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Final Interpretive Report

Acoustic Corer™ Survey to Identify Buried Conductors and Geo-Hazards at Mississippi Canyon Block 20 Gulf of Mexico

for

Couvillion Group

RPT-08387-5.0

OWNER	REVIEWED BY	APPROVED BY	ISSUE DATE	REVISION
Michael Manning	Dr. Ian McDermott	Dr. Jacques Guigne	26/11/2019	5.0

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[redacted]

Revision History

REVISION	ISSUE DATE	REASON FOR REVISION
1	27/09/2019	First draft released to Client for review and comment
1.1	22/10/2019	Added Geo-model Section 8 and updated linear feature width values
2.0	22/10/19	Removed Section 8 and Released to Client
3.0	8/11/2019	Revise the content of report following a -90-degree correction to the AC data sets.
4.0	22/11/19	Appended Memo on AC misalignment and updated figure for cross-section of linear features that was corrected for depth; Released to Client
5.0	26/11/19	Renamed linear structures to linear features, removed mention of SBI survey in Conclusion, Minor textual edits; Released to Client

Professional Certification Stamp	

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DOCUMENT REFERENCES

REF.	DOCUMENT NUMBER	DOCUMENT TITLE
(1)		Mississippi Canyon 20 Sub-bottom Acoustic Survey Statement of Work, Couvillion Group
(2)		https://www.oceaneering.com/brochures/msv-chloe-candies/
(3)		https://oilprice.com/js/common/tinymce /jscripts/tiny_mce/plugins/imagemanager/files/AE2260.png
(4)	Report No. 0201-6235	Geotechnical Investigation Excavation Project, OCS-G-04935 Block 20, Mississippi Canyon Area, Gulf of Mexico. Fugro document for Taylor Energy Company
(5)		Proposed Acoustic Corer REDACTED
(6)		Plug stability V1.xlsx

Table 1 - External Document References

REF.	DOCUMENT NUMBER	DOCUMENT TITLE
(7)		Commercial Proposal, May 14, 2019, PanGeo Subsea document for Couvillion Group
(8)		Acoustic Corer™ Mechanical Components and Launch and Recovery Procedure, July 2019
(9)		P19-0170-RPT-001-AC-20190815-AC01-REV2 Conductor Trends Acoustic Corer™ Survey AC01 for Couvillion Group, August 2019
(10)	PRC-1320-1200-103-REV7	Acoustic Corer Launch and Recovery Procedure Onboard MSV Chloe Candies

(11)	RPT-08374	Acoustic Corer Quay Side test Chloe Candies
(12)	PRC-08375	Acoustic Corer Emergency Vessel run:off recovery procedure_Rev05
(13)	RPT-1822-850-200- P19-017O	Mississippi Canyon Chloe Candies SBI Interface

Table 2 - Internal Document References

ABBREVIATIONS

ABBREVIATION	DESCRIPTION
AC	Acoustic Corer™
Anomaly	Acoustically identified buried targets, suggestive of debris/infrastructure, other than linear features
BML	Below Mud Line
FoS	Factor of Safety
ft	ft
GOM	Gulf of Mexico
HAZID	Hazard Identification
HF	High Frequency
JSE	Job Safety Equipment
kPa	kilo Pascal
ksf	kilo pounds square ft
Linear Features	Acoustically identified linear targets, suggestive of conductor casings
LF	Low Frequency
m	meter
MC20	Mississippi Canyon Area, Block 20
MSL	Mean Sea Level
MSV	Marine Survey Vessel
PCSC	Pollution Containment System Component
PGSS	PanGeo Subsea
psf	pounds cubic ft
psi	Pounds per square inch
ref.	reference
ROV	Remotely Operated Vehicle

SAS	Synthetic Aperture Sonar
SBI	Sub-Bottom Imager™
USBL	Ultra-Short Base Line
WROV	Work Class Remotely Operated Vehicle

Table 3 - Abbreviation Table

EXECUTIVE SUMMARY

PanGeo Subsea carried out three (3) Acoustic Corer™ (AC) surveys at the site of the downed Taylor Energy platform within Mississippi Canyon Block 20 (MC20 site) in the Gulf of Mexico during September 2019. The equipment was mobilized onto the O.S.R.V Chloe Candies, a vessel managed by Oceaneering®. During mobilization the vessel was equipped with the AC equipment along with a Launch and Recovery system (LARS) frame, and two (2) Oceaneering® Millennium® Plus 220 hp work class ROVs. Prior geotechnical knowledge and a scaled AC test carried out at the site indicated that normal landing/operation/recovery of the AC at this site would not be possible REDACTED
REDACTED [redacted]

The objective of the AC surveys was to prove the equipment's capability at accurately locating, providing size, shape and the nature of anomalous linear features suggestive of buried conductors or tubulars, to the depth of AC penetration. AC surveys were carried out at locations B6, B3, and B9. Additional information was provided regarding acoustic anomalies suggestive of buried debris, infrastructure, or other geohazards within each acoustic core. Throughout the survey, safety and environmental protection was of paramount importance.

The JYG-Cross multifold data collected at Site B6 was used to determine a velocity profile for the survey area. This velocity profile was used in subsequent processing of the high frequency (HF) and low frequency (LF) acoustic core data. Low and high frequency (LF and HF) acoustic cores were acquired at all three sites. The acoustic core result provides a 12m diameter volumetric image of the sub-bottom down to full penetration depth. These data were interpreted to identify and map linear feature site. A total of fourteen (14) linear features were identified and the track of these have been digitized and easting, northing and depth BML is reported in tabular form within the body of the report. By way of summary, Table 4 provides start and end co-ordinates of the linear features together with interpreted diameter of the features. Figure 1 and Figure 2 illustrate the orientation of the identified linear features in the context of the AC survey grid. The linear features are shown to have a north east to south west orientation. The data set as it stands is sparse, consisting of just 3 acoustic cores that are each spaced approximately 33m apart (107 ft). It is not possible at this stage to identify which of the linear features are common to each of the acoustic cores. Additional acoustic cores would make alignment of linear features feasible and is a recommendation going forward.

The acoustic core data was also analysed to identify acoustic anomalies suggestive of buried debris, infrastructure or geohazards. Nine (9) anomalies were identified in the HF acoustic cores and 14 anomalies were identified in the LF acoustic cores. The LF acoustic data provides deeper sub-bottom penetration than the HF data, but the LF has lower resolution than that of the HF acoustic data. A high-level breakdown of anomaly distribution in each acoustic core is provided in Table 5. Full details of identified anomalies are provided in the main body of the report.

A stratigraphic layer was identified at Site B3. This stratum was located between 9.0- 12.3m (29.5ft to 40.5ft) BML with a dip of approximately 14 degrees.

The Acoustic Corer surveys carried out at the site of the downed Taylor Energy platform successfully identified linear features located within the subsurface. Acoustic data was recorded to 55m (180 ft) below, but sub-bottom features were only identified within the top 40m (132 ft). The results provided a wealth of information on the occurrence and track of linear features that generally trend in a north west to south east orientation across the site. The presence of these linear features was confirmed in both LF and HF acoustic cores.

Site Name	Linear Feature Name	Start Easting (ft)	Start Northing (ft)	Start Depth BML (ft)	End Easting (ft)	End Northing (ft)	End Depth (ft)	Diameter (in)
B6	B6-HF-C1	1010434.8	10506811.6	29.9	1010455.8	10506787.1	34.6	10 ± 1
	B6-HF-C2	1010428.3	10506809.3	45.5	1010449.3	10506781.9	47.8	30 ± 3
B3	B3-HF-C1	1010524.0	10506702.1	49.8	1010507.9	10506727.9	50.4	10 ± 1
	B3-HF-C2	1010526.6	10506740.6	54.3	1010539.8	10506725.8	54.8	8 ± 1
	B3-HF-C3	1010545.7	10506711.1	70.6	1010515.5	10506743.6	66.7	20 ± 2
	B3-HF-C4	1010539.1	10506705.1	43.4	1010527.3	10506723.4	44.9	17 ± 2
B9	B9-HF-C1	1010368.8	10506854.7	30.1	1010350.1	10506870.2	29.8	24 ± 2
	B9-HF-C2	1010356.4	10506875.7	36.1	1010378.7	10506863.1	37.4	12 ± 2
	B9-HF-C3	1010380.6	10506850.7	44.3	1010346.9	10506873.1	44.2	27 ± 3
	B9-HF-C4	1010359.3	10506843.0	34.9	1010340.9	10506866.4	34.5	29 ± 3
	B9-HF-C5	1010370.5	10506849.2	33.2	1010345.2	10506872.1	33.7	20 ± 2
	B9-HF-C6	1010383.9	10506855.6	41.1	1010347.8	10506880.4	39.6	21 ± 2
	B9-HF-C7	1010366.5	10506856.2	48.9	1010350.5	10506870.1	45.6	13 ± 2
	B9-HF-C8	1010370.5	10506849.4	31.0	1010345.5	10506871.1	30.8	20 ± 2

Table 4 - Start and End Points of each Linear Feature interpreted at MC20

Site Name	Anomaly Names (Anomalies correspond to objects such as buried debris, not linear in nature)		Number of Anomalies Found	
	High Frequency	Low Frequency	High Frequency	Low Frequency
B6	B6-HF-A01	B6-LF-A01	5	5
	B6-HF-A02	B6-LF-A02		
	B6-HF-A03	B6-LF-A03		
	B6-HF-A04	B6-LF-A04		
	B6-HF-A05	B6-LF-A05		
B3	B3-HF-A01	B3-LF-A01	1	2
		B3-LF-A02		
B9	B9-HF-A01	B9-LF-A01	3	7
	B9-HF-A02	B9-LF-A02		
	B9-HF-A03	B9-LF-A03		
		B9-LF-A04		
		B9-LF-A05		
		B9-LF-A06		
		B9-LF-A07		

Table 5 - MC20 High Level Anomaly Summary

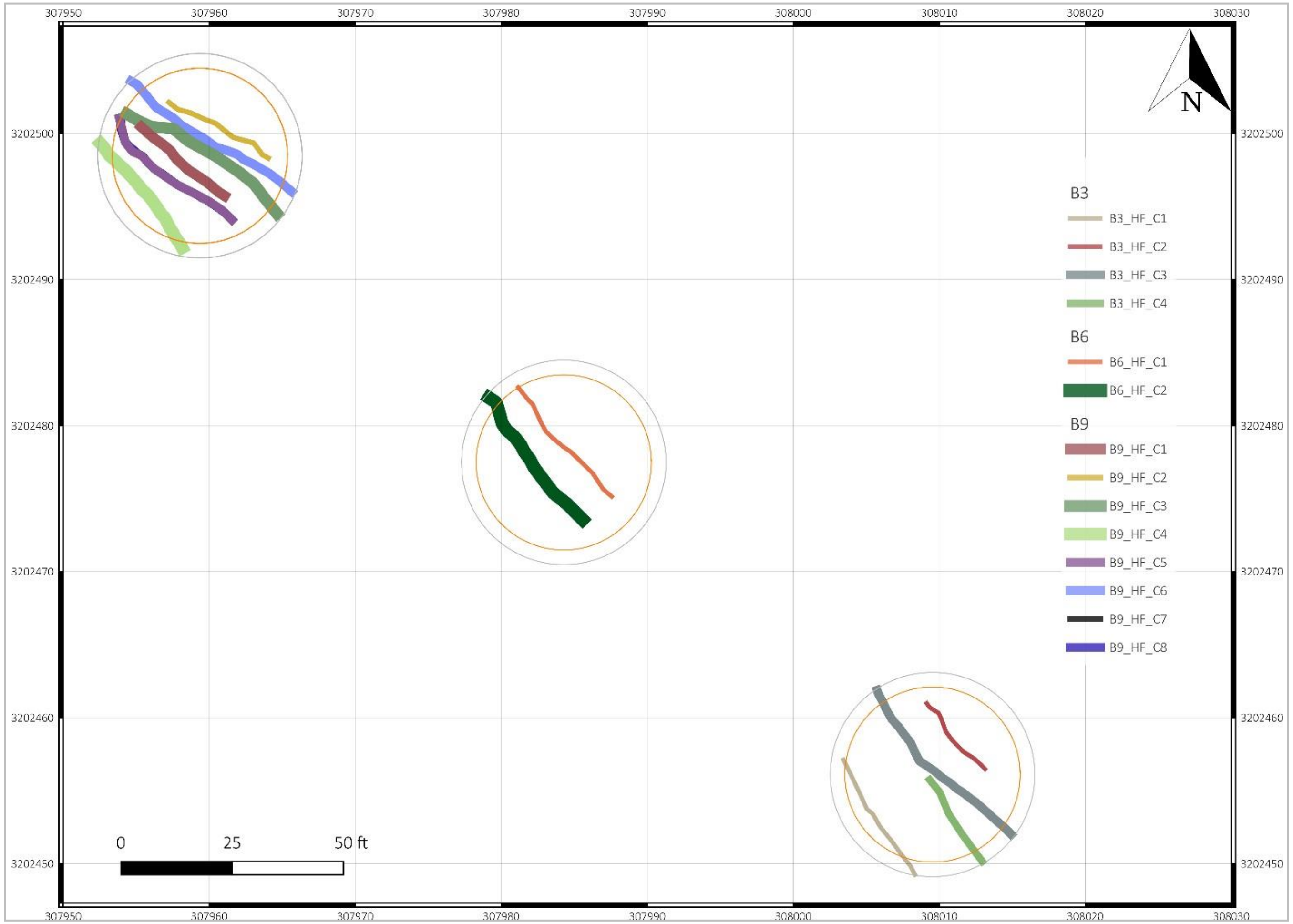

Figure 1 - Plan-View Map of the MC20 Survey Area showing Sites B3, B6, and B9 including identified Linear features (*NAD27 UTM 16N in meters).* Linear feature widths are not to scale. Note: this map includes only the linear features outlined in Table 4, not the anomalies in Table 5. B9_HF_C8 is shadowed by B9_HF_C5 and B9_HF_C7 is shadowed by B9_HF_C1 in plan-view. Refer to Section 7 for more information.

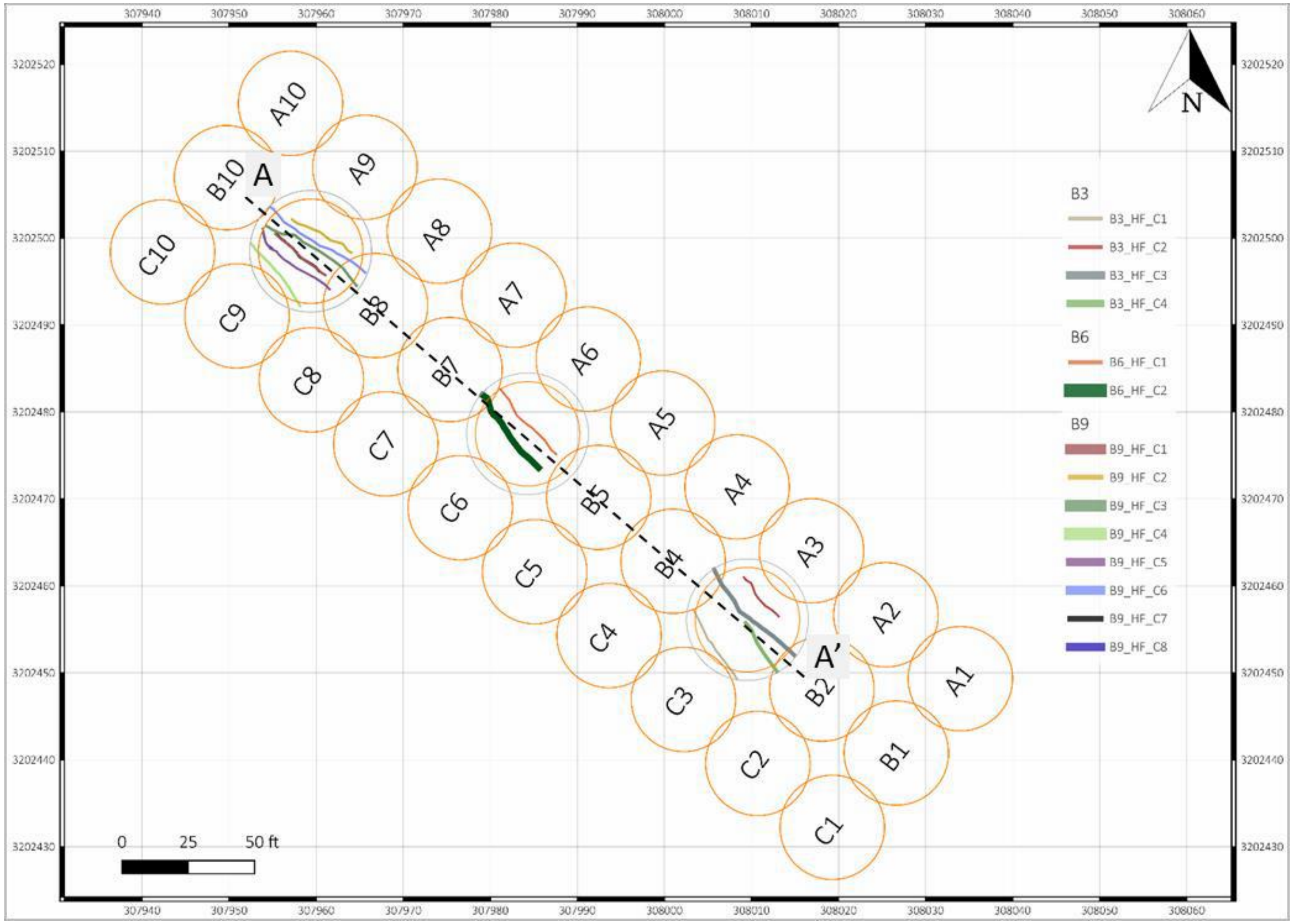

Figure 2 - Plan-View Map of the MC20 Survey Area showing other potential AC Sites including identified Linear features (*NAD27 UTM 16N in meters).* Linear feature widths are not to scale. Note: this map includes only the linear features outlined in Table 4, not the anomalies in Table 5. B9_HF_C8 is shadowed by B9_HF_C5 and B9_HF_C7 is shadowed by B9_HF_C1 in plan-view. Refer to Section 7 for more information.

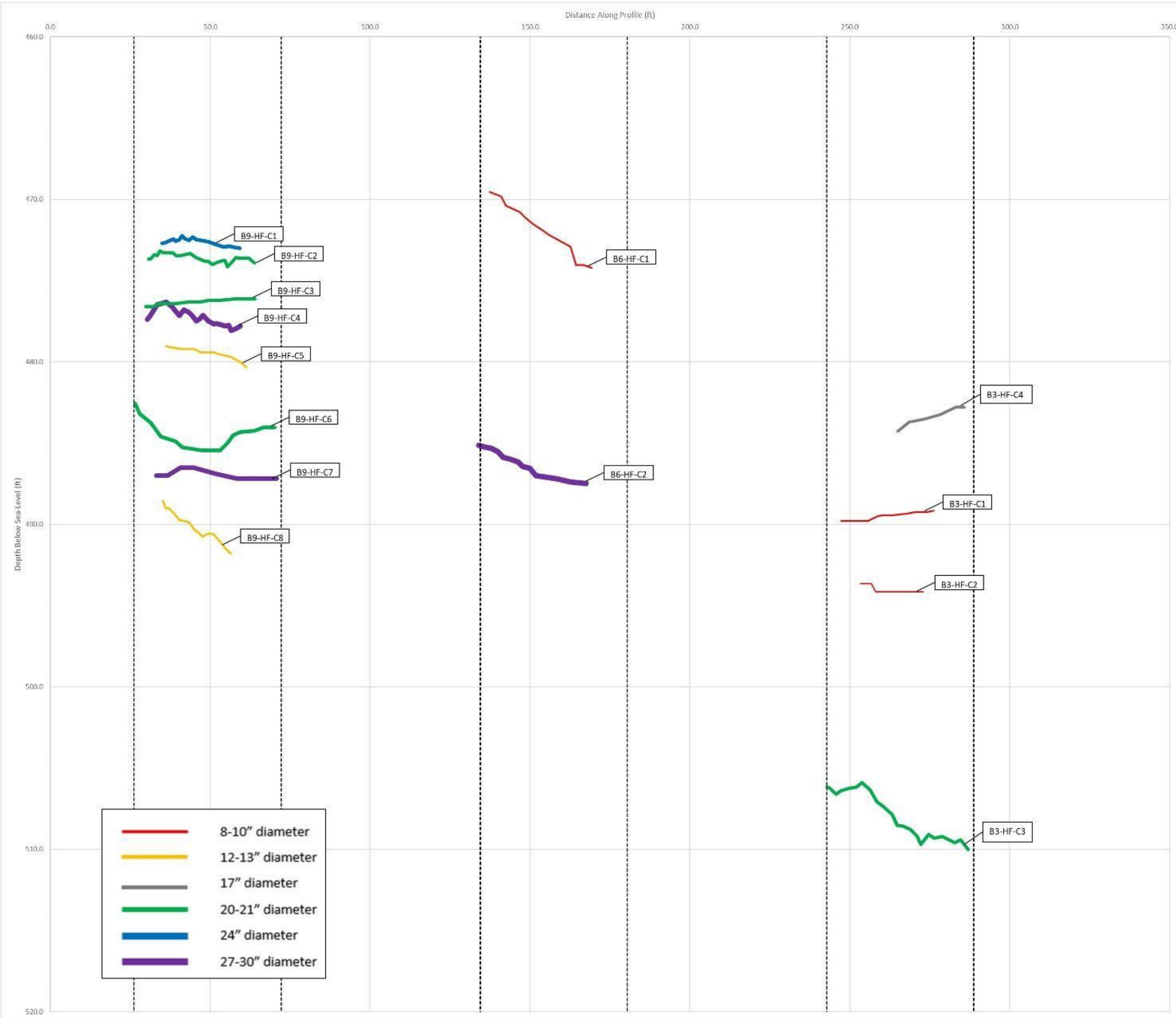

Figure 3 - Annotated Profile showing all linear features identified within the AC data. Profile A-A' is shown in Figure 2. The data shown is from sea-level and is not tidally corrected.

1 INTRODUCTION

1.1 Project Description

PanGeo Subsea deployed its Acoustic Corer™ (AC) technology and carried out 3 Acoustic Cores in order to prove that the technology could be used to successfully map any linear features up to the depth of AC penetration. Information regarding linear feature trends and anomaly locations was procured through analysis of the AC survey results and will be presented to Couvillion Group.

1.2 Project Objective

The following objectives were executed by PanGeo Subsea:

- A review of existing geotechnical data to assess the stability of the soil regime.
- A sub-bottom/below mudline (BML) Acoustic Corer™ survey to identify and accurately map any linear features within the cylindrical Acoustic Core.
- Reporting of any additional anomalies interpreted to be debris or infrastructure located in each of the 3 cores.

AC Reference & Location ID	NAD27 UTM ZONE 16N		NAD27 UTM ZONE 16N		Depth to Mudline (m)	Depth to Mudline (ft)
	Easting (m)	Northing(m)	Easting(ft)	Northing (ft)		
B6	307984.28	3202477.48	1010445.09	10506794.85	133.93	439.39
B3	308009.54	3202456.10	1010527.96	10506724.80	134.01	439.65
B9	307959.36	3202498.48	1010363.28	10506863.80	135.00	442.91

Table 6 - Landed positions of the Acoustic Corer for MC20 *NAD27 UTM ZONE 16N*

Note: Locations were provided by the client in both UTM Zone 16N-US Survey Ft as well as UTM Zone 16N-meters since PanGeo uses grid co-ordinates in meters for its data processing. Oceaneering Survey was responsible for these conversions.

