DAILY LOG BOOK

MISSION NUMBER 2009-08

DATE: From: MAY 26/09 to: JUNE 6/09

VESSEL: J. P. TULLY

PROJECT: LA PEROUSE

INSTITUTE OF OCEAN SCIENCES
OCEAN SCIENCES AND PRODUCTIVITY DIVISION
SIDNEY, BC, CANADA

Captain: MURRAY MCLAUGHLIN First Officer: _____
Second Officer: _____ Third Officer: _____

Mission Participants / Agencies: _____

Scientific Personnel: Party Chief: DOUG YELLAND

Name	Watch	Cabin	Name	Watch	Cabin
DOUG MOORE	8-12	G	KENDRA MUEIR	4-8	D
SCOTT ROSE	12-4	C			
SHANE RIERSON	4-8	F			
HUGH MACLEAN	4-8	DOWN			
OLIVER WURL	8-16	F			
MARIE ROBERT	8-12	A			
JANET BARWELL-CLARKE	LAT	G			
MOIRA GALBRAITH	12-4	UP ASST			
CHRIS PAYNE	12-4	B			
SARA STATHAM	8-12	D			

Second leg of Mission: Party Chief: _____

Name	Watch	Cabin	Name	Watch	Cabin

Data logging computer: _____
Data acquisition program: WIN 32 V7
CTD deck unit make: SBE model: 11 serial number: 0508

Primary CTD
Make: SBE model: 9 serial number: 0443
Primary temperature serial number: 2038
Primary conductivity serial number: 2128
Secondary temperature serial number: 2449
Secondary conductivity serial number: 2424
Transmissometer: WET LABS Model: _____ s/n: 1005D
Fluorometer: Model SEAPOINT Cable gain: 10x 0.15 s/n: 2228 **P, S or NO pump?**
Oxygen sensor: SBE Model: 43 s/n: 0997 **P, S or NO pump?**
PAR sensor: BIOSPHERICAL Model: _____ s/n: 4615
Other sensors: ALTIMETER s/n: 1252 **P, S or NO pump?**
Other sensors: PH s/n: 0692 **P, S or NO pump?**
Other sensors: _____ s/n: _____ **P, S or NO pump?**
Other sensors: _____ s/n: _____ **P, S or NO pump?**

Secondary CTD
Make: _____ model: _____ serial number: _____
Primary temperature serial number: _____
Primary conductivity serial number: _____
Secondary temperature serial number: _____
Secondary conductivity serial number: _____
Transmissometer: _____ Model: _____ s/n: _____
Fluorometer: Model _____ Cable gain: _____ s/n: _____ **P, S or NO pump?**
Oxygen sensor: _____ Model: _____ s/n: _____ **P, S or NO pump?**
PAR sensor: _____ Model: _____ s/n: _____
Other sensors: _____ s/n: _____ **P, S or NO pump?**
Other sensors: _____ s/n: _____ **P, S or NO pump?**
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CTD calibration bottle location (height above CTD in metres): _____

DAILY LOG

Ocean Sciences and Productivity Division

INSTITUTE OF OCEAN SCIENCES

Month MAY **Year** 2009 **Ship** J. P. TULLY **Cruise ID** 2009-08 p. 1

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Position Latitude	Position Longitude	Bottom Depth	Max Depth	Sample Numbers	#of Bottles	Watch Keepers	Trans. Cleaned	Comments
27	SI 03	0250	BE	ROS	US	1	48° 35.40	123° 30.02	225		1-12	12	BLUE	✓	PAR AND pH ON
		0255	BO				48° 35 40	123° 29.97		215					→
		0315	EN				48 35 38	123° 29.94							
27	LS 01	1502	BE	ROS	US	2	48° 40.47	124° 59.61	32		13-16	4	BLUE/GR	✓	
		1503	BO				48° 40. 46	124° 59 61		26					
		1508	EN				48° 40 42	124 59 59							
27	LB02	1555	BE	ROS	US	3	48° 39.00	125° 02 42	55		17-22	6	GREEN	✓	→
		1556	BO				48 39 01	125° 02 41		47					
		1602	EN				48° 39.03	125° 02.44							
27	LB03	1631	BE	ROS	US	4	48° 37 34	125° 05 63	93				GREEN	✓	5m NISKIN + LOOP
		1634	BO				48° 37.34	125° 05.66		83	23	1			
		1637	EN				48° 37.35	125° 05.69							
27	LB04	1707	BE	ROS	US	5	48° 35.64	125° 08.73	112				GREEN	✓	
		1710	BO				48° 35.66	125° 08 74		100	24. 30	7			
		1719	EN				48° 35.68	125° 08 76							
27	E1	1813	BE	BOAT		6	48° 31 93	125° 04 43							
		1857	EN	733			48° 31.94	125° 04.24							

Cast type:
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bottle firing method:
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ST 03 CAST 1:

12 Niskins closed for actual sampling (1-12)

12 Niskins just closed for rinsing (13-24).

CAST 3: Computer rebooted in the middle of the downcast.

