Table K.10. Cd column pH during the perturbation on day 238.

	Set A	pH		Set B	pH		Set C	pH
Location	Time (hrs)		Location	Time (hrs)		Location	Time (hrs)	
1	-1	7.6	1	0.690278	7.3	1	1.178611	7.7
2	-0.81111	7.6	2	0.847222	7.1	2	1.498611	6.5
3	-0.66917	7.6	3	1.005556	7.2	3	1.863889	6.5
4	-0.49833	7.6	4	1.335	7	4	2.18	6.4
5	-0.33306	7.6	5	1.666667	6.9	5	2.333333	6.4
6	-0.17083	7.6	6	2.025	7.1	6	2.506111	7

	Set D	pH		Set E	pH
Location	Time (hrs)		Location	Time (hrs)	
1	3.390278	7.4	1	5.183333	7.4
2	3.525556	7.2	2	5.361944	7.4
3	3.690278	7.1	3	5.497222	7.5
4	3.850556	7	4	5.678333	7.5
5	4.004167	6.7	5	5.882222	7.4
6	4.17	6.8	6	6.039444	7.5

Table K.11. Cd column normalized potassium per port by set A.

Set A	
Average	s
1.478333	0.007638
1.775	0.005
1.838333	0.007638
1.673333	0.005774
1.613333	0.007638
1.533333	0.005774

Set B			Normalized by Set A	
Average	s		Kb/Ka	s of quot.
1.608333	0.022546		1.087937	0.01494
1.473333	0.007638		0.830047	0.0059
1.4	0.00866		0.761559	0.007452
1.35	0.00866		0.806773	0.007284
1.341667	0.012583		0.831612	0.010506
1.635	0.025981		1.066304	0.01633

Set C			Normalized by Set A	
Average	s		Kc/Ka	s of quot.
1.846667	0.007638		1.249154	0.006618
1.631667	0.014434		0.919249	0.009284
1.903333	0.011547		1.035358	0.007353
1.893333	0.002887		1.131474	0.003772
1.778333	0.023629		1.102273	0.014105
1.633333	0.015275		1.065217	0.010082

Set D			Normalized by Set A	
Average	s		Kd/Ka	s of quot.
1.775	0.022913		1.200676	0.013904
1.448333	0.007638		0.815962	0.005979
1.866667	0.014434		1.015413	0.008778
1.816667	0.011547		1.085657	0.007232
1.881667	0.005774		1.166322	0.005641
1.538333	0.010408		1.003261	0.007743

Set E			Normalized by Set A	
Average	s		Ke/Ka	s of quot.
1.941667	0.016073		1.313416	0.009758
1.771667	0.016073		0.998122	0.009499
1.821667	0.002887		0.990934	0.004447
1.778333	0.012583		1.062749	0.007872
1.636667	0.002887		1.014463	0.005052
1.505	0.005		0.981522	0.005021

Table K.12a-b. Cd column K raw data for the day 238 Cd perturbation expt.

Standard Curve

units	stnd	Triplicate Readings			Average	Stdev
	0	-0.062	-0.06	-0.061	-0.061	0.001
abs	0.05	0.056	0.057	0.055	0.056	0.001
	0.1	0.069	0.07	0.07	0.069667	0.000577
	0.5	0.361	0.359	0.361	0.360333	0.001155
ppm	1	0.909	0.908	0.913	0.91	0.002646
	2	1.91	1.884	1.881	1.891667	0.015948

r^2	0.99892
m	0.2102
b	0.012

Set A	Cd	Triplate Analysis			Account for 1:5 Dilution			Average	s
6	L6	0.296	0.297	0.294	1.48	1.485	1.47	1.478333	0.007638
5	L5	0.356	0.355	0.354	1.78	1.775	1.77	1.775	0.005
4	L4	0.366	0.368	0.369	1.83	1.84	1.845	1.838333	0.007638
3	L3	0.334	0.336	0.334	1.67	1.68	1.67	1.673333	0.005774
2	L2	0.324	0.321	0.323	1.62	1.605	1.615	1.613333	0.007638
1	L1	0.308	0.306	0.306	1.54	1.53	1.53	1.533333	0.005774
	0.1	0.108	0.106	0.11				0.108	0.002
	0.5	0.546	0.546	0.547				0.546333	0.000577
	0	-0.052	-0.055	-0.054				-0.05367	0.001528

