

Company: L-DEO - Lamont - Doherty Earth Observatory
Vessel: Marcus G. Langseth
Client: Shillington / NSF

Project: MGL1902

Area: Emperor Sea Mounts / North Pacific
Start Date: 23-Apr-19

Vessel Sensor Offsets

Towing Offsets

Towing Configuration

Acoustic Overhead

Gun Array Offsets

Streamer Front End

Streamer Tail End

Streamer Complete

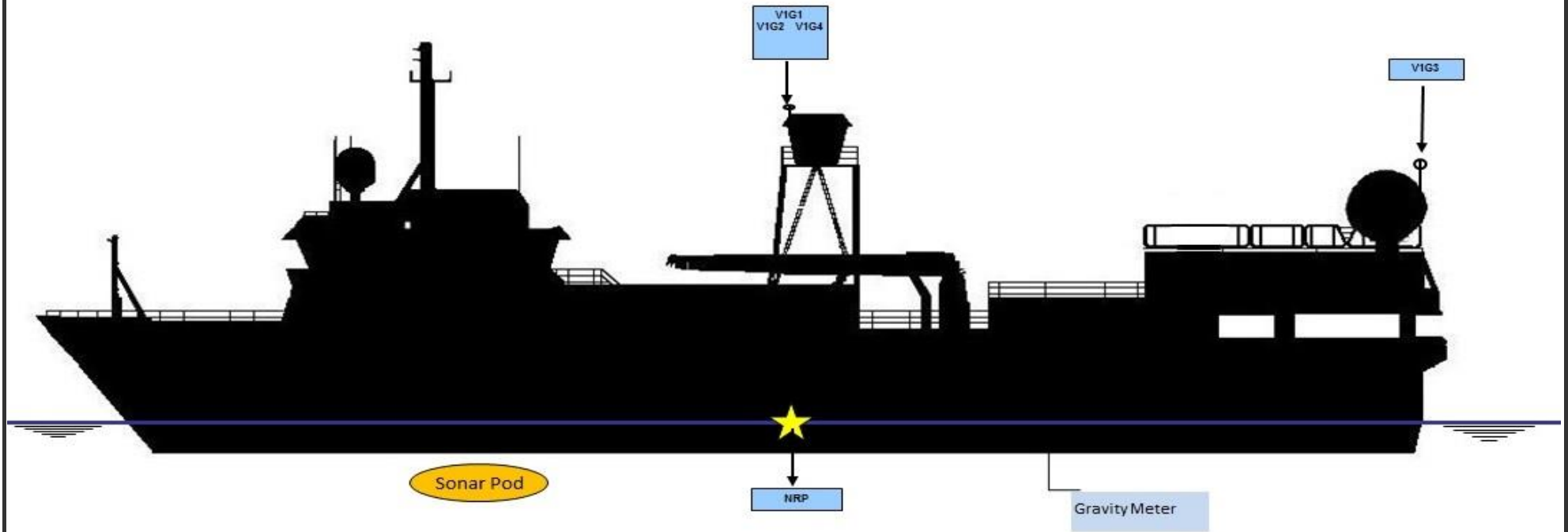
Hydrophone Offsets

Tailbuoy Offsets

Timing

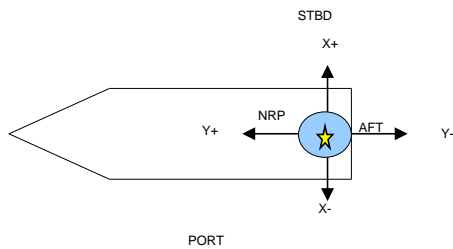


R/V Marcus G. Langseth - Vessel Sensor Offsets



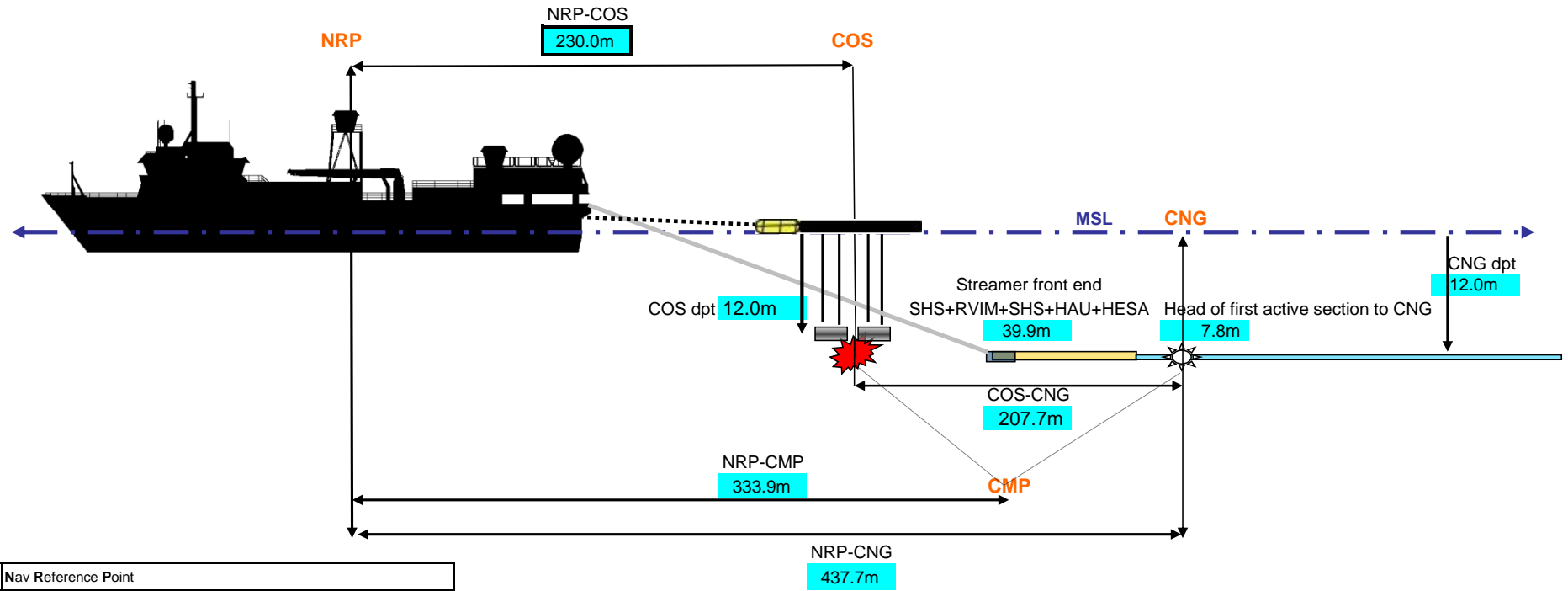
Negative values are above water line

All measurements in meters



		STBD/PORT (X)	FORE/AFT (Y)	UP/DOWN (Z)	
NRP	NAVIGATION REFERENCE POINT	0.00	0.00	0.00	
V1G1	C-Nav 3050	0.00	0.00	-16.90	
V1G2	SeaPath 200	0.00	1.50	-16.90	
V1G3	C-Nav 2000	-2.10	-29.20	-14.50	
