

DAILY SCIENCE LOG BOOK

MISSION
NUMBER

2023-066

DATE:

From: 30 APRIL 2023

To: 16 MAY 2023

VESSEL:

JOHN P TULLY

PROJECT(S):

LINO P + SORG

Water Properties Group
Fisheries and Oceans Canada
Institute of Ocean Sciences
Ocean Sciences Division
North Saanich, BC, Canada

WaterProperties.ca

Captain: FREDERIC HAMILTON First Officer: RYAN HULL
Second Officer: DAVID REPSCH Third Officer: DAVID BOLTON
Fishing Master: N/A Chief Engineer: ROBIN HIELSCHER

Mission Participants / Agencies:

DFO-IOS ; UVIC, UBC, MUN, CNL

**** Chief Scientist to tape Scientific Personnel section of their cruise plan here ****

This is accessed from your WaterProperties.ca Dashboard or from here:
<https://www.waterproperties.ca/requests/cruiseplanview.php?cruiseid=YYYY-NNN>

MARIE ROBERT	A	0600-1800
ROWENA DIGGLE	B	1200 - 2400
DANIELLE CALEB	B	0000 - 1200
GRACE HO	C	0000 - 1200
JULIA FAST	C	1200- 2400
JODY KLYMAK	D	0000- 1200
BERNARD YANG	D	1200- 2400
LU GUAN	E	0000- 1200
MOIRA GALBRAITH	E	1200- 2400
MARK BELTON	F	0000 - 1200
MICHAEL ARYCHUK	F	1200 - 2400
KAVI HEERAH	G	0000- 1200
ALASTAIR ROBERTS	G	1200- 2400
STEPHANIE WALSH	H	0000- 1200
OLIVIA MELVILLE	H	1200- 2400

①

**** The following 3 pages are VERY IMPORTANT as they document equipment and settings used on board ****

These pages are to be completed by the CTD Technician setting up the equipment, the Watch Leader on board, and the Chief Scientist MUST verify that all relevant sections are completed prior to leaving the vessel. Any mid-cruise changes to be noted by watch leader in the notes.

Data logging computer: WP #102

Data acquisition program: Seasave

CTD deck unit make: SBE model: 11+ serial number: 0424

Primary CTD

Make: SBE model: 9+ serial number: 1515

Primary temperature serial number: 6754

Primary conductivity serial number: 6141

Secondary temperature serial number: 6736

Secondary conductivity serial number: 6146

Transmissometer: C-Star Model: C-Star serial: 1185DR

Transmissometer: C-Star Model: C-Star serial: 1883DG

Fluorometer: Model Seapoint Cable gain: 3X serial: 3685 P(S) or NO pump?

Fluorometer: Model _____ Cable gain: _____ serial: _____ P, S or NO pump?

Oxygen sensor: _____ Model: _____ serial: 1119 (P) S or NO pump?

PAR sensor: Biospherical Model: QSP2350 serial: 70613 Surface PAR? Y/N

Other sensors: _____ serial: _____ P, S or NO pump?

Other sensors: _____ serial: _____ P, S or NO pump?

Other sensors: _____ serial: _____ P, S or NO pump?

Other sensors: _____ serial: _____ P, S or NO pump?

Secondary CTD

Make: SBE model: 9+ serial number: 550

Primary temperature serial number: 12663

Primary conductivity serial number: 2280

Secondary temperature serial number: 22106

Secondary conductivity serial number: 2754

Transmissometer: C-STAR Model: C-STAR serial: 1185DR

Transmissometer: C-STAR Model: C-STAR serial: 1883DG

Fluorometer: Model Seapoint Cable gain: 10X serial: 3640 P(S) or NO pump?

Fluorometer: Model _____ Cable gain: _____ serial: _____ P, S or NO pump?

Oxygen sensor: _____ Model: _____ serial: 3791 (P) S or NO pump?

PAR sensor: Biospherical Model: QSP2350 serial: 70613 Surface PAR? Y/N

Other sensors: _____ serial: _____ P, S or NO pump?

Other sensors: _____ serial: _____ P, S or NO pump?

Other sensors: _____ serial: _____ P, S or NO pump?

Other sensors: _____ serial: _____ P, S or NO pump?

CTD calibration bottle location (height above CTD in metres): _____

This also includes the bottle location above the CTD on non-rosette casts (typical on small launches).

Rosette Setup:

Number of bottles: 24
Manufacturer: 105
Volume of bottles (litres): 10L

Rosette/Niskin Bottle Serial Numbers:

1: <u>2016-10-04</u>	2: <u>2016-10-05</u>	3: <u>2016-10-06</u>	4: <u>2016-10-07</u>	5: <u>2016-10-08</u>
6: <u>2018-10-02</u>	7: <u>2000-10-29</u>	8: <u>2016-10-09</u>	9: <u>N/A</u>	10: <u>2000-10-30</u>
11: <u>2018-10-04</u>	12: <u>2016-10-10</u>	13: <u>2016-10-11</u>	14: <u>N/A</u>	15: <u>2000-10-24</u>
16: <u>2016-10-12</u>	17: <u>2000-10-23</u>	18: <u>2016-10-13</u>	19: <u>2016-10-14</u>	20: <u>2016-10-15</u>
21: <u>2018-10-03</u>	22: <u>2016-10-16</u>	23: <u>2016-10-17</u>	24: <u>2016-10-18</u>	

Make sure to note any bottle changes or repairs during your cruise in this log book.

Winches:

1. Make: HAWBOLDT Model: HAW Serial #: 17026 Used for: CTD / Rosette
2. Make: HAWBOLDT Model: 32523? Serial #: 1076-01? Used for: TRACE METAL
3. Make: SWANN Model: 329 Serial #: 1482 Used for: BOMBO

Comments on performance during cruise (comments should also be reflected in the post-cruise report):

TM WINCH MUCH BETTER!
CTD 17026 NOT WORKING @ -BEG OF CRUISE

Salinometer:

Make: _____ Model: _____ Serial Number: _____

Comments on performance during cruise (comments should also be reflected in the post-cruise report):

Label Printers:

Primary Printer Kit #: BRADY KIT #8
Secondary Printer Kit #: "PRIMARY"
Software Version: MARK'S LABOR LAPTOP #4

Thermosalinograph System (SBE21/45):

Program: _____ Version: _____
Sampling interval (seconds): 30s
TSG serial number: 45-0789
Fluorometer sensor serial number: WSCHL-1656

Comments on performance during cruise (comments should also be reflected in the post-cruise report):

ADCP Setup:

Computer time zone: _____	User Exits: Name: _____	Exit points: _____
Sampling interval (sec): _____	Name: _____	Exit points: _____
Bin Length: (2^x): _____	Name: _____	Exit points: _____
Pulse Length: _____	Work File: _____	
Buffer (bytes): _____		
Gyro Offset: _____		

Comments on performance during cruise (comments should also be reflected in the post-cruise report):

CTD Test Cast Information

Test Cast along side? Yes No

Comments _____

Test Cast in Saanich Inlet or other location? ☒ Yes No

Comments _____

CTD pressure reading on deck (db), before cast: _____ after cast: _____

Pumps working? Yes (0011) No (0010)

Secondary Temp – Primary Temp: _____
(Average from the mixed region)

Secondary Salinity – Primary Salinity: _____
(Average from the mixed region)

Additional Comments:

Scientific Equipment Used During Cruise

This sheet allows you to enter all of the equipment used while on board. Please use the separate CTD sheet for entry for SBE 9/16/19/25.