Set B	Cd	Triplate Analysis			Account for 1:5 Dilution			Average	s
	L6	0.317	0.322	0.326	1.585	1.61	1.63	1.608333	0.022546
	L5	0.295	0.296	0.293	1.475	1.48	1.465	1.473333	0.007638
	L4	0.282	0.279	0.279	1.41	1.395	1.395	1.4	0.00866
	L3	0.268	0.271	0.271	1.34	1.355	1.355	1.35	0.00866
	L2	0.266	0.268	0.271	1.33	1.34	1.355	1.341667	0.012583
	L1	0.321	0.33	0.33	1.605	1.65	1.65	1.635	0.025981
	0.1	0.114	0.111	0.109				0.111333	0.002517
	0.5	0.547	0.554	0.558				0.553	0.005568
	0	-0.053	-0.051	-0.051				-0.05167	0.001155

Table K.12c-e. Cd column K raw data for the day 238 Cd perturbation expt. (con't)

Set C

Cd	Triplate Analysis			Account for 1:5 Dilution			Average	s
L6	0.369	0.368	0.371	1.845	1.84	1.855	1.846667	0.007638
L5	0.328	0.323	0.328	1.64	1.615	1.64	1.631667	0.014434
L4	0.378	0.382	0.382	1.89	1.91	1.91	1.903333	0.011547
L3	0.379	0.378	0.379	1.895	1.89	1.895	1.893333	0.002887
L2	0.354	0.352	0.361	1.77	1.76	1.805	1.778333	0.023629
L1	0.326	0.324	0.33	1.63	1.62	1.65	1.633333	0.015275
ck 0.1	0.114	0.109	0.113				0.112	0.002646
ck 0.5	0.545	0.55	0.549				0.548	0.002646
0	-0.048	-0.052	-0.051				-0.05033	0.002082

Set D

Cd	Triplate Analysis			Account for 1:5 Dilution			Average	s
L6	0.35	0.356	0.359	1.75	1.78	1.795	1.775	0.022913
L5	0.288	0.29	0.291	1.44	1.45	1.455	1.448333	0.007638
L4	0.375	0.37	0.375	1.875	1.85	1.875	1.866667	0.014434
L3	0.362	0.362	0.366	1.81	1.81	1.83	1.816667	0.011547
L2	0.377	0.375	0.377	1.885	1.875	1.885	1.881667	0.005774
L1	0.306	0.307	0.31	1.53	1.535	1.55	1.538333	0.010408
ck 0.1	0.115	0.113	0.113				0.113667	0.001155
ck 0.5	0.55	0.555	0.556				0.553667	0.003215
0	-0.047	-0.046	-0.048				-0.047	0.001

Set E

Cd	Triplate Analysis			Account for 1:5 Dilution			Average	s
L6	0.386	0.387	0.392	1.93	1.935	1.96	1.941667	0.016073
L5	0.353	0.352	0.358	1.765	1.76	1.79	1.771667	0.016073
L4	0.365	0.364	0.364	1.825	1.82	1.82	1.821667	0.002887
L3	0.356	0.358	0.353	1.78	1.79	1.765	1.778333	0.012583
L2	0.328	0.327	0.327	1.64	1.635	1.635	1.636667	0.002887
L1	0.301	0.302	0.3	1.505	1.51	1.5	1.505	0.005
ck 0.1	0.115	0.115	0.112				0.114	0.001732
ck 0.5	0.541	0.544	0.546				0.543667	0.002517
0	-0.048	-0.047	-0.047				-0.04733	0.000577

Table K.12. Cd column HPC data for the Cd perturbation on day 238.