V1G4	Pos MV	-1.30	1.20	-16.90	
V1R1	PosNet	-1.30	0.00	-16.90	
Sonar Pod	EM122 Knudsen ADCP	0.00	20.20	7.49	
	EM122 Center Beam offset (in Spectra)	0.00	13.4	7.49	
MRU	Seapath MRU	2.30	14.16	-4.30	
BGM	Bell Gravity Meter	0.00	-13.10	1.10	

R/V Marcus G. Langseth - Towing Offsets



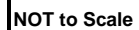
NRP	Nav Reference Point
COS	Centre of Source
CNG	Centre of Near Group
CMP	Common Mid-Point
MSL	Mean Sea Level
NRP-Stern	29.5m
NRP-COS	230.0m

All measurements in meters



Cell contents referenced from Config_offsets tab

# Streamers	Length	Channels	Spacing	
SEAL	1	15000	1200	12.5m
# Gun Strings Used	4	Vol (in^3)	6600	

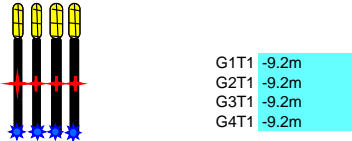


Cell contents referenced from Config_offsets tab

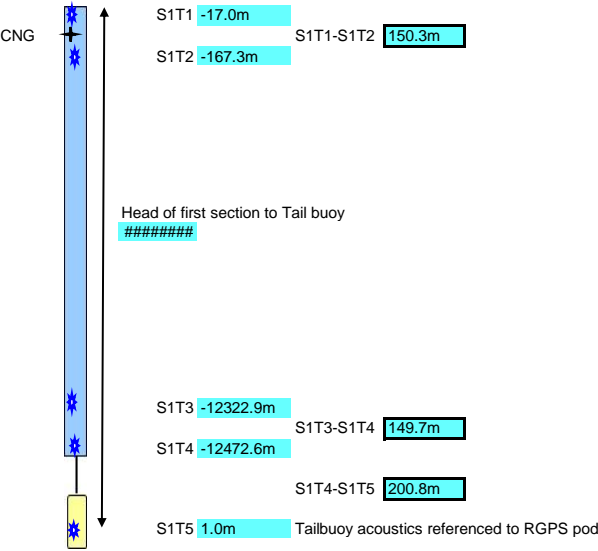
R/V Marcus G. Langseth - Acoustic Offsets