Other CTD units:

RBR Serial Number: Sensors:

Others:

Plankton Nets:

Bongo/SCOR #1	Frame Size: 0.6 cm	Mesh: 236 μm	Flowmeter: 5294
Bongo/SCOR #2	Frame Size: 0.6 cm	Mesh: 236 μm	Flowmeter:
	Frame Size:	Mesh:	Flowmeter:
	Frame Size:	Mesh:	Flowmeter:

Multinet BIONESS Neuston Others:

Trawl Gear:

Midwater Trawls: SOG Highseas Pelagic Other:

Bottom Trawls: Atlantic Western IIA Yankee 36 Hard & Soft Bottom Other:

American Shrimp Trawl

Notes:

Trawl Doors: USA Jet Tyburon

Sounders : Wesmar 380 Others:

Acoustics:

Echosounder #1 Frequencies (KHz): 12 18 38 70 120 200

Others:

Echosounder #2 Frequencies (KHz): 12 18 38 70 120 200

Others:

Software & Notes:

Other Gear in Operation:

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 1 of

Month <u>MAY</u>				Year <u>2023</u>			Vessel <u>JP TULLY</u>			Cruise ID <u>2023-066</u>					
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
1	SIO3	1	19:11	BE	ROS	US	48°35.455	123°30.335	225		1 - 17	17	MG	☒	ANOXIC BOT 3-1
			19:15	BO			48°35.506	123°30.325		216	-			☐	
			19:34	EN			48°35.478	123°30.319			-			☐	
2	SI	1	21:11	BE	MVP	UN	48°37.525	123°30.26	199	30	-	-	MG/HB	☐	TEST/SET
			21:24	BO			48°38.792	123°30.167	194.7		-			☐	
3	HARO59	1	23:53	BE	ROS	US	48°36.83	123°14.83	234		18 - 29	12	MG	☐	RESTARTS COMPUTER
			23:58	BO			48°36.81	123°14.82		226	-			☐	CONFLICT W MACRO?
		2	00:02	EN			48°36.79	123°14.82			-			☐	UHF
4	HARO59	2	00:34	BE	NET	-	48°36.803	123°14.877	237	225	-	-	MG	☐	BONGO
			00:43	BO			48°36.839	123°14.859	234	225	-			☐	
			00:47	EN			48°36.832	123°14.874	235.6		-			☐	1 NOT ISAL 2 CAL
5	JF1	2	03:26	BE	LOOP	UN	48°15.92	123°30.84	176	4.5	5005		MG	☐	1 NOT ISAL 2 CAL
6	69	2	04:22	BE	ROS	US	48°15.63	123°43.22	178		30 - 41	12	MG	☒	
			04:26	BO			48°15.63	123°43.22		170	-			☐	
			04:51	EN			48°15.616	123°43.224			-			☐	
7	JF2	2	06:22	BE	ROS	US	48°17.97	123°59.95	187		42 - 55	14	MG	☐	
			06:27	BO			48°17.95	123°59.898		178	-			☐	
			06:52	EN			48°17.980	123°59.873			-			☐	
			:				.	.			-			☐	

Event Type:

BOT = Bottle cast (no CTD)
 CTD = Standalone CTD
 ROS = CTD in Rosette
 SET = Fish Set

LOOP = Sea Water Loop

MOR = Mooring
 NET = Plankton Net Haul
 DRF = Drifter

Bottle Firing Method:

US = Up / Stop (default)
 UN = Up / No stop
 DN = Down / No stop

Notes:

Time Code:

BE = Beginning Time of Cast
 BO = Bottom Time of Cast
 EN = End Time of Cast

CTD Transmissometer and Fluorometer to be cleaned before each cast -- do not use Ammonia products

DE = Deployment Time
 MR = Messenger Release Time
 RE = Recover Mooring Time

Produced by the Water Properties Group, IOS

WaterProperties.ca
 Version: 17 Feb 2020

DURING THIS CRUISE:

ROSETTES 0001 TO 0091: 30 SEC SOAK FOR NISKINS DEEPER THAN 400.

60 SEC SOAK FOR NISKINS = 400 AND SHALLOWER. PLS / 21

SOFG STATIONS: 30 SEC SOAK FOR ALL BOTTLES.

EVENT 3 H02059

SHELF LED STRING

BOTTLE FIRED 5 TIMES WITH NO CONFIRMATION

INTERFERENCE WITH UHF - TURNING OVERHEAD LIGHTS ON + BOTTLES WOULD NOT FIRE AFTER 16 MISSED SURFACE 17

MACRO - WITH EXCEL OPEN IN THE LAB, ACCESSED FROM CLOSET SEASAVE WOULD NOT INITIALIZE

HAD TO RESTART COMPUTER TO GET PROGRAM TO WORK AGAIN

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 2 of

Month <u>May</u>			Year <u>2023</u>			Vessel <u>J P TULLY</u>			Cruise ID <u>2023066</u>						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
8	JF2	2	07:01	BE	NET	BE	48°17.9623	123°59.872	188		✓	✓	DL	☐ ☐	BONGO
			07:08	BO		BO	48°17.945	123°59.799		180	-			☐ ☐	
			07:11	EN			48°17.929	123°59.755			-			☐ ☐	
9	JF2	2	07:45	BE	BOT	US	48°17.940	123°59.757			56-62	7		☐ ☐	GO FID
			08:16	BO			48°17.886	123°59.587		187	-			☐ ☐	
			08:35	EN			48°17.886	123°59.588			-			☐ ☐	
10	75	2	11:20	BE	ROS	US	48°28.208	124°32.789	220		63-76	14	MB	☒ ☐	
			11:24	BO			48°28.219	124°32.803		219	-			☐ ☐	
			11:44	EN			48°28.210	124°32.777			-			☐ ☐	
11	JF4	2	13:40	BE	Loop	-	48°32.320	124°59.664	54	5	5011	1	MB	☐ ☐	1 NUT, 1 SPK, 2-CHK Loop
12	P1	2	16:02	BE	ROS		48°34.556	125°29.801	112		77-80	4	MB	☒ ☐	COMPUTER REBOOT
			16:04	BO			48°34.550	125°29.800		101	-			☐ ☐	
			16:11	EN			48°34.540	125°29.846			-			☐ ☐	TEST UHF 1W @ SRR
13	P2	2	18:34	BE	ROS	US	48°36.052	125°59.933	117		81-92	12	MB	☒ ☐	DMS
			18:37	BO			48°36.060	125°59.894			-			☐ ☐	
			18:56	EN			48°36.098	125°59.986			-			☐ ☐	
14	P2	2	19:08	BE	NET	✓	48°36.101	125°59.988	118		✓	✓	M	☐ ☐	BONGO
			19:10	BO			48°36.124	126°00.121		110	-			☐ ☐	
			19:13	EN			48°36.113	126°00.154			-			☐ ☐	

Event Type:

BOT = Bottle cast (no CTD)
 CTD = Standalone CTD
 ROS = CTD in Rosette
 SET = Fish Set

LOOP = Sea Water Loop

MOR = Mooring
 NET = Plankton Net Haul
 DRF = Drifter
 =

Bottle Firing Method:

US = Up / Stop (default)
 UN = Up / No stop
 DN = Down / No stop

Notes:

Time Code:

BE = Beginning Time of Cast
 BO = Bottom Time of Cast
 EN = End Time of Cast

CTD Transmissometer and Fluorometer to be cleaned before each cast -- do not use Ammonia products

DE = Deployment Time
 MR = Messenger Release Time
 RE = Recover Mooring Time

Produced by the Water Properties Group, IOS

WaterProperties.ca
 Version: 17 Feb 2020

This page is for any notes or observations

p2.5

1W
TEST UHF RADIO @ SURFACE

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 3 of

Month <u>MAY</u>			Year <u>2023</u>			Vessel <u>J.P. TULLY</u>			Cruise ID <u>2023-066</u>						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Tms/FI Cleaned	Comments
							Latitude	Longitude							
15	P2	2	19:21	BE	BINGO NET	/	48°36.089	126°0.029	118		-		MG	☐	BINGO
			19:26	BO			48°36.157	126°0.047	117.7	110	-			☐	
			19:28	EN			48°36.189	126°0.062	117.9		-			☐	
16	P2	2	19:31	EN	Loop	UN	.	.			-			☐	
17	P2	2	19:41	BE	ROS	US	48°36.19	125°59.96	117		93-101	9	SW	☐	60 L Cs loop
			19:45	BO			48°36.22	126°00.00		107	-		MR	☒	
			19:57	UN			48°36.27	125°59.98			-			☐	
18	P3	2	21:47	BE	ROS	US	48°37.47	126°19.91	819		102-103	2	MG	☐	
			22:02	BO			48°37.49	126°19.86		805	-			☐	
			22:19	EN			48°37.52	126°19.88			-			☐	
19	P4	3	00:04	BE	ROS	US	48°38.97	126°39.98	1320		104-124	21	MG/MR	☒	DMS
			00:20	BO			48°38.97	126°39.95		600	-			☐	OUT-OF-ORDER
			00:57	EN			48°38.95	126°39.93			-			☐	
20	P4	3	01:02	BE	BONDO	/	48°38.743	126°37.901	1316		-		MG/MR	☐	
			01:12	BO			48°38.957	126°37.878	1316	250	-			☐	
			01:17	EN			48°38.958	126°39.905	1318		-			☐	
21	P4	3	01:27	BE	BONBO	/	48°38.999	126°39.939	1314		-		MG/MR	☐	
			02:15	BO			48°38.991	126°40.007	1321	1200	-			☐	
			02:39	EN			48°38.955	126°39.992			-			☐	

Event Type:

BOT = Bottle cast (no CTD)
CTD = Standalone CTD
ROS = CTD in Rosette
SET = Fish Set

LOOP = Sea Water Loop
MOR = Mooring
NET = Plankton Net Haul
DRF = Drifter
=

Bottle Firing Method:

US = Up / Stop (default)
UN = Up / No stop
DN = Down / No stop

Notes:

Time Code:

BE = Beginning Time of Cast
BO = Bottom Time of Cast
EN = End Time of Cast

CTD Transmissometer and Fluorometer to be cleaned before each cast -- do not use Ammonia products

DE = Deployment Time
MR = Messenger Release Time
RE = Recover Mooring Time

Produced by the Water Properties Group, IOS

WaterProperties.ca
Version: 17 Feb 2020

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 4 of

Month <u>MAY</u>				Year <u>2023</u>		Vessel <u>JP TULLY</u>			Cruise ID <u>2023066</u>						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
22	P4	3	03:18	BE	BOT	MR	48° 38.935	126° 40.010	1325		125-129	5	DL	☐	Go Flo
			03:50	BO			° 38.935	° 40.010		1000	-			☐	
			04:08	EN			° 38.931	° 40.021		1	-			☐	
23	P4	3	04:20	BE	ROS	US	48° 38.95	126° 40.06	1324		130-150	21	MG	☐	DEEP CAST
			04:41	BO			° 38.98	° 40.05		1323	-			☐	P1323 ACT 10
			05:36	EN			° 38.99	° 40.13			-			☐	D1308
24	A4	3	05:50	BE	BOT	MR	48° 38.925	126° 40.076	1331		151-155	5	DL	☐	Deep, Go Flo
			06:21	BO			° 38.978	° 40.123		800	-			☐	
			07:06	EN			48° 38.94	126° 40.17			-			☐	
25	P4	3	06:15	BE	LOOP	—	48° 38.94	126° 40.093	1325	5	—	3	MG	☐	Cs samples
26	P5	3	09:47	BE	ROS	US	48° 41.480	127° 9.890	2690		156-157	2	MR	☒	+Loop 5026
			10:23	BO			48° 41.480	127° 9.980		2000	-			☐	WENT THE
			10:58	EN			48° 41.486	127° 10.055			-			☐	WENT DEEPER
27	P6	3	13:37	BE	ROS	US	48° 44.560	127° 40.010	2543		158-159	2	MR	☒	AFTER 2005 →
			14:12	BO			48° 44.560	127° 39.980		2005	-			☐	WENT DEEPER
			14:43	EN			48° 44.550	127° 40.050			-			☐	IN HEADSET
28	P7	3	17:09	BE	ROS	US	48° 46.580	128° 10.050	2506		160-161	2		☒	
			17:41	BO			48° 46.630	128° 10.120		2005	-			☐	
			18:13	EN			48° 46.550	128° 10.100			-			☐	

Event Type:

BOT = Bottle cast (no CTD)
 CTD = Standalone CTD
 ROS = CTD in Rosette
 SET = Fish Set

LOOP = Sea Water Loop
 MOR = Mooring
 NET = Plankton Net Haul
 DRF = Drifter
 =

Bottle Firing Method:

US = Up / Stop (default)
 UN = Up / No stop
 DN = Down / No stop

Notes:

Time Code:

BE = Beginning Time of Cast
 BO = Bottom Time of Cast
 EN = End Time of Cast

CTD Transmissometer and Fluorometer to be cleaned before each cast -- do not use Ammonia products

DE = Deployment Time

MR = Messenger Release Time

RE = Recover Mooring Time

Produced by the Water Properties Group, IOS

WaterProperties.ca
 Version: 17 Feb 2020

p45

EVENT 26

TROUBLE WITH RADIO COMS

EVENT 27

FLUROMETER EXTREMELY NOISY ON DESCENT TO ~ 800m. LOOKS BETTER AFTER THIS, DOWN & UP,

CLEANED CABLE

EVENT 28

STILL VERY NOISY FL. SIGNAL. TRY REPLACING CABLE. O₂ SIGNAL STARTING TO LOOK NOISY AS WELL.
REPLACED THE 3x FL. CABLE.

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 5 of

Month MAY				Year 2023			Vessel J P Tully			Cruise ID 2023 066					
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
29	P8	03	20:23	BE	LOOP	/	48° 48.91	128° 39.93	2520	4.5	162-5062	/	MG	☐ ☐	CESIUM 602
30	P8	03	20:44	BE	ROS	US	48° 48.98	128° 40.09	2519		162-185	24	MG	☐ ☐	FLUOR CABLE? →
			21:21	BO			48° 48.96	128° 40.11		2005	-			☐ ☐	
			22:33	EN			48° 48.97	128° 39.99			-			☐ ☐	
31	P8	03	22:46	BE	NET	/	48° 48.987	128° 40.014	2529		-		MG	☐ ☐	BONGO
			22:56	BO			48° 48.994	128° 39.952	2532	250	-			☐ ☐	
			23:01	EN			48° 49.0069	128° 39.9474			-			☐ ☐	
32	P8	03	23:08	BE	NET	/	48° 48.9504	128° 39.9488	2518		-		MG	☐ ☐	BONGO
			23:55	BO			48° 49.00	128° 40.28		1200	-			☐ ☐	
		04	00:18	EN			48° 49.0893	128° 40.2174	2527		-			☐ ☐	
33	P9	04	02:44	BE	ROS	US	48° 51.38	129° 09.96	2341		186-188	3	MG	☐ ☐	DMS WATER
			03:21	BO			48° 51.41	129° 10.12		2005	-			☐ ☐	STILL SPIKEY - FLUOR
			03:48	EN			48° 51.41	129° 10.16			-			☐ ☐	DMS DEEP WATER
34	P10	04	06:22	BE	ROS	US	48° 53.57	129° 40.03	2640		189-190	2	MG/MS	☐ ☐	
			07:03	BO			48° 53.682	129° 40.134		2005	-			☐ ☐	
			07:38	EN			48° 53.743	129° 40.56			-			☐ ☐	
35	P10	04	09:04	BE	LOOP	UN	48° 55.020	129° 57.804	2778	4.5	5035		DL	☐ ☐	1x NOT, 1x SAC 2x SHC
			:				°	°		2005	-			☐ ☐	
			:				°	°			-			☐ ☐	

Event Type:

BOT = Bottle cast (no CTD)
 CTD = Standalone CTD
 ROS = CTD in Rosette
 SET = Fish Set

LOOP = Sea Water Loop

MOR = Mooring
 NET = Plankton Net Haul
 DRF = Drifter
 =

Bottle Firing Method:

US = Up / Stop (default)
 UN = Up / No stop
 DN = Down / No stop

Notes:

Time Code:

BE = Beginning Time of Cast
 BO = Bottom Time of Cast
 EN = End Time of Cast

CTD Transmissometer and Fluorometer to be cleaned before each cast -- do not use Ammonia products

DE = Deployment Time
 MR = Messenger Release Time
 RE = Recover Mooring Time

Produced by the Water Properties Group, IOS

WaterProperties.ca
 Version: 17 Feb 2020

EVENT 30

FLUOR VERY JAGGED/NOISY ADDRESS ON ROS RETURN TO DECK CHANGE CABLE?

P5.5

DOWN TO 1000 STRAIGHTWIRE ZERO AFTER THAT

O₂ FUZZY AFTER 300

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 6 of

Month <u>MAY</u>			Year <u>2023</u>			Vessel <u>JP TULLY</u>			Cruise ID <u>2023-066</u>						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
36	P11	4	10:07	BE	ROS	US	48° 55.920	130° 10.030	2752		191-192	2	MB	☒	
			10:47	BO			48° 55.973	130° 10.074		2005	-			☐	
			11:22	EN			48° 56.052	130° 10.124			-			☐	
37	P12	4	13:55	B	LOOP	UN	48° 58.137	130° 39.946			503-7			☐	LOOP FOR CS
38	P12	4	13:59	BE	BOT	MR	48° 58.1371	130° 39.982	3227		193-197		MB	☐	Go-Flow (shallow)
			14:13	BN			48° 58.1307	130° 40.1854		100	-			☐	
			14:27	EN			48° 58.1169	130° 40.2925			-			☐	
39	P12	4	14:40	BE	ROS	US	48° 58.16	130° 40.01	3225		198-221	24	MB	☒	DEEP CAST PAUL OFF
			15:33	BO			48° 58.09	130° 40.24		3156	-			☐	S A D 3.56
			16:52	EN			48° 58.34	130° 40.19			-		MB	☐	→
40	P12	4	17:30	BE	BOT	MR	48° 58.15	130° 40.13	2995		222-226		MB	☐	Go-Flow Deep
			17:51	MR			48° 58.15	130° 40.21		800	-			☐	
			18:30	EN			48° 58.15	130° 40.21			-			☐	
41	P12	4	18:44	BE	ROS		48° 58.270	130° 40.050	3227		227-246	20	MB	☒	DM3 →
			18:54	BO			48° 58.35	130° 40.01		600	-		MB	☐	
			19:36	EN			48° 58.29	130° 40.09			-			☐	
42	P12	4	19:53	BE	BONGO	/	48° 58.206	130° 40.106	3226		-		JF/AR	☐	
			20:03	BO			48° 58.295	130° 40.069	3228	250	-			☐	
			20:09	EN			48° 58.34	130° 40.03			-			☐	