DAILY LOG

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INSTITUTE OF OCEAN SCIENCES

Month MAY **Year** 2009 **Ship** TULLY **Cruise ID** 2009-08 P2

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Position Latitude	Position Longitude	Bottom Depth	Max Depth	Sample Numbers	#of Bottles	Watch Keepers	Trans. Cleaned	Comments
27	E1	1819	BE	ROS		7	48° 31.95	125° 04.51	115				GRIEN	✓	
		1821	BO				48° 31.94	125° 04.54		105	—	Ø	TEAM		
		1823	EN				48° 31.95	125° 04.57							
27	E1	1841	BE	NET		8	48° 31.70	125° 04.05	120						
		1846	BO				48° 31.73	125° 04.15		110					
		1849	EN				48° 31.78	125° 04.18							
27	LB05	2001	BE	ROS		9	48° 33.89	125° 11.01	104	99			SR/MG/CP	✓	
		2004	BO				48° 33.89	125° 11.01			—	Ø			
		2007	EN				48° 33.89	125° 11.01							
27	LB06	2136	BE	ROS		10	48° 32.20	125° 15.42	114	109			"	✓	
		2139	BO				48° 32.25	125° 15.40			31-37	7			
		2149	EN				48° 32.24	125° 15.38							
27	C1	2229	BE	ROS		11	48 28.96	125 15.26	152	145			"	✓	
		2232	BO				48 28.96	125 15.26			—	Ø			
		2236	EN				48 28.95	125 15.26							
	C1	2249	BE	NET		12	48° 29.90	125° 15.20	153						
		2253	BO				48° 28.91	125° 15.14		143					
		2300	EN				48° 29.96	125° 15.10							

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DAILY LOG

Ocean Sciences and Productivity Division

INSTITUTE OF OCEAN SCIENCES

Month MAY **Year** 2009 **Ship** TULLY **Cruise ID** 2009-08 P3

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Position Latitude	Position Longitude	Bottom Depth	Max Depth	Sample Numbers	#of Bottles	Watch Keepers	Trans. Cleaned	Comments
27	CZ	2350	BG	NET		13	48° 25 .2065	125° 07.4514					HM/KM/SL		BONGO
		2353	BO				48° 25 2124	125° 07 4414							
		2355	EN				48 25 2114	125° 07 4372							
28	CZ	0012	BG	ROS CTD		14	48° 25 17	125 07 39	112				"	✓	
		0015	BO				48° 25. 16	125° 07. 36		100	—	ϕ			
		0018	EN				48° 25. 15	125° 67. 36							
28	C3	0134	BE	ROS CTD		15	48° 23. 39	125° 20. 70					"	✓	
		0137	BO				48° 23. 38	125° 20. 67			—	ϕ			
		0140	EN				48° 23. 39	125° 20. 65							
28	C3	0149	BG	NET		16	48° 23.38	125° 20. 66	123	110			"		BONGO
		0153	BO				48° 23 36	125° 20 60							
		0155	EN				48° 23 35	125° 20 58							
28	LBOT	0242	BE	NET		17	48° 28 12	125° 21 75	160				"		BONGO
		0248	BO				48° 28. 14	125° 21. 74		150					
		0250	EN				48 28 13	125 21. 76							
28	LBOT	0303	BE	ROS	US	18	48 28. 13	125 21. 72	160					✓	MISC @ 100 → Jam t MISC @ 5
		0307	BO				48 28. 13	125° 21. 70		150	38-39	2	Green Team		+ LOOP
		0313	EN				48° 28. 14	125 21 70							

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DAILY LOG

Ocean Sciences and Productivity Division

INSTITUTE OF OCEAN SCIENCES

Month MAI **Year** 2009 **Ship** TULLY **Cruise ID** 2009-08 P4

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Position Latitude	Position Longitude	Bottom Depth	Max Depth	Sample Numbers	#of Bottles	Watch Keepers	Trans. Cleaned	Comments
28	B8	0421	BE	ROS		19	48° 34.55	125° 30.05	112				Green Team		
		0425	BO				48° 34.54	125° 30.03	116	106	—	∅			
		0427	EN				48° 34.54	125° 30.06							
28	B8	0437	BE	NET		20	48° 34.59	125° 30.05	112						
		0440	BO				48° 34.59	125° 30.06		100					
		0442	EN				48° 34.60	125° 30.05							
28	B7	0537	BE	NET		21	48° 31.87	125° 35.57	80						
		0540	BO				48° 31.87	125° 35.58		70					
		0541	EN				48° 31.87	125° 35.58							
28	B7	0559	BE	ROS		22	48° 31.87	125° 35.53	80				Green Team		
		0602	BO				48° 31.86	125° 35.53			—	∅			
		0603	EN				48° 31.85	125° 35.54							
28	LB08	0739	BE	ROS		23	48° 25.25	125° 28.79	154	145	40-48	9	Yellow Team		
		0742	BO				48° 25.29	125° 28.74							
		0754	EN				48° 25.34	125° 28.74							
28	LB08	0815	BO	NET		24	48° 25.34	125° 28.77	156	145					
28	LB09	0912	BE	ROS		25	48° 22.06	125° 34.75			49-56	8			
		0915	BO				48° 22.05	125° 34.79							
		0925	EN				48° 22.05	125° 34.81							

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DAILY LOG

Ocean Sciences and Productivity Division

INSTITUTE OF OCEAN SCIENCES

Month MAI **Year** 2009 **Ship** TULLY **Cruise ID** 2009-08 P5

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Position Latitude	Position Longitude	Bottom Depth	Max Depth	Sample Numbers	#of Bottles	Watch Keepers	Trans. Cleaned	Comments
28	LB10	1020	BE	ROS		26	48° 18.61	125° 41.36				0	ER		
		1023	BO				48° 18.62	125° 41.37							
		1025	EN				48° 18.63	125° 41.38							
															PAR+pH off
28	LB 11	1113	BG	ROS	US	27	48° 15.23	125° 47.71	207		57-67	11	HM/DM/SR	✓	
		1117	BO				48° 15.21	125° 47.78		195					
		1132	EN				48° 15.15	125° 47.57							
28	LB 11	1159	BE	NET		28	48° 15.20	125° 47.71	206				BLUE TEAM		Bongo
		1207	BO				48° 15.16	125° 47.76		180					
		1210	EN				48° 15.19	125° 47.73							
28	LB12	1249	BG	ROS	US	29	48° 12.94	125° 51.91	501		68-82	15	"	✓	
		1257	BO				48° 12.99	125° 51.85		490					
		1320	EN				48° 12.98	125° 51.84							
28	LB13	1357	BG	ROS		30	48° 10.55	125° 56.10	916		—	Ø	"	✓	
		1412	BO				48° 10.56	125° 56.12							
		1426	EN				48° 10.57	125° 56.08							

