	2.3	750	612	125	119	6.0	23	2564			1877	
08/22/12	Cyanotech #3 (SW Sump)	1324	7.25	27.98	15,487	21.42	7.30	5.2	4.8	911	573	168	133	5.4	49	6499			2193	
12/05/12	Cyanotech #3 (SW Sump)	951	7.48	29.83	16,511	14.30	7.97	10.3	20.1	1287	1047	185	150	7.0	12	2662			1359	
03/20/13	Cyanotech #3 (SW Sump)	1251	6.92	12.94	7,162	19.12	8.49	6.7	6.5	1073	232	312	219	3.4	89	16051			489	
05/30/13	Cyanotech #3 (SW Sump)	1322	6.91	34.82	19,273	20.58	5.95	5.1	2.5	749	637	102	91	7.3	0	2405			3203	
09/05/13	Cyanotech #3 (SW Sump)	1336	7.03	25.25	13,976	22.42	6.79	6.3	7.0	1005	418	163	100	6.2	17	7418			3853	
12/18/13	Cyanotech #3 (SW Sump)	1420	6.51	27.32	15,122	19.19	7.48	6.7	14.2	2174	446	480	390	4.5	46	4934			2567	
03/06/14	Cyanotech #3 (SW Sump)	1346	7.06	25.83	14,297	18.27	7.59	5.2	4.8	941	435	177	128	5.3	26	4867			1710	
06/19/14	Cyanotech #3 (SW Sump)	1433	7.19	34.33	19,002	20.53	6.23	6.0	4.9	758	583	108	100	7.0	15	3201			3780	
09/24/14	Cyanotech #3 (SW Sump)	1441	7.38	34.17	18,913	21.28	6.50	5.0	4.4	855	500	125	72	6.8	7	3112			3913	
12/24/14	Cyanotech #3 (SW Sump)	1337	6.59	34.52	19,107	17.28	7.47	9.7	6.2	1063	677	183	147	5.8	72	2974			3913	
03/19/15	Cyanotech #3 (SW Sump)	1345	7.09	34.32	18,996	16.53	7.95	4.2	3.7	2280	630	256	116	8.9	27	2314			809	
06/04/15	Cyanotech #3 (SW Sump)	1332	7.24	33.85	18,736	15.84	6.73	4.4	4.0	771	618	96	102	8.0	39	2324			2554	
09/02/15	Cyanotech #3 (SW Sump)	1007	7.50	34.02	18,830	16.10	7.43	4.4	2.0	772	606	77	131	10.0	56	2484			2606	
12/02/15	Cyanotech #3 (SW Sump)	1528	8.02	34.07	18,858	12.21	6.78	2.9	2.0	654	626	100	97	6.5	5	2368			2632	
02/24/16	Cyanotech #3 (SW Sump)	1420	7.34	27.85	15,415	17.05	6.35	16.6	16.0	1096	520	328	206	3.3	4	6121			2817	
06/08/16	Cyanotech #3 (SW Sump)	1356	7.32	27.34	15,133	15.67	7.37	23.4	5.9	1222	491	247	175	4.9	81	6426			3658	
09/07/16	Cyanotech #3 (SW Sump)	1423	7.69	22.90	12,675	16.65	5.68	19.2	18.1	2063	644	436	193	4.7	9	14219			3291	
11/30/16	Cyanotech #3 (SW Sump)	1425	7.20	33.39	18,482	13.24	7.49	6.4	2.4	715	521	111	129	6.5	171	2797			2789	
03/15/17	Cyanotech #3 (SW Sump)	1417	7.60	33.64	18,620	14.58	4.73	11.0	2.0	638	502	118	93	5.4	8	2747			2954	
05/18/17	Cyanotech #3 (SW Sump)	1534	7.56	28.85	15,969	16.18	3.86	20.9	16.4	761	462	162	183	4.7	171	5323			3604	
08/24/17	Cyanotech #3 (SW Sump)	1412	7.47	34.50	19,096	11.96	4.52	4.1	2.0	619	564	99	92	6.3	22	2370			4177	
12/07/17	Cyanotech #3 (SW Sump)	1423	7.61	35.11	19,434	12.09	3.26	4.9	2.1	1138	553	157	85	7.2	2	2264			2865	
03/01/18	Cyanotech #3 (SW Sump)	1428	7.63	33.79	18,703	12.63	5.77	8.2	3.9	724	598	200	131	3.6	41	2723			2944	
06/20/18	Cyanotech #3 (SW Sump)	1359	7.16	32.96	18,244	14.04	6.01	14.8	6.2	809	553	257	202	3.1	3	3546			3258	
09/26/18	Cyanotech #3 (SW Sump)	1422	7.48	34.56	19,129	13.90	5.18	3.6	2.3	638	553	87	79	7.3	20	2360			3166	
12/12/18	Cyanotech #3 (SW Sump)	1403	7.52	29.41	16,279	13.25	3.68	38.0	21.7	1107	325	308	66	3.6	17	7031			3479	
03/07/19	Cyanotech #3 (SW Sump)	1341	7.30	34.67	19,190	11.45	7.28	14.5	2.6	1102	960	233	177	4.7	5	2739			3252	
06/05/19	Cyanotech #3 (SW Sump)	1320	7.51	34.80	19,262	11.25	9.06	3.9	2.2	657	520	113	94	5.8	24	2735			2700	
09/18/19	Cyanotech #3 (SW Sump)	1332	7.57	34.42	19,052	13.65	7.65	2.5	2.0	689	646	112	105	6.1	7	2498			1960	
11/01/19	Cyanotech #3 (SW Sump)	1337	7.53	36.06	19,960	14.28	7.78	3.2	2.0	593	573	62	78	9.6	-7	2254			2165	
03/11/20	Cyanotech #3 (SW Sump)	1347	7.33	34.46	19,074	14.45	7.38	5.2	2.7	1681	1512	309	291	5.4	119	3173			1091	
06/18/20	Cyanotech #3 (SW Sump)	1348	7.53	20.25	11,209	15.93	6.50	1.7	2.0	575	568	107	89	5.4	-5	2190			2538	
09/03/20	Cyanotech #3 (SW Sump)	1338	7.61	35.59	19,699	16.75	4.82	4.4		709	617	108	97	6.6	1	2248	0		3692	BOD - N/A - equipment failure
12/02/20	Cyanotech #3 (SW Sump)	1319	7.59	34.77	19,246	16.9	7.78	3.8	2.0	739	582	105	93	7.0	28	2638	0		1251	
03/17/21	Cyanotech #3 (SW Sump)	1306	7.49	35.68	19,749	16.0	6.68	6.3	2.0	588	553	84	91	7.0	60	2359			926	
05/28/21	Cyanotech #3 (SW Sump)	1251	7.41	35.56	19,683	14.5	6.75	4.7	2.0	628	572	78	86	8.1	5	2345			2035	
08/26/21	Cyanotech #3 (SW Sump)	1248	7.39	35.10	19,428	16.4	5.11	4.6	2.0	643	600	75	90	8.6	1	2293			1939	
12/08/21	Cyanotech #3 (SW Sump)	1309	7.50	33.71	18,659	12.7	7.76	9.9	5.1	2709	2459	279	294	9.7	239	2714			524	
03/03/22	Cyanotech #3 (SW Sump)	1308	7.39	33.91	18,770	14.7	7.42	3.6	2.0	748	557	130	83	5.8	124	2886			452	
05/19/22	Cyanotech #3 (SW Sump)	1302	7.45	34.52	19,107	19.5	6.31	5.0	2.0	639	560	85	83	7.5	17	2290			1801	
08/31/22	Cyanotech #3 (SW Sump)	1255	7.40	34.52	19,107	16.5	6.65	2.3	2.0	648	553	78	77	8.3	4	2519			3351	
11/30/22	Cyanotech #3 (SW Sump)	1220	7.57	34.79	19,257	10.0	8.29	3.8	2.0	679	597	76	79	8.9	17	2917			1126	
02/08/23	Cyanotech #3 (SW Sump)	1134	7.50	34.43	19,057	12.5	7.65	4.1	2.0	749	595	94	91	7.9	94	2176			672	
05/18/23	Cyanotech #3 (SW Sump)	1040	7.46	34.50	19,096	12.7	5.98	7.5	2.0	755	594	90	83	8.4	67	2361			2016	
08/30/23	Cyanotech #3 (SW Sump)	1127	7.54	34.49	19,091	11.2	6.79	3.6	2.0	723	588	81	86	9.0	51	2134				
12/07/23	Cyanotech #3 (SW Sump)	938	7.55	34.18	18,919	12.9	7.51	3.4	2.0	671	605	88	79	7.7	35	2443		123		
02/15/24	Cyanotech #3 (SW Sump)	1013	7.39	30.98	17,148	14.2	6.96	10.9	9.1	13720	11920	1979	1798	6.9	90	4088		300		
05/16/24	Cyanotech #3 (SW Sump)	1017	7.51	34.40	19,041	15.1	6.05	5.0	2.0	681	576	73	75	9.4	0	2126		141		

Cyanotech Corporation Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'29.04"N
Longitude: 156° 3'19.11"W

Seawater Disposal Trench Dimensions
L (ft) W (ft) D (ft)

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
Mean			7.38	32.28	17,865	15.26	6.72	7.3	5.0	1168	849	195	158	6.5	41	3667	0	188	2286	
Std. Dev.			0.28	4.39	2,429	2.93	1.28	6.4	5.2	1799	1612	267	243	1.8	51	2744	0	97	1121	
n=			54	54	54	54	54	54	53	54	51	54	51	54	50	50	2	3	50	

Discharge GPS:
Latitude: 19°44'4"N
Longitude: 156° 3'11"W

Seawater Disposal Trench Dimensions
L (ft.) W (ft.) D (ft.)
Leach Field

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(Kgal/day)*	
			SM4500-H	SM2520-B			G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
09/21/11	C2 Disp. Field North	No Sample			0														0	
12/08/11	C2 Disp. Field North	No Sample			0														0	
03/08/12	C2 Disp. Field North	No Sample			0														0	
06/07/12	C2 Disp. Field North	1018	8.18	35.38	19,583	29.93	5.32	1.5	2.0	96	6	19	7	5.1	7	21			62	
08/15/12	C2 Disp. Field North	815	8.74	0.71	393	25.89	6.38	33.7	2.8	1,392	1,299	174	158	8.0	41	20,432			27	
11/15/12	C2 Disp. Field North	1319	7.84	34.10	18,875	21.59	6.71	1.8	2.7	869	686	104	94	8.4	10	2,480			28	
02/27/13	C2 Disp. Field North	1043	8.01	39.60	21,919	24.72	5.45	4.6	10.1	721	214	155	72	4.7	3	1,508			18	
05/30/13	C2 Disp. Field North	1050	7.62	34.93	19,334	28.50	5.41	3.5	2.0	691	608	104	94	6.6	4	2,307			30	
09/05/13	C2 Disp. Field North	1059	8.31	3.24	1,793	35.31	4.39	2.2	3.2	1,727	1,486	242	235	7.1	40	16,898			51	
12/18/13	C2 Disp. Field North	1106	7.72	35.12	19,439	21.13	7.09	8.7	4.3	632	565	99	95	6.4	3	2,197			55	
03/06/14	C2 Disp. Field North	1104	7.65	34.70	19,207	23.64	5.87	3.6	2.0	702	615	95	97	7.4	25	2,481			44	
06/19/14	C2 Disp. Field North	959	7.89	4.35	2,408	26.29	5.82	3.7	9.1	1,045	139	614	572	1.7	235	22,988			35	
09/25/14	C2 Disp. Field North	1104	7.94	38.55	21,338	27.15	5.88	6.8	3.3	1,464	257	293	190	5.0	446	5,906			35	
12/24/14	C2 Disp. Field North	925	7.96	26.05	14,419	24.38	4.22	1.7	2.0	3,823	3,381	766	811	5.0	95	18,605			7	
03/19/15	C2 Disp. Field North	1118	7.72	34.57	19,135	25.45	6.89	3.3	3.9	586	521	87	90	6.7	12	2,270			43	
06/04/15	C2 Disp. Field North	1146	7.61	34.51	19,102	18.82	7.41	3.3	2.2	745	588	83	95	9.0	8	2,286			25	
09/10/15	C2 Disp. Field North	842	7.66	35.01	19,378	27.68	6.15	3.7	2.0	738	666	96	90	7.7	2	2,215			47	
12/16/15	C2 Disp. Field North	919	7.91	0.14	77	24.69	8.24	19.5	17.2	1,233	372	79	148	15.6	163	1,166			33	
02/17/16	C2 Disp. Field North	1054	7.74	34.42	19,052	21.42	6.54	3.0	3.4	642	598	109	101	5.9	10	2,242			40	
06/30/16	C2 Disp. Field North	921	7.76	34.26	18,963	24.63	6.87	3.7	2.0	506	465	82	81	6.2	2	2,075			47	
09/23/16	C2 Disp. Field North	847	7.63	34.72	19,218	12.09	9.32	3.3	2.0	1,072	972	150	147	7.1	25	3,863			72	
12/26/16	C2 Disp. Field North	1009	7.66	34.66	19,185	22.81	5.95	3.4	2.0	609	568	90	90	6.8	12	2,444			45	
03/09/17	C2 Disp. Field North	1024	7.78	35.77	19,799	24.31	5.05	7.6	2.2	661	580	109	101	6.1	33	2,496			31	
05/25/17	C2 Disp. Field North	1100	7.69	34.53	19,113	17.03	5.71	3.1	2.0	587	565	95	92	6.2	11	2,349			16	
09/14/17	C2 Disp. Field North	1121	7.90	33.97	18,803	22.38	6.93	3.6	2.0	587	552	95	90	6.2	30	2,208			27	
12/12/17	C2 Disp. Field North	1107																	21	No flow into PBR system
																				Cellana cease operations
09/03/20	Cyanotech CIC North	1408	7.76	0.17	94	31.41	4.73	15.4		818	335	62	47	13.3	-3	588	0		0	1st sampling for Cyanotech starting operations at CIC site
12/02/20	Cyanotech CIC North	1349	7.64	18.24	10,096	28.5	3.60	436.0	52.2	58,490	29,285	13,760	13,729	4.3	20,170	28,586	0		1	Very concentrated green algae
03/17/21	Cyanotech CIC North	1329	7.81	4.57	2,530	27.0	6.82	8.3	7.4	14,833	9,434	1,701	1,736	8.7	6,379	5,939			0	
05/28/21	Cyanotech CIC North	1309	8.28	13.83	7,655	29.1	3.20	96.5	88.0	25,720	13,380	11,304	9,038	2.3	10,304	25,988			0	
08/26/21	Cyanotech CIC North	1323	7.70	5.84	3,233	30.5	2.89	6.6	10.5	28,790	13,450	3,396	3,983	8.5	20,740	8,165			0	
12/08/21	Cyanotech CIC North	1335	7.42	0.21	116	26.9	4.88	11.0	4.1	2,185	1,786	146	486	15.0	5	6,916			1	
03/03/22	Cyanotech CIC North	1333	7.60	0.99	548	28.5	5.73	1.4	2.0	1,390	252	1,443	1,403	1.0	233	11,959			0	
05/19/22	Cyanotech CIC North	1331	7.26	0.27	149	29.0	5.68	29.0	2.0	1,048	556	220	123	4.8	21	3,295			5	
08/31/22	Cyanotech CIC North	1317	7.04	0.07	39	30.6	5.93	2.0	2.0	878	728	66	41	13.3	42	1,378			10	
11/30/22	Cyanotech CIC North	1156	7.48	0.35	194	29.1	7.12	1.0	2.0	1,840	1,718	47	37	39.0	21	1,458			1	
02/08/23	Cyanotech CIC North	1159	8.23	0.18	100	27.2	6.69	39.4	2.0	1,836	1,662	85	47	21.7	0	2,906			1	
05/18/23	Cyanotech CIC North	1026	7.25	0.23	127	28.3	6.22	1.7	16.0	1,101	461	70	12	15.7	13	616			1	
08/30/23	Cyanotech CIC North	1151	7.83	0.15	83	31.3	7.27	16.1	2.0	2,542	2,378	68	66	37.2	35	4,452				
12/07/23	Cyanotech CIC North	1010	7.58	0.14	77	27.2	7.15	1.6	2.0	1,692	706	108	99	15.6	384	1,289		151		
02/15/24	Cyanotech CIC North	1041	7.70	0.33	183	26.6	6.99	2.0	2.0	1,174	964	62	36	18.9	9	1,562		163		
05/16/24	Cyanotech CIC North	1123	7.82	0.22	122	30.0	5.98	2.1	2.0	902	586	50	64	18.0	1	1,375		149		
Mean			7.77	17.87	9,168	26.08	6.01	21.0	7.6	4,378	2,457	956	908	10.2	1,568	5,998	0	154	23	
Std. Dev.			0.31	16.67	9,250	4.37	1.31	71.2	16.2	10,983	5,491	2,849	2,657	8.3	4,907	7,656	0	8	21	
n=			38	38	41	38	38	38	37	38	38	38	38	38	38	38	2	3	38	

Discharge GPS:
Latitude: 19°44'4"N
Longitude: 156° 3'11"W

Seawater Disposal Trench Dimensions
L (ft.) W (ft.) D (ft.)
Leach Field

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		(2400)	(unit)	(PSU)	(mg/L)	(˚C)	(mg/L)	(mg/L)	(mg/L)	(µg N/L)	(µg N/L)	(µg P/L)	(µg P/L)	(ratio)	(µg N/L)	(µg Si/L)	(mg/L)	(mV)	(Kgal/day)	
			SM4500-H	SM2520-B			G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
09/21/11	C1 Disp. Field South	1427	8.07	53.13	29,408	33.84	4.63	4.6	2.0	638		124		5.1					20	
12/08/11	C1 Disp. Field South	952	7.39	35.12	19,439	28.37	4.35	1.2	2.5	121		20		6.1					0	
03/08/11	C1 Disp. Field South	1000	7.80	35.10	19,428	28.37	4.21	1.8	2.0	94	9	33	15	2.8	15	148			0	
06/07/12	C1 Disp. Field South	1010	7.81	35.26	19,517	29.37	3.73	11.4	2.0	1544	17	50	27	30.9	1240	137			62	
08/15/12	C1 Disp. Field South	800	7.28	35.20	19,484	30.66	2.94	3.0	2.0	515	164	57	38	9.0	152	919			27	
11/15/12	C1 Disp. Field South	1313	7.72	34.78	19,251	20.30	6.37	2.4	2.0	863	695	108	97	8.0	13	2459			28	
02/27/13	C1 Disp. Field South	1031	7.25	34.53	19,113	25.60	4.50	4.2	2.0	726	580	113	103	6.4	51	2462			18	
05/30/13	C1 Disp. Field South	1050	7.73	35.69	19,755	27.01	6.40	28.7	15.7	1429	674	234	210	6.1	90	2435			30	composite sample (centrifuge and pond)
09/05/13	C1 Disp. Field South	1050	7.39	34.47	19,080	29.48	2.54	4.6	2.2	1312	690	533	555	2.5	548	2683			51	
12/18/13	C1 Disp. Field South	1058	7.48	34.22	18,941	27.49	3.46	41.9	15.0	858	628	187	163	4.6	49	2820			55	
03/06/14	C1 Disp. Field South	1104	7.56	34.27	18,969	24.72	6.98	7.6	5.2	693	585	107	97	6.5	19	2284			44	
06/19/14	C1 Disp. Field South	955	7.52	33.95	18,792	28.83	4.90	14.8	3.8	743	557	143	131	5.2	94	3806			35	
09/25/14	C1 Disp. Field South	1100	7.41	34.65	19,179	30.10	4.95	4.2	2.0	713	578	106	98	6.7	15	2181			35	
12/24/14	C1 Disp. Field South	910	7.35	34.54	19,118	25.44	4.91	2.6	2.0	784	649	125	119	6.3	11	2432			7	
03/19/15	C1 Disp. Field South	1113	7.56	31.91	17,663	23.47	7.12	8.2	3.6	937	633	125	135	7.5	18	3565			43	
06/04/15	C1 Disp. Field South	1137	8.45	37.83	20,939	32.42	5.29	6.9	3.4	785	32	57	44	13.9	1	727			25	
09/10/15	C1 Disp. Field South	832	7.84	36.63	20,275	27.54	6.20	4.0	2.0	766	789	103	121	7.4	0.4	2680			47	
12/16/15	C1 Disp. Field South	909	7.98	37.67	20,851	24.14	7.26	7.4	6.2	1616	33	257	62	6.3	135	789			33	
02/17/16	C1 Disp. Field South	1040	8.32	38.06	21,067	24.45	6.67	166.5	12.9	1058	45	411	298	2.6	87	3102			40	
03/09/16	C1 Disp. Field South	935						21.0												Met with Avery to diagnose high TSS values. Resampled TSS.
04/13/16	C1 Disp. Field South	1009						6.4												follow up TSS sample from high 1st Q value
06/30/16	C1 Disp. Field South	909	7.79	22.59	12,504	25.60	7.02	2.6	2.0	857	732	124	120	6.9	3	8570			47	
09/23/16	C1 Disp. Field South	840	7.84	38.84	21,498	12.63	8.82	7.9	2.1	1425	815	614	598	2.3	22	4781			72	
12/08/16	C1 Disp. Field South	906	7.47	32.76	18,133	8.09	7.62	8.3	2.0	1084	824	108	108	10.0	84	2582			45	
03/09/17	C1 Disp. Field South	1009	7.73	34.40	19,041	11.37	7.45	3.4	2.0	704	672	124	126	5.7	33	2363			31	
05/25/17	C1 Disp. Field South	1053	7.67	34.69	19,201	9.55	4.71	3.7	2.0	610	542	100	96	6.1	6	2267			16	
09/14/17	C1 Disp. Field South	1115	7.66	34.44	19,063	12.08	6.89	4.3	2.0	610	572	121	116	5.0	20	2276			27	
12/12/17	C1 Disp. Field South	1107															0		21	No flow into sump
																				Cellana cease operations
09/03/20	Cyanotech CIC South	1400	8.29	1.43	792	31.45	5.08	8.9		1065	851	365	430	2.9	-3	6593	0		0	(former Cellana); BOD - N/A - equipment failure
12/02/20	Cyanotech CIC South	1357	8.49	1.42	786	28.0	7.69	8.0	2.0	1313	1056	432	477	3.0	18	6831	0		1	
03/05/21	Cyanotech CIC South	1342	8.22	0.30	166	26.7	7.78	1.7	2.0	754	547	200	152	3.8	71	1733			0	
05/28/21	Cyanotech CIC South	1320	8.36	0.45	249	29.9	7.33	0.4	2.0	931	877	257	198	3.6	15	4160			0	
08/26/21	Cyanotech CIC South	1306	8.37	0.53	293	30.7	7.34	0.5	2.0	946	827	309	341	3.1	16	5488			0	
12/08/21	Cyanotech CIC South	1324	8.68	0.90	498	26.8	7.89	3.3	2.0	2133	33	394	226	5.4	1260	1451			1	
03/03/21	Cyanotech CIC South																		0	No flow, sump dry.
05/19/22	Cyanotech CIC South																		5	No flow, sump dry.
08/31/22	Cyanotech CIC South	1310	8.25	0.40	221	31.5	6.28	2.2	2.0	1108	944	160	181	6.9	5	4202			10	
11/30/22	Cyanotech CIC South	1207	8.57	0.58	321	29.6	7.49	1.5	2.0	900	884	216	222	4.2	8	4944			1	
02/08/23	Cyanotech CIC South	1148	8.53	0.69	382	27.1	7.64	2.9	2.0	1074	886	182	191	5.9	17	4206			1	
05/18/23	Cyanotech CIC South	1019	8.65	0.62	343	29.7	7.30	4.7	2.0	1176	878	184	215	6.4	12	4762			1	
08/30/23	Cyanotech CIC South	1143	8.73	1.08	598	31.9	7.30	1.3	2.0	2192	1856	257	293	8.5	8	6442				
12/07/23	Cyanotech CIC South	955	8.36	0.33	183	27.1	7.59	1.6	2.0	2080	1719	156	131	13.4	37	2423		127		
02/15/24	Cyanotech CIC South	1047	8.59	0.52	288	26.0	8.05	2.6	2.0	2273	2263	184	193	12.4	2	4388		139		
05/16/24	Cyanotech CIC South	1139	8.60	0.85	470	30.6	7.38	3.9	2.0	4257	3805	150	221	28.4	17	4808		159		
Mean			7.97	22.94	12,700	25.85	6.21	10.4	3.3	1120	782	193	188	7.4	113	3268	0	142	23	
Std. Dev.			0.47	17.27	9,557	6.49	1.60	26.2	3.5	722	702	135	139	5.9	291	1928	0	16	21	
n=			39	39	39	39	39	41	38	39	37	39	37	39	37	37	3	3	38	0

Indo-Pacific Sea Farms Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'43.28"N
Longitude: 156° 3'26.98"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
12	8	6

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	(mg/L)	(mV)	*(kgal/day)*	
			SM4500-H+	SM2520-B			G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
03/17/11	IPSF #1	1005	7.86	35.54	19,672	19.40	6.23	2.9	2.0	327		64		5.1					67.7	
06/09/11	IPSF #1	852	7.92	34.54	19,118	18.22	6.18	4.5	2.0	341		65		5.2					69.5	
09/22/11	IPSF #1	932	7.89	34.58	19,140	20.55	6.36	5.1	2.0	288		54		5.3					80.4	
12/15/11	IPSF #1	950	7.92	34.60	19,151	19.04	6.95	3.9	2.0	376		48		7.8					67.8	
03/08/12	IPSF #1	1035	8.09	34.97	19,356	21.07	6.12	1.8	2.0	306	151	58	40	5.3	29	717			67.7	
05/31/12	IPSF #1	901	8.00	34.77	19,246	19.83	7.33	3.6	2.0	424	122	53	33	8.0	25	817			70.8	
09/13/12	IPSF #1	1111	8.09	35.00	19,373	22.17	6.88	3.2	2.0	387	117	55	34	7.0	26	877			67.7	
12/13/12	IPSF #1	906	7.91	35.04	19,395	19.63	7.43	3.3	2.0	342	165	49	31	7.0	47	837			65.7	
03/21/13	IPSF #1	931	7.90	34.37	19,024	19.46	8.25	3.3	2.0	285	167	58	45	4.9	40	980			67.7	
05/30/13	IPSF #1	1114	8.19	35.06	19,406	23.08	6.72	3.4	2.0	308	114	59	37	5.2	26	845			67.7	
09/05/13	IPSF #1	1011	8.05	34.67	19,190	22.16	6.50	3.1	2.0	283	121	54	35	5.2	23	939			67.7	
12/18/13	IPSF #1	1034	7.98	34.89	19,312	19.14	6.91	2.5	2.3	362	228	68	51	5.3	31	1165			67.7	
03/06/14	IPSF #1	1004	8.06	34.77	19,246	21.40	8.06	4.8	2.0	311	98	53	31	5.9	37	608			71.7	
06/26/14	IPSF #1	1011	8.08	34.83	19,279	21.32	6.52	3.5	4.0	339	151	46	35	7.3	32	1073			67.7	
09/25/14	IPSF #1	1001	8.02	34.96	19,351	25.26	4.45	4.4	2.2	523	149	56	14	9.4	51	747			67.7	
12/24/14	IPSF #1	945	7.93	34.98	19,362	21.80	4.61	2.7	2.0	567	187	62	50	9.1	37	657			70.6	
03/19/15	IPSF #1	958	7.98	34.62	19,163	22.02	7.22	4.5	2.0	276	66	35	26	7.9	38	350			68.5	
06/25/15	IPSF #1	1000	8.01	34.44	19,063	21.94	5.52	4.5	2.0	375	175	21	40	17.6	30	753			67.7	
09/10/15	IPSF #1	856	7.87	34.70	19,207	23.54	7.06	5.7	2.0	468	211	29	35	16.0	25	893			67.7	
12/03/15	IPSF #1	1114	8.14	34.58	19,140	22.07	5.80	4.5	2.0	226	147	42	30	5.4	6	726			67.7	
02/25/16	IPSF #1	932	8.19	34.73	19,223	21.35	6.91	4.4	2.0	279	99	55	41	5.1	16	565			67.7	
06/02/16	IPSF #1	822	8.01	34.71	19,212	21.86	6.86	4.3	2.0	201	93	40	29	5.0	6	709			66.9	
09/08/16	IPSF #1	842	8.12	34.63	19,168	20.08	6.56	4.3	2.0	517	352	90	75	5.7	30	1909			67.0	
12/01/16	IPSF #1	922	7.96	34.64	19,174	19.94	7.07	6.2	2.0	317	201	57	45	5.6	58	971			67.0	
03/16/17	IPSF #1	840	7.72	34.65	19,179	21.33	6.04	4.9	2.0	370	115	74	52	5.0	165	626			66.9	
05/25/17	IPSF #1	905	7.85	34.61	19,157	21.80	4.37	15.8	2.2	560	107	111	74	5.0	187	651			67.7	
08/31/17	IPSF #1	849	7.79	34.71	19,212	22.62	5.29	5.4	2.0	559	135	110	86	5.1	291	811			68.5	
12/07/17	IPSF #1	951	7.82	34.98	19,362	21.04	3.34	5.9	2.0	525	148	97	81	5.4	460	707			67.7	
03/15/18	IPSF #1	1027	7.81	34.71	19,212	21.33	4.10	4.6	2.0	446	111	81	59	5.5	217	551			67.7	
06/21/18	IPSF #1	1002	7.89	35.34	19,561	22.21	5.41	5.6	2.0	393	141	67	54	5.9	146	693			67.7	
09/20/18	IPSF #1	1011	7.84	34.48	19,085	22.54	5.98	5.2	2.0	259	135	43	29	6.1	50	824			67.7	
12/13/18	IPSF #1	1017	8.06	34.89	19,312	20.28	5.72	11.7	2.0	273	169	51	41	5.4	41	784			67.0	
03/07/19	IPSF #1	1000	7.79	35.21	19,489	20.07	6.57	6.7	2.0	464	148	73	52	6.4	137	813			67.7	
06/13/19	IPSF #1	908	7.89	34.82	19,273	20.79	6.10	4.9	2.0	425	148	79	57	5.4	167	898			67.7	
09/19/19	IPSF #1	835	7.91	34.75	19,234	22.03	6.50	3.1	2.0	330	196	66	52	5.0	63	1049			67.7	
11/07/19	IPSF #1	939	7.91	35.05	19,401	21.28	6.81	4.2	2.0	385	224	179	49	2.2	63	973			67.7	
03/12/20	IPSF #1	914	7.90	35.57	19,688	18.39	7.32	4.7	2.0	420	223	72	55	5.8	92	958			67.7	
06/18/20	IPSF #1	945	7.89	36.75	20,342	23.05	5.85	4.6	2.0	347	170	63	48	5.5	120	911			57.7	
09/03/20	IPSF #1	1004	7.92	35.77	19,799	21.79	6.07	4.2		478	220	54	48	8.8	66	1065	0.0		37.9	BOD - N/A - equipment failure
11/19/20	IPSF #1	956	7.66	35.47	19,633	20.7	5.40	4.3	4.2	948	249	113	93	8.4	297	1040	0.0		37.5	
03/25/21	IPSF #1	1010	7.64	35.86	19,849	21.9	4.37	6.3	4.0	857	124	112	92	7.6	384	784			37.1	
05/27/21	IPSF #1	908	7.50	35.69	19,755	23.0	3.62	5.2	3.3	735	132	103	94	7.2	406	799			37.1	Elevated water level in sump
08/26/21	IPSF #1	855	7.22	35.49	19,644	25.2	1.22	11.0	7.4	1917	73	271	209	7.1	894	929			37.9	Elevated water level in sump
12/02/21	IPSF #1	952	7.92	34.84	19,284	19.1	7.51	4.7	2.9	698	317	79	55	8.8	25	1361			37.9	Samples collected from pipe flowing into sump
03/03/22	IPSF #1	941	7.63	34.78	19,251	20.8	5.16	3.9	2.7	803	188	77	70	10.4	319	993			37.0	Water level still fluctuating. Sample collected from sump
06/16/22	IPSF #1	910	7.32	34.57	19,135	21.7	3.09	4.1	6.6	1603	206	184	128	8.7	437	1103			37.5	Sump level highest its been, back flowing into discharge pipe.
09/08/22	IPSF #1	904	7.32	34.80	19,262	21.6	4.30	4.1	3.2	962	237	139	118	6.9	256	1240			37.9	
12/08/22	IPSF #1	925	7.29	34.66	19,185	20.6	3.52	5.3	3.7	1558	250	177	127	8.8	780	1277			37.5	Apparent subterranean seepage from neighbors' sump
03/02/23	IPSF #1	934	7.50	34.53	19,113	19.3	4.48	5.2	3.4	967	265	139	100	6.9	394	1057			37.5	
05/18/23	IPSF #1	933	7.81	34.58	19,140	19.4	7.29	4.1	2.0	480	256	56	49	8.6	86	1323			37.5	Sump level going down and water clarity is improving
09/14/23	IPSF #1	1356	7.89	34.67	19,190	21.7	7.08	2.8	2.0	422	281	55	53	7.7	65	1346		365.2		
12/14/23	IPSF #1	901	7.65	34.65	19,179	18.5	7.50	2.3	2.0	455	314	70	65	6.5	40	1309		259.3		
02/15/24	IPSF #1	901	7.82	34.74	19,229	18.1	7.53	2.9	2.0	407	235	40	36	10.1	32	1077		180.2		sump level has been constant with clear clarity
05/23/24	IPSF #1	905	7.83	34.71	19,212	19.1	7.32	3.4	2.0	509	276	62	58	8.2	113	1265		409.6		

Indo-Pacific Sea Farms Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'43.28"N
Longitude: 156° 3'26.98"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
12	8	6

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	(mg/L)	(mV)	*(kgal/day)*	
			SM4500-H+	SM2520-B			G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
Mean			7.85	34.91	19,321	21.07	5.99	4.7	2.5	518	178	77	59	7.0	148	927	0	304	61	
Std. Dev.			0.22	0.43	241	1.59	1.43	2.3	1.1	343	67	45	34	2.6	191	269	0	104	13	
n=			54	54	54	54	54	54	53	54	50	54	50	54	50	50	2	4	50	

Jamestown Port Whitney Ventures, LLC Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'40.47"N
Longitude: 156° 3'30.45"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
30	8	5

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
03/16/11	Troutlodge 1 (Main)	915	7.77	34.72	19,218	19.35	6.99	2.6	2.0	295		43		6.9					675	
06/08/11	Troutlodge 1 (Main)	1033	7.81	34.67	19,190	19.40	7.16	3.3	3.7	650		92		7.1					812	
09/28/11	Troutlodge 1 (Main)	1631	7.33	34.65	19,179	14.26	6.82	7.5	3.4	896		198		4.5					590	
12/07/11	Troutlodge 1 (Main)	1546	7.02	34.35	19,013	12.74	6.60	4.1	2.0	875	495	136	273	6.4	481	2072			144	
03/07/12	Troutlodge 1 (Main)	1400	7.23	34.46	19,074	11.18	7.17	12.0	5.9	1229	495	299	273	4.1	481	2072			65	
05/24/12	Troutlodge 1 (Main)	828	7.32	34.55	19,124	9.95	7.98	7.0	4.2	1126	554	263	239	4.3	632	3037			288	
08/16/12	Troutlodge 1 (Main)	944	7.28	34.97	19,356	10.97	7.81	7.0	4.0	1467	551	291	274	5.0					485	
11/14/12	Troutlodge 1 (Main)	1022	7.33	34.57	19,135	8.37	6.26	5.6	4.0	1911	576	281	279	6.8	691	2261			421	
02/20/13	Troutlodge 1 (Main)	1021	7.38	34.56	19,129	10.38	9.80	7.5	3.1	1465	580	244	236	6.0	690	2218			363	
05/09/13	Troutlodge 1 (Main)	819	7.51	34.66	19,185	8.85	9.11	2.2	2.0	742	547	114	114	6.5	156	2120			339	
08/22/13	Troutlodge 1 (Main)																		0	No Sample (facility not in operation)
12/05/13	Troutlodge 1 (Main)																		0	No Sample (facility not in operation)
02/25/14	Troutlodge 1 (Main)																		0	No Sample (facility not in operation)
05/14/14	Troutlodge 1 (Main)																		0	No Sample (facility not in operation)
08/13/14	Troutlodge 1 (Main)																		0	No Sample (facility not in operation)
12/10/14	Troutlodge 1 (Main)																		0	No Sample (facility not in operation)
02/26/15	Troutlodge 1 (Main)																		0	No Sample (facility not in operation)
06/25/15	Marine Aqua 1 (Main)	913	7.93	34.34	19,008	19.29	5.85	2.7	2.0	319	268	49	46	6.5	4	992			0	
09/02/15	Marine Aqua 1 (Main)	902	8.11	33.36	18,465	21.59	6.73	6.2	2.0	5280	4720	130	139	40.7	210	1359			45	
12/03/15	Marine Aqua 1 (Main)	1207	7.74	34.40	19,041	12.26	3.71	2.5	2.0	709	647	107	105	6.6	11	1968			90	
02/24/16	Marine Aqua 1 (Main)	1442	8.28	33.28	18,421	22.75	6.56	5.9	2.4	3252	3065	262	257	12.4	46	879			50	
06/08/16	Marine Aqua 1 (Main)	921	8.10	34.60	19,151	23.14	5.80	4.5	2.0	279	175	39	32	7.2	8	635			71	
09/01/16	Marine Aqua 1 (Main)	854	7.91	34.34	19,008	16.30	7.43	3.8	2.0	864	816	64	65	13.5	34	1480			71	
11/30/16	Marine Aqua 1 (Main)	1032	7.87	34.45	19,068	15.61	7.48	4.8	2.0	962	884	112	106	8.6	52	1214			73	
03/08/17	Marine Aqua 1 (Main)	1013	8.00	27.79	15,382	17.02	6.90	3.7	2.0	1080	998	118	104	9.1	33	1354			95	
06/01/17	Marine Aqua 1 (Main)	948	7.84	34.95	19,345	16.43	4.18	4.4	2.7	3486	3270	392	373	8.9	131	2296			108	
08/24/17	Marine Aqua 1 (Main)	931	8.07	34.43	19,057	17.12	5.34	5.0	2.0	1032	923	100	85	10.3	41	1262			109	
12/14/17	Marine Aqua 1 (Main)	856	7.78	34.34	19,008	12.90	5.58	4.6	2.0	1587	1706	118	132	13.4	89	1653			108	
03/01/18	Jamestown Port Whitney Venture	1056	7.81	34.52	19,107	14.62	7.85	4.0	2.0	1106	1097	137	132	8.1	45	1190			108	
06/14/18	Jamestown Port Whitney Venture	1008	7.96	34.41	19,046	17.65	6.01	9.8	2.0	768	696	81	61	9.5	26	1102			108	
09/10/18	Jamestown Port Whitney Venture	1104	7.60	34.37	19,024	11.72	5.88	6.1	2.0	888	687	139	113	6.4	81	2124			108	
11/09/18	Jamestown Port Whitney Venture	941	7.89	34.72	19,218	18.69	5.20	3.7	2.0	489	447	76	66	6.5	14	1272			107	
02/15/19	Jamestown Port Whitney Venture	906	7.58	34.58	19,140	14.54	7.82	4.6	2.0	381	342	57	52	6.6	13	1317			108	
05/24/19	Jamestown Port Whitney Venture	929	7.56	35.64	19,727	14.99	7.51	3.8	2.0	516	485	73	67	7.1	6	1510			108	
09/12/19	Jamestown Port Whitney Venture	1130	7.86	34.46	19,074	15.35	7.48	3.9	2.0	587	537	78	71	7.6	21	1497			108	
10/23/19	Jamestown Port Whitney Venture	1401	7.92	35.79	19,810	18.78	7.28	1.9	2.0	1306	1232	116	109	11.3	25	1650			108	
03/06/20	Jamestown Port Whitney Venture	857	7.92	35.41	19,600	16.25	6.97	4.0	2.0	652	586	73	66	8.9	25	1214			108	
06/18/20	Jamestown Port Whitney Venture	1023	7.81	36.49	20,198	16.18	7.54	6.0	2.0	521	477	75	70	7.0	18	1362			108	
08/28/20	Jamestown Port Whitney Venture	1136	7.74	32.10	17,768	14.72	7.04	3.6		1001	835	105	97	9.6	24	1618			109	BOD - N/A - equipment failure
11/12/20	Jamestown Port Whitney Venture	923	7.89	35.28	19,528	18.0	7.32	6.4	2.0	787	639	101	74	7.8	23	1215			108	
03/05/21	Jamestown Port Whitney Venture	1056	7.91	35.74	19,782	14.4	6.88	4.5	2.1	736	621	122	127	6.1	135	1541			107	
05/06/21	Jamestown Port Whitney Venture	1052	7.93	35.58	19,694	17.3	6.89	5.1	2.0	535	476	91	100	5.9	59	1264			107	
07/15/21	Jamestown Port Whitney Venture	1144	7.84	34.97	19,356	17.9	6.81	4.6	2.0	796	662	154	149	5.2	14	1372			109	
12/02/21	Jamestown Port Whitney Venture	1003	7.89	34.93	19,334	15.8	6.78	2.6	2.0	733	658	74	69	9.9	13	1347			109	
02/10/22	Jamestown Port Whitney Venture	1148	7.96	34.54	19,118	19.2	7.09	4.8	2.0	676	560	67	63	10.0	4	1411			108	
06/15/22	Jamestown Port Whitney Venture	959	7.87	34.46	19,074	17.6	7.33	3.4	2.0	599	479	66	59	9.1	15	1340			109	
08/05/22	Jamestown Port Whitney Venture	1117	8.13	34.77	19,246	20.5	6.85	5.1	2.0	656	478	65	56	10.1	25	975			108	
11/17/22	Jamestown Port Whitney Venture	942	7.75	35.35	19,567	13.9	6.79	2.0	2.0	476	412	59	57	8.0	21	1616			108	
02/03/23	Jamestown Port Whitney Venture	1127	8.01	34.48	19,085	19.8	6.86	5.1	2.0	576	471	62	58	9.4	62	880			108	
05/05/23	Jamestown Port Whitney Venture	1126	8.02	34.55	19,124	20.3	6.94	3.9	2.0	594	488	59	64	10.1	83	939			108	
08/24/23	Jamestown Port Whitney Venture	1106	7.84	34.50	19,096	17.9	7.06	3.0	2.0	932	927	54	53	17.4	61	1241				
11/02/23	Jamestown Port Whitney Venture	932	8.10	33.91	18,770	19.4	6.58	7.6	2.0	943	714	75	57	12.5	20	1121		206.5		
02/08/24	Jamestown Port Whitney Venture	1151	8.11	34.51	19,102	20.9	7.37	4.9	2.0	761	582	64	55	12.0	4	1031		108.8		
05/10/24	Jamestown Port Whitney Venture	911	8.04	34.25	18,958	20.5	6.95	8.6	2.2	752	557	77	62	9.8	53	1396		232.3		
Mean			7.80	34.48	19,087	16.31	6.86	4.9	2.3	1027	850	120	117	9.1	109	1475	#DIV/0!	183	148	
Std. Dev.			0.27	1.21	668	3.63	1.03	2.0	0.8	887	841	81	82	5.4	187	474	#DIV/0!	65	173	

Jamestown Port Whitney Ventures, LLC Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'40.47"N
Longitude: 156° 3'30.45"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
30	8	5

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
n=			47	47	47	47	47	47	46	47	44	47	44	47	43	43	0	3	42	

Keahole Point Provisions Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'36.26"N
Longitude: 156° 3'30.60"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
15	12	6