Stage	Deliverable
Prior to Mobilization	• Study of existing geotechnical data. • Acoustic Corer & Sub-Bottom Imager Data Acquisition Plan developed between PanGeo, Oceaneering and Couvillion Group and accepted by all parties.
In Field	• Acceptance Report confirming spread is operational • Daily Progress Reports (DPRs) during the work • Preliminary QA/QC reports delivered 6 hours after surveying a core containing recommendations for potential modifications of the Data Acquisition Plan based on the AC results to date
On Shore	• Site Report provided 24 hours after processing of data begins at PGSS office. Report will include: JYG-Cross and Acoustic Core data interpretation, conductor locations in tabular format as well as figures showing trends and any evident entanglement, interpreted anomalies such as debris and infrastructure presented in tabular format.

Stage	Deliverable
	• Final Interpretive Report delivered three weeks after demobilization. This report will include: survey methodology, full conductor trend report connecting each site if possible, a table and plan positional map of identified conductors including position of the acoustic core, positional data of conductors, size of interpreted conductors or strings, confidence, correlation between HF and LF data if any exists, a table and plan positional map of identified anomalies including anomaly positional data, size of anomaly, confidence, correlation between HF and LF data, and an interpretation.

Table 7 - Deliverables given at each stage of the campaign

An inspection of the seafloor was carried out with WROV mounted cameras prior to launching the AC to identify any debris that may cause damage to the AC or the umbilical.

1.3 Survey Parameters

The following survey parameters were provided in ref. 1.

- Location: Gulf of Mexico, Mississippi Canyon Area, Block 20 (MC20); approximately 11 miles south of Plaquemine Parish, Louisiana.
- Water Depth: Approximately 133m - 137m (435 to 450 ft).
- Sediment/BML Conditions: Unconsolidated soil cover of an estimated 18m-53m (60-175ft) overlaying the buried well conductors.
- Survey Area: A 244m x 91m (800ft x 300ft) or larger grid that fully encompasses the previous platform/conductor bay location down to the site of the current jacket location – in close proximity to pollution containment system components (see Figure 4).

2 SITE DESCRIPTION

2.1 Mississippi Canyon Area, Block 20 Project Outline

The site of the felled Taylor Energy oil platform is located approximately 11 miles south of Plaquemine Parish, Louisiana in the Gulf of Mexico (MC20). Water depths in the region are approximately 133-137m (435-450ft) above unconsolidated clays with an estimated 60-175ft (18-53m) of coverage on top of the buried well conductors. The survey area is a 244-91m (800-300ft) grid that encompasses the previous platform down to the site of the new jacket in close proximity to the PCSC.

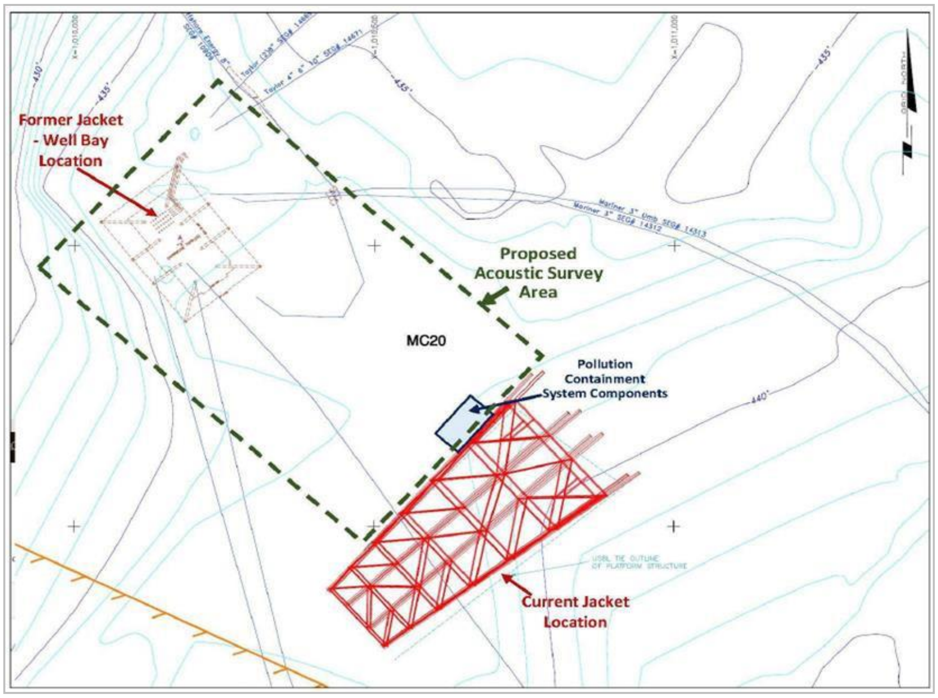

Figure 4 - Mississippi Canyon Area, Block 20 Project components map showing the current and former jacket locations, proposed survey area and pollution containment area (ref. 1)

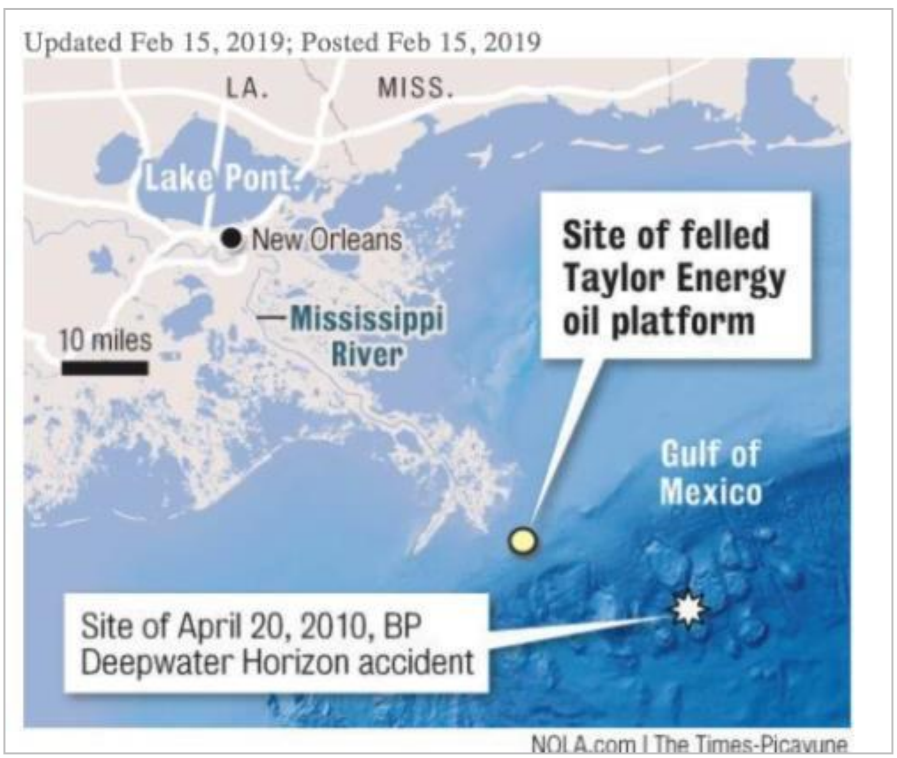

Figure 5 - Site location in relation to nearest land and Deepwater Horizon accident (ref. 3)

3 SURVEY EQUIPMENT

3.1 Vessel

PanGeo personnel, the Acoustic CorerTM (AC3) and all subsequent equipment were mobilized onto the Chloe Candies, shown in Figure 3. The Chloe Candies is an offshore, supply and support vessel that has previously operated in the offshore area where this campaign took place.

Figure 6 - O.S.R.V Chloe Candies (ref. 2)

Dimensions	
Length	280ft / 85.25m
Beam	59ft / 18m
Modelled Depth	24ft / 7.4m
Draft	16.4ft / 5m
Open Deck Area	8000ft^2 /745m^2
Deck Load Rating	1,000 lbf/ft^2 / 5 mT/m^2

Table 8 - Vessel specifications (ref. 2)

The vessel is equipped with the following:

- Two Oceaneering® Millennium® Plus 220 hp work class ROVs
- Onboard tooling suite
- 100 T knuckle boom crane
- 75 T auxiliary winch and over boarding davit
- Large working moonpool
- Kongsberg DP Class 2 rated
- Satellite communications equipment system for transmitting and streaming real-time video to onshore personnel

3.2 Acoustic Corer™ Subsea Equipment

The Acoustic Corer™ (Figure 7) 3D sub-bottom imaging technology uses multi-aspect acoustic imaging to delineate sub-seabed stratigraphy and buried geohazards such as boulders, hard layers, shallow gas, and abandoned seabed infrastructure. These present a considerable potential cost and schedule risk during the installation of offshore infrastructure.

The Acoustic Corer™ unit consists of two sonar heads attached to each arm of a 12m (39.4ft) boom. A tight grid of acoustic data is acquired as the boom rotates 180° thereby creating a 360° acoustic core.

Figure 7 - Acoustic Corer – normal operation on tripod legs

The AC was modified to deploy REDACTED over a soft, low load bearing sediment. The AC equipment spread is comprised of subsea and topside equipment as described in the following sections.

The AC is a highly integrated semi-autonomous electromechanical machine comprised of the following main components and assemblies:

- 1 x Upper weldment and central hub assembly with integrated electric servomotor
- 1 x Stab Guide
- 2 x 6m long folding boom (attached above central hub assembly)
- 2 x Acoustics Carriage (installed on each boom)
- 2 x Electric servomotor (installed on each boom to move acoustics carriages)
- 5 x AC subsea electronics bottle (chirp TX / RX, power, sensors, motor control)
- 2 x High Frequency Chirp Projector (installed on each acoustics carriage)
- 2 x Low Frequency Chirp Projector (installed on each acoustics carriage)
- 5 x Hydraulic cylinders, HPU, and associated distribution equipment and hoses
- 1 x Optical gyro (installed on upper weldment)
- 1 x Depth Sensor (installed on upper weldment)

- 1 x Velocimeter (installed on upper weldment)
- 3 x Altimeter (installed on upper weldment and each acoustics carriage)
- 2 x Tilt Sensor (installed on each acoustics carriage)
- 2 x Pan/Tilt Colour Camera
- 2 x Underwater lights
- Associated subsea interconnect cabling

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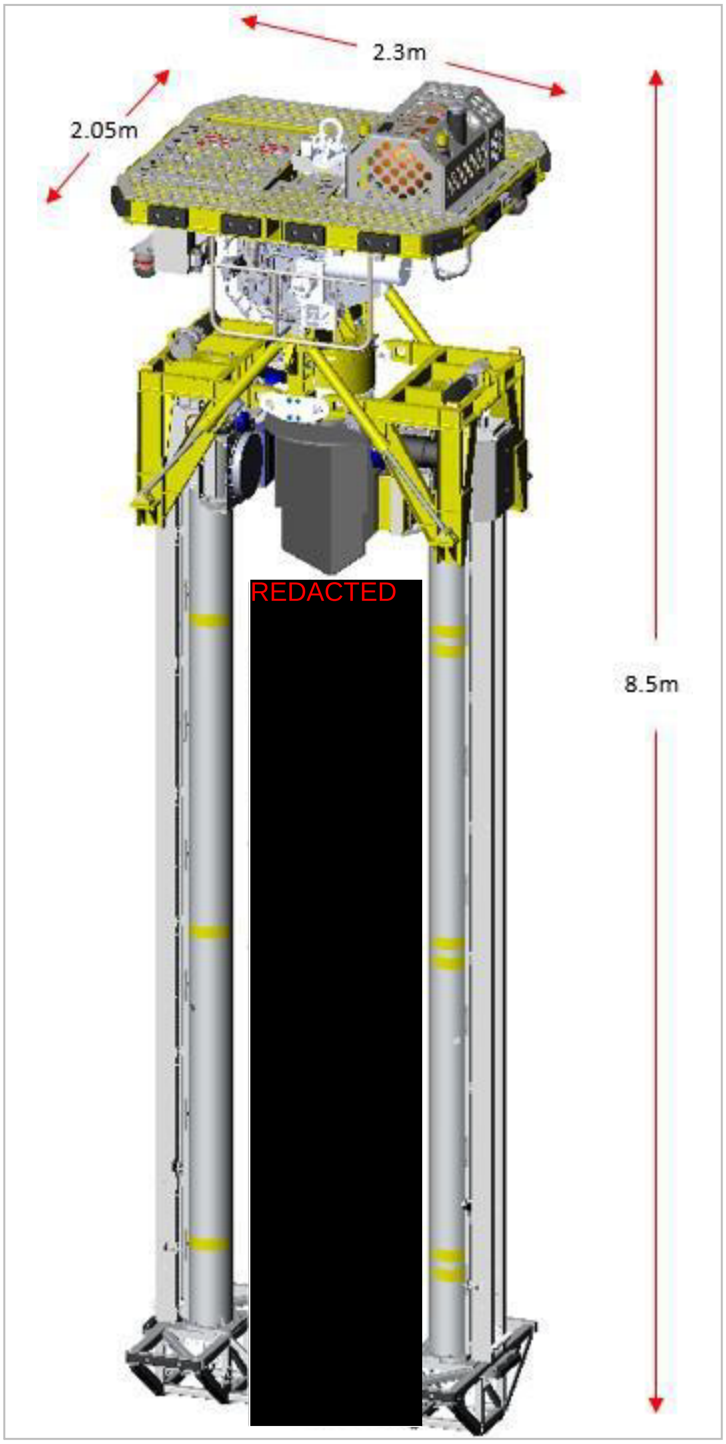
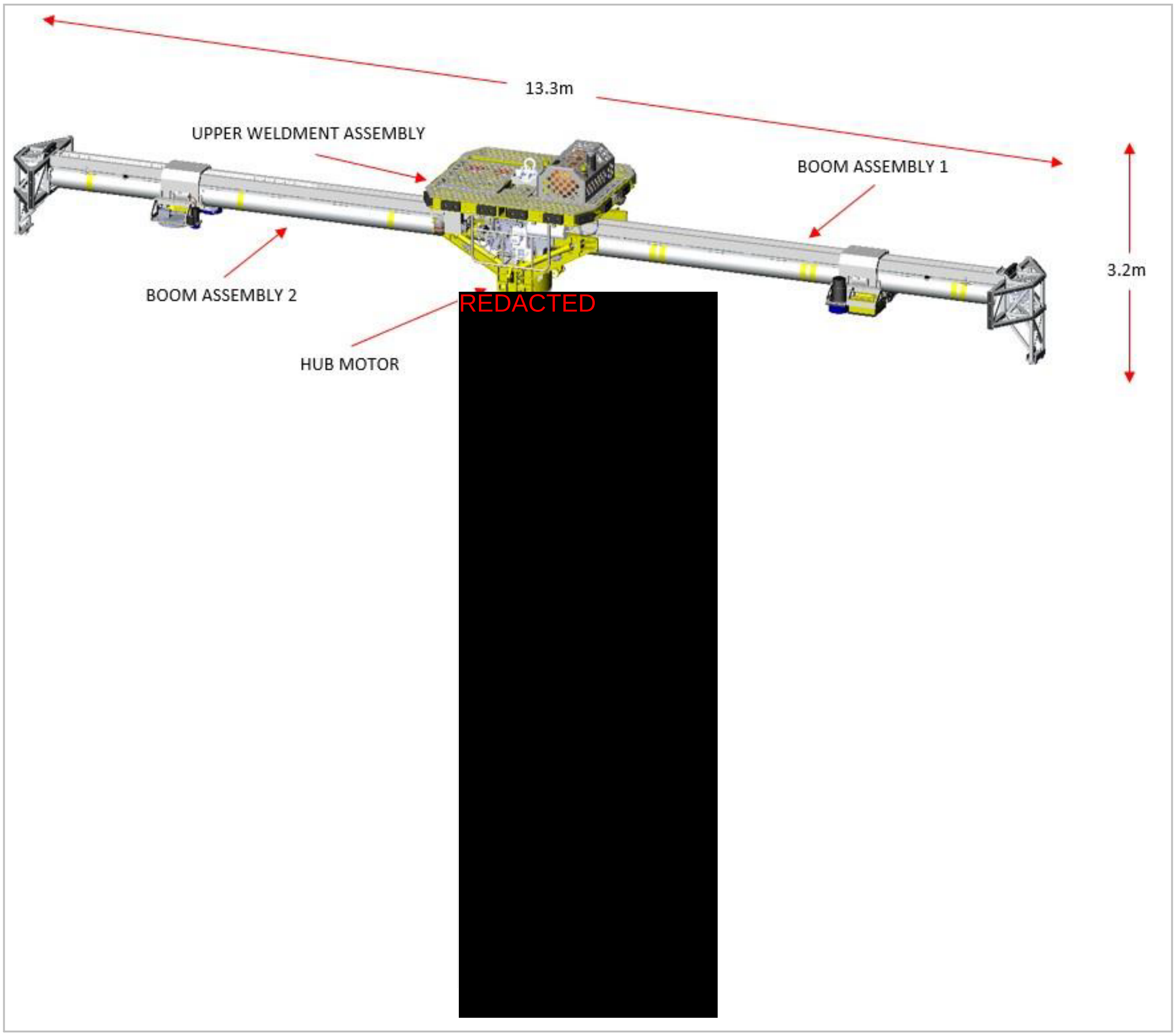


Figure 8 - AC in folded position with attached stab guide. Dimensions in *meters* are 8.5m/2.3m/2.05m while dimensions in *ft* are 27.9ft/7.5ft/6.7ft. Dimensions are of AC only, REDACTED [redacted]



[redacted]

Figure 9 - AC in unfolded survey configuration with attached stab guide. Dimensions in *meters are* 13.3m/3.2m while dimensions in *ft* are 43.6ft/10.5ft. Dimensions are of REDACTED [redacted]

3.2.1 AC Control Van and Spares

The AC topside survey equipment is self-contained in the 20ft ISO container known as the AC Control Van. High-powered processing computers in 19" rack form factor is used for data acquisition, viewing, and processing. Additional PCs are used for post-processing, visualization tools, and report generation. Spare parts, consumables, and tools are stored in the 10ft ISO container known as the Spares Van.

3.2.2 AC Umbilical Winch

The AC umbilical winch, shown in Figure 8, has 600m of non-load bearing fiber and copper umbilical on its drum. The umbilical winch has a 1.6m x 1.4m footprint, weighs 2500kg, and is normally operated from a wired remote control. The winch has speed control and an automatic level-wind system.

Figure 10 - AC Umbilical Winch

An over-boarding sheave and mount is used to manage the AC umbilical as it leaves the vessel.

3.2.3 Acoustic Corer system power requirements

The Acoustic Corer system runs off a single 440V 3-phase 63A power supply. The AC winch and control van are all powered from the single supply power distribution and protection equipment – circuit breakers and GFI units – are housed in the control van.

The Ship was only able to supply 480V 3-phase 60A, yielding a voltage at the AC panel of 465V. Multiple power faults happened during crane OPS or vessel heading changes as a result of the main generators dropping from applied load and then over ramping and exceeding the 480Volt protection fault on the AC panel. This was mitigated by turning off the AC while the crane was powering up and restarting after it was in operation.

3.2.4 Acoustic Corer lifting equipment

All lifting equipment will be certified. The control and spares vans have dedicated 4-point bridles as does the umbilical winch. The AC itself has a dedicated 3-point bridle for lifting the unit horizontally.

3.3 AC Auxiliary Sensors – Depth Measurement

The AC measures the seafloor z co-ordinate using a combination of two instruments – a depth sensor and an altimeter. These are aligned on the frame of the AC so as to have co-incident sensor z-axis measurement offset positions.

The depth sensor is a Valeport iPS unit with a 1000m range and accuracy of +/-0.01% of F.S. (+/-0.1m).

The altimeter is a Tritech PA200 unit with a resolution of +/-5mm.

4 SURFICIAL GEOLOGY AND GEOTECHNICAL DATA

Since the AC is a bottom located survey instrument, knowledge of the seafloor soil properties is critically important. PanGeo obtained information from the Client and also carried out background research of their own. The geotechnical investigation carried out at the MC20 area by Fugro in June 2007 [ref 4] was found to be the most useful information, some of which is reproduced here.

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Submerged unit weights are about 20 pcf at the mudline, increase to about 35 pcf at 24.4m (80 ft) depth and 46 pcf at 61m (200 ft) depth".

Ref 4. states that the site investigation consisted of drilling, sampling, and occasionally performing in situ piezoprobe and remote vane shear tests at ten (10) soil boring locations to a penetration depth that range from 40.2-217.0m (132 to 712ft) BML. In addition, in situ seabed Halibut vane tests were performed in the area simultaneously to drilling operations. The latter measurements yield "Shear Strength" data for the uppermost seabed (i.e. 0.61m to 7.3m (2-24ft) below mudline). The remote vane did not record shear strength values above 15.2m (50ft) below mudline. At this depth, the remote vane recorded shear strengths of between 14kPa and 24kPa (292-501psf).