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DAILY LOG

Ocean Sciences and Productivity Division

INSTITUTE OF OCEAN SCIENCES

Month MAI **Year** 2009 **Ship** TULLY **Cruise ID** 2009-08 p6

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Position Latitude	Position Longitude	Bottom Depth	Max Depth	Sample Numbers	#of Bottles	Watch Keepers	Trans. Cleaned	Comments
28	LB 14	1504	BE	ROS	US	31	48 08.49	125 59.92	1171		83- 100	18	Green Team	✓	
		1524	BO				48 08.52	125 59.97	1181	1175					
		1600	EN				48 08 60	125 59.85							
28	LB15	1707	BE	ROS	US	32	48 04.35	126 08.42	1545				Green Team	✓	NISKIN @ 5m + LOOP
		1732	BO				48 04.28	126 08.42		1540	101	1			20 off bottom
		1756	EN				48 04.33	126 08 37							→
28	LB15	1745	EN	BOAT		33	48 04 33	126 08.43							
28	LB16	1858	BE	ROS		34	48 0.05	126 16.94	1855				Yellow Team		
		1927	BO				48 59.97	126 16.60		1890	—	Ø			
		1957	EN				48 59.81	126 16.38							
28	LB16	2015	BO	NET		35	48 59.67	126 16.26	1890	250		Ø			
28	LB16	2050	BO	NET		36	48 59.50	126 16.16		1000		Ø			
28	LC12	2351	BE	ROS		37	48 15.04	126 40.02	2526			Ø	H.M/H.M/SR	✓	
29		0033	BO				48 15.06	126 39.99					BLUE		
		0109	EN				48 15.06	126 40.02							
29	LC12	0116	BE	NET		38	48 15 05	126 40 01		250					
		0125	BO				48 15 06	126 39 99							
		0131	EN				48 15 08	126 39 97							

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Cast 32, ≈ 450 dbar: O_2 and T traces quite different between down and up casts

DAILY LOG

Ocean Sciences and Productivity Division

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Month MAY **Year** 2009 **Ship** TULLY **Cruise ID** 2009-08 p7 ✓

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Position Latitude	Position Longitude	Bottom Depth	Max Depth	Sample Numbers	#of Bottles	Watch Keepers	Trans. Cleaned	Comments
29	LC 11	0244	BE	ROS	US	39	48° 18.92	126° 26.79	1464		102-120	19	BLUE	✓	
		0310	BO				48° 18.95	126° 26.70		1475			GREEN		
		0354	EN				48° 19.15	126° 26.58							
29	LC 10	0447	BE	ROS	US	40	48° 22.36	126° 20.16	1250				GREEN	✓	NISKIN @ 5 mbar TROUP
		0506	BO				48° 22.40	126° 20.11		1240	121	1			→
		0525	EN				48° 22.26	126° 20.21							
29	LC09	0619	BE	ROS	US	41	48° 25.88	126° 13.62	608						
		0629	BO				48° 25.90	126° 13.65		600	122-139	18	Green	✓	
		0655	EN				48° 25.90	126° 13.60							
29	LC09	0715	BO	NET		42	48° 25.92	126° 13.63	604	250					
29	A2	0820	BO	NET		43	48° 22.66	126° 3.80	361	250					
29	A2	0843	BE	ROS		44	48° 22.66	126° 3.79	361	3 2		Ø		✓	
		0849	BO				48° 22.69	126° 3.99		352					
		0855	EN				48° 22.73	126° 3.75							
29	A1	1008	BE	ROS		45	48° 29.31	126° 07.11	203			11		✓	
		1019	BO				48° 29.32	126° 07.12		197	140-150				
		1026	EN				48° 29.41	126 7.05							
29	A1	1036	BO	NET		46	48 29.41	126 7.05	203	190					

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Computer crashed @ beginning of cast 40 @ surface

DAILY LOG

Ocean Sciences and Productivity Division

INSTITUTE OF OCEAN SCIENCES

Month MAI **Year** 2009 **Ship** TULLY **Cruise ID** 2009-08 P8 ✓

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Position Latitude	Position Longitude	Bottom Depth	Max Depth	Sample Numbers	#of Bottles	Watch Keepers	Trans. Cleaned	Comments
29	LC07	1156	BE	ROS		47	48° 32.05	126° 00.49	129		—		BLUE	✓	
		1159	BO				48° 32.87	126° 00.47		120					
		1201	EN				48° 32.88	126° 00.45							
29	LC06	1259	BE	ROS		48	48° 36.47	125° 53.98	94				"	✓	
		1304	BO				48° 36.47	125° 54.00		84	151-157	7			
		1312	EN				48° 36.49	125° 54.01							
29	LC06	1332	BE	NET		49	48° 36.47	125° 54.07	94				"		BONGO
		1336	BO				48° 36.47	125° 54.06		85					
		1339	EN				48° 36.47	125° 54.05							
29	LC05	1435	BE	NET		50	48 39.89	125 47.42	65				"		Bongo
		1436	BO	"		"	48 39.89	125 47.46		55					
		1437	EN				48 39.88	125 47.49							
29	LC05	1449	BE	ROS		51	48 39.98	125 47.52	65				Green	✓	
		1451	BO				48 39.98	125 47.52		56	—	Ø			
		1452	EN				48 39.99	125 47.51							
29	LC04	1556	BE	ROS		52	48 43.47	125 40.82	167				Green	✓	PAR ON
		1600	BO				48 43.46	125 40.82		157	158-167	10			
		1612	EN				48 43.49	125 40.84							