Source acoustic offsets are referenced to COS on individual gun string

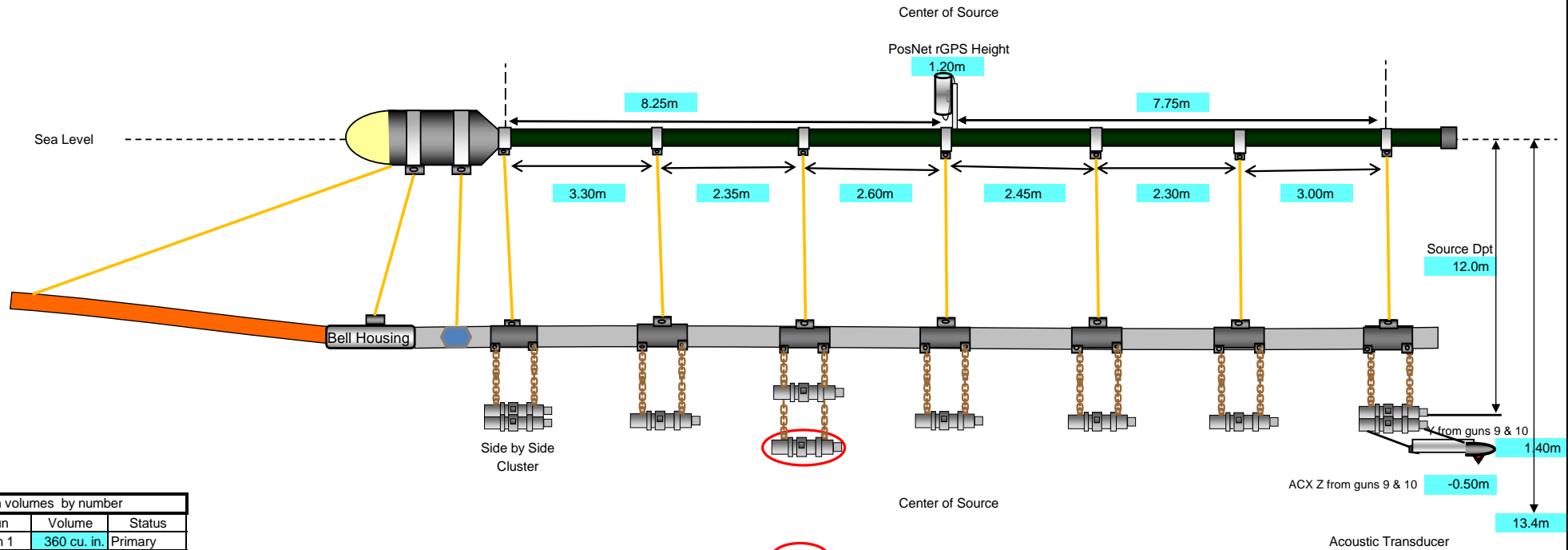


Streamer acoustic offsets are referenced to CNG on individual streamer

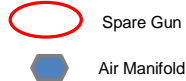


Cell contents referenced from Config_offsets tab

R/V Marcus G. Langseth - Gun Array Offsets



Gun volumes by number		
Gun	Volume	Status
Gun 1	360 cu. in.	Primary
Gun 2	360 cu. in.	Primary
Gun 3	40 cu. in.	Primary & Mitigation
Gun 4	180 cu. in.	Primary
Gun 5	180 cu. in.	Spare
Gun 6	90 cu. in.	Primary
Gun 7	120 cu. in.	Primary
Gun 8	60 cu. in.	Primary
Gun 9	220 cu. in.	Primary
Gun 10	220 cu. in.	Primary



Array total volume (without spares) is 6600 cu. in. Total volume/string (without spare) 1650 cu. in.

Guns (1 & 2) & (9 & 10) in a horizontal cluster. Guns (5 & 6) in a vertical cluster but #6 is spare only

Gun clusters have 0.75m between guns and hang 0.95m from center of hanger

Horizontal Clusters are 1m from gun port to gun port

Single guns hang from hanger 1.15m

All gun volumes, numbering, locations, and offsets were inspected and verified by Chief Source Mechanic.

All measurements in meters
NOTE: drawing not to scale

Cell contents referenced from Config_offsets tab

R/V Marcus G. Langseth - Gun Configuration

ACX = Acoustic

Center of Source



Spare Gun

Gun Clusters

Guns 1 & 2 horizontal array

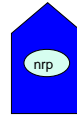
Guns 4 & 5 vertical - lower gun is spare only

Guns 9 & 10 horizontal array

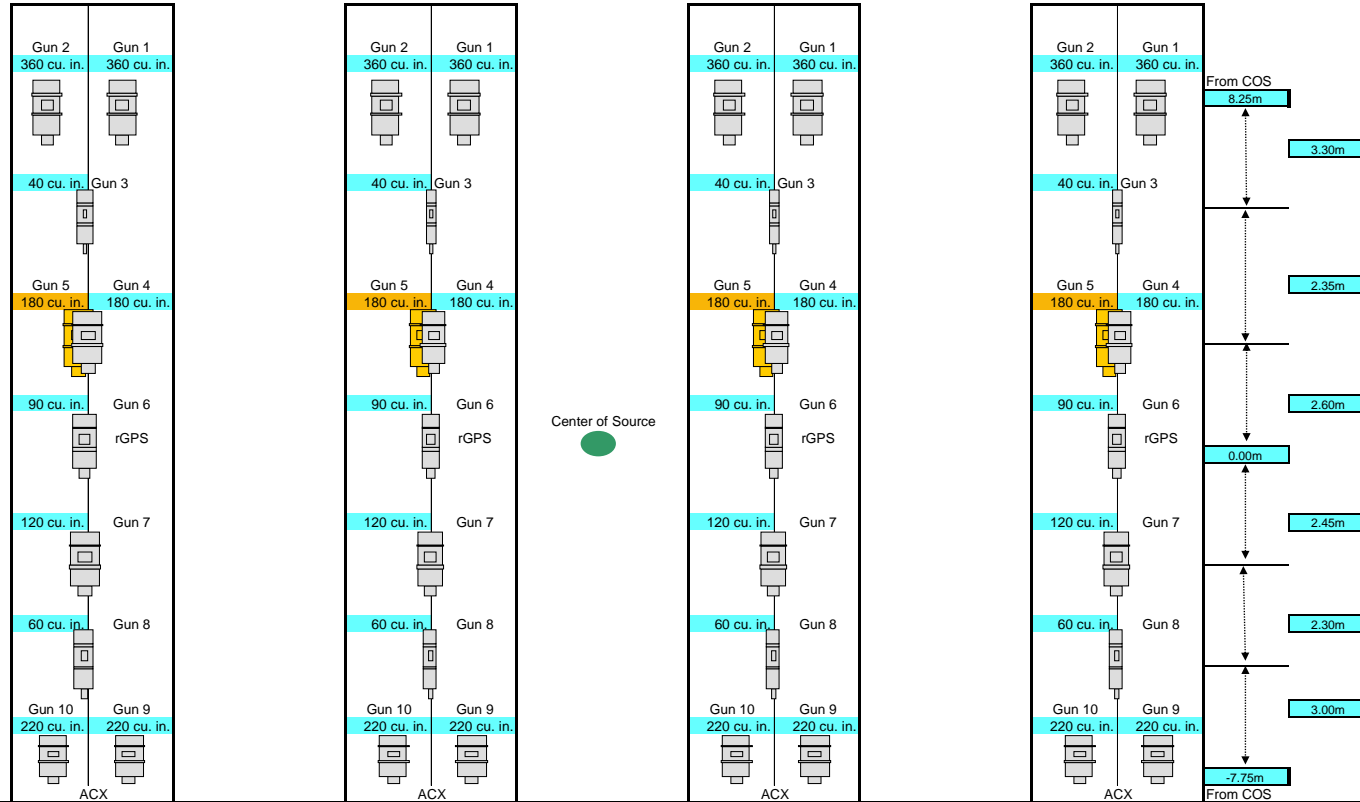
Gun Offsets relative to Center of String