Event Type:

BOT = Bottle cast (no CTD)
CTD = Standalone CTD
ROS = CTD in Rosette
SET = Fish Set

LOOP = Sea Water Loop
MOR = Mooring
NET = Plankton Net Haul
DRF = Drifter
=

Bottle Firing Method:

US = Up / Stop (default)
UN = Up / No stop
DN = Down / No stop

Notes:

Time Code:

BE = Beginning Time of Cast
BO = Bottom Time of Cast
EN = End Time of Cast

CTD Transmissometer and Fluorometer to be cleaned before each cast -- do not use Ammonia products

DE = Deployment Time
MR = Messenger Release Time
RE = Recover Mooring Time

Produced by the Water Properties Group, IOS

WaterProperties.ca
Version: 17 Feb 2020

PL.5

WEIRD VERTICAL SPIKE DOWN TO ~5200M PRESSURE WITH INSTRUMENT @ ~1150.

· SPIKES IN SALINITY @ 1050 & 1500, SPIKE IN σ_t @ 1500, 1790
1600, OTHERS

PAR OFF AFTER P11, RINSED FL WITH DI.

CAST 39: SPIKE ↓ ~750.

↓ ~950

↓ ~1050

and many more.

AFTER CAST 39: CHANGE # LINES TO BE
AVERAGED BY DZK UNIT FROM 24 → 1.

- PAR BACK ON FOR DMS. CAST

- CLEANED & RESEATED SEA CABLE PIG TAIL.

- CHANGED TO 10X LAIN CABLE FOR FL. UPDATED CONFEL FRG: 2023-066-2023-1-10XFLUO

EVENT 41 -

SCAN LENGTH WARNING EXPECTED 74 SCAN LENGTH 32 DATA ACQUISITION CONTINUING

FLUOR STRAIGHT FUZZY LINE OFFSET 2.5 0 @ 250 ON WAY UP

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 7 of

Month <u>MAY</u>				Year <u>2023</u>		Vessel <u>JOHN P TULLY</u>				Cruise ID <u>2023-066</u>					
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
43	P12	4	20:17	BE	NET	/	48° 58.26	130° 39.97	3229		-		JPIAL	☐	BONAO 1200
			21:02	BO			48° 58.550	130° 39.816	3229	1200	-			☐	
			21:24	EN			48° 58.64	130° 39.77			-			☐	
44	P13	5	01:55	BE	ROS	US	49° 02.62	131° 39.91	3025		247-248	24	MG	☐	LOOP@5m
			02:33	BO			49° 02.66	131° 40.03		2005	-			☐	SPIKE @ 1900M
			03:07	EN			49° 02.65	131° 40.14			-			☐	
45	P14	5	07:40	BE	LOOP	US	49° 7.340	132° 39.920	3311	5	5045	24	MB	☐	Custom Loop
46	P14	5	08:19	BE	ROS	US	49° 7.380	132° 39.910	3311		249-272	24	MB	☒	PAR OFF
			09:20	BO			49° 7.410	132° 39.980		3361	-			☐	
			10:42	GN			49° 7.380	132° 40.000			-			☐	P: 3361 D: 3306
47	P15	5	16:30	BE	ROS	US	49° 11.98	133° 40.00	3398		273-279	2	MB	☒	A: 10 C: 3311
48	P16	5	21:02	BO	ROS	US	49° 16.97	134° 39.88	3622		-			☐	+ LOOP 5046
			21:44	EN			.	.		600	273-294	22	MG	☐	ROST ABORTED
49	P16	5	21:32	BE	ROS	US	49° 16.97	134° 39.88	3622		273-294	22	MG	☐	DMS OUT OF ORDER
			21:45	BO			49° 16.99	134° 39.85		600	-			☐	
			22:24	EN			49° 17.03	134° 39.91			-			☐	
50	P16	5	22:38	BE	BONAO	/	49° 17.052	134° 40.092	3638		-			☐	
			22:48	BO			49° 17.041	134° 40.102	3638	250	-			☐	
			22:56	GN			49° 17.040	134° 40.127	3638		-			☐	

Event Type:

BOT = Bottle cast (no CTD)
 CTD = Standalone CTD
 ROS = CTD in Rosette
 SET = Fish Set

LOOP = Sea Water Loop
 MOR = Mooring
 NET = Plankton Net Haul
 DRF = Drifter
 =

Bottle Firing Method:

US = Up / Stop (default)
 UN = Up / No stop
 DN = Down / No stop

Notes:

Time Code:

BE = Beginning Time of Cast
 BO = Bottom Time of Cast
 EN = End Time of Cast

CTD Transmissometer and Fluorometer to be cleaned before each cast -- do not use Ammonia products

DE = Deployment Time
 MR = Messenger Release Time
 RE = Recover Mooring Time

Produced by the Water Properties Group, IOS

WaterProperties.ca
 Version: 17 Feb 2020

AFTER CAST A1: SWAP FLUORIMETER FROM 3685 TO 3640
10x CABLE

p75

CAST LOOKS BETTER, FL SIGNAL LOOKS BETTER, 1 SPIKE TOWARDS 2005 M

HYDRAULIC PROBLEM, DELAYED ~ 30 MIN.
LOTS OF SPIKES.

- STOP @ ~ 2500 BB.

→ TERMINATION BEFORE 0047

CAST A7: FLUORESCENCE IS GETTING FUZZY AGAIN.

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 8 of

Month			Year			Vessel			Cruise ID						
MAY			2023			JOHN P TULLY			2023-066						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
							Latitude	Longitude							
51	P16	5	23:05	BE	BONGO	/	49° 17.028	134° 40.129	3638		-		MG	☐	
			23:53	BO			49° 16.852	134° 40.015	3638	1200	-			☐	
			00:14	EN			49° 16.7573	134° 39.881			-			☐	PAR OFF
52	P16	6	00:55	BE	ROS	US	49° 16.98	134° 39.69	3620		295-318	24	MG	☒	DEEP CAST
			02:00	BO			49° 16.96	134° 39.69		3685	-			☐	P 3685 A 9.8 D 3623 S 3621
			03:41	EN			49° 16.80	134° 39.63			-			☐	PRESSURE SPIKE @ 1600
53	P16	6	05:20	BE	ROS	US	49° 17.010	134° 40.01	3620		319-342	24	MG	☒	CS 300
			05:27	BO			49° 17.03	134° 40.00		30	-			☐	PROGRAM RESTART
			05:40	EN			49° 16.99	134° 39.98			-			☐	
54	P16	6	06:09	BE	ROS	US	49° 17.03	134° 39.96	3620		343-366	24	MG	☒	CS 100
			06:11	BO			49° 17.03	134° 39.98			-			☐	
			06:23	EN			49° 17.00	134° 39.96			-			☐	
55	P16	6	06:48	BE	ROS	US	49° 17.03	134° 39.93	3621		367-390	24	MG	☒	
			06:50	BO			49° 17.03	134° 40.02		100	-			☐	
			06:59	EN			49° 17.03	134° 39.99			-			☐	
56	P16	6	07:12	BE	BOT	MSG	49° 17.03	134° 39.99	3621		391-395	5	DC	☐	GO-FLOW 800
			07:34	BO			49° 17.01	134° 39.96		9555	-			☐	- bottle 4 & 5
			08:07	EN			49° 17.00	134° 40.00			-			☐	did not trip
			:				.	.			-			☐	due to faulty Messenger

Event Type:

BOT = Bottle cast (no CTD)
 CTD = Standalone CTD
 ROS = CTD in Rosette
 SET = Fish Set

LOOP = Sea Water Loop

MOR = Mooring
 NET = Plankton Net Haul
 DRF = Drifter
 =

Bottle Firing Method:

US = Up / Stop (default)
 UN = Up / No stop
 DN = Down / No stop

Time Code:

BE = Beginning Time of Cast
 BO = Bottom Time of Cast
 EN = End Time of Cast

CTD Transmissometer and Fluorometer to be cleaned before each cast -- do not use Ammonia products