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DAILY LOG

Ocean Sciences and Productivity Division

INSTITUTE OF OCEAN SCIENCES

Month MAI **Year** 2009 **Ship** TULLY **Cruise ID** 2009-08 P9J

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Position Latitude	Position Longitude	Bottom Depth	Max Depth	Sample Numbers	#of Bottles	Watch Keepers	Trans. Cleaned	Comments
29	LC03	1700	BE	ROS	US	53	48° 46.93	125° 34.23	133				Green	✓	5m NISKIN + LOOP
		1703	BO				48° 46.95	125° 34.22		127	168	1			
		1707	EN				48° 46.95	125° 34.21							
29	LC02	1745	BE	BOAT		54	48° 48.59	125° 31.00	109						
		1844	EN				48° 50.34	125° 27.78	95						
29	LC02	1757	BE	ROS	US	55	48° 48.62	125° 30.87	109				Green	✓	Computer crash
		1800	BO				48° 48.62	125° 30.85		100	169-175	7			AGAIN!
		1808	EN				48° 48.63	125° 30.88							
29	LC01	1859	BE	ROS	US	56	48° 50.36	125° 27.65	95				Green/ Yellow		
		1901	BO				48° 50.36	125° 27.62		85	176-181	6			
		1908	EN				48° 50.40	125° 27.64							
29	LD02		BE	ROS		57	48° 58.45	125 47.07			182-185	4			
			BO				48° 58.45	125 47.07							
			EN				48° 58.46	125 47.05							
29	LD02	2129	BO	NET		58	48 58.45	125 47.03	43	35					
29	LD03	2214	BE	ROS		59	48° 56.62	125° 50.35				Ø			
		2215	BO				48° 56.62	125° 50.35							
		2217	EN				48° 56.62	125° 56.34							

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INSTITUTE OF OCEAN SCIENCES

Month MAI **Year** 2009 **Ship** TULLY **Cruise ID** 2009-08 p10 ✓

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Position Latitude	Position Longitude	Bottom Depth	Max Depth	Sample Numbers	#of Bottles	Watch Keepers	Trans. Cleaned	Comments
30	LD06	0107	BE	ROS	US	60	48° 46.17	126° 10 07	138		186-193	8	BLUE	✓	
		0110	BO			+ 61	48° 46 18	126° 10. 07		128					
		0	EN			ON UPCAST FROM 30m ↑									
30	LD 07	0222	BE	ROS		62	48° 42. 60	126° 16 . 84	450		—	0	"	✓	
		0239	BO				48° 42. 57	126° 16. 84		440					
		0236	EN				48° 42. 59	126° 16. 85							
															PAR OFF
30	LD 09	0358	BE	ROS	US	63	48 35.66	126° 30.07	1050		194-210	17	Green	✓	+LOOP
		0414	BO				48 35.68	126° 30.10		1048			Team		
		0447	EN				48 35.66	126 30.07							
30	LD09	0505	BO	NET		64	48 35.56	126. 30.16	1054	250					BONGO TO 250
30	LG09	0955	BO	NET		65	48°51.18	127° 19.47	2060	250			Yellow		Bongo to 250
30	LG09	1043	BO	NET		66	48°51.202	127°19.479	2074	1000			Yellow		Bongo to 1000

Cast type:
BOT = bottle cast, no CTD
CTD = CTD without Rosette
ROS = Rosette plus CTD
USW = sea water loop
MOR = mooring
NET = net haul
DRF = drifter

bottle firing method:
US = up/stop
UN = up/no stop
DN = down/no stop

Time Code
BE = beginning time of cast
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Transmissometer to be cleaned for each cast, do not use Ammonia products

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DAILY LOG

Ocean Sciences and Productivity Division

INSTITUTE OF OCEAN SCIENCES

Month MAY **Year** 2009 **Ship** TULLY **Cruise ID** 2009-05 P11 ✓

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Position Latitude	Position Longitude	Bottom Depth	Max Depth	Sample Numbers	#of Bottles	Watch Keepers	Trans. Cleaned	Comments
30	LG09	1109	BE	ROS	U.S.	67	48° 51.15	127° 19.49	2064?		211-230	20	BLUE	✓	CALLED LD in
		1141	BO				48° 51.23	127° 19.38		2000					header
		1232	EN				48° 51.30	127° 19.55							
30	LG09	1327	BE	ROS		68	48° 55.30	127° 13.29	2265		—	8	"	✓	Called LD in
		1357	BO				48° 55.25	127° 13.08		2000					header
		1427	EN				48° 55.25	127° 13.07							
30	LG07	1523	BE	ROS	US	69	48 59.36	127 07.17	1760				Green	✓	5m NISKIN + LOOP
		1551	BO				48 59.39	127 07.13		1760	231	1			
		1619	EN				48 59.37	127 07.18							
30	LG07	1628	BE	NET		70	48 59.40	127 07.19	1760						
		1640	BO				48 59.39	127 07.21		250					Bongo TO 250m
		1645	EN				48 59.39	127 07.20							
30	LG06	1735	BE	BOAT		71	49 03.33	127 01.42							
		1845	EN				49 03.41	127 01.14							
30	LG06	1752		ROS		72	49 03.44	127 01.17	960				Green	✓	
		1807					49 03.49	127 01.17			232-248	17			
		1838					49 03.45	127 01.10							