	A		B		C		D		E	
Location	cell conc (x10^4)	Stdev	cell conc (x10^4)	Stdev	cell conc (x10^4)	Stdev	cell conc (x10^4)	Stdev	cell conc (x10^4)	Stdev
1	3.80E+01	9.54E+00	2.23E+01	3.21E+00	2.07E+01	2.52E+00	5.57E+01	2.31E+01	3.20E+01	1.49E+01
2	4.93E+01	5.03E+00	3.60E+01	1.00E+00	1.24E+01	9.50E-01	3.00E+01	6.56E+00	3.97E+01	2.89E+00
3	4.43E+01	4.51E+00	3.23E+01	7.51E+00	1.04E+01	3.06E-01	3.20E+01	1.73E+00	3.30E+01	9.85E+00
4	4.83E+01	5.13E+00	2.00E+01	2.02E+00	1.22E+01	1.12E+00	1.77E+01	1.01E+00	2.73E+01	8.74E+00
5	2.77E+01	4.16E+00	2.77E+01	3.79E+00	1.55E+01	1.14E+00	1.43E+01	1.42E+00	2.47E+01	5.13E+00
6	3.07E+01	3.51E+00	4.00E+01	4.58E+00	2.42E+01	9.07E-01	1.59E+01	8.50E-01	1.86E+01	9.07E-01

Table K.12.a Cd column HPC data for the Cd perturbation on day 238. (raw data)

Set A

Location	Dilution	Count	Plate Count cell conc. (CFU/mL)	cell conc (CFU/mL)	cell conc (x10^4) (CFU/mL)	s
6	0.001	34	340000	306666.7	30.66667	3.511885
		27	270000			
		31	310000			
5	0.001	31	310000	276666.7	27.66667	4.163332
		23	230000			
		29	290000			
4	0.001	54	540000	483333.3	48.33333	5.131601
		47	470000			
		44	440000			
3	0.001	49	490000	443333.3	44.33333	4.50925
		40	400000			
		44	440000			
2	0.001	54	540000	493333.3	49.33333	5.033223
		44	440000			
		50	500000			
1	0.001	43	430000	380000	38	9.539392
		27	270000			
		44	440000			

Table K.12.b Cd column HPC data for the Cd perturbation on day 238. (raw data)

Set B

Location	Dilution	Count	Plate Count cell conc.	cell conc	cell conc (x10^4)	Stdev
6	0.001	39	390000	400000	40	4.582576
		36	360000			
		45	450000			
5	0.001	32	320000	276666.7	27.66667	3.785939
		26	260000			
		25	250000			
4	0.01	197	197000	200333.3	20.03333	2.020726
		182	182000			
		222	222000			
3	0.001	41	410000	323333.3	32.33333	7.505553
		28	280000			
		28	280000			
2	0.001	37	370000	360000	36	1
		36	360000			
		35	350000			
1	0.001	20	200000	223333.3	22.33333	3.21455
		26	260000			
		21	210000			

Table K.12.c Cd column HPC data for the Cd perturbation on day 238. (raw data)

Set C

Location	Dilution	Count	Plate Count cell conc.	cell conc	cell conc (x10^4)	Stdev
6	0.01	249	249000	242333.3	24.23333	0.907377
		232	232000			
		246	246000			
5	0.01	163	163000	155000	15.5	1.135782
		160	160000			
		142	142000			
4	0.01	132	132000	122333.3	12.23333	1.123981
		125	125000			
		110	110000			
3	0.01	101	101000	103666.7	10.36667	0.305505
		107	107000			
		103	103000			
2	0.01	133	133000	123666.7	12.36667	0.950438
		124	124000			
		114	114000			
1	0.001	18	180000	206666.7	20.66667	2.516611
		21	210000			
		23	230000			

Table K.12.d Cd column HPC data for the Cd perturbation on day 238. (raw data)

Set D

Location	Dilution	Count	Plate Count cell conc.	cell conc	cell conc (x10^4)	Stdev
6	0.01	150	150000	158666.7	15.86667	0.85049
		159	159000			
		167	167000			
5	0.01	159	159000	143000	14.3	1.417745
		132	132000			
		138	138000			
4	0.01	182	182000	176666.7	17.66667	1.011599
		183	183000			
		165	165000			
3	0.001	31	310000	320000	32	1.732051
		31	310000			
		34	340000			
2	0.001	24	240000	300000	30	6.557439
		37	370000			
		29	290000			
1	0.001	39	390000	556666.7	55.66667	23.07235
		46	460000			
		82	820000			