	X	Y
Gun 1	0.50m	8.31m
Gun 2	-0.50m	8.31m
Gun 3	0.00m	5.03m
Gun 4	0.00m	2.60m
Gun 5	0.00m	2.60m
Gun 6	0.00m	0.00m
Gun 7	0.00m	-2.74m
Gun 8	0.00m	-5.09m
Gun 9	0.50m	-8.21m
Gun 10	-0.50m	-8.21m

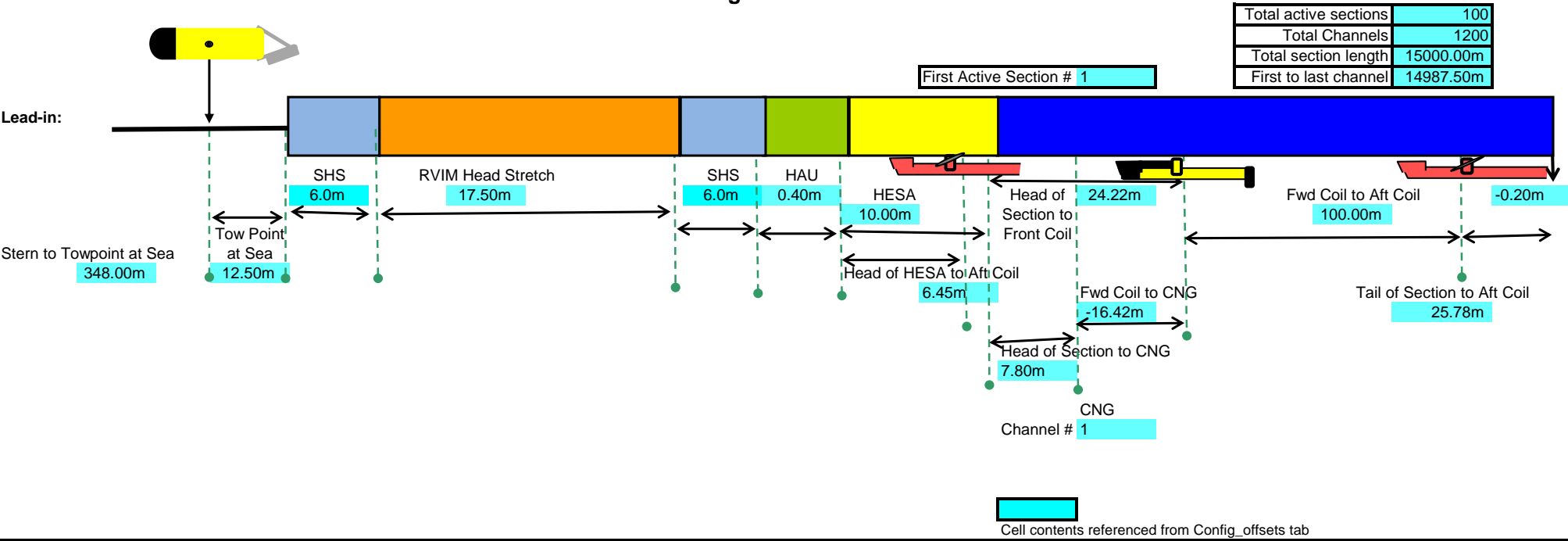
All measurements in meters



Sub array #4 6.0m Sub array #3 6.0m Sub array #2 6.0m Sub array #1



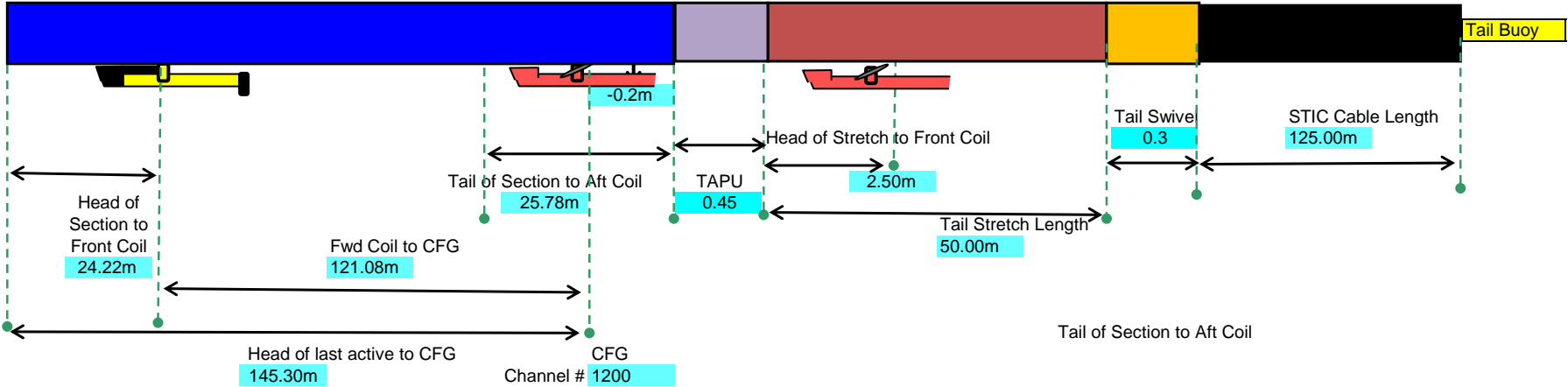
R/V Marcus G. Langseth - Streamer Front End