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H+	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
12/02/10	Kona Cold Lobster	953	7.67	34.24	18,952			2.1	2.0	652	597	98	94	6.6	4	2716			458	
02/03/11	Kona Cold Lobster	933	7.81	34.65	19,179	7.19	9.00	2.4	2.0	627		102		6.1					389	
05/11/11	Kona Cold Lobster	917	7.70	34.60	19,151	6.36	11.16	3.5	2.0	663		95		7.0					338	
08/18/11	Kona Cold Lobster	917	7.72	34.31	18,991	6.91	9.58	1.8	2.0	663		101		6.6					386	
12/01/11	Kona Cold Lobster	954	7.71	34.20	18,930	8.11	10.22	2.4	2.9	1118		157		7.1					395	
02/16/12	Kona Cold Lobster	954	7.78	34.50	19,096	7.50	11.37	2.1	2.0	726	580	100	93	7.3	38	2308			494	
05/31/12	Kona Cold Lobster	825	7.60	34.29	18,980	7.53	10.21	3.5	2.2	805	582	127	108	6.3	49	2299			475	
08/16/12	Kona Cold Lobster	1000	7.65	34.51	19,102	7.29	11.43	3.5	2.0	762	572	112	96	6.8	27	2385			411	
12/12/12	Kona Cold Lobster	956	7.59	34.75	19,234	10.59	10.49	3.5	2.5	987	598	147	111	6.7	94	2444			368	
02/28/13	Kona Cold Lobster	952	7.51	34.83	19,279	7.62	11.90	5.3	6.1	1243	706	129	114	9.7	150	2267			340	
05/15/13	Kona Cold Lobster	902	7.63	34.48	19,085	7.42	10.37	5.1	2.0	960	640	122	104	7.9	83	2475			326	
08/28/13	Kona Cold Lobster	912	7.62	34.75	19,234	7.83	10.90	3.8	2.0	744	603	110	110	6.8	41	2290			349	
12/12/13	Kona Cold Lobster	1035	7.47	34.77	19,246	7.92	9.28	7.5	2.7	1012	627	118	97	8.6	204	2121			388	
03/05/14	Kona Cold Lobster	907	7.58	34.89	19,312	7.48	10.52	3.4	2.0	736	603	104	104	7.1	40	2253			485	
06/26/14	Kona Cold Lobster	909	7.59	34.58	19,140	7.68	12.08	3.5	2.6	613	538	90	91	6.8	20	2975			498	
09/04/14	Kona Cold Lobster	854	7.68	34.60	19,151	8.14	8.15	3.3	2.4	823	566	108	97	7.6	112	2085			361	
12/18/14	Kona Cold Lobster	1115	7.49	35.33	19,556	7.49	10.22	8.8	4.0	1452	624	158	111	9.2	165	2342			373	
03/12/15	Kona Cold Lobster	839	7.54	34.47	19,080	7.19	10.73	5.8	2.5	1970	1228	330	227	6.0	144	5072			476	
06/04/15	Kona Cold Lobster	1121	7.74	34.45	19,068	7.19	10.94	4.4	2.0	723	597	96	92	7.5	28	2208			412	
08/20/15	Kona Cold Lobster	903	7.86	35.10	19,428	7.10	12.32	6.3	2.0	767	593	108	102	7.1	33	2166			397	
12/02/15	Kona Cold Lobster	914	7.82	34.52	19,107	7.49	10.91	5.4	2.0	845	609	116	102	7.3	60	2192			409	
02/17/16	Kona Cold Lobster	906	7.59	34.32	18,996	7.14	10.59	5.7	3.1	1089	718	144	122	7.6	275	2266			384	
06/02/16	Kona Cold Lobster	844	7.54	34.54	19,118	6.86	14.78	4.0	2.0	646	525	181	112	3.6	48	2269			395	
09/01/16	Kona Cold Lobster	845	8.03	35.21	19,489	7.45	11.56	5.9	2.0	747	574	85	68	8.8	34	2200			355	
11/30/16	Kona Cold Lobster	902	7.54	34.65	19,179	6.88	10.77	7.3	2.0	673	553	108	100	6.2	107	2381			368	
03/08/17	Kona Cold Lobster	1002	7.75	34.60	19,151	8.18	9.65	4.7	2.0	708	554	104	90	6.8	119	2211			305	
05/18/17	Kona Cold Lobster	1042	7.76	34.74	19,229	8.21	7.54	10.2	5.4	1025	518	159	86	6.4	221	2024			275	
08/30/17	Kona Cold Lobster	816	7.56	34.43	19,057	8.54	9.63	9.0	4.4	1408	552	200	140	7.0	717	2156			374	
12/07/17	Kona Cold Lobster	1014	7.60	34.74	19,229	8.52	4.87	10.3	7.4	1689	586	180	72	9.4	1241	2043			375	
03/01/18	Kona Cold Lobster	1102	7.75	34.41	19,046	8.43	11.18	58.4	21.1	1766	491	272	21	6.5	752	2169			365	Sample contained fleshy parts & oily sheen
05/08/18	Kona Cold Lobster	952	7.63	34.58	19,140	8.09	9.79				586		99		94	2213				1st BAP sampling
06/14/18	Kona Cold Lobster	1032	7.66	35.02	19,384	7.86	10.77	8.6	2.0	708	564	102	81	7.0	47	2298			407	
07/12/18	Kona Cold Lobster	1056	7.65	34.50	19,096	8.00	11.11				561		97		21	2326				monthly BAP testing
08/13/18	Kona Cold Lobster	1016	7.73	34.51	19,102	6.99	11.00				595		84		18	2271				monthly BAP testing
09/10/18	Kona Cold Lobster	1117	7.57	34.55	19,124	8.79	10.68	13.2	2.6	763	541	102	69	7.5	67	2286			424	
10/11/18	Kona Cold Lobster	1027	7.66	34.78	19,251	8.51	8.84				545		87		58	2195				monthly BAP testing
11/02/18	Kona Cold Lobster	930	7.49	34.58	19,140	9.02	10.30				538		88		72	2227				monthly BAP testing
12/12/18	Kona Cold Lobster	855	7.67	34.75	19,234	8.18	7.18	5.1	2.0	771	555	107	76	7.2	158	2246			325	
01/15/19	Kona Cold Lobster	1027	7.64	34.63	19,168	7.68	10.59				569		109		208	2328				monthly BAP testing
02/13/19	Kona Cold Lobster	1012	7.32	35.23	19,500	7.76	11.24				553		92		93	2375				monthly BAP testing
03/01/19	Kona Cold Lobster	1027	7.45	34.60	19,151	7.68	11.20	6.1	3.1	823	631	108	87	7.7	146	2365			358	
04/25/19	Kona Cold Lobster	954	7.18	35.42	19,605	8.05	11.40				547		92		98	2260				monthly BAP testing
05/07/19	Kona Cold Lobster	1030	7.18	35.59	19,699	8.10	11.13				594		116		156	2343				monthly BAP testing
06/05/19	Kona Cold Lobster	911	7.38	35.65	19,733	8.37	10.96	3.7	2.0	677	546	105	90	6.4	72	2280			400	
07/17/19	Kona Cold Lobster	1012	7.44	35.62	19,716	8.34	10.67				639		107		221	2205				monthly BAP testing
08/23/19	Kona Cold Lobster	1358	7.69	34.88	19,306	8.89	11.33				560		80		184	2162				monthly BAP testing
09/12/19	Kona Cold Lobster	1135	7.76	34.68	19,196	9.46	11.96	5.8	3.9	1274	553	219	87	5.8	160	2238			390	
10/16/19	Kona Cold Lobster	1049	7.58	35.41	19,600	9.42	11.03				486		85		79	2118				monthly BAP testing
11/01/19	Kona Cold Lobster	924	7.82	35.27	19,522	8.24	11.20	2.5	2.0	708	567	87	92	8.1	120	2202			323	
12/17/19	Kona Cold Lobster	939	7.53	34.39	19,035	9.19	9.36				564		86		755	2111				monthly BAP testing
01/09/20	Kona Cold Lobster	1033	7.71	35.77	19,799	8.72	10.57				571		82		211	2086				monthly BAP testing

Keahole Point Provisions Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'36.26"N
Longitude: 156° 3'30.60"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
15	12	6

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H+	SM2520-B			G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
02/04/20	Kona Cold Lobster	1140	7.56	35.35	19,567	9.84	9.75				561		102		545	2213				monthly BAP testing
03/06/20	Kona Cold Lobster	1056	7.78	36.15	20,009	9.00	10.30	6.2	2.7	678	584	107	94	6.4	208	2136			305	
04/01/20	Kona Cold Lobster																			No Sampling - COVID-19
05/21/20	Kona Cold Lobster	1145	7.67	36.06	19,960	7.86	10.76				561		89		27	2244				
06/26/20	Kona Cold Lobster	856	7.66	35.60	19,705	8.06	10.07	4.6	2.0	594	546	92	84	6.4	11	2068			306	no direct flow into big sump, collected sample at small makai
07/14/20	Kona Cold Lobster	1110	7.39	33.90	18,764	13.96	7.12				481		172		1325	2278				sump
08/25/20	Kona Cold Lobster	944	7.67	35.78	19,805	9.92	10.78				581		85		23	2030				no direct flow into big sump, collected sample at small makai
09/16/20	Kona Cold Lobster	947	7.59	35.36	19,572	11.91	6.51	3.9		1387	545	161	136	8.6	471	2093	0		203	BOD - N/A - equipment failure
10/14/20	Kona Cold Lobster	1100	7.71	34.99	19,367	12.6	9.60				551		135		879	2089				monthly BAP, composite sample collected
11/04/20	Kona Cold Lobster	1120	7.56	35.33	19,556	12.3	9.01				617		90		1261	2149				monthly BAP, composite sample collected
12/02/20	Kona Cold Lobster	915	7.53	35.44	19,616	10.5	8.34	3.5	3.6	1855	550	140	103	13.2	773	2051	0		236	
01/14/21	Kona Cold Lobster	1017	7.42	33.97	18,803	12.0	6.89				593		459		2680	2151				monthly BAP, composite sample collected
02/11/21	Kona Cold Lobster	1028	7.69	35.64	19,727	9.2	9.26				573		97		221	2063				monthly BAP, composite sample collected
03/25/21	Kona Cold Lobster	1113	7.61	35.72	19,771	9.1	9.70	2.8	2.0	714	567	87	88	8.2	81	2358			332	
04/13/21	Kona Cold Lobster	1106	7.68	35.54	19,672	8.8	9.57				610		104		299	2181				monthly BAP, composite sample collected
05/06/21	Kona Cold Lobster	1045	7.58	35.48	19,639	8.6	9.48	3.3	2.0	639	538	75	86	8.5	49	2210			313	
06/22/21	Kona Cold Lobster	1015	7.67	35.51	19,655	9.1	9.53				536		106		351	2256				monthly BAP, composite sample collected
07/01/21	Kona Cold Lobster	1350	7.53	35.71	19,766	9.2	9.30				578		101		186	2162				monthly BAP, composite sample collected
08/13/21	Kona Cold Lobster	1034	7.55	35.15	19,456	10.0	9.38	7.4	2.9	971	575	102	94	9.5	244	2137			259	
09/07/21	Kona Cold Lobster	1021	7.56	35.21	19,489	12.3	8.33				591		185		1066	2260				monthly BAP, composite sample collected
10/19/21	Kona Cold Lobster	1258	7.46	35.14	19,450	12.2	8.44				561		143		1240	2366				monthly BAP, composite sample collected
11/30/21	Kona Cold Lobster	1156	7.51	34.74	19,229	10.7	8.78				547		105		884	2216				monthly BAP, composite sample collected
12/08/21	Kona Cold Lobster	903	7.63	34.70	19,207	9.7	8.94	3.4	2.2	780	555	105	101	7.4	234	2291			307	
01/27/22	Kona Cold Lobster	1016	7.67	34.40	19,041	12.0	8.69				578		109		104	2320				monthly BAP, composite sample collected
02/03/22	Kona Cold Lobster	918	7.51	34.26	18,963	9.9	8.81				613		190		717	2432				monthly BAP, composite sample collected
03/09/22	Kona Cold Lobster	926	7.54	33.99	18,814	8.9	9.19	6.1	9.9	2278	589	498	484	4.6	1311	2256				Improvements were made to sump, single point collection from
04/12/22	Kona Cold Lobster	1006	7.56	34.59	19,146	8.7	9.55				566		96		41	2314				monthly BAP
05/10/22	Kona Cold Lobster	956	7.68	35.03	19,389	8.4	9.43				595		92		27	2379				monthly BAP
06/15/22	Kona Cold Lobster	1006	7.48	34.45	19,068	9.0	9.41	5.8	2.0	757	586	92	79	8.2	13	2078			363	
07/21/22	Kona Cold Lobster	1121	7.62	34.62	19,163	7.9	9.70				565		87		13	2181				monthly BAP
08/05/22	Kona Cold Lobster	910	7.20	34.46	19,074	8.6	9.58	4.7	2.0	680	565	139	128	4.9	31	2204			593	
09/08/22	Keahole Point Provisions	1029	7.64	34.60	19,151	7.6	7.40				601		95		15	2349				monthly BAP; KCL was purchased by BOM, renamed as
10/12/22	Keahole Point Provisions	1019	7.66	34.51	19,102	7.8	7.80				568		90		8	2187				monthly BAP
11/16/22	Keahole Point Provisions	850	7.70	34.52	19,107	8.1	9.63				598		93		32	2567				monthly BAP
12/08/22	Keahole Point Provisions	1019	7.51	34.50	19,096	8.6	9.05	2.9	2.0	789	584	92	87	8.6	83	2460			536	
01/17/23	Keahole Point Provisions	1016	7.63	35.07	19,412	8.5	6.84				546		86		68	2199				monthly BAP testing
02/03/23	Keahole Point Provisions	1122	7.56	34.40	19,041	9.1	8.69	4.9	2.0	764	580	97	98	7.9	161	2118			497	
03/10/23	Keahole Point Provisions	1100	7.65	34.49	19,091	8.5	8.92				539		98		112	1994				monthly BAP testing.
04/21/23	Keahole Point Provisions	1031	7.55	33.93	18,781	7.4	6.14				20		323		3230	2127				monthly BAP testing.
05/05/23	Keahole Point Provisions	1121	7.58	34.39	19,035	7.7	5.76	3.6	2.0	884	582	118	144	7.5	468	2205			638	
06/30/23	Keahole Point Provisions	957	7.66	34.45	19,068	8.1	7.52				574		89		26	2135				monthly BAP testing
07/12/23	Keahole Point Provisions	1452	7.44	33.68	18,642	7.4	7.38				558		499		287	2045				monthly BAP testing
08/04/23	Keahole Point Provisions	1023	7.56	34.49	19,091	8.5	6.66				574		104		47	2213				monthly BAP testing
09/07/23	Keahole Point Provisions	829	7.53	34.46	19,074	8.4	7.58	2.7	2.3	716	567	98	94	7.3	47	2028		155.5		
10/26/23	Keahole Point Provisions	1223	7.59	34.37	19,024	8.7	8.09	5.0	2.0	725	594	84	86	8.6	32	2159				
11/14/23	Keahole Point Provisions	945	7.68	34.46	19,074	8.2	7.20				569		89		37	2095				monthly BAP testing
12/19/23	Keahole Point Provisions	1212	7.66	34.48	19,085	8.1	7.10				536		104		57	2063		135.3		monthly BAP testing
01/11/24	Keahole Point Provisions	1359	7.47	34.56	19,129	8.8	6.73				562		98		49	1988		187.5		monthly BAP testing
02/08/24	Keahole Point Provisions	1147	7.64	34.47	19,080	8.9	6.89	5.5	2.0	737	589	89	85	8.3	38	2021		89.5		
03/13/24	Keahole Point Provisions	1000	7.67	34.42	19,052	8.8	7.22				583		95		57	2079		129.1		monthly BAP testing
04/02/24	Keahole Point Provisions	1528	7.71	34.54	19,118	9.0	7.51				557		85		34	1851		158.0		monthly BAP testing
05/10/24	Keahole Point Provisions	906	7.45	34.43	19,057	9.0	7.37	3.2	2.0	660	548	106	102	6.2	25	1956		232.5		
06/26/24	Keahole Point Provisions	934	7.61	34.45	19,068	7.6	6.33				587		93		32	2047		129.6		monthly BAP testing

Keahole Point Provisions Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'36.26"N
Longitude: 156° 3'30.60"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
15	12	6

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H⁺	SM2520-B			G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
Mean			7.60	34.78	19,254	8.63	9.44	6.0	3.0	927	574	130	114	7.4	284	2247	0	152	385	
Std. Dev.			0.13	0.50	278	1.40	1.72	7.6	2.9	381	93	69	73	1.4	508	326	0	43	83	
n=			103	103	103	102	102	55	54	55	99	55	99	55	99	99	2	8	50	

Koyo USA Corporation Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'5.53"N
Longitude: 156° 2'15.58"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
35	16	8

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		(2400)	(unit)	(PSU)	(mg/L)	(˚C)	(mg/L)	(mg/L)	(mg/L)	(µg N/L)	(µg N/L)	(µg P/L)	(µg P/L)	(ratio)	(µg N/L)	(µg Si/L)	(mg/L)	(mV)	(kgal/day)	
			SM4500-H+	SM2520-B			G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
10/20/10	Koyo Concentrate	950	7.74	47.00	26,015			1.0	<2.0	838		130		6.4					146	
10/20/10	Koyo 1st filter SW	1000	7.75	47.00	26,015			0.2	2.0	804		127		6.3					146	
02/09/11	Koyo Concentrate	1020	7.75	47.68	26,391	11.56	7.48	2.3	2.0	925		149		6.2					184	
02/09/11	Koyo 1st filter SW	1016	7.70	47.53	26,308	10.88	7.75	2.0	2.0	925		151		6.1					184	
05/18/11	Koyo Concentrate	1130	7.66	46.77	25,888	15.27	7.30	3.8	2.0	861		137		6.3					150	
05/18/11	Koyo 1st filter SW	1117	7.65	46.95	25,987	12.37	7.83	3.3	2.0	846		139		6.1					150	
08/24/11	Koyo Composite	937	7.61	47.35	26,209	11.19	8.00	3.0	2.0	849		141		6.0					383	
12/14/11	Koyo Composite	1015	7.67	46.02	25,473	13.21	8.15	0.9	2.0	893		129		6.9					312	
02/29/12	Koyo Composite	1000	7.66	45.22	25,030	10.95	8.66	2.8	2.0	861	813	118	128	7.3	1.0	3635			327	
05/23/12	Koyo Composite	939	7.64	42.36	23,447	12.40	8.43	1.6	2.0	927	770	134	141	6.9	6.7	3514			209	
08/15/12	Koyo Composite	921	7.49	50.30	27,842	15.90	6.85	3.6		1062	887	113	112	9.4	3.0	4317				BOD check std not compliant, resampled on 8/23
08/23/12	Koyo Composite	910	7.56	45.76	25,329	14.17	8.33	3.0	2.0	855	849	135	133	6.3	2.5	4100			265	
12/05/12	Koyo Composite	913	7.55	48.20	26,679	11.69	8.39	2.5	2.0	855	841	139	114	6.2	6.9	4171			238	
02/28/13	Koyo Composite	914	7.41	55.65	30,803	10.49	9.47	3.7	2.0	1089	1053	159	165	6.8	12.2	4818			177	
05/29/13	Koyo Composite	919	7.48	55.57	30,759	15.44	6.44	3.9	2.0	1149	1118	188	188	6.1	4.2	5047			78	
09/04/13	Koyo Composite	1007	7.44	58.97	32,641	14.34	6.31	3.0	2.0	1087	1045	175	180	6.2	41.4	4803			79	
12/11/13	Koyo Composite	1018	7.42	47.97	26,552	13.41	6.85	3.0	2.0	907	764	157	148	5.8	24.6	3835			79	
02/26/14	Koyo Composite	1006	7.51	59.82	33,111	11.38	7.63	3.3	2.0	1251	1092	184	177	6.8	12.3	5005			80	
06/25/14	Koyo Composite	1039	7.46	50.36	27,875	10.42	8.33	4.5	2.0	980	930	162	166	6.0	2.0	6162			148	
09/24/14	Koyo Composite	1036	7.41	50.61	28,013	10.93	8.00	3.6	2.0	990	891	119	157	8.3	37.8	3948			259	
01/07/15	Koyo Composite	1030	7.39	50.63	28,024	9.21	8.53	5.3	2.0	1069	928	152	147	7.0	3.1	4249			343	
03/18/15	Koyo Composite	1010	7.43	49.65	27,482	10.08	9.59	4.7	2.1	980	922	155	150	6.3	34.4	4394			184	
06/25/15	Koyo Composite	835	7.57	43.85	24,271	14.50	6.54	5.6	2.0	920	849	136	141	6.8	6.8	3622			104	
09/09/15	Koyo Composite	1339	7.63	52.18	28,882	10.65	10.54	6.2	2.0	1280	1158	121	174	10.6	5.7	5048			100	
12/02/15	Koyo Composite	902	7.76	46.65	25,821	10.37	9.22	5.4	2.0	952	842	140	141	6.8	42.6	3823			130	
02/25/16	Koyo Composite	1034	7.79	55.01	30,449	18.34	7.46	7.0	2.0	1068	1046	197	196	5.4	5.6	4653			130	
06/08/16	Koyo Composite	954	7.67	45.72	25,307	23.20	6.04	4.7	2.0	838	875	140	130	6.0	0.5	4398			246	
09/07/16	Koyo Composite	1405	8.19	56.85	31,467	25.55	5.27	5.8	2.0	1614	1562	262	258	6.2	12.5	7979			335	
11/30/16	Koyo Composite	1016	7.41	54.84	30,355	11.88	7.54	6.2	2.0	939	934	151	148	6.2	4.7	4613			414	
03/15/17	Koyo Composite	948	7.71	54.86	30,366	12.52	7.33	6.4	2.0	1036	992	171	164	6.1	13.3	4649			269	
06/01/17	Koyo Composite	1233	7.58	44.92	24,864	10.56	6.00	5.8	2.0	772	782	148	146	5.2	3.9	3893			465	sampled inside RO building, middle sump
08/30/17	Koyo Composite	957	7.57	54.74	30,299	16.54	6.34	6.8	2.0	990	918	163	160	6.1	9.6	4545			363	
12/07/17	Koyo Composite	1242	7.56	55.56	30,753	9.90	3.75	14.6	2.0	1020	931	158	163	6.5	9.8	4467			340	
03/14/18	Koyo Composite	921	7.59	56.20	31,107	12.42	5.90	6.6	2.0	962	913	170	170	5.7	29.0	4668			323	
06/14/18	Koyo Composite	1129	7.52	52.36	28,982	13.94	7.52	5.8	2.0	883	856	159	151	5.6	10.2	4212			352	
09/26/18	Koyo Composite	835	7.50	55.85	30,914	15.35	5.53	11.0	2.0	940	891	172	172	5.5	13.7	4680			378	
12/12/18	Koyo Composite	959	7.57	56.11	31,057	10.51	5.40	18.6	2.0	946	901	159	153	6.0	22.7	4850			421	
03/13/19	Koyo Composite	1027	7.41	57.26	31,694	14.47	7.44	6.2	2.0	844	823	159	163	5.3	1.9	5178			492	
06/05/19	Koyo Composite	1009	7.41	57.80	31,993	14.08	6.55	6.0	2.0	926	880	155	152	6.0	5.9	4736			343	
09/18/19	Koyo Composite	1359	7.58	57.47	31,810	15.56	7.73	4.5	2.0	996	935	161	158	6.2	6.1	4665			289	
11/06/19	Koyo Composite	900	7.68	56.97	31,534	13.10	7.58	3.1	2.0	113	1076	6	201	18.4	17.6	5215			285	
03/11/20	Koyo Composite	1002	7.65	59.17	32,751	13.34	7.65	8.2	2.0	1023	975	167	162	6.1	11.6	4620			195	
06/18/20	Koyo Composite	1050	7.63	58.97	32,641	14.27	8.08	5.0	2.0	1026	993	174	167	5.9	2.9	4579			208	
09/16/20	Koyo	1029	7.55	56.55	31,301	10.75	7.55	3.1		1031	1043	165	161	6.2	3.6	4921	0		264	BOD - N/A - equipment failure
12/02/20	Koyo	1301	7.48	51.31	28,401	11.1	7.98	4.3	2.0	949	880	135	136	7.0	12.3	4040	0		235	
03/24/21	Koyo	1106	7.49	45.94	25,428	11.6	8.23	4.0	2.0	781	723	123	130	6.4	8.5	3688			267	
05/19/21	Koyo	857	7.46	57.72	31,949	15.7	7.04	4.5	2.0	914	901	132	140	6.9	13.0	4724			200	
08/26/21	Koyo	957	7.40	55.97	30,980	10.7	7.80	5.9	2.0	1167	916	138	135	8.5	10.9	4753			226	
12/08/21	Koyo	946	7.48	55.22	30,565	12.7	7.52	6.9	2.0	966	953	166	147	5.8	8.4	4710			213	
03/30/22	Koyo	1347	7.44	44.89	24,847	13.8	8.03	2.1	2.0	835	760	138	140	6.1	1.6	3708			258	
06/15/22	Koyo	841	7.36	55.21	30,559	12.4	7.59	4.0	2.0	1383	962	148	152	9.4	19.0	4372			277	
08/31/22	Koyo	924	7.50	55.34	30,631	15.3	7.19	3.9	2.0	1043	902	140	144	7.4	10.2	5102			344	
11/30/22	Koyo	850	7.44	55.65	30,803	11.2	7.75	4.8	2.0	955	922	143	147	6.7	6.3	4551			362	
02/08/23	Koyo	1029	7.46	55.38	30,653	10.0	8.04	5.0	2.0	1166	953	158	152	7.4	24.8	4146			323	

Koyo USA Corporation Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'5.53"N
Longitude: 156° 2'15.58"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
35	16	8

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H+	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
05/18/23	Koyo	842	7.40	54.80	30,332	11.0	7.78	4.2	2.0	967	931	133	132	7.3	30.4	4445			293	
09/07/23	Koyo	854	7.53	54.93	30,404	15.5	7.16	3.6	2.0	938	907	132	139	7.1	6.5	3925		104.9		
12/07/23	Koyo	921	7.39	54.19	29,995	10.8	7.77	4.4	2.0	982	929	136	140	7.2	4.6	4106		202.7		
03/13/24	Koyo	912	7.67	0.44	244	15.1	10.16	0.7	2.0	66	21	22	11	3.0	3.6	-20		252.3		
05/23/24	Koyo	931	7.47	55.57	30,759	11.8	7.66	4.4	2.0	1012	865	145	149	7.0	61.8	4187		325.6		
Mean			7.56	51.35	28424	13.08	7.53	4.7	2.0	953	914	146	152	6.7	12.8	4440	0	221	251	
Std. Dev.			0.14	8.26	4573	3.00	1.18	3.0	0.0	219	181	34	31	1.9	12.8	948	0	93	104	
n=			59	59	59	57	57	59	56	59	51	59	51	59	51	51	2	4	54	

Makai Ocean Engineering Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'47.16"N
Longitude: 156° 3'31.22"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
110	30	16

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
07/28/10	Makai - RC	847	7.94					1.2	2.0	398		62		6.4					230	
02/02/11	Makai - RC	828	8.28					1.0	2.0	463		78		5.9					246	
05/18/11	Makai - RC	1025	7.90	34.77	19,246	14.97	7.15	3.2	2.0	409		60		6.8					424	
08/17/11	Makai - RC	1111	7.96	34.55	19,124	14.87	6.58	2.3	2.0	406		64		6.3					232	
11/30/11	Makai - RC	1018	8.02	34.62	19,163	15.76	7.23	3.0	2.0	373		61		6.1					240	
02/09/12	Makai - RC	1038	7.93	34.79	19,257	15.58	6.36	4.6	2.0	356		60		5.9					331	
05/16/12	Makai - RC	1132	7.91	34.60	19,151	16.08	5.32	1.1	2.0	450		68		6.6					320	
08/01/12	Makai - RC	1028	7.80	34.55	19,124	13.70	4.71	3.7	2.0	456	385	63	58	7.2	1.4	1517			320	
11/08/12	Makai - RC	1103	7.94	34.96	19,351	18.70	6.11	5.3	2.0	360	273	50	44	7.2	5.0				652	
02/14/13	Makai - RC	1005	7.78	34.77	19,246	15.67	4.67	2.1	2.0	404	320	61	63	6.6	5.9	1225			668	
05/09/13	Makai - RC	1010	7.90	34.81	19,268	18.04	4.98	3.0	2.0	326	266	57	44	5.7	1.3	1062			646	
08/22/13	Makai - RC	1113	7.38	34.39	19,035	9.15	3.11	2.1	2.0	421	343	63	61	6.7	6.7	1324			607	
12/05/13	Makai - RC	959	7.85	34.85	19,290	16.51	4.48	1.8	4.5	437	359	61	56	7.1	3.6	1340			708	
02/25/14	Makai - RC	1148	7.84	34.69	19,201	16.41	5.27	2.3	2.0	411	335	65	57	6.3	5.8	1312			703	
05/14/14	Makai - RC	1200	7.93	34.73	19,223	18.23	7.67	4.9	2.0	372	313	60	55	6.2	11.0	1262			720	
08/13/14	Makai - RC	1215	7.83	34.91	19,323	20.26	5.22	3.2	2.6	413	307	64	56	6.5	14.9	1172			870	
12/10/14	Makai - RC	1335	7.87	35.05	19,401	18.31	5.00	2.6	2.0	388	320	65	56	5.9	1.6	1123			972	
02/26/15	Makai - RC	1115	8.26	35.03	19,389	18.02	5.41	1.3	2.0	697	339	92	50	7.6	3.9	1051			787	
06/04/15	Makai - RC	1000	7.69	34.10	18,875	14.74	5.50	3.4	2.0	408	359	51	65	7.9	7.7	1372			927	
09/02/15	Makai - RC	943	7.84	34.68	19,196	17.55	5.38	2.7	2.0	378	303	51	48	7.4	8.9	1085			646	
11/24/15	Makai - RC	1031	7.94	34.33	19,002	16.61	5.23	13.9	2.0	725	320	100	53	7.2	1.3	1125			828	shallow trench, collected sediment from bottom
02/17/16	Makai - RC	947	7.85	34.30	18,985	15.73	5.18	3.0	2.0	366	322	62	57	6.0	10.4	1150			2292	
05/12/16	Makai - RC	1358	7.92	34.47	19,080	16.20	5.92	2.9	2.0	412	305	52	49	8.0	1.8	1030			1702	
08/26/16	Makai - RC	1029	8.13	34.73	19,223	17.35	5.02	3.3	2.0	545	450	85	72	6.4	11.8	1872			959	
11/25/16	Makai - RC	1048	7.92	34.44	19,063	16.27	5.34	3.5	2.0	351	268	63	49	5.6	11.5	1245			1642	
03/08/17	Makai - RC	1018	8.01	34.67	19,190	16.71	5.33	2.9	2.0	302	257	48	41	6.3	13.8	1001			639	
05/18/17	Makai - RC	1050	7.90	34.53	19,113	16.65	3.32	4.5	2.0	301	243	48	43	6.3	0.9	1062			543	
08/17/17	Makai - RC	1139	7.90	34.41	19,046	18.20	5.27	5.7	2.0	294	257	49	45	6.0	15.1	1006			493	
11/02/17	Makai - RC	954	7.90	34.81	19,268	17.51	4.43	3.3	2.0	311	269	51	44	6.1	4.7	1071			438	
03/01/18	Makai - RC	1034	7.69	34.49	19,091	10.98	9.44	3.5	2.0	423	430	77	74	5.5	26.4	1706			430	
06/07/18	Makai - RC	1059	7.70	35.06	19,406	11.77	7.24	10.5	2.0	344	399	76	69	4.6	7.1	1653			362	
09/10/18	Makai - RC	1015	7.96	34.52	19,107	18.80	6.86	13.1	2.0	284	245	43	35	6.6	4.7	1002			218	
11/09/18	Makai - RC	931	7.56	34.56	19,129	9.58	11.04	4.1	2.0	507	478	85	79	6.0	5.3	1967			225	
02/15/19	Makai - RC	1303	7.56	33.24	18,399	12.26	7.81	4.3	2.0	434	411	70	65	6.2	0.8	1714			281	
05/24/19	Makai - RC	1141	7.46	35.80	19,816	14.34	8.42	3.7	2.0	480	446	75	69	6.4	6.1	1983			165	
09/12/19	Makai - RC	1203	7.90	35.21	19,489	15.65	8.58	3.4	2.0	389	362	65	60	6.0	11.4	1472			99	
10/23/19	Makai - RC	1446	8.00	35.45	19,622	18.35	7.57	1.1	2.0	251	239	51	45	4.9	-0.4	1032			119	
03/06/20	Makai - RC	1127	8.13	36.00	19,926	24.92	6.07	14.5	2.0	188	110	44	34	4.3	0.5	490			22	
06/18/20	Makai - RC	1213	8.03	33.51	18,548	25.85	5.54	3.3	2.0	234	175	42	37	5.5	8.4	682			14	
08/28/20	Makai - RC	1224	8.16	32.90	18,211	25.40	5.97	3.1		326	204	45	42	7.2	-2.1	812	0		15	BOD - N/A - equipment failure
11/12/20	Makai - RC	1114	7.95	35.66	19,738	18.6	6.82	3.6	2.0	393	326	57	55	6.9	11.1	1181	0		41	
03/05/21	Makai - RC	1106	8.01	35.71	19,766	20.6	7.10	2.0	2.0	279	244	47	50	6.0	5.9	974			15	
05/06/21	Makai - RC	1118	8.30	35.63	19,722	14.5	7.64	2.9	2.0	5466	477	62	68	88.6	5386.0	1890			27	ammonia transfer/release at end of April
07/15/21	Makai - RC	1155	7.69	35.15	19,456	18.2	7.17	4.3	2.0	557	505	83	84	6.7	2.8	2088			15	
12/02/21	Makai - RC	1012	7.96	34.87	19,301	18.7	7.45	3.2	2.0	292	248	40	38	7.3	0.0	917			80	
03/09/22	Makai - RC	942	7.97	34.83	19,279	22.6	6.75	2.3	2.2	240	146	26	20	9.4	1.6	751			14	
05/19/22	Makai - RC	1040	7.91	34.69	19,201	21.2	6.61	2.8	2.0	359	199	37	28	9.7	2.1	742			85	
08/11/22	Makai - RC	1018	7.86	34.49	19,091	18.2	6.97	3.3	2.0	429	319	46	46	9.3	11.9	1174			50	
11/17/22	Makai - RC	1322	7.80	34.73	19,223	16.7	7.09	3.2	2.0	471	383	50	49	9.3	10.7	1520			46	
02/03/23	Makai - RC	1153	7.99	34.75	19,234	22.2	7.00	5.2	2.0	480	204	41	38	11.6	87.0	742			54	
05/12/23	Makai - RC	1103	7.83	34.57	19,135	16.1	7.13	5.0	2.0	392	332	48	46	8.1	18.4	1199			120	
09/24/23	Makai - RC	1138	7.73	34.64	19,174	17.7	7.22	3.1	2.0	430	384	56	57	7.6	-1.4	1372				
11/02/23	Makai - RC	1042	7.73	34.35	19,013	10.3	7.81	56.1	2.0	841	591	115	84	7.3	8.8	1988		253.3		low water level, particulates from bottom sump
02/08/24	Makai - RC	1200	8.05	34.93	19,334	22.6	6.85	5.0	2.0	318	99	24	21	13.1	7.3	362		127.5		
05/10/24	Makai - RC	1109	8.02	34.91	19,323	24.3	6.85	4.1	2.0	220	98	29	24	7.7	10.4	427		194.4		

Makai Ocean Engineering Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'47.16"N
Longitude: 156° 3'31.22"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
110	30	16

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
Mean			7.90	34.72	19218	17.25	6.34	4.9	2.1	490	312	59	52	8.4	120.4	1218	0	192	457	
Std. Dev.			0.18	0.55	302	3.71	1.45	7.6	0.3	693	105	17	15	11.1	776.3	414	0	63	470	
n=			55	53	53	53	53	55	54	55	48	55	48	55	48	47	2	3	51	

Makai Ocean Engineering Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'36.26"N
Longitude: 156° 3'30.60"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
27	22	8

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(kgal/day)*	
			SM4500-H⁺	SM2520-B			G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G				
07/28/10	Makai 55"	901	7.67					1.2	2.0	640		101		6.3				4.7	
02/02/11	Makai 55"	949	7.68					1.2	2.0	625		101		6.2				5.0	
05/18/11	Makai 55"	820	7.66	34.46	19,074	6.05	2.38	3.0	2.0	655		101		6.5				8.7	
08/17/11	Makai 55"	1211	7.69	34.38	19,030	5.18	1.89	1.8	2.0	636		96		6.6				4.7	
11/30/11	Makai 55"	939	7.65	34.25	18,958	7.20	2.29	1.1	2.0	651		101		6.4				4.9	
02/09/12	Makai 55"	949	7.50	34.40	19,041	6.24	2.40	2.5	2.0	611		97		6.3				6.7	
05/16/12	Makai 55"	1045	7.57	34.47	19,080	5.79	1.86	1.5	2.0	660		104		6.3				6.5	
08/01/12	Makai 55"	940	7.48	34.23	18,947	7.30	2.50	1.9	2.0	675	604	103	94	6.6	1.4	2796		6.5	
11/08/12	Makai 55"	1002	7.50	34.67	19,190	7.15	2.94	1.8	2.0	622	592	91	95	6.8	6.1			13.3	
02/14/13	Makai 55"	1005	7.78	34.77	19,246	15.67	4.67	2.1	2.0	636	597	99	104	6.4	7.2	2824		13.6	
05/09/13	Makai 55"	852	7.43	34.43	19,057	6.40	2.81	2.3	2.0	679	607	102	98	6.7	0.7	2787		13.2	
08/22/13	Makai 55"	1028	7.30	34.38	19,030	7.40	2.71	2.1	2.0	633	604	97	97	6.5	3.5	2650		12.4	
12/05/13	Makai 55"	923	7.41	34.35	19,013	6.40	2.53	0.6	2.0	651	624	97	96	6.7	3.8	2733		14.4	
02/25/14	Makai 55"	1050	7.44	34.54	19,118	6.55	4.09	1.6	2.0	644	632	98	94	6.6	3.9	2905		14.3	
05/14/14	Makai 55"	1111	7.49	34.61	19,157	6.29	2.58	3.4	2.0	648	649	100	103	6.5	4.0	2968		14.3	
08/13/14	Makai 55"	1131	7.41	34.54	19,118	7.09	3.92	2.7	2.0	760	611	104	106	7.3	42.5	2646		14.3	
12/10/14	Makai 55"	1244	7.33	34.59	19,146	6.92	3.34	2.0	3.0	727	660	109	109	6.7	1.0	2897		14.3	
02/26/15	Makai 55"	1013	8.25	34.48	19,085	7.25	2.54	3.8	2.0	2110	705	302	97	7.0	5.6	2693		14.3	
05/28/15	Makai 55"	1032	7.54	34.91	19,323	6.83	3.15	3.3	2.0	2110	632	302	95	7.0	6.2	2831		14.3	
09/02/15	Makai 55"	932	7.54	34.81	19,268	7.37	5.74	2.3	2.0	653	661	90	100	7.3	22.9	2671		14.3	
11/24/15	Makai 55"	1056	7.56	33.64	18,620	6.09	2.69	4.1	2.0	404	635	59	99	6.8	0.4	2648		14.3	
02/17/16	Makai 55"	852	7.47	34.40	19,041	5.68	4.78	3.7	2.0	698	645	110	109	6.3	12.8	2824		14.3	
05/12/16	Makai 55"	1321	7.70	34.43	19,057	5.63	5.24	2.7	2.0	745	677	96	95	7.8	1.1	2628		14.3	
08/26/16	Makai 55"	1003	7.40	34.52	19,107	6.03	3.54	3.4	2.0	1016	970	160	152	6.4	1.3	4585		14.3	
11/25/16	Makai 55"	958	7.44	34.53	19,113	6.85	4.38	3.5	2.0	657	584	91	87	7.2	39.9	2825		14.3	
03/08/17	Makai 55"	938	7.68	34.63	19,168	6.11	4.29	4.4	2.0	649	595	95	92	6.8	18.1	2810		14.3	
05/18/17	Makai 55"	939	7.65	34.63	19,168	6.64	2.74	4.2	2.0	608	500	92	89	6.6	1.9	2744		14.3	
08/17/17	Makai 55"	1108	7.66	34.43	19,057	6.60	3.63	5.6	2.0	616	594	96	94	6.4	12.7	2705		14.3	
11/02/17	Makai 55"	1056	7.57	34.73	19,223	6.54	3.73	4.3	2.0	628	598	99	95	6.3	3.4	2754		14.3	
03/01/18	Makai 55"																		No flow, system shut down
Mean			7.57	34.49	19090	6.86	3.31	2.7	2.0	760	635	114	100	6.7	9.1	2854	#DIV/0!	12	
Std. Dev.			0.18	0.24	130	1.86	1.03	1.2	0.2	385	85	54	13	0.4	11.9	408	#DIV/0!	4	
n=			29	27	27	27	27	29	29	29	22	29	22	29	22	21	0	29	

Marine Mammal Center Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'17.01"N
Longitude: 156° 3'16.56"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
8.3	8.3	5.17

Date	Sample Name	Time	Tide		pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(ft)*	*cycle*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	(mg/L)	(mV)	*(kgal/day)*	
					SM4500-H	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
10/16/14	MMC 1	951	1.60	High	7.93	34.93	19,334	25.62	6.28	6.2	3.2	652	340	73	59	8.9	4.7	1473			125.3	
10/23/14	MMC 1	927	0.37	Low	7.96	35.04	19,395	24.79	5.90	6.1	2.0	381	305	69	63	5.6	15.3	1272			125.3	
10/30/14	MMC 1	914	1.95	High	7.99	34.99	19,367	26.01	5.23	6.2	2.0	294	192	63	52	4.7	15.4	820			125.3	
11/06/14	MMC 1	904	0.3	Low	8.00	34.83	19,279	26.59	5.91	5.6	2.0	305	149	77	62	4.0	45.3	599			125.3	
12/10/14	MMC 1	914	1.50	Ebb	7.88	35.02	19,384	25.01	6.41	3.6	2.0	382	116	93	16	4.1	0.9	748			125.3	
03/19/15	MMC 1	1057	0.1	Flood	7.92	34.74	19,229	20.84	6.46	3.3	2.3	220	146	48	28	4.6	13.2	732			59.7	
06/18/15	MMC 1	0913	-0.1	Low	8.19	34.42	19,052	26.55	6.44	3.2	2.0	89	2	29	34	3.0	10.1	5			33.5	
08/20/15	MMC 1	912	1.30	Ebb	8.07	34.97	19,356	28.26	5.07	3.3	2.0	203	12	42	19	4.8	14.5	82			57.8	
12/02/15	MMC 1	924	1.74	High	7.80	34.62	19,163	18.75	4.31	4.0	2.0	812	640	131	122	6.2	72.1	2168			58.5	
02/18/16	MMC 1	0926	0.50	Flood	8.16	34.48	19,085	24.66	7.79	4.3	4.9	729	517	203	186	3.6	140.6	13			32.6	Effluent tank over-flowing
06/08/16	MMC 1	1038	-0.10	Low	8.28	34.49	19,091	27.07	6.38	3.1	2.0	61	10	18	10	3.4	1.2	30			20.0	
09/01/16	MMC 1	0905	0.01	Low	8.48	34.86	19,295	27.83	5.36	3.8	2.0	148	63	65	63	2.3	52.4	3			75.5	
11/30/16	MMC 1	847	0.70	Ebb	8.07	34.97	19,356	25.66	5.17	3.8	2.0	412	142	92	79	4.5	202.8	71			18.1	
03/16/17	MMC 1	1036	0.20	Ebb	8.03	33.94	18,786	25.28	6.20	4.1	2.3	287	96	94	75	3.0	45.7	573			19.4	
06/01/17	MMC 1	1004	0.90	High	8.11	34.82	19,273	26.26	4.22	3.6	2.0	61	10	22	12	2.8	10.6	49			87.5	
08/24/17	MMC 1	920	0.30	Ebb	8.13	34.38	19,030	27.38	4.58	4.1	2.0	159	29	70	48	2.3	47.4	43			126.8	
12/05/17	MMC 1																				62.6	No flow - System drained and shut down until early 2018.
03/01/18	MMC 1																				3.9	No flow - System drained and shut down.
06/21/18	MMC 1	1048	1.30	High	8.11	28.97	16,035	25.39	5.62	10.6	2.0	587	500	49	40	11.9	1.6	4862			15.5	
09/10/18	MMC 1	1037	-0.06	Low	8.19	34.71	19,212	27.72	5.39	13.7	2.0	124	22	29	22	4.3	44.5	24			83.4	
11/09/18	MMC 1	1006	0.7	Ebb	8.19	29.20	16,163	27.18	4.90	3.1	2.0	105	44	36	31	2.9	14.2	261			110.1	
03/01/19	MMC 1	924	0.4	Low	8.21	34.48	19,085	24.29	6.61	13.7	2.2	140	17	25	16	5.7	20.6	112			108.0	
05/24/19	MMC 1	1104	0.25	Ebb	8.18	35.72	19,771	26.84	6.60	5.3	2.0	79	3	20	9	4.0	16.8	20			98.5	
09/12/19	MMC 1	1102	0.75	Flood	8.15	34.87	19,301	27.83	7.08	3.4	2.0	122	24	27	10	4.5	34.9	140			73.5	
10/23/19	MMC 1	1208	2.0	High	8.05	35.64	19,727	22.70	7.00	1.8	2.0	234	173	50	39	4.7	21.3	778			82.2	
03/06/20	MMC 1	909	0.26	Low	8.12	35.85	19,843	25.00	6.50	5.3	2.0	133	-1	31	21	4.3	29.9	-18			113.2	middle tank overflowing
06/12/20	MMC 1	1042	0.6	Ebb	8.10	36.05	19,954	24.05	6.50	2.6	2.0	125	75	15	15	8.2	7.1	351			111.5	
08/28/20	MMC 1	1105	1.7	Flood	8.00	9.66	5,347	24.14	6.52	16.5		1792	1622	200	110	9.0	31.6	15910	0.0		37.0	BOD - N/A - equipment failure
11/12/20	MMC 1	952	0.7	Flood	8.11	35.42	19,605	27.0	6.60	3.7	2.0	201	8	20	16	10.3	18.4	21	0.0		3.6	
03/05/21	MMC 1	1034	0.5	Ebb	8.15	35.95	19,899	24.5	6.96	3.6	2.0	265	31	17	10	15.2	90.3	9			46.9	
05/27/21	MMC 1																				14.1	No flow, sump dry
07/15/21	MMC 1	1059	.5	Low	8.01	35.31	19,544	27.2	6.69	4.5	2.0	181	7	10	5	18.1	10.6	16			133.0	
10/29/21	MMC 1	1026	1.7	High	7.96	35.33	19,556	25.7	6.82	3.9	2.0	385	21	26	21	14.6	73.6	31			57.8	
02/10/22	MMC 1	952	0.7	High	8.01	34.89	19,312	25.1	6.79	0.8	2.0	74	0	16	15	4.7	2.6	18			31.6	
05/13/22	MMC 1	1036	.5	Flood	8.07	34.53	19,113	25.4	6.92	1.5	2.0	67	14	11	5	6.1	0.2	28			91.7	
08/05/22	MMC 1	1041	1.57	High	7.71	34.80	19,262	26.4	6.77	3.2	2.0	220	15	19	14	11.5	42.4	45			117.7	
11/17/22	MMC 1	1148	1.69	High	8.15	34.97	19,356	27.1	6.66	2.6	2.0	112	11	21	14	5.2	14.7	89			153.1	
02/03/23	MMC 1	1041	0.5	Flood	8.02	34.55	19,124	24.8	6.93	4.1	2.0	851	362	139	148	6.1	432.9	72			89.2	
05/05/23	MMC 1	1041	0.0	Flood	7.98	34.77	19,246	26.0	6.71	3.5	2.0	840	422	155	157	5.4	392.1	37			39.4	
08/24/23	MMC 1	1007	1.5	High	7.98	34.73	19,223	26.4	6.70	4.4	2.0	620	123	87	79	7.1	235.1	51				
10/26/23	MMC 1	1143	1.5	Flood	8.04	34.83	19,279	26.9	6.67	3.9	2.0	207	18	27	18	7.6	10.2	16				
02/08/24	MMC 1																					No flow, system shut down
05/23/24	MMC 1																					No flow, system shut down
Mean					8.07	33.97	18,801	25.64	6.20	4.8	2.1	333	165	58	46	6.3	59	830	0	#DIV/0!	74	
Std. Dev.					0.14	4.28	2,372	1.89	0.83	3.3	0.5	337	295	50	46	3.8	99	2663	0	#DIV/0!	43	
n=					38	38	21,033	38	38	38	37	38	37	38	38	38	38	37	2	0	39	