REDACTED [redacted]

Term	Undrained shear strength	
	[kPa]	[ksf] (2)
Very soft	Less than 12.5	Less than 0.25
Soft	12.5 to 25	0.25 to 0.50
Firm	25 to 50	0.50 to 1.0
Stiff	50 to 100	1.0 to 2.0
Very stiff	100 to 200	2.0 to 4.0
Hard	200 to 400	4.0 to 8.0
Very hard (3)	Greater than 400	Greater than 8.0

Table 9 - Undrained Shear Strength Scale for Cohesive Soils (after Fugro)

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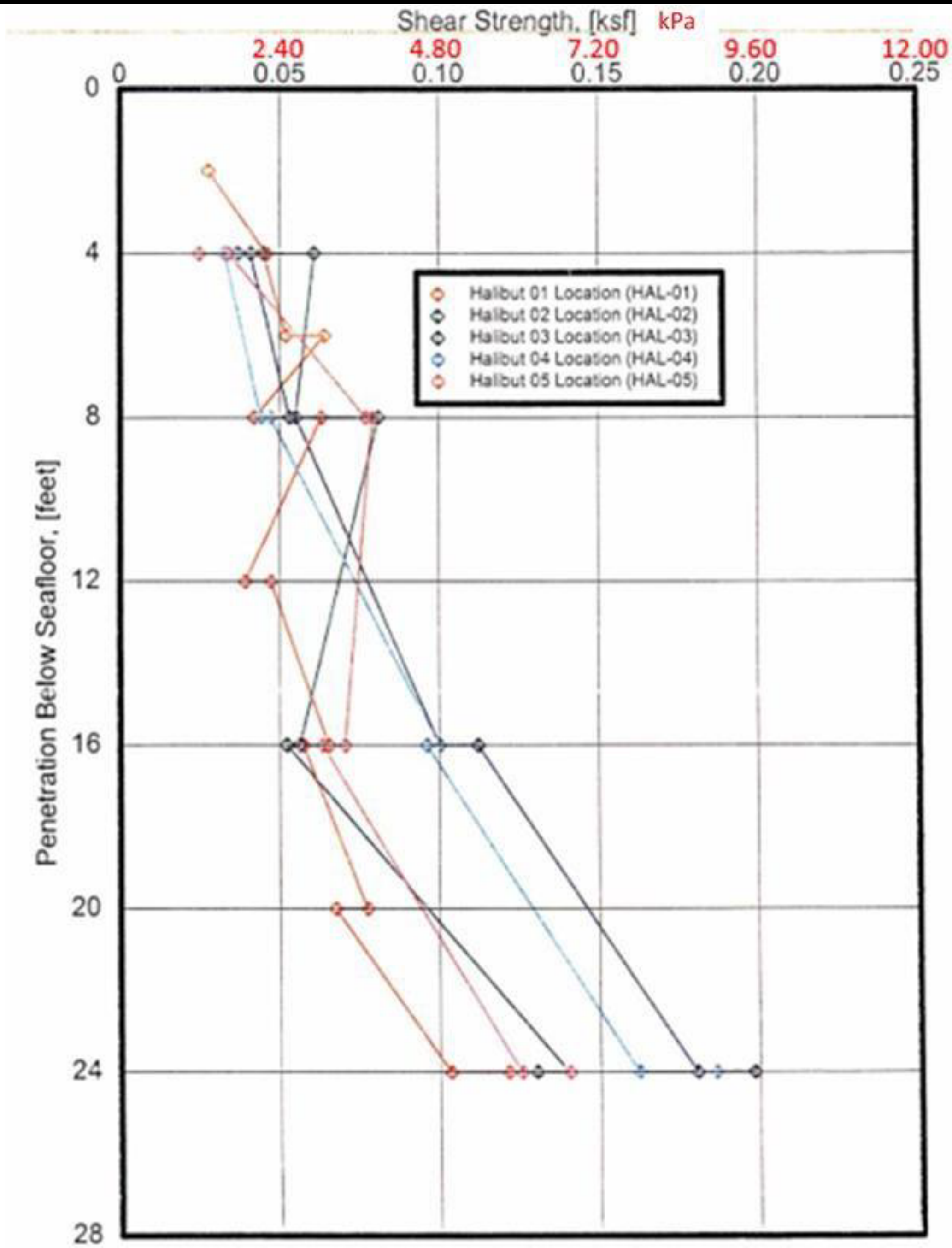


Figure 11 - Halibut vane test results at MC20 area from ref. [4]

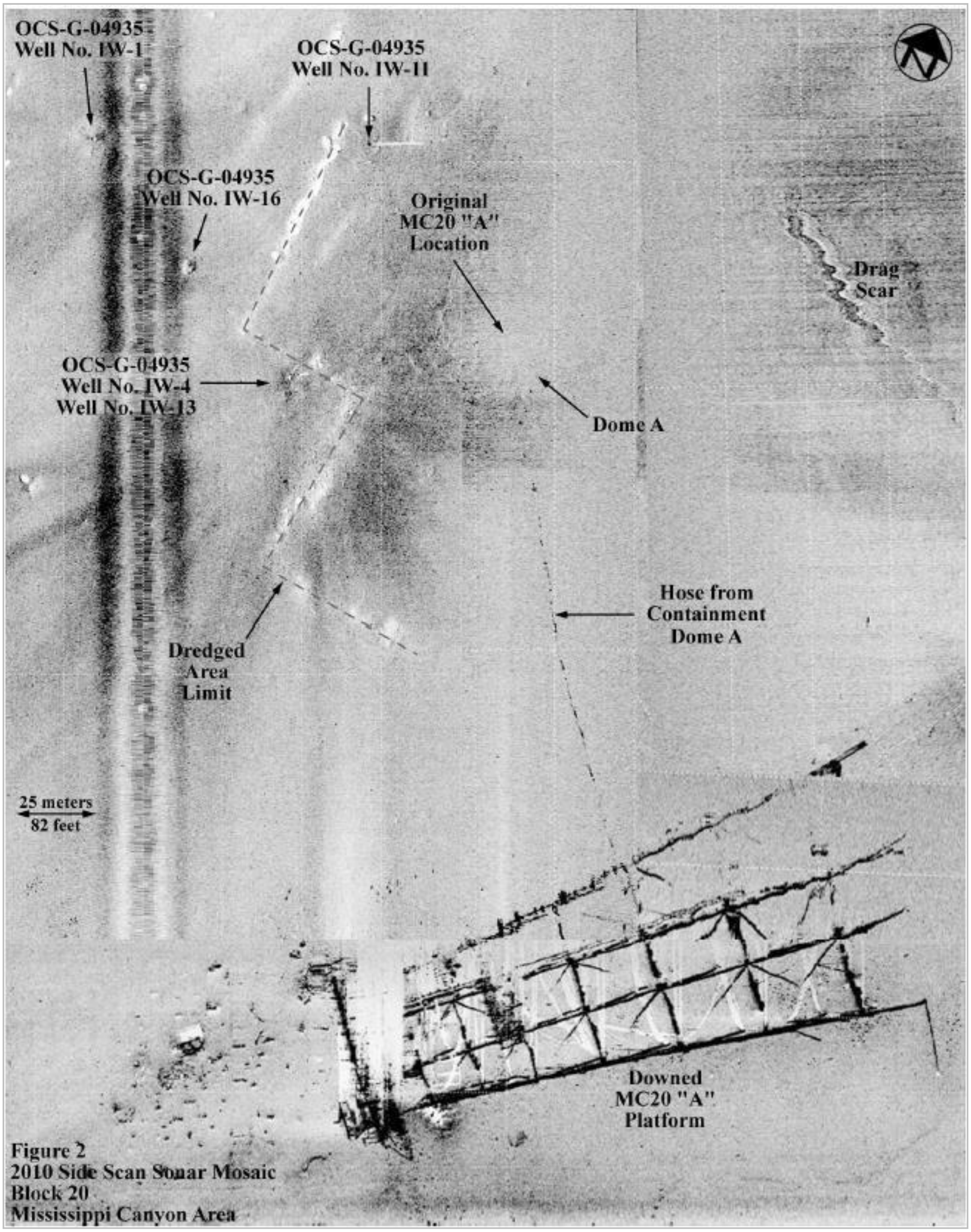


Figure 12 - 2010 side scan mosaic MC20 area

5 SURVEY METHODOLOGIES

5.1 Acoustic Corer^{TM} Set Up

[redacted] a depth and altitude measurement from the upper hub weldment was [redacted] and depth markings at seabed for any obvious shifts from the applied load. Having determined that the system was stable in static mode, the AC was rotated to multiple positions within its scanning extents. The acoustic packages were homed to the boom extents while monitoring pitch, roll, and altitude at the upper hub weldment and compared to the tilt and altitude values from the acoustic packages. [redacted]

Below is a step-by-step listing of the AC survey launch, set-up and recovery process. For details on the AC launch and recovery procedure see ref. (10), document Acoustic Corer Launch and Recovery Procedure Onboard MSV Chloe Candies, PanGeo Report No. PRC-1320-1200-103.

1. Move vessel to target location on DP and prepare for equipment launch
2. Conduct ROV launch tool box talk
3. Deploy ROV to 100ft
4. Confirm target landing area is clear of debris using ROV
5. Conduct [redacted] deployment tool box talk.
6. Oceaneering [redacted]

[redacted] required survey site locations

8. Oceaneering Survey provide [redacted] positions to PanGeo.
9. If AC already deployed go to (12) otherwise go to (10)
10. Conduct AC launch tool box talk.
11. AC launched in booms folded and acoustic packages parked configuration.
12. Position AC boom ends at a height of approximately 15m [redacted] (and top of AC is below vessel hull).
13. Activate extend mode via software until booms are fully deployed. Have ROV inspect to confirm.
14. Set AC [redacted]
15. With slack crane wire connected, PanGeo monitor AC altimeters and tilt sensors to determine if the AC settlement and tilt is within accepted tolerance. Anticipate static load, short term (elastic) settlement and monitor accordingly. Crane operator will be on stand-by to recover AC if there is evidence of settlement and tilt exceeding accepted tolerance to lift [redacted] seabed and go to (30). If AC is stable, that is no evidence of settlement or tilt, then proceed to (16).

16. Crane wire still attached and slack, PanGeo to carry out several cycles of rotating the AC booms back-and- forth through 180 degrees and moving the acoustic packages along the booms. Monitor settlement and tilt during this process. Crane operator will be on stand-by to recover AC if there is evidence of settlement and tilt exceeding accepted tolerance to lift [redacted] off seabed and go to (30) otherwise oceed to (17).
17. If and only if, having completed these [redacted] and tilt sensors indicate that the AC is in a fully stable condition the PanGeo OM will pronounce the AC stable on the seabed and give the go ahead for the crane hook to be disconnected from AC using ROV.
18. Recover ROV hook to vessel.
19. Position AC umbilical using ROV prior to vessel standoff. Install clump weights on umbilical as required.
20. While the AC monitors noise levels, the vessel will be moved to a suitable standoff position; pay-out AC umbilical (monitor touchdown using ROV). Commence soft-start routine.
21. Vessel at standoff position.
22. Conduct ROV toolbox talk. Recover ROV to deck.
23. Commence AC data acquisition (refer to Appendix D.).
24. AC Survey complete.
25. Conduct ROV launch toolbox talk. Deploy ROV to seabed.
26. Move vessel to AC landed position; rewind AC umbilical (monitor umbilical recovery using ROV).
27. Deploy ROV hook to AC connection point using USBL and ROV to guide.
28. Connect ROV hook to AC using ROV.
29. If next [redacted] ready to receive the AC then retrieve [redacted], set on next [redacted] go to 12 otherwise go to 30.
30. Conduct AC recovery toolbox talk and recover AC to vessel.
31. Retrieve [redacted]
32. If AC survey complete then end. Go to 34 otherwise 33
33. Move vessel to next site and go to 7.
34. Conduct [redacted] recovery toolbox talk.
35. Recover [redacted] to deck.
36. Conduct ROV recovery toolbox talk. Recover ROV to deck.
37. Transit to demob port.

5.2 Survey Data Acquisition Settings

The AC data acquisition comprised 2 sets at the first [redacted] position, Site B6. These were: (1) JYG-Cross scan and (2) Acoustic Core (SAS) LF and HF scans.

For Sites B3 and B9, the AC data acquisition comprised just the HF and LF acoustic core (SAS) scans. The JYG-Cross data from Site B6 was considered suitable for use with the other sites.

5.2.1 JYG-Cross Data Acquisition

Two approximately orthogonal lines of high resolution, multifold data were acquired using the LF chirp at an interval spacing of 10cm (4 inches) at Site B6. A total of 2600 data traces are acquired on each line. The acquisition parameters are outlined in the following table. These data sets were interpreted to provide a velocity profile at the site. The velocity profile for the area was used for the processing of the acoustic core data.

Setting	Value
Number of lines	2
Grid spacing	10cm
Grid spacing Sampling rate	50kHz
Target depth	55m
Samples/trace	4200
Ambient noise recording	ON

Table 10 - JYG-Cross acquisition parameters

The JYG-Cross data acquisition plan was carried out as outlined below:

1. A JYG-Cross survey was carried out at Site B6 using the LF chirp and parameters provided in Table 10.
2. Two lines of data were acquired. Each line took approximately 3 hours to acquire.
3. During JYG-Cross data acquisition, Ops monitored for any signs of AC settlement and tilt and were prepared to authorize a halt to data acquisition and call for the recovery of the AC should settlement and tilt exceed accepted tolerance. AC recovery was not necessary
4. JYG-Cross data QA/QC was carried out onboard and a QA/QC Report generated.
5. JYG-Cross data was hand carried to PanGeo (Canada) office for data processing as described below in Section Appendix D.
6. JYG-Cross data was processed at the PanGeo office using ZoomSpace software.
7. The data processing flow, which was carried out onshore, is described in APPENDIX D.
8. On completion of the JYG-Cross data acquisition and data QA/QC, Ops returned the booms to the start position and initiated the acquisition of the acoustic core (SAS) data.

5.2.2 Acoustic Core Data Acquisition

The Acoustic Corer is designed to deliver a 12m (40ft) diameter data volume down to penetration depth. HF and LF acoustic core data sets were acquired at Site B6, Site B3, and Site B9 locations. The acoustic core scanning process involved the acoustic packages moving over a pre-programmed sampling grid using the acquisition parameters listed in Table 11 and Table 12. A full 360-degree coverage is achieved, equating to over 20,000 data traces for both HF and LF acoustic cores.

These data were processed and analysed in order to identify buried linear features suggestive of buried 30" well conductor(s) and/or the internal casing string(s). The track of the identified conductors/strings were to be determined and data points, comprising Easting (m), Northing (m) and Depth BML (m), along the top of the conductors were tabulated.

HF and LF acoustic (SAS) core data were acquired to a target depth of 55m below seafloor using the following acquisition parameters:

a. For each payload grid position, the data collection script will execute the following:
   i. Payload moves into place
   ii. Collect HF/LF chirp data (usual settings)
   iii. Collect ambient noise (usual settings – samples/trace = 1024)

Note: Depending on penetration depth achieved by the HF Chirp, the number of samples per trace may be reduced after the first few acoustic cores in order to reduce survey time. The samples per trace will reduced in accordance with the depth of useable data acquired by the HF chirp.

Setting	Value
Sampling rate	50kHz
Grid spacing	7 cm
Target depth	55m
Samples/trace	4200
Ambient noise recording	ON

Table 11 - HF Chirp SAS Acquisition Parameters

Setting	Value
Sampling rate	50kHz
Grid spacing	10 cm
Target depth	55 m
Samples/trace	4200
Ambient noise recording	ON

Table 12 - LF Chirp SAS Acquisition Parameters

1. The first acoustic core data was acquired at Site B6, which involved acquiring data with both HF and LF chirp acoustics.
2. The procedure involved acquiring 20,000 data traces (with both HF and LF) within a 12m diameter area using the acquisition parameters listed in Table 11 and Table 12.
3. The acquisition of acoustic core data typically takes 18 hours.
4. Data acquisition has to take place in a continuous fashion. That is, the AC subsea unit cannot be moved during a scan otherwise the scan must be re-started from the beginning. The scan can be interrupted and re-started as long as the AC is not moved.
5. On completion of the HF and LF acoustic core data acquisition and data QA/QC, Ops notified the vessel that AC recovery procedure could be initiated.
6. The AC was moved to the next site to be surveyed.
7. Data was hand-carried to the PanGeo Office after demobilization.
8. HF and LF acoustic core data were processed at the PanGeo office using ZoomSpace software.
9. The data processing flow carried out onshore, is described in APPENDIX D.
10. Site Reports were produced for each of the three sites and provided to the Client. A follow-up call/WebEx was made with the Client to discuss these results.

5.3 Geodetic System and Datums

The project data is delivered in NAD27 UTM Zone 16N grid co-ordinates, with units in meters. Data Processing will be completed with units in meters, with conductor and anomaly picks reported in tabular format in both meters and survey ft. Figures will have a scale bar showing conversion to survey ft with primary axis units in meters. Tidal datum is mean sea level (MSL) and sub-seabed stratigraphy and anomaly datum is the seafloor with units in meters. All times are referenced to the universal time co-ordinate (UTC).

5.4 Completed Work Narrative

5.4.1 Mobilization

Mobilization commenced on September 1, 2019. All personnel were given a vessel induction by Oceaneering aboard the O.S.R.V Chloe Candies prior to sailing.

The mobilization commenced at 06:00 with welders fabricating brackets to secure vans and equipment. A modification of the Lars was necessary after test fitting the AC. The Stab guide protruded beyond the booms and posed a snag risk during launch and recovery. The center Leg brace of the LARS was omitted and two 24” wide, 12” high and 12’ long I-beam were secured to deck, inboard of the LARS to raise the top end and allow for better clearance. The park position of the hub motor was changed to 40 degrees to lessen the extent of the protrusion.

A USBL pole were fastened to the end of each boom of the AC in order to provide the most accurate location monitoring of the boom during its decent REDACTED and during surveying.

The ROV was wet tested on September 4, 2019. This testing period allowed the crew to practice launch/recovery of the AC while the vessel was waiting on the USCG to visit the vessel and carry out their inspection. This period was also used to place the AC on quayside for full scan testing while waiting.

A Sub-Bottom Imager (SBI) Survey was also scheduled to take place prior to the AC scan, however two interfacing challenges arose during mobilization. The requirements for the SBI ping rate frequency (PRF) was not met at the increased number of samples. This was a result of a poor network speed through the ROV mux. The ROV team upgraded the Millennium with a gigabit network switch and bulk head connection to support the 4 twisted pairs required for gigabit speeds. This solved the Network speed issue and a PRF =30 was achieved.

A second issue arose when interfacing with survey. Survey was unable to send a GGA string over Ethernet, so a Pearl was used to convert the serial string to Ethernet, however, the string was not decoding properly. The solution was to input the serial string via a serial to USB converter to a laptop and re-broadcast over TCP/IP. The issue was deemed solved at 0530 4th Sept 2019. However, due to time constraints it was determined the AC would have priority and the SBI would only be used should there be an interruption in the AC survey.

Figure 13 - LARS test fit with AC3. Leg brace omitted and I-beam installed to ensure clearances with stab guide during lift

5.4.2 Pre-Acceptance

A mock version REDACTED REDAC welded to the starboard aft stern of the vessel. A functionality test and stab guide clearance test were completed at 14:25 UTC.

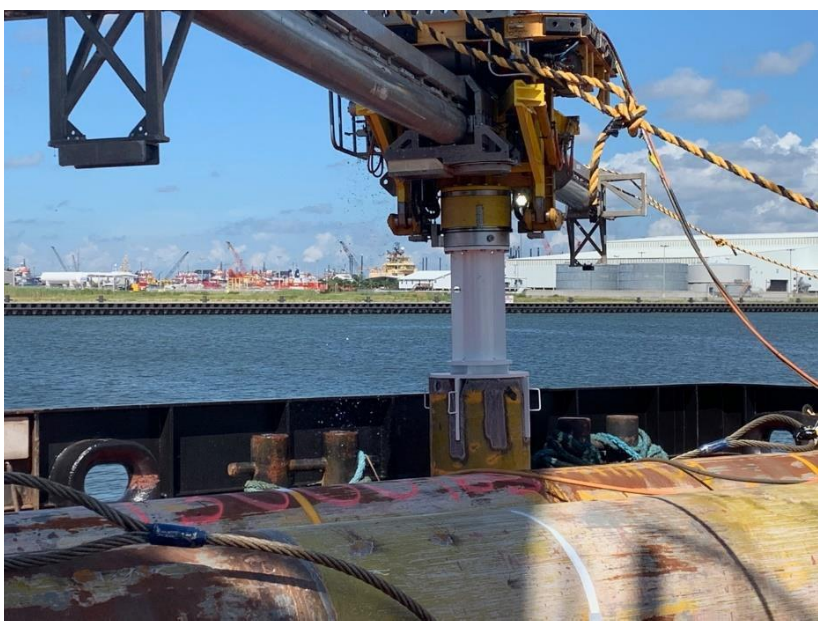


Figure 14 - AC stab guide and functionality test

5.4.3 Survey

The AC3 equipment was deployed at 09:00 on Sept 5th. Once REDACTED (129m (423ft) depth) the vessel commenced standing off while the ambient noise at the AC3 was monitored. At a standoff distance of 30m (98ft) the noise was gauged as low enough and the vessel parked. This was also deemed to be the maximum distance that umbilical could be safely deployed given the surface current conditions. This was consistent with the remaining cores.

Average pitch roll values were less than a degree, with very little settlement REDACTED Sensor drift in the TOGS was observed while surveying site B6 and was conflicting with the package readings. The ROV was sent out to observe the Bullseye and it was determined that the values from the TOGS gyro were erroneous and resulted from sensor drift. Going forward should the TOGS and boom sensors disagree then a sensor bottle reset would be performed before sending out the ROV.

During Site B6 recovery, surface current peaked to 2.9knots, this caused the umbilical to become suspended in the water column and orient under the vessel near the location of the Heli-deck. To avoid washing into a thruster or applying too much force to the umbilical at the Kellems grip, it was decided in conjunction with the Vessel OM, to install the ROV basket on the seafloor and tether it to the umbilical to act as clump weight and maintain slack at the AC connection.

Site	Total Survey Time	Comments
B6	5hr 29min	JYG scan completed 05 Sept 2019
B6	16hr 37min	SAS scan completed 06 Sept 2019
B3	15hr 09min	JYG scan completed 07 Sept 2019
B9	15hr 29min	SAS scan completed 08 Sept 2019

Table 13 - Acoustic Corer Deployment Table

Acoustic Core Reference & Location ID	Required Position		Landed Position		Difference between Required & Landed (m)	
	Easting (m)	Northing (m)	Easting (m)	Northing (m)	Easting (m)	Northing (m)
B6	307983.91	3202477.53	307984.28	3202477.48	0.37	0.05
B3	308009.56	3202455.47	308009.54	3202456.10	0.02	0.63
B9	307958.26	3202499.59	307959.36	3202498.48	1.10	1.11

Table 14 - Acoustic Corer™ *required and landed position NAD27 UTM Zone 16N*

Table 14 summarizes the AC deployment during the campaign, including offset from proposed positions.

5.4.4 Demobilization

Demobilization of the Chloe Candies and PGSS equipment took place during transit and at Oceaneering's yard in Port Fourchon, at 06:00 on September 9, 2019 and was completed at 11:00 on September 9,2019.

6 SAFETY

A HAZID meeting was held on 26th Sept 2019 via WebEx to evaluate the risks involved in the campaign. A second discussion was held on the vessel with all parties involved on 3rd Sept 2019.

Oceaneering gave all PGSS crew a vessel induction immediately after boarding.

Before the start of each of the survey deployments, moves or recoveries, a toolbox talk was held between all parties and personnel involved in the operation.

Oceaneering also provided JSE's for general back deck work, working at heights and for crane OPS during mobilization. Oceaneering was extremely cooperative to work with and provided assistance, input and guidance throughout the campaign to ensure a safe and efficient operation.

7 RESULTS AND INTERPRETATION OF ACOUSTIC CORER™ DATA

For more details on data processing, the reader is directed to the Appendix D where a brief overview of the data processing is provided. This section of the Appendix contains an Acoustic Corer Acquisition, Processing and Interpretation flow diagram and diagrams showing the JYG-Cross and Volumetric SAS data processing flow. Also presented is the velocity profile determined for Site B6 that was subsequently used for data processing. The AC data was processed using Acoustic Zoom Inc. ZoomSpace software suite. The technical support of Ryan Laidley of Acoustic Zoom Inc. is gratefully acknowledged.

7.1 Data Interpretation

7.1.1 Overall Description of Acoustic Anomalies and Interpretation

The aim of the survey was to identify and locate the buried 28 well conductors as well as any potential geohazard resembling debris or infrastructure from the downed Taylor Energy platform.

Any interpreted linear feature or anomaly was identified using the HF and LF chirp synthetic aperture sonar (SAS) rendered results to provide correlation. These volumetric images produced are referred to as acoustic cores. Linear features were identified using the criterion of any long, linear feature that was presented throughout the core. Both the identification and interpretation of linear features and anomalies relies on the strength of acoustic return from buried targets (i.e. red coloration indicates a strong acoustic response relative to the soil background level) together with the size, and shape of the feature. Linear feature and anomaly analysis are presented in the Linear Feature Summary Table and the Anomaly Summary Table displayed in the Executive summary as well as individual site data below.