R/V Marcus G. Langseth - Streamer Tail End

Total active sections	100
Total Channels	1200
Total section length	15000.00m
First to last channel	14987.50m
CFG to TB RGPS	181.95m

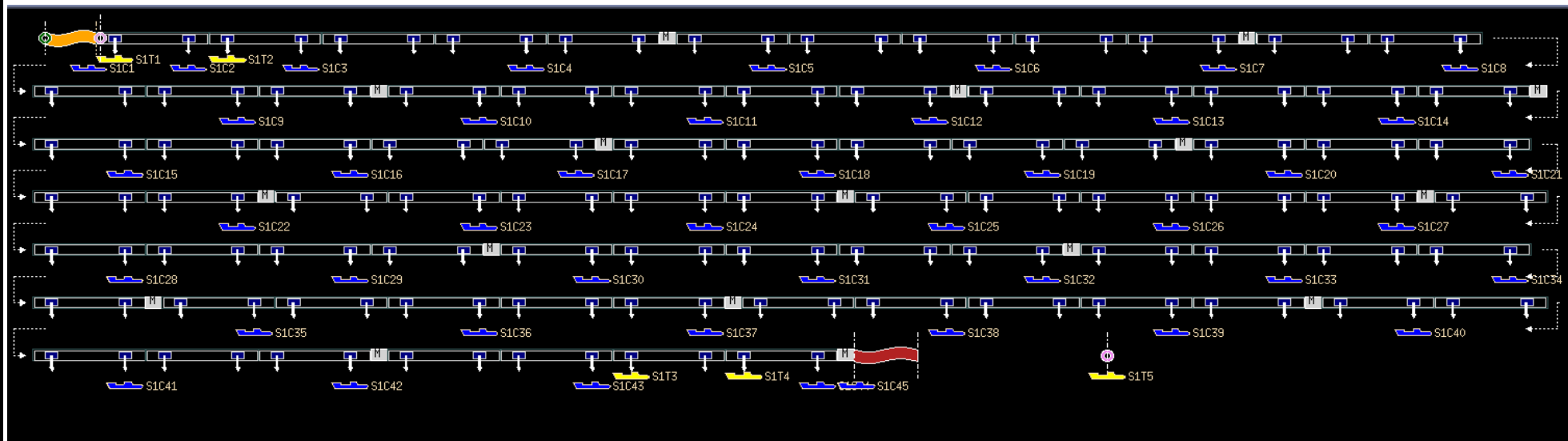
Last Active Section # 100



Cell contents referenced from Config_offsets tab

R/V Marcus G. Langseth - Streamer Complete

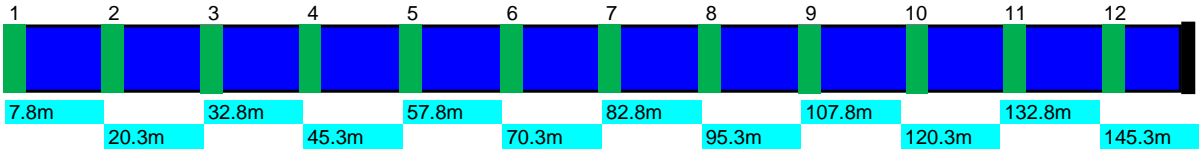
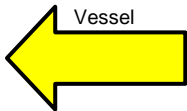
Total active sections	100
Total Channels	1200
Total section length	15000.00m
First to last channel	14987.50m



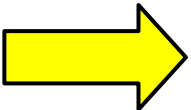
Cell contents referenced from Config_offsets tab