DE = Deployment Time
 MR = Messenger Release Time
 RE = Recover Mooring Time

Produced by the Water Properties Group, IOS

WaterProperties.ca
 Version: 17 Feb 2020

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 9 of

Month <u>MAY</u>				Year <u>2023</u>			Vessel <u>SP TULLY</u>				Cruise ID <u>2023-066</u>				
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
57	P16	6	08:33	BE	Bot	MSR	49° 17.00	134° 40.03	3621		397 - 401	5	DL	☐ ☐	Go-Flow 100m
			08:46	BO			49° 17.06	134° 40.02		255	-			☐ ☐	
			08:12	EN			49° 17.02	134° 39.98			-			☐ ☐	
58	P17	6	13:39	BE	ROS	US	49° 21.035	135° 39.978	3628		402 - 403	2	MB	☒ ☐	PAR ON
			14:12	BO			49° 20.940	135° 40.040		2065	-			☐ ☐	
			14:45	EN			49° 20.940	135° 39.920			-			☐ ☐	
59	P18	6	18:52	BE	LOOP	UN	49° 26.08	136° 40.12	3834	4.5	5059	✓	MG	☐ ☐	CESIUM
60	P18	6	19:10	BE	ROS	US	49° 25.99	136° 39.98	3817		404 - 427	24	MG	☐ ☐	PAR OFF
			20:29	BO			49° 25.99	136° 40.03		3889	-			☐ ☐	S 3818 P 3892 D 3823 A 9.2
			22:04	EN			49° 26.02	136° 40.01			-			☐ ☐	
61	P18	6	22:21	DE	DRF	✓	49° 25.97	136° 39.84	3837		-	✓	MR	☐ ☐	FLOAT 41305
62	P19	7	02:37	BE	ROS	US	49° 30.00	137° 40.05	3907		428 - 429	2	MG	☐ ☐	
			03:17	BO			49° 30.01	137° 40.01		2005	-			☐ ☐	
			03:52	EN			49° 29.92	137° 39.98			-			☐ ☐	
63	P19-P20	7	06:19	BE	Loop	-	49° 32.392	138° 15.719	3962	5	5063	1	MG	☐ ☐	1 NUT 2 CHL 1 SAL UNDERWAY Loop
64	P20	7	07:47	BE	Loop	-	49° 33.925	138° 39.962	3945		5064	1	MB	☐ ☐	Cs Loop
65	P20	7	07:58	BE	NET		49° 34.036	138° 40.186	3965		-	-	MB	☐ ☐	BuGo 250
			08:07	BO			49° 34.055	138° 40.097		250	-			☐ ☐	
			08:17	EN			49° 34.063	138° 40.064			-			☐ ☐	

Event Type:

BOT = Bottle cast (no CTD)
 CTD = Standalone CTD
 ROS = CTD in Rosette
 SET = Fish Set

LOOP = Sea Water Loop
 MOR = Mooring
 NET = Plankton Net Haul
 DRF = Drifter
 =

Bottle Firing Method:

US = Up / Stop (default)
 UN = Up / No stop
 DN = Down / No stop

Notes:

Time Code:

BE = Beginning Time of Cast
 BO = Bottom Time of Cast
 EN = End Time of Cast

CTD Transmissometer and Fluorometer to be cleaned before each cast -- do not use Ammonia products

DE = Deployment Time
 MR = Messenger Release Time
 RE = Recover Mooring Time

Produced by the Water Properties Group, IOS

WaterProperties.ca
 Version: 17 Feb 2020

EVENT 57

LEAK

{ BOTTLE DID NOT CLOSE WENT BACK TO ZSTN @ 0901

SKIPPED '396'

P. 9.5

EVENT 58

DATA SPIKES MOSTLY 1200 → 1600

EVENT 60 A/D SWITCHED OUT - BACK UP IN WITH FLUOR FROM ORIGINAL
SPIKE @ DEPTH 3040 + 3700 ↓ CHIRP ALARM @ 50, 1375, 3560

EVENT 62 NO SPIKES ↓ CHIRP @ 1300

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 10 of

Month MAY				Year 2023			Vessel JP TULLY			Cruise ID 2023-066					
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
66	P20	7	08:21	BE	NET		49° 34.056	138° 40.110	3946		-		MB	☐ ☐	Room Bonga
			09:05	BO			49° 34.224	138° 39.900		1200	-			☐ ☐	
			09:25	EN			49° 34.274	138° 39.771			-			☐ ☐	
67	P20	7	10:10	BE	BOT	MSC	49° 34.054	138° 40.182	3965		430 - 434	5	DC	☐ ☐	Go-Alo 100m
			10:28	BO			49° 34.019	138° 40.097		255	-			☐ ☐	
			10:45	EN			49° 34.054	138° 40.079			-			☐ ☐	
68/69	P20	7	11:16	BE	ROS	US	49° 34.044	138° 40.080	4023		435 - 458	24	MB	☐ ☐	RESINATED
69			12:26	BO			49° 33.990	138° 40.050	3943	4024	-			☐ ☐	ACQUISITION EVENT 69
			13:56	EN			49° 34.04	138° 40.05			-			☐ ☐	←
70	P20	7	14:45	BE	BOT	MSC	49° 33.997	138° 40.109	3963		480 - 484		DC	☐ ☐	Go-Alo 800
			15:18	BO			49° 34.067	138° 40.135	-	955	-			☐ ☐	
			15:58	EN			49° 34.079	138° 40.165			-			☐ ☐	
71	P20	7	16:11	BE	ROS	US	49° 34.040	138° 40.080	3942		459 - 479	21	MB	☒ ☐	DMF CAS
			16:21	BO			49° 34.080	138° 40.120		600	-			☐ ☐	PAR ON
			16:54	EN			49° 34.000	138° 39.990			-			☐ ☐	
72	P20	7	17:12	BE	DRF	.	49° 34.167	138° 39.893	3961	Ø	-	-	MB	☐ ☐	FLUAT BTR ARW02-0019
73	P21	7	21:28	BE	ROS	US	49° 38.08	139° 39.77	3938		485 - 486	2	MG	☐ ☐	ARW02
			22:04	BO			49° 38.06	139° 39.64		2005	-			☐ ☐	
			22:37	EN			49° 38.12	139° 39.77			-			☐ ☐	

Event Type:

BOT = Bottle cast (no CTD)
 CTD = Standalone CTD
 ROS = CTD in Rosette
 SET = Fish Set

LOOP = Sea Water Loop

MOR = Mooring
 NET = Plankton Net Haul
 DRF = Drifter
 =

Bottle Firing Method:

US = Up / Stop (default)
 UN = Up / No stop
 DN = Down / No stop

Notes:

Time Code:

BE = Beginning Time of Cast
 BO = Bottom Time of Cast
 EN = End Time of Cast

CTD Transmissometer and Fluorometer to be cleaned before each cast -- do not use Ammonia products

DE = Deployment Time
 MR = Messenger Release Time
 RE = Recover Mooring Time

Produced by the Water Properties Group, IOS

WaterProperties.ca
 Version: 17 Feb 2020

p 10.5

EVEN 68

Trouble lifting the boom, lost ~ 15 min.

CHIRP @ 2400m ↓

15 scan length errors

STOP @ 3185

DATA ACQUISITION STOPPED, SCAN LENGTH ERRORS

STOP & RESTART

2023-066-0068-1.hex

PUMP TURNS ON/OFF

FOLLOWING THIS

SCANNER

CONTINUING.

CONTINUING GETTING

DATA READINGS



DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month MAY				Year 2023			Vessel J P TULLY			Cruise ID 2023-066					
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
							Latitude	Longitude							
74	LOOP74	8	01:33	BE	LOOP	/	49°40.927	140°23.911	3934	5	5074-	/	MG	☐ ☐	ISAL 2CHL 1NUT →
75	P22	8	03:00	BE	ROS	US	49°41.95	140°39.95	3883		487-510	24	MG	☒ ☐	S3879 P 3988 D 3818 A 10
			04:15	BO			49°41.95	140°39.92		3989	-			☐ ☐	PAR OFF BUCKET ON
			06:00	EN			49°42.05	140°39.99			-			☐ ☐	SEANERROKS ↑
76	Loop 5076 P22-P23	8	06:44	BE	Loop	-	49°42.395	140°45.513	3625	5	5076	-	MB	☐ ☐	As Loop
77	P23	8	10:23	BE	ROS	US	49°46.109	141°39.884	4029		511-516	6	MB	☒ ☐	PAR ON →
			10:56	BO			49°46.110	141°39.900		2005	-			☐ ☐	
			11:32	EN			49°46.080	141°39.870			-			☐ ☐	
78	P24	8	15:33	BE	Loop		49°50.200	142°40.000	3963	5	5078	21	MB	☐ ☐	Cesium loop
79	P24	8	15:38	BE	ROS	US	49°50.208	142°40.020	3964		517-540	24	MB	☒ ☐	PAR OFF ↓ →
			16:43	BO			49°50.110	142°39.960		4043	-			☐ ☐	BUCKET ON
			18:13	EN			49°49.960	142°39.910			-			☐ ☐	D=3970 A=10 P=4043 S=3963
80	Loop 80	8	20:58	BE	Loop	UN	49°57.13	143°20.14	4084	4.5	5080		MG	☐ ☐	ISAL 2CHL 1NUT
81	P25	8	22:21	BE	ROS	US	50°00.098	143°36.23	4117		541-542	2	MG	☒ ☐	PAR ON
			22:58	BO			50°00.13	143°36.22		2005	-			☐ ☐	2 SPIKES OXY ↓
			23:33	EN			50°00.10	143°36.19			-			☐ ☐	
82	P35	9	02:57	BE	ROS	US	50°00.70	144°18.17	4125		543-544	2	MG	☒ ☐	CHIRP @ 570 ↓
			03:34	BO			50°00.02	144°18.11		2005	-			☐ ☐	+LOOP
			04:10	EN			50°00.02	144°18.03			-			☐ ☐	