Marine Mammal Center Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'17.23"N
Longitude: 156° 3'16.70"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
8.3	8.3	4.83

Date	Sample Name	Time	Tide		pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		(2400)	(ft)	(cycle)	(unit)	(PSU)	(mg/L)	(˚C)	(mg/L)	(mg/L)	(mg/L)	(µg N/L)	(µg N/L)	(µg P/L)	(µg P/L)	(ratio)	(µg N/L)	(µg Si/L)	(mg/L)	(mV)	(kgal/day)	
					SM4500-H	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
10/16/14	MMC 2	959	1.60	High	8.19	34.95	19,345	28.18	6.23	3.6	2.0	253	51	54	39	4.7	26.6	95			72.0	
10/23/14	MMC 2	932	0.37	Low	8.18	35.16	19,461	27.59	6.03	3.9	2.0	180	30	53	49	3.4	38.2	44			72.0	
10/30/14	MMC 2	919	1.95	High	8.08	34.99	19,367	26.90	5.63	4.6	2.0	257	95	65	63	3.9	59.9	332			72.0	
11/06/14	MMC 2	909	0.3	Low	8.12	34.79	19,257	27.41	6.23	4.4	2.0	172	44	44	32	3.9	14.2	212			72.0	
12/10/14	MMC 2	921	1.50	Ebb	7.89	34.98	19,362	23.78	6.35	4.1	2.0	399	200	67	73	6.0	27.0	646			72.0	
03/19/15	MMC 2	1100	0.1	Flood	8.02	34.35	19,013	22.57	7.07	4.7	3.0	289	122	32	22	9.1	25.6	648			32.2	
06/18/15	MMC 2	931	-0.1	Low	8.17	34.50	19,096	26.65	5.32	3.4	2.0	69	1	23	14	3.0	2.0	7			18.1	
08/20/15	MMC 2	914	1.30	Ebb	8.11	35.01	19,378	28.53	4.85	3.4	2.0	390	69	98	79	4.0	95.5	89			31.2	
12/02/15	MMC 2	924	1.74	High	7.80	34.62	19,163	18.75	4.31	4.0	2.0	812	640	131	122	6.2	72.1	2168			31.6	
02/18/16	MMC 2	934	0.50	Flood	8.12	34.30	18,985	24.70	6.22	4.4	2.7	513	224	179	150	2.9	224.3	23			17.7	Effluent tank over-flowing
06/08/16	MMC 2	1012	-0.10	Low	8.30	34.56	19,129	27.13	6.17	3.4	2.0	54	8	19	10	2.9	1.7	61			10.8	
09/01/16	MMC 2	906	0.01	Low	8.52	34.86	19,295	27.81	5.79	3.5	2.0	79	20	27	36	2.9	12.8	9			40.7	
11/30/16	MMC 2	849	0.70	Ebb	8.09	34.92	19,329	25.69	5.77	4.1	2.0	136	28	70	59	2.0	64.9	194			9.8	
03/16/17	MMC 2	1024	0.20	Ebb	8.04	34.22	18,941	25.36	6.29	2.9	2.0	237	87	51	34	4.7	26.0	418			10.6	
06/01/17	MMC 2	1009	0.90	High	8.13	34.79	19,257	26.29	4.29	3.0	2.0	56	4	11	4	5.1	5.9	56			47.2	
08/24/17	MMC 2	922	0.30	Ebb	8.13	34.53	19,113	24.75	4.55	4.1	2.0	66	4	31	21	2.1	21.8	47			68.4	
12/05/17	MMC 2																				33.8	No flow - System drained and shut down until early 2018.
03/01/18	MMC 2																				2.1	No flow - System drained and shut down.
06/21/18	MMC 2	1057	1.30	High	8.11	30.24	16,738	25.81	6.19	4.1	2.0	483	398	39	28	12.5	1.1	3938			8.3	
09/10/18	MMC 2	1041	-0.06	Low	8.21	34.03	18,836	27.92	6.05	26.0	4.8	319	51	122	56	2.6	59.6	547			45.0	Effluent ws green from alge growth inside tank
11/09/18	MMC 2	1011	0.7	Ebb	8.18	34.92	19,329	27.52	4.53	4.1	2.0	156	31	52	40	3.0	50.8	59			59.4	
03/01/19	MMC 2	909	0.4	Low	8.22	34.53	19,113	24.33	6.71	4.6	2.1	215	44	44	27	4.9	49.0	86			58.3	
05/24/19	MMC 2	1107	0.25	Ebb	8.21	35.61	19,711	27.04	6.39	3.1	2.0	66	6	52	41	1.3	26.5	164			53.2	
09/12/19	MMC 2	1105	0.75	Flood	8.18	34.86	19,295	28.46	6.90	11.9	2.0	109	14	32	16	3.4	27.1	94			39.7	
10/23/19	MMC 2	1211	2.0	High	8.05	35.63	19,722	22.06	7.02	2.5	2.0	239	189	50	39	4.8	13.9	880			44.4	
03/06/20	MMC 2	913	0.26	Low	8.12	35.71	19,766	25.11	6.34	7.1	3.1	221	-18	72	45	3.1	75.7	-10			61.1	
06/12/20	MMC 2	1045	.6	Ebb	8.10	35.97	19,910	24.33	6.65	3.4	3.4	185	123	122	107	1.5	114.2	388			60.4	
08/28/20	MMC 2	1108	1.7	Flood	7.94	9.06	5,015	23.77	6.41	6.0		1657	1594	157	118	10.5	11.4	16304	0.0		20.0	BOD - N/A - equipment failure
11/12/20	MMC 2	957	0.7	Flood	8.08	30.77	17,032	25.8	6.90	136.0	8.4	2545	501	967	105	2.6	77.2	4112	0.0		2.0	Tanks were being cleaned; system shut down remainder of year, no resample available.
03/05/21	MMC 2	1037	.5	Ebb	8.17	35.97	19,910	24.6	6.95	4.4	2.3	270	11	29	33	9.3	121.8	8			6.9	
05/27/21																					7.7	No flow, sump dry
07/15/21	MMC 2	1101	.5	Low	8.02	35.33	19,556	27.1	6.67	4.9	2.0	162	4	29	22	5.7	9.1	10			71.7	
10/29/21	MMC 2	1028	1.7	High	8.02	35.45	19,622	26.4	6.76	2.6	2.0	142	8	15	11	9.6	30.9	132			31.2	
02/10/22	MMC 2	954	0.7	High	8.08	34.89	19,312	25.4	7.05	2.4	2.0	74	3	14	10	5.5	3.0	5			17.1	
05/13/22	MMC 2	1038	.5	Flood	8.08	34.52	19,107	25.5	6.93	1.2	2.0	61	8	7	5	8.7	1.1	39			49.5	
08/05/22	MMC 2	1044	1.57	High	7.72	34.78	19,251	26.7	6.78	2.2	2.0	102	6	23	17	4.4	12.7	66			63.5	
11/17/22	MMC 2	1018	1.69	High	8.09	34.96	19,351	27.2	6.68	3.8	2.0	244	45	45	38	5.4	81.1	86			82.7	
02/03/23	MMC 2	1044	0.5	Flood	8.02	34.64	19,174	25.1	6.88	2.1	2.0	1056	449	127	132	8.3	490.4	65			48.2	
05/05/23	MMC 2	1043	0.0	Flood	8.05	34.72	19,218	25.9	6.76	3.4	2.0	306	91	35	32	8.8	159.8	61			21.4	
08/24/23	MMC 2	1011	1.5	High	7.94	34.78	19,251	27.1	6.47	3.4	2.9	1642	759	116	115	14.2	680.0	62				
10/26/23	MMC 2	1146	1.5	Flood	8.05	34.84	19,284	26.8	6.66	3.9	2.0	147	2	11	7	13.6	5.6	15				
02/08/24	MMC 2																					No flow, system shut down
05/10/24	MMC 2	1001	-0.31	Low	8.06	35.06	19,406	25.8	6.78	3.2	2.0	222	18	13	10	16.9	11.3	95		195.9		
Mean					8.09	34.02	18,831	25.84	6.22	7.9	2.4	374	153	80	48	5.8	73	827	0	196	40	
Std. Dev.					0.13	4.24	2,348	1.93	0.78	21.4	1.2	516	300	152	40	3.8	132	2709	0	#DIV/0!	24	
n=					39	39	39	39	39	39	38	39	38	39	39	39	39	38	2	1	39	

Moana Technologies, Inc. Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'4.79"N
Longitude: 156° 2'35.88"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
55	42	10

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
03/17/11	MT #1	1221	7.65	34.40	19,041	20.18	4.19	5.7	4.9	1987		261		7.6					258	
06/03/11	MT #1	1316	7.72	34.90	19,318	22.06	4.37	8.5	3.8	1588		234		6.8					249	
09/14/11	MT #1	829	7.70	35.00	19,373	24.06	5.64	9.5	3.9	880		119		7.4					266	
12/14/11	MT #1	913	7.75	34.96	19,351	21.58	4.18	8.5	3.8	1192		130		9.2					253	
02/16/12	MT #1	800	7.44	34.87	19,301	20.11	5.21	5.7	3.0	1008	308	132	65	7.6	356	792			295	
05/23/12	MT #1	823	7.77	34.89	19,312	23.36	4.30	11.7	4.2	966	165	133	49	7.3	399	362			331	
08/09/12	MT #1	1007	7.69	34.43	19,057	23.47	5.35	5.8	4.3	1397	490	189	150	7.4	550	891			273	
12/12/12	MT #1	926	7.68	35.21	19,489	22.44	4.82	5.4	6.2	1377	301	184	76	7.5	509	654			339	
02/27/12	MT #1	913	7.65	35.11	19,434	21.13	5.35	4.6	6.2	1807	679	198	113	9.1	533	652			328	
05/16/13	MT #1	847	7.50	35.20	19,484	25.18	4.70	34.3	14.5	2993	597	362	122	8.3	1338	308			352	
09/04/13	MT #1	912	7.75	34.93	19,334	24.36	4.63	5.8	4.8	1446	521	169	106	8.6	607	511			314	
12/11/13	MT #1	910	7.57	34.48	19,085	21.88	5.91	6.6	5.3	1415	614	106	106	13.3	635	752			323	
02/26/14	MT #1	841	7.73	34.86	19,295	21.00	5.33	5.4	3.3	1316	354	179	77	7.3	443	679			372	
06/25/14	MT #1	847	7.62	34.84	19,284	25.46	5.01	7.9	4.3	1352	483	181	92	7.5	562	427			346	
09/24/14	MT #1	931	7.57	34.61	19,157	24.88	4.28	5.6	7.3	1506	486	188	122	8.0	714	680			375	
12/17/14	MT #1	915	7.68	34.88	19,306	22.83	5.13	6.1	4.4	1283	453	184	88	7.0	397	749			336	
03/18/15	MT #1	948	7.77	34.53	19,113	22.31	6.21	5.0	5.6	408	94	51	634	7.9	198.5	497			286	
06/04/15	MT #1	1027	7.69	34.20	18,930	25.19	5.57	11.0	8.8	738	327	90	75	8.2	590.5	615			357	
09/09/15	MT #1	840	7.40	34.06	18,853	26.79	4.11	11.6	7.1	1912	686	201	146	9.5	683.1	948			217	
12/03/15	MT #1	1042	7.69	34.46	19,074	24.12	4.35	9.8	9.7	1974	830	284	187	7.0	729.7	674			306	
02/24/16	MT #1	1027	7.71	34.50	19,096	22.51	5.28	10.7	11.0	1606	209	298	168	5.4	720.9	649			319	
06/08/16	MT #1	846	7.52	34.19	18,925	24.69	4.78	24.0	13.3	2579	721	383	220	6.7	1219.6	786			315	
09/01/16	MT #1	936	7.95	34.91	19,323	27.37	4.41	9.9	7.8	1804	592	213	100	8.5	640.0	186			282	
12/07/16	MT #1	850	7.71	34.81	19,268	21.03	5.58	7.6	6.8	1395	399	186	159	7.5	834.0	827			157	
03/15/17	MT #1	845	8.00	34.65	19,179	19.22	5.53	6.5	3.9	1269	603	196	120	6.5	421.5	1017			338	
06/01/17	MT #1	837	7.67	34.83	19,279	21.45	4.58	5.9	5.2	1152	427	189	137	6.1	520.9	795			294	
08/24/17	MT #1	1012	7.62	34.66	19,185	22.10	3.92	8.1	6.9	1317	538	185	99	7.1	607.7	855			421	
12/13/17	MT #1	947	7.64	35.34	19,561	22.28	2.98	11.8	10.1	1414	630	217	121	6.5	930.0	572			336	
03/08/18	MT #1	1046	7.60	34.90	19,318	21.35	5.09	9.1	7.4	1202	390	205	133	5.9	605.4	531			312	
06/14/18	MT #1	1143	7.74	35.18	19,473	23.63	5.18	17.3	5.6	1051	372	170	109	6.2	484.7	648			350	
09/20/18	MT #1	1111	7.34	34.49	19,091	24.21	4.30	6.8	7.1	1394	560	193	114	7.2	624.1	651			327	
12/12/18	MT #1	1056	7.57	35.16	19,461	22.88	3.35	9.4	9.1	1407	549	222	135	6.3	692.6	548			333	
03/01/19	MT #1	1008	7.70	34.50	19,096	20.93	5.75	6.0	6.6	1213	435	213	122	5.7	429.3	797			304	
06/05/19	MT #1	927	7.61	35.81	19,821	25.57	4.38	21.7	9.5	921	573	291	133	3.2	643.5	309			362	
09/19/19	MT #1	1003	7.69	35.00	19,373	25.38	4.35	10.7	10.0	1751	585	225	140	7.8	645.3	549			330	
11/01/19	MT #1	1043	7.72	35.61	19,711	24.06	5.08	14.7	9.2	1645	445	207	129	7.9	694.9	562			275	
03/01/20	MT #1																		151	No Sample - COVID-19 Shutdown
06/18/20	MT #1	1109	7.76	35.36	19,572	23.42	5.29	14.5	9.6	1243	328	238	149	5.2	545.5	1383			156	
09/16/20	MT #1	910	7.68	35.90	19,871	24.89	4.12	10.9		2020	630	225	159	9.0	530.4	431	0		216	BOD - N/A - equipment failure
12/02/20	MT #1	940	7.64	35.55	19,677	22.6	5.95	10.1	6.3	1276	329	178	119	7.2	338.8	532	0		205	
03/25/21	MT #1	1032	7.72	35.81	19,821	24.1	5.96	7.4	7.1	956	177	160	108	6.0	360.9	251			325	
05/27/21	MT #1	1020	7.58	35.69	19,755	24.3	5.66	7.2	6.0	1001	253	150	110	6.7	410.1	416			373	
08/26/21	MT #1	945	7.51	35.49	19,644	23.6	5.61	8.9	7.2	1604	372	219	130	7.3	406.1	590			320	
12/08/21	MT #1	933	7.72	35.11	19,434	23.8	5.82	8.1	5.2	1257	212	162	119	7.7	520.4	418			228	
03/09/22	MT #1	907	7.62	34.77	19,246	23.1	5.70	7.5	6.9	1414	277	177	154	8.0	818.8	540			327	
06/15/22	MT #1	901	7.58	34.52	19,107	22.6	6.02	6.4	4.2	1412	355	180	212	7.8	456.6	770			256	
08/31/22	MT #1	935	7.65	34.94	19,340	24.2	5.61	6.9	5.5	1874	352	180	110	10.4	535.2	967			123	
11/30/22	MT #1	900	7.62	34.96	19,351	23.2	5.50	16.0	7.0	1548	356	223	152	6.9	617.2	534			51	
03/02/23	MT #1	845	7.57	34.85	19,290	21.5	5.12	7.7	9.2	1394	234	220	134	6.3	557.2	515			266	
05/18/23	MT #1	831	7.50	34.57	19,135	23.9	5.46	6.8	4.5	1767	340	247	166	7.2	1057.2	524			352	
09/07/23	MT #1	915	7.71	34.69	19,201	24.6	5.60	5.9	4.6	1188	306	161	143	7.4	590.8	495		114.9		
12/07/23	MT #1	853	7.59	34.95	19,345	23.7	5.70	8.5	3.5	1135	300	129	92	8.8	422.4	412		141.2		
02/29/24	MT #1	915	7.58	35.00	19,373	20.9	5.73	6.0	4.1	1020	265	115	80	8.9	370.8	703		184.0		
05/16/24	MT #1	937	7.64	34.88	19,306	23.7	5.54	6.7	6.1	1043	267	144	73	7.3	306.5	465		182.0		
Mean			7.65	34.91	19,325	23.19	5.05	9.4	6.6	1412	424	194	134	7.5	588	621	0	156	292	
Std. Dev.			0.11	0.42	232	1.71	0.72	5.3	2.5	432	165	60	81	1.5	217	217	0	34	72	

Moana Technologies, Inc. Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'4.79"N
Longitude: 156° 2'35.88"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
55	42	10

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
n=			53	53	53	53	53	53	52	53	49	53	49	53	49	49	2	4	50	

NELHA Gateway Center Seawater Disposal Log

Discharge GPS:
Latitude: 19°42'56"N
Longitude: 156° 2'05"W

Seawater Disposal Trench Dimensions
L (ft) W (ft) D (ft)

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H+	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) SM4500-O G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
06/01/11	NELHA #1 (Gateway SWAC)	1011	7.65	34.45	19,068	13.32	7.72	2.0	2.0	662		102						36.0	
08/17/11	NELHA #1 (Gateway SWAC)	1250	7.65	34.33	19,002	11.53	8.05	3.8	2.0	648		95						36.0	
11/30/11	NELHA #1 (Gateway SWAC)	916	7.66	34.53	19,113	10.08	8.22	0.6	2.0	636		103						35.0	
02/09/12	NELHA #1 (Gateway SWAC)	1018	7.63	34.44	19,063	11.61	8.17	2.4	2.0	651		93						35.0	
05/16/12	NELHA #1 (Gateway SWAC)	1106	7.61	34.35	19,013	11.02	7.40	2.5	2.0	652		102						33.8	
08/01/12	NELHA #1 (Gateway SWAC)	959	7.59	34.23	18,947	13.79	7.74	2.8	2.0	1569	596	275	95	1.8	2856			31.5	
11/08/12	NELHA #1 (Gateway SWAC)	1023	7.56	34.71	19,212	13.20	8.57	2.4	2.0	625	592	93	96	6.6				31.8	
02/14/13	NELHA #1 (Gateway SWAC)	927	7.44	34.34	19,008	11.53	6.74	2.1	2.0	648	597	94	93	2.0	2839			33.0	
05/09/13	NELHA #1 (Gateway SWAC)	947	7.56	34.04	18,842	13.12	7.73	5.7	2.0	672	616	97	95	3.4	2921			30.8	
08/22/13	NELHA #1 (Gateway SWAC)	1009	7.52	34.37	19,024	15.66	7.19	5.2	3.2	769	609	98	97	8.9	2758			30.2	
12/05/13	NELHA #1 (Gateway SWAC)	940	7.57	34.50	19,096	13.56	7.54	3.1	2.0	692	625	95	100	1.5	2829			30.6	
02/25/14	NELHA #1 (Gateway SWAC)	1030	7.48	34.25	18,958	13.82	8.77	3.0	3.4	716	630	91	95	4.2	2776			32.1	
05/14/14	NELHA #1 (Gateway SWAC)	1052	7.45	34.35	19,013	12.43	7.61	3.6	2.9	705	647	104	103	4.9	2924			32.0	
08/13/14	NELHA #1 (Gateway SWAC)	1051	7.49	34.65	19,179	14.88	7.24	2.8	2.0	679	602	106	104	8.9	2572			31.8	
12/10/14	NELHA #1 (Gateway SWAC)	1130	7.46	34.74	19,229	14.17	7.99	4.6	2.0	721	659	110	107	0.6	2832			31.8	
02/26/15	NELHA #1 (Gateway SWAC)	948	8.48	34.64	19,174	10.77	8.36	3.4	2.0	785	705	57	110	0.4	2721			52.2	
05/28/15	NELHA #1 (Gateway SWAC)	952	7.50	34.36	19,019	9.95	10.82	2.5	2.0	785	623	57	93	7.5	2775			61.7	
08/19/15	NELHA #1 (Gateway SWAC)	924	7.53	11.57	6,404	8.43	11.98	3.7	2.0	665	636	99	98	10.7	2670			69.9	
11/24/15	NELHA #1 (Gateway SWAC)	849	7.52	10.35	5,729	8.41	12.55	2.3	2.0	686	631	101	99	8.2	2643			76.1	
02/17/16	NELHA #1 (Gateway SWAC)	825	7.94	13.41	7,423	7.54	11.26	4.0	2.0	678	637	110	107	7.8	2795			76.1	
05/12/16	NELHA #1 (Gateway SWAC)	1153	7.65	24.43	13,522	8.07	11.84	3.0	2.0	716	637	89	93	1.6	2495			74.9	
08/26/16	NELHA #1 (Gateway SWAC)	923	7.60	6.40	3,542	8.76	10.35	3.8	2.0	1068	972	141	137	22.7	4560			78.1	
11/25/16	NELHA #1 (Gateway SWAC)	927	7.48	18.48	10,229	7.56	11.63	3.7	2.0	547	496	87	85	9.8	2415			80.1	
03/08/17	NELHA #1 (Gateway SWAC)	856	7.63	19.29	10,677	6.94	10.20	3.6	2.0	624	600	95	91	15.3	2830			81.9	
05/18/17	NELHA #1 (Gateway SWAC)	958	7.64	12.54	6,941	7.75	6.70	4.0	2.0	613	494	91	89	3.4	2872			81.5	
08/17/17	NELHA #1 (Gateway SWAC)	1030	7.66	33.94	18,786	8.45	7.36	4.6	2.0	617	595	97	93	15.2	2739			99.4	
11/02/17	NELHA #1 (Gateway SWAC)	1016	7.57	25.26	13,982	7.58	7.03	4.8	2.0	614	584	96	93	11.3	2626			97.5	
03/01/18	NELHA #1 (Gateway SWAC)	951	7.46	33.06	18,299	6.82	4.52	4.1	2.0	557	580	99	96	23.0	2663			118.0	
06/07/18	NELHA #1 (Gateway SWAC)	937	7.46	34.63	19,168	7.23	2.40	4.3	2.0	544	573	97	94	1.7	2769			116.4	
09/10/18	NELHA #1 (Gateway SWAC)	903	7.36	31.41	17,386	6.95	4.21	4.4	2.0	570	564	95	90	1.7	2595			169.7	
11/09/18	NELHA #1 (Gateway SWAC)	1055	7.43	4.66	2,579	12.13	6.98	3.1	2.0	583	563	98	89	2.4	2729			75.7	
02/15/19	NELHA #1 (Gateway SWAC)	947	7.39	34.53	19,113	11.04	8.27	3.5	2.0	650	567	93	86	8.7	2856			56.3	
05/24/19	NELHA #1 (Gateway SWAC)	1010	7.26	2.23	1,234	11.47	9.88	2.6	2.0	579	563	90	88	1.6	2824			56.8	
09/12/19	NELHA #1 (Gateway SWAC)	953	7.74	2.82	1,561	12.33	9.09	2.8	2.0	629	574	94	94	8.7	2687			61.3	
10/23/19	NELHA #1 (Gateway SWAC)	959	7.72	3.74	2,070	13.42	8.44	1.2	2.0	555	576	93	90	-3.4	2763			56.1	
03/12/20	NELHA #1 (Gateway SWAC)	1101	7.73	2.98	1,649	10.6	8.34	3.9	2.0	604	586	98	96	6.3	2620			55.6	
06/12/20	NELHA #1 (Gateway SWAC)	1007	7.62	34.72	19,218	13.7	7.69	3.2	2.0	581	590	72	82	-1.1	2741			56.6	
08/28/20	NELHA #1 (Gateway SWAC)	1028	7.52	33.70	18,653	13.3	12.12	2.0		610	595	94	90	1.6	2707	0.0		100.1	BOD- N/A - equipment failure
11/12/20	NELHA #1 (Gateway SWAC)	1140	7.63	35.55	19,677	15.5	7.83	4.5	2.0	702	600	91	96	9.9	2721	0.0		48.7	
03/05/21	NELHA #1 (Gateway SWAC)	1017	7.56	35.70	19,760	12.2	7.63	4.3	2.0	590	584	85	92	11.6	2724			48.8	
05/06/21	NELHA #1 (Gateway SWAC)	920	7.40	4.16	2,303	10.8	7.42	3.5	2.0	587	619	70	87	-6.9	2744			51.7	
07/15/21	NELHA #1 (Gateway SWAC)	935	7.44	35.18	19,473	13.5	6.86	3.1	2.0	605	596	94	99	0.5	2750			55.7	
10/29/21	NELHA #1 (Gateway SWAC)	920	7.43	35.22	19,495	11.2	8.32	4.5	2.0	639	579	90	90	20.2	2858			71.9	
02/10/22	NELHA #1 (Gateway SWAC)	1019	7.45	34.46	19,074	13.9	7.94	2.0	2.0	721	610	91	97	6.9	2877			45.6	
05/13/22	NELHA #1 (Gateway SWAC)	946	7.42	34.68	19,196	13.1	8.07	1.2	2.0	576	585	92	96	0.6	2826			49.4	
08/05/22	NELHA #1 (Gateway SWAC)	944	8.14	34.69	19,201	11.2	8.61	3.9	2.0	648	604	127	127	2.7	2947			53.1	
11/17/22	NELHA #1 (Gateway SWAC)	1053	7.59	34.59	19,146	11.8	7.22	2.3	2.0	618	586	86	88	9.8	2798			54.1	
02/02/23	NELHA #1 (Gateway SWAC)	947	7.36	34.47	19,080	14.3	7.93	2.4	2.0	623	587	99	104	1.6	2621			28.2	
05/05/23	NELHA #1 (Gateway SWAC)	943	7.48	34.71	19,212	13.1	7.98	2.1	2.0	624	581	109	122	0.1	2760			34.8	
08/24/23	NELHA #1 (Gateway SWAC)	925	7.48	34.49	19,091	14.3	8.03	3.9	2.0	573	568	102	106	-3.0	2471				
10/26/23	NELHA #1 (Gateway SWAC)	1045	7.47	34.44	19,063	13.5	7.93	2.9	2.0	651	612	119	126	-0.1	2609				
02/08/24	NELHA #1 (Gateway SWAC)	1030	7.33	34.69	19,201	14.5	7.55	3.7	2.0	685	602	112	115	0.5	2442		298.3		
05/10/24	NELHA #1 (Gateway SWAC)	1023	7.60	34.74	19,229	11.6	8.07	3.7	2.0	664	555	93	96	8.0	2529		206.8		

NELHA Gateway Center Seawater Disposal Log

Discharge GPS:
Latitude: 19°42'56"N
Longitude: 156° 2'05"W

Seawater Disposal Trench Dimensions
L (ft) W (ft) D (ft)

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H+	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F		SM 4500-NH3 G					
Mean			7.57	27.76	15,365	11.46	8.23	3.3	2.1	668	604	99	98	6	2768	0	253	59	
Std. Dev.			0.19	11.52	6,378	2.52	1.87	1.0	0.3	150	65	28	11	6	296	0	65	29	
n=			53	53	53	53	53	53	52	53	48	53	48	42	47	2	2	49	

Discharge GPS:
Latitude: 19°42'55"N
Longitude: 156° 2'13"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
45	30	6

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) SM4500-O G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
03/30/11	NELHA #2 (55" Spillway)	1057	7.60	34.35	19,013	6.08	4.87	2.6	2.0	632		101		6.3					144	
06/01/11	NELHA #2 (55" Spillway)	945	7.63	34.40	19,041	6.15	3.69	2.0	2.0	662		102		6.5					144	
08/17/11	NELHA #2 (55" Spillway)	1223	7.87	34.81	19,268	18.52	4.55	2.1	2.0	505		77		6.6					144	
11/30/11	NELHA #2 (55" Spillway)	928	7.99	34.61	19,157	14.93	5.18	0.9	2.0	371		60		6.2					144	
02/09/12	NELHA #2 (55" Spillway)	958	7.94	34.95	19,345	15.43	4.98	1.9	2.0	651		93		7.0					144	
05/16/12	NELHA #2 (55" Spillway)	1055	7.59	34.35	19,013	6.14	7.55	1.8	2.0	661		105		6.3					144	
08/01/12	NELHA #2 (55" Spillway)	947	7.53	34.37	19,024	7.42	2.78	2.6	2.0	701	604	98	94	7.2	0.1	2807			144	
11/08/12	NELHA #2 (55" Spillway)	1014	7.47	34.55	19,124	7.02	2.88	1.9	2.0	604	593	93	95	6.5	4.1				144	
02/14/13	NELHA #2 (55" Spillway)	916	7.46	34.72	19,218	6.66	6.49	2.3	2.0	655	604	95	94	6.9	3.7	2867			144	
05/09/13	NELHA #2 (55" Spillway)	842	7.51	34.55	19,124	7.69	2.85	2.3	2.0	620	610	95	95	6.5	0.7	2767			144	
08/22/13	NELHA #2 (55" Spillway)	1018	7.60	34.58	19,140	12.26	3.83	3.3	2.0	570	529	86	87	6.7	7.6	2426			144	
12/05/13	NELHA #2 (55" Spillway)	932	7.64	34.84	19,284	9.52	2.90	1.8	2.0	626	580	86	90	7.3	0.0	2645			144	
02/25/14	NELHA #2 (55" Spillway)	1041	7.76	34.81	19,268	12.90	4.05	1.7	2.0	515	496	81	57	6.3	0.8	2256			144	
05/14/14	NELHA #2 (55" Spillway)	1101	7.61	34.78	19,251	7.75	4.11	1.6	2.0	664	587	93	95	7.1	14.8	2705			144	
08/13/14	NELHA #2 (55" Spillway)	1120	7.48	34.54	19,118	7.03	5.41	2.4	2.0	811	612	108	109	7.5	21.3	2630			144	
12/10/14	NELHA #2 (55" Spillway)	1158	7.41	34.64	19,174	6.58	5.33	3.6	2.0	721	659	109	108	6.6	0.5	2828			144	
02/26/15	NELHA #2 (55" Spillway)	1003	8.34	34.42	19,052	7.51	2.37	2.8	2.0	745	713	83	87	9.0	2.9	2582			144	
05/28/15	NELHA #2 (55" Spillway)	1016	7.50	35.40	19,594	7.20	4.72	3.0	2.0	745	611	83	97	9.0	6.1	2742			144	
08/19/15	NELHA #2 (55" Spillway)	941	7.51	34.63	19,168	6.32	7.79	3.5	2.0	643	636	107	99	6.0	5.2	2667			144	
11/24/15	NELHA #2 (55" Spillway)	930	7.66	34.34	19,008	5.35	3.19	4.2	2.0	686	628	101	98	6.8	2.3	2656			144	
02/17/16	NELHA #2 (55" Spillway)	839	7.56	34.36	19,019	5.12	3.19	2.9	2.0	661	639	110	109	6.0	9.3	2793			144	
05/12/16	NELHA #2 (55" Spillway)	1307	7.64	34.44	19,063	5.18	16.23	3.5	2.0	732	664	93	94	7.9	1.5	2580			144	
08/26/16	NELHA #2 (55" Spillway)	952	7.91	34.63	19,168	14.29	6.62	4.2	2.0	815	638	104	99	7.9	13.0	3128			144	
11/25/16	NELHA #2 (55" Spillway)	945	7.78	34.59	19,146	12.98	6.76	4.9	2.0	589	390	70	59	8.4	103.8	1906			144	
03/08/17	NELHA #2 (55" Spillway)	926	7.77	34.60	19,151	10.20	5.88	3.7	2.0	544	471	77	73	7.1	21.0	2200			144	
05/18/17	NELHA #2 (55" Spillway)	927	7.78	34.55	19,124	12.39	3.52	3.7	2.0	475	141	71	66	6.7	7.0	2043			144	
08/17/17	NELHA #2 (55" Spillway)	1056	7.73	34.35	19,013	10.67	5.99	3.9	2.0	573	513	87	78	6.6	13.3	2360			144	
11/02/17	NELHA #2 (55" Spillway)	1043	7.77	34.79	19,257	12.84	4.40	4.2	2.0	469	438	74	65	6.3	16.7	1928			144	
03/01/18	NELHA #2 (55" Spillway)	1337	7.90	34.43	19,057	17.10	4.29	3.5	2.0	343	328	62	56	5.5	25.1	1551			144	
06/07/18	NELHA #2 (55" Spillway)	1007	7.85	35.07	19,412	16.19	6.69	13.3	2.0	352	327	72	66	4.9	6.1	1605			144	
09/10/18	NELHA #2 (55" Spillway)	930	7.91	34.58	19,140	17.29	5.35	13.1	2.0	357	301	54	48	6.6	10.4	1423			144	
11/09/18	NELHA #2 (55" Spillway)	1115	7.74	34.89	19,312	13.40	3.76	3.8	2.0	467	405	73	55	6.4	10.9	1962			144	
02/15/19	NELHA #2 (55" Spillway)	1032	7.68	34.85	19,290	15.29	5.55	11.6	2.0	418	316	56	38	7.4	23.1	1498			144	
05/24/19	NELHA #2 (55" Spillway)	1025	7.61	35.59	19,699	13.31	5.30	3.3	2.0	467	411	70	59	6.7	5.3	2074			144	
09/12/19	NELHA #2 (55" Spillway)	1032	7.69	34.89	19,312	7.04	5.21	3.7	2.0	644	577	96	94	6.7	21.4	2717			144	
10/23/19	NELHA #2 (55" Spillway)	1142	7.67	35.79	19,810	6.72	5.36	1.6	2.0	611	537	94	92	6.5	-2.1	2846			144	
03/06/20	NELHA #2 (55" Spillway)	953	7.73	35.25	19,511	12.48	5.23	4.6	2.0	511	433	75	65	6.8	-0.9	1871			144	
06/12/20	NELHA #2 (55" Spillway)	1025	7.77	36.18	20,026	12.90	4.65	3.1	2.0	489	431	64	62	7.7	9.9	2057			144	
08/28/20	NELHA #2 (55" Spillway)	1042	7.56	34.54	19,118	7.89	7.87	2.5		717	600	87	84	8.3	10.4	2693	0.0		144	BOD- N/A - equipment failure
11/12/20	NELHA #2 (55" Spillway)	1009	7.53	35.58	19,694	7.5	4.89	2.0	2.0	698	601	89	93	7.9	13.1	2704	0.0		144	
03/05/21	NELHA #2 (55" Spillway)	921	7.52	35.79	19,810	6.6	5.03	3.1	2.0	600	594	85	90	7.0	44.2	2869			144	
05/06/21	NELHA #2 (55" Spillway)	953	7.80	35.67	19,744	16.0	5.22	2.1	2.0	420	293	39	46	10.9	45.3	1470			144	
07/15/21	NELHA #2 (55" Spillway)	1006	7.72	35.25	19,511	14.4	4.89	3.5	2.0	516	407	64	62	8.0	2.7	1877			144	
10/29/21	NELHA #2 (55" Spillway)	1012	7.70	35.33	19,556	15.1	5.21	4.2	2.0	445	345	55	52	8.0	29.9	1697			144	
02/10/22	NELHA #2 (55" Spillway)	1111	7.73	34.62	19,163	14.7	5.00	1.6	2.0	503	390	55	58	9.1	5.9	1836			144	
05/13/22	NELHA #2 (55" Spillway)	1015	7.74	34.56	19,129	15.1	5.00	1.6	2.0	475	365	56	55	8.4	18.9	1729			144	
08/05/22	NELHA #2 (55" Spillway)	1014	7.46	34.64	19,174	11.9	5.11	3.8	2.0	562	468	76	74	7.4	10.9	2270			144	
11/17/22	NELHA #2 (55" Spillway)	1102	7.74	34.61	19,157	11.7	5.02	3.0	2.0	581	451	60	59	9.7	44.7	2141			144	
02/03/23	NELHA #2 (55" Spillway)	1019	7.79	34.26	18,963	14.2	5.33	2.9	2.0	499	387	64	66	7.8	33.1	1736			144	more flow than usual
05/05/23	NELHA #2 (55" Spillway)	1023	7.84	34.59	19,146	16.9	7.15	4.0	2.0	466	325	49	50	9.5	55.9	1501			144	
08/24/23	NELHA #2 (55" Spillway)	949	7.78	34.55	19,124	17.9	6.72	3.5	2.0	435	293	43	36	10.1	28.0	1131				
10/26/23	NELHA #2 (55" Spillway)	1113	7.80	34.58	19,140	17.7	4.92	3.3	2.0	519	352	55	56	9.4	5.0	1384				
02/08/24	NELHA #2 (55" Spillway)	1058	8.03	35.00	19,373	26.3	6.67	1.5	2.0	171	6	12	12	14.2	7.1	34		227.5		SSW only, no discharge from DSW pipe
05/10/24	NELHA #2 (55" Spillway)	1032	8.06	34.90	19,318	27.9	6.53	4.6	2.0	136	6	12	10	11.4	12.7	118		192.1		SSW only, no discharge from DSW pipe

Discharge GPS:
Latitude: 19°42'55"N
Longitude: 156° 2'13"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
45	30	6

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
Mean			7.71	34.80	19,260	11.77	5.26	3.5	2.0	556	465	77	73	7.5	15	2134	0	210	144	
Std. Dev.			0.18	0.44	241	5.08	2.01	2.4	0.0	142	162	22	24	1.6	19	675	0	25	0	
n=			54	54	54	54	54	54	53	54	48	54	48	54	44	47	2	2	50	

Discharge GPS:
Latitude: 19°42'44"N
Longitude: 156° 2'54"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
28	20	6

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
03/30/11	NELHA #3 (SRT 55")	1057	7.60	34.35	19,013	6.08	4.84	0.8	2.0	647		106		6.1					43.9	
06/01/11	NELHA #3 (SRT 55")	1033	7.62	34.49	19,091	7.00	2.34	2.7	2.0	652		98		6.7					43.9	
08/17/11	NELHA #3 (SRT 55")	1216	7.71	34.40	19,041	6.38	2.75	4.4	2.0	715		105		6.8					43.9	
11/30/11	NELHA #3 (SRT 55")	938	7.68	34.28	18,974	5.83	2.22	8.3	2.0	666		104		6.4					43.9	
02/09/12	NELHA #3 (SRT 55")	947	7.60	34.47	19,080	6.18	1.67	9.5	2.0	617		96		6.4					43.9	
05/16/12	NELHA #3 (SRT 55")	1043	7.57	34.55	19,124	5.93	1.45	1.9	2.0	669		106		6.3					43.9	
08/01/12	NELHA #3 (SRT 55")	938	7.59	34.37	19,024	6.58	1.82	2.8	2.0	721	609	98	96	7.4	5.6	2817			43.9	
11/08/12	NELHA #3 (SRT 55")	1002	7.55	34.69	19,201	6.19	1.96	2.6	2.0	683	595	92	95	7.4	28.7				43.9	
02/14/13	NELHA #3 (SRT 55")	912	7.36	34.59	19,146	5.95	3.05	1.6	2.0	713	597	96	95	7.4	2.1	2806			43.9	
05/09/13	NELHA #3 (SRT 55")	850	7.49	34.54	19,118	5.82	2.17	2.2	2.0	686	610	100	96	6.9	10.4	2796			43.9	
08/22/13	NELHA #3 (SRT 55")	1026	7.39	34.45	19,068	6.62	1.89	3.1	2.0	668	603	96	95	7.0	4.9	2646			43.9	
12/05/13	NELHA #3 (SRT 55")	921	7.50	34.56	19,129	5.84	1.52	1.5	2.0	669	621	92	99	7.3	0.4	2703			43.9	
02/25/14	NELHA #3 (SRT 55")	1049	7.50	34.43	19,057	5.65	2.08	1.8	2.0	400	632	109	99	3.7	13.1	2916			43.9	
05/14/14	NELHA #3 (SRT 55")	1110	7.51	34.80	19,262	6.05	2.71	2.7	2.0	673	635	100	103	6.7	3.7	2929			43.9	
08/13/14	NELHA #3 (SRT 55")	1130	7.44	34.60	19,151	6.04	3.27	2.4	2.0	680	607	107	106	6.3	13.4	2651			43.9	
12/10/14	NELHA #3 (SRT 55")	1240	7.44	34.79	19,257	6.08	2.03	3.5	2.0	769	660	112	105	6.8	4.3	2878			43.9	
02/26/15	NELHA #3 (SRT 55")	1011	8.32	34.64	19,174	5.54	1.95	2.8	2.0	909	715	92	91	9.9	15.6	2712			43.9	
05/28/15	NELHA #3 (SRT 55")	1030	7.58	34.85	19,290	5.66	4.15	2.9	2.0	909	619	92	102	9.9	9.8	2815			43.9	
08/19/15	NELHA #3 (SRT 55")	950	7.57	33.82	18,720	5.95	7.38	3.6	2.0	634	637	102	100	6.2	5.9	2626			43.9	
11/24/15	NELHA #3 (SRT 55")	1053	7.70	34.31	18,991	5.94	7.51	4.4	2.0	692	630	101	99	6.9	1.1	2637			43.9	
02/17/16	NELHA #3 (SRT 55")	849	7.61	34.15	18,902	5.44	6.93	3.0	2.0	665	644	111	107	6.0	8.5	2808			43.9	
05/12/16	NELHA #3 (SRT 55")	1317	7.65	34.43	19,057	5.73	7.20	2.8	2.0	760	665	96	96	7.9	0.9	2586			43.9	
08/26/16	NELHA #3 (SRT 55")	1001	7.53	34.55	19,124	6.70	4.89	4.1	2.0	1173	980	157	139	7.5	15.7	4529			43.9	
11/25/16	NELHA #3 (SRT 55")	955	7.51	34.53	19,113	6.66	5.10	3.2	2.0	700	617	90	84	7.8	46.3	2812			43.9	
03/08/17	NELHA #3 (SRT 55")	935	7.68	34.63	19,168	6.44	4.80	7.2	2.0	646	597	94	91	6.9	16.0	2810			43.9	
05/18/17	NELHA #3 (SRT 55")	936	7.61	34.65	19,179	6.33	3.40	4.1	2.0	623	230	94	89	6.6	2.6	2749			43.9	
08/17/17	NELHA #3 (SRT 55")	1106	7.70	34.43	19,057	6.41	5.43	4.1	2.0	643	602	98	95	6.6	15.3	2711			43.9	
11/02/17	NELHA #3 (SRT 55")	1054	7.59	34.71	19,212	6.94	4.65	4.6	2.0	629	605	98	93	6.4	14.2	2761			43.9	
03/01/18	NELHA #3 (SRT 55")	1349	7.51	34.45	19,068	7.15	3.59	6.1	2.0	581	595	106	97	5.5	23.3	2835			43.9	
06/07/18	NELHA #3 (SRT 55")	1016	7.47	35.05	19,401	7.12	4.04	13.6	2.0	554	565	101	96	5.5	6.7	2703			43.9	
09/10/18	NELHA #3 (SRT 55")	938	7.53	34.51	19,102	7.39	4.10	6.3	2.0	656	571	97	90	6.8	19.0	2653			43.9	
11/09/18	NELHA #3 (SRT 55")	1124	7.43	34.75	19,234	7.34	7.34	4.6	2.0	605	571	95	84	6.3	12.3	2744			43.9	
02/15/19	NELHA #3 (SRT 55")	1042	7.17	34.75	19,234	6.81	4.75	4.9	2.0	606	572	96	89	6.3	16.4	2925			43.9	
05/24/19	NELHA #3 (SRT 55")	1043	7.38	35.79	19,810	6.82	4.85	5.1	2.0	592	566	91	86	6.5	4.3	2846			43.9	
09/12/19	NELHA #3 (SRT 55")	1038	7.69	34.87	19,301	7.36	5.21	2.8	2.0	625	578	97	95	6.5	17.3	2798			43.9	
10/23/19	NELHA #3 (SRT 55")	1150	7.65	35.80	19,816	8.76	3.13	1.4	2.0	613	551	95	93	6.4	0.0	2827			43.9	
03/06/20	NELHA #3 (SRT 55")	1002	7.66	36.17	20,020	7.77	3.91	5.5	2.0	649	602	96	91	6.8	4.5	2826			43.9	
06/12/20	NELHA #3 (SRT 55")	1032	7.68	36.21	20,043	8.29	3.35	3.3	2.0	592	596	83	83	7.1	4.0	2693			43.9	
08/28/20	NELHA #3 (SRT 55")	1050	7.57	32.80	18,155	8.53	7.80	2.7		694	597	88	90	7.9	12.8	2661	0.0		43.9	BOD- N/A - equipment failure
11/12/20	NELHA #3 (SRT 55")	1017	7.55	35.47	19,633	7.9	3.35	3.6	2.0	640	593	89	94	7.2	9.6	2650	0.0		43.9	
03/05/21	NELHA #3 (SRT 55")	929	7.50	35.74	19,782	7.0	3.91	2.3	2.0	609	588	85	91	7.2	38.4	2786			43.9	
05/06/21	NELHA #3 (SRT 55")	1144	7.49	35.69	19,755	7.8	3.47	3.2	2.0	601	572	73	89	8.3	10.2	2741			43.9	
07/15/21	NELHA #3 (SRT 55")	1041	7.51	35.25	19,511	8.1	3.66	3.5	2.0	646	595	96	98	6.7	1.3	2866			43.9	
10/29/21	NELHA #3 (SRT 55")	1018	7.45	35.19	19,478	6.5	3.71	4.2	2.0	642	586	85	86	7.5	35.3	2954			43.9	
02/10/22	NELHA #3 (SRT 55")	1118	7.43	34.50	19,096	6.8	3.98	2.4	2.0	698	612	79	89	8.9	6.5	3005			43.9	
05/13/22	NELHA #3 (SRT 55")	1022	7.46	34.60	19,151	7.6	3.62	1.9	2.0	650	603	86	88	7.5	17.4	2760			43.9	
08/05/22	NELHA #3 (SRT 55")	1023	7.27	34.55	19,124	7.5	3.03	3.4	2.0	720	595	90	87	8.0	21.1	2763			43.9	
11/17/22	NELHA #3 (SRT 55")	1109	7.56	34.53	19,113	6.8	4.08	8.4	2.0	676	590	79	84	8.5	36.3	2809			43.9	
02/03/23	NELHA #3 (SRT 55")	1027	7.53	34.52	19,107	7.5	3.71	5.1	2.0	705	606	94	92	7.5	62.6	2611			43.9	
05/05/23	NELHA #3 (SRT 55")	1031	7.53	34.55	19,124	8.4	3.48	2.5	2.0	691	601	82	86	8.5	48.3	2718			43.9	
08/24/23	NELHA #3 (SRT 55")	955	7.46	34.49	19,091	7.5	3.04	3.8	2.0	679	592	75	78	9.0	36.5	2518				
10/26/23	NELHA #3 (SRT 55")	1120	7.49	34.47	19,080	8.0	3.01	3.5	2.0	707	608	84	91	8.4	2.5	2508				
02/08/24	NELHA #3 (SRT 55")	1105	7.51	34.82	19,273	8.3	3.30	2.3	2.0	654	604	75	78	8.8	1.4	2456		242.3		
05/10/24	NELHA #3 (SRT 55")	1039	7.57	34.59	19,146	8.3	3.43	2.9	2.0	581	560	89	91	6.5	5.4	2469		198.7		