R/V Marcus G. Langseth - Hydrophone Offsets
Sercel 150meter SSAS

Number of SSAS Sections 100
Channels per active section 12
Total channels 1200

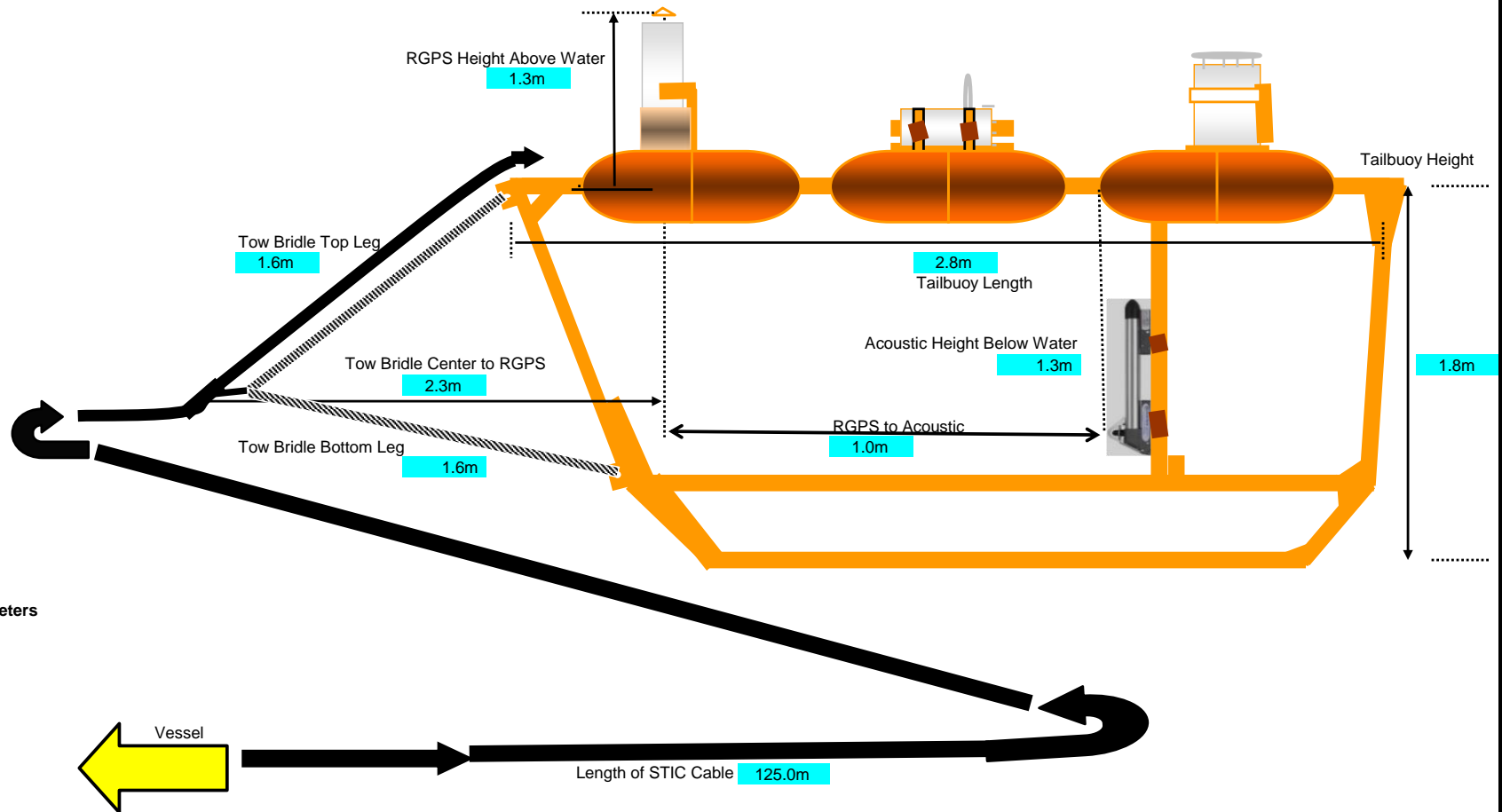


Tail buoy



Cell contents referenced from Config_offsets tab

R/V Marcus G. Langseth - Tailbuoy



All measurements in meters

Cell contents referenced from Config_offsets tab

Chip Parameters	
NBP to COS Y	230
NBP to COS X	0
Source Depth	12
Sweeper Depth	12
* sweeper sections	100
* channels	1200
CNG Channel #	8
CFG Channel #	1200
MFC# Streams	1
lead-on stream to low end of lead	246
MCS Stream Step	0
Gm volume total	68000
Volume per string	1000
# of gpm strings	36
Gm Strings	4
g string separation	6
PWM Y from stem	80
PWM X - (outside of stem)	79
Stem to MAG Y	113
Stem to MAG X - (outside of stem rail)	113
Flow Parameters	
NBP to Stem	29.5
Stem cut at sea to top of well	12.5
Bottle length	40
Well section to cut	24.223
End of section to cut	25.777
Channel assembly	12.5
NBP to Point B1B2	19.0
Lead to First RZ	7.5
Flowed to Last RZ	146.5
Channels per section	12
Center of section to Top of last channel	-0.2
First Section Number	-0.1
Length of 1st section	17.5
Bottle length	17.5
HESA Length	10
HESA Length	10
TSS test strand	50
Active Section Count	20
TSS test coil	20
HESA Coil Count	2,400
Efficiency values	
RGPS height above	1.3
TSR	1.8
TSR	1.8
RGPS Accuracy	1.3
TSR Accuracy	1.3
TSR Accuracy	1.3
ACN below water line	1.3

Channel Officers (Revenue)	
NRP to CMP	333.85
COS-CNG	307.70
CNG-CFG	-1469.37
NRP-Mag Y	142.35
NRP-Mag X	10.5
NRP to full busy RGPS	15582.22
Total Length of Streamer sections	15000
PWM-COS Y	120.5
PWM-COS X	10.5
NRP-PAM Y	105.5
NRP-PAM X	10.5
NRP-CNG	437.37

Derived Offsets (Formula)	
Towing Offsets Tab	
NRP-COS	2018
NRP-CNG	433
NRP-CMP	333
COS-CNG	2018
CNG Channel #	
NRP-Stem	2018
Distance from Head of first section to CNG	2018
Source Depth	1
Sreamer Depth	1
Front End Length	30