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DAILY LOG

Ocean Sciences and Productivity Division

INSTITUTE OF OCEAN SCIENCES

Month MAY **Year** 2009 **Ship** TULLY **Cruise ID** 2009-08 P 12 ✓

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Position Latitude	Position Longitude	Bottom Depth	Max Depth	Sample Numbers	#of Bottles	Watch Keepers	Trans. Cleaned	Comments
30	LG05	1935	BE	ROS		73	49° 7.19	126° 55.36	284			Ø	Yellow		
		1941	BO				49° 7.19	126° 55.36	281	276					
		1946	EN				49 7.16	126° 55.39							
30															
30	LG04	2034	BE	ROS		74	49° 11.20	126° 49.40	145		249-257	9		✓	
		2037	BO				49° 11.18	126° 49.41		135					
		2047	EN				49° 11.13	126° 49.51							
30	LG04	2101	BO	NET		75	49 11.035	126 49.609	145	135					
30	LG03	2201	BE	ROS		76	49° 14.96	126° 43.86	122			Ø		NO	
		2203	BO				49° 14.97	126° 43.85		112					
		2206	EN				49° 15.00	126° 43.84							
30	LG02	2238	BE	ROS	US	77	49° 16.86	126° 40.83	115		258-264	7		?	Off-station
		2240	BO				49° 16.83	126° 40.83		105					
		2249	EN				49° 16.83	126° 40.89							
30	LG02	2300	BO	NET		78	49° 16.79	126° 40.97		105					

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DAILY LOG

Ocean Sciences and Productivity Division

INSTITUTE OF OCEAN SCIENCES

Month MAY **Year** 2009 **Ship** TULLY **Cruise ID** 2009-08 P13 /

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Position Latitude	Position Longitude	Bottom Depth	Max Depth	Sample Numbers	#of Bottles	Watch Keepers	Trans. Cleaned	Comments
30	LG01	2351	BO	ROS		79	49° 20.53	126° 34.97	53		265 - 269	5	BLUE	✓	
		2353	BO				49° 20.54	126° 34.98		43					
		2359	EN				49° 20.55	126° 35.00							
31	LBP1	0723	BE	ROS		80	50° 4.69	127° 53.28	55			Ø	Yellow	✓	Tripped bot by
		0725	BO				50° 4.71	127° 53.28		47					mistake
		0727	EN				50° 4.74	127° 53.27							
31	LBP2	0751	BE	ROS		81	50° 3.99	127° 54.31				Ø	Yellow	✓	
		0753	BO				50° 4.00	127° 54.27							
		0755	EN				50° 4.01	127° 54.26							
31	LBP2	0809	BO	NET		82	50 4.02	127 54.308					Yellow		
31	LBP3	0836	BO	NET		83	50° 3.13	127 55.42					Yellow		
31	LBP3	0853	BE	ROS		84	50° 3.17	127° 55.44	172		270-279	10	Yellow	✓	
		0857	BO				50° 3.19	127° 55.49		166					
		0911	EN				50° 3.06	127° 55.73							

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DAILY LOG

Ocean Sciences and Productivity Division

INSTITUTE OF OCEAN SCIENCES

Month MAI **Year** 2009 **Ship** TULLY **Cruise ID** 2009-08 P14 ✓

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Position Latitude	Position Longitude	Bottom Depth	Max Depth	Sample Numbers	#of Bottles	Watch Keepers	Trans. Cleaned	Comments
31	LBP4	0945	BE	ROS		85	50° 1.41	127° 58.06	1016			Ø	Yellow	✓	
		1002	BO				50° 1.41	127° 58.07		1000					
		1017	EN				50° 1.40	127° 58.10							
31	LBP5	1047	BE	ROS	US	86	49° 59.97	128° 0.07	1285		280-297	18	BLUE	✓	
		1107	BO				50° 00.00	128° 6.00							
		1146	EN				49° 59.98	127° 59.95							
31	LBP5	1205	BO	NET		87	49° 59.98	127° 59.97	1205	250					BONGO
31	LBP6	1256	BE	ROS	U.S	88	49° 56.10	128° 05.56	823		—	Ø		✓	
		1311	BO				49° 56.12	128° 05.51		810					
		1322	EN				49° 56.23	128° 05.59							
31	LBP7	1409	BE	ROS	U.S	89	49° 52.34	128° 11.05	2200		296-317	20	BLUE		
		1439	BO				49° 52.34	128° 11.27		2000					
		1532	EN				49°52.30	128 11 27							
	LBP7		BO	NET		90	NEXT	PAGE			—	Ø			BONGO

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DAILY LOG

Ocean Sciences and Productivity Division

INSTITUTE OF OCEAN SCIENCES

Month MAI/JUIN **Year** 2009 **Ship** TULLY **Cruise ID** 2009-08 P15 ✓

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Position Latitude	Position Longitude	Bottom Depth	Max Depth	Sample Numbers	#of Bottles	Watch Keepers	Trans. Cleaned	Comments
31	LBP7	1542	BE	NET		90	49 52.36	128 11.31					Gram		
		1552	BO				49 52 36	128 11 32		252					
		1556	EN				49 52 36	128 11 33							
31	LBP8	1646	BE	BOAT		91	49 48.62	128 16.98	2077				Gr		
		1800	EN				49 48.54	128 16.91							
31	LBP8	1658	BE	NET		92	49 48.62	128 16.89	2075				Gr		
		1735	BO				49 48.61	128 16.82		1000					Bongo to 1000 m
		1752	EN				49 48.60	128 16.81							
31	LBP8	1815	BE	NET		93	49 48.58	128 16.81	2074				Gr		
		1825	BO				49 48.60	128 16.83		250					Bongo to 250m
		1829	EN				49 48.61	128 16.84							
31	LBP8	1842	BE	ROS		94	49 48.61	128 16.79	2070				Gr	✓	
		1916	BO				49 48.57	128 16.92		2005	318-325	8			Roxette for Oliver. 5m Niskin for DOS
		2000	EN				49 48.54	128 17.05							+LOOP
1	CPE2	0328	BE	ROS		95	50 43.00	128 39.94	125				Gr	✓	
		0331	BO				50 42.99	128 39.94		116	326	1			5M NISKIN AT LOOP
		0334	EN				50 42.99	128 39.94							
											/				