NELHA 55" Seawater Disposal Log

Discharge GPS:
Latitude: 19°42'44"N
Longitude: 156° 2'54"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
28	20	6

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
Mean			7.55	34.71	19,211	6.84	3.82	3.9	2.0	672	604	95	94	7.1	14	2783	0	221	44	
Std. Dev.			0.15	0.56	309	0.90	1.62	2.2	0.0	102	83	13	9	1.1	14	288	0	31	0	
n=			54	54	54	54	54	54	53	54	48	54	48	54	47	47	2	2	50	

NELHA SRT-5 Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'23"N
Longitude: 156° 3'16"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
64	22	10

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
03/30/11	NELHA #4 (SRT-5)	1122	7.61	34.38	19,030	9.24	8.63	2.1	2.0	631		106		6.0					36.0	
06/02/11	NELHA #4 (SRT-5)	937	7.60	34.55	19,124	27.58	4.20	2.6	2.0	665		105		6.3					36.0	
08/17/11	NELHA #4 (SRT-5)	1204	7.74	34.43	19,057	13.58	7.80	2.1	2.0	707		103		6.9					36.0	
11/30/11	NELHA #4 (SRT-5)	956	7.69	34.34	19,008	20.96	5.97	1.7	2.0	657		100		6.6					36.0	
02/09/12	NELHA #4 (SRT-5)	930	7.59	34.61	19,157	19.93	6.33	1.5	2.0	640		94		6.8					36.0	
05/16/12	NELHA #4 (SRT-5)	1034	7.59	34.47	19,080	25.94	3.41	2.1	2.0	674		104		6.5					36.0	
08/01/12	NELHA #4 (SRT-5)	929	7.59	34.48	19,085	26.88	3.60	2.4	2.0	670	614	97	95	6.9	1.4	2812			36.0	
11/08/12	NELHA #4 (SRT-5)	No sample - Flow diverted			0														0.0	
02/14/13	NELHA #4 (SRT-5)	No sample - Flow diverted			0														0.0	
05/09/13	NELHA #4 (SRT-5)	No sample - No Flow			0														0.0	
08/22/13	NELHA #4 (SRT-5)	1040	7.54	34.34	19,008	15.46	8.00	2.5	2.0	662	606	101	99	6.6	34.8	2773			36.0	
12/05/13	NELHA #4 (SRT-5)	913	7.55	34.78	19,251	14.12	7.38	0.5	2.0	674	636	94	100	7.2	0.1	2808			36.0	
02/25/14	NELHA #4 (SRT-5)	1100	7.55	34.45	19,068	13.20	7.83	1.7	2.0	659	629	105	102	6.3	0.7	2854			36.0	
05/14/14	NELHA #4 (SRT-5)	1124	7.59	34.47	19,080	16.51	7.04	2.5	2.0	679	641	102	104	6.7	1.7	2940			36.0	
08/13/14	NELHA #4 (SRT-5)	1145	7.55	34.65	19,179	17.70	6.82	6.5	2.1	881	635	113	111	7.8	31.7	2645			36.0	
12/10/14	NELHA #4 (SRT-5)	1258	7.43	34.44	19,063	14.93	7.01	2.6	2.0	725	661	108	108	6.7	0.5	2912			36.0	
02/26/15	NELHA #4 (SRT-5)	1027	8.22	34.50	19,096	13.54	8.32	3.1	2.0	771	719	96	92	8.0	0.8	2659			36.0	
05/28/15	NELHA #4 (SRT-5)	1304	7.55	34.96	19,351	8.96	9.20	2.6	2.0	771	627	96	99	8.0	11.0	2807			36.0	
08/19/15	NELHA #4 (SRT-5)	1009	7.67	34.79	19,257	9.36	11.26	3.6	2.0	657	633	106	100	6.2	4.7	2641			36.0	
11/24/15	NELHA #4 (SRT-5)	945	7.56	34.31	18,991	8.92	9.49	3.8	2.0	690	627	100	98	6.9	0.9	2610			36.0	
02/17/16	NELHA #4 (SRT-5)	1107	7.76	33.73	18,670	8.43	12.90	3.6	2.0	660	636	111	104	5.9	8.9	2792			36.0	
05/12/16	NELHA #4 (SRT-5)	1347	7.67	34.45	19,068	8.39	10.54	3.7	2.0	741	666	94	94	7.9	0.9	2526			36.0	
08/26/16	NELHA #4 (SRT-5)	1015	7.54	34.61	19,157	7.51	9.67	4.1	2.0	1060	976	158	139	6.7	11.7	4625			36.0	
11/25/16	NELHA #4 (SRT-5)	1016	7.48	34.58	19,140	7.37	9.91	4.6	2.0	677	613	92	86	7.4	44.9	2845			36.0	
03/08/17	NELHA #4 (SRT-5)	1104	7.66	34.74	19,229	6.25	5.26	3.5	2.0	650	594	95	92	6.8	16.8	2818			36.0	
05/18/17	NELHA #4 (SRT-5)	1021	7.60	34.64	19,174	6.35	6.58	3.5	2.0	633	269	95	90	6.7	3.3	2856			36.0	
08/17/17	NELHA #4 (SRT-5)	1120	7.68	34.44	19,063	6.67	10.18	2.9	2.0	611	598	97	93	6.3	13.6	2695			36.0	
11/02/17	NELHA #4 (SRT-5)	1109	7.61	34.74	19,229	6.68	8.33	4.6	2.0	617	596	98	91	6.3	9.9	2697			36.0	
03/01/18	NELHA #4 (SRT-5)	1407	7.54	34.52	19,107	6.41	8.66	4.4	2.0	598	578	100	98	6.0	24.3	2762			36.0	
06/07/18	NELHA #4 (SRT-5)	1041	7.53	35.08	19,417	6.41	10.03	4.2	2.0	552	565	98	95	5.6	6.6	2765			36.0	
09/10/18	NELHA #4 (SRT-5)	950	7.50	34.44	19,063	6.49	7.60	13.5	2.0	612	564	92	92	6.7	6.2	2652			36.0	
11/09/18	NELHA #4 (SRT-5)	1134	7.49	34.92	19,329	7.77	5.28	4.2	2.0	599	574	96	88	6.2	2.0	2780			36.0	
02/15/19	NELHA #4 (SRT-5)	1055	7.13	34.70	19,207	6.13	9.19	3.8	2.0	598	569	94	90	6.3	13.6	2824			36.0	
05/24/19	NELHA #4 (SRT-5)	1056	7.12	35.63	19,722	7.31	9.95	5.2	2.0	599	566	93	88	6.4	8.0	2820			36.0	
09/12/19	NELHA #4 (SRT-5)	1116	7.69	34.79	19,257	7.29	3.56	2.6	2.0	603	578	95	96	6.3	16.0	2683			36.0	
10/23/19	NELHA #4 (SRT-5)	1431	7.66	35.89	19,865	7.07	9.05	10.8	2.0	595	551	96	94	6.2	3.5	2805			36.0	
03/06/20	NELHA #4 (SRT-5)	1042	7.39	36.27	20,076	7.39	7.31	4.8	2.0	648	598	94	92	6.9	8.2	2661			36.0	
06/12/20	NELHA #4 (SRT-5)	1057	7.66	36.24	20,059	7.34	5.57	4.3	2.0	592	586	86	88	6.9	10.7	2638			36.0	
08/28/20	NELHA #4 (SRT-5)	1121	7.58	32.80	18,155	7.69	10.49	2.6		657	596	86	91	7.6	7.1	2679	0.0		36.0	BOD- N/A - equipment failure
11/12/20	NELHA #4 (SRT-5)	1030	7.59	35.53	19,666	7.5	3.82	2.5	2.0	634	600	89	94	7.1	6.3	2648	0.0		36.0	
03/05/21	NELHA #4 (SRT-5)	1048	7.55	35.73	19,777	7.3	5.23	3.2	2.0	610	583	85	93	7.2	33.0	2774			36.0	
05/06/21	NELHA #4 (SRT-5)	1032	7.47	35.61	19,711	7.7	4.76	3.1	2.0	629	617	73	86	8.6	9.8	2699			36.0	
07/15/21	NELHA #4 (SRT-5)	1132	7.51	35.23	19,500	7.5	7.96	3.0	2.0	616	597	95	99	6.5	2.6	2824			36.0	
10/29/21	NELHA #4 (SRT-5)	1103	7.47	35.18	19,473	7.3	3.20	4.3	2.0	632	569	85	88	7.4	27.1	2872			36.0	
02/10/22	NELHA #4 (SRT-5)	1136	7.50	34.47	19,080	7.7	2.86	2.6	2.0	684	609	83	90	8.3	3.9	2844			36.0	
05/15/22	NELHA #4 (SRT-5)	1101	7.49	34.59	19,146	7.9	4.45	1.2	2.0	600	578	82	91	7.3	-0.1	2792			36.0	
08/05/22	NELHA #4 (SRT-5)	1055	7.58	34.59	19,146	6.4	4.41	2.8	2.0	601	590	87	92	6.9	1.9	2736			36.0	
11/17/22	NELHA #4 (SRT-5)	155	7.60	34.66	19,185	6.2	4.38	1.7	2.0	625	592	80	85	7.8	9.9	2794			36.0	
02/03/23	NELHA #4 (SRT-5)																		36.0	No sample, sump level too high to open valve (for all of 1st Q)
05/05/23	NELHA #4 (SRT-5)	1101	7.55	34.54	19,118	6.7	3.99	3.6	2.0	679	603	80	84	8.5	56.6	2703			36.0	
08/24/23	NELHA #4 (SRT-5)	1031	7.45	34.49	19,091	7.3	2.93	1.7	2.0	633	586	76	78	8.3	22.6	2556				
10/26/23	NELHA #4 (SRT-5)	1155	7.51	34.45	19,068	6.8	2.79	1.9	2.0	677	614	83	91	8.2	1.3	2550				
02/08/24	NELHA #4 (SRT-5)	1119	7.54	34.56	19,129	6.9	3.63	2.5	2.0	673	606	79	82	8.5	0.0	2435		237.5		
05/10/24	NELHA #4 (SRT-5)	1050	7.60	34.54	19,118	6.6	3.42	2.5	2.0	665	575	89	95	7.5	7.0	2416		187.8		

Discharge GPS:
Latitude: 19°43'23"N
Longitude: 156° 3'16"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
64	22	10

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
Mean			7.57	34.73	18,134	10.23	6.80	3.4	2.0	661	605	95	94	7.0	11	2773	0	213	34	
Std. Dev.			0.15	0.58	4,495	5.65	2.65	2.1	0.0	80	83	13	10	0.8	13	309	0	35	9	
n=			50	50	50	50	50	50	49	50	44	50	44	50	41	44	2	2	47	

NELHA SRT-5 2" Pipe Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'23"N
Longitude: 156° 3'16"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
1	1	0.5

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
03/30/11	NELHA #5 (SRT-5 2")	1127	7.64	34.47	19,080	5.67	5.67	1.7	2.0	650		100		6.5					7.2	
06/02/11	NELHA #5 (SRT-5 2")	933	7.61	34.25	18,958	28.55	3.69	1.0	2.0	665		105		6.3					7.2	
08/17/11	NELHA #5 (SRT-5 2")	1139	7.73	34.49	19,091	14.71	2.83	2.8	2.0	713		103		6.9					7.2	
11/30/11	NELHA #5 (SRT-5 2")	949	7.64	34.30	18,985	21.25	1.95	1.0	2.0	634		102		6.2					7.2	
02/09/12	NELHA #5 (SRT-5 2")	930	7.59	34.61	19,157	19.93	6.33	5.5	2.0	629		98		6.4					7.2	
05/16/12	NELHA #5 (SRT-5 2")	1032	7.54	34.42	19,052	26.12	1.54	2.1	2.0	697		104		6.7					7.2	
08/01/12	NELHA #5 (SRT-5 2")	926	7.57	34.50	19,096	26.82	1.83	2.0	2.0	657	605	99	99	6.6	0.4	2829			7.2	
11/08/12	NELHA #5 (SRT-5 2")	944	7.60	34.74	19,229	22.38	2.05	2.8	2.0	601	591	96	97	6.3	11.4				7.2	
02/14/13	NELHA #5 (SRT-5 2")	858	7.43	34.47	19,080	24.55	2.01	5.5	2.0	554	597	99	97	5.6	2.0	2828			7.2	
05/09/13	NELHA #5 (SRT-5 2")	907	7.48	34.45	19,068	28.02	1.99	1.6	2.0	626	609	99	95	6.3	0.5	2843			7.2	
08/22/13	NELHA #5 (SRT-5 2")	1036	7.44	34.40	19,041	14.99	2.53	2.6	2.0	630	608	92	96	6.9	3.4	2769			7.2	
12/05/13	NELHA #5 (SRT-5 2")	905	7.49	34.65	19,179	14.51	2.07	1.6	2.0	664	625	98	100	6.8	0.1	2822			7.2	
02/25/14	NELHA #5 (SRT-5 2")	1057	7.51	34.48	19,085	13.47	3.70	2.0	2.0	654	630	86	103	7.6	0.4	2845			7.2	
05/14/14	NELHA #5 (SRT-5 2")	1118	7.53	34.54	19,118	16.67	1.77	3.1	2.0	655	641	100	104	6.5	2.5	2938			7.2	
08/13/14	NELHA #5 (SRT-5 2")	1138	7.46	34.54	19,118	17.39	2.38	2.2	2.0	705	604	107	106	6.6	13.6	2614			7.2	
12/10/14	NELHA #5 (SRT-5 2")	1254	7.38	34.75	19,234	14.02	1.66	3.0	2.0	719	667	88	108	8.2	4.8	2926			7.2	
02/26/15	NELHA #5 (SRT-5 2")	1022	8.21	34.59	19,146	13.67	1.99	2.9	2.0	723	713	96	93	7.5	2.0	2638			7.2	
05/28/15	NELHA #5 (SRT-5 2")	1043	7.53	35.00	19,373	9.71	3.00	3.0	2.0	723	632	96	99	7.5	7.6	2816			7.2	
08/19/15	NELHA #5 (SRT-5 2")	1019	7.56	34.61	19,157	10.22	6.79	4.6	2.0	660	639	100	100	6.6	4.5	2659			7.2	
11/24/15	NELHA #5 (SRT-5 2")	939	7.59	34.50	19,096	8.33	3.44	4.3	2.0	698	624	100	99	7.0	3.3	2634			7.2	
02/17/16	NELHA #5 (SRT-5 2")	917	7.60	34.43	19,057	8.08	4.33	3.7	2.0	668	643	110	104	6.1	8.1	2781			7.2	
05/12/16	NELHA #5 (SRT-5 2")	1339	7.66	34.53	19,113	8.58	4.32	3.3	2.0	743	662	97	94	7.7	0.6	2468			7.2	
08/26/16	NELHA #5 (SRT-5 2")	1011	7.53	34.63	19,168	6.95	2.37	3.7	2.0	1084	987	159	139	6.8	7.9	4671			7.2	
11/25/16	NELHA #5 (SRT-5 2")	1009	7.45	34.56	19,129	6.42	2.77	2.7	2.0	605	608	93	89	6.5	9.3	2876			7.2	
03/08/17	NELHA #5 (SRT-5 2")	947	7.65	33.46	18,520	6.25	9.98	4.4	2.0	673	589	97	93	7.0	21.6	2844			7.2	
05/18/17	NELHA #5 (SRT-5 2")	1016	7.60	34.56	19,129	6.62	2.57	4.6	2.0	605	302	95	89	6.4	1.9	2862			7.2	
08/17/17	NELHA #5 (SRT-5 2")	1124	7.69	34.44	19,063	5.59	2.69	4.2	2.0	616	597	102	98	6.0	16.1	2686			7.2	
11/02/17	NELHA #5 (SRT-5 2")	1114	7.57	34.72	19,218	5.87	3.45	3.3	2.0	626	606	99	95	6.3	8.3	2707			7.2	
03/01/18	NELHA #5 (SRT-5 2")	1400	7.53	34.49	19,091	6.14	2.02	12.5	2.0	618	575	99	98	6.2	26.7	2764			7.2	
06/07/18	NELHA #5 (SRT-5 2")	1025	7.50	35.08	19,417	6.54	3.02	12.1	2.0	578	562	99	94	5.9	7.8	2838			7.2	
09/10/18	NELHA #5 (SRT-5 2")	946	7.51	34.53	19,113	6.38	2.62	9.9	2.0	627	568	93	90	6.7	12.4	2604			7.2	
11/09/18	NELHA #5 (SRT-5 2")	1138	7.48	34.87	19,301	5.61	2.40	10.3	2.0	599	576	95	88	6.3	4.8	2761			7.2	
02/15/19	NELHA #5 (SRT-5 2")	1051	7.18	34.58	19,140	5.86	4.20	4.7	2.0	589	569	94	90	6.3	11.9	2831			7.2	
05/24/19	NELHA #5 (SRT-5 2")	1051	7.28	35.89	19,865	7.00	3.23	3.7	2.0	587	565	92	87	6.4	2.3	2821			7.2	
09/12/19	NELHA #5 (SRT-5 2")	1112	7.69	34.84	19,284	7.02	2.10	2.4	2.0	609	577	97	95	6.3	12.8	2668			7.2	
10/23/19	NELHA #5 (SRT-5 2")	1427	7.64	35.97	19,910	6.84	1.96	2.2	2.0	561	564	94	93	6.0	3.9	2791			7.2	
03/06/20	NELHA #5 (SRT-5 2")	1036	7.67	36.18	20,026	7.38	1.95	4.7	2.0	634	605	96	93	6.6	4.3	2661			7.2	
06/12/20	NELHA #5 (SRT-5 2")	1053	7.65	36.17	20,020	7.66	1.67	3.5	2.0	596	579	88	91	6.7	8.4	2600			7.2	
08/28/20	NELHA #5 (SRT-5 2")	1117	7.57	33.30	18,432	7.34	7.04	2.8		667	603	88	91	7.6	8.0	2684	0.0		7.2	BOD- N/A - equipment failure
11/12/20	NELHA #5 (SRT-5 2")	1025	7.58	35.53	19,666	6.9	1.54	2.9	2.0	633	594	88	95	7.2	10.4	2646	0.0		7.2	
03/05/21	NELHA #5 (SRT-5 2")	1044	7.55	35.86	19,849	6.8	2.14	3.0	2.0	582	591	83	91	7.0	6.6	2784			7.2	
05/06/21	NELHA #5 (SRT-5 2")	1037	7.45	35.64	19,727	7.0	1.84	3.8	2.0	576	562	86	90	6.7	3.9	2702			7.2	
07/15/21	NELHA #5 (SRT-5 2")	1129	7.43	35.21	19,489	6.8	1.86	4.3	2.0	618	601	96	102	6.4	0.7	2835			7.2	
10/29/21	NELHA #5 (SRT-5 2")	1059	7.46	35.20	19,484	6.6	1.95	4.8	2.0	601	597	87	91	6.9	3.8	2834			7.2	
02/10/22	NELHA #5 (SRT-5 2")	1131	7.45	34.46	19,074	6.7	1.74	1.6	2.0	641	608	81	88	7.9	1.7	2819			7.2	
05/15/22	NELHA #5 (SRT-5 2")	1105	7.43	34.56	19,129	7.0	1.89	1.4	2.0	575	612	88	92	6.6	1.3	2790			7.2	
08/05/22	NELHA #5 (SRT-5 2")	1100	7.18	34.67	19,190	5.6	1.87	3.2	2.0	649	594	90	91	7.2	3.6	2735			7.2	
11/17/22	NELHA #5 (SRT-5 2")	1158	7.57	34.49	19,091	5.4	2.11	3.6	2.0	645	594	81	86	8.0	14.5	2809			7.2	
02/03/23	NELHA #5 (SRT-5 2")	1052	7.54	34.66	19,185	6.5	2.00	2.0	2.0	621	605	92	94	6.8	2.9	2626			7.2	
05/05/23	NELHA #5 (SRT-5 2")	1050	7.51	34.59	19,146	6.2	1.87	2.9	2.0	631	601	79	81	8.0	11.1	2762			7.2	
08/24/23	NELHA #5 (SRT-5 2")	1027	7.48	34.51	19,102	6.7	1.76	3.0	2.0	596	598	76	81	7.9	0.8	2557				
10/26/23	NELHA #5 (SRT-5 2")	1152	7.52	34.55	19,124	6.3	1.87	2.8	2.0	644	613	82	89	7.9	-0.1	2579				
02/08/24	NELHA #5 (SRT-5 2")	1122	7.56	34.53	19,113	5.9	1.78	1.8	2.0	648	609	78	79	8.3	-1.9	2428		219.1		
05/10/24	NELHA #5 (SRT-5 2")	1048	7.60	34.52	19,107	5.8	1.84	2.1	2.0	626	607	86	85	7.3	7.2	2425		195.0		

NELHA SRT-5 2" Pipe Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'23"N
Longitude: 156° 3'16"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
1	1	0.5

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
Mean			7.54	34.72	19,219	10.65	2.81	3.7	2.0	645	606	95	95	6.8	6	2775	0	207	7	
Std. Dev.			0.14	0.55	305	6.76	1.64	2.4	0.0	75	77	12	9	0.6	6	308	0	17	0	
n=			54	54	54	54	54	54	53	54	48	54	48	54	45	47	2	2	50	

NELHA Kau Pump Station Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'22"N
Longitude: 156° 3'21"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
8	8	1.5

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
03/30/11	NELHA #6 (Kau Pump Station)	1136	7.65	34.36	19,019	7.42	2.29	8.3	2.0	601		94		6.4					14.4	
06/01/11	NELHA #6 (Kau Pump Station)	1044	7.70	34.50	19,096	9.10	2.33	9.7	2.0	576		85		6.8					14.4	
08/17/11	NELHA #6 (Kau Pump Station)	1131	7.71	34.66	19,185	8.48	2.20	3.2	2.0	689		94		7.3					14.4	
11/30/11	NELHA #6 (Kau Pump Station)	1007	7.71	34.36	19,019	7.97	1.52	6.3	2.0	605		96		6.3					14.4	
02/09/12	NELHA #6 (Kau Pump Station)	918	7.82	34.56	19,129	14.47	3.96	8.2	2.0	241		34		7.1					14.4	
05/16/12	NELHA #6 (Kau Pump Station)	1015	8.01	34.76	19,240	21.76	5.81	0.9	2.0	278		40		7.0					14.4	
08/01/12	NELHA #6 (Kau Pump Station)	919	8.14	34.92	19,329	26.04	6.22	1.9	2.0	148	61	22	11	6.8	3.2	241			14.4	
11/08/12	NELHA #6 (Kau Pump Station)	938	8.08	34.85	19,290	21.15	6.02	1.3	2.0	171	114	28	20	6.1	20.9				14.4	
02/14/13	NELHA #6 (Kau Pump Station)	845	7.87	34.94	19,340	16.08	5.51	3.0	2.0	247	259	54	48	4.6	2.4	1045			14.4	
05/09/13	NELHA #6 (Kau Pump Station)	916	8.08	35.17	19,467	23.10	5.00	4.2	2.0	504	408	79	66	6.4	1.3	1615			14.4	
08/22/13	NELHA #6 (Kau Pump Station)	1047	7.87	34.66	19,185	10.87	3.81	2.2	2.0	503	449	78	76	6.4	4.8	1707			14.4	
12/05/13	NELHA #6 (Kau Pump Station)	855	7.48	34.65	19,179	8.30	1.66	1.6	2.0	534	492	71	78	7.5	1.8	1901			14.4	
02/25/14	NELHA #6 (Kau Pump Station)	1109	7.85	34.44	19,063	9.32	5.03	2.6	2.0	620	589	104	99	6.0	2.2	2288			14.4	
05/14/14	NELHA #6 (Kau Pump Station)	1132	7.89	34.51	19,102	7.91	3.89	7.5	2.0	688	606	105	101	6.5	17.4	2362			14.4	
08/13/14	NELHA #6 (Kau Pump Station)	1138	7.46	34.54	19,118	17.39	2.38	5.5	2.0	242	105	36	23	6.8	8.2	424			14.4	
12/10/14	NELHA #6 (Kau Pump Station)	1305	7.60	34.75	19,234	9.73	5.23	3.6	2.0	460	371	74	63	6.2	5.8	1311			14.4	
02/26/15	NELHA #6 (Kau Pump Station)	1036	8.42	34.67	19,190	16.47	4.25	14.3	2.0	408	312	51	47	7.9	1.4	954			14.4	
05/28/15	NELHA #6 (Kau Pump Station)	1052	8.14	35.08	19,417	24.87	5.91	2.4	2.0	408	85	51	23	7.9	8.1	385			14.4	
08/19/15	NELHA #6 (Kau Pump Station)	1024	8.01	34.99	19,367	27.97	6.32	3.4	2.0	235	164	39	28	6.1	7.1	593			14.4	
11/24/15	NELHA #6 (Kau Pump Station)	1041	7.85	35.70	19,760	11.36	4.77	4.8	2.0	262	174	41	33	6.5	3.0	609			14.4	
02/17/16	NELHA #6 (Kau Pump Station)	938	7.95	34.07	18,858	12.91	2.47	3.2	2.0	432	387	73	68	5.9	7.8	1423			14.4	
05/12/16	NELHA #6 (Kau Pump Station)	1334	8.05	36.87	20,408	18.18	4.90	2.9	2.0	310	175	39	33	7.9	1.7	651			14.4	
08/26/16	NELHA #6 (Kau Pump Station)	1022	7.89	36.40	20,148	10.65	6.74	4.7	2.0	561	452	84	79	6.7	6.7	1936			14.4	
11/25/16	NELHA #6 (Kau Pump Station)	1023	7.45	34.55	19,124	6.92	2.70	5.5	2.0	550	166	56	39	9.9	68.4	734			14.4	
03/08/17	NELHA #6 (Kau Pump Station)	953	7.77	36.03	19,943	16.95	4.90	3.5	2.0	497	467	77	71	6.5	15.3	2141			14.4	
05/18/17	NELHA #6 (Kau Pump Station)	1027	7.97	34.63	19,168	6.02	1.59	12.9	2.0	287	150	47	39	6.1	2.4	1203			14.4	
08/17/17	NELHA #6 (Kau Pump Station)	1129	7.75	34.75	19,234	6.76	5.22	23.7	5.3	785	427	136	81	5.8	79.5	2008			14.4	thick algal mat growth covering sump
11/02/17	NELHA #6 (Kau Pump Station)	1121	8.05	34.94	19,340	26.17	4.52	3.5	2.0	196	168	37	28	5.3	6.9	756			14.4	
03/01/18	NELHA #6 (Kau Pump Station)	1415	7.60	34.78	19,251	6.38	1.82	7.3	2.0	457	240	67	46	6.9	25.0	1167			14.4	
06/07/18	NELHA #6 (Kau Pump Station)	1049	7.74	36.45	20,175	17.00	6.65	12.6	2.0	139	82	28	18	5.1	3.1	402			14.4	
09/10/18	NELHA #6 (Kau Pump Station)	957	7.64	37.02	20,491	9.18	6.89	14.1	2.0	199	152	37	25	5.4	4.5	747			14.4	
11/09/18	NELHA #6 (Kau Pump Station)	1144	7.05	32.60	18,044	17.30	2.87	15.8	2.0	674	316	124	75	5.4	31.7	1395			14.4	
02/15/19	NELHA #6 (Kau Pump Station)	1102	7.25	35.02	19,384	7.11	2.88	17.4	2.0	419	282	77	48	5.4	9.8	1325			14.4	
05/24/19	NELHA #6 (Kau Pump Station)	1115	7.15	36.02	19,937	7.38	2.86	10.1	2.0	491	404	81	65	6.1	4.0	1978			14.4	
09/12/19	NELHA #6 (Kau Pump Station)	1123	7.77	34.54	19,118	8.67	1.92	63.1	2.0	792	437	171	71	4.6	10.4	2101			14.4	lots of macroalgae particulates in TSS sample
10/23/19	NELHA #6 (Kau Pump Station)	1438	7.88	35.92	19,882	7.95	2.42	2.5	2.0	325	288	59	53	5.5	0.6	1367			14.4	
03/06/20	NELHA #6 (Kau Pump Station)	1050	7.70	35.02	19,384	7.73	1.21	32.4	2.5	665	447	115	73	5.8	4.8	1751			14.4	lots of macroalgae particulates in sample
06/26/20	NELHA #6 (Kau Pump Station)	846	7.68	35.28	19,528	8.64	1.90	6.8	2.0	673	578	98	81	6.9	9.3	2619			14.4	resample due to excessive macroalage in 6/12/20 sample
08/28/20	NELHA #6 (Kau Pump Station)	1129	7.57	32.80	18,155	8.44	5.13	5.1		686	592	93	91	7.4	21.2	2618	0.0		14.4	BOD- N/A - equipment failure
11/12/20	NELHA #6 (Kau Pump Station)	1037	7.59	35.52	19,661	7.8	1.58	39.5	7.7	1496	571	179	81	8.4	9.0	2309	0.0		14.4	lots of limu present in sump and sample
03/05/21	NELHA #6 (Kau Pump Station)	937	7.56	35.87	19,854	7.9	2.34	7.8	2.0	677	566	93	101	7.3	131.5	2655			14.4	
05/06/21	NELHA #6 (Kau Pump Station)	1010	7.48	35.85	19,843	7.9	2.14	5.8	2.0	653	581	87	96	7.5	74.8	2735			14.4	
07/15/21	NELHA #6 (Kau Pump Station)	1139	7.56	35.30	19,539	8.3	2.89	3.9	2.0	617	575	93	91	6.7	6.7	2681			14.4	
10/29/21	NELHA #6 (Kau Pump Station)	1111	7.45	35.16	19,461	7.3	1.81	4.0	2.0	594	586	82	86	7.2	8.2	2773			14.4	
02/10/22	NELHA #6 (Kau Pump Station)	1142	7.55	34.52	19,107	7.5	2.13	21.9	10.3	1502	600	194	83	7.8	2.9	2835			14.4	
05/15/22	NELHA #6 (Kau Pump Station)	1110	7.46	34.89	19,312	7.8	1.55	2.5	2.0	637	607	92	91	7.0	16.6	2501			14.4	
08/05/22	NELHA #6 (Kau Pump Station)	1106	7.37	34.86	19,295	6.2	2.13	88.4	22.2	3842	385	969	155	4.0	1191.4	3131			14.4	
11/17/22	NELHA #6 (Kau Pump Station)	1203	7.60	35.10	19,428	6.4	2.41	9.2	2.0	795	589	111	110	7.2	161.8	2668			14.4	
02/03/23	NELHA #6 (Kau Pump Station)	1115	7.59	34.73	19,223	7.2	2.62	33.1	7.7	1956	660	294	300	6.6	1014.0	3265			14.4	
05/05/23	NELHA #6 (Kau Pump Station)	1056	7.65	34.79	19,257	7.1	2.97	41.6	27.6	2349	67	538	622	4.4	2983.0	4111			14.4	
08/24/23	NELHA #6 (Kau Pump Station)	1037	7.47	30.78	17,037	14.3	1.89	14.5	3.7	1244	589	167	158	7.5	395.9	2738				
10/26/23	NELHA #6 (Kau Pump Station)	1202	7.56	34.76	19,240	8.1	2.57	4.6	2.0	671	606	85	87	7.9	-1.9	2512				
02/08/24	NELHA #6 (Kau Pump Station)	1127	7.62	34.71	19,212	7.3	2.48	3.0	2.0	643	601	77	72	8.3	1.7	2450		215.2		
05/10/24	NELHA #6 (Kau Pump Station)	1055	7.62	34.52	19,107	7.3	2.13	7.0	2.0	699	542	95	86	7.4	19.5	2456		186.6		

Discharge GPS:
Latitude: 19°43'22"N
Longitude: 156° 3'21"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
8	8	1.5

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
Mean			7.71	34.89	19,313	11.64	3.47	11.6	3.3	665	386	110	84	6.6	134	1821	0	201	14	
Std. Dev.			0.26	0.97	536	6.07	1.68	16.0	4.6	607	191	142	92	1.1	477	914	0	20	0	
n=			54	54	54	54	54	54	53	54	48	54	48	54	47	47	2	2	50	

Discharge GPS:
Latitude: 19°43'42"N
Longitude: 156° 3'35"W

Seawater Disposal Trench Dimensions
L (ft) W (ft) D (ft)

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) SM4500-O G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
06/08/11	NELHA #7 (Lab)	922	7.58	34.25	18,958	8.56	2.22	2.8	2.0	646		98		6.6					64.9	
08/17/11	NELHA #7 (Lab)	1055	7.68	34.34	19,008	8.77	2.72	0.9	2.0	690		103		6.7					64.9	
11/30/11	NELHA #7 (Lab)	1032	7.69	34.33	19,002	9.56	1.84	0.7	2.0	649		98		6.6					64.9	
02/09/12	NELHA #7 (Lab)	1058	7.55	34.43	19,057	11.03	6.87	1.8	2.0	680		95		7.2					64.9	
05/16/12	NELHA #7 (Lab)	1218	7.60	34.32	18,996	9.62	2.28	0.9	2.0	655		102		6.4					64.9	
08/01/12	NELHA #7 (Lab)	1037	7.55	34.40	19,041	11.56	5.89	2.4	2.0	706	592	94	93	7.5	2.6	2407			64.9	
11/08/12	NELHA #7 (Lab)	910	7.42	35.00	19,373	9.25	2.84	1.7	2.0	592	576	92	95	6.4	6.2				64.9	
02/14/13	NELHA #7 (Lab)	1016	7.35	34.55	19,124	9.18	5.29	2.1	2.0	563	585	93	66	6.0	6.0	2330			64.9	
05/09/13	NELHA #7 (Lab)	1023	7.44	34.48	19,085	9.58	3.34	2.1	2.0	620	592	93	91	6.6	0.4	2365			64.9	
08/22/13	NELHA #7 (Lab)	1057	7.79	34.40	19,041	18.31	4.66	3.3	2.0	649	596	94	98	6.9	2.8	2382			64.9	
12/05/13	NELHA #7 (Lab)	1019	7.48	34.55	19,124	9.17	2.21	1.3	2.0	638	608	93	95	6.9	3.5	2357			64.9	
02/25/14	NELHA #7 (Lab)	1206	7.47	34.41	19,046	9.45	3.06	2.1	2.0	641	613	105	99	6.1	2.3	2404			64.9	
05/14/14	NELHA #7 (Lab)	1212	7.57	34.78	19,251	12.24	5.89	2.9	2.0	666	625	98	101	6.8	2.8	2408			64.9	
08/13/14	NELHA #7 (Lab)	1228	7.49	34.55	19,124	13.41	7.02	3.1	2.0	678	591	103	104	6.6	1.9	2260			64.9	
12/10/14	NELHA #7 (Lab)	1325	7.42	34.86	19,295	12.54	4.06	2.5	2.0	719	636	104	105	6.9	0.6	2316			64.9	
02/26/15	NELHA #7 (Lab)	1132	8.03	34.57	19,135	18.58	5.75	3.7	2.0	738	705	90	99	8.2	3.6	2247			64.9	
05/28/15	NELHA #7 (Lab)	1105	7.58	34.82	19,273	17.94	6.22	6.1	2.0	738	602	90	97	8.2	12.5	2276			64.9	
08/19/15	NELHA #7 (Lab)	1037	7.56	34.98	19,362	10.47	6.75	3.8	2.0	641	610	91	97	7.0	3.5	2128			64.9	
11/24/15	NELHA #7 (Lab)	1015	7.66	34.28	18,974	10.26	9.71	5.1	2.0	716	627	98	97	7.3	0.7	2189			64.9	
02/17/16	NELHA #7 (Lab)	1133	7.62	34.34	19,008	12.45	8.83	3.4	2.0	636	619	107	105	5.9	13.3	2250			64.9	
05/12/16	NELHA #7 (Lab)	1412	7.65	34.33	19,002	14.96	9.05	3.9	2.0	724	617	97	92	7.4	1.4	2002			64.9	
08/26/16	NELHA #7 (Lab)	1045	7.57	34.53	19,113	11.54	8.23	3.8	2.0	1005	950	151	140	6.7	2.3	4296			64.9	
11/25/16	NELHA #7 (Lab)	1035	7.59	34.41	19,046	11.65	8.94	5.8	2.0	593	491	88	80	6.8	26.1	2094			64.9	
03/08/17	NELHA #7 (Lab)	1046	7.68	34.45	19,068	15.93	6.90	4.2	2.0	639	572	94	88	6.8	18.4	2281			64.9	
05/18/17	NELHA #7 (Lab)	1115	7.67	34.65	19,179	18.24	5.04	5.4	2.1	668	466	95	88	7.0	4.5	2234			64.9	
08/17/17	NELHA #7 (Lab)	1156	7.70	34.37	19,024	15.63	7.60	4.1	2.0	616	575	98	93	6.3	11.4	2277			64.9	
11/02/17	NELHA #7 (Lab)	1142	7.62	34.65	19,179	15.66	6.00	3.3	2.0	611	567	97	88	6.3	12.0	2241			64.9	
03/01/18	NELHA #7 (Lab)	1452	7.58	34.43	19,057	16.11	6.41	13.6	2.0	575	563	98	95	5.8	33.2	2277			64.9	
06/07/18	NELHA #7 (Lab)	1120	7.55	35.00	19,373	13.30	8.51	12.0	2.0	526	535	99	94	5.3	11.1	2212			64.9	
09/10/18	NELHA #7 (Lab)	1201	7.53	34.57	19,135	17.32	8.18	13.8	2.0	575	552	92	89	6.2	4.9	2277			64.9	
11/09/18	NELHA #7 (Lab)	1203	7.51	34.81	19,268	17.36	6.12	11.3	2.0	601	553	93	83	6.5	10.7	2287			64.9	
02/15/19	NELHA #7 (Lab)	1220	8.07	34.94	19,340	23.24	5.96	4.4	2.0	199	127	34	24	5.8	5.8	567			64.9	
05/24/19	NELHA #7 (Lab)	1305	7.66	35.71	19,766	20.42	7.65	4.7	2.0	498	431	75	65	6.6	1.2	1977			64.9	
09/12/19	NELHA #7 (Lab)	1308	7.93	34.70	19,207	26.12	6.84	3.9	2.0	405	321	65	56	6.2	15.3	1317			64.9	
10/23/19	NELHA #7 (Lab)	1537	7.84	35.75	19,788	24.28	6.83	3.6	2.0	458	386	70	64	6.5	5.5	1501			64.9	
03/11/20	NELHA #7 (Lab)	1411	7.78	36.44	20,170	21.22	7.10	4.4	2.0	365	331	61	56	6.0	7.8	1248			64.9	
06/12/20	NELHA #7 (Lab)	1138	7.65	36.17	20,020	15.57	7.26	3.2	2.7	539	542	90	84	6.0	4.6	2059			64.9	
08/28/20	NELHA #7 (Lab)	1439	7.82	35.58	19,694	23.65	5.59	3.9		590	487	78	76	7.6	1.3	1860	0.0		64.9	BOD- N/A - equipment failure
11/12/20	NELHA #7 (Lab)	1220	7.81	35.51	19,655	18.2	7.28	4.3	2.0	601	401	67	70	9.0	17.7	1460	0.0		64.9	
03/05/21	NELHA #7 (Lab)	1125	7.78	35.99	19,921	16.2	7.49	4.3	2.0	459	420	63	72	7.3	17.0	1675			64.9	
05/06/21	NELHA #7 (Lab)	1252	7.52	35.69	19,755	17.0	8.00	2.9	2.0	528	521	74	80	7.1	-2.6	2110			64.9	
07/15/21	NELHA #7 (Lab)	1214	7.60	35.26	19,517	17.2	7.80	6.7	2.0	646	556	96	91	6.7	0.6	2139			64.9	
10/29/21	NELHA #7 (Lab)	1403	7.56	35.43	19,611	16.8	8.04	2.5	2.0	618	551	82	84	7.5	11.5	2226			64.9	
02/10/22	NELHA #7 (Lab)	1423	7.46	34.46	19,074	15.2	8.29	2.5	2.0	690	596	77	86	9.0	7.4	2252			64.9	
05/13/22	NELHA #7 (Lab)	1148	7.57	34.51	19,102	18.4	7.95	1.9	2.0	650	553	85	85	7.7	7.0	2157			64.9	
08/05/22	NELHA #7 (Lab)	1229	7.79	34.53	19,113	22.0	6.82	3.8	2.0	617	554	85	90	7.2	4.9	2177			64.9	
11/17/22	NELHA #7 (Lab)	1216	7.56	34.47	19,080	15.1	6.47	5.5	2.0	646	570	79	81	8.2	21.9	2264			64.9	
02/03/23	NELHA #7 (Lab)	1230	7.60	34.70	19,207	17.4	7.39	6.4	2.0	708	576	90	87	7.8	29.2	2135			64.9	
05/05/23	NELHA #7 (Lab)	1153	7.61	34.45	19,068	17.7	7.78	2.1	2.0	610	574	82	88	7.5	38.6	2256			64.9	
08/24/23	NELHA #7 (Lab)	1214	7.50	34.56	19,129	14.8	3.99	5.0	2.0	902	569	102	81	8.8	41.1	2041				
10/26/23	NELHA #7 (Lab)	1356	7.55	34.37	19,024	16.0	7.00	4.2	2.0	732	600	81	85	9.0	4.9	2191				
02/08/24	NELHA #7 (Lab)	1253	7.52	34.72	19,218	14.1	5.67	2.8	2.0	694	600	75	80	9.2	4.5	2049		173.6		
05/10/24	NELHA #7 (Lab)	1141	7.57	34.45	19,068	16.5	7.69	3.9	2.0	633	599	87	88	7.3	2.6	2056		189.1		
Mean			7.62	34.79	19,250	15.35	6.37	4.2	2.0	626	552	89	86	7.0	9	2139	0	181	65	
Std. Dev.			0.15	0.53	293	4.32	1.93	2.9	0.1	120	115	16	17	0.9	10	478	0	11	0	
n=			52	52	53	52	52	52	51	52	48	52	48	52	47	47	2	2	48	