Towing Configuration TAB		
NRP-COS	230	
NRP-CNG	437	
COS-CNG	207	
NRP-Possible	0	
COS-Possible	0	
COS-Cables	0	
P-Cable Strainer Gap	0	
NRP-PAM-Y	109.5	
NRP-PAM-X	15.5	
PAM-COS-X	125.5	
NRP-COS-X	10.5	
# Gun Strings	4	
gun volume	5500	
Gun separation	6	
# 2D Strings	1	
2D Stringer Co Spacing	12.5	
Number 2D Strings	1200	
2D Stringer Length	155000	
2D Stringer Area	150	
NRP-MAG-X	10.5	
NRP-MAG-Y	142.5	

Desired Effects	
Acoustic Overhead TAB	
G1T1	-9.15
G2T1	-9.15
G3T1	-9.15
G4T1	-9.15
S1T1	-16.35
S1T2	-167.28
S1T3	-12322.92
S1T4	-12472.6
S1T5	1
S1T6	0
S1T7	0
S2T1	0
S2T2	0
S2T3	0
S2T4	0
S2T5	0
S2T6	0
S2T7	0
S3T1	0
S3T2	0

Car array effects	
Breakout distance 1-2	0
Breakout distance 2-3	3.1
Breakout distance 3-4	2.35
Breakout distance 4-5	1.6
Breakout distance 5-6	2.45
Breakout distance 6-7	0.3
Breakout distance 7-8	1.4
Steers/PS-CDS-Y	
CDS - Accel-Y	-5.47
GPS Height down	1.2
C2 Volume	385
C3 Volume	65
G4 Volume	186
G5 Volume	185
G6 Volume	80
G7 Volume	235
G8 Volume	121
G9 Volume	235
G10 Volume	235
G-Digit 1	0.95
G-Digit 2	0.95
G-Digit 3	0.95
G-Digit 4	0.95
G-Digit 5	0.95
G-Digit 6	0.95
G-Digit 7	0.95
G-Digit 8	1.13
G-Digit 9	0.95
G-Digit 10	0.95
CDS to Acc Z	1.4
CDS to Acc X	15.4
Surface to Acc	-0.4
Per bracketed to CDS	0.85
Per bracketed to Acc	0.75

Demanded Objects	
Streamline Front-End	
Downstream at sea	340
Instream at sea to end of lead-in	12.5
SHS Length	9
rx/rx length	17.5
HAUSTU length	0.4
HEISA Lgh	10
Feed Coil to All Coil	100
Feed to Head SW	7.8
Feed Coil to CNG	-16.423
Feed Coil	24.223
Feed to All Coil	26.777
CNG Channel #	1
Center of streamer to Ace	-0.2
Feed to Head	9
First Section #	1
# channels	1,200
section length	15,000
# sections	100
channel revenue	12.5
First to last	1,400.75
HEISA Feed to all	6.40

Streamers Tail End	
Head to First Coil	24.22
Tail to Air Coil	25.77
Head to CPG	145.5
Coil to Coil	10
TAPU Levels	0.40
Tail Switch Length	54
Trenched Length	0.7
STIC Length	12
Last active	10
# channels	1200
# sections	10
total section length	15000
First to last Switch Coil	14987
Center of streamer to Act transducer	-0.1
channel width	12.1
CPG #	1200
First coil to CPG	121.007
CPG to TERGPS	181.95
Switch head to first coil	2.1
Switch head to aft	47.7

Derived Offsets	
Streamer complete	
#Sections	10
# Channels	120
First to last	14987
Total section length	15000

Derived Offsets	
Hydrophone Offsets	
Channel 1	7.82
2	20.32
3	32.82
4	45.32
5	57.82
6	70.32
7	82.82
8	95.32
9	107.82
10	120.32
11	132.82
12	145.32
# channels	12
# Active's	10
Total Channels	120

Derived Offsets	
Tailbuoy offsets	
RGPS height above water	5
TB length	2
TB height	1.8
RGPS - ACX	2.2
Birdie-RGPS	2.2
Top Leg	1.5
Bottom Leg	5
STC	12
ACX below water line	5