Table K.12.e Cd column HPC data for the Cd perturbation on day 238. (raw data)

Set E

Location	Dilution	Count	Plate Count cell conc.	cell conc	cell conc (x10^4)	Stdev
6	0.01	176	176000	186333.3	18.63333	0.907377
		190	190000			
		193	193000			
5	0.001	26	260000	246666.7	24.66667	5.131601
		19	190000			
		29	290000			
4	0.001	25	250000	273333.3	27.33333	8.736895
		20	200000			
		37	370000			
3	0.001	30	300000	330000	33	9.848858
		25	250000			
		44	440000			
2	0.001	38	380000	396666.7	39.66667	2.886751
		43	430000			
		38	380000			
1	0.001	21	210000	320000	32	14.93318
		49	490000			
		26	260000			

Figure K.13. Cd column dK and dHPC data.

K+ samples				HPC	Standard Deviation (10^4)	
	Average	s		Set A		
L6	1.478333	0.007638		3.07E+05	3.51E+00	L6-5
L5	1.775	0.005		2.77E+05	4.16E+00	L5-4
L4	1.838333	0.007638		4.83E+05	5.13E+00	L4-3
L3	1.673333	0.005774		4.43E+05	4.51E+00	L3-2
L2	1.613333	0.007638		4.93E+05	5.03E+00	L2-1
L1	1.533333	0.005774		3.80E+05	9.54E+00	
	Average	s		Set B		
L6	1.608333	0.022546		400000	4.58E+00	L6-5
L5	1.473333	0.007638		276666.7	3.79E+00	L5-4
L4	1.4	0.00866		200333.3	2.02E+00	L4-3
L3	1.35	0.00866		323333.3	7.51E+00	L3-2
L2	1.341667	0.012583		360000	1.00E+00	L2-1
L1	1.635	0.025981		223333.3	3.21E+00	
	Average	s		Set C		
L6	1.846667	0.007638		2.42E+05	9.07E-01	L6-5
L5	1.631667	0.014434		1.55E+05	1.14E+00	L5-4
L4	1.903333	0.011547		1.22E+05	1.12E+00	L4-3
L3	1.893333	0.002887		1.04E+05	3.06E-01	L3-2
L2	1.778333	0.023629		1.24E+05	9.50E-01	L2-1
L1	1.633333	0.015275		2.07E+05	2.52E+00	
	Average	s		Set D		
L6	1.775	0.022913		1.59E+05	8.50E-01	L6-5
L5	1.448333	0.007638		1.43E+05	1.42E+00	L5-4
L4	1.866667	0.014434		1.77E+05	1.01E+00	L4-3
L3	1.816667	0.011547		3.20E+05	1.73E+00	L3-2
L2	1.881667	0.005774		3.00E+05	6.56E+00	L2-1

dK (mg/L)	K Standard Dev of difference		dHPC (cell/mL)	dHPC (cell/mL) (x10^4)	HPC Standard Dev of Difference
			Set A		
-0.29667	0.009129		3.00E+04	3.00E+00	5.45E+00
-0.06333	0.009129		-2.07E+05	-2.07E+01	6.61E+00
0.165	0.009574		4.00E+04	4.00E+00	6.83E+00
0.06	0.009574		-5.00E+04	-5.00E+00	6.76E+00
0.08	0.009574		1.13E+05	1.13E+01	1.08E+01
			Set B		
0.135	0.023805		1.23E+05	1.23E+01	5.94E+00
0.073333	0.011547		7.63E+04	7.63E+00	4.29E+00
0.05	0.012247		-1.23E+05	-1.23E+01	7.77E+00
0.008333	0.015275		-3.67E+04	-3.67E+00	7.57E+00
-0.29333	0.028868		1.37E+05	1.37E+01	3.37E+00
			Set C		
0.215	0.01633		8.73E+04	8.73E+00	1.45E+00
-0.27167	0.018484		3.27E+04	3.27E+00	1.60E+00
0.01	0.011902		1.87E+04	1.87E+00	1.16E+00
0.115	0.023805		-2.00E+04	-2.00E+00	9.98E-01
0.145	0.028137		-8.30E+04	-8.30E+00	2.69E+00
			Set D		
0.326667	0.024152		1.57E+04	1.57E+00	1.65E+00
-0.41833	0.01633		-3.37E+04	-3.37E+00	1.74E+00
0.05	0.018484		-1.43E+05	-1.43E+01	2.01E+00
-0.065	0.01291		2.00E+04	2.00E+00	6.78E+00
0.343333	0.011902		-2.57E+05	-2.57E+01	2.40E+01