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DAILY LOG

Ocean Sciences and Productivity Division

INSTITUTE OF OCEAN SCIENCES

Month JUIN **Year** 2009 **Ship** TULLY **Cruise ID** 2009-08 P 16 ✓

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Position Latitude	Position Longitude	Bottom Depth	Max Depth	Sample Numbers	#of Bottles	Watch Keepers	Trans. Cleaned	Comments
1	CPE2	0340	BE	NET		96	50 42.99	128 39 93	126				Green		
		0344	BO				50 42.99	128 39 93		115					
		0346	EN				50 42.99	128 39.93							
1	LQ03	0520	BE	NET		97	50 39.69	129 01.94	1240?				Green		
		0529	BO				50 39.70	129 01.94		250					
		0534	EN				50 39.60	129 01.95							
1	LQ03	0549	BE	ROS		98	50 39.67	129 01.92	1238			∅	Green		
		0608	BO				50 39.65	129 01.96		1248	—				
		0626	EN				50 39.66	129 01.93							
1	JI22	0802	BE	ROS		99	50° 39.78	129° 17.52			——	∅	YELLOW	✓	
		0825	BO				50° 39.74	129° 17.58							
		0848	EN				50° 39.73	129° 17.57							
1	JI22	0908	BO	NET		100	50 39.814	129 17.555	1434	250		—	Yellow		
1	CS01	1115	BO	NET		101	50° 34.88	129° 41.52	2100	250			BLUE		BONGO
1	CS01	1132	BE	ROS		102	50° 34.87	129° 41.52	2100						CTD ONLY
		1150	BO				50° 34.89	129° 41.53		1005		∅			
			EN												

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DAILY LOG

Ocean Sciences and Productivity Division

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Month JUNE **Year** 2009 **Ship** TULLY **Cruise ID** 2009-08 P17 ✓

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Position Latitude	Position Longitude	Bottom Depth	Max Depth	Sample Numbers	#of Bottles	Watch Keepers	Trans. Cleaned	Comments
1	CS02	1329	BG	ROS	U.S	103	50° 41.31	129° 27.82	1902		327-343	17	BLUE	✓	
		1343	BO				50° 41.28	129° 27.94		1000					
		1414	EN				50° 41.28	129° 27.91							
1	CS02	1433	BO	NET		104	50° 41.26	129° 27.84	1902	250			1		BONGO
1	CS03	1533	BE	NET		105	50° 45.60	129° 19.98	242				Green		
		1541	BO				50° 45.61	129° 19.92		230					
		1545	EN				50° 45.61	129° 19.90							
1	CS03	1556	BE	ROS	US	106	50° 45.60	129° 19.94	220				Green	✓	PAR ON
		1600	BO				50° 45.60	129° 19.95		210	344	1			5m Niskin +LOOP
		1605	EN				50° 45.59	129° 19.97							
1	CS04	1656	BE	BOAT		107	50° 49.17	129° 12.90	102						
		1740	EN				50° 49.07	129° 13.30							
1	CS04	1709	BE	ROS	US	108	50° 49.19	129° 12.99	95				Green	✓	
		1712	BO				50° 49.19	129° 12.99		87	345-351	7			
		1720	EN				50° 49.17	129° 12.98							
1	CS04	1725	BE	NET		109	50° 49.30	129° 13.09	95						
		1730	BO				51° 00.06	129° 13.01		80					
		1733	EN				50° 49.20	129° 13.01							

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DAILY LOG

Ocean Sciences and Productivity Division

INSTITUTE OF OCEAN SCIENCES

Month JUN **Year** 2009 **Ship** TULLY **Cruise ID** 2009-08 P18 ✓

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Position Latitude	Position Longitude	Bottom Depth	Max Depth	Sample Numbers	#of Bottles	Watch Keepers	Trans. Cleaned	Comments
1	CS3B	1928	BO	NET		110	51° 59.56	129° 26.99		55					
1	CS3B	1945	BE	ROS		111	51° 59.95	129° 26.96	220			Ø	Yellow		
		1949	BO				51° 59.95	129° 26.96							
		1952	EN				51° 59.95	129° 26.97							
															Tripped bot 1 for
1	CS05	2202	BE	ROS		112	50° 56.03	129° 00. 21	64		352-354	2	Yellow		2 max CHLs. at
		2203	BO				50° 56. 03	129° 00. 21		57					@ 20m and bottle
		2207	EN				50° 56.05	129° 00.18							@ 5m
1	CS05	2216	BO	NET		113	50 56.13	129 0.19	65	52					
1	CS1B	23 13	BO	NET		114	50 56 04	128 39 52	72	65					BONGO
2	CS1B	00 03	BE	ROS		115	50° 53.12	128° 39.73	78		355 - 356	2	BLUE	✓	
		00 05	BO				50° 53. 11	128° 39.72		68					
		00 10	EN				50° 53. 10	128° 39. 70							