Ocean Era LLC Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'40"N
Longitude: 156° 3'32"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
16	16	3

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) SM4500-O G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
05/12/11	Kona Blue SK (1)	1001	8.18	34.83	19,279	25.89	6.14	2.3	2.0	135		17		7.9					190	
08/18/11	Kampachi Farms 1, SK	1057	8.12	34.96	19,351	26.71	5.47	2.9	2.0	234		29		8.1					159	
12/01/11	Kampachi Farms 1, SK																		0	No Discharge
02/16/12	Kampachi Farms 1, SK																		0	No Discharge
05/17/12	Kampachi Farms 1, SK	832	8.16	34.91	19,323	24.99	6.46	2.6	2.0	122	7	17	4	7.2	11	29			146	
08/08/12	Kampachi Farms 1, SK	800	8.07	35.15	19,456	26.33	6.47	2.6	2.0	165	11	22	1	7.5	17	130			167	
12/05/12	Kampachi Farms 1, SK	827	8.12	35.34	19,561	24.96	5.59	3.0	2.0	215	16	15	14	14.8	62	78			154	
02/27/13	Kampachi Farms 1, SK																		0	No Discharge
05/15/13	Kampachi Farms 1, SK	834	8.09	34.88	19,306	26.20	5.53	2.4	2.0	205	9	27	8	7.7	51	47			161	
08/28/13	Kampachi Farms 1, SK	854	8.10	34.72	19,218	26.90	5.93	3.1	2.0	233	12	29	4	8.0	34	52			152	
12/12/13	Kampachi Farms 1, SK	1059	7.96	35.16	19,461	26.12	4.65	2.0	2.0	226	6	33	9	6.8	129	44			185	
03/05/14	Kampachi Farms 1, SK	849	8.11	34.84	19,284	25.00	6.11	2.3	2.0	166	9	22	13	7.7	134	49			150	
06/26/14	Kampachi Farms 1, SK																			No Discharge
09/24/14	Kampachi Farms 1, SK	907	8.12	34.89	19,312	27.93	5.34	3.1	2.0	152	15	23	4	6.6	6	8			68	
12/17/14	Kampachi Farms 1, SK	955	8.10	35.24	19,506	25.94	6.00	4.3	2.0	248	11	26	6	9.5	10	4			104	
03/19/15	Kampachi Farms 1, SK	757	7.89	34.33	19,002	24.71	5.78	1.8	2.0	98	13	32	9	3.1	49	45			123	
06/12/15	Kampachi Farms 1, SK	848	8.03	34.76	19,240	26.46	6.41	4.3	2.0	299	6	26	13	11.7	118	49			109	
08/19/15	Kampachi Farms 1, SK	1105	8.08	35.09	19,423	28.82	6.00	4.6	2.0	343	6	23	7	14.9	214	18			115	
12/09/15	Kampachi Farms 1, SK																		0	No Discharge
02/17/16	Kampachi Farms 1, SK																		0	No Discharge
06/01/16	Kampachi Farms 1, SK																		0	No Discharge
08/26/16	Kampachi Farms 1, SK	1123	8.52	35.01	19,378	28.24	5.93	4.3	2.0	347	7	62	16	5.6	82	8			126	
11/25/16	Kampachi Farms 1, SK	1117	8.15	34.93	19,334	26.20	5.89	3.9	2.0	139	7	26	14	5.4	63	116			130	
03/08/17	Kampachi Farms 1, SK																		0	No Discharge
05/18/17	Kampachi Farms 1, SK	907	8.15	34.52	19,107	25.94	4.50	4.5	2.0	102	6	18	5	5.7	20	32			92	
08/17/17	Kampachi Farms 1, SK	1232	8.17	34.42	19,052	28.03	6.03	5.0	2.0	73	3	20	11	3.7	36	28			90	
11/02/17	Kampachi Farms 1, SK	939	8.14	35.06	19,406	27.48	4.39	4.2	2.0	95	3	16	4	5.9	25	19			86	
03/01/18	Kampachi Farms 1, SK	1222	8.21	34.69	19,201	25.03	5.59	8.3	2.0	74	1	27	10	2.8	27	22			78	
06/07/18	Kampachi Farms 1, SK																			No Discharge
09/10/18	Kampachi Farms 1, SK	1154	8.10	34.80	19,262	28.19	5.76	5.1	2.0	206	1	21	6	10.0	157	31			190	
11/09/18	Kampachi Farms 1, SK	921	8.12	34.97	19,356	27.64	4.45	11.7	2.0	174	5	18	5	9.9	72	26			159	
02/15/19	Kampachi Farms 1, SK	1154	7.60	6.93	3,836	20.70	6.26	3.8	4.4	832	165	423	331	2.0	692	715			133	
05/24/19	Kampachi Farms 1, SK	1216	8.11	35.73	19,777	27.76	5.78	4.1	2.0	196	5	31	15	6.3	141	19			184	
09/18/19	Kampachi Farms 1, SK	1430	8.18	35.28	19,528	29.19	6.03	2.9	2.0	129	7	21	13	6.2	43	5			167	
10/23/19	Kampachi Farms 1, SK	1522	8.10	35.82	19,827	28.54	6.04	13.2	2.0	273	10	64	23	4.3	160	19			179	
03/06/20	Kampachi Farms 1, SK																		0	No Discharge
06/26/20	Ocean Era 1																		0	No Discharge
09/03/20	Ocean Era 1	1200	7.64	35.58	19,694	11.89	4.72	4.1		729	599	84	85	8.7	-3	2215	0		92	BOD - N/A - equipment failure
11/12/20	Ocean Era 1	910	7.50	35.70	19,760	10.8	3.08	2.8	2.0	634	559	86	93	7.3	12	2085	0		67	
03/05/21	Ocean Era 1	1205	7.58	35.81	19,821	11.1	3.55	5.0	2.0	588	534	81	82	7.3	29	2125			1	
05/06/21	Ocean Era 1	1206	7.72	35.67	19,744	17.0	4.27	3.9	2.0	402	346	49	53	8.3	29	1367			103	
08/13/21	Ocean Era 1	1024	7.62	35.42	19,605	16.9	3.88	4.1	2.0	561	414	57	57	9.8	34	1536			167	
10/29/21	Ocean Era 1	1332	7.72	29.24	16,185	17.2	4.19	4.3	3.7	1026	643	144	124	7.1	2	5494			86	
02/10/22	Ocean Era 1	1215	7.47	34.48	19,085	12.1	3.60	1.9	2.0	647	589	79	87	8.2	4	2350			103	
05/19/22	Ocean Era 1	947	7.70	34.56	19,129	17.4	4.28	3.0	2.0	476	413	66	58	7.3	13	1484			134	
08/05/22	Ocean Era 1	1149	8.30	34.67	19,190	18.9	4.39	4.3	2.0	430	332	54	47	8.0	42	1225			133	
11/17/22	Ocean Era 1	1344	7.66	34.61	19,157	16.5	4.41	4.6	2.0	602	439	72	75	8.3	102	1725			171	
02/03/23	Ocean Era 1	1201	7.54	34.44	19,063	12.2	4.18	3.7	2.0	668	582	89	91	7.5	26	2158			94	
05/05/23	Ocean Era 1	1148	7.54	34.67	19,190	12.5	3.66	3.9	2.0	635	587	78	88	8.1	28	2256			137	
08/24/23	Ocean Era 1	1204	7.72	34.53	19,113	17.6	6.10	4.5	2.0	458	383	52	56	8.7	14	1376				
10/26/23	Ocean Era 1	1352	7.64	34.47	19,080	14.5	4.55	4.9	2.0	664	549	78	79	8.5	7	1988				
02/08/24	Ocean Era 1	1225	7.86	34.79	19,257	17.7	5.94	1.7	2.0	419	342	45	27	9.3	3	1206		151		
05/10/24	Ocean Era 1	1136	7.79	34.59	19,146	16.2	5.24	3.9	2.0	579	432	72	67	8.0	15	1614		185		
Mean			7.94	34.15	18,905	22.15	5.20	4.1	2.1	357	202	54	43	7.6	68	845	0	168	104	
Std. Dev.			0.26	4.41	2,442	6.06	0.95	2.2	0.5	240	243	65	58	2.6	114	1155	0	24	64	
n=			42	42	42	42	42	42	41	42	40	42	40	42	39	40	2	2	38	

Discharge GPS:
Latitude: 19°43'39.22"N
Longitude: 156° 3'33.51"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
4	4	2

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) SM4500-O G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
5/12/11	Kona Blue Grouper (1)	1005	8.19	34.80	19,262	25.99	6.14	2.5	2.0	103		17		6.1					66	
08/18/11	Kampachi Farms 2 Grouper 1	1048	8.14	30.27	16,755	26.19	5.90	2.3	2.0	121		19		6.4					55	
12/01/11	Kampachi Farms 2 Grouper 1																		0	No Discharge
02/16/12	Kampachi Farms 2 Grouper 1																		0	No Discharge
05/17/12	Kampachi Farms 2 Grouper 1																		0	No Discharge
08/08/12	Kampachi Farms 2 Grouper 1																		0	No Discharge
12/05/12	Kampachi Farms 2 Grouper 1																		0	No Discharge
02/27/13	Kampachi Farms 2 Grouper 1	1000	8.04	35.29	19,533	24.88	5.76	3.3	2.0	248	8	32	14	7.8	72	43			43	
05/15/13	Kampachi Farms 2 Grouper 1	838	8.06	34.98	19,362	25.76	5.48	2.4	2.0	270	9	37	20	7.2	133	29			81	
08/28/13	Kampachi Farms 2 Grouper 1	846	8.13	34.83	19,279	26.48	6.01	2.9	2.0	124	10	30	18	4.2	28	49			76	
12/12/13	Kampachi Farms 2 Grouper 1																		0	No Discharge
03/05/14	Kampachi Farms 2 Grouper 1																		0	No Discharge
06/26/14	Kampachi Farms 2 Grouper 1																		0	No Discharge
09/24/14	Kampachi Farms 2 Grouper 1	900	7.97	34.98	19,362	27.89	5.19	3.1	2.5	702	18	45	1	15.7	493	8			68	
12/17/14	Kampachi Farms 2 Grouper 1	947	8.06	35.56	19,683	25.91	6.07	4.3	2.0	423	22	29	3	14.5	156	4			104	
03/19/15	Kampachi Farms 2 Grouper 1																		0	No Discharge
06/12/15	Kampachi Farms 2 Grouper 1	839	8.09	34.81	19,268	26.19	6.55	3.9	2.0	289	22	20	15	14.4	46	51			109	
08/19/15	Kampachi Farms 2 Grouper 1	1055	8.22	16.89	9,349	29.06	6.73	2.2	2.0	670	557	75	77	8.9	15	10919			115	
12/09/15	Kampachi Farms 2 Grouper 1																		0	No Discharge
02/17/16	Kampachi Farms 2 Grouper 1	1015	8.14	34.53	19,113	24.87	5.98	4.3	2.0	228	19	26	14	8.7	64	12			93	
06/01/16	Kampachi Farms 2 Grouper 1	913	8.21	34.52	19,107	26.32	5.39	3.1	2.0	47	7	17	11	2.8	11	10			93	
08/26/16	Kampachi Farms 2 Grouper 1	1114	8.55	35.04	19,395	28.18	5.22	4.3	2.0	221	9	16	10	13.9	35	20			126	
11/25/16	Kampachi Farms 2 Grouper 1	1107	8.19	34.90	19,318	26.02	5.76	4.3	2.0	73	7	18	11	4.0	30	79			130	
03/08/17	Kampachi Farms 2 Grouper 1	1120	8.21	34.78	19,251	25.12	5.12	4.7	2.0	128	6	19	6	6.9	23	42			150	
05/18/17	Kampachi Farms 2 Grouper 1	844	8.11	34.52	19,107	25.64	5.55	4.0	2.0	95	6	21	8	4.5	14	32			137	
08/17/17	Kampachi Farms 2 Grouper 1	1223	8.15	34.50	19,096	27.79	5.69	8.3	2.0	152	3	27	12	5.6	97	30			135	
11/02/17	Kampachi Farms 2 Grouper 1	931	8.10	35.04	19,395	27.33	4.63	3.4	2.0	147	4	17	4	8.6	88	16			86	
03/01/18	Kampachi Farms 2 Grouper 1	1214	8.19	34.79	19,257	25.10	5.50	8.5	2.0	41	0	16	7	2.5	43	30			78	
06/07/18	Kampachi Farms 2 Grouper 1																			No Discharge
09/10/18	Kampachi Farms 2 Grouper 1																			No Discharge
11/09/18	Kampachi Farms 2 Grouper 1	913	8.16	34.91	19,323	27.53	4.74	12.2	2.0	164	5	24	10	6.8	72	21			159	
02/15/19	Kampachi Farms 2 Grouper 1	1148	8.15	35.07	19,412	24.41	6.48	12.7	2.0	84	0	22	13	3.8	26	61			133	
05/24/19	Kampachi Farms 2 Grouper 1	1209	8.18	35.74	19,782	27.32	5.73	3.0	2.0	59	5	16	7	3.8	14	18			184	
09/12/19	Kampachi Farms 2 Grouper 1	1327	8.16	34.89	19,312	29.61	6.71	2.7	2.0	56	2	17	10	3.3	9	43			167	
10/23/19	Kampachi Farms 2 Grouper 1	1518	8.18	35.83	19,832	28.08	6.24	5.0	2.0	218	7	45	14	4.9	45	22			179	
03/06/20	Kampachi Farms 2 Grouper 1	1208	8.11	36.11	19,987	25.75	6.58	4.6	2.0	115	-11	30	25	3.8	80	-19			220	
06/26/20	Ocean Era 2																		0	No Discharge
09/03/20	Ocean Era 2																			No Discharge
11/12/20	Ocean Era 2	856	8.09	35.37	19,578	27.5	6.55	3.5	2.0	266	11	35	21	7.5	20	2	0		67	
03/05/21	Ocean Era 2																			No Discharge
05/06/21	Ocean Era 2																			No Discharge
08/13/02	Ocean Era 2	1004	8.02	35.43	19,611	28.3	6.39	4.4	2.0	167	-1	14	9	12.0	3	3			167	
10/29/21	Ocean Era 2	1325	7.97	35.54	19,672	26.0	6.62	1.3	2.0	74	5	11	7	6.6	2	17			86	
02/10/22	Ocean Era 2																			No Discharge
05/19/22	Ocean Era 2																			No Discharge
08/05/22	Ocean Era 2																			No Discharge
11/17/22	Ocean Era 2	1336	8.09	34.98	19,362	27.8	6.44	3.4	2.0	148	5	4	-3	41.0	31	85			171	
02/03/23	Ocean Era 2	1211	8.11	34.54	19,118	25.3	6.62	19.9	2.0	245	0	43	24	5.7	59	61			94	
05/18/23	Ocean Era 2	956	8.04	34.75	19,234	26.2	6.67	4.2	2.0	211	7	8	3	26.3	76	34			137	
08/24/23	Ocean Era 2	1155	7.92	34.76	19,240	27.2	6.34	3.8	2.0	386	2	10	5	37.5	238	49				
10/26/23	Ocean Era 2	1345	8.01	34.85	19,290	27.9	6.35	5.0	2.0	260	-1	18	7	14.4	75	9				
02/08/24	Ocean Era 2	1216	8.03	35.06	19,406	25.4	6.73	3.1	2.0	177	9	13	7	14.0	32	30		140		
05/10/24	Ocean Era 2	1129	8.08	35.04	19,395	26.5	6.72	4.4	2.1	2085	1747	191	199	10.9	41	87		168		
Mean			8.12	34.35	19,013	26.63	6.02	4.9	2.0	259	78	29	18	10.1	68	372	0	154	86	
Std. Dev.			0.11	3.21	1,779	1.29	0.60	3.6	0.1	357	320	32	36	8.9	92	1925	#DIV/0!	19	65	
n=			34	34	31	34	34	34	34	34	28	34	31	34	32	31	1	2	31	

Discharge GPS:
Latitude: 19°43'40"N
Longitude: 156° 3'33"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
8.5	4.75	2.5

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H⁺	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
08/18/11	Kampachi Farms 3, Grouper 2	1051	8.14	34.55	19,124	26.50	5.66	1.9	2.0	64		10		6.4					159	
12/01/11	Kampachi Farms 3, Grouper 2	914	8.11	34.99	19,367	25.13	6.00	1.1	2.0	212		34		6.2					126	
02/16/12	Kampachi Farms 3, Grouper 2	830	8.17	35.11	19,434	24.51	4.95	0.5	2.0	100	9	16	6	6.3	33	24			198	
05/17/12	Kampachi Farms 3, Grouper 2	828	8.12	34.80	19,262	25.08	5.81	1.9	2.0	202	9	22	9	9.2	95	22			146	
08/08/12	Kampachi Farms 3, Grouper 2	824	8.12	35.13	19,445	26.03	5.71	1.9	2.0	103	10	19	5	5.4	32	43			167	
12/05/12	Kampachi Farms 3, Grouper 2	823	8.14	35.34	19,561	24.95	6.27	1.8	2.0	146	13	21	10	7.0	31	72			154	
02/27/13	Kampachi Farms 3, Grouper 2	1005	8.07	35.26	19,517	24.71	5.81	2.9	2.0	152	9	27	16	5.6	34	53			122	
05/15/13	Kampachi Farms 3, Grouper 2	841	8.07	34.95	19,345	26.03	5.24	2.0	2.0	125	9	32	21	3.9	74	46			161	
08/28/13	Kampachi Farms 3, Grouper 2	850	8.08	34.80	19,262	26.55	6.11	7.9	2.0	182	12	28	12	6.5	44	48			152	
12/12/13	Kampachi Farms 3, Grouper 2	1103	8.06	35.20	19,484	26.31	5.50	2.1	2.0	121	5	21	10	5.8	41	41			185	
03/05/14	Kampachi Farms 3, Grouper 2	845	8.09	34.82	19,273	24.63	6.34	2.8	2.0	177	8	24	12	7.5	44	50			277	
06/26/14	Kampachi Farms 3, Grouper 2	848	8.06	34.90	19,318	26.14	6.10	2.7	2.0	155	7	30	18	5.2	64	62			127	
09/24/14	Kampachi Farms 3, Grouper 2	903	8.07	34.97	19,356	26.75	5.65	2.7	2.0	279	17	35	9	8.0	100	10			68	
12/17/14	Kampachi Farms 3, Grouper 2	950	8.08	35.35	19,567	25.70	6.06	3.0	2.0	29	13	28	7	1.0	83	4			104	
03/19/15	Kampachi Farms 3, Grouper 2	750	7.84	24.78	13,716	24.33	6.06	2.6	2.0	181	18	24	44	7.6	93	83			123	
06/12/15	Kampachi Farms 3, Grouper 2	845	8.04	34.68	19,196	26.24	6.89	3.6	2.0	189	11	19	15	9.8	74	45			109	
08/19/15	Kampachi Farms 3, Grouper 2	1101	8.07	34.23	18,947	28.28	5.98	4.6	2.0	155	7	22	8	7.0	66	10			115	
12/09/15	Kampachi Farms 3, Grouper 2	838	8.10	33.90	18,764	26.16	6.38	3.6	2.0	212	32	26	18	8.2	160	193			100	
02/17/16	Kampachi Farms 3, Grouper 2	1021	8.13	34.33	19,002	24.85	6.14	3.2	2.0	129	21	24	15	5.4	43	9			124	
06/01/16	Kampachi Farms 3, Grouper 2	918	8.20	34.21	18,936	26.28	6.04	2.1	2.0	54	8	17	11	3.2	19	13			139	
08/26/16	Kampachi Farms 3, Grouper 2	1119	8.55	34.96	19,351	27.86	6.07	3.7	2.0	115	8	19	10	6.0	20	25			126	
11/25/16	Kampachi Farms 3, Grouper 2	1113	8.16	34.93	19,334	25.89	5.96	4.2	2.0	134	7	29	16	4.7	52	59			130	
03/08/17	Kampachi Farms 3, Grouper 2	1124	8.20	23.40	12,952	24.97	5.79	2.7	2.0	99	6	16	7	6.1	55	49			150	
05/18/17	Kampachi Farms 3, Grouper 2	849	8.10	34.46	19,074	25.79	4.99	4.4	2.0	63	9	16	8	3.9	23	28			137	
08/17/17	Kampachi Farms 3, Grouper 2	1228	8.14	34.41	19,046	27.58	5.87	4.3	2.0	221	4	27	15	8.2	153	35			135	
11/02/17	Kampachi Farms 3, Grouper 2	935	8.10	35.03	19,389	27.21	4.87	4.8	2.0	476	4	55	27	8.7	420	154			86	
03/01/18	Kampachi Farms 3, Grouper 2	1218	8.22	34.34	19,008	24.70	5.52	5.0	2.0	63	18	17	10	3.6	50	381			78	
06/07/18	Kampachi Farms 3, Grouper 2	1138	8.16	34.53	19,113	26.35	6.40	3.2	2.0	64	0	17	9	3.8	59	34			101	
09/10/18	Kampachi Farms 3, Grouper 2	1151	8.17	34.67	19,190	27.95	6.03	13.3	2.0	44	2	13	4	3.4	22	22			190	
11/09/18	Kampachi Farms 3, Grouper 2	918	8.16	34.89	19,312	27.38	4.49	11.6	2.0	83	7	16	9	5.1	13	17			159	
02/15/19	Kampachi Farms 3, Grouper 2	1151	8.15	35.05	19,401	24.08	6.50	13.6	2.0	76	1	18	12	4.1	27	52			133	
05/24/19	Kampachi Farms 3, Grouper 2	1212	8.18	35.30	19,539	27.07	6.57	3.6	2.0	42	7	15	8	2.8	12	21			184	
09/12/19	Kampachi Farms 3, Grouper 2	1330	8.15	34.82	19,273	28.79	6.90	1.9	2.0	69	2	17	9	4.2	21	39			167	
10/23/19	Kampachi Farms 3, Grouper 2																		0	No flow, sump under construction
03/06/20	Kampachi Farms 3, Grouper 2																		0	No flow, sump under construction
06/26/20	Ocean Era 3	950	8.04	14.44	7,993	26.20	6.83	3.0	2.0	67	-11	17	6	4.1	37	-2			200	
09/03/20	Ocean Era 3	1220	8.09	35.66	19,738	27.74	5.06	2.0		126	6	25	17	5.0	39	48	0			BOD - N/A - equipment failure
11/12/20	Ocean Era 3	906	8.07	35.37	19,578	27.4	6.53	4.8	2.0	146	10	24	19	6.2	27	5	0		54	
03/05/21	Ocean Era 3	1201	8.13	35.60	19,705	25.1	6.93	3.4	2.0	147	0	13	13	11.2	65	4			2	
05/06/21	Ocean Era 3	1200	8.01	35.63	19,722	25.3	6.77	4.5	2.0	159	7	10	12	16.5	64	5			123	
08/13/21	Ocean Era 3	1001	7.98	35.21	19,489	27.3	6.73	2.9	2.0	212	-2	20	12	10.6	70	-4			134	
10/29/21	Ocean Era 3	1328	7.94	35.62	19,716	26.6	6.91	2.1	2.0	109	3	17	11	6.5	33	16			69	
02/10/22	Ocean Era 3	1210	8.10	34.89	19,312	25.6	6.85	2.9	2.0	214	1	15	11	14.8	14	8			123	
05/19/22	Ocean Era 3	941	8.03	34.56	19,129	25.5	6.88	2.5	2.0	175	7	19	4	9.1	51	39			161	
08/05/22	Ocean Era 3	1146	7.72	34.84	19,284	27.1	6.62	4.0	2.0	141	4	15	1	9.1	41	45			160	
11/17/22	Ocean Era 3	1340	7.88	35.00	19,373	27.8	5.69	7.2	2.6	602	6	49	20	12.3	410	74			137	
02/03/23	Ocean Era 3	1214	7.97	34.60	19,151	25.6	6.28	5.5	2.0	328	1	49	34	6.7	206	43			75	
05/05/23	Ocean Era 3	1142	8.10	34.75	19,234	26.0	6.67	2.3	2.0	119	4	8	5	14.1	39	33			109	
08/24/23	Ocean Era 3	1158	7.95	34.75	19,234	27.2	6.57	9.6	2.0	251	0	11	5	22.8	136	46				
10/26/23	Ocean Era 3	1347	8.02	34.85	19,290	27.6	6.33	3.4	2.0	269	-1	15	9	18.3	68	10				
02/08/24	Ocean Era 3	1220	8.02	35.05	19,401	25.4	6.79	2.7	2.0	186	7	14	7	13.0	59	20		142		
05/10/24	Ocean Era 3	1132	8.02	34.95	19,345	25.9	6.78	2.2	2.0	111	26	15	11	7.7	72	90		173		
Mean			8.09	34.06	18,851	26.20	6.12	3.9	2.0	158	7	22	12	7.6	73	46	0	158	127	
Std. Dev.			0.12	3.57	1,977	1.14	0.61	2.8	0.1	104	7	10	8	4.2	82	61	0	21	52	
n=			50	50	50	50	50	50	49	50	44	50	48	50	48	46	2	2	45	

Discharge GPS:
Latitude: 19°43'38.88"
Longitude: 156° 3'34.77"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
4	4	2.5

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
10/21/10	Kona Blue Main	1000	8.16					0.8	2.0	157	10.7	12	0.8	13.1	57	153.6			287	
02/10/11	Kona Blue Main	752	8.18	35.04	19,395	25.19	5.00	2.3	2.0	277		43		6.4					241	
05/12/11	Kona Blue Main	1012	8.18	33.38	18,476	26.04	6.04	2.4	2.0	183		23		8.0					226	
08/18/11	Kampachi Farms 4, Main	1043	8.05	34.63	19,168	26.78	5.57	2.0	2.0	239		25		9.6					189	
12/01/11	Kampachi Farms 4, Main	911	8.09	34.97	19,356	25.07	6.73	0.7	2.0	162		22		7.4					150	
02/16/12	Kampachi Farms 4, Main																		0	No Discharge
05/17/12	Kampachi Farms 4, Main	815	8.15	33.95	18,792	24.97	6.64	1.4	2.0	138	7	21	7	6.6	4	72			180	
08/08/12	Kampachi Farms 4, Main	828	8.06	35.07	19,412	26.31	6.16	2.1	2.0	178	27	25	8	7.1	80	137			206	
12/05/12	Kampachi Farms 4, Main	812	8.12	35.27	19,522	25.09	6.42	2.7	2.0	164	12	22	11	7.5	58	86			190	
02/27/13	Kampachi Farms 4, Main	958	8.10	35.48	19,639	25.31	6.12	2.9	2.0	183	8	28	14	6.5	16	113			122	
05/15/13	Kampachi Farms 4, Main	843	8.10	34.92	19,329	26.29	5.37	6.5	2.0	192	9	25	7	7.7	26	67			188	
08/28/13	Kampachi Farms 4, Main	843	8.03	34.31	18,991	26.72	5.82	3.9	2.0	266	6	69	46	3.8	128	78			178	
12/12/13	Kampachi Farms 4, Main	1111	8.03	34.89	19,312	26.52	5.34	3.4	2.0	351	26	41	14	8.6	67	271			228	
03/05/14	Kampachi Farms 4, Main																		0	No Discharge
06/26/14	Kampachi Farms 4, Main	846	8.12	34.88	19,306	26.61	6.39	7.5	2.6	129	6	25	15	5.1	6	65			131	
09/24/14	Kampachi Farms 4, Main	857	8.12	35.05	19,401	28.22	4.92	12.8	2.0	193	13	25	3	7.6	7	15			68	
12/17/14	Kampachi Farms 4, Main																		0	No Discharge
03/19/15	Kampachi Farms 4, Main																		0	No Discharge
06/12/15	Kampachi Farms 4, Main																		0	No Discharge
08/19/15	Kampachi Farms 4, Main	1047	8.14	35.01	19,378	29.05	5.76	3.7	2.0	109	9	18	7	6.1	26	190			115	
12/09/15	Kampachi Farms 4, Main	825	7.99	34.19	18,925	25.59	6.40	3.7	2.0	252	35	38	20	6.6	132	396			100	
02/17/16	Kampachi Farms 4, Main																		0	No Discharge
06/01/16	Kampachi Farms 4, Main	907	8.16	34.50	19,096	26.54	5.81	2.8	2.0	148	27	27	11	5.5	56	37			139	
08/26/16	Kampachi Farms 4, Main	1105	8.64	35.07	19,412	28.47	5.88	6.5	2.0	355	8	120	47	3.0	52	329			126	
11/25/16	Kampachi Farms 4, Main	1057	8.13	34.86	19,295	26.05	5.82	3.2	9.1	222	7	35	22	6.4	69	184			130	
03/08/17	Kampachi Farms 4, Main	1111	8.17	34.65	19,179	25.28	5.13	3.5	2.0	116	9	18	7	6.5	80	79			100	
05/18/17	Kampachi Farms 4, Main																		0	No Discharge - rearranging tanks
08/17/17	Kampachi Farms 4, Main																		0	No Discharge - rearranging & upgrading tanks
11/02/17	Kampachi Farms 4, Main	923	8.15	34.27	18,969	27.54	4.76	22.7	2.0	233	3	41	8	5.7	6	19			86	very low flow, some TSS from sediment on bottc
03/01/18	Kampachi Farms 4, Main	1204	8.25	34.92	19,329	23.35	6.06	10.8	2.0	30	1	15	7	2.0	26	22			78	
06/07/18	Kampachi Farms 4, Main																			No Discharge
09/10/18	Kampachi Farms 4, Main	1144	8.12	34.72	19,218	28.06	5.65	4.2	2.0	203	2	20	7	10.2	159	31			190	
11/09/18	Kampachi Farms 4, Main	905	8.13	32.04	17,734	27.54	6.23	11.8	2.0	120	2	16	5	7.5	50	23			159	
02/15/19	Kampachi Farms 4, Main	1141	8.15	33.82	18,720	24.23	6.54	5.3	2.0	91	21	25	16	3.7	20	485			133	
05/24/19	Kampachi Farms 4, Main	1203	8.08	35.71	19,766	26.17	6.14	4.1	2.0	233	29	30	18	7.7	156	167			184	
09/12/19	Kampachi Farms 4, Main	1316	8.12	34.83	19,279	28.80	6.63	2.8	2.0	232	3	26	13	8.9	200	34			167	
10/23/19	Kampachi Farms 4, Main	1510	8.14	35.77	19,799	23.45	6.31	3.0	3.9	489	7	104	48	4.7	220	19			179	
03/06/20	Kampachi Farms 4, Main	1201	8.10	36.12	19,993	25.66	6.81	5.7	2.3	148	-9	25	15	6.0	94	7			293	
06/26/20	Ocean Era 4	917	8.06	14.80	8,192	26.15	7.04	3.2	2.0	82	-8	14	6	5.9	41	6			267	
09/03/20	Ocean Era 4	1210	8.15	35.67	19,744	26.82	5.35	4.5		101	-3	24	18	4.3	-3	46	0		74	BOD - N/A - equipment failure
11/12/20	Ocean Era 4	851	8.02	35.38	19,583	27.5	6.34	2.2	2.0	135	5	21	17	6.5	50	6	0		54	
03/05/21	Ocean Era 4	1133	8.07	35.97	19,910	25.0	6.61	3.1	2.0	191	1	14	14	13.3	138	5			1	
05/06/21	Ocean Era 4	1154	8.01	35.66	19,738	25.4	6.66	2.4	2.0	102	4	9	12	10.9	10	7			82	
08/13/21	Ocean Era 4	956	8.02	35.38	19,583	27.3	6.56	4.1	2.0	101	-3	11	7	9.2	1	-3			134	
10/29/21	Ocean Era 4	1313	7.93	35.61	19,711	26.6	6.35	1.9	2.0	205	6	19	16	10.6	125	21			69	
02/10/22	Ocean Era 4	1203	8.06	34.89	19,312	25.8	6.73	1.7	2.0	130	0	14	12	9.1	52	8			82	
05/19/22	Ocean Era 4	932	8.01	34.62	19,163	25.6	6.62	2.2	2.0	172	5	17	6	10.3	30	106			107	
08/05/22	Ocean Era 4	1139	7.68	34.80	19,262	27.0	6.37	4.3	2.0	144	5	11	1	13.2	62	61			107	
11/17/22	Ocean Era 4	1329	8.06	34.98	19,362	27.7	6.34	2.8	2.0	173	5	6	1	30.8	90	67			137	
02/03/23	Ocean Era 4	1204	8.08	34.60	19,151	25.6	6.71	4.3	2.0	91	0	22	15	4.2	19	44			75	
05/05/23	Ocean Era 4	1135	8.08	34.74	19,229	26.0	6.55	4.2	2.0	305	7	10	6	30.8	145	31			109	
08/24/23	Ocean Era 4	1145	7.95	34.76	19,240	27.0	6.37	6.3	2.0	277	3	13	5	22.0	85	47				
10/26/23	Ocean Era 4	1328	8.04	34.64	19,174	27.7	6.32	2.7	2.0	172	15	16	9	11.0	45	162				
02/08/24	Ocean Era 4	1209	8.05	35.02	19,384	25.3	6.73	2.6	2.0	159	9	13	4	12.1	20	27		131		
05/10/24	Ocean Era 4	1122	8.04	34.95	19,345	25.9	6.56	2.2	2.0	85	6	10	7	8.2	13	94		157		

Ocean Era LLC Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'38.88"
Longitude: 156° 3'34.77"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
4	4	2.5

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
Mean			8.09	34.42	19,050	26.29	6.15	4.3	2.2	183	8	26	13	8.9	65	91	0	144	121	
Std. Dev.			0.12	3.07	1,699	1.28	0.56	3.8	1.1	84	10	22	11	5.8	56	109	0	19	80	
n=			46	45	45	45	45	46	45	46	37	46	42	46	41	41	2	2	46	

Ocean Era LLC Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'39"N
Longitude: 156° 3'34"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
10	10	3

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H+	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) SM4500-O G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
08/18/11	Kampachi Farms 5, K	1040	8.20	35.04	19,395	26.42	5.26	2.7	2.0	102		15		6.8					49	
12/01/11	Kampachi Farms 5, K	926	8.15	35.03	19,389	24.65	5.16	0.3	2.0	133		21		6.3					44	
02/16/12	Kampachi Farms 5, K	840	8.19	35.05	19,401	24.18	5.90	1.3	2.0	140	24	15	24	9.3	22	250			70	
05/17/12	Kampachi Farms 5, K	838	8.15	35.00	19,373	24.99	5.15	2.2	2.0	119	7	20	9	6.0	23	22			90	
08/08/12	Kampachi Farms 5, K	835	8.16	35.18	19,473	26.17	5.25	2.3	2.0	97	8	16	6	6.1	19	57			103	
12/05/12	Kampachi Farms 5, K	817	8.16	35.29	19,533	24.89	5.03	2.8	2.0	79	10	19	8	4.2	13	63			95	
02/27/13	Kampachi Farms 5, K	953	8.11	35.33	19,556	25.39	7.20	2.0	2.0	129	9	29	18	4.5	17	49			43	
05/15/13	Kampachi Farms 5, K	847	8.05	34.75	19,234	26.21	5.28	2.0	2.0	140	9	27	8	5.2	47	49			81	
08/28/13	Kampachi Farms 5, K	838	8.08	34.83	19,279	26.77	5.71	2.4	2.0	119	8	48	38	2.5	67	51			76	
12/12/13	Kampachi Farms 5, K	1109	7.96	35.10	19,428	26.41	5.20	2.1	2.0	338	9	33	10	10.2	140	46			114	
03/05/14	Kampachi Farms 5, K	842	8.00	34.83	19,279	24.48	6.07	2.5	2.0	277	9	34	13	8.1	134	49			150	
06/26/14	Kampachi Farms 5, K	841	8.00	34.79	19,257	25.84	6.71	3.3	2.6	236	7	41	22	5.7	131	60			127	
09/24/14	Kampachi Farms 5, K	852	8.10	35.00	19,373	27.59	6.24	3.8	2.0	343	17	47	15	7.3	35	25			68	
12/17/14	Kampachi Farms 5, K	945	7.89	35.34	19,561	25.82	4.42	3.2	2.0	285	11	32	5	8.9	136	4			104	
03/19/15	Kampachi Farms 5, K																		0	No Discharge
06/12/15	Kampachi Farms 5, K	836	8.05	34.70	19,207	26.16	6.81	3.6	2.0	176	6	19	22	9.2	95	50			109	
08/19/15	Kampachi Farms 5, K	1051	8.11	34.27	18,969	28.42	6.06	4.6	2.0	263	9	18	7	14.8	106	44			115	
12/09/15	Kampachi Farms 5, K	829	8.10	33.63	18,615	26.33	6.44	4.0	2.0	121	9	19	6	6.4	60	53			133	
02/17/16	Kampachi Farms 5, K	1012	8.15	34.51	19,102	25.14	5.81	3.5	2.0	98	19	22	15	4.4	22	44			93	
06/01/16	Kampachi Farms 5, K	911	8.14	34.22	18,941	26.48	5.65	2.8	2.0	125	7	17	10	7.6	84	22			93	
08/26/16	Kampachi Farms 5, K	1111	8.47	35.02	19,384	28.12	5.77	5.9	2.0	269	8	52	15	5.2	149	30			126	
11/25/16	Kampachi Farms 5, K	1101	8.18	34.35	19,013	26.16	5.95	4.1	3.9	81	7	21	13	3.8	20	156			130	
03/08/17	Kampachi Farms 5, K	1116	8.19	34.67	19,190	25.19	5.19	5.4	2.0	168	5	23	9	7.2	47	38			100	
05/18/17	Kampachi Farms 5, K	839	8.13	34.46	19,074	26.01	5.40	4.4	2.0	98	5	20	9	4.9	31	28			92	
08/17/17	Kampachi Farms 5, K	1219	8.14	34.48	19,085	28.38	5.82	3.2	2.0	120	2	22	14	5.5	112	26			90	
11/02/17	Kampachi Farms 5, K	927	8.12	35.04	19,395	27.44	4.74	3.3	2.0	87	4	9	5	9.7	31	16			86	
03/01/18	Kampachi Farms 5, K	1211	8.20	34.47	19,080	25.26	5.73	13.1	2.0	85	1	21	11	4.1	58	31			78	
06/07/18	Kampachi Farms 5, K	1133	8.15	34.80	19,262	26.70	6.17	12.5	2.0	98	6	39	27	2.5	47	202			151	
09/10/18	Kampachi Farms 5, K	1147	8.15	34.61	19,157	28.01	5.93	3.5	2.0	154	2	22	9	7.0	87	33			190	
11/09/18	Kampachi Farms 5, K	910	8.15	34.66	19,185	27.51	5.84	3.8	2.0	103	5	23	10	4.5	29	79			159	
02/15/19	Kampachi Farms 5, K	1145	8.15	34.92	19,329	24.19	6.45	3.3	2.0	69	2	20	12	3.5	29	53			133	
05/24/19	Kampachi Farms 5, K	1205	8.17	35.73	19,777	27.16	6.05	4.0	2.0	89	5	17	9	5.1	32	19			184	
09/12/19	Kampachi Farms 5, K	1323	8.16	33.36	18,465	28.65	6.89	2.0	3.7	70	2	18	9	3.9	41	60			167	
10/23/19	Kampachi Farms 5, K	1515	8.14	35.76	19,794	28.27	6.46	1.9	2.0	41	5	20	12	2.1	21	19			179	
03/06/20	Kampachi Farms 5, K	1205	8.09	36.07	19,965	25.19	6.85	3.1	2.0	48	-23	23	16	2.1	37	-18			220	
06/26/20	Ocean Era 5	920	8.11	15.01	8,308	26.00	7.05	2.3	2.0	61	-10	13	5	4.6	23	5			200	
09/03/20	Ocean Era 5	1216	8.25	35.71	19,766	26.03	5.11	2.3		103	17	23	20	4.5	-2	253	0		92	BOD - N/A - equipment failure
11/12/20	Ocean Era 5	901	8.05	35.27	19,522	27.3	6.52	2.2	2.0	76	7	18	17	4.3	13	4	0		27	
03/05/21	Ocean Era 5	1138	8.14	35.99	19,921	25.3	6.76	3.6	2.0	62	1	13	10	4.8	2	7			1	
05/06/21	Ocean Era 5																		103	No Flow, sump dry
08/13/21	Ocean Era 5	953	7.98	35.42	19,605	27.3	6.44	3.5	2.0	134	-2	15	10	9.2	39	-1			67	
10/29/21	Ocean Era 5	1321	7.96	35.60	19,705	26.6	6.57	1.3	2.0	63	6	13	8	4.8	2	9			35	
02/10/22	Ocean Era 5	1206	8.08	34.91	19,323	26.1	6.68	3.1	2.0	214	3	14	9	15.4	64	11			103	
05/19/22	Ocean Era 5	935	8.05	34.61	19,157	25.6	6.76	2.1	2.0	154	3	10	1	16.1	11	91			134	
08/05/22	Ocean Era 5	1142	7.71	34.81	19,268	27.6	6.59	6.4	2.0	201	3	17	4	12.2	47	47			133	
11/17/22	Ocean Era 5	1332	8.09	35.08	19,417	28.2	6.40	4.0	2.0	272	8	7	-1	37.8	94	113			68	
02/03/23	Ocean Era 5	1207	8.12	34.61	19,157	26.6	6.79	3.6	2.0	179	0	22	18	8.1	66	40			38	
05/05/23	Ocean Era 5	1138	8.13	34.71	19,212	26.1	6.68	2.8	2.0	112	4	8	5	13.3	41	35			55	
08/24/23	Ocean Era 5	1151	8.00	34.76	19,240	27.6	6.57	9.0	2.0	254	2	13	6	19.9	114	44				
10/26/23	Ocean Era 5	1341	8.07	34.89	19,312	28.7	6.44	5.0	2.0	323	5	19	11	17.2	44	16				
02/08/24	Ocean Era 5	1213	8.08	35.06	19,406	25.7	6.81	4.2	2.0	185	7	11	7	17.6	16	30		135		
05/10/24	Ocean Era 5	1125	8.14	35.03	19,389	26.8	6.88	2.9	2.0	171	3	13	9	12.9	19	92		159		
Mean			8.11	34.52	19,105	26.44	6.07	3.7	2.1	149	6	21	12	8.1	52	52	0	147	102	
Std. Dev.			0.10	2.86	1,583	1.21	0.68	2.4	0.4	80	7	10	7	6.1	41	57	0	16	50	
n=			50	50	50	50	50	50	49	50	44	50	47	50	47	46	2	2	48	

Ocean Rider, Inc. Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'22.14"N
Longitude: 156° 3'24.35"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
11	11	3