P 11.5. / 21

EVENT 75 CHECKED SENSORS BEFORE DEPLOYMENT - SCREW COVER LOOSE - TEMP WAS GAPPED - TOOK OFF + CLEANED + PUT BACK ON WITH NO GAP - SCREWS TIGHT
NO CHIRPS, NO SPIKES ON THE BRIDGE NOTICED A SCREEN IN THE WATER + ASSUMED LEAKY HYDRAULICS; MADE
ARRANGEMENTS TO HAVE COVER FOR CAROUSEL + ABSORBANT PADS WHEN BACK ON DECK
FOUND NOTHING OILWISE BUT GREASY BUILD UP FRONT WIRE, CLEANED BY CREW

EVENT 77
SPIKE ~ 950m ↓ COUPLE SPICES CLOSE TO 2000m ↓

EVENT 79
SCAN LENGTH ERRORS,

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month			Year			Vessel			Cruise ID						
May			2023			J P GULLY			2023066						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
83	P26	9	07:40	BE	ROS	US	50° 0' 020	144° 59' 920	4222		545-568	24	MB	☒	CS 300
			07:45	BO			50° 0' 040	144° 59' 890		300	-			☐	
			07:55	GN			50° 0' 044	144° 59' 898			-			☐	
84	P26	9	08:21	BE	ROS	US	49° 59' 944	144° 59' 998	4222		569-592	24	MB	☒	CS 100
			08:23	BO			49° 59' 942	144° 59' 996		100	-			☐	
			08:30	GN			49° 59' 946	144° 59' 960			-			☐	
85	P26	9	08:53	BE	ROS	US	50° 0' 016	145° 0' 012	4222?		593-616	24	MB	☐	CS 25 Lost
			08:56	BO			50° 0' 010	145° 0' 010		100	-			☐	Sounder
			09:03	GN			50° 0' 010	145° 0' 010			-			☐	
86	P26	9	09:46	BE	ROS	US	50° 0' 020	144° 59' 988	4223		630-653	24	MB	☒	DEEP
87			10:57	BO			50° 0' 005	145° 0' 019	4454	4320	-			☐	BUCKET ON, PAR OF
			12:34	GN			50° 0' 012	145° 0' 019			-			☐	START NEW EVENT
88	P26	9	14:13	BE	BOT	MSG	50° 0' 005	145° 0' 008	4243		623-629	7	DC	☐	ON UPCAST TM
			14:39	BO			50° 0' 019	144° 59' 974		355	-			☐	WENCHI TROUBLE
			MESSAGE 15:00	GN							-			☐	Lost - 10-15 min
89	P29	9	16:30	BE	BOT	MSG	49° 59' 944	145° 00' 00	4246		617-622	6	DC	☐	DEEP TM
			17:16	BO			49° 59' 958	144° 59' 957	4243	1500	-			☐	
			18:10	GN			50° 00' 003	144° 59' 907			-			☐	
			:								-			☐	

P12.5 /21

EVENT 86/87
D=4239 P=4320 A=8 S=4235
STOP @ 3700 ↓ Bathroom Break.

EVENT 86 1 SCAN LENGTH ERROR, 1 SPIKE.

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month			Year			Vessel			Cruise ID						
MAY			2023			JOHN P TULLY			2023-066						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
90	P26	9	18:58	BE	ROS	US	50° 00.01	145° 00.17	4242	654	677	24	MG	☒ ☐	STOP FILE @ BOT
			19:27	EN			50° 00.00	145° 00.05		1005	-			☐ ☐	DMS
91	P26	9	19:29	BOT	ROS	US	50° 00.00	145° 00.09	4242		-			☐ ☐	START FILE FOR ↑
			20:16				49° 59.97	145° 00.00		1005	-			☐ ☐	
92	P26	9	20:29	BE	NET	/	50° 00.097	145° 00.020	4224		-		MG	☐ ☐	BONGO
			20:39	BO			50° 00.087	145° 00.084	4236	250	-			☐ ☐	
			20:44	EN			50° 00.09	145° 00.09	4243		-			☐ ☐	
93	P26	9	20:57	BE	NET	/	50° 00.08	145° 00.08	4243		-		MG	☐ ☐	BONGO
			21:44	BO			49° 59.19	145° 00.32		1200	-			☐ ☐	
			22:05	EN			49° 59.79	145° 00.44	4242		-			☐ ☐	
94	P26	9	22:20	BE	ARGO	-	49° 59.88	145° 00.34	4222	0	-		MG/MR	☐ ☐	ARMOR 0385
95	P26	9	22:34	BE	ARGO		49° 59.92	145° 00.12	4195	0	-		MG/MR	☐ ☐	PROVOR 0720
96	PA-017	9	23:57	BE	ROS	US	50° 08.57	144° 50.76	4200		-		MG	☒ ☐	FIRE ALL BOTTLES
		10	00:04	BO			50° 08.58	144° 50.72		350	-			☐ ☐	SPIKE SAL 280M
			00:11	EN			50° 08.55	144° 50.72			-			☐ ☐	
97	PA-017	10	00:25	BE	MVP	UN	50° 08.58	144° 50.29	4212	200	-		MG	☐ ☐	DEPLOYED @ 2 KNOTS
98	LOOP 5099 UNDERWAY	10	10:00	BE	Loop	-	50° 14.361	142° 43.165	3344	5	5098	1	MR/CS	☐ ☐	2xCHL, 1xSAL, 1xNUT
99	LOOP 5099 UNDERWAY	11	13:51	BE	Loop	-	50° 30.405	136° 55.208	3018	5	5099	1	KIT	☐ ☐	2xCHL, 1xSAL, 1xNUT
100	LOOP 5100 UNDERWAY	11	20:04	EN	MVP	UN	50° 34.145	135° 30.734	3641	200	-		MG	☐ ☐	RECOVERY FISH

EVENT 90/91

SUSPECTED

ROSETTE STOPPED @ 268 FOR 9 MINUTES HYDRAULIC LEAK OIL SHEEN IN WATER

STOPPED: CAST 90 @ BOTTOM. STARTED 91 FOR UPCAST

p13.5 / 21

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 14 of 21

Month MAY			Year 2023			Vessel JPTOLLY			Cruise ID 2023-066						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
101	TEST LOOP	11	20:23	BE	ROS	UN	50°33.97	135°30.50	3641		/	24	MG	☒	SPLICE TEST ONLY
			20:34	BO			50°33.92	135°30.42		600	-			☐	BOTTLES CLOSED @ 23H ↑
			20:45	EN			50°33.86	135°30.38			-			☐	SAL SPIKE @ 415
102	UNDERWAY	11	20:59	BE	MVP	UN	50°33.82	135°30.02	3639	200	/	/	MG	☐	
103	LOOP 103	11	22:21	BE	LOOP	UN	50°35.10	135°11.65	3441	5	5103	/	MG	☐	ISAL INUT 2CHL
104	LOOP 104	12	11:15	BE	LOOP	UN	50°42.504	132°28.565	3062	5	5104	-	MB	☐	ISAL INUT 2CHL
105	UNDERWAY	13	01:87	EN	MVP	UN	50°50.82	129°29.49	235	0	/	/	MG	☐	PARKED
106	SCOTT 3	13	02:05	BE	ROS	/	50°50.81	129°29.75	233		/	/	MG	☒	
			02:10	BO			50°50.85	129°29.77		224	-			☐	
			02:15	EN			50°50.87	129°29.76			-			☐	
107	LOOP 107	13	02:45	BE	LOOP	BE	50°55.40	129°24.08	235	4.5	5107	/	MG	☐	ISAL 2CHL INUT
108	SCOTT 2	13	03:53	BE	ROS	/	51°07.01	129°28.00	288		/	/	MG	☒	
			03:59	BO			51°07.10	129°28.02		280	-			☐	
			04:05	EN			51°07.11	129°28.05			-			☐	
109	CPE1	13	09:25	BE	ROS	-	51°0.000	127°49.960	147		-	-0	MB	☒	
			09:27	BO			51°0.000	127°49.960		140	-			☐	
			09:29	EN			51°0.010	127°49.960			-			☐	
110	CPE1	13	09:29	BO	LOOP	-	51°0.010	127°49.960	142	5	-		SH	☐	COSMOS LOOP
			:				.	.			-			☐	