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DAILY LOG

Ocean Sciences and Productivity Division

INSTITUTE OF OCEAN SCIENCES

Month JUIN **Year** 2009 **Ship** TULLY **Cruise ID** 2009-08 p. 19 ✓

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Position Latitude	Position Longitude	Bottom Depth	Max Depth	Sample Numbers	#of Bottles	Watch Keepers	Trans. Cleaned	Comments
2	CS 06	01 31	BE	ROS	U.S	116	51° 00.03	128° 51.71	66		357-362	6	BLUE	✓	
		01 33	BO				51° 00.04	128° 51.68		56					
		01 39	EN				51° 00.06	128° 51.60							
2	CS06	0153	BO	NET		117	51 00 04	128° 51 42	67	55			Blueman Group		BONGO
2	CS 07	0253	BO	NET		118	51 04 22	128 43 55		57			"		BONGO
2	CS 07	0308	BE	ROS		119	51 04.20	128 43.44	68		363-364	2	Green Team	✓	NISKIN @ 10 + 5
		0310	BO				51 04.20	128 43.40		60					
		0313	EN				51 04.20	128 43.34							
2	CS08	0406	BE	ROS		120	51 08.40	128 35.92	146				Green	✓	2 NISKINS FOR DOC @ 15 and 5
		0409	BO				51 08.37	128 35.89		136	365-366	2			IOS samples from BOT 2 as well + LOOP.
		0414	EN				51 08.35	128 35.95							
2	CS08	0422	BE	NET		121	51 08.39	128 36.14	145				Green		
		0427	BO				51 08.37	128 36.14		135					
		0429	EN				51 08.36	128 36.13							
2	CS09	0545	BE	NET		122	51 12.31	128 27.86	197				Green		
		0551	BO				51 12.27	128 27 96		185			Team		
		0555	EN				51 12.27	128 28.00							

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DAILY LOG

Ocean Sciences and Productivity Division

INSTITUTE OF OCEAN SCIENCES

Month JUIN **Year** 2009 **Ship** TULLY **Cruise ID** 2009-08 P20 ✓

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Position Latitude	Position Longitude	Bottom Depth	Max Depth	Sample Numbers	#of Bottles	Watch Keepers	Trans. Cleaned	Comments
2	CS09	0607	BE	ROS		123	51° 12.25	128° 27.94	197				Green	✓	
		0611	BO				51° 12.25	128° 27.93		185	367-377	11	Team		
		0625	EN				51° 12.24	128° 27.88							
2	CS10	0743	BE	ROS		124	51° 16.52	128° 19.99	80						bottles tripped @ 11 +5m
		0745	BO				51° 16.51	128° 19.99		72	378-380	3			
		0749	EN				51° 16.51	128° 19.98							
2	CS10	0800	BO	NET		125	51° 16.51	128° 19.98	80	70		0			
2	M6	1129	BE	ROS		126	51° 42.66	129° 07.52	246		381-382	2	BLUEMAN/ CREW		BOT @ 9+5m - CHL
		1134	BO				51° 42.61	129° 07.45		236					
		1140	EN				51° 42.61	128° 07.53							
2	M5	1213	BE	ROS		127	51° 43.44	128° 03.71	335		383-384	2			
		1219	BO				51° 43.45	128° 03.73		325					
		12	EN				51° 43.	128° 03.							

Cast type:
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DAILY LOG

Ocean Sciences and Productivity Division

INSTITUTE OF OCEAN SCIENCES

Month JUNE **Year** 2009 **Ship** TULLY **Cruise ID** 2009-08 P21 ✓

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Position Latitude	Position Longitude	Bottom Depth	Max Depth	Sample Numbers	#of Bottles	Watch Keepers	Trans. Cleaned	Comments
2	M 4	1259	BG	ROS	U.S	129	51° 44.58	128° 00.28	429		385-398	14	BLUEMAN CREW	✓	
		1307	BO				51° 44.59	128° 00.22		420					
		1328	EN				51° 44.61	128° 00.14							
2	M3	1407	BG	ROS	U.S.	129	51° 46.22	127° 54.74	350		399-411	13	"	✓	
		1414	BO				51° 46.20	127° 54.70		340					
		1433	EN				51° 46.17	127° 54.43							
2	M2	1501	BG	ROS	U.S	130	51° 46.47	127° 53.24	194		412-421	10	"	✓	
		1506	BO				51° 46.46	127° 53.29		185					
		1519	EN				51° 46.47	127° 53.33							
2	UBC7	1711	BG	ROS	US	131	51° 30.07	127° 49.13	159				Green	✓	
		1715	BO				51° 30.07	127° 49.12		150	422-430	9			
			EN												
2	UBC7	1742	BO	NET		132	51° 29.76	127° 49.11	153	~~150~~ 140					BONGO TO 140m
	UBC7	1825	BE	NET		133	51°	127°	132	110					BOTTLES
		18	EN												

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DAILY LOG

Ocean Sciences and Productivity Division

INSTITUTE OF OCEAN SCIENCES

Month JUN **Year** 2009 **Ship** TULLY **Cruise ID** 2009-08 A 22 ✓

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Position Latitude	Position Longitude	Bottom Depth	Max Depth	Sample Numbers	#of Bottles	Watch Keepers	Trans. Cleaned	Comments
3	Ri 1	0009	BE	ROS		134	57° 26.32	127° 38.30	327		700 - 702	3	BLUEMAN CREW	✓	BOT @ 5, 7, 30
		0015	BO				51° 26. 35	127° 38. 23		315					FOR UBC + CHL (UVIC)
		0023	EN				57° 26. 33	127° 38. 13							
3	Ri 1	0045	BO	NET		135	57° 26. 40	127° 38. 22	334	324	—				BONGO
			EN												
3	Ri 2	0155	BO	NET		136	57° 31. 27	127° 33.56	327	315	—				BONGO
3	Ri 2	0209	BE	ROS		137	51° 31. 26	127° 33. 56			431 - 444	13		✓	
		0215	BO				57° 31. 29	127° 33. 58							
		0233	EN				57° 31. 29	127° 33. 59							
3	Ri 1 - Ri 4	0009		ZODIAC		138									OLIVER ZODIAC TRIP
3	Ri 3	0316	BE	ROS		139	51 35.90	127 32.16	328		445-446	2			30m & 5m
		0322	BO				51 35.89	127 32.16							
			EN				51 35.88	127 32.16							
3	R. 3	0335	BE	NET		140	51° 36.00	127° 31.86	328	318					BONGO
		0346	BO				51° 36.00	127° 31.86							
		0351	EN				51° 36.00	127° 31.86							