L1	1.538333	0.010408		5.57E+05	2.31E+01

Figure K.13. Cd column dK and dHPC data. (Con't)

	Average	s		Set E		
L6	1.941667	0.016073		1.86E+05	9.07E-01	L6-5
L5	1.771667	0.016073		2.47E+05	5.13E+00	L5-4
L4	1.821667	0.002887		2.73E+05	8.74E+00	L4-3
L3	1.778333	0.012583		3.30E+05	9.85E+00	L3-2
L2	1.636667	0.002887		3.97E+05	2.89E+00	L2-1
L1	1.505	0.005		3.20E+05	1.49E+01	

			Set E		
0.17	0.02273		-6.03E+04	-6.03E+00	5.21E+00
-0.05	0.01633		-2.67E+04	-2.67E+00	1.01E+01
0.043333	0.01291		-5.67E+04	-5.67E+00	1.32E+01
0.141667	0.01291		-6.67E+04	-6.67E+00	1.03E+01
0.131667	0.005774		7.67E+04	7.67E+00	1.52E+01

Table K.14. Cd concentrations from the Cd perturabtion expt on day 270. (Con't)

Standard Curve

units	stnd	Triplicate Readings			Average	Stdev		
	0	-0.012	-0.011	-0.01	-0.011	0.001	r^2	0.9995
abs	0.05	0.048	0.049	0.052	0.049667	0.002082	m	0.1311
	0.1	0.093	0.094	0.095	0.094	0.001	b	0.003
ppm	0.5	0.446	0.445	0.445	0.445333	0.000577		
	1	0.957	0.951	0.954	0.954	0.003		
	2	1.9	1.898	1.906	1.901333	0.004163		

Set A	Cadmium	Triplate Analysis			Account for 1:10 Dilution			Average	s
6	L6	0.346	0.347	0.346	3.46	3.47	3.46	3.463333	0.005774
5	L5	0.359	0.358	0.36	3.59	3.58	3.6	3.59	0.01
4	L4							#DIV/0!	#DIV/0!
3	L3	0.334	0.336	0.333	3.34	3.36	3.33	3.343333	0.015275
2	L2	0.343	0.339		3.43	3.39		3.41	0.028284
1	L1	0.273	0.271		2.73	2.71		2.72	0.014142
	ckstnd 0.1	0.112	0.114	0.111				0.112333	0.001528
	ckstnd 0.5	0.526	0.526	0.526				0.526	0
	0	0.007	0.007	0.005				0.006333	0.001155

Table K.14. Cd concentrations from the Cd perturabtion expt on day 270. (Con't)

Standard Curve

units	stnd	Triplicate Readings			Average	Stdev		
	0	-0.017	-0.015	-0.015	-0.01567	0.001155	r^2	0.9997
abs	0.05	0.036	0.036	0.038	0.036667	0.001155	m	0.1298
	0.1	0.1	0.099	0.103	0.100667	0.002082	b	0.002
ppm	0.5	0.472	0.473	0.473	0.472667	0.000577		
	1	0.961	0.96	0.961	0.960667	0.000577		
	2	1.917	1.919	1.914	1.916667	0.002517		