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H⁺	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
03/03/11	Central Sump	1144	8.05	34.40	19,041	23.59	6.60	2.5	2.0	215		32		6.7					50.5	
06/24/11	Central Sump	804	8.13	34.48	19,085	22.89	5.64	2.8	2.0	299		40		7.5					58.3	
09/29/11	Central Sump	855	8.02	34.93	19,334	25.17	6.37	2.4	2.0	172		21		8.2					54.9	
12/14/11	Central Sump	846	7.85	34.70	19,207	23.21	6.32	0.9	2.1	230		21		11.0					61.4	
03/08/12	Central Sump	839	8.14	34.15	18,902	23.81	6.53	1.0	2.0	178	60	26	19	6.8	17.0	729			58.8	
06/06/12	Central Sump	825	7.98	34.55	19,124	24.09	5.24	2.4	2.0	185	53	32	15	5.8	12.4	341			56.3	
08/23/12	Central Sump	815	7.82	34.98	19,362	24.33	6.03	2.8	2.1	264	87	26	12	10.2	15.0	506			56.1	
12/06/12	Central Sump	826	8.08	34.33	19,002	23.92	6.97	2.5	2.0	210	93	27	14	7.8	2.4	802			55.1	
02/28/13	Central Sump	821	8.18	34.65	19,179	23.00	5.84	1.9	2.0	358	44	56	15	6.4	10.6	344			35.7	
05/30/13	Central Sump	837	8.12	34.80	19,262	24.63	6.60	2.8	2.0	167	87	33	22	5.1	13.8	324			42.6	
09/05/13	Central Sump	837	8.02	34.66	19,185	23.87	5.76	2.9	2.0	141	96	41	20	3.4	10.6	374			42.8	
12/18/13	Central Sump	853	7.92	34.81	19,268	23.64	5.65	3.6	2.7	182	63	29	24	6.3	13.6	272			48.0	
03/06/14	Central Sump	838	8.06	34.80	19,262	23.73	5.56	2.9	2.0	157	26	22	8	7.1	4.9	136			41.7	
06/25/14	Central Sump	823	8.01	34.48	19,085	24.62	6.14	3.9	2.1	168	73	30	20	5.6	36.2	714			50.4	
09/25/14	Central Sump	821	7.83	34.86	19,295	25.95	6.40	3.3	2.0	207	66	32	10	6.5	1.0	215			61.8	
12/18/14	Central Sump	928	7.95	35.35	19,567	24.12	6.78	3.0	2.0	235	96	38	19	6.2	7.6	342			50.0	
03/12/15	Central Sump	835	7.67	34.47	19,080	22.72	6.01	9.6	3.0	502	140	99	50	5.1	73.4	568			64.4	
06/04/15	Central Sump	821	7.88	33.87	18,747	24.20	5.68	4.5	2.0	2110	265	302	36	7.0	15.0	845			89.3	
08/20/15	Central Sump	846	8.03	34.89	19,312	24.78	5.27	3.5	2.0	258	130	33	24	7.8	0.3	575			57.8	
12/03/15	Central Sump	809	7.87	34.64	19,174	24.05	5.75	3.7	2.0	196	69	31	9	6.3	2.5	339			62.3	
02/24/16	Central Sump	822	8.13	34.43	19,057	23.65	6.08	2.9	2.0	168	36	38	25	4.4	4.0	275			84.6	
06/02/16	Central Sump	800	8.04	34.69	19,201	25.19	6.44	10.7	2.0	89	33	17	12	5.1	5.9	194			107.1	
09/01/16	Central Sump	822	8.31	34.76	19,240	24.56	5.69	3.7	2.0	237	163	46	39	5.1	0.3	499			117.8	
11/30/16	Central Sump	828	8.06	34.95	19,345	24.23	5.74	2.8	2.0	118	40	23	11	5.2	25.5	186			65.8	
03/09/17	Central Sump	842	8.09	34.69	19,201	22.81	4.94	4.6	2.0	161	78	25	16	6.4	18.0	358			77.3	
05/24/17	Central Sump	823	8.03	34.68	19,196	22.58	5.24	4.3	2.0	152	129	29	22	5.2	11.6	569			63.4	
08/24/17	Central Sump	837	8.03	34.54	19,118	24.01	5.75	3.1	2.0	238	172	42	29	5.7	13.4	576			78.2	
12/13/17	Central Sump	836	8.02	35.40	19,594	23.23	5.10	10.1	2.0	122	66	23	14	5.3	27.7	298			94.3	
03/14/18	Central Sump	827	8.11	34.54	19,118	21.93	6.07	10.9	2.0	128	78	28	18	4.7	30.4	329			93.6	
06/20/18	Central Sump	828	8.06	35.05	19,401	24.33	5.37	3.4	2.0	113	70	21	10	5.3	0.8	443			89.7	
09/20/18	Central Sump	833	7.80	33.79	18,703	23.45	5.85	4.8	2.3	412	158	45	13	9.1	37.2	1126			83.9	
12/13/18	Central Sump	813	8.13	34.67	19,190	22.97	5.92	10.7	2.0	162	93	32	22	5.1	12.1	597			56.8	
03/01/19	Central Sump	850	8.11	34.23	18,947	22.34	6.09	12.3	2.0	161	94	28	21	5.7	17.0	506			73.1	
06/05/19	Central Sump	836	8.02	33.89	18,758	22.68	6.35	3.4	2.0	263	223	45	38	5.8	6.0	1990			82.8	
09/18/19	Central Sump	841	8.11	34.26	18,963	23.92	6.24	2.5	2.0	213	156	36	29	5.9	2.5	1176			77.4	
11/01/19	Central Sump	905	8.15	34.78	19,251	23.85	5.89	9.6	2.0	282	179	40	36	7.0	15.7	883			91.2	
03/11/20	Central Sump	836	8.14	34.49	19,091	22.22	6.38	10.4	2.0	151	91	38	28	4.0	12.6	911			82.6	
06/18/20	Central Sump	828	8.10	36.55	20,231	22.93	6.15	2.4	2.0	191	144	38	28	5.1	7.5	667			82.9	
09/16/20	Central Sump	851	8.09	35.30	19,539	23.16	5.75	2.3		214	116	26	20	8.3	10.1	629	0.0		131.5	BOD - N/A - equipment failure
11/19/20	Central Sump	859	8.02	35.15	19,456	22.9	6.71	1.5	2.9	267	152	34	31	7.9	21.5	739	0.0		84.0	
03/17/21	Central Sump	916	8.04	35.44	19,616	23.0	6.68	3.1	2.0	169	91	24	25	7.0	43.2	479			64.9	
05/19/21	Central Sump	914	8.01	35.15	19,456	23.8	6.74	2.1	2.0	134	68	22	21	6.2	9.2	510			79.5	
08/13/21	Central Sump	908	7.93	35.28	19,528	23.8	6.69	2.6	2.0	185	104	25	20	7.4	7.9	458			112.8	
12/02/21	Central Sump	859	8.04	34.82	19,273	23.7	6.69	1.5	2.0	232	97	28	19	8.4	14.6	537			91.8	
03/03/22	Central Sump	924	8.00	34.63	19,168	23.1	6.74	1.5	2.0	198	100	44	60	4.5	20.3	627			71.1	
05/19/22	Central Sump	848	7.95	34.28	18,974	22.6	6.80	1.1	2.0	220	124	29	24	7.6	23.1	782			60.2	
08/31/22	Central Sump	904	8.00	33.81	18,714	22.9	6.80	2.7	2.0	272	174	23	20	11.6	14.1	1565			50.6	
11/30/22	Central Sump	831	7.95	33.28	18,421	21.8	6.85	3.0	2.0	326	237	48	33	6.7	27.0	1860			53.4	
03/02/23	Central Sump	824	7.92	33.20	18,377	22.0	6.92	2.2	2.0	252	159	35	30	7.2	24.5	1384			43.4	
05/12/23	Central Sump	950	8.00	32.92	18,222	23.3	6.48	1.5	2.0	251	162	29	29	8.6	27.5	1542			48.7	
08/30/23	Central Sump	831	7.87	34.45	19,068	23.4	6.77	2.7	2.0	205	133	23	19	9.0	30.7	759				
11/02/23	Central Sump	915	8.09	34.47	19,080	23.6	6.62	2.4	2.0	258	145	23	21	11.1	16.5	733		192.0		
02/15/24	Central Sump	846	8.00	34.49	19,091	22.4	6.81	2.9	2.0	272	177	27	21	10.1	12.3	671		191.6		
05/16/24	Central Sump	917	7.98	34.38	19,030	24.3	6.59	2.8	2.0	222	130	17	21	13.3	18.1	664		222.0		

Ocean Rider, Inc. Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'22.14"N
Longitude: 156° 3'24.35"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
11	11	3

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H⁺	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
Mean			8.02	34.60	19,150	23.54	6.17	3.9	2.1	249	112	37	23	6.9	16	659	0	202	70	
Std. Dev.			0.11	0.58	322	0.87	0.53	2.9	0.2	268	54	39	10	2.0	13	415	0	17	21	
n=			54	54	54	54	54	54	53	54	50	54	50	54	50	50	2	3	50	

Discharge GPS:
Latitude: 19°43'22.79"N
Longitude: 156° 3'25.79"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
13	9	3

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H⁺	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
03/03/11	OR #2 (west)	1158	8.16	34.68	19,196	25.70	6.60	1.8	2.0	206		30		6.9					50.5	
06/24/11	OR #2 (west)	810	8.25	35.19	19,478	25.36	6.05	2.7	2.0	209		32		6.5					58.3	
09/29/11	OR #2 (west)	900	8.19	36.58	20,247	26.00	7.42	3.3	2.0	156		21		7.4					54.9	
12/14/11	OR #2 (west)	851	8.21	34.98	19,362	23.34	6.41	1.3	2.0	249		18		13.8					61.4	
03/08/12	OR #2 (west)	843	8.14	35.80	19,816	24.27	4.89	2.3	2.0	181	1	30	1	6.0	3.0	513			61.2	
06/06/12	OR #2 (west)	831	7.64	34.92	19,329	25.97	0.42	4.2	20.7	918	5	164	15	5.6	4.5	2526			56.3	
08/23/12	OR #2 (west)	819	7.87	34.99	19,367	23.52	5.06	3.7	2.2	363	62	51	2	7.1	9.0	799			56.1	
12/06/12	OR #2 (west)	831	8.03	34.86	19,295	19.37	3.81	2.5	3.0	332	142	46	12	7.2	0.5	1800			55.1	
02/28/13	OR #2 (west)	825	7.83	36.39	20,142	22.00	3.65	5.3	4.8	1795	33	321	18	5.6	51	1366			35.7	
05/30/13	OR #2 (west)	841	8.14	34.66	19,185	24.73	5.62	7.2	2.8	372	36	56	17	6.6	46	383			42.6	
09/05/13	OR #2 (west)	840	8.16	35.89	19,865	24.34	7.19	45.5	5.8	710	0	117	6	6.1	6.0	1899			42.8	
12/18/13	OR #2 (west)	858	7.99	35.14	19,450	22.73	6.14	7.6	4.0	437	47	46	17	9.5	12.0	235			48.0	
03/06/14	OR #2 (west)	841	8.12	34.73	19,223	23.26	6.56	4.0	2.0	244	14	23	8	10.7	25.2	70			41.7	
06/25/14	OR #2 (west)	827	8.23	35.06	19,406	23.68	8.86	66.8	2.8	617	3	100	14	6.2	12.4	299			50.4	
09/25/14	OR #2 (west)	826	7.99	34.51	19,102	24.37	6.70	11.4	3.2	435	162	61	32	7.1	42.6	1117			61.8	
12/18/14	OR #2 (west)	934	8.04	35.77	19,799	22.47	7.16	6.5	3.5	388	51	46	11	8.4	30.5	276			50.0	
03/12/15	OR #2 (west)	825	7.86	34.16	18,908	20.70	4.04	12.4	5.4	1053	185	166	112	6.3	157.1	2490			64.4	
06/04/15	OR #2 (west)	826	8.01	34.25	18,958	25.13	6.01	5.8	3.2	418	51	54	19	7.8	7.6	230			89.3	
08/20/15	OR #2 (west)	851	8.10	34.66	19,185	25.83	5.63	4.0	2.0	201	58	30	16	6.7	1.7	389			57.8	
12/03/15	OR #2 (west)	814	7.93	34.53	19,113	23.50	5.61	6.1	3.1	276	62	35	13	8.0	23.8	260			62.3	
02/24/16	OR #2 (west)	828	8.16	34.80	19,262	22.38	5.77	3.7	5.2	152	20	43	27	3.5	24.2	330			84.6	
06/02/16	OR #2 (west)																		0.0	No flow
09/01/16	OR #2 (west)																		0.0	No flow
11/30/16	OR #2 (west)	831	8.12	35.34	19,561	23.08	6.34	4.0	2.0	151	6	31	17	4.9	86.2	158			65.6	
03/09/17	OR #2 (west)																		0.0	No flow
05/24/17	OR #2 (west)	827	8.11	34.80	19,262	24.60	4.92	17.9	3.4	327	5	52	9	6.3	22.1	8			63.3	
08/24/17	OR #2 (west)	840	8.16	34.72	19,218	26.26	5.53	5.2	2.0	90	6	20	1	4.5	11.3	66			78.0	
12/13/17	OR #2 (west)	839	8.07	35.75	19,788	22.48	4.29	5.8	3.7	198	5	23	7	8.6	44.3	121			94.1	
03/14/18	OR #2 (west)	830	8.24	34.88	19,306	22.56	6.13	6.1	2.6	155	0	19	8	8.0	24.8	10			93.5	
06/20/18	OR #2 (west)	832	8.22	35.23	19,500	23.40	5.55	5.5	4.4	345	33	53	19	6.6	7.5	892			89.6	
09/20/18	OR #2 (west)	838	7.88	34.39	19,035	23.20	5.87	9.4	2.0	311	218	40	34	7.7	27.1	1079			83.7	
12/13/18	OR #2 (west)	817	8.07	35.16	19,461	22.03	6.26	12.0	2.0	218	129	46	33	4.8	25.0	675			56.5	
03/01/19	OR #2 (west)	855	8.08	24.67	13,655	20.15	5.70	5.7	3.4	281	26	54	37	5.2	120.8	47			72.9	
06/05/19	OR #2 (west)	840	8.10	35.25	19,511	25.43	6.38	5.8	2.1	124	29	26	18	4.7	5.5	108			82.5	
09/18/19	OR #2 (west)	845	8.07	35.18	19,473	25.12	6.89	23.9	5.6	471	43	86	18	5.5	6.6	319			77.1	
11/01/19	OR #2 (west)	910	8.15	35.21	19,489	24.04	7.44	13.8	2.1	259	148	42	31	6.2	27.0	299			90.8	
03/11/20	OR #2 (west)	839	8.06	35.61	19,711	20.99	6.98	5.1	2.6	256	109	43	32	6.0	22.6	457			82.2	
06/18/20	OR #2 (west)	831	8.05	36.86	20,402	22.08	7.75	7.2	3.2	280	134	48	26	5.9	19.7	656			82.6	
09/16/20	OR #2 (west)																		0.0	No flow, sump dry
11/19/20	OR #2 (west)	904	8.11	35.39	19,589	25.5	6.71	4.0	3.4	429	189	54	47	7.9	27.2	119	0.0		83.7	
03/17/21	OR #2 (west)	922	8.08	33.71	18,659	23.5	6.99	3.1	2.0	190	44	20	20	9.6	73.3	3			64.5	
05/19/21	OR #2 (west)	921	8.04	35.71	19,766	24.4	6.92	4.1	2.0	112	11	14	11	8.0	22.8	12			79.2	
08/13/21	OR #2 (west)																		0.0	No flow, sump dry
12/02/21	OR #2 (west)																		0.0	No flow, sump dry
03/03/22	OR #2 (west)																		0.0	No flow, sump dry
05/19/22	OR #2 (west)																		0.0	No flow, sump dry
08/31/22	OR #2 (west)																		0.0	No flow, sump dry
11/30/22	OR #2 (west)																		0.0	No flow, sump dry
03/02/23	OR #2 (west)	828	8.13	34.75	19,234	22.0	9.02	4.1	2.0	162	38	32	19	5.1	15.5	214			42.9	
05/12/23	OR #2 (west)	953	8.11	34.80	19,262	24.9	7.97	4.3	2.0	238	95	27	25	9.0	39.7	541			48.2	
08/30/23	OR #2 (west)																			No flow, sump dry
11/02/23	OR #2 (west)																			No flow, sump dry
02/15/24	OR #2 (west)																			No flow, sump dry
05/16/24	OR #2 (west)	920	8.05	34.81	19,268	26.8	7.17	2.9	2.0	142	4	9	4	15.7	19.2	111		75.5		

Discharge GPS:
Latitude: 19°43'22.79"N
Longitude: 156° 3'25.79"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
13	9	3

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H⁺	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
Mean			8.07	34.85	19,289	23.69	6.11	8.7	3.4	352	60	54	20	7.2	30	564	0	76	52	
Std. Dev.			0.12	1.75	967	1.73	1.50	12.0	3.0	308	62	55	19	2.3	33	668	#DIV/0!	#DIV/0!	30	
n=			41	41	41	41	41	41	41	41	36	41	37	41	37	37	1	1	40	

Discharge GPS:
Latitude: 19°43'23.26"N
Longitude: 156° 3'25.47"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
12	7	3.5

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H+	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
03/03/11	OR #3 (east)	1158	8.16	34.68	19,196	25.70	5.70	1.8	2.0	206		30		6.9						
06/24/11	OR #3 (east)	837	8.02	34.72	19,218	23.33	5.94	2.8	3.7	192		35		5.5						
09/29/11	OR #3 (east)	905	8.06	34.14	18,897	25.34	6.31	0.8	2.0	219		28		7.8						
12/14/11	OR #3 (east)	854	8.09	34.91	19,323	22.72	6.51	0.7	2.0	221		21		10.5						
03/08/12	OR #3 (east)	846	8.13	35.11	19,434	23.64	5.18	1.7	2.0	181	78	33	21	5.5	10.0	359				
06/06/12	OR #3 (east)	834	8.13	34.98	19,362	23.50	5.82	2.1	2.0	178	80	33	17	5.4	1.8	333				
08/23/12	OR #3 (east)	824	8.02	35.07	19,412	23.26	6.35	2.3	2.0	198	140	31	22	6.4	2.0	621				
12/06/12	OR #3 (east)	834	8.06	34.88	19,306	22.14	6.04	4.1	2.0	200	115	32	19	6.3	0.9	491				
02/28/13	OR #3 (east)	829	7.98	35.28	19,528	22.45	6.07	2.2	2.0	156	67	33	20	4.8	14.1	267				
05/30/13	OR #3 (east)	845	8.19	34.83	19,279	25.05	6.43	3.2	2.0	241	103	34	26	7.1	0.1	427				
09/05/13	OR #3 (east)	844	8.01	34.69	19,201	24.08	5.43	2.9	2.0	196	137	41	28	4.8	5.7	570				
12/18/13	OR #3 (east)	901	8.00	35.12	19,439	23.89	5.91	4.5	2.0	205	123	37	27	5.5	3.8	513				
03/06/14	OR #3 (east)	846	8.11	34.83	19,279	24.36	5.86	2.4	2.0	109	13	19	10	5.9	22.5	72				
06/25/14	OR #3 (east)	830	8.02	34.79	19,257	24.28	6.30	5.3	2.0	183	91	36	21	5.1	11.2	539				
09/24/14	OR #3 (east)	832	8.03	34.87	19,301	25.27	6.47	4.0	2.0	284	132	38	18	7.4	5.6	471				
12/18/14	OR #3 (east)	937	8.00	35.23	19,500	24.36	5.64	2.6	2.0	131	30	24	9	5.5	19.4	80				
03/12/15	OR #3 (east)	828	8.01	34.50	19,096	22.86	5.90	10.7	2.0	492	293	116	78	4.2	68.9	974				
06/04/15	OR #3 (east)	829	7.99	34.48	19,085	24.47	5.30	3.5	2.0	418	77	54	23	7.8	9.1	278				
08/20/15	OR #3 (east)	854	8.05	34.87	19,301	24.71	5.23	3.7	2.0	211	96	33	21	6.4	3.3	474				
12/03/15	OR #3 (east)	818	8.03	34.59	19,146	24.44	5.47	3.4	2.0	152	76	24	14	6.4	5.9	288				
02/24/16	OR #3 (east)	831	8.15	34.69	19,201	24.04	6.28	2.9	2.0	89	27	40	25	2.2	9.0	74				
06/02/16	OR #3 (east)	805	8.15	34.77	19,246	25.91	5.95	3.2	2.0	67	18	13	10	5.1	3.8	53				
09/01/16	OR #3 (east)	828	8.39	34.79	19,257	25.90	6.01	3.9	2.0	189	75	33	27	5.8	2.4	281				
11/30/16	OR #3 (east)	836	8.11	32.90	18,211	24.78	5.79	4.3	2.0	126	56	26	12	4.9	13.3	1349				
03/09/17	OR #3 (east)	845	8.14	34.61	19,157	24.09	5.08	13.5	2.0	119	18	19	6	6.2	11.7	154				
05/24/17	OR #3 (east)	831	8.09	34.66	19,185	24.04	4.90	3.8	2.0	138	68	22	14	6.3	11.0	322				
08/24/17	OR #3 (east)	844	8.06	34.53	19,113	24.75	5.60	3.4	2.0	148	98	29	11	5.1	9.8	463				
12/13/17	OR #3 (east)	847	8.06	34.47	19,080	22.25	4.84	10.3	2.0	196	123	31	21	6.3	28.7	957				
03/14/18	OR #3 (east)	833	8.17	34.63	19,168	23.46	5.47	3.8	2.0	99	34	18	10	5.4	24.0	145				
06/20/18	OR #3 (east)	835	8.04	35.30	19,539	23.55	5.57	11.1	2.0	188	143	32	22	5.8	4.6	667				
09/20/18	OR #3 (east)	841	7.82	34.35	19,013	21.43	5.19	4.6	2.0	286	162	44	25	6.4	30.9	918				
12/13/18	OR #3 (east)	820	8.15	34.83	19,279	23.99	6.16	5.3	2.0	139	80	28	18	4.9	7.7	406				
03/01/19	OR #3 (east)	858	8.19	34.61	19,157	23.60	6.52	4.3	2.0	75	10	18	11	4.1	21.1	41			73.1	
06/05/19	OR #3 (east)	843	8.11	35.68	19,749	25.46	6.46	4.0	2.0	170	125	36	29	4.7	13.0	609			82.8	
09/18/19	OR #3 (east)	848	7.99	35.30	19,539	24.09	5.77	4.8	2.0	266	135	46	24	5.7	2.6	814			77.4	
11/01/19	OR #3 (east)	912	8.10	35.32	19,550	22.40	6.52	2.1	2.0	250	191	41	37	6.1	21.3	854			91.2	
03/11/20	OR #3 (east)	843	8.04	35.64	19,727	18.05	7.03	12.4	2.0	243	177	46	38	5.2	6.6	703			82.6	
06/18/20	OR #3 (east)	834	8.02	36.84	20,391	21.16	6.75	3.1	2.0	249	215	46	40	5.4	0.7	925			82.9	
09/16/20	OR #3 (east)	855	7.98	35.49	19,644	19.50	6.86	1.3		316	266	41	38	7.6	6.9	1151	0.0		131.5	BOD - N/A - equipment failure
11/19/20	OR #3 (east)	907	7.84	35.47	19,633	16.4	7.32	4.2	4.3	475	409	61	61	7.8	7.1	1650	0.0		84.0	
03/17/02	OR #3 (east)	920	7.96	35.80	19,816	20.0	7.11	3.0	2.0	252	205	37	38	6.9	1.7	925			64.9	
05/19/21	OR #3 (east)	918	7.94	35.58	19,694	21.5	6.97	2.3	2.0	191	166	27	30	7.0	-2.4	757			79.5	
08/13/21	OR #3 (east)	911	7.88	35.34	19,561	22.4	6.76	3.4	2.0	240	181	30	27	7.9	0.5	713			112.8	
12/02/21	OR #3 (east)	902	7.94	35.04	19,395	19.4	7.04	1.1	2.0	317	278	45	43	7.0	0.9	1277			91.8	
03/03/22	OR #3 (east)	928	7.96	34.78	19,251	21.4	8.64	1.3	2.0	238	180	41	60	5.8	9.6	836			71.1	
05/19/22	OR #3 (east)	852	7.91	34.95	19,345	19.0	8.44	1.2	2.0	291	261	38	37	7.7	2.3	1278			60.2	
08/31/22	OR #3 (east)	909	8.02	34.86	19,295	21.3	8.36	2.6	2.0	305	229	31	30	9.7	11.2	1715			50.6	
11/30/22	OR #3 (east)	836	7.93	31.20	17,270	21.2	7.26	2.4	2.0	433	320	69	66	6.3	12.5	3279			53.4	
03/02/23	OR #3 (east)	831	8.00	34.56	19,129	19.2	8.19	2.0	2.0	354	263	49	50	7.2	6.5	1369			43.4	
05/12/23	OR #3 (east)	955	7.94	34.54	19,118	21.9	7.04	2.5	2.0	256	190	41	40	6.2	13.1	852			48.7	
08/30/23	OR #3 (east)	834	7.85	34.61	19,157	21.3	7.02	1.3	2.0	296	238	39	37	7.7	13.2	1265				
11/02/23	OR #3 (east)	917	8.03	34.76	19,240	21.7	6.61	3.2	2.0	356	220	34	32	10.5	31.9	916		194.5		
02/15/24	OR #3 (east)	850	7.98	34.93	19,334	21.6	7.02	2.9	2.0	249	124	20	18	12.7	20.9	513		190.6		
05/16/24	OR #3 (east)	922	7.92	34.72	19,218	22.3	7.05	2.8	2.0	273	190	25	30	10.7	24.5	814		153.4		

Ocean Rider, Inc. Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'23.26"N
Longitude: 156° 3'25.47"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
12	7	3.5

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H⁺	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
Mean			8.04	34.84	19,282	22.83	6.32	3.8	2.1	227	143	36	28	6.5	11	716	0	180	77	
Std. Dev.			0.10	0.73	402	2.09	0.88	2.8	0.4	94	89	15	15	1.8	12	559	0	23	22	
n=			54	54	54	54	54	54	53	54	50	54	50	54	48	50	2	3	18	

Pacific Hybrid Seawater Disposal Log

Discharge GPS:
Latitude:
Longitude:

Seawater Disposal Trench Dimensions
L (ft.) W (ft.) D (ft.)

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
05/12/23	Pacific Hybreed - Main sump	1127	7.92	34.71	19,212	19.8	7.24	7.3	2.0	4028	3913.5	309.3	343.3	13.0	225.6	1659.7				1st sampling at main sump, High N levels
08/30/23	Pacific Hybreed - Main sump	1006	7.81	34.29	18,980	18.6	7.41	3.4	2.0	553	414	68	67	8.2	66.1	1455				
11/02/23	Pacific Hybreed - Main sump	1140	8.02	34.45	19,068	21.9	6.99	6.1	2.4	3124	2730	198	192	15.8	41.5	1070		169.4		
02/15/24	Pacific Hybreed - Main sump																			No flow, system shut down
05/16/24	Pacific Hybreed - Main sump																			No flow, system shut down
Mean			7.92	34.48	19,087	20.10	7.21	5.6	2.1	2568	2352	191	201	12.3	111	1395	#DIV/0!	169	#DIV/0!	
Std. Dev.			0.11	0.21	117	1.67	0.21	2.0	0.2	1803	1780	121	138	3.9	100	299	#DIV/0!	#DIV/0!	#DIV/0!	
n=			3	3	3	3	3	3	3	3	3	3	3	3	3	3	0	1	0	

Pacific Hybrid Seawater Disposal Log

Discharge GPS:
Latitude:
Longitude:

Seawater Disposal Trench Dimensions
L (ft.) W (ft.) D (ft.)

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
06/18/20	Pacific Hybreed	1156	8.21	36.16	20,015	22.40	6.19	5.2	2.0	837.4	797.4	116.7	108.4	7.2	-8.9	1425.6			6.1	
09/03/20	Pacific Hybreed	1158	8.26	32.81	18,161	26.12	4.94	5.9		963	718	82	91	11.7	-3.1	2378	0.0		32.7	BOD - N/A - equipment failure
11/19/20	Pacific Hybreed	1038	8.06	34.81	19,268	24.9	6.33	4.0	2.0	435	331	45	44	9.6	9.0	1068	0.0		11.5	
03/17/21	Pacific Hybreed	1013	8.09	35.67	19,744	24.7	6.67	9.0	2.0	562	464	68	68	8.2	11.3	278			11.3	
05/19/21	Pacific Hybreed	1010	7.98	35.59	19,699	26.6	6.66	3.1	2.0	122	49	19	15	6.4	-4.6	199			47.1	
08/13/21	Pacific Hybreed	1105	7.75	35.27	19,522	20.7	5.98	2.6	2.0	432	384	54	54	8.0	-1.3	1460			32.7	
12/08/21	Pacific Hybreed																		0.3	No Flow, System Shut Down
03/09/22	Pacific Hybreed	1000	8.03	34.87	19,301	25.2	6.48	2.1	2.0	219	84	24	20	9.1	23	328			12.2	
05/19/22	Pacific Hybreed	1012	7.94	33.31	18,437	23.5	6.77	2.2	2.0	915	856	97	89	9.4	3	1647			19.9	
08/11/22	Pacific Hybreed	1029	7.86	34.62	19,163	23.7	6.87	5.9	2.0	1960	1366	129	128	15.2	63	1034			11.7	
11/30/22	Pacific Hybreed	1010	7.77	34.72	19,218	19.5	6.21	3.7	2.0	448	394	77	79	5.8	11	1613			45.3	
02/08/23	Pacific Hybreed	1109	7.73	34.45	19,068	19.4	6.89	2.5	2.0	473	431	77	64	6.2	0	1615			196.1	
05/12/23	Pacific Hybreed - Overflow	1137	7.90	34.60	19,151	25.4	6.74	6.3	3.0	18245	16010	1210	1236	15.1	671	4314			85.4	Very high N and P levels
08/30/23	Pacific Hybreed - Overflow	1021	7.65	34.25	18,958	19.6	7.65	3.0	2.0	1277	1141	120	127	10.7	77	2136			0.0	
11/02/23	Pacific Hybreed - Overflow																			No Flow
02/15/24	Pacific Hybreed - Overflow																			No Flow, System Shut Down
05/16/24	Pacific Hybreed - Overflow																			No Flow, System Shut Down
Mean			7.94	34.70	19,208	23.21	6.49	4.3	2.1	2068	1771	163	163	9.4	65	1500	0	#DIV/0!	37	
Std. Dev.			0.19	0.91	506	2.62	0.63	2.1	0.3	4885	4296	316	324	3.1	184	1084	0	#DIV/0!	51	
n=			13	13	13	13	13	13	12	13	13	13	13	13	9	13	2	0	13	

Pacific Planktonics Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'38"N
Longitude: 156° 3'32"W

Seawater Disposal Trench Dimensions

L (ft.)	W (ft.)	D (ft.)
11	9	9

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H+	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (°C)	DO (mg/L) SM4500-O G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
07/22/10	Pacific Planktonics	930	8.00					2.1	2.0	273		45.9		5.9					11.5	
07/28/10	Pacific Planktonics	930	8.12					1.2	2.0	234		37		6.3						
02/03/11	Pacific Planktonics	845	8.25	23.87	13,212	23.58	7.15	3.4	2.0	430		42		10.2					7.2	
05/12/11	Pacific Planktonics	941	8.15	34.64	19,174	25.57	5.77	3.0	2.0	183		27		6.8					13.5	
08/18/11	Pacific Planktonics	859	8.13	34.98	19,362	25.60	6.51	2.5	2.0	168		27		6.2					19.6	
12/01/11	Pacific Planktonics	943	8.13	35.01	19,378	24.31	6.09	1.1	2.0	223		39		5.7					21.1	
02/16/12	Pacific Planktonics	947	8.17	35.16	19,461	23.93	5.52	2.6	2.0	352	32	33	22	10.7	71	0			58.6	
05/17/12	Pacific Planktonics	902	8.10	34.82	19,273	24.99	5.14	3.3	2.0	296	38	40	21	7.4	71	19			66.9	
08/08/12	Pacific Planktonics	958	8.13	35.15	19,456	26.32	6.12	2.7	2.0	318	80	46	29	6.9	54	29			55.8	
11/14/12	Pacific Planktonics	1016	8.18	35.48	19,639	25.90	6.60	3.8	2.0	373	104	61	40	6.1	60	44			57.3	
02/20/13	Pacific Planktonics	1010	8.04	35.60	19,705	24.02	5.90	19.9	3.7	614	152	86	37	7.2	164	71			45.6	Trench almost empty, tuna tank H2O supply off
05/15/13	Pacific Planktonics	918	8.06	35.05	19,401	26.39	5.47	4.8	2.1	564	180	79	61	7.1	111	44			46.1	
09/05/13	Pacific Planktonics	1132	7.99	35.11	19,434	26.84	5.77	1.2	2.0	403	163	48	32	8.4	46	39			46.1	
12/12/13	Pacific Planktonics	1025	8.15	35.23	19,500	25.51	5.85	5.7	2.6	351	47	36	15	9.8	35	58			7.2	Debris from bucket scraping wall during collection
03/05/14	Pacific Planktonics	917	8.17	34.33	19,002	23.05	5.51	2.8	2.0	295	28	24	13	12.3	26	43			7.6	
06/26/14	Pacific Planktonics	917	8.12	34.79	19,257	25.55	5.76	5.0	4.6	340	31	51	14	6.7	33	60			7.2	
09/24/14	Pacific Planktonics	917	8.10	35.06	19,406	27.39	5.20	4.0	2.0	275	23	16	13	17.5	36	7			7.2	
12/18/14	Pacific Planktonics	1005	8.04	35.43	19,611	24.90	5.53	1.7	2.0	256	12	21	4	12.4	9	4			7.5	
03/12/15	Pacific Planktonics	902	8.06	34.53	19,113	23.18	6.37	12.5	2.3	600	77	99	56	6.1	153	186			7.3	
06/04/15	Pacific Planktonics	949	8.13	34.59	19,146	27.15	4.83	3.6	2.0	418	5	54	14	7.8	17	28			7.2	
09/02/15	Pacific Planktonics	854	7.99	33.97	18,803	26.85	6.13	4.4	2.0	263	74	32	15	8.2	41	222			70.6	
12/03/15	Pacific Planktonics	1159	8.17	34.85	19,290	25.97	5.21	6.6	2.0	213	34	27	10	8.0	30	57			7.5	
02/18/16	Pacific Planktonics	905	7.90	34.65	19,179	23.66	4.92	5.4	2.8	394	40	61	25	6.5	128	7			11.5	1st effluent tested with shrimp use
06/02/16	Pacific Planktonics	850	7.99	34.47	19,080	26.06	4.53	4.1	2.5	416	33	50	23	8.3	73	26			11.4	
09/01/16	Pacific Planktonics	837	8.31	34.81	19,268	25.05	4.74	6.3	2.0	425	100	37	23	11.6	117	334			11.4	
12/01/16	Pacific Planktonics	1028	8.08	34.92	19,329	24.84	6.19	6.7	2.0	152	23	40	22	3.8	40	128			11.6	
03/15/17	Pacific Planktonics	834	8.32	34.79	19,257	24.32	4.90	4.2	2.0	143	16	24	8	5.9	38	20			11.4	
05/18/17	Pacific Planktonics	1035	8.00	34.58	19,140	26.12	3.59	6.7	2.3	242	32	46	14	5.3	93	40			11.5	
08/24/17	Pacific Planktonics	939	7.91	34.57	19,135	27.07	3.67	5.7	2.0	134	24	26	12	5.2	48	35			11.7	
12/14/17	Pacific Planktonics	1004	8.04	35.36	19,572	23.81	5.53	5.5	2.0	180	21	19	8	9.5	34	31			11.5	
03/14/18	Pacific Planktonics	855	8.15	34.73	19,223	23.81	5.02	4.0	2.0	137	7	17	7	8.2	35	1			11.5	
06/14/18	Pacific Planktonics	1014	8.09	35.14	19,450	26.48	5.97	4.1	2.0	192	17	25	12	7.8	36	23			11.5	
09/20/18	Pacific Planktonics	948	7.89	34.41	19,046	25.43	4.90	4.5	2.0	243	85	27	14	9.0	81	313			11.5	
12/12/18	Pacific Planktonics	1413	8.11	35.14	19,450	24.04	4.25	5.4	2.0	231	100	34	20	6.8	52	353			11.4	
03/01/19	Pacific Planktonics	842	8.04	34.61	19,157	23.21	6.00	5.1	2.1	222	30	34	18	6.6	42	2			11.5	
05/24/19	Pacific Planktonics	923	7.97	35.77	19,799	26.45	5.64	4.9	2.0	177	25	39	11	4.6	19	14			11.5	
09/12/19	Pacific Planktonics	858	8.09	34.88	19,306	25.74	6.43	4.5	2.0	232	105	37	24	6.2	71	477			11.5	
10/23/19	Pacific Planktonics	939	8.12	35.62	19,716	25.89	6.26	2.4	2.0	167	60	27	14	6.2	13	270			11.5	
03/12/20	Pacific Planktonics	1011	8.15	35.47	19,633	24.49	6.77	12.2	2.0	126	17	22	12	5.9	28	13			11.5	
06/18/20	Pacific Planktonics	1018	8.06	36.67	20,297	26.38	6.52	3.8	2.0	61	24	23	14	2.6	13	34			11.5	
09/03/20	Pacific Planktonics	1109	7.98	35.74	19,782	22.49	6.75	2.3		332	196	40	36	8.3	12	666	0.0		11.7	BOD - N/A - equipment failure
11/12/20	Pacific Planktonics	929	7.88	35.56	19,683	21.2	6.93	4.2	2.0	410	280	60	45	6.8	27	781	0.0		11.5	
03/17/21	Pacific Planktonics																		11.4	No flow, sump dry
05/19/21	Pacific Planktonics	953	8.02	35.71	19,766	25.4	6.91	6.2	2.0	238	28	19	13	12.5	64	2			11.4	
08/13/21	Pacific Planktonics	944	7.96	35.41	19,600	25.3	6.68	4.7	2.0	275	75	24	19	11.5	33	211			11.7	
12/08/21	Pacific Planktonics	853	8.00	35.16	19,461	25.0	6.72	4.6	2.0	276	44	18	9	15.0	85	-3			11.7	
03/09/22	Pacific Planktonics	1054	8.07	35.06	19,406	24.7	7.24	4.2	2.5	234	37	8	6	28.8	53	-1			11.4	
06/15/22	Pacific Planktonics	955	7.96	34.57	19,135	26.1	7.04	5.2	2.0	238	23	14	3	16.7	7	38			11.5	
08/31/22	Pacific Planktonics	1006	8.12	35.26	19,517	26.2	7.71	16.7	3.0	478	39	32	-1	14.8	38	-39			11.7	
11/17/22	Pacific Planktonics	953	8.05	35.12	19,439	25.5	6.81	8.1	2.0	239	68	18	5	13.5	20	57			11.5	
03/02/23	Pacific Planktonics	816	7.87	32.48	17,978	21.7	7.31	3.1	2.0	206	56	30	20	6.9	21	73			11.5	
05/12/23	Pacific Planktonics	1008	8.06	34.90	19,318	25.7	7.13	7.1	2.0	217	17	13	4	16.9	91	13			11.5	
08/30/23	Pacific Planktonics	958	7.84	34.76	19,240	23.0	7.07	8.0	2.0	490	259	43	34	11.5	42	907				
12/07/23	Pacific Planktonics	834	7.78	34.83	19,279	22.1	6.51	9.0	2.0	381	247	43	34	8.8	17	817		169.2		
02/15/24	Pacific Planktonics	914	8.00	34.96	19,351	23.6	6.90	2.8	2.0	137	25	4	2	32.5	6	13		176.6		
05/16/24	Pacific Planktonics	1025	7.98	34.70	19,207	21.0	7.26	5.0	2.0	315	178	25	26	12.6	16	645		151.9		

Pacific Planktonics Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'38"N
Longitude: 156° 3'32"W

Seawater Disposal Trench Dimensions

L (ft.)	W (ft.)	D (ft.)
11	9	9

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H+	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) SM4500-O G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
Mean			8.06	34.76	19,242	24.88	5.99	5.2	2.2	287	70	35	19	9.5	50	147	0	166	18	
Std. Dev.			0.11	1.63	901	1.55	0.95	3.5	0.5	123	69	18	13	5.4	37	238	0	13	17	
n=			55	53	53	53	53	55	54	55	49	55	48	55	49	45	2	3	51	

Royal Hawaiian Sea Farms, Inc. Effluent Log

Discharge GPS:
Latitude: 19°43'31.49"N
Longitude: 156° 3'26.02"W

Discharge Trench Dimensions

L (ft)	W (ft)	D (ft)
49	7	4

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H⁺	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
03/10/11	RHSF Composite	917	8.17	34.73	19,223	24.72	5.69	2.8	2.0	117		20		6.0					337	
06/09/11	RHSF Composite	802	8.29	34.80	19,262	25.33	6.61	2.5	2.0	94		13		7.2					424	
09/21/11	RHSF Composite	820	8.20	35.12	19,439	26.31	6.84	0.7	2.0	85		12		7.1					473	
12/14/11	RHSF Composite	822	8.07	34.04	18,842	24.38	4.73	1.6	2.0	124		3		41.3					386	
03/07/12	RHSF Composite	800	8.05	35.15	19,456	23.17	6.53	2.6	2.0	213	8	18	5	11.8	15.0	26			358	
06/07/12	RHSF Composite	808	8.21	35.00	19,373	25.14	6.31	2.2	2.0	146	11	19	3	7.7	8.4	48			363	
08/15/12	RHSF Composite	830	8.20	35.18	19,473	25.79	5.19	3.3	2.0	209	5	8	2	26.1	21.0	76			322	
12/06/12	RHSF Composite	855	8.29	35.16	19,461	24.53	6.40	2.6	2.0	174	4	12	2	14.5	22.2	66			197	
02/27/13	RHSF Composite	855	8.02	35.26	19,517	23.91	6.42	2.7	2.6	212	4	28	19	7.6	28.5	54			297	
05/15/13	RHSF Composite	808	8.19	35.03	19,389	26.14	6.04	2.7	2.0	157	10	18	8	8.6	20.4	61			287	
08/28/13	RHSF Composite	806	8.20	34.57	19,135	26.29	6.57	3.2	2.0	128	2	50	35	2.6	5.4	78			283	
12/11/13	RHSF Composite	743	7.91	35.09	19,423	24.52	6.30	2.3	2.0	305	73	29	7	10.6	7.9	47			300	
03/05/14	RHSF Composite	809	8.08	34.62	19,163	23.01	6.00	3.5	2.0	165	7	16	4	10.3	13.5	43			182	
06/25/14	RHSF Composite	815	8.08	34.94	19,340	25.96	6.74	3.8	2.0	159	6	22	7	7.3	14.0	61			261	
09/24/14	RHSF Composite	804	7.92	35.21	19,489	27.56	6.93	3.4	2.0	201	3	26	6	7.7	5.2	1			282	
12/17/14	RHSF Composite	815	8.05	35.39	19,589	24.59	5.82	2.2	2.0	206	16	21	3	9.7	10.3	4			261	
03/18/15	RHSF Composite	818	8.09	34.74	19,229	24.00	6.63	3.0	3.8	738	30	90	18	8.2	3.6	40			205	
06/12/15	RHSF Composite	815	8.16	35.01	19,378	25.76	6.07	3.0	2.0	195	3	21	16	9.3	18.7	51			211	
09/09/15	RHSF Composite	812	8.02	35.05	19,401	28.96	5.60	4.7	2.0	245	13	26	9	9.3	4.9	32			136	
12/02/15	RHSF Composite	817	8.10	35.31	19,544	25.27	6.42	4.5	2.4	241	10	36	25	6.7	10.8	32			202	
02/24/16	RHSF Composite	811	8.18	34.79	19,257	24.12	6.32	2.3	2.0	172	8	33	19	5.3	25.9	3			202	
06/01/16	RHSF Composite	807	8.16	34.58	19,140	26.36	6.47	4.0	2.0	148	13	17	5	8.9	23.4	12			239	
09/07/16	RHSF Composite	745	8.61	34.95	19,345	26.88	5.93	3.5	2.0	227	7	30	12	7.5	25.5	5			273	
11/30/16	RHSF Composite	810	8.10	35.05	19,401	24.03	6.02	4.4	2.0	165	5	37	25	4.5	67.5	40			259	
03/15/17	RHSF Composite	811	8.37	34.88	19,306	24.41	5.81	4.0	2.0	129	1	15	5	8.6	23.2	9			170	
05/24/17	RHSF Composite	806	8.28	34.68	19,196	25.40	4.97	3.4	2.0	128	2	16	3	8.0	31.7	27			228	
08/30/17	RHSF Composite	803	8.32	34.66	19,185	27.29	6.01	4.3	2.0	140	7	23	10	6.1	30.5	18			337	
12/13/17	RHSF Composite	822	8.22	35.59	19,699	24.14	5.57	8.3	2.0	86	3	14	3	6.1	21.8	35			286	
03/14/18	RHSF Composite	809	8.31	34.72	19,218	23.53	5.79	3.9	2.0	161	1	18	7	9.0	28.1	0			219	
06/20/18	RHSF Composite	818	8.33	35.48	19,639	26.77	5.77	4.9	2.0	159	4	20	7	8.1	11.7	46			203	
09/26/18	RHSF Composite	807	8.31	34.84	19,284	27.80	5.35	6.6	2.0	188	5	26	2	7.1	45.3	10			289	
12/12/18	RHSF Composite	810	8.18	35.27	19,522	24.51	5.91	4.7	2.0	149	8	15	1	10.1	20.8	15			257	
03/13/19	RHSF Composite	821	8.24	35.52	19,661	24.15	6.50	11.0	2.0	74	1	19	7	4.0	1.8	10			210	
06/05/19	RHSF Composite	823	8.35	35.69	19,755	27.03	6.63	3.6	2.0	130	4	20	11	6.7	6.9	6			236	
09/18/19	RHSF Composite	823	8.32	35.36	19,572	27.79	6.15	4.2	2.0	106	7	29	18	3.7	6.3	27			353	
11/06/19	RHSF Composite	825	8.26	35.33	19,556	26.81	6.20	3.0	2.0	201	-2	36	11	5.6	22.6	9			266	
03/01/20	RHSF Composite																		246	No Sample - COVID-19 Shutdown
06/18/20	RHSF Composite	818	8.30	36.80	20,369	26.49	6.47	3.7	2.0	139	-7	21	13	6.7	17.7	10			229	
09/16/20	RHSF Composite	836	8.23	36.04	19,949	26.16	6.78	2.7		211	11	15	10	13.9	5.7	53	0		251	BOD - N/A - equipment failure
12/02/20	RHSF Composite	819	8.13	35.62	19,716	25.1	6.69	2.3	2.0	253	0	20	16	12.8	63.0	0	0		313	
03/17/21	RHSF Composite	817	8.18	35.96	19,904	24.2	6.87	2.6	2.4	186	38	17	12	10.9	54.5	27			339	
05/19/21	RHSF Composite	820	8.25	35.78	19,805	25.2	7.12	3.7	2.0	177	15	18	12	9.8	35.9	-14			269	
08/25/21	RHSF Composite	815	8.16	35.69	19,755	26.8	6.32	6.0	3.7	259	3	76	75	3.4	15.7	1			251	
12/08/21	RHSF Composite	820	8.07	35.13	19,445	25.2	6.69	5.3	2.0	171	5	31	25	5.6	42.7	-11			313	
03/09/22	RHSF Composite	826	8.13	35.06	19,406	24.8	6.65	1.7	2.0	166	6	24	19	6.9	14.8	3			339	
06/15/22	RHSF Composite	817	8.05	34.24	18,952	26.4	6.88	2.6	2.0	199	23	42	30	4.8	4.4	263			269	
08/31/22	RHSF Composite	814	8.09	35.17	19,467	26.6	6.73	1.6	2.0	167	6	38	34	4.4	13.4	11			225	
11/30/22	RHSF Composite	814	7.97	35.08	19,417	25.4	6.58	3.3	2.3	165	4	44	36	3.7	17.5	51			254	
02/08/23	RHSF Composite	811	8.06	34.72	19,218	24.6	6.55	3.2	2.0	146	-1	30	30	4.9	32.4	34			269	
05/18/23	RHSF Composite	817	8.07	34.79	19,257	25.9	6.69	6.6	2.4	296	40	21	8	13.9	129.4	15			273	
08/30/23	RHSF Composite	816	8.12	34.98	19,362	26.5	6.62	3.6	2.0	213	-1	30	23	7.2	39.8	27			0	
12/06/23	RHSF Composite	754	8.05	35.14	19,450	25.2	6.44	3.0	2.0	178	5	34	30	5.2	18.6	33		248		
03/13/24	RHSF Composite	857	8.08	35.20	19,484	24.8	6.86	2.2	2.0	140	2	32	27	4.4	5.3	-24		253		
06/26/24	RHSF Composite	909	8.02	34.97	19,356	26.6	6.80	12.2	2.9	379	22	42	25	9.0	15.6	42		269		