Identification of each linear feature follows the scheme:

- {Site Name}-{HF or LF used}-{Linear Feature Number}-{Point Along The Feature Number}

Where

- {Site Name} = B3, B6, B9
- {HF or LF used} = HF, LF
- {Linear Feature Number} = C1, C2, C3 etc.
- {Point Along The Feature Number} = 01, 02, 03 etc.

Identification of each anomaly follows the scheme:

- {Site Name}-{HF or LF used}-{Anomaly Number}

Where

- {Site Name} = B3, B6, B9
- {HF or LF used} = HF, LF
- {Linear Feature Number} = A01, A02, A03 etc.

When a linear feature is identified, several attributes are recorded in the "Linear Feature Summary Table". Similarly, when any acoustic anomaly is identified, attributes associated with each anomaly are recorded in the "Anomaly Summary Table". These attributes were tabulated using an MS Excel spreadsheet. For Linear Features, the following attributes were recorded:

- Easting and Northing Position in meters and US survey ft
- Depth of Burial below mudline in meters and US survey ft
- Length between picks along the feature in meters and US survey ft
- Equivalent diameter (largest effective diameter) of Linear features presented in inches with a degree of uncertainty attached

For anomalies, the following attributes were recorded:

- Easting and Northing Position in meters and US survey ft
- Depth of Burial below mudline in meters and US survey ft
- Length between picks along the feature in meters and US survey ft
- Equivalent width (largest effective width measured in in-line/cross-line view) in meters and US survey feet
- Equivalent Length (largest effective length measured in plan-view) in meters and US survey ft
- Suggestive Interpretation

It should be noted that while the acoustic core is a 12m in diameter area, features can be identified over a 14m diameter area. Beyond the 12m diameter scan area, however, the acoustic sampling of anomalies is greatly reduced and as such, the size and shape of anomalies is reported with greater uncertainty.

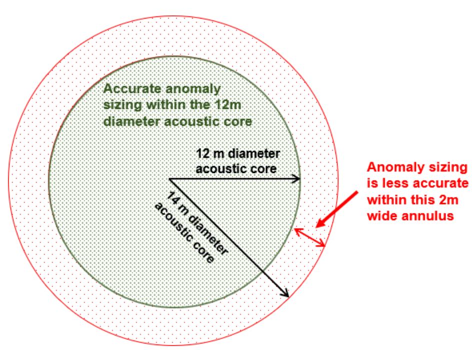


Figure 15 - Acoustic Core diameter showing area of uncertainty

Figure 16 shows an example of the cross-sections obtained at MC20. The left- and right-hand images show the HF and LF acoustic cores respectively. Note that specular returns can be seen deep in both images, with resolution being much higher in the HF chirp than LF chirp, while LF Chirp can provide greater reliability at greater depth.

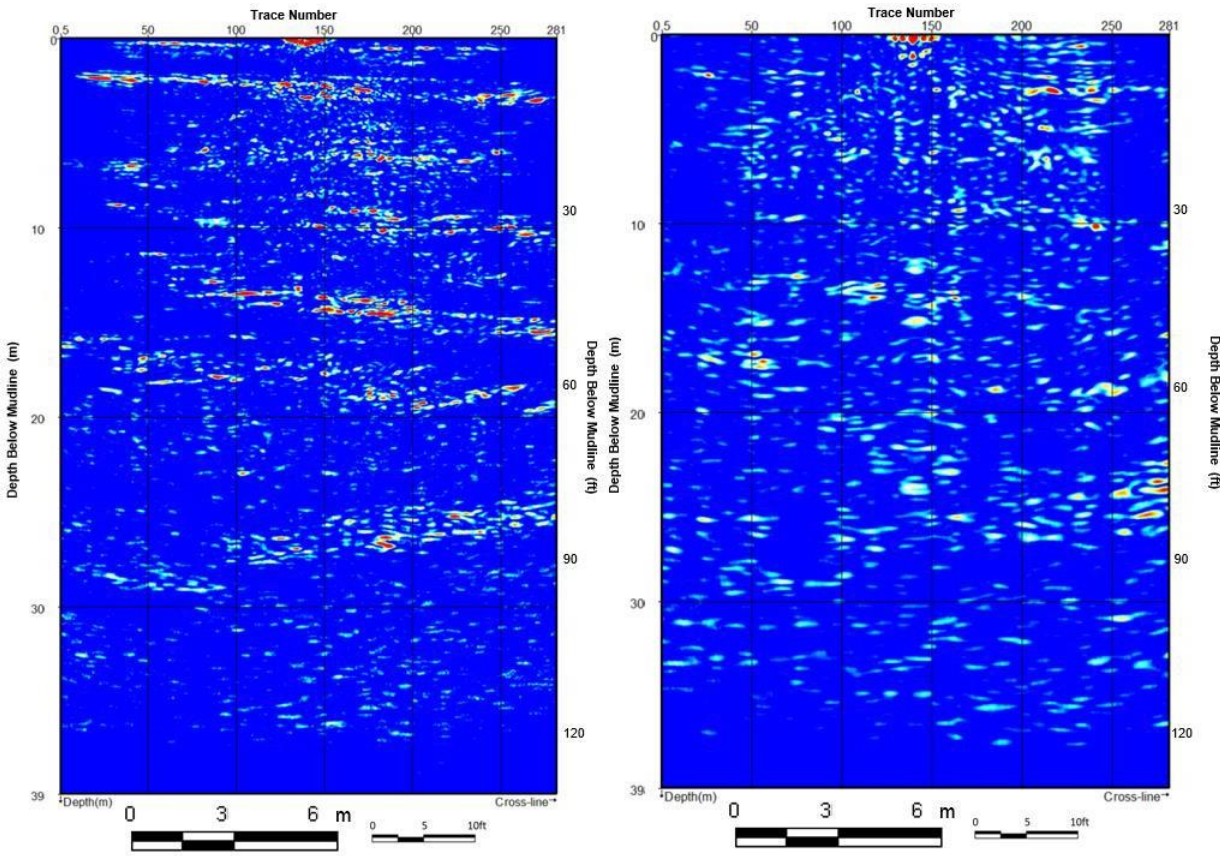


Figure 16 - Cross-sections through an acoustic core (HF left and LF right)

7.1.2 Acoustic Core (Volumetric Data) Interpretation Criteria

When interpreting features or anomalies, the shape and uniformity of the reflection response is a key factor when deciding when an anomaly is a discrete object, linear object, or whether the anomaly is made up of a cluster of objects.

A statistical method was used for interpretation and sizing. A colour scale for each acoustic (SAS) core was chosen such that the samples with a value of at least 6 standard deviations above the mean (6σ) are coloured in red. Red areas would be interpreted then to be the anomaly boundaries.

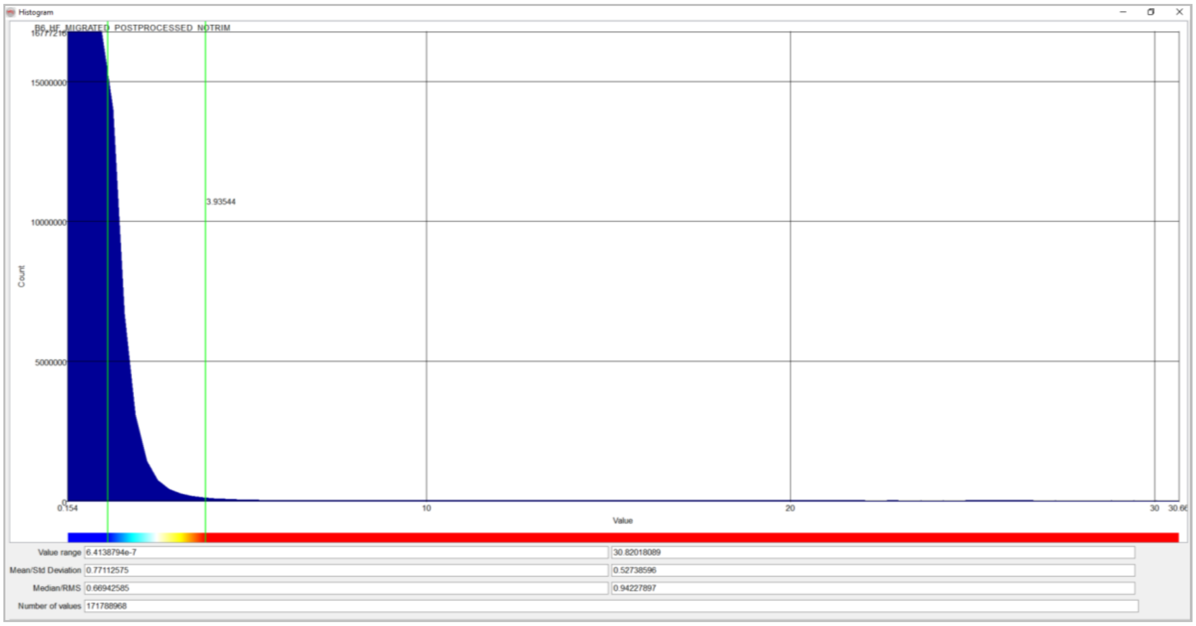


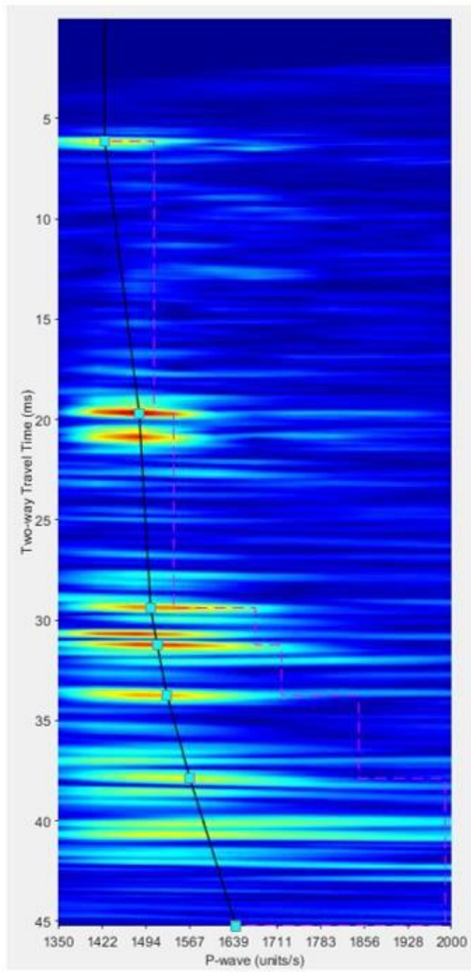
Figure 17 - Intensity Histogram for Site B6 HF SAS

The images presented in this document, include cross-sections, plan-view slices and isometric views. These data sections and slices are extracted from the 3D volumetric data set using Inline, Crossline, and Z-Slices, which are used in order to pinpoint anomaly or feature locations. Please note that the full value of the AC data set can only be appreciated within the 3D viewing environment. The following figures present 2D screenshots of the 3D data set such that linear targets, such as linear features, may seem to disappear within a given image. Note that each 2D data section represents a plane of just 2-inch thickness. In actual fact, the linear target may have moved out of the 2D plane of view and still be quite visible within the 3D viewing environment. The data isometric views are presented here to display linear features penetrating through the acoustic core together with the strata suggestive of the bottom of the mud flow deposit. The volumetric data was collected to the required 55m (180 ft) depth below mud line. The limit at which features were detected was circa 40m (132 ft) below mud line.

7.2 Site B6 Interpreted Results

7.2.1 JYGs-Cross Velocity Model

Semblance Analysis was performed at Site B6 following the acquisition of 2D JYGs-Cross data. See Figure 18 for the velocity model that resulted from semblance analysis. These velocities are expected in an area with water saturated clay/silt soils such as those found at MC20. This model was used in subsequent SAS migration being considered as representative of the survey area as a whole.



Time (ms)	Velocity (m/s)
0	1429.9
6.15	1429.9
19.69	1486.77
29.39	1504.9
31.24	1514.4
33.77	1529.61
37.89	1569.52
45.22	1645.54

Figure 18 - Semblance Analysis and resultant velocity model (P-model) taken at Site B6

7.2.2 Site B6 Linear Features

The HF and LF acoustic core data were interpreted to map linear features evident in the data sets. The results are summarized in Table 15. Cross-section and plan-view images of the linear features are shown in Figure 19 to Figure 22. Two (2) linear features were identified and these were identified in both HF and LF acoustic cores. The B6-HF-C1 feature was interpreted to be of 10±1-inch diameter at a depth of between 9.1-10.5m (29.9 to

34.6 ft) BML (Figure 19). The B6-HF-C2 feature was interpreted to be of 9.1±0.9m (30±3ft) diameter located at a depth between 13.9-14.6m (45.5 to 47.8ft) (Figure 20 to Figure 22).

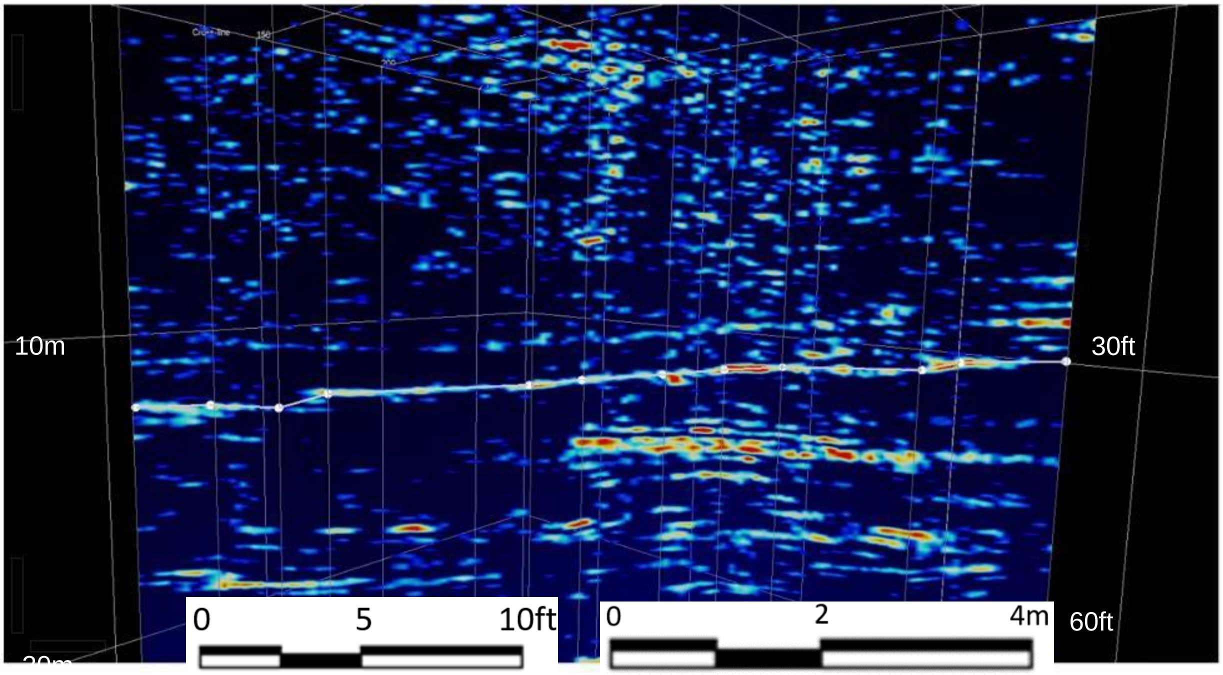


Figure 19 - Cross-sectional view of B6-HF-C1. Depths along the side of the section are distances BML

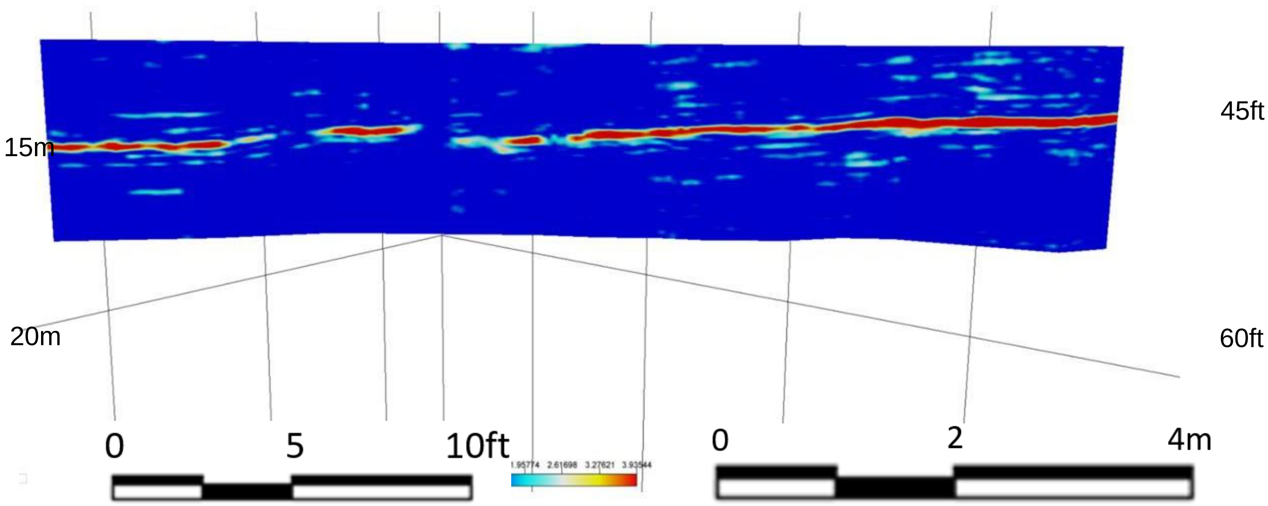


Figure 20 - Side View of B6-HF-C2. Depths along the side of the profile are recorded as BML.

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B6-HF-C1-01	307981.16	3202482.61	0.00	9.11	1010434.8	10506811.6	0.0	29.9	10 ± 1
B6-HF-C1-02	307981.86	3202481.74	1.12	9.20	1010437.1	10506808.7	3.7	30.2	10 ± 1
B6-HF-C1-03	307982.16	3202481.45	1.54	9.37	1010438.1	10506807.8	5.1	30.7	10 ± 1
B6-HF-C1-04	307982.76	3202480.13	2.98	9.48	1010440.1	10506803.5	9.8	31.1	10 ± 1
B6-HF-C1-05	307983.06	3202479.59	3.60	9.60	1010441.1	10506801.7	11.8	31.5	10 ± 1
B6-HF-C1-06	307983.56	3202479.11	4.29	9.71	1010442.7	10506800.1	14.1	31.9	10 ± 1
B6-HF-C1-07	307984.26	3202478.54	5.20	9.82	1010445.0	10506798.2	17.1	32.2	10 ± 1
B6-HF-C1-08	307984.76	3202478.21	5.80	9.91	1010446.7	10506797.1	19.0	32.5	10 ± 1
B6-HF-C1-09	307986.26	3202476.73	7.90	10.14	1010451.6	10506792.3	25.9	33.3	10 ± 1
B6-HF-C1-10	307986.56	3202476.29	8.44	10.48	1010452.6	10506790.9	27.7	34.4	10 ± 1
B6-HF-C1-11	307986.96	3202475.67	9.18	10.48	1010453.9	10506788.8	30.1	34.4	10 ± 1
B6-HF-C1-12	307987.56	3202475.14	9.97	10.54	1010455.8	10506787.1	32.7	34.6	10 ± 1

B6-HF-C2-01	307979.16	3202481.91	0.00	13.87	1010428.3	10506809.3	0.0	45.5	30 ± 3
B6-HF-C2-02	307979.66	3202481.59	0.59	13.89	1010429.9	10506808.2	1.9	45.6	30 ± 3
B6-HF-C2-03	307979.86	3202480.90	1.31	13.92	1010430.6	10506806.0	4.3	45.7	30 ± 3
B6-HF-C2-04	307980.06	3202480.15	2.09	13.98	1010431.2	10506803.5	6.8	45.9	30 ± 3
B6-HF-C2-05	307980.36	3202479.69	2.63	14.09	1010432.2	10506802.0	8.6	46.2	30 ± 3
B6-HF-C2-06	307980.86	3202479.28	3.28	14.12	1010433.9	10506800.7	10.8	46.3	30 ± 3
B6-HF-C2-07	307981.36	3202478.64	4.09	14.18	1010435.5	10506798.6	13.4	46.5	30 ± 3
B6-HF-C2-08	307981.56	3202478.23	4.55	14.27	1010436.2	10506797.2	14.9	46.8	30 ± 3
B6-HF-C2-09	307981.96	3202477.68	5.23	14.29	1010437.5	10506795.4	17.2	46.9	30 ± 3
B6-HF-C2-10	307982.26	3202477.11	5.87	14.44	1010438.5	10506793.5	19.3	47.4	30 ± 3
B6-HF-C2-11	307983.56	3202475.39	8.03	14.49	1010442.7	10506787.9	26.3	47.6	30 ± 3
B6-HF-C2-12	307984.46	3202474.67	9.18	14.55	1010445.7	10506785.5	30.1	47.7	30 ± 3
B6-HF-C2-13	307985.56	3202473.57	10.74	14.58	1010449.3	10506781.9	35.2	47.8	30 ± 3

Table 15 - Linear Feature Summary Table for Site B6

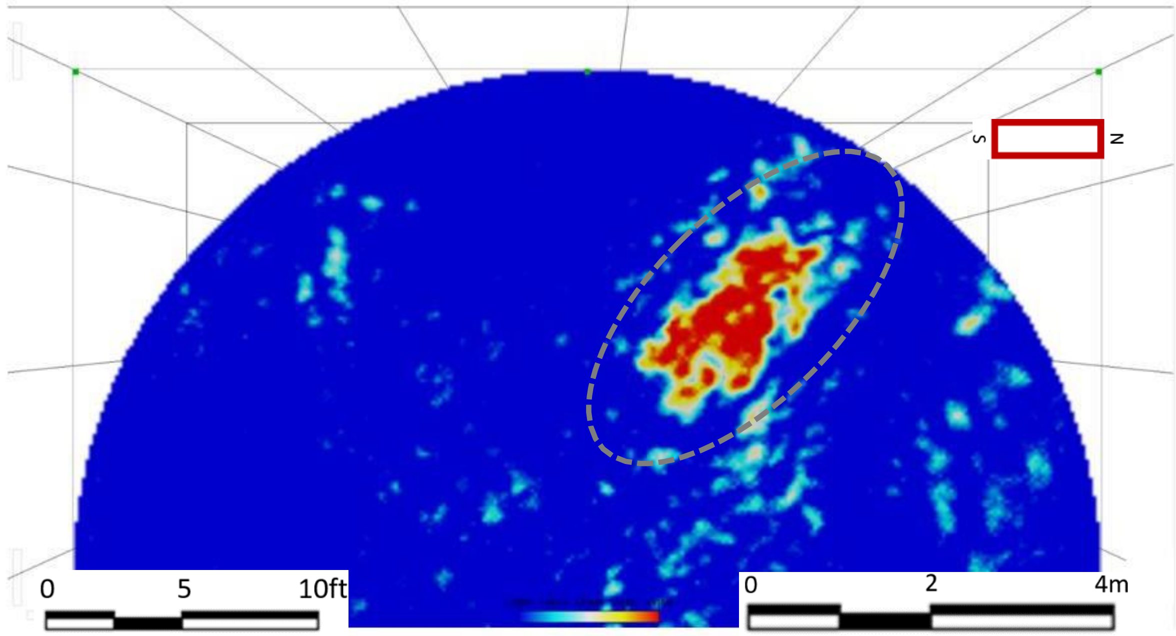


Figure 21 - Plan-View of B6-HF-C2 located at 14.15m BML (46.4ft) showing a portion of the dipping linear feature (dipping towards the NW) through the acoustic core.