Set A	Cadmium	Triplate Analysis			Account for 1:10 Dilution			Average	s
	L6							#DIV/0!	#DIV/0!
	L5							#DIV/0!	#DIV/0!
	L4	0.347	0.348	0.348	3.47	3.48	3.48	3.476667	0.005774
	L3							#DIV/0!	#DIV/0!
	L2	0.33	0.332	0.332	3.3	3.32	3.32	3.313333	0.011547
	L1	0.261	0.261	0.26	2.61	2.61	2.6	2.606667	0.005774
	ckstnd 0.1	0.103	0.105	0.106				0.104667	0.001528
	ckstnd 0.5	0.524	0.525	0.526				0.525	0.001
	0	-0.003	-0.003	-0.002				-0.00267	0.000577

Set B	Cadmium	Triplate Analysis			Account for 1:25 Dilution			Average	s
	L6	0.143	0.141	0.142	3.575	3.525	3.55	3.55	0.025
	L5	0.141	0.14	0.142	3.525	3.5	3.55	3.525	0.025
	L4	0.142	0.143	0.141	3.55	3.575	3.525	3.55	0.025
	L3	0.138	0.141	0.139	3.45	3.525	3.475	3.483333	0.038188
	L2	0.135	0.137	0.137	3.375	3.425	3.425	3.408333	0.028868
	L1	0.465	0.465	0.465	11.625	11.625	11.625	11.625	0
	ckstnd 0.1	0.109	0.107	0.106				0.107333	0.001528
	ckstnd 0.5	0.529	0.526	0.527				0.527333	0.001528
	0	0	0	-0.001				-0.00033	0.000577

Table K.14. Cd concentrations from the Cd perturabtion expt on day 270. (Con't)

	Cadmium	Triplate Analysis			Account for 1:25 Dilution			Average	s
Set C	L6	0.147	0.145	0.146	3.675	3.625	3.65	3.65	0.025
	L5	0.164	0.162	0.163	4.1	4.05	4.075	4.075	0.025
	L4	0.179	0.18	0.181	4.475	4.5	4.525	4.5	0.025
	L3	0.173	0.172	0.171	4.325	4.3	4.275	4.3	0.025
	L2	0.194	0.194	0.195	4.85	4.85	4.875	4.858333	0.014434
	L1	0.601	0.601	0.601	15.025	15.025	15.025	15.025	2.38E-07
	0.1	0.109	0.107	0.109				0.108333	0.001155
	0.5	0.525	0.529	0.528				0.527333	0.002082
	0	0.001	-0.001	0.001				0.000333	0.001155

	Cadmium	Triplate Analysis			Account for 1:25 Dilution			Average	s
Set D	L6	0.236	0.236	0.236	5.9	5.9	5.9	5.9	0
	L5	0.312	0.309	0.313	7.8	7.725	7.825	7.783333	0.052042
	L4	0.361	0.363	0.36	9.025	9.075	9	9.033333	0.038188
	L3	0.422	0.422	0.421	10.55	10.55	10.525	10.54167	0.014434
	L2	0.464	0.461	0.463	11.6	11.525	11.575	11.56667	0.038188
	L1	0.272	0.269	0.269	6.8	6.725	6.725	6.75	0.043301
	0.1	0.113	0.11	0.11			0.10825	0.005679	
	0.5	0.528	0.528	0.535			0.52275	0.015521	
	0	0.003	0.003	0.003			0.00225	0.0015	

	Cadmium	Triplate Analysis			Account for 1:10 Dilution			Average	s
	L6	0.571	0.571	0.568	6.246667	6.246667	6.216667	6.236667	0.017321
Set E	L5	0.599	0.599	0.597	6.526667	6.526667	6.506667	6.52	0.011547
	L4	0.635	0.63	0.633	6.886667	6.836667	6.866667	6.863333	0.025166
	L3	0.642	0.645	0.643	6.956667	6.986667	6.966667	6.97	0.015275
	L2	0.602	0.6	0.599	6.556667	6.536667	6.526667	6.54	0.015275
	L1	0.327	0.327	0.325	3.806667	3.806667	3.786667	3.8	0.011547
	0	0.007	0.004	0.006				0.005667	0.001528
	0.1	0.111	0.111	0.112				0.111333	0.000577
	0.5	0.53	0.53	0.53				0.53	0
	1	1.026	1.022	1.026				1.024667	0.002309