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Ocean Sciences and Productivity Division

INSTITUTE OF OCEAN SCIENCES

Month JUIN **Year** 2009 **Ship** TULLY **Cruise ID** 2009-08 P 23 ✓

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Position Latitude	Position Longitude	Bottom Depth	Max Depth	Sample Numbers	#of Bottles	Watch Keepers	Trans. Cleaned	Comments
3	Ri 4	0440	BE	NET		141	51° 38.89	127° 26.70	301				Green		
		0450	BO				51° 38.91	127° 26.70		290					
		0455	EN				51° 38.94	127° 26.65							
3	Ri 4	0505	BE	ROS		142	51° 38.93	127° 26.51	299			13	Green	✓	
		0510	BO				51° 38.93	127° 26.51		290	447-459				
		0526	EN				51° 38.93	127° 26.52							
3	Ri 5	0609	BE	ROS		143	51° 40.60	127° 19.83	202				Green	✓	
		0613	BO				51° 40.61	127° 19.83		190	460-461	2			NUSKIN @ 30+5 UBC
		0618	EN				51° 40.61	127° 19.83							
3	Ri 5	0624	BE	NET		144	51° 40.63	127° 19.82	201				Green		
		0630	BO				51° 40.64	127° 19.82		190			Team		
		0633	EN				51° 40.65	127° 19.81							
3	Ri 6	0716	BO	NET		145	51° 40.50	127° 16.98	146	136			Yellow		
3	Ri 6	0734	BE	ROS		146	51° 40.49	127° 16.94	144						
		0737	BO				51° 40.50	127° 16.95		139	462-463	2			
		0743	EN				51° 40.49	127° 16.96							

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DAILY LOG

Ocean Sciences and Productivity Division

INSTITUTE OF OCEAN SCIENCES

Month JUNE **Year** 2009 **Ship** TULLY **Cruise ID** 2009-08 P24 ✓

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Position Latitude	Position Longitude	Bottom Depth	Max Depth	Sample Numbers	#of Bottles	Watch Keepers	Trans. Cleaned	Comments
3	557	1049	BE	ROS	US	147	51° 24.58	127° 47.65	122			8	BLUE	✓	
		1053	BO				51° 24.58	127° 47.65		112	464-471				
		1102	EN				51° 24.58	127° 47.66							
3	556	1212	BE	ROS		148	51° 20.07	128° 00.07	178		—	Ø	"	✓	
		1216	BO				51° 20.07	128° 00.04		168					
		1219	EN				51° 20.07	128° 00.01							
3	555	1433	BE	ROS		149	51° 27.92	128° 30.02	201		472-482	11	"	✓	
		1437	BO				51° 27.90	128° 30.01		190					
		1451	EN				51° 27.80	128° 29.98							
3	554	1703	BE	ROS		150	51° 21.00	128° 59.96	240				Green	✓	5m NISKIN + LOOP
		1707	BO				51° 21.02	128° 59.92		229	483	1	Team		
		1712	EN				51° 21.02	128° 59.86							
3	553	1855	BE	ROS		151	51° 15.04	129° 21.36	292						
		1901	BO				51° 15.05	129° 21.32		287	484-496	13	Yellow		
		1918	EN				51° 15.03	129° 21.36					Team		

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DAILY LOG

Ocean Sciences and Productivity Division

INSTITUTE OF OCEAN SCIENCES

Month JUIN **Year** 2009 **Ship** TULLY **Cruise ID** 2009-08 p25

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Position		Bottom Depth	Max Depth	Sample Numbers	#of Bottles	Watch Keepers	Trans. Cleaned	Comments
							Latitude	Longitude							
3	SS3	1917	BI	Boat		152	51°15.03	129°21.35					YELLOW		
		2013	BO				51°13.57	129°32.11							
3	SS2	2103	BE	ROS		153	51° 12.62	129° 42.24	492						
		2111	BO				51° 12.62	129° 42.24		482	—	∅			
		2119	EN				51° 12.62	129° 42.23							
4	CPE1	0443	BE	ROS		154	51° 00.01	127° 49.92	151				Green	✓	
		0446	BO				50 59.99	127° 49 91		140	—	∅	Team		
		0448	EN				50° 59.98	127° 49.90							
4	CPE1	0455	BE	NET		155	50° 59.94	127° 49.87	157						
		0459	BO				50° 59.92	127° 49. 87		140					
		0502	EN				50° 59.91	127° 49 87							
5	GEO 1	1306	BG	ROS		156	49° 15. 10	123° 44. 88	402		497 - 502	6	Doug Hugh Kendra Sara	✓	
		13 14	BO				49° 15. 06	123° 44. 89		390			Team Awesome		
		13 24	EN				49° 15. 14	123° 44 90							
		13 49	BO	NET		157	49° 15 09	123° 44 92	402	390					
		1409	BO	NET		158	49 15.05	123 44 87	402	100					< 15

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