Royal Hawaiian Sea Farms, Inc. Effluent Log

Discharge GPS:
Latitude: 19°43'31.49"N
Longitude: 156° 3'26.02"W

Discharge Trench Dimensions

L (ft)	W (ft)	D (ft)
49	7	4

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) SM4500-O G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
Mean			8.17	35.12	19,437	25.52	6.28	3.8	2.13	187	9.2	26.2	15.0	8.6	23.0	30.8	0.0	256.8	267	
Std. Dev.			0.13	0.46	254	1.29	0.52	2.1	0.37	96	13	15.0	13.3	5.9	21.5	41.3	0.0	10.9	75	
n=			53	53	53	53	53	53	52	53	45	53	49	53	49	45.0	2	3	50	

Shrimp Improvement Systems Hawaii LLC
#1 Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'22.65"N
Longitude: 156° 3'16.92"W

Seawater Disposal Trench Dimensions

L (ft.)	W (ft.)	D (ft.)
64	22	10

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) SM4500-O G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (Kgal/day)	Comment
07/21/10	SIS Composite	930	8.20					36.2	18.6	1754		485		3.6						
08/26/10	SIS Composite	930	8.15					46.0	17.8	1341		356		3.8						
08/26/10	SIS Composite	930	8.15					78.0	20.1	1399		359		3.9					215	
10/21/10	SIS Composite	915	8.18					34.4	7.8	1162	33	228	0	5.1						
12/02/10	SIS Composite	902	7.92	34.50	19,096			37.4	9.3	1293	118	249	84	5.2	427	538			309	
02/02/11	SIS Composite	1330	8.07	34.70	19,207	20.44		14.4	9.7	784		221		3.5					308	
05/11/11	SIS Trench Grab	1315	7.87	34.52	19,107	26.41	4.74	25.0	16.6	1773		362		4.9					234	
08/18/11	SIS Trench Grab	847	7.52	34.87	19,301	22.58	3.07	7.1	7.6	1164		177		6.6					256	
11/30/11	SIS Trench Grab	955	7.36	35.10	19,428	23.68	0.20	9.9	10.1	1782		430		4.1					232	
02/09/12	SIS Trench Grab	926	7.50	34.88	19,306	22.62	0.06	6.5	10.9	1470		337		4.4					298	
06/07/12	SIS Trench Grab	834	7.65	34.69	19,201	24.42	0.53	10.3	12.9	1333	4	226	55	5.9	435	916			310	
08/15/12	SIS Composite	1000	8.26	35.31	19,544	26.53	6.56	18.4	34.8	1632	38	303	52	5.4	178	629			290	
11/08/12	SIS Trench Grab	950	7.47	35.55	19,677	24.50	6.55	16.2	14.0	1860	34	420	89	4.4	853				352	
02/14/13	SIS Trench Grab	852	7.44	35.81	19,821	23.03	6.18	33.8	17.7	1884	35	351	197	5.4	868	251			246	
05/09/13	SIS Trench Grab	910	7.46	35.22	19,495	25.95	5.85	23.5	18.7	1887	58	415	86	4.6	464	375			213	
08/22/13	SIS Trench Grab	1040	7.61	34.61	19,157	24.02	5.52	21.5	13.8	1564	177	233	118	6.7	490	945			312	
12/05/13	SIS Trench Grab	910	7.53	35.29	19,533	22.33	6.02	17.6	16.1	1496	165	245	129	6.1	751	722			278	
02/25/14	SIS Trench Grab	1102	7.38	34.88	19,306	21.68	6.02	20.1	10.8	1735	189	331	118	5.2	610	909			303	
05/14/14	SIS Trench Grab	1126	7.59	34.61	19,157	23.56	5.89	18.3	6.3	1508	205	229	114	6.6	764	779			149	
08/13/14	SIS Trench Grab	1148	7.27	34.43	19,057	25.71	5.40	17.8	8.7	2087	149	430	227	4.9	1181	949			316	
12/10/14	SIS Trench Grab	1300	8.05	34.44	19,063	26.16	7.40	24.4	7.5	1428	119	202	27	7.1	213	959			350	
02/26/15	SIS Trench Grab	1030	8.01	34.88	19,306	21.60	6.45	15.8	20.8	418	200	54	127	7.8	568	734			1197	
05/28/15	SIS Trench Grab	1300	7.30	34.47	19,080	22.75	5.66	18.4	21.2	418	745	54	316	7.8	1302	1606			455	
09/10/15	SIS Trench Grab	930	7.45	34.67	19,190	22.01	7.47	22.2	8.4	1669	489	259	191	6.4	672	1220			401	
12/03/15	SIS Trench Grab	953	7.62	34.20	18,930	21.42	5.78	44.6	16.6	1747	200	378	131	4.6	759	847			325	
02/25/16	SIS Trench Grab	833	7.41	34.78	19,251	18.94	7.29	41.7	25.7	1739	297	434	226	4.0	611	1163			301	
06/01/16	SIS Trench Grab	1006	7.44	34.50	19,096	18.66	6.74	35.2	16.5	1427	334	427	234	3.3	629	1623			283	
09/07/16	SIS Trench Grab	916	7.85	34.54	19,118	16.45	7.63	15.4	9.5	2342	623	487	302	4.8	655	2805			259	
11/18/16	SIS Trench Grab	1136	7.76	34.78	19,251	17.04	6.45	10.3	7.5											resampled due to effluent from DAF was rerouted to main trench
12/09/16	SIS Trench Grab	1025	7.48	34.27	18,969	23.11	6.62	39.6	12.7	1967	330	361	337	5.4	1722	734			281	
03/16/17	SIS Trench Grab	958	7.48	34.41	19,046	18.73	8.18	20.2	3.5	858	271	243	159	3.5	35	1230			280	
05/25/17	SIS Trench Grab	1025	7.59	34.75	19,234	21.74	5.39	14.8	6.7	745	178	326	197	2.3	155	905			306	no chlorine
09/14/17	SIS Trench Grab	1009	7.86	34.54	19,118	22.97	7.02	42.0	9.0	1556	167	424	283	3.7	745	990			326	Ozone has been running continuously since May 2017
12/14/17	SIS Trench Grab	929	7.47	35.22	19,495	23.20	5.86	25.2	11.2	1685	195	318	128	5.3	1241	316			367	Bolton construction crew should start trench repair soon (by Jan 2018)
03/15/18	SIS Trench Grab	937	8.02	34.79	19,257	25.20	4.62	5.0	3.4	2577	4	720	15	3.6	157	32			213	Composite north side 2 big pipes. Bolton was pumping sludge out of trench
06/21/18	SIS Trench Grab	925	7.74	35.05	19,401	25.17	6.58	7.6	2.0	776	160	242	129	3.2	5	681			274	
09/20/18	SIS Trench Grab	1140	7.48	34.96	19,351	26.25	4.94	8.0	7.5	1022	139	231	115	4.4	142	662			515	
12/21/18	SIS Trench Grab	916	7.52	34.89	19,312	24.20	5.17	79.6	11.6	2247	51	652	354	3.4	66	343			249	
03/13/19	SIS Trench Grab	837	7.41	35.64	19,727	25.35	6.19	48.8	7.5	1045	36	399	219	2.6	296	209			220	
06/14/19	SIS Trench Grab	841	7.84	34.77	19,246	25.22	6.73	16.6	11.2	875	104	198	85	4.4	186	777			222	
09/20/19	SIS Trench Grab	906	7.63	34.91	19,323	25.60	6.57	20.1	2.0	983	201	246	167	4.0	2	933			162	
11/07/19	SIS Trench Grab	823	7.59	34.80	19,262	23.67	6.67	38.4	3.1	1011	125	334	196	3.0	27	770			190	
03/01/20	SIS Trench Grab																		227	No Sample - COVID-19 Shutdown
06/12/20	SIS Trench Grab	919	7.73	36.22	20,048	26.02	6.25	45.0	12.2	916	98	233	101	3.9	94	342			203	
09/03/20	SIS Trench Grab	910	7.54	35.90	19,871	24.48	5.58	6.7		977	223	188	141	5.2	5	780	0.73		262	BOD - N/A - equipment failure
12/04/20	SIS Trench Grab	900	7.58	35.78	19,805	25.0	6.83	16.4	7.8	2133	146	371	166	5.7	22	350	3.96		267	
03/05/21	SIS Trench Grab	836	7.48	36.13	19,998	23.4	6.97	7.1	11.3	689	194	157	134	4.4	60	320	0.56		301	
05/28/21	SIS Trench Grab	1004	7.36	35.73	19,777	24.8	6.64	6.0	2.47	675	113	141	95	4.8	11	569			279	
08/13/21	SIS Trench Grab	835	7.63	35.16	19,461	25.7	6.84	23.5	2.94	931	71	141	78	6.6	17	467			134	
10/29/21	SIS Trench Grab	836	7.43	35.62	19,716	26.1	6.27	16.2	6.3	1157	67	238	163	4.9	168	242			92	
02/11/22	SIS Trench Grab	835	6.98	35.09	19,423	24.0	5.09	11.4	5.1	1360	47	272	139	5.0	19	312			182	
05/13/22	SIS Trench Grab	903	7.03	34.60	19,151	25.9	5.89	7.2	2.9	1268	33	327	243	3.9	418	175			162	
08/11/22	SIS Trench Grab	903	7.39	34.90	19,318	25.7	6.54	24.4	3.0	1135	50	251	128	4.5	73	258			118	

Shrimp Improvement Systems Hawaii LLC
#1 Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'22.65"N
Longitude: 156° 3'16.92"W

Seawater Disposal Trench Dimensions

L (ft.)	W (ft.)	D (ft.)
64	22	10

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) SM4500-O G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (Kgal/day)	Comment
12/08/22	SIS Trench Grab	854	7.09	34.97	19,356	23.4	5.71	7.4	2.8	1294	228	331	275	3.9	448	555			141	
03/02/23	SIS Trench Grab	905	7.30	34.79	19,257	21.9	5.88	13.4	5.0	1280	164	253	144	5.1	321	461	0.18		277	Sump is flooded.
05/12/23	SIS Trench Grab	924	7.62	34.72	19,218	22.4	5.07	28.2	6.4	569	1	7452	7408	0.1	7	821	0.11		196	Possible sample contamination. Will resample.
06/30/23	SIS Trench Grab	909	7.64	35.07	19,412	25.8	6.75			951	71	295	215	3.2	8	295				Resample
08/24/23	SIS Trench Grab	851	7.63	34.78	19,251	22.2	7.28	7.3	3.2	772	208	141	120	5.5	325	860			0	
12/07/23	SIS Trench Grab	822	7.41	34.91	19,323	24.0	6.21	14.2	13.7	1684	53	273	177	6.2	662	503		185.0		
02/29/24	SIS Trench Grab	901	7.32	35.05	19,401	24.2	6.87	19.2	3.9	1021	94	272	197	3.8	149	135	0.31	304.5		
05/23/24	SIS Trench Grab	839	7.59	35.02	19,384	24.8	6.56	21.2	3.0	881	83	187	89	4.7	33	412	0.87	743.7		
Mean			7.61	34.96	19,350	23.50	5.87	23.1	10.3	1341	159	422	298	4.7	401	702	1	411	276	
Std. Dev.			0.29	0.46	254	2.35	1.62	15.9	6.6	489	145	939	1019	1.4	400	472	1	294	155	
n=			60	56	56	55	53	59	58	59	51	59	51	58	50	49	7	3	52	

Shrimp Improvement Systems Hawaii LLC
#2 Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'39.47"N
Longitude: 156° 3'29.78"W

Seawater Disposal Trench Dimensions

L (ft.)	W (ft.)	D (ft.)
9	8	4

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H+	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) SM4500-O G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (Kgal/day)	Comment
03/10/11	HHA #1 (Kona Sump	1026	7.96	34.63	19,168	25.20	6.02	11.4	2.2	473		64		7.4					155	
06/08/11	HHA #1 (Kona Sump	1122	8.11	34.90	19,318	26.17	5.71	3.1	2.0	287		46		6.2					184	
09/21/11	HHA #1 (Kona Sump	843	8.01	34.90	19,318	24.21	5.32	4.3	2.0	415		66		6.3					161	
12/14/11	HHA #1 (Kona Sump	937	7.97	35.02	19,384	22.92	5.20	8.2	3.7	728		53		13.7					112	
03/01/12	HHA #1 (Kona Sump	900	8.08	35.29	19,533	24.47	5.20	3.6	2.2	414	44	47	10	8.8	113	13			77	
06/06/12	HHA #1 (Kona Sump	1000	8.15	34.93	19,334	25.60	5.67	4.2	2.2	421	21	57	18	7.4	109	33			78	
08/22/12	SIS #2 (Kona Sump)																		0	No effluent- no production during facility upgrade
11/21/12	SIS #2 (Kona Sump)																		0	No effluent- no production during facility upgrade
02/21/13	SIS #2 (Kona Sump)																		0	No effluent- no production during facility upgrade
05/30/13	SIS #2 (Kona Sump)	958	7.77	35.54	19,672	27.33	3.08	18.1	17.3	1,995	46	422	71	4.7	284	108			7	Composite (tank bottom and flow through)
09/05/13	SIS #2 (Kona Sump)	959	7.65	35.39	19,589	22.28	5.62	13.8	6.0	1,392	361	195	104	7.1	324	1431			115	
12/18/13	SIS #2 (Kona Sump)	1001	7.94	35.09	19,423	21.04	6.62	29.4	10	1,178	44	253	11	4.7	152	716			101	
03/06/14	SIS #2 (Kona Sump)	954	8.02	34.93	19,334	23.19	6.62	29.6	18	2,168	1,506	244	91	8.9	100	76			128	
06/19/14	SIS #2 (Kona Sump)	917	7.35	35.33	19,556	25.86	3.50	16.4	13.8	2,983	179	506	137	5.9	1531	524			65	
09/25/14	SIS #2 (Kona Sump)																		0	No effluent- no production during facility upgrade
12/24/14	SIS #2 (Kona Sump)																		0	No effluent- no production during facility upgrade
03/19/15	SIS #2 (Kona Sump)	945	7.04	36.36	20,126	24.88	4.42	34	27	6,206	41	1237.5	782.5	5.0	7057	116.5			581	
06/18/15	SIS #2 (Kona Sump)	1009	7.82	34.53	19,113	23.26	7.15	54.2	17.1	1,628	130	354.7	180.2	4.6	221.1	489.7			188	
09/10/15	SIS #2 (Kona Sump)	914	7.64	33.98	18,808	20.91	7.31	24.1	9.4	1,413	345	196.6	79.1	7.2	309.5	1076.1			79	
12/03/15	SIS #2 (Kona Sump)	930	8.11	34.73	19,223	26.35	4.91	10.2	7.9	544	3	83.7	20.7	6.5	137.8	57.2			122	
02/25/16	SIS #2 (Kona Sump)	842	8.10	34.89	19,312	24.52	6.52	9.3	13.3	620	36	137.4	98.9	4.5	51.7	63			120	
06/01/16	SIS #2 (Kona Sump)	944	7.57	34.75	19,234	27.27	4.25	45.8	24.2	1,650	8	359	140.8	4.6	413.2	6.2			111	
09/07/16	SIS #2 (Kona Sump)	905	7.93	35.32	19,550	27.56	4.34	84.2	26.3	3,139	13	719.1	281.5	4.4	1010.2	492.5			98	
09/23/16	SIS #2 (Kona Sump)	910	8.59	34.91	19,323	28.09	5.23	14.8	11.7	1,373	96	233.9	166	5.9	154	210				resample due to high solids
11/18/16	SIS #2 (Kona Sump)	1101	8.47	35.17	19,467	27.03	4.14	21.3	2.0											resample via peristolic pump - heavily chlorinated sump
11/18/16	SIS #2 (Kona Sump)	1106						20.7	2.0										111	resample via bucket - heavily chlorinated sump
12/02/16	SIS #2 (Kona Sump)	919	7.68	35.16	19,461	23.34	5.44	86.0												resample - bucket collection
12/09/16	SIS #2 (Kona Sump)	918	7.21	34.80	19,262	24.45	5.53	61.2	11.1	934	13	360.6	265.8	2.6	307.2	97.3				sampled at last "settling" tank with peristaltic pump
12/09/16	SIS #2 (Kona Sump)	928	7.19	34.81	19,268	24.48	5.48	60.8	11.4	1,109	11	363.9	281.6	3.0	513.4	125				sampled at final sump with peristaltic pump
03/16/17	SIS #2 (Kona Sump)	910	8.25	34.82	19,273	23.76	6.90	8.1	2.0	484	112	111.1	54.2	4.4	3.0	345.5			111	sampled at final sump with bucket
05/25/17	SIS #2 (Kona Sump)	945	8.43	34.49	19,091	25.00	5.09	17.4	2.0	603	144	109	44	5.5	7.3	602			128	Chlorine ~100ppm
09/14/17	SIS #2 (Kona Sump)	1032	8.07	34.76	19,240	26.01	5.91	13.0	9.9	963	102	231.5	147.8	4.2	292.8	460.6			120	
12/14/17	SIS #2 (Kona Sump)	943	7.69	35.57	19,688	22.66	5.58	17.9	3.3	771	9	149	59	5.2	43.8	62			116	
03/15/18	SIS #2 (Kona Sump)	958	7.82	34.86	19,295	24.86	4.65	11.6	2	373	21	99.2	55.2	3.8	32.1	40.8			89	
06/21/18	SIS #2 (Kona Sump)	941	7.46	35.38	19,583	22.14	6.41	17.5	6.6	931	307	231.8	98.3	4.0	1.9	1310.1			78	
09/20/18	SIS #2 (Kona Sump)	1207	7.60	36.85	20,397	28.66	5.03	6.8	4.8	588	124	184.9	125.4	3.2	29.2	647.5			61	
12/21/18	SIS #2 (Kona Sump)	929	7.61	34.94	19,340	23.72	4.18	32.6	9.7	949	10	299.8	151	3.2	158	44.9			84	
03/13/19	SIS #2 (Kona Sump)	857	8.05	35.37	19,578	23.75	5.31	12.4	5.1	217	0	41.7	21.9	5.2	91.8	31.3			79	
06/14/19	SIS #2 (Kona Sump)	849	8.01	35.15	19,456	26.00	5.91	9	11.1	731	30	126.8	32.4	5.8	144	319.5			81	
09/20/19	SIS #2 (Kona Sump)	924	8.16	35.12	19,439	27.09	5.66	44.8	2	1,070	70	268.5	70.6	4.0	9.4	201.3			61	undissolved chlorine tab pieces present in sump
11/07/19	SIS #2 (Kona Sump)	851	8.01	34.99	19,367	25.06	5.89	5.6	2	485	64	71.4	47	6.8	11.2	200.5			71	
03/01/20	SIS #2 (Kona Sump)																		88	No Sample - COVID-19 Shutdown
06/12/20	SIS #2 (Kona Sump)	936	7.85	36.32	20,104	27.06	5.38	32.2	23.5	1,184	34	130.8	64.4	9.1	546.5	217.9			69	
09/03/20	SIS #2 (Kona Sump)	953	7.69	35.98	19,915	24.56	5.79	9.8		1,394	199	96.9	49.2	14.4	269.5	598.4	0.00		77	BOD - N/A - equipment failure
12/04/20	SIS #2 (Kona Sump)	922	7.68	35.81	19,821	26.0	5.66	26.4	19.7	2,994	33	428.6	255.2	7.0	778	95.8	0.36		90	
03/05/21	SIS #2 (Kona Sump)	856	7.64	36.27	20,076	23.7	5.72	21.6	37.8	1,782	14	199	185	9.0	1665	50.8			115	
05/28/21	SIS #2 (Kona Sump)	1020	7.31	35.80	19,816	26.6	4.61	17.4	25.9	2,630	219	442	277	6.0	1043.7	1179.9			99	
08/13/21	SIS #2 (Kona Sump)	848	7.35	34.93	19,334	19.4	5.88	17.0	8.85	1,667	374	269.5	184	6.2	63.6	1639.4			32	
10/29/21	SIS #2 (Kona Sump)	846	7.45	35.77	19,799	25.2	5.91	15.2	12.1	1,494	48	294.5	220.3	5.1	357.4	277.7			34	
02/11/22	SIS #2 (Kona Sump)	847	7.49	34.59	19,146	14.4	7.04	13.0	11.0	1,701	512	290.1	194.4	5.9	39.6	2004.3			73	
05/13/22	SIS #2 (Kona Sump)	914	7.58	34.58	19,140	24.8	4.89	10.6	14.4	1,124	55	168.8	111.7	6.7	423.1	216.5			64	
08/11/22	SIS #2 (Kona Sump)	912	7.99	34.73	19,223	25.9	6.61	6.9	2	614	34	88.1	33.7	7.0	165	167.8			45	
12/08/22	SIS #2 (Kona Sump)	902	8.00	35.00	19,373	23.6	6.41	5.2	2	736	141	125.8	66.3	5.9	5.6	413.4			50	
03/02/23	SIS #2 (Kona Sump)	913	7.87	34.65	19,179	23.1	6.24	12.4	8.25	980	23	124.2	38.8	7.9	273.4	120.1			95	

Shrimp Improvement Systems Hawaii LLC
#2 Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'39.47"N
Longitude: 156° 3'29.78"W

Seawater Disposal Trench Dimensions

L (ft.)	W (ft.)	D (ft.)
9	8	4

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H+	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) SM4500-O G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (Kgal/day)	Comment
05/12/23	SIS #2 (Kona Sump)	932	7.52	34.63	19,168	23.4	6.25	14.4	6.75	1,257	291	147.1	130.4	8.5	463.6	1187			65	
Mean			7.81	35.14	19,450	24.52	5.55	21.8	10.1	1,278	140	233	130	6.1	469	430	0	#DIV/0!	93	
Std. Dev.			0.34	0.56	310	2.44	0.92	19.4	8.5	1,042	249	209	131	2.4	1110	496	0	#DIV/0!	83	
n=			48	48	48	48	48	49	47	46	42	46	42	46	42	42	2	0	45	

Shrimp Improvement Systems Hawaii LLC
#3 Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'44.26"N
Longitude: 156° 3'27.69"W

Seawater Disposal Trench Dimensions

L (ft.)	W (ft.)	D (ft.)
55	13	7

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) SM4500-O G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (Kgal/day)	Comment
03/03/11	HHA #2 (Office Sump	1050	7.98	34.70	19,207	25.33	5.83	7.4	2.1	470		57		8.2					288	
06/08/11	HHA #2 (Office Sump	1138	8.10	34.72	19,218	26.74	5.19	4.7	2.0	329		51		6.5					342	
09/21/11	HHA #2 (Office Sump	836	8.03	35.19	19,478	26.98	5.66	9.8	2.8	579		88		6.6					299	
12/14/11	HHA #2 (Office Sump	944	7.95	35.15	19,456	24.60	3.98	13.4	3.3	728		53		13.7					208	
03/01/12	HHA #2 (Office Sump	936	8.04	35.32	19,550	24.83	4.25	6.6	3.4	595	74	82	21	7.3	103	56			143	
06/06/12	HHA #2 (Office Sump	1017	8.12	35.22	19,495	26.31	4.99	10.4	7.2	1023	32	271	14	3.8	146	22			145	
08/22/12	SIS #3 (Office Sump	1221	8.28	35.13	19,445	26.63	5.29	14.0	7.2	939	47	97	6	9.7	139	531			2	
11/21/12	SIS #3 (Office Sump	837	7.92	34.51	19,102	25.52	5.30	13.5	4.9	1627	1242	247	247	6.6	503	1806			7	
02/21/13	SIS #3 (Office Sump	914	7.67	36.24	20,059	22.89	4.25	32.4	11.0	1663	158	219	85	7.6	564	203			30	
05/30/13	SIS #3 (Office Sump	946	7.76	35.91	19,877	24.15	5.44	25.2	21.6	3252	169	596	516	5.5	2102	1001			7	Composite (tank bottom and flow through)
09/05/13	SIS #3 (Office Sump	953	7.89	35.09	19,423	25.48	5.31	14.9	7.1	1075	205	191	61	5.6	216	863			344	
12/18/13	SIS #3 (Office Sump	957	7.80	35.26	19,517	21.69	6.18	22.1	12.8	1784	439	254	95	7.0	587	514			302	
03/06/14	SIS #3 (Office Sump	943	8.08	34.88	19,306	23.76	6.89	9.1	5.2	459	74	50	27	9.2	62	677			300	
06/19/14	SIS #3 (Office Sump	911	7.60	34.74	19,229	22.64	6.20	20.8	12.8	2563	38	542	125	4.7	485	410			382	
09/25/14	SIS #3 (Office Sump	931	7.56	34.91	19,323	23.21	3.95	33.9	5.2	1813	204	272	49	6.7	366	877			439	
12/24/14	SIS #3 (Office Sump	850	7.53	35.17	19,467	23.86	5.52	17.5	13.3	2102	80	361	201	5.8	999	49			512	
03/19/15	SIS #3 (Office Sump	938	7.54	34.69	19,201	25.06	5.40	15.0	11.9	754	34	195	157	3.9	238	65			964	
06/18/15	SIS #3 (Office Sump	1001	7.95	34.39	19,035	26.57	6.15	15.0	5.7	807	35	189	108	4.3	50	124			380	
09/10/15	SIS #3 (Office Sump	920	7.89	35.11	19,434	28.96	5.57	29.2	7.6	1156	45	229	116	5.0	67	147			370	
12/03/15	SIS #3 (Office Sump	942	8.03	34.66	19,185	24.50	4.98	19.2	12.2	1404	128	177	24	7.9	556	519			277	
02/25/16	SIS #3 (Office Sump	849	8.12	34.88	19,306	24.16	6.16	19.0	11.6	854	44	202	72	4.2	41	163			253	
06/01/16	SIS #3 (Office Sump	951	8.17	34.18	18,919	26.71	5.18	15.6	7.3	921	27	224	58	4.1	123	242			239	
09/07/16	SIS #3 (Office Sump	858	8.02	35.26	19,517	27.63	4.33	54.2	20.9	2817	65	654	143	4.3	288	64			220	
09/23/16	SIS #3 (Office Sump	901	8.45	35.03	19,389	27.97	4.73	24.0	14.7	1973	84	429	110	4.6	104	162				resample from high solids
11/18/16	SIS #3 (Office Sump	1034	8.00	34.97	19,356	26.38	3.78	21.0	5.6											resample via peristolic pump
11/18/16	SIS #3 (Office Sump	1040						21.4	4.4										236	resample via bucket
12/02/16	SIS #3 (Office Sump	909	7.93	34.67	19,190	24.54	5.58	13.4												resample via peristolic pump
12/09/16	SIS #3 (Office Sump	945	8.01	34.82	19,273	24.96	6.02	13.6	8.4	533	16	116	85	4.6	373	146				composite of both discharge pipes via buckets
03/16/17	SIS #3 (Office Sump	907	8.00	34.83	19,279	24.90	6.09	19.5	2.0	749	34	145	59	5.2	15	125			236	composite of both discharge pipes via buckets
05/25/17	SIS #3 (Office Sump	939	8.18	34.63	19,168	25.89	4.57	55.1	2.0	685	39	236	98	2.9	11	183			255	Chlorine ~10ppm
09/14/17	SIS #3 (Office Sump	1025	8.37	34.47	19,080	27.41	5.47	18.6	9.7	917	47	250	45	3.7	136	325			278	Ozone only on at night
12/14/17	SIS #3 (Office Sump	950	7.87	35.36	19,572	24.42	4.89	28.7	8.4	843	28	222	81	3.8	197	122			321	
03/15/18	SIS #3 (Office Sump	1004	8.02	34.58	19,140	24.29	4.82	14.2	3.3	679	30	99	34	6.8	30	243			178	
06/21/18	SIS #3 (Office Sump	949	7.97	33.41	18,493	26.88	5.35	24.0	7.6	734	147	181	60	4.1	78	1683			243	
09/20/18	SIS #3 (Office Sump	1159	7.59	38.15	21,116	22.71	4.18	25.6	8.7	919	28	333	237	2.8	197	260			453	
12/21/18	SIS #3 (Office Sump	936	7.88	34.80	19,262	22.88	4.63	13.4	5.2	573	113	137	103	4.2	181	502			165	
03/13/19	SIS #3 (Office Sump	849	7.82	35.35	19,567	21.33	6.44	7.7	7.5	560	154	125	49	4.5	192	655			140	
06/14/19	SIS #3 (Office Sump	857	7.42	35.31	19,544	27.34	4.26	186.4	38.9	1990	29	1609	103	1.2	637	161			141	
06/25/19	SIS #3 (Office Sump	840	7.76	35.53	19,666	26.30	4.57	7.4												TSS resample #1
06/26/19	SIS #3 (Office Sump	836	7.72	35.88	19,860	26.57	4.08	8.4												TSS resample #2
06/28/19	SIS #3 (Office Sump	840	7.66	35.85	19,843	27.63	4.43	8.6												TSS resample #3
09/20/19	SIS #3 (Office Sump	918	8.06	35.02	19,384	25.64	4.89	42.8	10.5	1027	83	498	58	2.1	4	552			100	undissolved chlorine tab pieces present in sump
11/07/19	SIS #3 (Office Sump	843	8.17	24.72	13,683	23.91	6.24	11.6	2.0	1720	784	302	166	5.7	13	7158			119	
03/01/20	SIS #3 (Office Sump)																		139	No Sample - COVID-19 Shutdown
06/12/20	SIS #3 (Office Sump	929	7.96	36.30	20,092	25.95	5.70	8.0	9.7	491	73	67	37	7.4	212	253			134	
09/03/20	SIS #3 (Office Sump	944	7.79	36.01	19,932	24.08	5.45	11.0		1097	197	100	72	11.0	207	661	0.00		185	BOD - N/A - equipment failure; Bolton will excavate sump following week
12/04/20	SIS #3 (Office Sump	914	7.11	35.86	19,849	25.0	1.54	23.6	33.2	2290	13	336	123	6.8	394	120	0.18		177	New sump configuration; open air pit
03/05/21	SIS #3 (Office Sump	849	7.11	36.33	20,109	23.4	0.35	19.6	38.5	2896	2	403	380	7.2	2534	108			185	
05/28/21	SIS #3 (Office Sump	1014	7.77	35.90	19,871	27.7	7.99	27.2	23.1	2832	2	315	178	9.0	693	453			181	
08/13/21	SIS #3 (Office Sump	855	7.37	35.37	19,578	25.4	7.16	84.0	86.0	3519	73	500	137	7.0	937	555			101	
10/29/21	SIS #3 (Office Sump	853	7.18	35.92	19,882	24.3	6.27	54.0	34.9	4712	101	634	405	7.4	2954	315			58	
02/11/22	SIS #3 (Office Sump	853	7.47	34.68	19,196	15.1	6.64	20.8	16.7	1948	358	311	74	6.3	190	1513			109	
05/13/22	SIS #3 (Office Sump	920	7.03	34.39	19,035	26.0	0.39	18.0	35.4	3464	11	526	323	6.6	1724	421			98	
08/11/22	SIS #3 (Office Sump	918	7.51	34.61	19,157	21.9	6.21	12.8	3.0	1147	300	213	87	5.4	85	1255			73	

Shrimp Improvement Systems Hawaii LLC
#3 Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'44.26"N
Longitude: 156° 3'27.69"W

Seawater Disposal Trench Dimensions

L (ft.)	W (ft.)	D (ft.)
55	13	7

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) SM4500-O G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (Kgal/day)	Comment
12/08/22	SIS #3 (Office Sump)	908	7.29	34.83	19,279	23.6	6.26	56.6	20.8	2598	78	383	65	6.8	738	227			91	
03/02/23	SIS #3 (Office Sump)	919	7.61	34.51	19,102	21.6	6.11	43.0	10.5	1260	98	292	141	4.3	117	433	0.13		182	
05/12/23	SIS #3 (Office Sump)	938	7.54	34.68	19,196	24.4	6.57	16.8	3.1	1279	439	318	151	4.0	350	1812			131	
Mean			7.81	34.95	19,343	24.88	5.16	24.7	12.8	1463	141	288	121	5.9	455	625	0	#DIV/0!	223	
Std. Dev.			0.32	1.57	870	2.22	1.39	26.8	14.3	983	220	248	106	2.3	648	1091	0	#DIV/0!	160	
n=			55	55	55	55	55	56	51	50	46	50	46	50	46	46	3	0	50	

Shrimp Improvement Systems Hawaii LLC
#4 Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'20.53"
Longitude: 156° 3'17.97"W

Seawater Disposal Trench Dimensions
L (ft.) W (ft.) D (ft.)

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H+	Sal. (PSU) SM2520-B	Temp. (˚C)	DO (mg/L) SM4500-O G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Discharge Volume (Kgal/day)	Comment
12/03/15	SIS DAF Unit	1015	7.29	33.82	25.60	0.84	5.8	10.9	2949	294.1	515.8	408.1	5.7	2907.2	829.9	75	
02/25/16	SIS DAF Unit																Pump failure, system not operational. Anticipated operational in mid-April 2016
06/01/16	SIS DAF Unit	1021	6.78	21.78	27.99	0.26	27.0	36.8	5698	248	631	61	9.0	5630.0	10838	68	
09/07/16	SIS DAF Unit	932	7.91	15.72	27.16	5.82	79.6	34.7	6488	1260	857	625	7.6	3329.1	21372	60	Unit is overflowing
09/23/16	SIS DAF Unit	931	7.90	15.64	27.34	2.85	18.5	28.7	4545	634	1244	247	3.7	5991	24487		DAF unit not working, resample
11/18/16	SIS DAF Unit	1125														68	trench
12/02/16	SIS DAF Unit	934	7.67	31.00	23.91	6.27	60.0										DAF with geobag installed. Sample was clear but hard to filter
12/09/16	SIS DAF Unit	1008	7.89	30.51	27.33	5.94	51.5	7.7	2877	2208	313	318	9.2	510	3190		trials
03/16/17	SIS DAF Unit	930	7.56	3.78	27.17	11.59	4.6	7.2	2588	1130	383	329	6.8	1354	21122	68	present
05/25/17	SIS DAF Unit	1011	7.59	26.70	27.77	6.43	22.8	5.2	1674	505	246	196	6.8	1044	5477	78	Ozone generator on for ~ 2 months, no chlorine, still hard to filter due to polymer
09/14/17	SIS DAF Unit	921	7.95	27.07	27.71	11.12	4.3	2.9	1508	832	214	187	7.0	696	5176	74	Continuos Ozone injection this quarter. Filter 1L for TSS - no polymer present
12/14/17	SIS DAF Unit	914	7.28	19.94	24.43	16.28	8.1	2.3	1242	918	333	396	3.7	23	9547	72	
03/15/18	SIS DAF Unit	917	7.65	31.90	23.23	5.45	67.4	7.3	2183	1881	677	665	3.2		2650	55	Polymer in filter. Ammonia not analyzed due to potentially clogging coils in heater.
06/21/18	SIS DAF Unit	912	7.84	33.36	27.77	5.59	18.0	5.5	1488	715	295	207	5.0	381	1701	49	
09/20/18	SIS DAF Unit	1126	6.86	7.49	28.89	0.47	7.9	22.2	3003	1584	1000	978	3.0	2906	19474	38	
12/21/18	SIS DAF Unit																System was shut down Oct/Nov 2018, will be shutdown for a while
03/13/19	SIS DAF Unit																DAF unit still shut down
06/14/19	SIS DAF Unit																DAF unit still shut down
09/20/19	SIS DAF Unit																DAF unit still shut down
11/07/19	SIS DAF Unit																DAF unit still shut down
Mean			7.55	22.98	26.64	6.07	28.9	14.3	3020	1017	559	385	5.9	2252	10489	64	
Std. Dev.			0.39	9.93	1.76	4.69	26.5	12.7	1707	619	331	257	2.2	2088	8779	12	
n=			13	13	13	13	13	12	12	12	12	12	12	11	12	11	

Taylor Shellfish-Kona Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'46.86"N
Longitude: 156° 3'30.21"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
19	12	8

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H+	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) SM4500-O G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
12/02/10	T#1 Main Office	1044		34.05	18,847			29.4	5.9	2309	1645	631	349.6	3.7	334	1619			510	
02/09/11	T#1 Main Office	821	7.79	34.36	19,019	18.55	6.38	17.9	3.0	1899		373		5.1					614	
05/11/11	T#1 Main Office	842	7.80	34.25	18,958	19.00	5.67	11.4	2.0	1644		267		6.2					630	
08/18/11	T#1 Main Office	930	7.80	34.38	19,030	19.01	4.13	14.0	3.3	1724		307		5.6					592	
12/08/11	T#1 Main Office	915	7.77	34.46	19,074	21.50	4.14	11.9	2.1	2154		231		9.3					622	
02/29/12	T#1 Main Office	900	7.85	34.89	19,312	21.28	4.72	4.7	2.0	1834	1575	182	154	10.1	113	750			648	
05/17/12	T#1 Main Office	1003	7.61	34.21	18,936	20.39	4.23	16.2	2.9	1532	1318	245	223	6.3	169	1380			665	
08/08/12	T#1 Main Office	915	7.66	34.47	19,080	19.33	4.79	7.9	4.0	3425	2585	366	245	9.4	179	1192			613	
12/06/12	T#1 Main Office	922	7.63	34.31	18,991	20.04	4.37	3.3	2.0	1660	1330	263	244	6.3	145	1231			470	
02/21/13	T#1 Main Office	1005	7.51	34.87	19,301	20.38	5.04	6.2	2.5	2100	1803	269	242	7.8	158	1055			570	
05/15/13	T#1 Main Office	938	7.53	34.75	19,234	22.14	4.36	6.7	2.7	1984	1503	318	257	6.2	269	1119			523	
08/28/13	T#1 Main Office	926	7.85	34.52	19,107	21.06	6.54	17.2	4.7	1584	1245	162	94	9.8	71	1064			561	
12/12/13	T#1 Main Office	1000	7.41	34.66	19,185	19.87	7.01	5.3	2.0	1414	1376	280	310	5.1	43	1282			576	
03/05/14	T#1 Main Office	941	7.73	34.47	19,080	18.41	6.03	12.9	3.1	2683	2416	548	445	4.9	84	946			633	
06/26/14	T#1 Main Office	927	7.81	34.79	19,257	22.07	5.42	7.3	7.7	987	837	134	123	7.4	94	1164			629	
09/04/14	T#1 Main Office	907	7.79	34.90	19,318	23.20	4.86	10.9	3.5	2082	1440	336	189	6.2	361	1029			554	
12/18/14	T#1 Main Office	1021	7.57	34.65	19,179	5.05	5.05	8.7	3.9	2201	1831	255	168	8.6	171	1289			630	
03/12/15	T#1 Main Office	925	7.63	34.11	18,880	17.06	6.40	24.1	6.8	4779	4179	794	805	6.0	343	4046			577	
06/12/15	T#1 Main Office	905	7.73	34.57	19,135	17.81	6.98	22.4	5.0	1730	1162	230	84	7.5	80	1069			657	
09/02/15	T#1 Main Office	814	7.66	34.05	18,847	21.03	5.93	13.6	5.4	1842	1380	182	136	10.1	177	1020			397	
12/03/15	T#1 Main Office	837	7.66	33.61	18,603	18.43	4.49	6.1	3.5	520	1608	73	243	7.1	237	1149			582	
02/24/16	T#1 Main Office	908	7.58	34.00	18,819	16.73	5.79	6.5	5.8	1432	960	256	197	5.6	107	1234			562	
06/02/16	T#1 Main Office	859	7.80	34.66	19,185	19.61	5.37	13.6	7.1	2500	1135	355	181	7.0	150	1139			614	
09/08/16	T#1 Main Office	803	7.64	35.00	19,373	16.91	5.56	11.2	5.4	2248	1706	354	268	6.3	231	2250			564	
12/07/16	T#1 Main Office	907	7.68	34.53	19,113	16.67	6.01	6.3	3.2	1491	1227	162	154	9.2	179	1455			572	
03/15/17	T#1 Main Office	904	7.80	34.61	19,157	18.40	4.99	17.2	2.3	1498	1140	204	125	7.4	196	937			586	
06/01/17	T#1 Main Office	908	7.63	34.54	19,118	18.00	3.43	18.9	3.9	1549	1238	233	165	6.6	201	1480			575	
08/30/17	T#1 Main Office	858	7.61	34.51	19,102	18.37	3.89	5.4	2.0	1139	850	163	127	7.0	226	1319			532	
12/13/17	T#1 Main Office	905	7.66	34.59	19,146	18.16	4.01	23.1	2.8	1499	1161	274	187	5.5	219	1329			488	
03/08/18	T#1 Main Office	927	7.66	34.42	19,052	18.47	7.15	11.9	4.5	1266	1019	219	140	5.8	144	1101			407	
06/14/18	T#1 Main Office	908	7.78	35.01	19,378	20.26	4.87	19.0	3.2	1442	822	209	108	6.9	58	916			455	
09/20/18	T#1 Main Office	906	7.51	32.27	17,862	22.65	4.90	8.9	4.8	987	783	125	95	7.9	122	1143			491	
12/12/18	T#1 Main Office	905	7.67	34.82	19,273	19.96	3.72	17.1	3.3	1466	942	211	89	6.9	128	930			482	
03/13/19	T#1 Main Office	912	7.67	34.99	19,367	18.45	5.92	25.8	6.2	2963	2756	286	179	10.3	125	1277			529	
06/13/19	T#1 Main Office	937	7.75	34.75	19,234	19.52	4.37	19.9	4.0	1103	793	161	64	6.8	127	1162			514	
09/19/19	T#1 Main Office	920	7.64	34.61	19,157	18.36	3.96	6.5	2.5	1255	1018	163	105	7.7	156	1360			571	
11/07/19	T#1 Main Office	900	7.59	34.90	19,318	19.57	3.07	20.2	4.0	1539	1285	159	106	9.7	183	1069			529	
03/01/20	T#1 Main Office																		555	No sample - COVID-19 shutdown
06/18/20	T#1 Main Office	918	7.66	36.32	20,104	18.41	4.00	14.0	5.3	1903	1428	214	130	8.9	197	1657			555	
09/03/20	T#1 Main Office	1025	7.55	35.84	19,838	18.39	5.44	3.8		1459	1140	116	107	12.5	106	1318	0.06		510	BOD - N/A - equipment failure
11/19/20	T#1 Main Office	921	7.50	35.31	19,544	18.1	4.96	7.4	3.9	2441	2015	226	183	10.8	191	1259	0		453	
03/25/21	T#1 Main Office	900	7.39	35.53	19,666	18.9	4.36	5.8	2.7	1732	1426	136	106	12.8	174	1263			514	
05/27/21	T#1 Main Office	944	7.36	35.32	19,550	19.3	4.82	7.0	3.3	1835	1315	143	113	12.8	258	1392			493	
08/26/21	T#1 Main Office	909	7.73	35.37	19,578	19.0	4.31	5.9	2.9	1783	1405	290	252	6.2	152	1115			497	
12/02/21	T#1 Main Office	913	7.71	34.84	19,284	17.8	4.82	5.5	2.0	1730	1356	152	120	11.4	144	1134			500	
03/03/22	T#1 Main Office	1023	7.58	34.80	19,262	20.0	4.80	6.8	3.2	1585	1096	127	65	12.5	189	993			403	
05/19/22	T#1 Main Office	903	7.50	34.68	19,196	20.1	4.85	5.8	2.8	1702	1216	139	65	12.3	176	894			514	
08/11/22	T#1 Main Office	931	7.52	35.05	19,401	19.1	5.11	5.8	2.1	1582	1191	139	96	11.4	143	1198			452	
11/30/22	T#1 Main Office	927	7.79	34.64	19,174	16.6	5.68	25.0	6.7	2860	1649	344	134	8.3	316	1315			512	
02/08/23	T#1 Main Office	935	7.67	33.94	18,786	18.2	5.42	13.2	4.2	2236	1572	176	155	12.7	358	1379			457	
05/12/23	T#1 Main Office	1017	7.67	34.30	18,985	16.4	5.56	20.4	3.7	1766	1365	160	145	11.0	329	1642			358	
08/30/23	T#1 Main Office	923	7.64	34.55	19,124	22.2	4.75	11.6	3.1	1270	781	146	109	8.7	232	975				
11/02/23	T#1 Main Office	940	7.86	34.51	19,102	20.2	5.05	6.2	2.2	1232	748	117	72	10.6	140	1180		178.5		
02/15/24	T#1 Main Office	923	7.63	34.79	19,257	19.7	5.22	6.8	2.7	1372	806	120	64	11.4	169	875		159.4		
05/16/24	T#1 Main Office	1039	7.92	34.60	19,151	20.6	4.71	6.7	2.9	2104	1436	174	120	12.1	168	1144		151.3		