Event Type:
 BOT = Bottle cast (no CTD)
 CTD = Standalone CTD
 ROS = CTD in Rosette
 SET = Fish Set
 LOOP = Sea Water Loop
 MOR = Mooring
 NET = Plankton Net Haul
 DRF = Drifter
 =

Bottle Firing Method:
 US = Up / Stop (default)
 UN = Up / No stop
 DN = Down / No stop

Time Code:
 BE = Beginning Time of Cast
 BO = Bottom Time of Cast
 EN = End Time of Cast

CTD Transmissometer and Fluorometer to be cleaned before each cast -- do not use Ammonia products
 DE = Deployment Time
 MR = Messenger Release Time
 RE = Recover Mooring Time

Notes:

Produced by the Water Properties Group, IOS

WaterProperties.ca
 Version: 17 Feb 2020

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 15 of 21

Month MAY				Year 2023			Vessel JP TULLY			Cruise ID 2023-066					
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
111	CPE	13	09:37	BE	NET	-	51° 0.005	127° 50.057	142		-	-	DC	☐ ☐	Banks
			09:42	BO			51° 0.021	127° 50.056		135	-			☐ ☐	
			09:45	EN		"	51° 0.040	127° 50.071			-			☐ ☐	
112	LBA1	13	10:44	BE	ROS	-	50° 54.342	127° 39.161	438		-	-0	MB	☒ ☒	
			10:51	BO			50° 54.365	127° 39.155		433	-			☐ ☐	
			10:58	EN			50° 54.370	127° 39.130			-			☐ ☐	
113	QCS3	13	12:39	BE	ROS	-	50° 43.750	127° 14.941	212		-	-0	MB	☒ ☐	
			12:42	BO			50° 43.746	127° 14.945		202	-			☐ ☐	
			12:45	EN			50° 43.747	127° 14.969			-			☐ ☐	
114	QCS1	13	14:27	BE	ROS	-	50° 40.070	126° 46.230	156		-	-0	MB	☒ ☐	
			14:30	BO			50° 40.110	126° 46.200		145	-			☐ ☐	
			14:32	EN			50° 40.140	126° 46.220			-			☐ ☐	
115	LOOP 115 UNDERWAY	13	15:28	BE	Loop		50° 30.972	126° 39.753	2374	5	5115	-	MB	☐ ☐	1 SAL 2 CHT
116	116.5	13	21:34	BE	Loop	UN	49° 57.721	125° 08.695	155	5	5116	-		☐ ☐	CESIUM
117	16	13	21:41	BE	ROS	US	49° 57.75	125° 08.74	154		678-688	11	MG	☒ ☐	
			21:45	BO		150	49° 57.76	125° 08.75		148	-			☐ ☐	
			21:57	EN		EN	49° 57.76	125° 08.79			-			☐ ☐	
			:				°	°			-			☐ ☐	
			:				°	°			-			☐ ☐	

Event Type:

BOT = Bottle cast (no CTD)
 CTD = Standalone CTD
 ROS = CTD in Rosette
 SET = Fish Set

LOOP = Sea Water Loop

MOR = Mooring
 NET = Plankton Net Haul
 DRF = Drifter

Bottle Firing Method:

US = Up / Stop (default)
 UN = Up / No stop
 DN = Down / No stop

Notes:

Time Code:

BE = Beginning Time of Cast
 BO = Bottom Time of Cast
 EN = End Time of Cast

CTD Transmissometer and Fluorometer to be cleaned before each cast -- do not use Ammonia products

DE = Deployment Time
 MR = Messenger Release Time
 RE = Recover Mooring Time

Produced by the Water Properties Group, IOS

WaterProperties.ca
 Version: 17 Feb 2020

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 16 of 21

Month <u>MAY</u>			Year <u>2023</u>			Vessel <u>JPTULLY</u>			Cruise ID <u>2023-066</u>						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
118	14 14	13	22:59	BE	ROS	US	49° 53.06	124° 59.53	314		689-705	17	MG	☒ ☐	
			23:06	BO			49° 53.06	124° 59.54		310	-			☐ ☐	
			23:30	EN			49° 53.04	124° 59.58			-			☐ ☐	
119	14	13	23:41	BE	NET	/	49° 52.996	124° 59.514	314		-		MG	☐ ☐	Bongo VNH
			23:53	BO			49° 52.845	124° 59.425	313	303	-			☐ ☐	
			23:58	EN			49° 52.805	124° 59.408	312		-			☐ ☐	
120	12	14	01:48	BE	ROS	US	49° 43.72	124° 40.84	353		706-722	17	MG	☒ ☐	CHIT
			01:56	BO			49° 43.71	124° 40.91		350	-			☐ ☐	
			02:25	EN			49° 43.67	124° 40.85			-			☐ ☐	
121	12	14	02:38	BE	NET	/	49° 43.66	124° 40.83	355		-		MG	☐ ☐	Bongo
			02:48	BO			49° 43.66	124° 40.94		345	-			☐ ☐	
			02:52	EN			49° 43.67	124° 40.96			-			☐ ☐	
122	9	14	04:02	BE	ROS	US	49° 35.49	124° 38.24	168		723-734	12	MG	☒ ☐	
			04:06	BO			49° 35.50	124° 38.21		163	-			☐ ☐	
			04:22	EN			49° 35.54	124° 38.14			-			☐ ☐	
123	6	14	05:26	BE	ROS	US	49° 30.68	124° 27.94	191		735-747	13	MG	☒ ☐	
			05:31	BO			49° 30.67	124° 27.89		187	-			☐ ☐	
			05:48	EN			49° 30.66	124° 27.78			-			☐ ☐	
			:				°	°			-			☐ ☐	

Event Type:

BOT = Bottle cast (no CTD)
CTD = Standalone CTD
ROS = CTD in Rosette
SET = Fish Set

LOOP = Sea Water Loop
MOR = Mooring
NET = Plankton Net Haul
DRF = Drifter

Bottle Firing Method:

US = Up / Stop (default)
UN = Up / No stop
DN = Down / No stop

Notes:

Time Code:

BE = Beginning Time of Cast
BO = Bottom Time of Cast
EN = End Time of Cast

CTD Transmissometer and Fluorometer to be cleaned before each cast -- do not use Ammonia products

DE = Deployment Time
MR = Messenger Release Time
RE = Recover Mooring Time

Produced by the Water Properties Group, IOS

WaterProperties.ca
Version: 17 Feb 2020

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 17 of 21

Month MAY				Year 2023			Vessel JP TULLY			Cruise ID 2023-066					
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
							Latitude	Longitude							
124	CPF2	14	06:21	BE	ROS	/	49° 28. 01	124° 29. 90	326		/	/	MG	☒ ☐	
			06:28	BO			49° 28. 02	124° 29. 85		321	-			☐ ☐	
			06:34	EN			49° 27. 998	124° 29. 797			-			☐ ☐	
125	CPF2	14	06:41	BE	NET	/	49° 27. 95	124° 29. 87	327		-		MG	☐ ☐	
			06:53	BO			49° 27. 94	124° 29. 96	328	317	-			☐ ☐	
			07:00	EN			49° 27. 9230	124° 29. 9951	329		-			☐ ☐	
126	3	14	07:58	BE	ROS	US	49° 26. 625	124° 20. 262	323		-		SKlynal	☒ ☒	
			08:02	BO			49° 26. 64	124° 20. 32		319	-			☐ ☐	
			08:20	EN			49° 26. 640	124° 20. 34	323		748-763	16		☐ ☐	
127	2	14	09:17	BE	ROS	US	49° 24. 115	124° 9. 274	278.5		7 -		SKlynal	☒ ☒	
			09:21	BO			49° 24. 100	124° 9. 270		273	-			☐ ☐	
			09:41	EN			49° 24. 060	124° 9. 250	280		764-773	16		☐ ☐	
128	2	14	09:42	BE	LOOP	US	49° 24. 060	124° 9. 250	278.5	5	51-128	3	SUE	☐ ☐	Cesium loop
129	24	14	10:30	BE	ROS		49° 30. 322	124° 5. 98	423		-		SKlynal	☒ ☒	
			10:37	BO			49° 30. 300	124° 5. 95		422	-			☐ ☐	
			10:44	EN			49° 30. 300	124° 5. 920			-			☐ ☐	
130	24	14	10:51	BE	NET	/	49° 30. 315	124° 5. 902	424	430	-		DIC	☐ ☐	Bongo
			11:07	BO			49° 30. 378	124° 5. 903	428.7		-			☐ ☐	
			11:14	EN			49° 30. 398	124° 5. 911	423.8		-			☐ ☐	