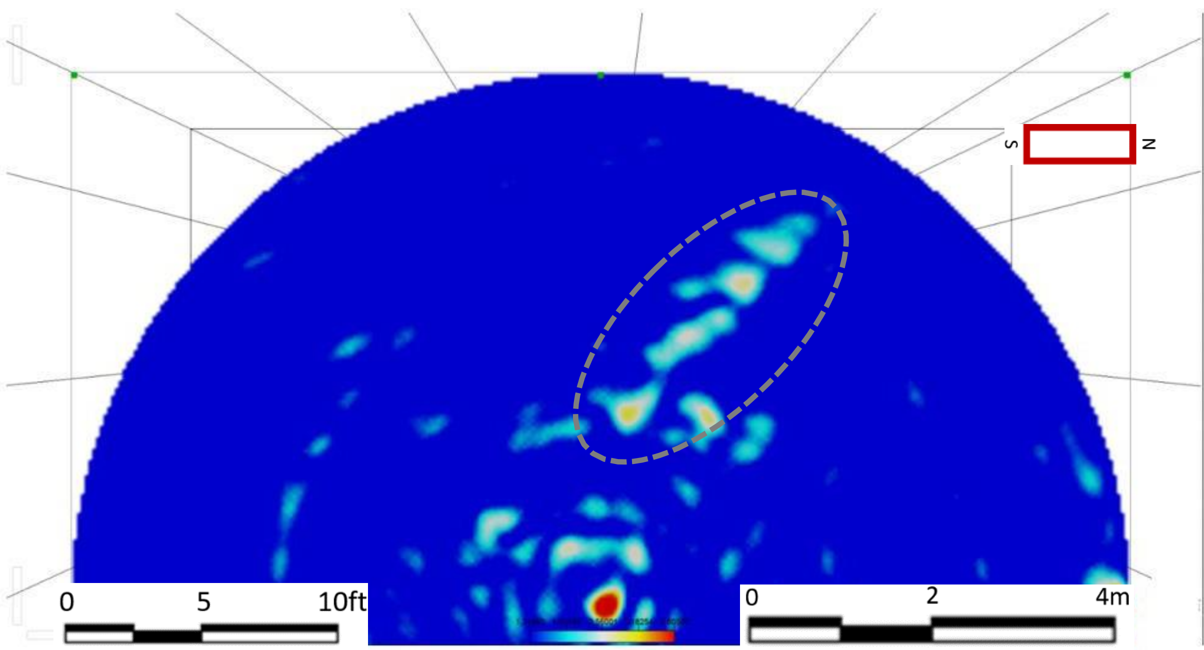


Figure 22 - Plan-View of B6-HF-C2 located at 14.05m BML (46.1ft) using the LF SAS to confirm correlation.

7.2.3 Site B6 Anomalies

The anomaly analysis result is summarized in Table 16 as well as in plan-view and cross-sectional plots in Figure 23 and Figure 24. A total of 5 anomalies were identified within the HF Core that correlated with 5 anomalies in the LF Core. These anomalies were located between 12-20m BML (39-66ft). Anomalies reported in grey text are in the 12-14m (39.4ft – 45.9ft) annulus of the acoustic core and therefore subject to a greater uncertainty. Sample images of identified anomalies can also be found in Figure 25 and Figure 26 below.

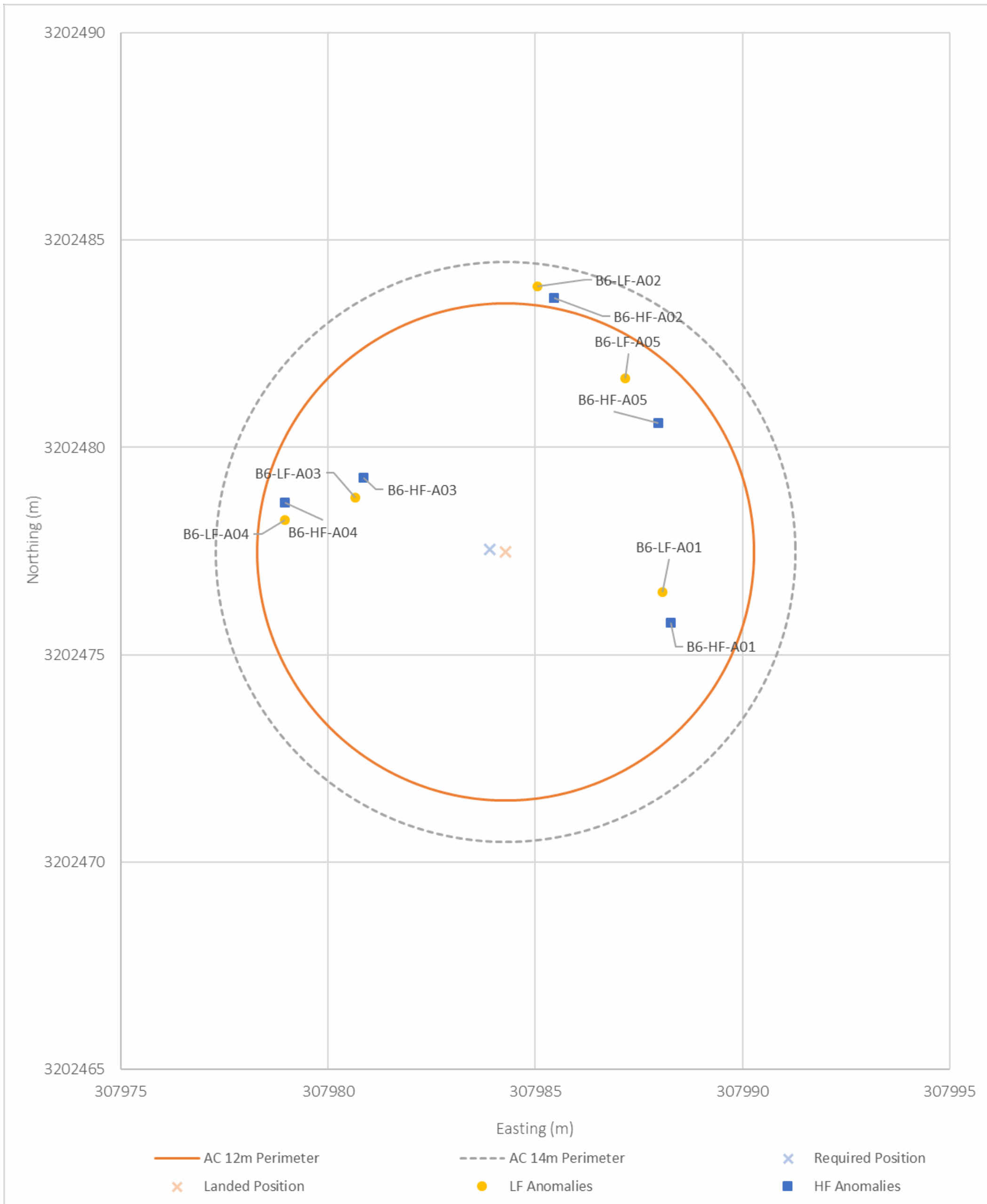


Figure 23 - Plan View Image showing B6 anomalies

Figure 24 - Cross-Sectional view of the HF and LF acoustic anomalies at Site B6 oriented East-West (left image) and North-South (right image)

Anomaly ID	Easting (m)	Northing (m)	Equivalent Length (m)	Equivalent Width (m)	Depth Below Seafloor (m)	Easting (ft)	Northing (ft)	Equivalent Diameter (ft)	Equivalent Width (ft)	Depth Below Mudline (ft)	Suggestive Interpretation
B6-HF-A01	307988.26	3202475.77	1.55	0.35	12.01	1010458.1	10506789.2	5.1	1.1	39.4	Linear cluster of anomalies; Correlated with B6_LF_01
B6-LF-A01	307988.06	3202476.50	1.98	0.50	12.01	1010457.5	10506791.5	6.5	1.6	39.4	Linear cluster of anomalies; Correlated with B6_HF_01
B6-HF-A02	307985.46	3202483.61	3.21	1.65	13.45	1010449.0	10506814.9	10.5	5.4	44.1	Irregular shaped cluster of 2 larger anomalies; Correlated with B6_LF_02
B6-LF-A02	307985.06	3202483.88	3.37	1.40	13.45	1010447.6	10506815.8	11.1	4.6	44.1	Irregular shaped cluster of 2 larger anomalies; Correlated with B6_HF_02
B6-HF-A03	307980.86	3202479.27	3.03	1.47	14.18	1010433.9	10506800.6	9.9	4.8	46.5	Irregular shaped anomaly; Correlated with B6_LF_03

Anomaly ID	Easting (m)	Northing (m)	Equivalent Length (m)	Equivalent Width (m)	Depth Below Seafloor (m)	Easting (ft)	Northing (ft)	Equivalent Diameter (ft)	Equivalent Width (ft)	Depth Below Mudline (ft)	Suggestive Interpretation
B6-LF-A03	307980.66	3202478.78	1.57	0.41	14.15	1010433.2	10506799.0	5.2	1.3	46.4	Irregular shaped anomaly; Correlated with B6_HF_03
B6-HF-A04	307978.96	3202478.66	2.3	0.84	19.09	1010427.6	10506798.6	7.5	2.8	62.6	Elongated anomaly; Correlated with B6_LF_04
B6-LF-A04	307978.96	3202478.24	1.16	0.86	19.09	1010427.6	10506797.3	3.8	2.8	62.6	Elongated anomaly; Correlated with B6_HF_04
B6-HF-A05	307987.96	3202480.60	4.75	1.65	20.09	1010457.2	10506805.0	15.6	5.4	65.9	Elongated, linear shaped anomaly indicative of natural gas; Correlated with B6_LF_05
B6-LF-A05	307987.16	3202481.66	2.94	1.24	20.03	1010454.5	10506808.5	9.6	4.1	65.7	Elongated, linear shaped anomaly indicative of natural gas; Correlated with B6_HF_05

Table 16 - Anomaly Summary table for Site B6

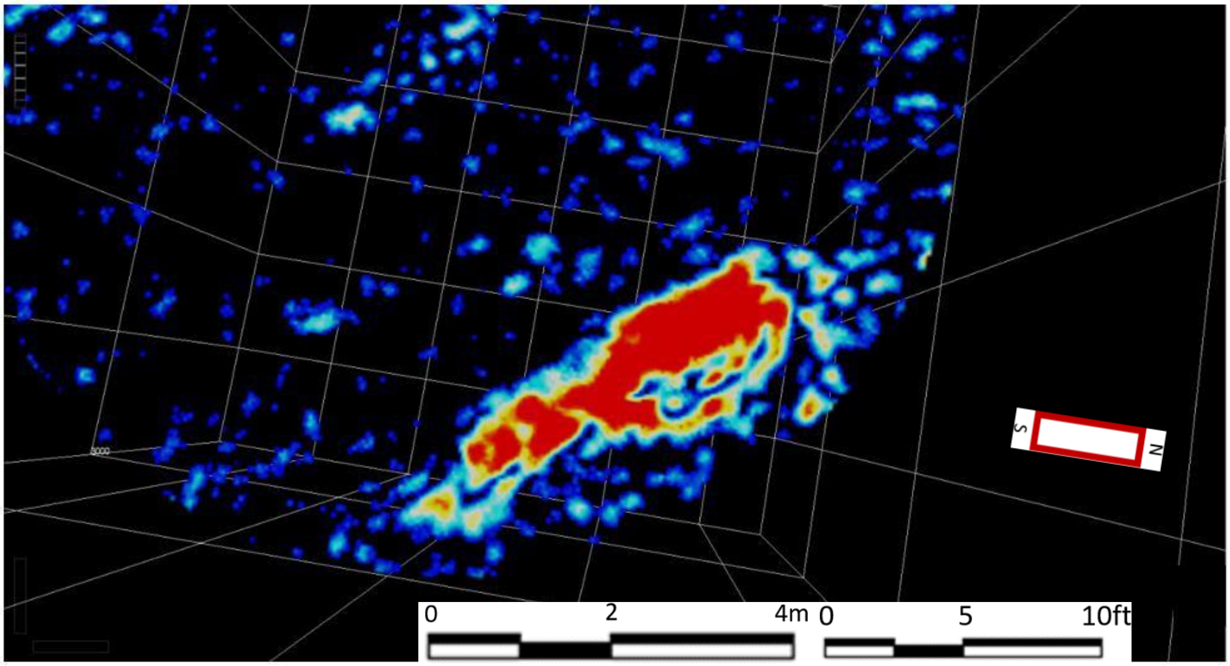


Figure 25 - Sample image showing B6-HF-A05 in plan-view. Depth is 20.09m BML (65.9ft BML). This type of linear feature is indicative of natural gas in the area.

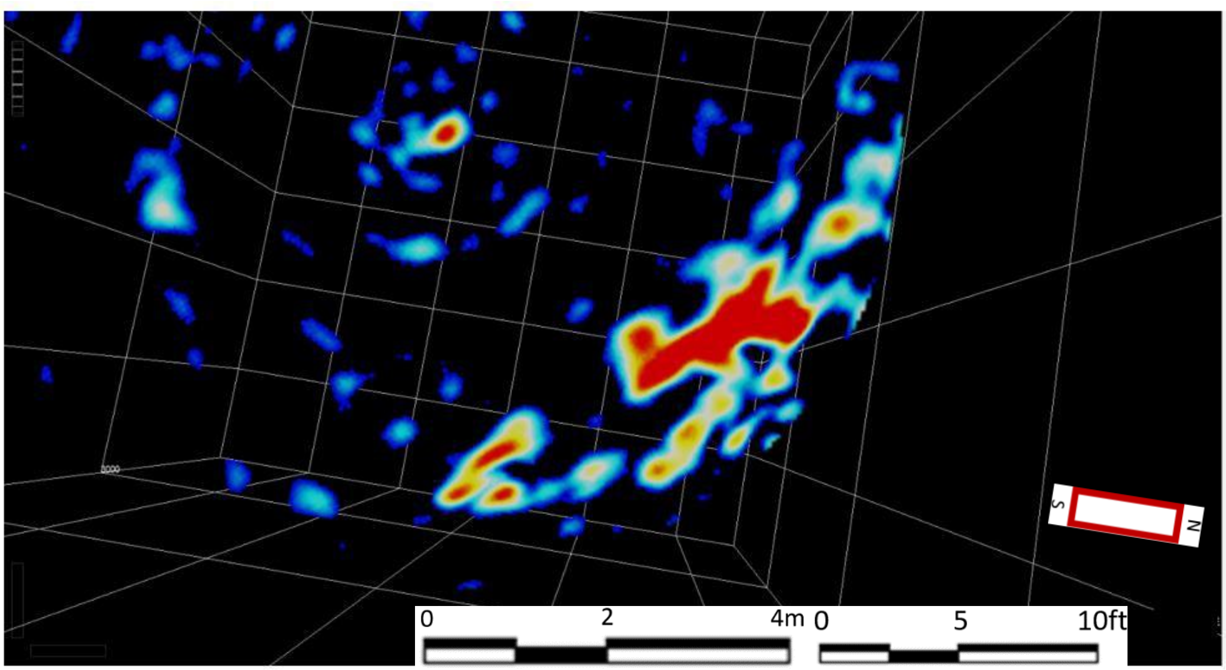


Figure 26 - Sample image showing B6-LF-A05 in plan-view. Depth is 20.03m BML (65.7ft BML). This type of linear feature is indicative of natural gas in the area.

7.3 Site B3 Interpreted Results

7.3.1 Linear Feature Results

The HF and LF acoustic core data were interpreted to map linear features evident in the data sets. The results are summarized in Table 17. Cross-section and plan-view images of the linear features are shown in Figure 25 to Figure 32. Four (4) linear features were identified and these were identified in both HF and LF acoustic cores.

The B3-HF-C1 feature was interpreted to be of 10±1 inch diameter at a depth of between15.2-15.4m (49.8 to 50.4 ft) BML (Figure 28 to Figure 30). The B3-HF-C2 feature was interpreted to be of 8±1 inch diameter located at a depth between 16.5-16.7m (54.3 to 54.8 ft) BML (Figure 20 to Figure 22). The B3-HF-C3 feature was interpreted to be of 20±2 inch diameter located at a depth between 20.3-21.4m (66.7 to 70.2ft) BML (Figure 32 to Figure 33) .The B3-HF-C4 feature was interpreted to be of 17±2 inch diameter located at a depth between 13.2-13.7m (43.4 to 44.9 ft) BML (Figure 27).

Also identified at Site B3 was a dipping layer extending across the acoustic core (Figure 34). The layer is located between 9.0-12.3m (29.5ft and 40.5ft) BML.

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B3-HF-C1-01	308008.34	3202449.24	0.00	15.17	1010524.0	10506702.1	0.0	49.8	10 ± 1
B3-HF-C1-02	308008.04	3202449.81	0.64	15.19	1010523.0	10506704.0	2.1	49.8	10 ± 1
B3-HF-C1-03	308007.34	3202450.71	1.78	15.19	1010520.7	10506706.9	5.8	49.8	10 ± 1
B3-HF-C1-04	308006.84	3202451.42	2.65	15.22	1010519.1	10506709.2	8.7	49.9	10 ± 1
B3-HF-C1-05	308005.94	3202452.54	4.09	15.25	1010516.1	10506712.9	13.4	50.0	10 ± 1
B3-HF-C1-06	308005.44	3202453.41	5.09	15.25	1010514.5	10506715.8	16.7	50.0	10 ± 1
B3-HF-C1-07	308005.04	3202453.73	5.61	15.28	1010513.2	10506716.8	18.4	50.1	10 ± 1
B3-HF-C1-08	308004.64	3202454.63	6.59	15.37	1010511.9	10506719.8	21.6	50.4	10 ± 1
B3-HF-C1-09	308004.04	3202455.89	7.99	15.37	1010509.9	10506723.9	26.2	50.4	10 ± 1
B3-HF-C1-10	308003.44	3202457.11	9.35	15.37	1010507.9	10506727.9	30.7	50.4	10 ± 1
B3-HF-C2-01	308009.14	3202460.98	0.00	16.54	1010526.6	10506740.6	0.0	54.3	8 ± 1
B3-HF-C2-02	308009.34	3202460.70	0.34	16.54	1010527.3	10506739.7	1.1	54.3	8 ± 1

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B3-HF-C2-03	308009.64	3202460.50	0.70	16.54	1010528.3	10506739.0	2.3	54.3	8 ± 1
B3-HF-C2-04	308009.94	3202460.33	1.05	16.54	1010529.3	10506738.5	3.4	54.3	8 ± 1
B3-HF-C2-05	308010.14	3202459.92	1.50	16.69	1010529.9	10506737.2	4.9	54.8	8 ± 1
B3-HF-C2-06	308010.44	3202459.06	2.42	16.69	1010530.9	10506734.3	7.9	54.8	8 ± 1
B3-HF-C2-07	308010.84	3202458.51	3.10	16.69	1010532.2	10506732.5	10.2	54.8	8 ± 1
B3-HF-C2-08	308011.24	3202458.08	3.68	16.69	1010533.5	10506731.1	12.1	54.8	8 ± 1
B3-HF-C2-09	308011.64	3202457.66	4.26	16.69	1010534.8	10506729.7	14.0	54.8	8 ± 1
B3-HF-C2-10	308012.34	3202457.23	5.08	16.69	1010537.1	10506728.3	16.7	54.8	8 ± 1
B3-HF-C2-11	308012.84	3202456.79	5.75	16.69	1010538.8	10506726.9	18.9	54.8	8 ± 1
B3-HF-C2-12	308013.14	3202456.48	6.19	16.69	1010539.8	10506725.8	20.3	54.8	8 ± 1
B3-HF-C3-01	308014.94	3202451.993	0.00	21.52	1010545.7	10506711.1	0.0	70.6	20 ± 2
B3-HF-C3-02	308014.44	3202452.491	0.71	21.35	1010544.0	10506712.8	2.3	70.0	20 ± 2

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B3-HF-C3-03	308014.04	3202452.831	1.23	21.39	1010542.7	10506713.9	4.0	70.2	20 ± 2
B3-HF-C3-04	308013.14	3202453.64	2.44	21.28	1010539.8	10506716.5	8.0	69.8	20 ± 2
B3-HF-C3-05	308012.54	3202454.171	3.24	21.31	1010537.8	10506718.3	10.6	69.9	20 ± 2
B3-HF-C3-06	308012.14	3202454.459	3.73	21.24	1010536.5	10506719.2	12.3	69.7	20 ± 2
B3-HF-C3-07	308011.54	3202454.923	4.49	21.43	1010534.5	10506720.8	14.7	70.3	20 ± 2
B3-HF-C3-08	308011.24	3202455.097	4.84	21.28	1010533.5	10506721.3	15.9	69.8	20 ± 2
B3-HF-C3-09	308010.74	3202455.531	5.50	21.15	1010531.9	10506722.7	18.1	69.4	20 ± 2
B3-HF-C3-10	308010.14	3202455.922	6.22	21.09	1010529.9	10506724.0	20.4	69.2	20 ± 2
B3-HF-C3-11	308009.74	3202456.296	6.77	21.07	1010528.6	10506725.3	22.2	69.1	20 ± 2
B3-HF-C3-12	308009.34	3202456.558	7.24	20.87	1010527.3	10506726.1	23.8	68.5	20 ± 2
B3-HF-C3-13	308008.64	3202457.028	8.09	20.72	1010525.0	10506727.7	26.5	68.0	20 ± 2
B3-HF-C3-14	308008.34	3202457.603	8.74	20.63	1010524.0	10506729.5	28.7	67.7	20 ± 2

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B3-HF-C3-15	308008.04	3202458.278	9.47	20.41	1010523.0	10506731.8	31.1	67.0	20 ± 2
B3-HF-C3-16	308007.54	3202458.922	10.29	20.27	1010521.4	10506733.9	33.8	66.5	20 ± 2
B3-HF-C3-17	308007.24	3202459.339	10.80	20.36	1010520.4	10506735.2	35.4	66.8	20 ± 2
B3-HF-C3-18	308006.74	3202459.896	11.55	20.38	1010518.8	10506737.1	37.9	66.9	20 ± 2
B3-HF-C3-19	308006.34	3202460.611	12.37	20.43	1010517.5	10506739.4	40.6	67.0	20 ± 2
B3-HF-C3-20	308006.14	3202461.059	12.86	20.48	1010516.8	10506740.9	42.2	67.2	20 ± 2
B3-HF-C3-21	308005.84	3202461.597	13.48	20.38	1010515.8	10506742.6	44.2	66.9	20 ± 2
B3-HF-C3-22	308005.74	3202461.879	13.78	20.35	1010515.5	10506743.6	45.2	66.7	20 ± 2
B3-HF-C4-01	308012.94	3202450.16	0.00	13.22	1010539.1	10506705.1	0.0	43.4	17 ± 2
B3-HF-C4-02	308012.44	3202450.82	0.83	13.22	1010537.5	10506707.3	2.7	43.4	17 ± 2
B3-HF-C4-03	308011.54	3202452.05	2.35	13.37	1010534.5	10506711.3	7.7	43.9	17 ± 2
B3-HF-C4-04	308010.64	3202453.43	4.00	13.45	1010531.6	10506715.9	13.1	44.1	17 ± 2