Taylor Shellfish-Kona Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'46.86"N
Longitude: 156° 3'30.21"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
19	12	8

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H⁺	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
Mean			7.66	34.63	19,167	19.03	5.05	12.0	3.7	1816	1400	239	173	8.4	180	1265	0	163	539	
Std. Dev.			0.12	0.57	313	2.52	0.90	6.7	1.5	666	593	129	120	2.5	77	471	0	14	72	
n=			53	54	54	53	53	54	53	54	50	54	50	54	50	50	2	3	51	

Taylor Shellfish-Kona Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'45.69"N
Longitude: 156° 3'30.19"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
11	10	8

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H+	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) SM4500-O G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
12/02/10	T#2 New Hatchery	1050						10.9	2.3	2132.3	1930	196.4	149.2	10.9	218	997			449	
02/09/11	T#2 New Hatchery	848	7.77	34.22	18,941	18.73	7.47	24.0	5.2	2337		306		7.6					543	
05/11/11	T#2 New Hatchery	858	7.95	33.82	18,720	17.23	7.46	9.6	2.3	1508		308		4.9					557	
08/18/11	T#2 New Hatchery	940	7.80	34.54	19,118	18.31	6.46	10.1	2.2	1286		202		6.4					523	
12/08/11	T#2 New Hatchery	920	7.84	34.59	19,146	18.47	7.72	18.3	3.1	1756		209		8.4					551	
02/29/12	T#2 New Hatchery	921	7.67	34.82	19,273	19.06	6.86	10.5	2.2	1401	1078	231	178	6.1	124	1108			574	
05/17/12	T#2 New Hatchery	1016	7.84	34.44	19,063	20.21	6.99	6.0	2.0	1198	1125	161	171	7.4	130	1132			588	
8/8//12	T#2 New Hatchery	930	7.75	34.63	19,168	18.37	7.02	4.7	2.0	1015	759	134	99	7.6	122	1154			538	
12/06/12	T#2 New Hatchery	939	7.77	34.68	19,196	18.92	7.12	3.3	2.3	1562	1284	240	231	6.5	133	965			412	
02/21/13	T#2 New Hatchery	1023	7.69	34.47	19,080	18.54	6.17	42.3	2.4	926	578	269	107	3.4	119	1423			501	
05/15/13	T#2 New Hatchery	950	7.74	34.87	19,301	22.46	5.62	14.0	6.7	3615	2766	350	212	10.3	414	1059			459	
08/28/13	T#2 New Hatchery	936	7.65	34.48	19,085	20.03	7.12	7.2	4.2	1824	1513	291	252	6.3	478	1211			492	
12/12/13	T#2 New Hatchery	1011	7.43	34.74	19,229	17.74	5.62	5.5	2.0	1616	1457	249	258	6.5	162	1319			505	
03/05/14	T#2 New Hatchery	954	7.73	34.43	19,057	16.50	7.15	10.0	2.0	1566	1245	266	231	5.9	135	1634			557	
06/26/14	T#2 New Hatchery	939	7.77	34.60	19,151	20.19	7.22	10.4	14.1	1760	1407	321	212	5.5	170	1858			553	
09/04/14	T#2 New Hatchery	918	7.71	33.80	18,709	20.50	5.96	32.1	5.8	2258	1625	409	244	5.5	326	1618			486	
12/18/14	T#2 New Hatchery	1027	7.59	35.13	19,445	19.32	6.36	24.6	3.0	2033	1602	269	215	7.6	232	1095			553	
03/12/15	T#2 New Hatchery	938	7.62	34.34	19,008	17.35	7.58	15.9	4.8	5088	4038	875	919	5.8	650	2316			502	
06/12/15	T#2 New Hatchery	923	7.79	34.68	19,196	20.07	6.10	32.5	7.9	2627	2603	410	354	6.4	225	926			573	
06/25/15	T#2 New Hatchery	934	7.75	34.03	18,836	20.09	6.16	49.0	6.8	1964	1103	399	151	4.9	130	962				resampled to verify
09/02/15	T#2 New Hatchery	835	7.54	33.24	18,399	19.13	8.02	8.6	4.3	2305	1815	332	282	6.9	166	1442			345	
12/03/15	T#2 New Hatchery	854	7.75	33.27	18,415	18.48	6.45	7.5	3.1	592	1905	69	299	8.6	285	1137			480	
02/24/16	T#2 New Hatchery	934	7.72	34.10	18,875	18.23	7.56	5.1	5.5	1561	653	2989	258	0.5	249	819			490	
06/02/16	T#2 New Hatchery	920	7.89	32.66	18,078	21.64	7.53	84.0	16.6	6980	5618	1060	707	6.6	371	2605			535	
09/08/16	T#2 New Hatchery	823	8.05	34.38	19,030	19.02	6.92	52.4	13.5	15985	13941	1591	1053	10.0	395	2472			491	
09/22/16	T#2 New Hatchery	812	7.94	34.46	19,074	19.85	7.23	7.5	4.7	4865	3976	661	614	7.4	525	1919				resample
11/18/16	T#2 New Hatchery	829	7.59	32.98	18,255	18.30	7.61	8.8	4.5											resample
12/02/16	T#2 New Hatchery	838	7.51	33.05	18,294	17.60	7.94	16.2												resample
12/07/16	T#2 New Hatchery	929	7.66	34.08	18,864	16.34	7.71	5.2	3.0	1535	1204	209	202	7.4	240	1420			498	
03/15/17	T#2 New Hatchery	918	7.85	33.54	18,565	20.51	5.71	7.7	2.2	2011	1589	319	262	6.3	386	745			511	
06/01/17	T#2 New Hatchery	928	7.81	34.56	19,129	20.26	4.98	10.4	4.4	2546	2079	305	187	8.3	221	1037			501	
08/30/17	T#2 New Hatchery	918	7.77	34.07	18,858	22.16	8.06	31.2	5.4	1717	1030	385	106	4.5	244	939			462	
12/13/17	T#2 New Hatchery	921	7.75	34.88	19,306	19.08	4.74	8.9	2.8	2226	1867	283	223	7.9	251	858			424	
03/18/18	T#2 New Hatchery	949	7.70	34.31	18,991	16.21	7.28	20.8	3.7	1813	1528	229	157	7.9	135	1293			354	
06/14/18	T#2 New Hatchery	926	7.85	33.61	18,603	20.97	6.94	15.5	2.2	1669	1058	218	164	7.7	170	760			396	
09/20/18	T#2 New Hatchery	923	7.83	34.16	18,908	22.65	6.38	6.8	4.9	1667	1361	74	67	22.4	84	1102			429	
12/12/18	T#2 New Hatchery	920	7.85	34.50	19,096	19.17	4.87	41.8	5.5	2686	1902	325	119	8.3	102	1253			419	
03/13/19	T#2 New Hatchery	931	7.59	34.68	19,196	18.39	7.60	60.1	5.1	1121	804	181	37	6.2	140	1050			462	
06/13/19	T#2 New Hatchery	950	7.85	34.03	18,836	18.96	8.02	8.7	4.0	1430	1142	150	62	9.5	114	1194			449	
09/19/19	T#2 New Hatchery	938	7.80	34.18	18,919	20.96	7.35	9.0	3.6	1340	1008	156	78	8.6	101	896			498	
11/07/19	T#2 New Hatchery	915	7.77	34.23	18,947	18.44	7.53	6.8	4.7	1337	1045	98	90	13.6	109	1370			472	
03/01/20	T#2 New Hatchery																		526	No sample - COVID-19 shutdown
06/18/20	T#2 New Hatchery	927	7.84	36.61	20,264	19.70	7.32	7.1	6.2	3831	3498	302	278	12.7	199	1121			498	
09/03/20	T#2 New Hatchery	1035	7.65	35.57	19,688	19.40	7.31	5.2		2908	2557	194	188	15.0	251	1157	0		458	BOD - N/A - equipment failure
11/19/20	T#2 New Hatchery	935	7.71	35.26	19,517	18.6	7.33	6.8	3.1	2336	2004	198	165	11.8	183	1056	0		427	
03/25/21	T#2 New Hatchery	916	7.66	35.54	19,672	19.3	7.09	5.5	2.4	1562	1197	130	111	12.1	196	1062			484	
05/27/21	T#2 New Hatchery	958	7.72	35.57	19,688	19.1	7.14	8.3	2.5	1321	855	102	95	13.0	172	1017			465	
08/26/21	T#2 New Hatchery	920	7.77	35.03	19,389	17.8	7.34	12.3	4.2	1856	1276	278	193	6.7	118	1276			469	
12/02/21	T#2 New Hatchery	927	7.75	33.24	18,399	18.7	6.98	3.8	2.1	2114	1766	171	160	12.3	175	1077			471	
03/03/22	T#2 New Hatchery	1037	7.65	34.61	19,157	19.9	7.22	4.2	2.0	2048	1637	171	125	11.9	223	858			380	
05/19/22	T#2 New Hatchery	915	7.65	34.55	19,124	20.1	7.14	5.2	2.6	2416	1893	200	155	12.1	243	1064			484	
08/11/22	T#2 New Hatchery	943	7.59	34.47	19,080	16.5	7.52	5.0	2.0	1282	1030	136	112	9.4	171	1331			427	
11/30/22	T#2 New Hatchery	944	7.74	34.73	19,223	20.1	7.23	5.9	2.0	1567	1241	130	120	12.1	194	842			483	
02/08/23	T#2 New Hatchery	952	7.69	34.25	18,958	18.6	7.11	21.2	5.5	2505	1354	310	169	8.1	588	896			431	
05/12/23	T#2 New Hatchery	1039	7.80	34.41	19,046	18.9	7.22	11.0	3.7	1955	1407	169	130	11.6	422	949			347	Pipe sump #3 redirected to this sump during construction work
08/30/23	T#2 New Hatchery	938	8.20	34.53	19,113	18.5	7.44	11.1	4.7	1459	795	227	134	6.4	33	1123				chlorine smell

Taylor Shellfish-Kona Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'45.69"N
Longitude: 156° 3'30.19"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
11	10	8

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) SM4500-O G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
11/02/23	T#2 New Hatchery	956	7.86	34.53	19,113	22.1	6.77	5.9	3.0	1698	998	137	104	12.4	302	814		241.9		
02/15/24	T#2 New Hatchery	943	7.92	34.40	19,041	19.5	7.14	10.8	3.4	1374	751	133	59	10.3	120	851		156.8		
05/16/24	T#2 New Hatchery	1058	8.00	34.45	19,068	21.4	6.98	8.4	2.0	996	723	76	58	13.1	111	723		156.2		
Mean			7.76	34.39	19,033	19.24	6.96	15.5	4.3	2287	1858	336	217	8.6	226	1198	0	185	480	
Std. Dev.			0.13	0.68	375	1.48	0.77	15.8	2.9	2152	1952	438	196	3.5	133	410	0	49	58	
n=			57	57	57	57	57	58	56	56	52	56	52	56	52	52	2	3	51	

Discharge GPS:
Latitude: 19°43'44.98"N
Longitude: 156° 3'30.67"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
26	21	4

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) SM4500-O G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
12/02/10	T#3 Baby Clams	1044		34.51	19,102			2.7	2.0	1670.9	1466	202.9	170.9	8.2	157	1271			325	
02/09/11	T#3 Baby Clams	854	7.88	34.09	18,869	19.63	6.39	13.6	2.0	1546		192		8.1					395	
05/11/11	T#3 Baby Clams	901	7.79	34.61	19,157	19.06	6.59	10.7	2.0	1302		133		9.8					405	
08/18/11	T#3 Baby Clams	948	7.87	34.33	19,002	16.70	5.75	16.4	2.4	1491		192		7.8					380	
12/08/11	T#3 Baby Clams	924	7.92	34.53	19,113	18.77	6.33	4.3	2.0	1578		163		9.7					401	
02/29/12	T#3 Baby Clams	928	7.85	34.93	19,334	19.38	5.78	8.3	2.0	1349	1101	107	69	12.6	90	974			418	
05/17/12	T#3 Baby Clams	1020	7.83	34.71	19,212	20.33	5.39	4.2	2.0	2004	879	468	123	4.3	150	869			428	
08/08/12	T#3 Baby Clams	938	7.81	34.58	19,140	17.08	6.67	5.9	2.0	1267	942	149	81	8.5	94	1347			382	
12/06/12	T#3 Baby Clams	946	7.76	33.93	18,781	19.07	6.08	8.4	3.0	1707	1230	265	125	6.4	88	1647			291	
02/21/13	T#3 Baby Clams	1028	7.67	34.80	19,262	18.74	6.37	8.2	2.0	1595	1221	188	109	8.5	98	1094			356	
05/15/13	T#3 Baby Clams	954	7.65	34.77	19,246	20.43	5.27	8.0	2.1	1524	1093	174	102	8.8	198	1156			325	
08/28/13	T#3 Baby Clams	944	7.81	34.29	18,980	18.68	6.27	7.3	2.0	1446	1136	163	48	8.9	253	1478			348	
12/12/13	T#3 Baby Clams	1016	7.59	34.87	19,301	17.86	5.21	3.2	2.0	1395	1313	149	122	9.3	116	1446			358	
03/05/14	T#3 Baby Clams	1000	7.81	33.46	18,520	19.11	5.72	23.3	3.8	1737	1196	356	157	4.9	161	1031			396	
06/26/14	T#3 Baby Clams	948	7.90	34.73	19,223	19.43	7.81	10.4	12.0	1129	824	137	48	8.2	95	1682			393	
09/04/14	T#3 Baby Clams	926	7.81	34.60	19,151	19.51	6.55	11.0	3.6	1687	1233	287	86	5.9	146	1404			345	
12/18/14	T#3 Baby Clams	1034	7.80	34.97	19,356	20.09	5.62	6.8	3.0	1879	1582	132	43	14.2	84	1112			393	
03/12/15	T#3 Baby Clams	945	7.70	34.28	18,974	17.05	7.02	5.4	4.3	4279	2533	492	341	8.7	406	2667			347	
06/12/15	T#3 Baby Clams	933	7.90	34.19	18,925	18.94	7.39	127.0	11.2	2602	1053	908	97	2.9	72	1267				Invalid sample due to sampling error
06/25/15	T#3 Baby Clams	941	7.91	34.19	18,925	18.75	6.56	8.1	3.0	1457	1175	137	78	10.7	44	898			396	Resample
09/02/15	T#3 Baby Clams	841	7.62	34.35	19,013	9.31	7.23	12.2	3.5	1693	1351	140	122	12.1	155	1065			238	
12/03/15	T#3 Baby Clams	907	7.98	0.37	205	20.10	7.85	185.0	9.9	656	1293	223	233	2.9	133	1578				Cleaning down 2 raceways
12/16/15	T#3 Baby Clams	935	7.82	33.86	18,742	19.37	7.51	22.5	5.8	1759	1269	233	112	7.6	190	957			331	Resample
02/24/16	T#3 Baby Clams	941	7.76	34.30	18,985	19.06	6.52	6.5	6.5	1514	597	225	138	6.7	356	1058			338	
06/02/16	T#3 Baby Clams	927	7.83	34.25	18,958	19.80	6.57	11.2	7.9	3179	818	294	84	10.8	390	1428			370	
09/08/16	T#3 Baby Clams	828	8.09	34.55	19,124	20.13	6.46	40.7	9.3	3001	1610	669	120	4.5	26	1482			339	
09/22/16	T#3 Baby Clams	822	7.98	35.15	19,456	16.47	6.90	6.6	4.0	3107	2244	299	186	10.4	253	2061				resample
11/18/16	T#3 Baby Clams	837	7.73	34.43	19,057	16.37	6.57	7.2	3.5											resample
12/02/16	T#3 Baby Clams	844	7.69	34.51	19,102	17.01	7.28	9.0												resample
12/07/16	T#3 Baby Clams	934	7.79	34.53	19,113	14.30	7.89	7.2	2.7	1372	1055	141	130	9.7	193	1671			330	
03/15/17	T#3 Baby Clams	924	7.98	34.49	19,091	18.47	5.77	7.3	2.0	1230	846	157	80	7.9	177	1071			354	
06/01/17	T#3 Baby Clams	936	7.94	34.64	19,174	19.35	5.05	32.3	5.4	1537	941	273	102	5.6	206	1160			347	
08/30/17	T#3 Baby Clams	924	7.86	34.47	19,080	20.07	6.66	7.6	2.6	1160	839	138	55	8.4	167	1049			319	
12/13/17	T#3 Baby Clams	927	7.82	35.03	19,389	18.68	4.30	27.5	4.4	1575	1336	227	92	6.9	179	931			295	
03/08/18	T#3 Baby Clams	956	7.85	34.67	19,190	17.65	7.60	16.4	3.9	1445	1157	170	91	8.5	121	851			244	
06/14/18	T#3 Baby Clams	932	7.88	35.03	19,389	19.29	6.61	11.1	2.9	1309	887	179	60	7.3	97	997			274	
09/20/18	T#3 Baby Clams	938	7.77	34.65	19,179	22.90	6.35	9.2	4.9	1215	1066	76	49	16.0	102	1047			297	
12/12/18	T#3 Baby Clams	930	7.90	34.87	19,301	17.97	4.67	18.5	3.5	1853	1435	176	77	10.5	90	1267			292	
03/13/19	T#3 Baby Clams	937	7.81	35.21	19,489	20.05	7.32	8.5	3.4	1760	1528	186	112	9.5	118	777			320	
06/13/19	T#3 Baby Clams	956	8.09	34.87	19,301	22.17	7.22	17.8	3.8	1197	963	114	43	10.5	93	769	0.06		311	
09/19/19	T#3 Baby Clams	943	7.87	34.74	19,229	24.20	6.36	6.4	3.8	1454	1262	160	118	9.1	107	701			345	
11/07/19	T#3 Baby Clams	925	7.81	34.95	19,345	18.63	6.95	47.0	2.9	1855	1663	151	133	12.3	124	1134			343	
03/01/20	T#3 Baby Clams																		380	No sample - COVID-19 shutdown
06/18/20	T#3 Baby Clams	932	7.88	36.80	20,369	20.24	6.88	6.7	4.8	1325	1092	120	65	11.1	116	938			370	
09/03/20	T#3 Baby Clams	1042	7.74	35.42	19,605	19.94	6.81	12.4		2900	2124	230	186	12.6	189	1422	0		340	BOD - N/A - equipment failure
11/19/20	T#3 Baby Clams	942	7.87	35.44	19,616	19.0	7.51	4.4	6.5	2189	1988	194	171	11.3	82	889	0		336	
03/25/21	T#3 Baby Clams	923	7.94	35.68	19,749	19.4	7.16	11.1	5.2	1380	629	101	36	13.6	143	833			382	
05/27/21	T#3 Baby Clams	1003	7.90	35.54	19,672	19.5	7.40	12.4	4.8	1426	802	164	84	8.7	150	880			366	
08/26/21	T#3 Baby Clams	925	7.91	35.24	19,506	18.3	7.50	15.0	4.6	1595	885	181	48	8.8	63	987			369	
12/02/21	T#3 Baby Clams	932	7.73	34.83	19,279	17.6	7.18	47.0	9.6	2068	1135	424	138	4.9	171	1047			371	
03/03/22	T#3 Baby Clams	1041	7.73	34.75	19,234	20.8	6.23	5.2	3.5	1799	1254	129	94	14.0	253	641			299	
05/19/22	T#3 Baby Clams	919	7.65	34.60	19,151	21.1	6.47	9.6	3.3	1705	983	137	51	12.5	232	740			382	
08/11/22	T#3 Baby Clams	948	7.69	34.60	19,151	21.3	6.29	10.0	3.2	1487	872	121	29	12.3	235	986			336	
11/30/22	T#3 Baby Clams	951	7.65	34.68	19,196	18.4	6.47	5.1	2.0	1554	1250	136	134	11.5	262	977			381	
02/08/23	T#3 Baby Clams	1000	7.72	34.43	19,057	18.5	6.61	23.4	4.5	2383	1345	289	163	8.2	508	869			340	
05/12/23	T#3 Baby Clams	1047	7.79	34.49	19,091	16.3	6.84	14.2	3.8	1735	1243	132	102	13.2	339	1081			280	sump under construction, sampled at makai end

Discharge GPS:
Latitude: 19°43'44.98"N
Longitude: 156° 3'30.67"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
26	21	4

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) SM4500-O G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
08/30/23	T#3 Baby Clams	943	8.09	34.49	19,091	19.1	9.59	8.9	3.8	1001	699	67	28	14.9	64	1030				sump still under contruction, no cover
11/02/23	T#3 Baby Clams	1003	8.01	33.86	18,742	17.3	7.81	100.5	21.5	2352	889	383	61	6.1	153	1378		237.8		
02/15/24	T#3 Baby Clams	949	8.21	34.90	19,318	21.7	8.05	6.7	2.2	948	620	84	51	11.3	80	574		150.9		
05/16/24	T#3 Baby Clams	1103	8.14	34.38	19,030	23.2	7.47	8.2	4.6	1702	1236	152	110	11.2	97	747		155.0		
Mean			7.84	34.09	18,870	18.99	6.67	18.8	4.4	1720	1192	215	104	9.3	163	1140	0	#DIV/0!	347	
Std. Dev.			0.13	4.49	2,487	2.17	0.91	30.4	3.3	617	393	145	56	3.0	97	369	0	#DIV/0!	42	
n=			58	59	59	58	58	59	57	57	53	57	53	57	53	53	3	3	51	

Taylor Shellfish-Kona Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'45.21"N
Longitude: 156° 3'30.85"W

Seawater Disposal Trench Dimensions
L (ft) W (ft) D (ft)

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		(2400)	(unit)	(PSU)	(mg/L)	(˚C)	(mg/L)	(mg/L)	(mg/L)	(µg N/L)	(µg N/L)	(µg P/L)	(µg P/L)	(ratio)	(µg N/L)	(µg Si/L)	(mg/L)	(mV)	(kgal/day)	
			SM4500-H+	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
09/13/12	T#4 Hatchery (Steady State)	828	7.87	35.15	19,456	23.26	6.00	2.6	2.0	245	115	37	18	6.6	13	408				
09/13/12	T#4 Hatchery (Tank Discharge)	837	7.98	35.18	19,473	23.78	6.28	4.0	2.0	1964	1661	68	60	28.9	86	401			98	
12/06/12	T#4 Hatchery	930	8.19	34.82	19,273	23.54	6.39	8.3	3.0	1092	807	57	41	19.2	59	753			75	
02/21/13	T#4 Hatchery	1011	8.01	34.60	19,151	22.36	6.07	2.7	2.0	833	607	64	53	13.0	59	1264			91	
05/15/13	T#4 Hatchery	943	8.07	34.93	19,334	23.59	5.11	18.6	2.0	1154	834	77	55	15.0	53	597			84	
08/28/13	T#4 Hatchery	931	8.08	34.73	19,223	24.94	5.87	5.9	2.3	566	358	47	41	12.0	55	389			90	
12/12/13	T#4 Hatchery	1005	7.88	34.91	19,323	23.34	5.24	2.7	2.0	2464	2255	100	103	24.6	119	542			92	
03/05/14	T#4 Hatchery	948	8.17	34.78	19,251	22.11	6.22	4.1	2.0	2002	1701	62	57	32.1	79	456			101	
06/26/14	T#4 Hatchery	932	8.17	34.63	19,168	24.44	6.01	4.7	8.4	1910	1793	64	66	29.8	123	679			101	
09/04/14	T#4 Hatchery	912	8.14	33.89	18,758	24.12	6.52	4.6	2.0	2360	2061	125	126	18.9	78	1096			89	
12/18/14	T#4 Hatchery	1021	8.07	34.84	19,284	22.77	5.30	2.7	2.0	1533	1274	70	59	21.9	3	748			101	
03/12/15	T#4 Hatchery	932	8.06	34.61	19,157	21.75	5.65	2.5	3.5	2582	1633	147	119	17.5	228	842			97	
06/12/15	T#4 Hatchery	916	8.16	33.74	18,675	23.09	6.79	10.1	2.0	692	256	88	52	7.8	9	1143			111	
09/02/15	T#4 Hatchery	827	7.92	34.77	19,246	23.86	6.48	4.4	2.0	872	704	51	40	17.2	597	64			67	
12/03/15	T#4 Hatchery																			No Flow - Operations shutdown till New Year
02/24/16	T#4 Hatchery	924	8.18	34.58	19,140	23.15	5.69	3.9	4.6	376	259	67	48	5.6	11	301			95	
06/02/16	T#4 Hatchery	912	8.15	34.81	19,268	21.32	6.27	3.5	4.2	753	483	110	49	6.8	34	948			104	
09/08/16	T#4 Hatchery	817	8.38	34.04	18,842	23.78	5.89	4.5	2.0	1200	1044	89	107	13.5	22	1365			95	
12/07/16	T#4 Hatchery	921	8.02	34.19	18,925	18.60	6.83	3.3	2.0	1330	1068	75	72	17.6	43	1612			97	
03/22/17	T#4 Hatchery	856	7.97	34.29	18,980	19.84	7.18	3.9	2.0	653	517	58	49	11.2	26	958			99	
06/01/17	T#4 Hatchery	920	8.04	33.39	18,482	21.22	4.69	13.7	2.0	1971	1605	83	66	23.7	28	1533			97	
08/30/17	T#4 Hatchery	911	8.03	34.52	19,107	21.57	6.16	2.9	2.0	248	168	43	28	5.8	19	698			90	
12/13/17	T#4 Hatchery	913	8.05	34.13	18,891	20.64	4.33	5.5	2.0	1184	967	57	50	20.8	70	1188			77	
03/08/18	T#4 Hatchery	941	8.03	32.52	18,000	21.37	7.46	5.0	2.0	844	638	98	58	8.6	24	2053			69	
06/14/18	T#4 Hatchery	920	8.06	33.30	18,432	31.71	6.26	10.9	2.0	1527	1032	64	55	23.8	76	1445			77	
09/20/18	T#4 Hatchery	931	7.67	34.36	19,019	22.40	6.71	5.4	4.2	1071	833	124	98	8.7	133	1037			83	
12/12/18	T#4 Hatchery	912	8.06	33.90	18,764	19.55	4.59	5.4	2.0	2396	1934	116	99	20.7	2	1570			76	
03/13/19	T#4 Hatchery	926	7.99	35.18	19,473	21.16	6.63	3.1	2.0	710	580	46	35	15.5	2	530			89	
06/21/19	T#4 Hatchery	840	7.94	34.96	19,351	21.04	7.09	7.5	3.1	1620	1384	92	84	17.6	109	976			87	
09/19/19	T#4 Hatchery	932	8.55	31.08	17,203	19.90	6.52	7.9	2.0	738	619	94	76	7.9	8	3375			97	
11/07/19	T#4 Hatchery	908	7.98	34.54	19,118	22.16	6.13	3.1	2.2	625	518	46	53	13.5	33	909			86	
03/01/20	T#4 Hatchery																		0	No sample - COVID-19 shutdown
06/18/20	T#4 Hatchery																		0	No flow - system shut down
09/03/20	T#4 Hatchery																		0	No flow - system shut down
11/19/20	T#4 Hatchery	928	7.97	35.25	19,511	19.5	7.44	2.6	3.9	1213	981	73	62	16.6	43	919	0		78	
03/25/21	T#4 Hatchery																		0	No flow - system shut down
05/27/21	T#4 Hatchery																		0	No flow - system shut down
08/26/21	T#4 Hatchery																		0	No flow - system shut down
12/02/21	T#4 Hatchery																		0	No flow - system shut down
03/03/22	T#4 Hatchery																		0	No flow - system shut down
05/19/22	T#4 Hatchery																		0	No flow - system shut down
08/11/22	T#4 Hatchery																		0	No flow - system shut down
11/30/22	T#4 Hatchery																		0	No flow - system shut down
02/08/23	T#4 Hatchery																		0	No flow - system shut down
05/12/23	T#4 Hatchery	1031	7.85	34.43	19,057	16.4	7.77	6.9	2.0	1296	1075	99	101	13.1	82	1696			67	
08/30/23	T#4 Hatchery																			No flow - system shut down
11/02/23	T#4 Hatchery																			No flow - system shut down
02/15/24	T#4 Hatchery																			No flow - system shut down
05/16/24	T#4 Hatchery	1050	7.85	34.64	19,174	16.5	7.73	3.2	2.0	878	689	64	56	13.7	40	1367		171		
Mean			8.05	34.35	19,015	22.08	6.22	5.5	2.6	1240	983	77	65	16.0	72	1026	0	171	64	
Std. Dev.			0.16	0.84	464	2.71	0.85	3.6	1.3	660	579	27	26	7.1	106	625	#DIV/0!	#DIV/0!	42	
n=			33	33	33	33	33	33	33	33	33	33	33	33	33	33	1	1	31	

Taylor Shellfish-Kona Seawater Disposal Log

Discharge GPS:
Latitude: 19°43'45.21"N
Longitude: 156° 3'30.85"W

Seawater Disposal Trench Dimensions
L (ft) W (ft) D (ft)

Date (mm/dd/yy)	Sample Name	Time (2400)	pH (unit) SM4500-H	Sal. (PSU) SM2520-B	Chloride (mg/L)	Temp. (˚C)	DO (mg/L) SM4500-O G	TSS (mg/L) <30 mg/L SM2540D	BOD (mg/L) <30 mg/L SM5210B	Total Nitrogen (µg N/L) SM4500-NO3- F	Nitrate & Nitrite (µg N/L)	Total Phosphorous (µg P/L) SM 4500-P F	Ortho-Phosphate (µg P/L)	N : P (ratio)	Ammonia (µg N/L) SM 4500-NH3 G	Silicate (µg Si/L)	Chlorine (mg/L)	ORP (mV)	Discharge Volume (kgal/day)	Comment
06/25/15	T#5 Northern Bldg	940	8.11	34.80	19,262	23.32	5.99	2.5	2.0	2039.8	1740.7	88.6	83.2	23.0	97	409.6			111	Newly online discharge trench
09/02/15	T#5 Northern Bldg	820	7.92	34.79	19,257	24.46	6.39	5.8	2.4	2428	2132	105	94	23.2	542	132			67	
12/03/15	T#5 Northern Bldg	845	8.15	34.08	18,864	21.91	5.86	4.9	9.8	5783	5584	432	456	13.4	209	960			155	
02/24/16	T#5 Northern Bldg	917	8.12	34.65	19,179	23.75	5.61	3.1	4.4	844	712	64	61	13.2	42	139			95	
06/02/16	T#5 Northern Bldg	908	8.17	34.26	18,963	23.55	6.04	2.2	4.0	1056	796	108	52	9.8	2	710			104	
09/08/16	T#5 Northern Bldg	809	8.30	34.63	19,168	23.04	6.55	5.0	2.0	3880	3079	168	180	23.1	129	1069			95	
12/07/16	T#5 Northern Bldg	913	8.11	34.73	19,223	22.79	5.90	3.4	2.4	1260	1067	99	95	12.8	95	563			97	
03/15/17	T#5 Northern Bldg	910	8.27	34.59	19,146	24.21	4.76	5.1	2.0	687	502	58	45	11.9	35	189			99	
06/01/17	T#5 Northern Bldg	913	8.10	34.61	19,157	25.29	3.99	4.1	2.0	654	434	62	43	10.5	43	272			97	
08/30/17	T#5 Northern Bldg	905	8.17	18.10	10,019	26.63	6.32	4.1	2.0	370	156	39	21	9.5	27	261			90	
12/13/17	T#5 Northern Bldg																		0	No flow, system shut down till early 2018
03/08/18	T#5 Northern Bldg	933	8.12	18.40	10,185	23.40	6.96	5.5	2.2	255	94	29	19	8.7	23	66			69	
06/14/18	T#5 Northern Bldg	914	8.21	35.07	19,412	25.26	4.98	3.0	2.0	330	159	29	19	11.3	15	149			77	
09/20/18	T#5 Northern Bldg	916	7.97	34.21	18,936	27.31	5.28	6.8	2.7	541	393	41	28	13.2	56	134			83	
12/12/18	T#5 Northern Bldg																		0	No flow, system shut down till early 2019
03/13/19	T#5 Northern Bldg	918	8.07	34.71	19,212	23.75	5.83	6.4	2.0	418	319	53	37	7.9	6	484			89	
06/13/19	T#5 Northern Bldg	943	8.24	34.25	18,958	26.34	6.42	3.8	2.1	416	274	63	40	6.6	21	356			87	
09/19/19	T#5 Northern Bldg	924	8.18	34.20	18,930	27.58	5.55	4.2	2.0	621	442	62	46	10.0	34	527			96	
11/07/19	T#5 Northern Bldg																		0	No flow, system shut down will early 2020
03/01/20	T#5 Northern Bldg																		0	No sample - COVID-19 shutdown
06/18/20	T#5 Northern Bldg																		0	No flow - system shut down
09/03/20	T#5 Northern Bldg																		0	No flow - system shut down
11/19/20	T#5 Northern Bldg																		0	No flow - system shut down
03/25/21	T#5 Northern Bldg	907	7.95	35.78	19,805	21.6	6.73	2.8	2.0	749	582	62	61	12.2	21	481			88	
05/27/21	T#5 Northern Bldg	951	7.92	35.69	19,755	20.9	7.03	4.3	2.0	582	445	78	49	7.5	16	732			85	
08/26/21	T#5 Northern Bldg	914	8.06	35.31	19,544	24.6	6.25	9.5	4.7	3814	3338	1263	1241	3.0	115	584			85	
12/02/21	T#5 Northern Bldg	919	8.19	34.01	18,825	19.8	7.37	11.6	3.5	7104	6576	691	654	10.3	19	1638			86	
03/03/22	T#5 Northern Bldg	1029	8.00	34.52	19,107	20.3	7.10	5.0	2.0	1436	1142	165	123	8.7	5	968			69	
05/19/22	T#5 Northern Bldg	908	8.06	34.08	18,864	21.6	7.05	5.0	2.0	1686	1266	147	131	11.5	17	971			88	
08/11/22	T#5 Northern Bldg	937	8.08	34.08	18,864	20.6	7.04	4.0	2.0	1010	862	90	83	11.3	65	876			77	
11/30/22	T#5 Northern Bldg	932	8.00	34.74	19,229	24.8	6.13	4.8	2.0	995	677	55	52	18.3	3	593			88	
02/08/23	T#5 Northern Bldg	944	8.08	33.55	18,570	24.6	6.98	4.9	2.0	694	453	73	57	9.5	56	143			78	
05/12/23	T#5 Northern Bldg	1025	7.96	34.65	19,179	21.2	7.05	2.2	2.0	646	508	139	49	4.7	23	697			67	
08/30/23	T#5 Northern Bldg	930	7.96	34.46	19,074	22.2	7.16	4.7	2.0	773	640	63	62	12.3	14	915				
11/02/23	T#5 Northern Bldg	947	8.06	34.65	19,179	24.3	6.65	11.6	2.0	2914	2356	65	62	44.8	102	535		318.4		
02/15/24	T#5 Northern Bldg	930	8.01	35.03	19,389	23.7	6.60	18.9	2.3	4571	3872	229	189	20.0	167	430		158.0		
05/16/24	T#5 Northern Bldg	1045	8.17	34.43	19,057	24.2	6.27	9.6	2.0	1666	1283	100	84	16.7	43	653		150.3		
Mean			8.09	33.50	18,544	23.57	6.26	5.6	2.6	1674	1396	157	141	13.3	68	554	#DIV/0!	209	70	
Std. Dev.			0.10	4.17	2,310	2.02	0.80	3.5	1.6	1728	1610	248	246	7.8	103	360	#DIV/0!	95	40	
n=			30	30	30	30	30	30	30	30	30	30	30	30	30	30	0	3	26	

WHEA Seawater Disposal Log

Discharge GPS:
Latitude: 19°42'50.77"N
Longitude: 156° 2'13.12"W

Seawater Disposal Trench Dimensions

L (ft)	W (ft)	D (ft)
13	7	6.3

Date	Sample Name	Time	pH	Sal.	Chloride	Temp.	DO	TSS	BOD	Total Nitrogen	Nitrate & Nitrite	Total Phosphorous	Ortho-Phosphate	N : P	Ammonia	Silicate	Chlorine	ORP	Discharge Volume	Comment
(mm/dd/yy)		*(2400)*	*(unit)*	*(PSU)*	*(mg/L)*	*(˚C)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(µg N/L)*	*(µg N/L)*	*(µg P/L)*	*(µg P/L)*	*(ratio)*	*(µg N/L)*	*(µg Si/L)*	*(mg/L)*	*(mV)*	*(kgal/day)*	
			SM4500-H⁺	SM2520-B			SM4500-O G	<30 mg/L SM2540D	<30 mg/L SM5210B	SM4500-NO3- F		SM 4500-P F			SM 4500-NH3 G					
10/16/14	WHEA #1	852	8.09	34.72	19,218	25.98	6.20	3.6	2.0	248	60	26.9	13.4	9.2	14.2	430			158	
10/23/14	WHEA #1	855	8.11	34.88	19,306	27.21	6.39	6.3	2.0	169	54	27	13	6.3	23.6	350			158	
10/30/14	WHEA #1	854	7.98	34.71	19,212	24.95	6.27	5.2	2.0	268	125	51	25	5.2	10.0	713			158	
11/06/14	WHEA #1	847	7.93	34.44	19,063	24.86	6.55	5.1	2.0	352	92	38	16	9.2	7.4	640			158	
12/10/14	WHEA #1	1105	8.08	34.97	19,356	24.23	6.23	3.7	2.0	285	224	37	47	7.7	1	958			158	
03/19/15	WHEA #1	1036	7.92	34.77	19,246	22.84	6.74	3.9	3.0	205	96	25	20	8.1	21	786			49	
06/05/15	WHEA #1	916	7.92	34.10	18,875	23.30	5.23	5.9	2.1	411	130	54	29	7.7	33	1090			82	
08/19/15	WHEA #1	908	8.02	34.39	19,035	26.01	5.80	4.3	2.0	248	104	37	26	6.8	38	817			77	
11/24/15	WHEA #1	923	7.96	34.46	19,074	21.31	6.14	4.4	2.0	466	286	61	52	7.6	29	1282			51	
02/25/16	WHEA #1	821	8.00	34.64	19,174	20.05	7.15	3.8	2.0	364	261	72	63	5.1	28	1220			44	
06/08/16	WHEA #1	821	7.93	34.77	19,246	23.65	6.14	3.3	2.0	272	180	56	46	4.9	17	988			48	
09/07/16	WHEA #1	1000	8.38	34.81	19,268	23.92	5.23	3.6	2.0	408	267	67	51	6.1	41	1775			66	
11/30/16	WHEA #1	951	8.05	34.82	19,273	22.44	6.00	4.6	2.0	215	105	37	35	5.9	45	853			55	
03/08/17	WHEA #1	846	8.08	34.50	19,096	22.27	6.90	3.1	2.0	185	131	35	26	5.3	26	731			42	
05/25/17	WHEA #1	841	8.00	34.50	19,096	23.47	4.85	4.0	2.0	224	135	40	27	5.6	24.2	756			52	
08/17/17	WHEA #1	1012	7.96	34.45	19,068	23.64	6.69	12.2	2.0	281	191	55	43	5.1	34.4	993			58	
11/02/17	WHEA #1	1033	8.00	34.88	19,306	22.76	4.67	3.6	2.0	245	153	41	25	6.0	25.8	794			51	
03/01/18	WHEA #1	923	7.86	34.49	19,091	17.16	6.97	4.4	2.3	344	280	65	57	5.3	25.9	1476			61	
06/07/18	WHEA #1	959	8.01	34.94	19,340	21.66	6.07	5.9	2.7	407	165	63	53	6.4	35.4	952			51	
09/10/18	WHEA #1	921	7.96	34.77	19,246	22.44	5.65	4.8	2.0	243	182	47	32	5.2	17.5	953			52	
11/09/18	WHEA #1	1029	7.98	34.95	19,345	23.46	4.06	3.2	2.0	231	161	44	31	5.2	25.9	977			56	
02/15/19	WHEA #1	1022	7.93	34.95	19,345	19.23	5.95	14.3	2.3	293	165	44	31	6.7	44.7	872			52	
05/24/19	WHEA #1	1033	8.00	35.85	19,843	22.97	6.02	3.5	2.0	252	170	46	35	5.5	31.1	999			73	
09/12/19	WHEA #1	1019	8.08	34.86	19,295	26.16	5.52	3.9	2.0	217	105	35	22	6.3	38.0	577			114	
10/23/19	WHEA #1	1135	7.97	35.64	19,727	23.08	6.28	3.4	2.3	373	247	58	37	6.5	32.4	1200			111	
03/11/20	WHEA #1	1019	7.99	36.37	20,131	20.68	6.36	6.3	2.1	302	171	44	37	6.8	23.4	821			113	
06/12/20	WHEA #1	956	8.07	36.03	19,943	24.43	6.14	3.3	3.5	200	127	22	19	9.3	24.0	641			47	
08/28/20	WHEA #1	1017	7.98	33.40	18,487	25.11	6.25	2.4		343	155	33	32	10.3	21.9	719	0		48	BOD - N/A - equipment failure
11/12/20	WHEA #1	1200	8.00	35.56	19,683	25.8	6.11	6.4	3.6	778	150	74	30	10.6	56.0	613	0		60	
03/05/21	WHEA #1	1000	7.94	35.91	19,877	19.8	6.79	3.8	2.0	367	220	43	45	8.6	59.5	1068			48	
05/06/21	WHEA #1	945	7.84	35.65	19,733	21.2	6.44	2.6	2.0	419	208	38	36	10.9	52.3	955			29	
07/15/21	WHEA #1	949	7.79	35.12	19,439	21.0	6.38	3.7	2.3	504	286	49	36	10.2	6.9	1371			55	
10/29/21	WHEA #1	1131	7.83	35.00	19,373	21.1	6.47	3.4	2.0	449	295	56	51	8.1	47.1	1598			51	
02/10/22	WHEA #1	1102	7.81	34.82	19,273	19.4	6.48	4.3	3.2	597	293	54	46	11.1	19.6	1329			66	
05/13/22	WHEA #1	1004	7.79	34.50	19,096	19.8	6.22	2.4	2.0	443	289	46	42	9.6	29.1	1356			70	
08/05/22	WHEA #1	1002	7.98	34.72	19,218	21.6	6.13	5.1	2.0	507	261	52	38	9.7	35.3	1252			60	
11/17/22	WHEA #1	1041	7.94	34.95	19,345	21.0	6.71	2.7	2.0	348	270	42	40	8.4	9.4	1330			89	
02/03/23	WHEA #1	1008	7.84	34.43	19,057	19.9	6.64	3.1	2.0	531	275	50	49	10.6	127.4	1232			69	
05/05/23	WHEA #1	1013	7.81	34.60	19,151	19.7	6.54	1.8	2.0	395	309	65	74	6.1	28.5	1442			54	
08/24/23	WHEA #1	940	7.75	34.61	19,157	20.3	6.53	4.9	2.0	417	296	47	39	8.9	26.1	1269				
10/26/23	WHEA #1	1103	7.86	34.63	19,168	21.7	6.67	4.1	2.0	381	278	48	46	7.9	9.5	1198				
02/08/24	WHEA #1	1047	7.80	34.77	19,246	18.6	6.49	1.4	2.0	451	311	53	51	8.5	7.6	1267		231		
05/16/24	WHEA #1	956	7.85	34.85	19,290	18.4	6.25	6.8	2.0	480	312	40	43	11.9	23.3	1275		187		
Mean			7.96	34.86	19,298	22.29	6.17	4.5	2.2	352	199	47	37	7.6	30	1021	0	209	74	
Std. Dev.			0.11	0.54	297	2.38	0.62	2.3	0.4	125	78	12	13	2.0	20	317	0	31	38	
n=			43	43	43	43	43	43	42	43	43	43	43	43	43	43	2	2	39	