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month MAY			Year 2023			Vessel JP Tully			Cruise ID 2023-066						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
131	22	14	12:40	BE	ROS	/	49° 40.17	124° 16.29	352		-		JK	☒	
			12:40	BO			49° 40.19	124° 16.27		348	-			☐	
			12:57	EN			49° 40.17	124° 16.25			780-784	5		☐	
132	22	14	13:05	BE	NET		45° 40.231	124° 16.271	353		780-784	5	DC	☐	L.O. : 343m
			13:16	BO			45° 40.271	124° 16.278	354	343	-			☐	
			13:22	EN			45° 40.287	124° 16.280			-			☐	
133	CPE1	14	15:28	BE	ROS	-	49° 21.950	124° 4.970	244		-	-	MB	☒	
			15:32	BO			49° 21.937	124° 4.964		236	-			☐	
			15:36	EN			49° 21.932	124° 4.964			-			☐	
134	CPE1	14	15:41	BE	NET		49° 21.948	124° 4.961	242		-	-	DC	☐	Bongo
			15:48	BO			49° 21.965	124° 4.971		230	-			☐	
			15:52	EN			49° 21.961	124° 4.981			-			☐	
135	78	14	17:22	BE	ROS	-	49° 24.054	123° 45.248	135		-	-	MB	☒	
			17:24	BO			49° 24.050	123° 45.250		130	-			☐	
			17:26	EN			49° 24.050	123° 45.240			-			☐	
136	28	14	17:31	BE	NET		49° 24.048	123° 45.260	135		-		DC	☐	Bongo
			17:35	BO			49° 24.052	123° 45.264		125	-			☐	
			17:37	EN			49° 24.047	123° 45.263			-			☐	
			:				°	°			-			☐	

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month <u>MAY</u>				Year <u>2023</u>			Vessel <u>JP TULLY</u>			Cruise ID <u>2023-066</u>					
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/Fl Cleaned	Comments
137	27	14	18:20	BE	ROS	US	49° 19.070	123° 47.980	345		785-801	17	MR	☒	
			18:25	BO			49° 19.060	123° 47.990		341	-			☐	
			18:42	EN			49° 19.080	123° 47.980			-			☐	
138	GEO1	14	19:27	BE	ROS	US	49° 14.95	123° 45.13	402		802-809	8	MG	☒	CHITO
			19:35	BO			49° 14.97	123° 45.15		398	-			☐	
			19:52	EN			49° 15.01	123° 45.08			-			☐	
139	GEO1	14	20:01	BE	NET	/	49° 15.02	123° 45.06	402		-	-	MG	☐	BONGO
			20:16	BO			49° 15.02	123° 45.13		392	-			☐	
			20:23	EN			49° 15.99	123° 45.26			-			☐	
140	38	14	22:01	BE	ROS	-	49° 11.89	123° 26.42	305		-	-	MG	☒	
			22:06	BO			49° 11.89	123° 26.45		301	-			☐	
			22:12	EN			49° 11.89	123° 26.47			-			☐	
141	38	14	22:19	BE	NET	/	49° 11.94	123° 26.53	307		-		MG	☐	BONGO
			22:36	BO			49° 11.94	123° 26.60		298	-			☐	
			22:35	EN			49° 11.95	123° 26.62			-			☐	
142	39	14	23:19	BE	ROS	US	49° 09.72	123° 32.98	375		810-826	17	MG	☐	
			23:25	BO			49° 09.79	123° 32.99		371	-			☐	
			23:49	EN			49° 09.78	123° 33.03			-			☐	
			:				.	.			-			☐	

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 20 of 21

Month <u>MAY</u>			Year <u>2023</u>			Vessel <u>JP TULLY</u>			Cruise ID <u>2023-066</u>						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
143	40	15	00:39	BE	NET	/	49° 08.60	123° 36.63	146		-		MLC	☐	
			00:44	Bo			49° 08.61	123° 36.64		136	-			☐	
			00:47	EN			49° 08.61	123° 36.65			-			☐	
144	40	15	00:57	BE	ROS	/	49° 08.64	123° 36.68	142		/	/	MG	☒	FLUOR MAXED
			01:01	Bo			49° 08.64	123° 36.68		138	-			☐	NEED TO CHANGE CABLE
			01:03	EN			49° 08.64	123° 36.68			-			☐	
145	42	15	02:10	BE	ROS	US	49° 01.78	123° 26.21	318		827-843	17	MG	☒	→
			02:17	Bo			49° 01.78	123° 26.25		314	-			☐	
			02:39	EN			49° 01.83	123° 26.28			-			☐	
146	42	15	02:45	BE	NET	/	49° 01.85	123° 26.31	318		-		MLC	☐	BONGO
			02:56	Bo			49° 01.92	123° 26.43		308	-			☐	
			03:02	EN			49° 01.95	123° 26.47			-			☐	
147	46	15	04:49	BE	ROS	US	48° 51.37	123° 10.73	178		844-855	12	MG	☒	
			04:53	Bo			48° 51.35	123° 10.74		174	-			☐	
			:	EN			°	°			-			☐	
148	46	15	05:13	BE	NET	/	48° 51.37	123° 10.81	180		-		MG	☐	BONGO
			05:20	Bo			48° 51.41	123° 10.84	179	174	-			☐	
			05:24	EN			48° 51.43	123° 10.84	178		-			☐	
			:				°	°			-			☐	

Event Type:

BOT = Bottle cast (no CTD)
 CTD = Standalone CTD
 ROS = CTD in Rosette
 SET = Fish Set

LOOP = Sea Water Loop

MOR = Mooring
 NET = Plankton Net Haul
 DRF = Drifter

=

Bottle Firing Method:

US = Up / Stop (default)
 UN = Up / No stop
 DN = Down / No stop

Notes:

Time Code:

BE = Beginning Time of Cast
 BO = Bottom Time of Cast
 EN = End Time of Cast

CTD Transmissometer and Fluorometer to be cleaned before each cast -- do not use Ammonia products

DE = Deployment Time
 MR = Messenger Release Time
 RE = Recover Mooring Time

Produced by the Water Properties Group, IOS

WaterProperties.ca
 Version: 17 Feb 2020

p 20.5/21

After cast 144: change fluo gain cable from 10x to 3x because fluo reached 15.

New corby Rte: 9p-550 2023-066 P18 on - 3x Fluo. xmlcon

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month MAY			Year 2023			Vessel SP TULLY			Cruise ID 2023-066						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
149	SB	15	07:49	BE	ROS	US	48° 46.410	123° 1.590	210		856-870	15	MB	☒	
			07:52	BO			48° 46.416	123° 1.588		205	-			☐	
			08:06	EN			48° 46.435	123° 1.466			-			☐	
150	SB	15	09:15	BE	ROS	-	48° 42.97	123° 14.31	335		-		JMK	☐	
			09:20	BO			48° 43.00	123° 13.340		330	-			☐	
			09:26	EN			48° 43.070	123° 14.230			-			☐	
151	G101	15	10:10	BE	ROS	-	48° 45.750	123° 20.530	67		-		MB	☒	
			10:11	BO			48° 45.750	123° 20.520		63	-			☐	
			10:12	EN			48° 45.750	123° 20.520			-			☐	
152	G101	15	10:17	BE	NET	-	48° 45.743	123° 20.462	68		-		JC	☐	
			10:19	BO			48° 45.739	123° 20.454		65	-			☐	
			10:20	EN			48° 45.736	123° 20.451			-			☐	
153	SC04	15	10:58	BE	ROS	US	48° 43.430	123° 25.050	96		871-874	4	MB	☒	
			10:59	BO			48° 43.430	123° 25.070		92	-			☐	
			11:04	EN			48° 43.450	123° 25.000			-			☐	
154	SC04	15	11:10	BE	NET	US	48° 43.492	123° 25.013	96		871-874	4	TX	☐	
			11:13	BO			48° 43.505	123° 24.983		87	-			☐	
			11:14	EN			48° 43.513	123° 24.972			-			☐	
			:				°	°			-			☐	