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B3-HF-C4-05	308010.04	3202454.88	5.57	13.51	1010529.6	10506720.6	18.3	44.3	17 ± 2
B3-HF-C4-06	308009.34	3202455.75	6.68	13.68	1010527.3	10506723.4	21.9	44.9	17 ± 2

Table 17 - Linear Feature Summary Table for Site B3

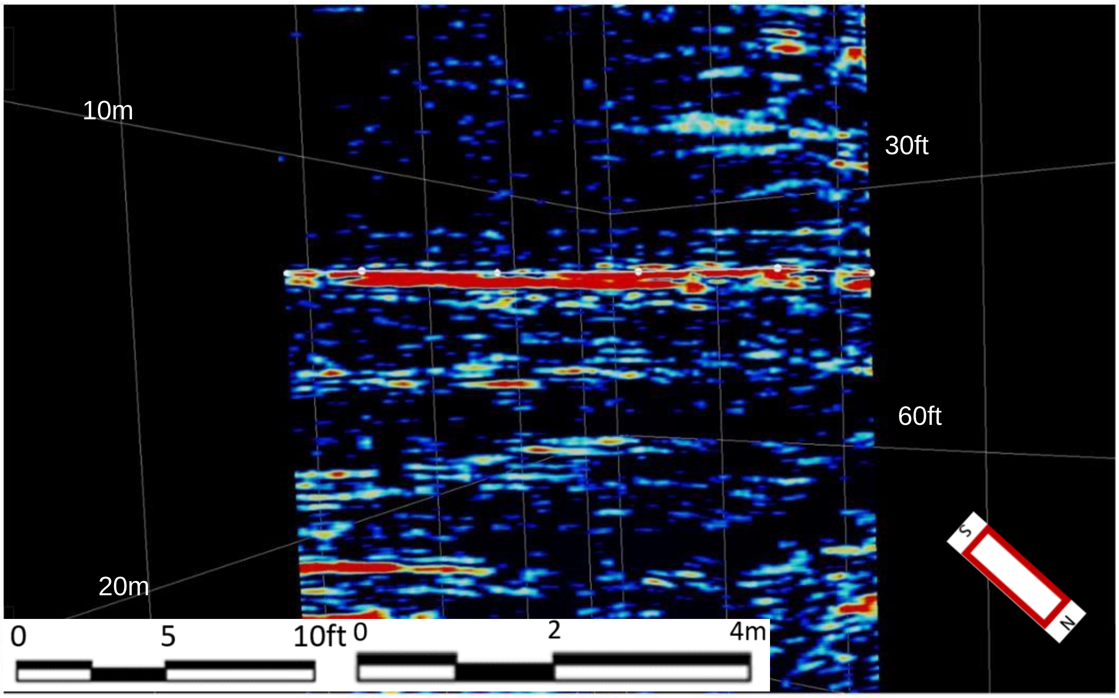


Figure 27 - Cross-section of B3-HF-C4 located between 43-45ft BML

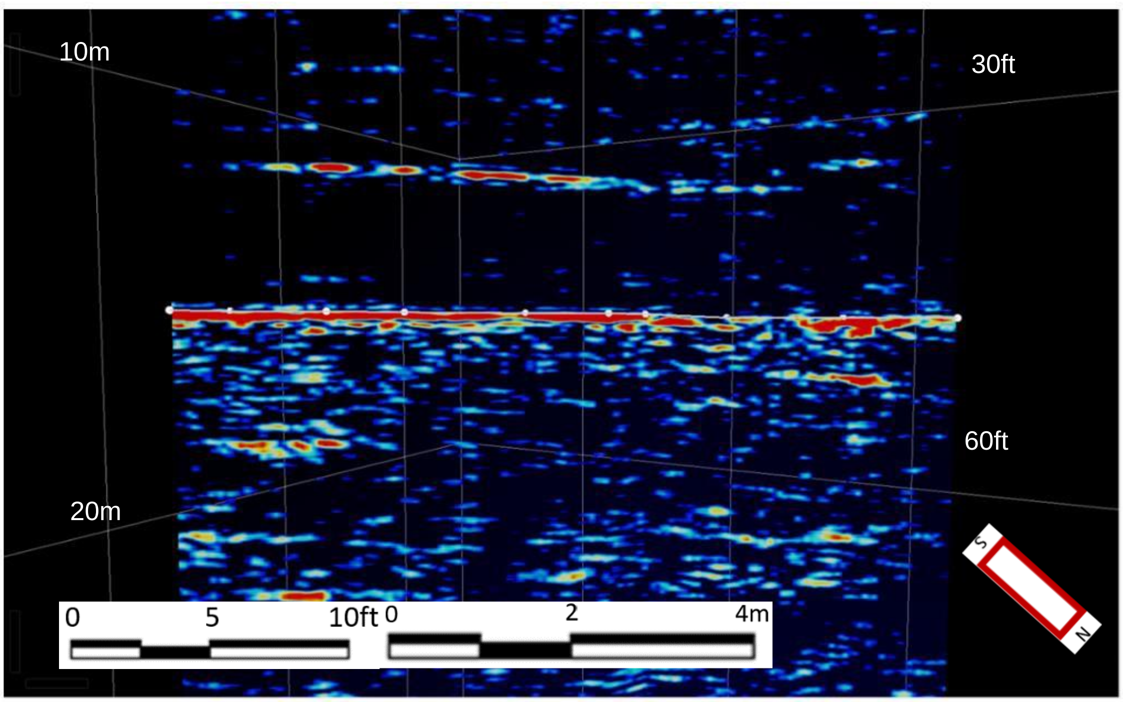


Figure 28 - Side-View of B3-HF-C1 located between 49-51ft BML

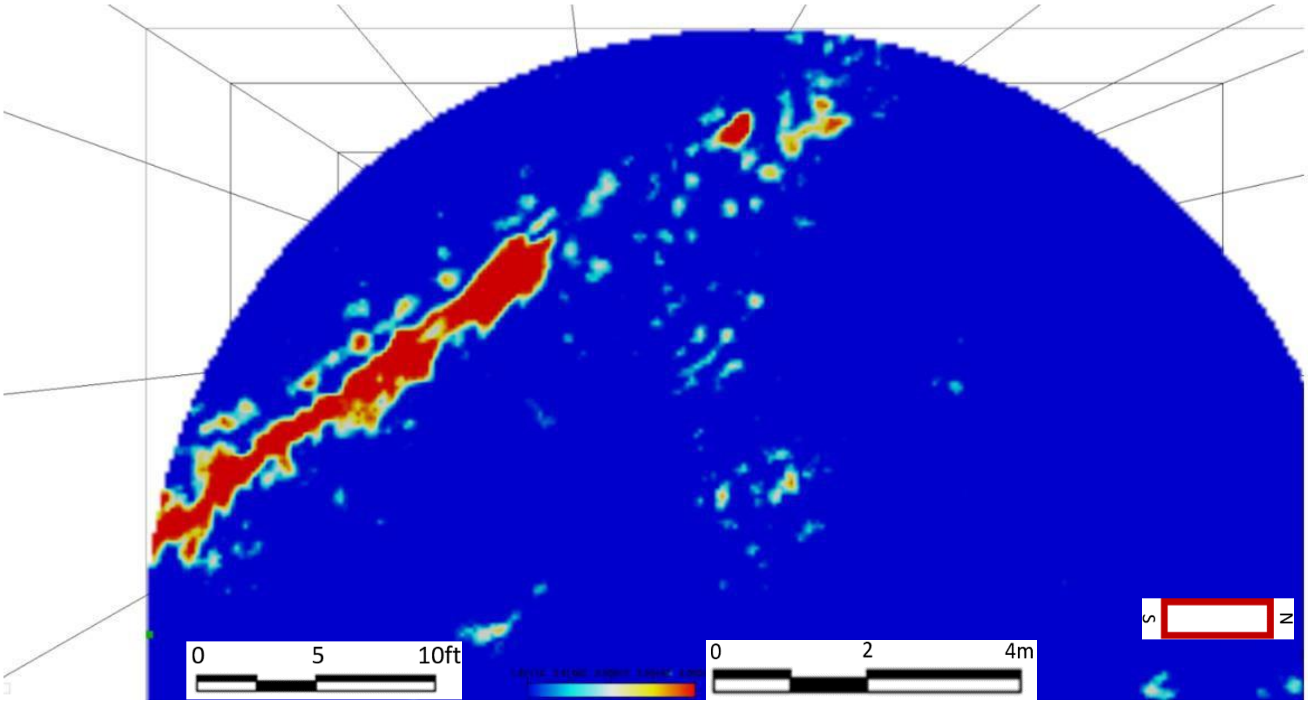


Figure 29 - Plan-view image of B3-C1-HF located at 15.34m BML (50.3ft BML)

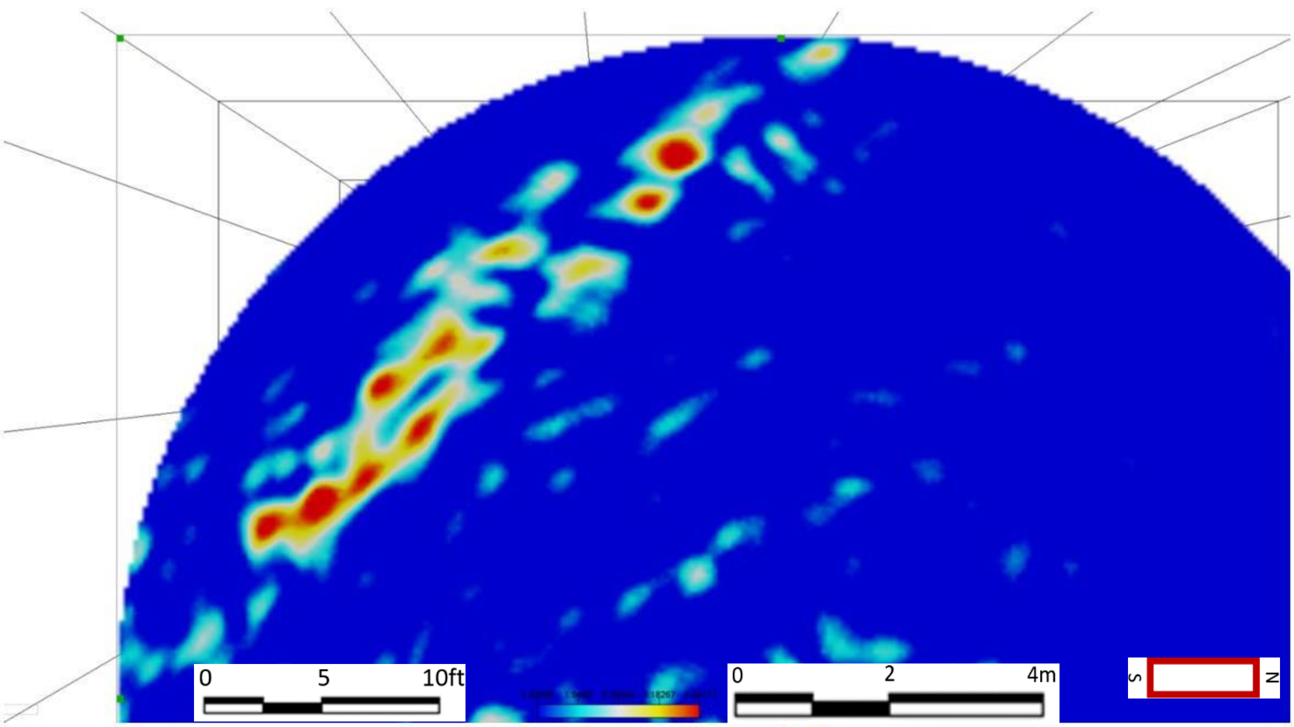


Figure 30 - Plan-view image of B3-C1 in LF SAS located at 15.33m BML (50.3ft BML)

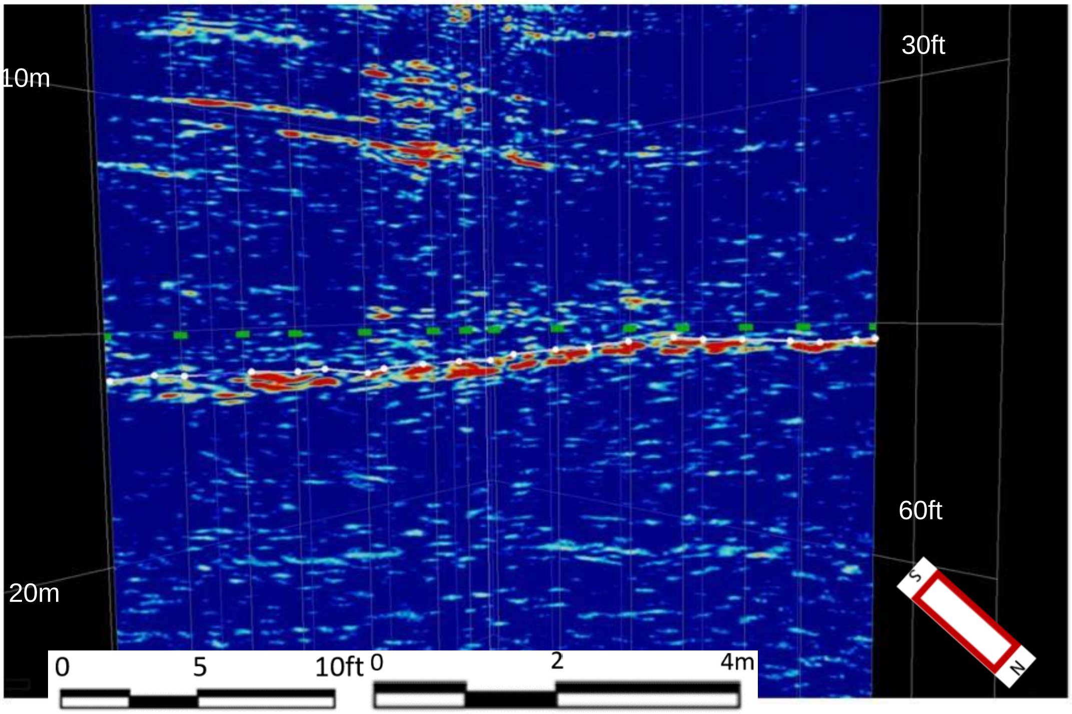


Figure 31 - Side-View of B3-HF-C2 located between 54-55ft BML

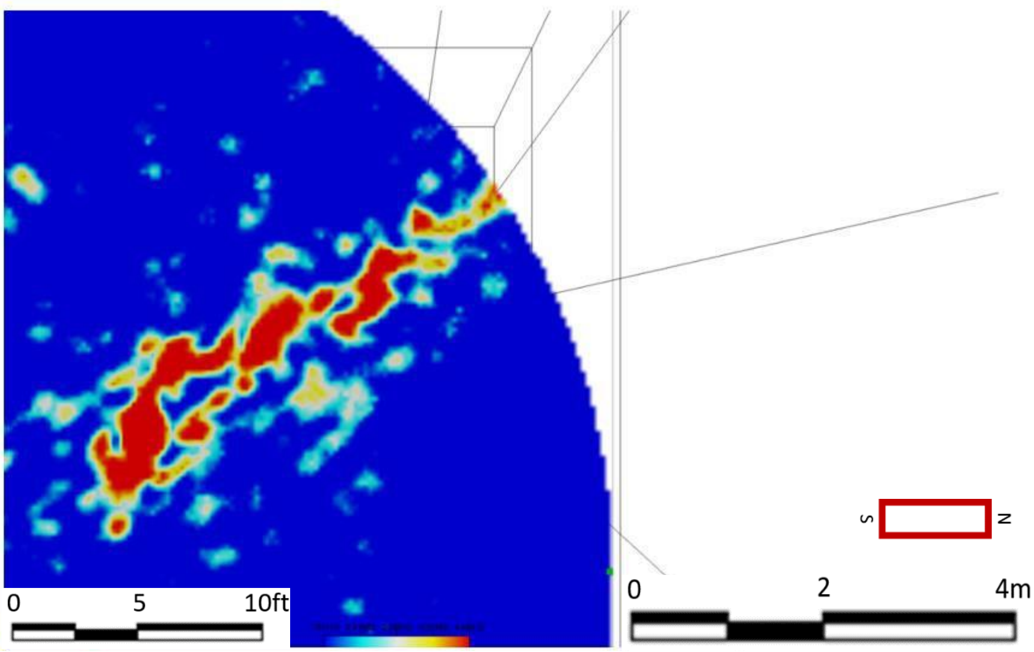


Figure 32 - Plan-View of B3-HF-C3 located at 20.56m BML (67.5ft BML) showing a portion of the dipping linear feature (dipping towards the NW) through the acoustic core. Note orientation in the bottom right of the figure

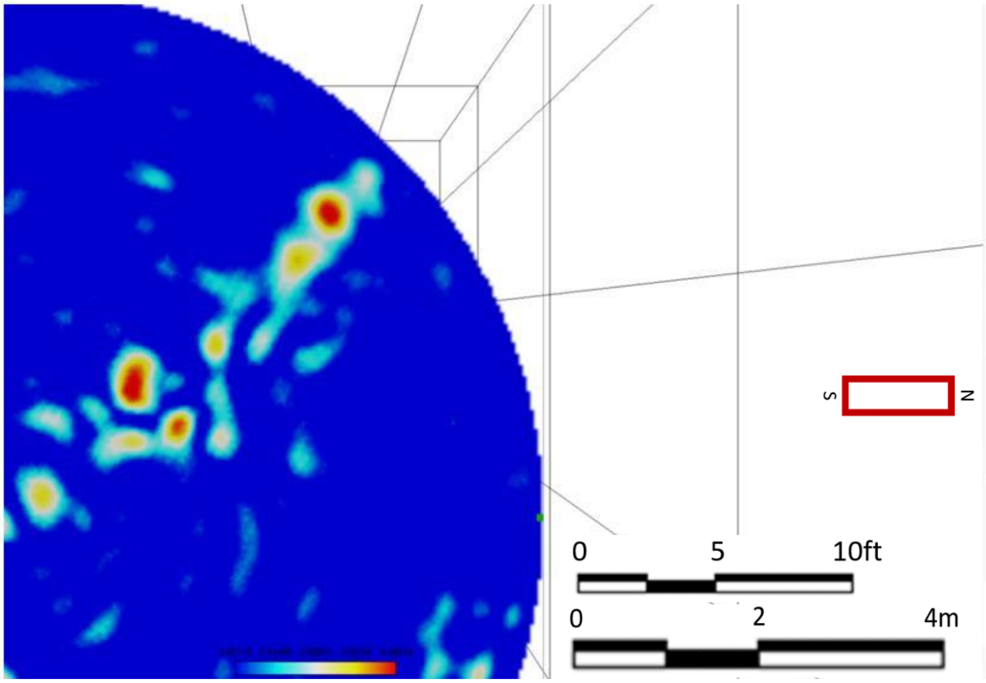


Figure 33 - Plan-View of B3-HF-C3 in LF SAS located at 20.61m BML (67.6ft BML) showing a portion of the dipping linear feature (dipping towards the NW) through the acoustic core. Note orientation in the bottom right of the figure

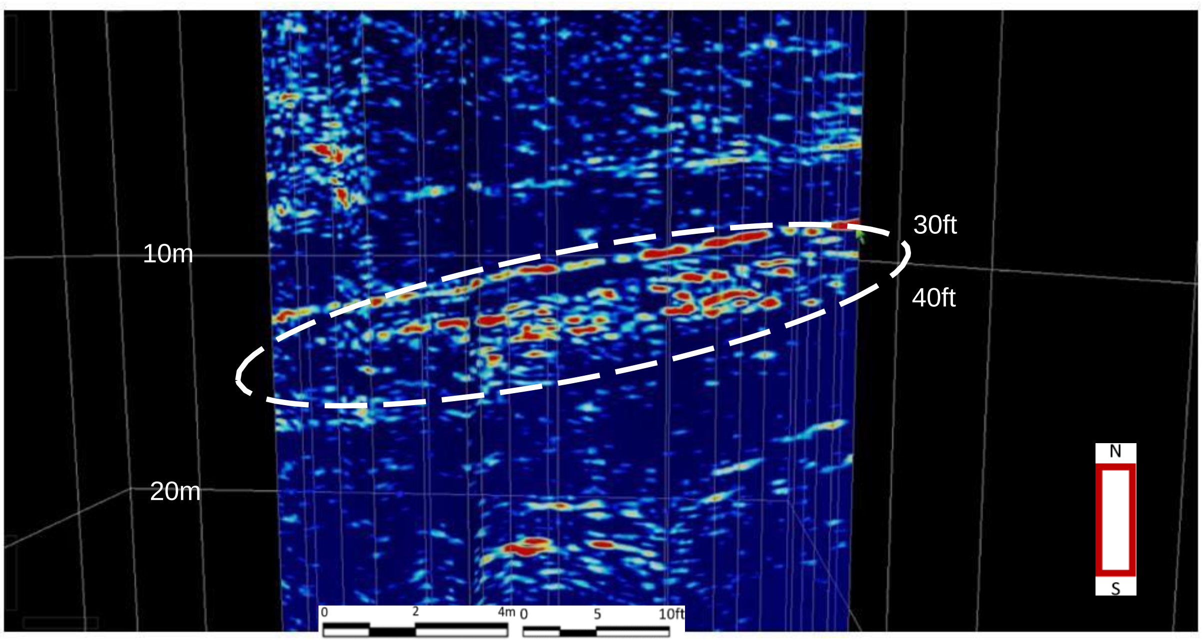


Figure 34 - Dipping layer that extends across the entire length of the acoustic core identified at Site B3. This layer has been interpreted to be a stratigraphic layer. The encircled area shows the layer dipping from west (Right-hand side) to east (Left-hand side) throughout the core. The layer can first be seen at 9.0m BML (29.5ft BML) and is last seen at 12.35m BML (40.5ft).

7.3.2 Site B3 Anomalies

The anomaly analysis result is summarized in Table 18 as well as plan-view and cross-sectional plots in Figure 35 and Figure 36. One anomaly was identified within the HF Core while two anomalies were identified in the LF Core. After further analysis, B3-LF-A01 first identified in the LF core is actually correlated with a dipping section of the linear feature B3-HF-C1. All anomalies were located between 15-26m BML (49-85ft). A sample image of an identified anomaly can also be found in Figure 37 below.