Quinn

Parameter	Value	Unit	Parameter	Value	Unit
Gravelly sand (G1)	1.5	%	Gravelly sand (G2)	1.5	%
Gravelly sand (G3)	1.5	%	Gravelly sand (G4)	0.31	%
Gravelly sand (G5)	1.5	%	Gravelly sand (G6)	0.31	%
Gravelly sand (G7)	1.5	%	Gravelly sand (G8)	0.31	%
Gravelly sand (G9)	1.5	%	Gravelly sand (G10)	0.31	%
Gravelly sand (G11)	1.5	%	Gravelly sand (G12)	0.31	%
Gravelly sand (G13)	1.5	%	Gravelly sand (G14)	0.31	%
Gravelly sand (G15)	1.5	%	Gravelly sand (G16)	0.31	%
Gravelly sand (G17)	1.5	%	Gravelly sand (G18)	0.31	%
Gravelly sand (G19)	1.5	%	Gravelly sand (G20)	0.31	%
Gravelly sand (G21)	1.5	%	Gravelly sand (G22)	0.31	%
Gravelly sand (G23)	1.5	%	Gravelly sand (G24)	0.31	%
Gravelly sand (G25)	1.5	%	Gravelly sand (G26)	0.31	%
Gravelly sand (G27)	1.5	%	Gravelly sand (G28)	0.31	%
Gravelly sand (G29)	1.5	%	Gravelly sand (G30)	0.31	%
Gravelly sand (G31)	1.5	%	Gravelly sand (G32)	0.31	%
Gravelly sand (G33)	1.5	%	Gravelly sand (G34)	0.31	%
Gravelly sand (G35)	1.5	%	Gravelly sand (G36)	0.31	%
Gravelly sand (G37)	1.5	%	Gravelly sand (G38)	0.31	%
Gravelly sand (G39)	1.5	%	Gravelly sand (G40)	0.31	%
Gravelly sand (G41)	1.5	%	Gravelly sand (G42)	0.31	%
Gravelly sand (G43)	1.5	%	Gravelly sand (G44)	0.31	%
Gravelly sand (G45)	1.5	%	Gravelly sand (G46)	0.31	%
Gravelly sand (G47)	1.5	%	Gravelly sand (G48)	0.31	%
Gravelly sand (G49)	1.5	%	Gravelly sand (G50)	0.31	%
Gravelly sand (G51)	1.5	%	Gravelly sand (G52)	0.31	%
Gravelly sand (G53)	1.5	%	Gravelly sand (G54)	0.31	%
Gravelly sand (G55)	1.5	%	Gravelly sand (G56)	0.31	%
Gravelly sand (G57)	1.5	%	Gravelly sand (G58)	0.31	%
Gravelly sand (G59)	1.5	%	Gravelly sand (G60)	0.31	%
Gravelly sand (G61)	1.5	%	Gravelly sand (G62)	0.31	%
Gravelly sand (G63)	1.5	%	Gravelly sand (G64)	0.31	%
Gravelly sand (G65)	1.5	%	Gravelly sand (G66)	0.31	%
Gravelly sand (G67)	1.5	%	Gravelly sand (G68)	0.31	%
Gravelly sand (G69)	1.5	%	Gravelly sand (G70)	0.31	%
Gravelly sand (G71)	1.5	%	Gravelly sand (G72)	0.31	%
Gravelly sand (G73)	1.5	%	Gravelly sand (G74)	0.31	%
Gravelly sand (G75)	1.5	%	Gravelly sand (G76)	0.31	%
Gravelly sand (G77)	1.5	%	Gravelly sand (G78)	0.31	%
Gravelly sand (G79)	1.5	%	Gravelly sand (G80)	0.31	%
Gravelly sand (G81)	1.5	%	Gravelly sand (G82)	0.31	%
Gravelly sand (G83)	1.5	%	Gravelly sand (G84)	0.31	%
Gravelly sand (G85)	1.5	%	Gravelly sand (G86)	0.31	%
Gravelly sand (G87)	1.5	%	Gravelly sand (G88)	0.31	%
Gravelly sand (G89)	1.5	%	Gravelly sand (G90)	0.31	%
Gravelly sand (G91)	1.5	%	Gravelly sand (G92)	0.31	%
Gravelly sand (G93)	1.5	%	Gravelly sand (G94)	0.31	%
Gravelly sand (G95)	1.5	%	Gravelly sand (G96)	0.31	%
Gravelly sand (G97)	1.5	%	Gravelly sand (G98)	0.31	%
Gravelly sand (G99)	1.5	%	Gravelly sand (G100)	0.31	%

Acoustics referenced to CNG or COS

AGE1	-0.55
AGE2	-0.50
AGE3	-0.55
AGE4	-0.55
AGE5	-0.55
AGE6	-0.55
AGE7	-0.55
AGE8	-0.55
AGE9	-0.55
AGE10	-0.55
AGE11	-0.55
AGE12	-0.55
AGE13	-0.55
AGE14	-0.55
AGE15	-0.55
AGE16	-0.55
AGE17	-0.55
AGE18	-0.55
AGE19	-0.55
AGE20	-0.55
AGE21	-0.55
AGE22	-0.55
AGE23	-0.55
AGE24	-0.55
AGE25	-0.55
AGE26	-0.55
AGE27	-0.55
AGE28	-0.55
AGE29	-0.55
AGE30	-0.55
AGE31	-0.55
AGE32	-0.55
AGE33	-0.55
AGE34	-0.55
AGE35	-0.55
AGE36	-0.55
AGE37	-0.55
AGE38	-0.55
AGE39	-0.55
AGE40	-0.55
AGE41	-0.55
AGE42	-0.55
AGE43	-0.55
AGE44	-0.55
AGE45	-0.55
AGE46	-0.55
AGE47	-0.55
AGE48	-0.55
AGE49	-0.55
AGE50	-0.55
AGE51	-0.55
AGE52	-0.55
AGE53	-0.55
AGE54	-0.55
AGE55	-0.55
AGE56	-0.55
AGE57	-0.55
AGE58	-0.55
AGE59	-0.55
AGE60	-0.55
AGE61	-0.55
AGE62	-0.55
AGE63	-0.55
AGE64	-0.55
AGE65	-0.55
AGE66	-0.55
AGE67	-0.55
AGE68	-0.55
AGE69	-0.55
AGE70	-0.55
AGE71	-0.55
AGE72	-0.55
AGE73	-0.55
AGE74	-0.55
AGE75	-0.55
AGE76	-0.55
AGE77	-0.55
AGE78	-0.55
AGE79	-0.55
AGE80	-0.55
AGE81	-0.55
AGE82	-0.55
AGE83	-0.55
AGE84	-0.55
AGE85	-0.55
AGE86	-0.55
AGE87	-0.55
AGE88	-0.55
AGE89	-0.55
AGE90	-0.55
AGE91	-0.55
AGE92	-0.55
AGE93	-0.55
AGE94	-0.55
AGE95	-0.55
AGE96	-0.55
AGE97	-0.55
AGE98	-0.55
AGE99	-0.55
AGE100	-0.55