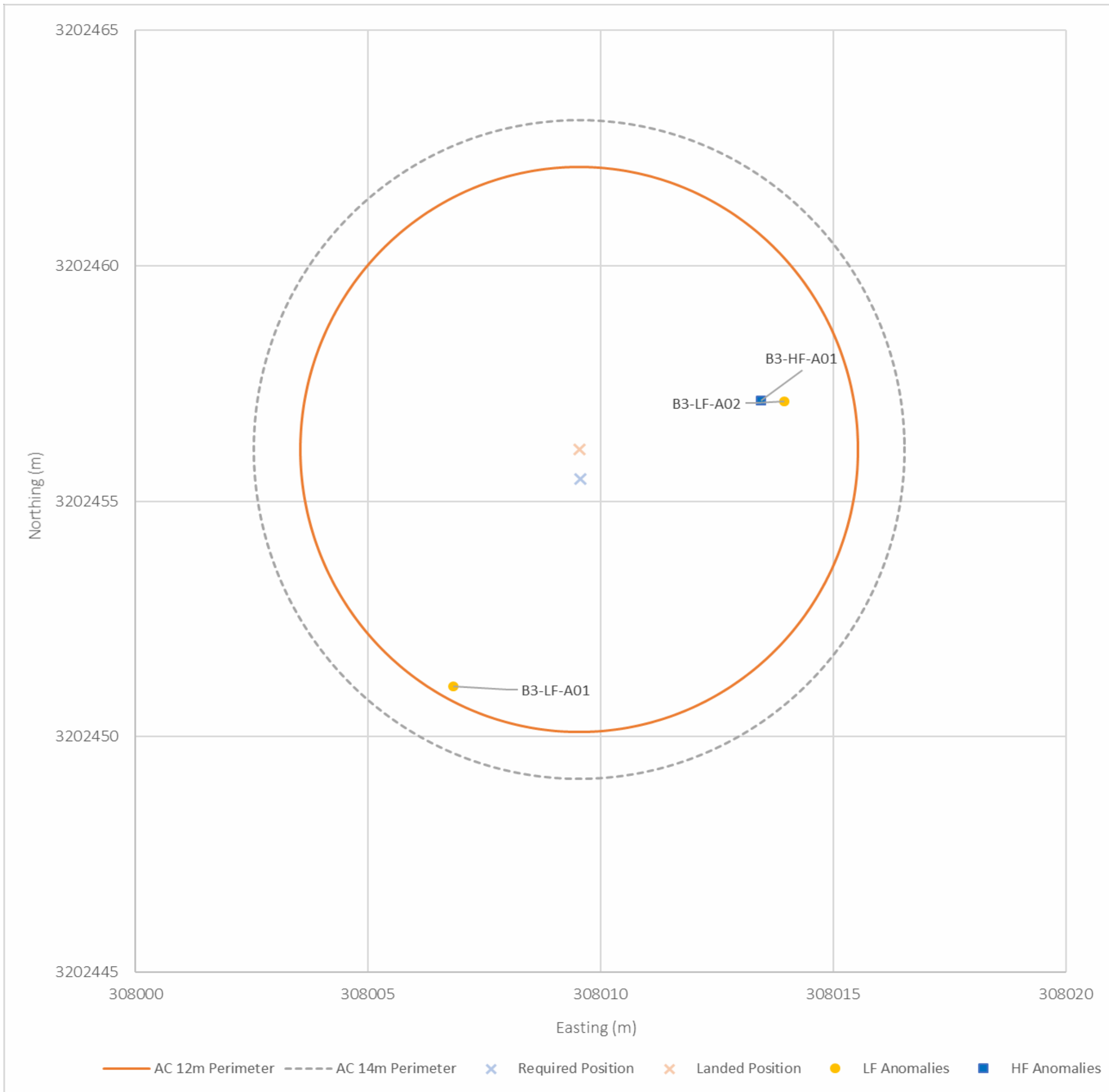


Figure 35 - Plan-View of Anomalies for Site B3

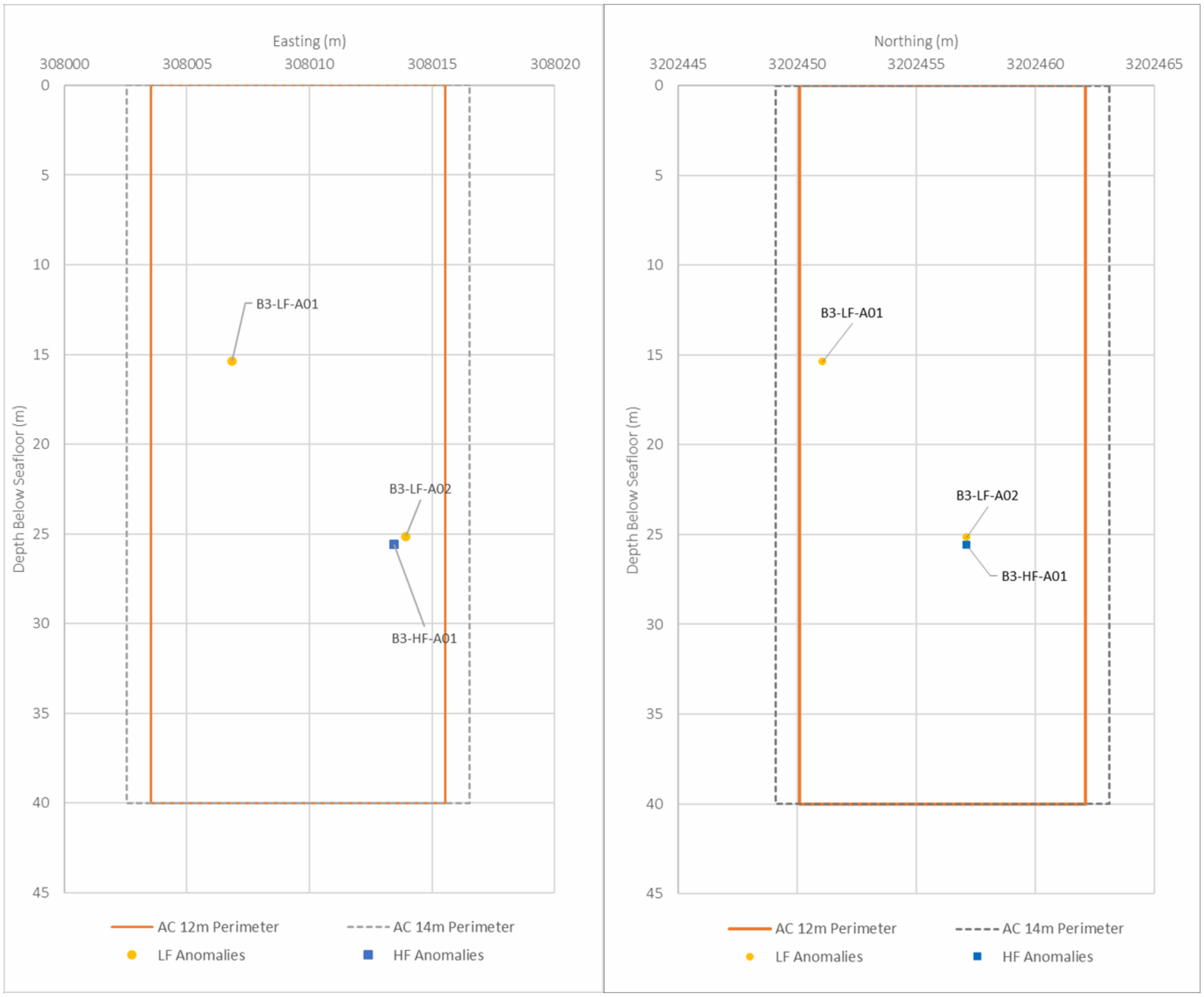


Figure 36 - Cross-Sectional view of the HF and LF acoustic anomalies at Site B3 oriented East-West (left image) and North-South (right image)

Anomaly ID	Easting (m)	Northing (m)	Equivalent Length (m)	Equivalent Width (m)	Depth Below Seafloor (m)	Easting (ft)	Northing (ft)	Equivalent Diameter (ft)	Equivalent Width (ft)	Depth Below Mudline (ft)	Suggestive Interpretation
B3-HF-A01	**308013.4**	**3202457.1**	1.56	0.25	25.60	**1010540.8**	**10506728.0**	5.1	0.8	84.0	Grouped anomalous cluster suggestive of Man-made Debris or Infrastructure
B3-LF-A01	308006.84	3202451.07	4.06	0.46	15.39	1010519.1	10506708.1	13.32	1.51	50.49	Grouped anomalous cluster suggestive of Man-made Debris or Infrastructure
B3-LF-A02	308013.94	3202457.12	1.41	0.34	25.15	1010542.4	10506728.0	4.6	1.1	82.5	Grouped anomalous cluster suggestive of Man-made Debris or Infrastructure

Table 18 - Anomaly Summary Table for Site B3

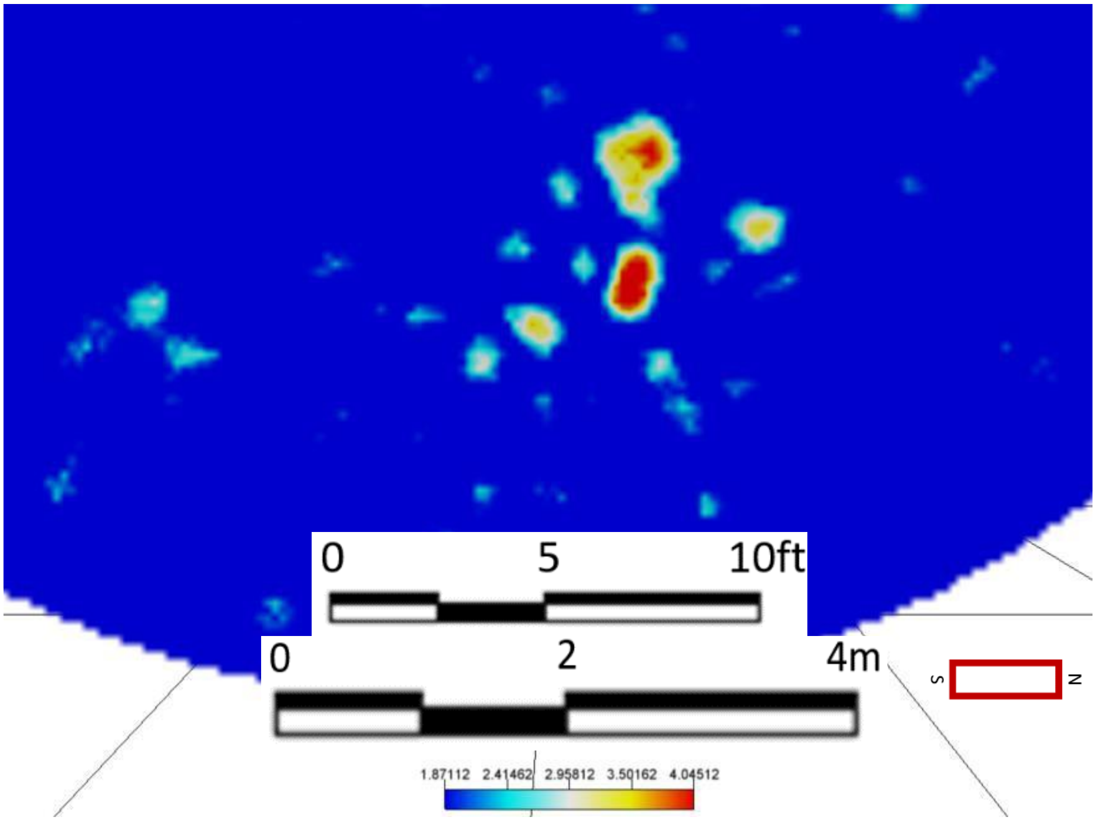


Figure 37 - Plan-view image of B3-HF-A01

7.4 Site B9 Interpreted Results

7.4.1 Linear Feature Results

The B9 HF and LF acoustic core data were interpreted to map linear features evident in the data sets. The results are summarized in Table 19. Cross-section and plan-view images of the linear features are shown in in Figure 37 to Figure 44 below. A total of eight (8) linear features were identified and correlate in both HF and LF acoustic cores.

The B9-HF-C1 feature was interpreted to be of 24 ± 2-inch diameter at a depth of between 9.1-9.2m (29.8 to 30.1 ft) BML (Figure 38). The B9-HF-C2 feature was interpreted to be of 12 ± 2-inch diameter located at a depth between 11.0-11.4m (36.1 to 37.4 ft) BML (Figure 41). The B9-HF-C3 feature was interpreted to be of 27 ± 3 inch diameter located at a depth between 13.3-13.5m (43.6 to 44.3 ft) BML (Figure 43 to Figure 45). The B9-HF-C4 feature was interpreted to be of 29 ± 3 inch diameter located at a depth between 10.6-10.7m (34.7 to 35.2 ft) BML (Figure 40). Linear feature B9-HF-C8 overlies B9-HF-C5. Both are suggestive of 20 ± 2-inch diameter features occupying a depth between 9.2-10.5m (30.3 to 33.7 ft) BML (Figure 39). The B9-HF-C6 feature was interpreted to be of 21 ± 2 inch diameter located at a depth of between 12.1-12.9m (39.6 to 42.5 ft) BML (Figure 42). The B9-HF-C7 feature was interpreted to be of 13 ± 2-inch diameter at a depth of between 13.9-14.8m (45.6 to 48.7 ft) BML (Figure 46).

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B9-HF-C1-01	307961.04	3202495.74	0.00	9.17	1010368.8	10506854.7	0.0	30.1	24 ± 2
B9-HF-C1-02	307960.64	3202495.99	0.47	9.16	1010367.5	10506855.5	1.5	30.1	24 ± 2
B9-HF-C1-03	307960.24	3202496.34	1.00	9.13	1010366.2	10506856.6	3.3	30.0	24 ± 2
B9-HF-C1-04	307959.84	3202496.67	1.52	9.15	1010364.9	10506857.7	5.0	30.0	24 ± 2
B9-HF-C1-05	307959.34	3202497.01	2.12	9.11	1010363.3	10506858.8	7.0	29.9	24 ± 2
B9-HF-C1-06	307958.54	3202497.52	3.07	9.05	1010360.6	10506860.5	10.1	29.7	24 ± 2
B9-HF-C1-07	307957.74	3202498.28	4.18	9.01	1010358.0	10506863.0	13.7	29.5	24 ± 2
B9-HF-C1-08	307957.54	3202498.54	4.50	8.96	1010357.4	10506863.8	14.8	29.4	24 ± 2
B9-HF-C1-09	307957.34	3202498.82	4.85	9.03	1010356.7	10506864.8	15.9	29.6	24 ± 2
B9-HF-C1-10	307957.04	3202499.09	5.25	8.99	1010355.7	10506865.6	17.2	29.5	24 ± 2
B9-HF-C1-11	307956.84	3202499.25	5.51	8.94	1010355.1	10506866.2	18.1	29.3	24 ± 2
B9-HF-C1-12	307956.64	3202499.39	5.75	9.01	1010354.4	10506866.6	18.9	29.6	24 ± 2

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B9-HF-C1-13	307956.34	3202499.59	6.12	9.04	1010353.4	10506867.3	20.1	29.7	24 ± 2
B9-HF-C1-14	307956.14	3202499.75	6.37	9.00	1010352.8	10506867.8	20.9	29.5	24 ± 2
B9-HF-C1-15	307955.94	3202499.92	6.63	9.02	1010352.1	10506868.4	21.8	29.6	24 ± 2
B9-HF-C1-16	307955.74	3202500.11	6.91	9.05	1010351.4	10506869.0	22.7	29.7	24 ± 2
B9-HF-C1-17	307955.54	3202500.27	7.16	9.08	1010350.8	10506869.5	23.5	29.8	24 ± 2
B9-HF-C1-18	307955.34	3202500.46	7.44	9.08	1010350.1	10506870.2	24.4	29.8	24 ± 2
B9-HF-C2-01	307957.24	3202502.14	0.00	11.01	1010356.4	10506875.7	0.0	36.1	12 ± 2
B9-HF-C2-02	307957.84	3202501.66	0.76	11.04	1010358.3	10506874.1	2.5	36.2	12 ± 2
B9-HF-C2-03	307958.74	3202501.41	1.70	11.07	1010361.3	10506873.3	5.6	36.3	12 ± 2
B9-HF-C2-04	307959.74	3202500.96	2.80	11.07	1010364.6	10506871.8	9.2	36.3	12 ± 2
B9-HF-C2-05	307960.44	3202500.70	3.54	11.12	1010366.9	10506870.9	11.6	36.5	12 ± 2

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B9-HF-C2-06	307961.34	3202499.97	4.70	11.12	1010369.8	10506868.5	15.4	36.5	12 ± 2
B9-HF-C2-07	307961.64	3202499.74	5.08	11.15	1010370.8	10506867.8	16.7	36.6	12 ± 2
B9-HF-C2-08	307963.04	3202499.36	6.53	11.21	1010375.4	10506866.5	21.4	36.8	12 ± 2
B9-HF-C2-09	307963.64	3202498.55	7.54	11.32	1010377.4	10506863.9	24.7	37.2	12 ± 2
B9-HF-C2-10	307964.04	3202498.32	8.00	11.41	1010378.7	10506863.1	26.2	37.4	12 ± 2
B9-HF-C3-01	307964.64	3202494.52	0.00	13.49	1010380.6	10506850.7	0.0	44.3	27 ± 3
B9-HF-C3-02	307963.84	3202495.52	1.28	13.49	1010378.0	10506853.9	4.2	44.3	27 ± 3
B9-HF-C3-03	307963.04	3202496.58	2.61	13.49	1010375.4	10506857.4	8.6	44.3	27 ± 3
B9-HF-C3-04	307962.04	3202497.36	3.88	13.49	1010372.1	10506860.0	12.7	44.3	27 ± 3
B9-HF-C3-05	307960.44	3202498.45	5.82	13.41	1010366.9	10506863.6	19.1	44.0	27 ± 3
B9-HF-C3-06	307958.54	3202499.51	7.99	13.29	1010360.6	10506867.0	26.2	43.6	27 ± 3

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B9-HF-C3-07	307957.54	3202500.34	9.29	13.29	1010357.4	10506869.8	30.5	43.6	27 ± 3
B9-HF-C3-08	307956.04	3202500.46	10.80	13.44	1010352.4	10506870.2	35.4	44.1	27 ± 3
B9-HF-C3-09	307955.04	3202500.93	11.90	13.44	1010349.2	10506871.7	39.0	44.1	27 ± 3
B9-HF-C3-10	307954.34	3202501.35	12.72	13.47	1010346.9	10506873.1	41.7	44.2	27 ± 3
B9-HF-C4-01	307958.14	3202492.19	0.00	10.63	1010359.3	10506843.0	0.0	34.9	29 ± 3
B9-HF-C4-02	307957.94	3202492.56	0.42	10.68	1010358.7	10506844.2	1.4	35.0	29 ± 3
B9-HF-C4-03	307957.64	3202492.95	0.92	10.72	1010357.7	10506845.5	3.0	35.2	29 ± 3
B9-HF-C4-04	307957.54	3202493.20	1.19	10.62	1010357.4	10506846.3	3.9	34.8	29 ± 3
B9-HF-C4-05	307957.34	3202493.46	1.51	10.63	1010356.7	10506847.2	5.0	34.9	29 ± 3
B9-HF-C4-06	307956.94	3202494.28	2.42	10.59	1010355.4	10506849.9	7.9	34.7	29 ± 3
B9-HF-C4-07	307956.74	3202494.45	2.69	10.59	1010354.7	10506850.4	8.8	34.8	29 ± 3

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B9-HF-C4-08	307956.44	3202494.92	3.24	10.54	1010353.7	10506852.0	10.6	34.6	29 ± 3
B9-HF-C4-09	307956.14	3202495.34	3.76	10.43	1010352.8	10506853.3	12.3	34.2	29 ± 3
B9-HF-C4-10	307955.94	3202495.62	4.10	10.50	1010352.1	10506854.3	13.5	34.5	29 ± 3
B9-HF-C4-11	307955.74	3202495.85	4.41	10.54	1010351.4	10506855.0	14.5	34.6	29 ± 3
B9-HF-C4-12	307955.44	3202496.11	4.80	10.44	1010350.5	10506855.9	15.8	34.2	29 ± 3
B9-HF-C4-13	307955.24	3202496.37	5.14	10.38	1010349.8	10506856.7	16.9	34.0	29 ± 3
B9-HF-C4-14	307954.94	3202496.73	5.60	10.33	1010348.8	10506857.9	18.4	33.9	29 ± 3
B9-HF-C4-15	307954.64	3202497.09	6.07	10.44	1010347.8	10506859.1	19.9	34.2	29 ± 3
B9-HF-C4-16	307954.14	3202497.60	6.79	10.27	1010346.2	10506860.8	22.3	33.7	29 ± 3
B9-HF-C4-17	307953.74	3202497.96	7.32	10.18	1010344.9	10506862.0	24.0	33.4	29 ± 3
B9-HF-C4-18	307953.44	3202498.26	7.75	10.21	1010343.9	10506862.9	25.4	33.5	29 ± 3
B9-HF-C4-19	307953.14	3202498.53	8.15	10.23	1010342.9	10506863.8	26.7	33.6	29 ± 3

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B9-HF-C4-20	307952.74	3202499.11	8.86	10.44	1010341.6	10506865.7	29.1	34.3	29 ± 3
B9-HF-C4-21	307952.54	3202499.33	9.15	10.51	1010340.9	10506866.4	30.0	34.5	29 ± 3
B9-HF-C5-01	307961.54	3202494.09	0.00	10.12	1010370.5	10506849.2	0.0	33.2	20 ± 2
B9-HF-C5-02	307960.84	3202494.79	0.99	10.12	1010368.2	10506851.5	3.3	33.2	20 ± 2
B9-HF-C5-03	307959.94	3202495.39	2.08	10.12	1010365.2	10506853.5	6.8	33.2	20 ± 2
B9-HF-C5-04	307958.84	3202495.97	3.32	10.15	1010361.6	10506855.4	10.9	33.3	20 ± 2
B9-HF-C5-05	307957.84	3202496.47	4.44	10.15	1010358.3	10506857.1	14.6	33.3	20 ± 2
B9-HF-C5-06	307957.14	3202496.96	5.29	10.18	1010356.0	10506858.7	17.4	33.4	20 ± 2
B9-HF-C5-07	307956.24	3202497.58	6.38	10.18	1010353.1	10506860.7	20.9	33.4	20 ± 2
B9-HF-C5-08	307955.34	3202498.51	7.68	10.21	1010350.1	10506863.8	25.2	33.5	20 ± 2
B9-HF-C5-09	307954.74	3202498.77	8.33	10.21	1010348.2	10506864.6	27.3	33.5	20 ± 2

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B9-HF-C5-10	307954.24	3202499.40	9.14	10.21	1010346.5	10506866.7	30.0	33.5	20 ± 2
B9-HF-C5-11	307954.04	3202500.30	10.06	10.27	1010345.9	10506869.6	33.0	33.7	20 ± 2
B9-HF-C5-12	307953.84	3202501.06	10.85	10.27	1010345.2	10506872.1	35.6	33.7	20 ± 2
B9-HF-C6-01	307965.64	3202496.03	0.00	12.54	1010383.9	10506855.6	0.0	41.1	21 ± 2
B9-HF-C6-02	307964.84	3202496.72	1.06	12.54	1010381.3	10506857.9	3.5	41.1	21 ± 2
B9-HF-C6-03	307964.14	3202497.25	1.94	12.59	1010379.0	10506859.6	6.4	41.3	21 ± 2
B9-HF-C6-04	307962.94	3202497.95	3.32	12.62	1010375.1	10506861.9	10.9	41.4	21 ± 2
B9-HF-C6-05	307962.34	3202498.23	3.98	12.68	1010373.1	10506862.8	13.1	41.6	21 ± 2
B9-HF-C6-06	307961.94	3202498.57	4.51	12.82	1010371.8	10506863.9	14.8	42.1	21 ± 2
B9-HF-C6-07	307961.24	3202498.84	5.26	12.97	1010369.5	10506864.8	17.3	42.5	21 ± 2
B9-HF-C6-08	307960.44	3202499.08	6.10	12.97	1010366.9	10506865.6	20.0	42.5	21 ± 2

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B9-HF-C6-09	307959.64	3202499.67	7.09	12.97	1010364.2	10506867.6	23.3	42.5	21 ± 2
B9-HF-C6-10	307958.94	3202500.06	7.89	12.94	1010361.9	10506868.9	25.9	42.4	21 ± 2
B9-HF-C6-11	307958.04	3202500.61	8.94	12.91	1010359.0	10506870.6	29.3	42.4	21 ± 2
B9-HF-C6-12	307957.54	3202501.07	9.63	12.79	1010357.4	10506872.2	31.6	42.0	21 ± 2
B9-HF-C6-13	307956.34	3202501.80	11.03	12.71	1010353.4	10506874.5	36.2	41.7	21 ± 2
B9-HF-C6-14	307955.74	3202502.55	11.99	12.45	1010351.4	10506877.0	39.3	40.9	21 ± 2
B9-HF-C6-15	307955.04	3202503.37	13.07	12.28	1010349.2	10506879.7	42.9	40.3	21 ± 2
B9-HF-C6-16	307954.64	3202503.60	13.53	12.08	1010347.8	10506880.4	44.4	39.6	21 ± 2
B9-HF-C7-01	307960.34	3202496.21	0.00	14.90	1010366.5	10506856.2	0.0	48.9	13 ± 2
B9-HF-C7-02	307960.04	3202496.55	0.46	14.82	1010365.6	10506857.3	1.5	48.6	13 ± 2
B9-HF-C7-03	307959.54	3202496.94	1.09	14.66	1010363.9	10506858.6	3.6	48.1	13 ± 2

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B9-HF-C7-04	307959.04	3202497.24	1.67	14.54	1010362.3	10506859.6	5.5	47.7	13 ± 2
B9-HF-C7-05	307958.64	3202497.47	2.13	14.52	1010361.0	10506860.3	7.0	47.6	13 ± 2
B9-HF-C7-06	307958.14	3202497.82	2.74	14.58	1010359.3	10506861.5	9.0	47.8	13 ± 2
B9-HF-C7-07	307957.94	3202498.05	3.05	14.52	1010358.7	10506862.3	10.0	47.6	13 ± 2
B9-HF-C7-08	307957.64	3202498.46	3.56	14.45	1010357.7	10506863.6	11.7	47.4	13 ± 2
B9-HF-C7-09	307957.34	3202498.80	4.01	14.32	1010356.7	10506864.7	13.2	47.0	13 ± 2
B9-HF-C7-10	307957.04	3202499.07	4.42	14.29	1010355.7	10506865.6	14.5	46.9	13 ± 2
B9-HF-C7-11	307956.64	3202499.38	4.92	14.27	1010354.4	10506866.6	16.2	46.8	13 ± 2
B9-HF-C7-12	307956.44	3202499.56	5.19	14.21	1010353.7	10506867.2	17.0	46.6	13 ± 2
B9-HF-C7-13	307955.84	3202500.03	5.95	14.04	1010351.8	10506868.8	19.5	46.1	13 ± 2
B9-HF-C7-14	307955.64	3202500.23	6.24	14.06	1010351.1	10506869.4	20.5	46.1	13 ± 2
B9-HF-C7-15	307955.44	3202500.43	6.52	13.91	1010350.5	10506870.1	21.4	45.6	13 ± 2

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B9-HF-C8-01	307961.54	3202494.12	0.00	9.45	1010370.5	10506849.4	0.0	31.0	20 ± 2
B9-HF-C8-02	307961.14	3202494.52	0.56	9.36	1010369.2	10506850.6	1.8	30.7	20 ± 2
B9-HF-C8-03	307960.64	3202494.90	1.19	9.36	1010367.5	10506851.9	3.9	30.7	20 ± 2
B9-HF-C8-04	307960.14	3202495.23	1.79	9.35	1010365.9	10506853.0	5.9	30.7	20 ± 2
B9-HF-C8-05	307959.84	3202495.44	2.16	9.44	1010364.9	10506853.7	7.1	31.0	20 ± 2
B9-HF-C8-06	307959.44	3202495.63	2.60	9.52	1010363.6	10506854.3	8.5	31.2	20 ± 2
B9-HF-C8-07	307959.24	3202495.77	2.84	9.40	1010362.9	10506854.8	9.3	30.8	20 ± 2
B9-HF-C8-08	307958.94	3202495.92	3.18	9.41	1010361.9	10506855.3	10.4	30.9	20 ± 2
B9-HF-C8-09	307958.44	3202496.17	3.74	9.45	1010360.3	10506856.1	12.3	31.0	20 ± 2
B9-HF-C8-10	307958.14	3202496.33	4.08	9.48	1010359.3	10506856.6	13.4	31.1	20 ± 2
B9-HF-C8-11	307957.84	3202496.48	4.41	9.43	1010358.3	10506857.1	14.5	30.9	20 ± 2
B9-HF-C8-12	307957.44	3202496.76	4.90	9.41	1010357.0	10506858.0	16.1	30.9	20 ± 2

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B9-HF-C8-13	307956.84	3202497.20	5.65	9.35	1010355.1	10506859.5	18.5	30.7	20 ± 2
B9-HF-C8-14	307956.34	3202497.51	6.23	9.27	1010353.4	10506860.5	20.4	30.4	20 ± 2
B9-HF-C8-15	307955.74	3202498.07	7.05	9.31	1010351.4	10506862.3	23.1	30.6	20 ± 2
B9-HF-C8-16	307955.44	3202498.46	7.55	9.32	1010350.5	10506863.6	24.8	30.6	20 ± 2
B9-HF-C8-17	307955.14	3202498.60	7.88	9.26	1010349.5	10506864.0	25.8	30.4	20 ± 2
B9-HF-C8-18	307954.44	3202499.20	8.80	9.26	1010347.2	10506866.0	28.9	30.4	20 ± 2
B9-HF-C8-19	307954.24	3202499.46	9.13	9.22	1010346.5	10506866.9	29.9	30.3	20 ± 2
B9-HF-C8-20	307954.14	3202499.73	9.42	9.31	1010346.2	10506867.8	30.9	30.5	20 ± 2
B9-HF-C8-21	307954.04	3202500.06	9.77	9.29	1010345.9	10506868.9	32.0	30.5	20 ± 2
B9-HF-C8-22	307953.94	3202500.48	10.20	9.37	1010345.5	10506870.2	33.4	30.8	20 ± 2
B9-HF-C8-23	307953.94	3202500.76	10.48	9.38	1010345.5	10506871.1	34.4	30.8	20 ± 2

Table 19 - Linear Feature Summary Table for Site B9

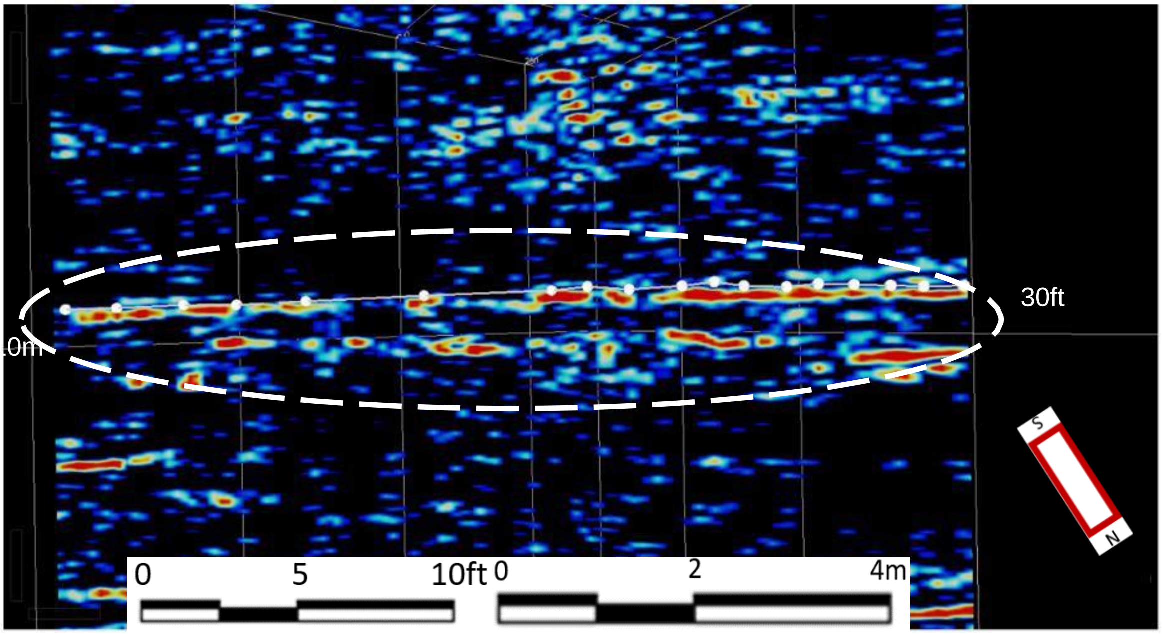


Figure 38 - Side-View image of B9-HF-C1 encircled located between 29-31ft BML

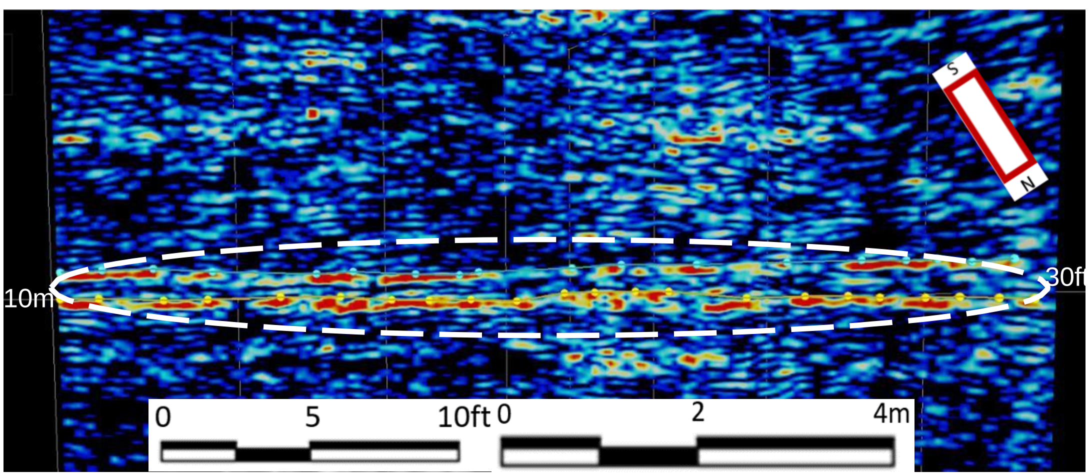


Figure 39 - Side-View image of B9-HF-C5 (Bottom) and B9-HF-C8 (Top). Note that these two linear features are nearly resting on top of one another. These linear features are located between 29-32ft BML

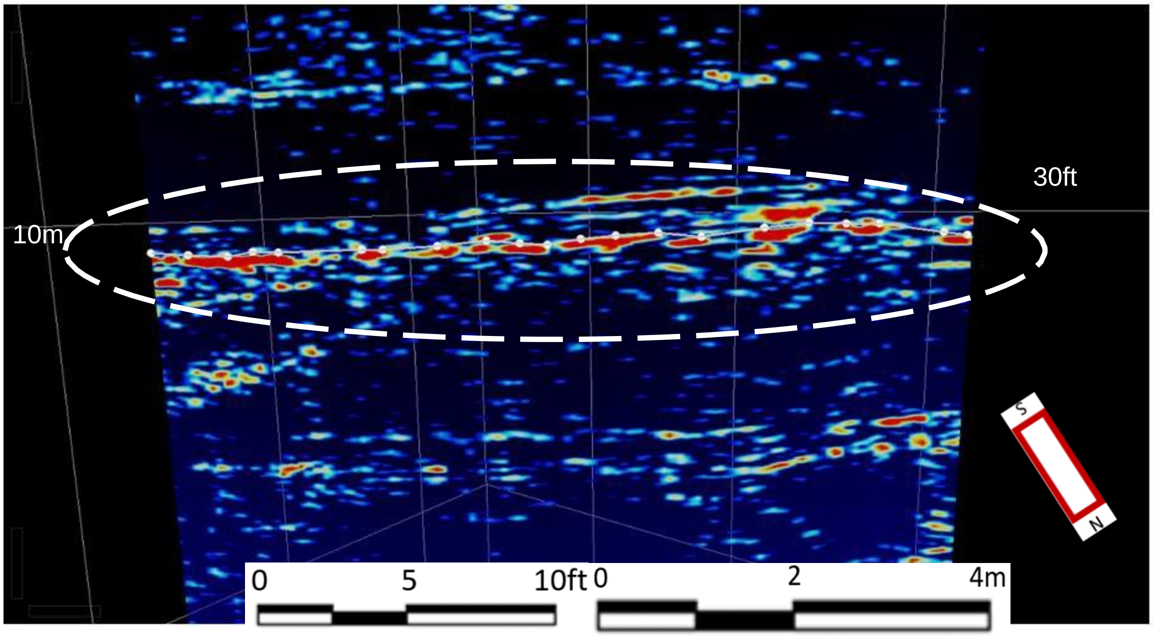


Figure 40 - Side-View image of B9-HF-C4. The feature is located between 33-36ft BML

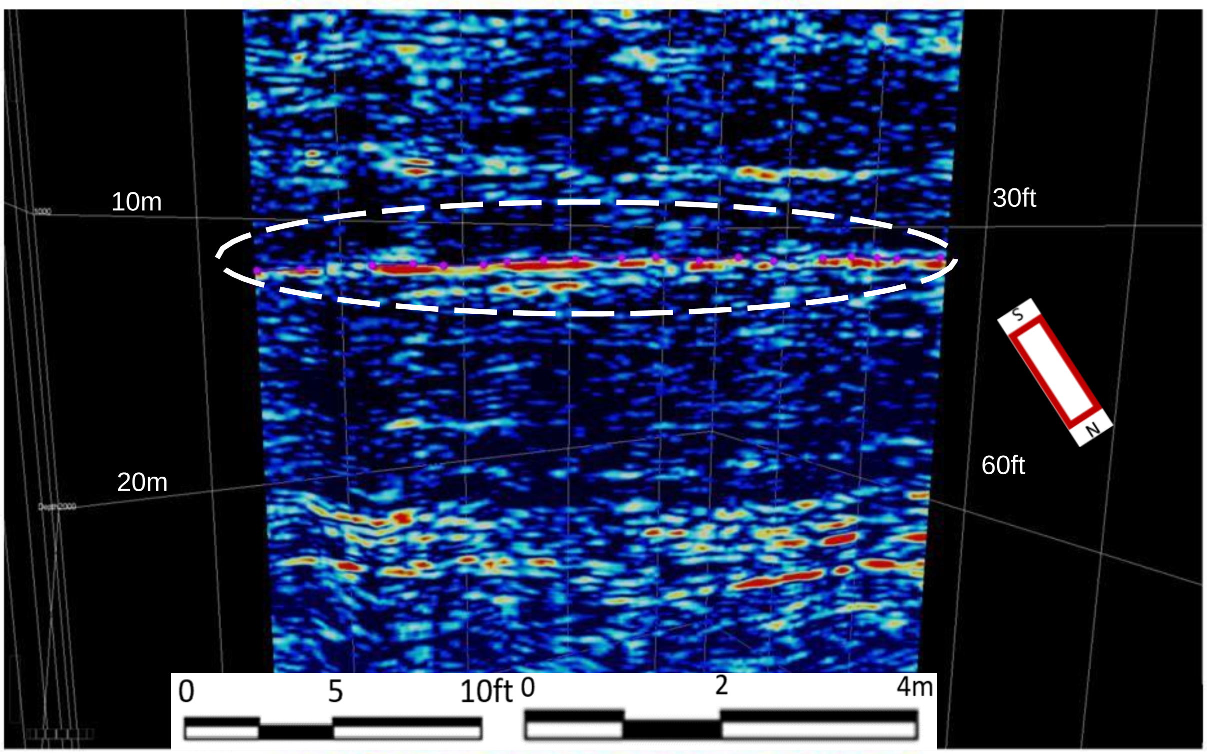


Figure 41 - Side-View image of B9-HF-C2. The feature is located between 35.5-37.5ft BML

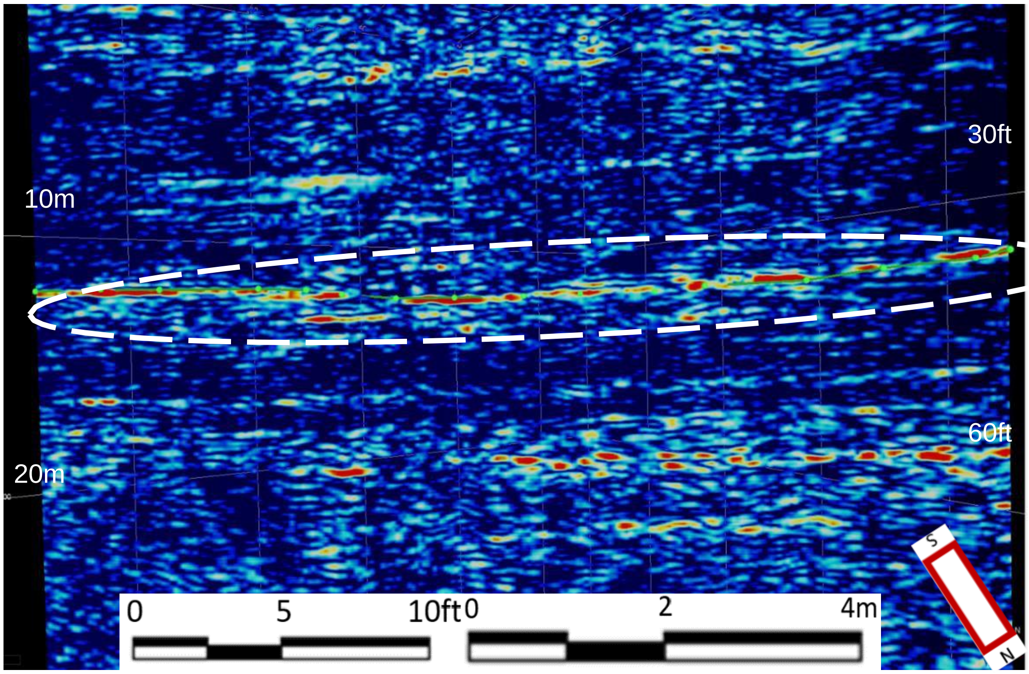


Figure 42 - Side-View image of B9-HF-C6. The feature is located between 39-43ft BML

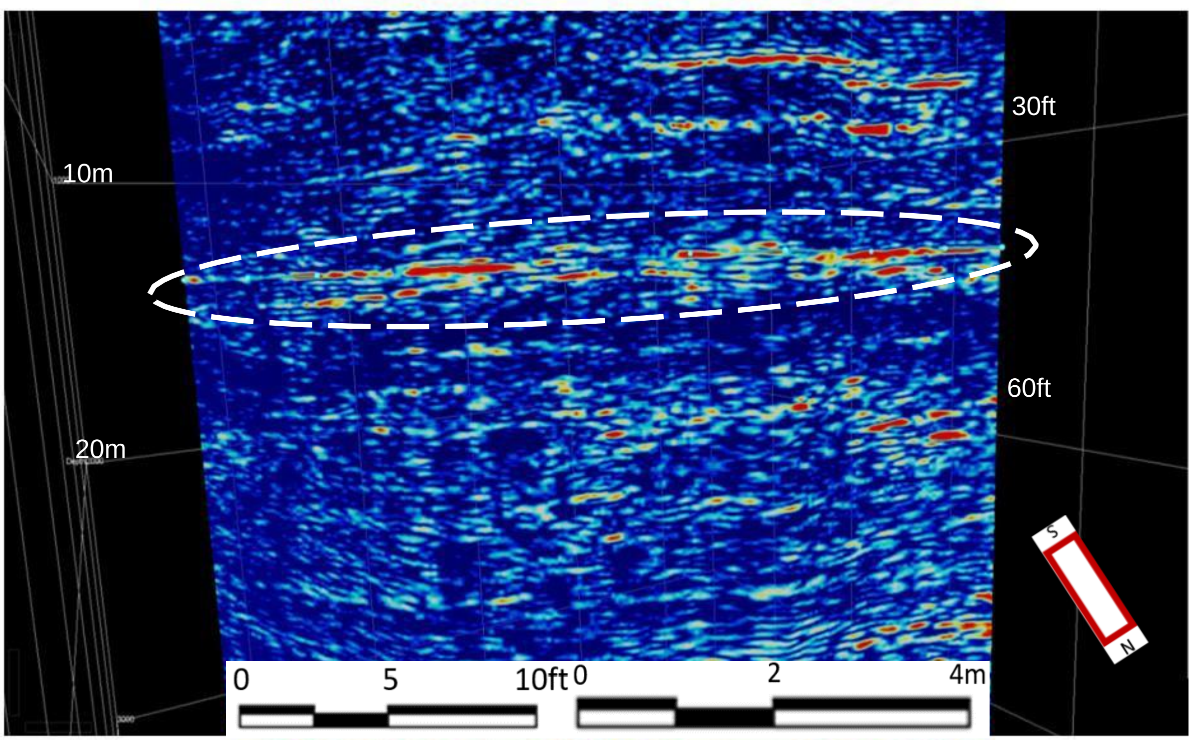


Figure 43 - Side-View image of B9-HF-C3. The feature is located between 42-45ft BML

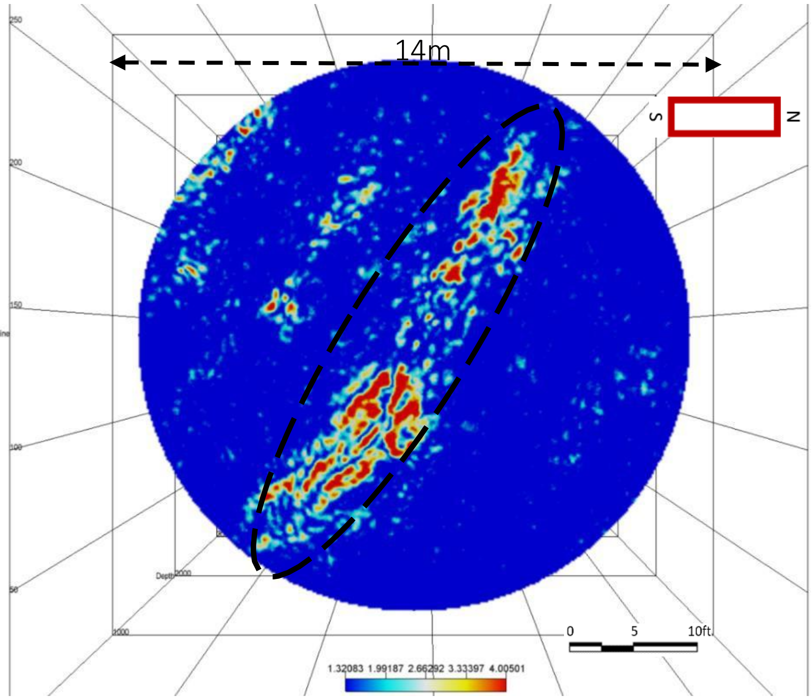


Figure 44 - Plan-view Image of B9-HF-C3. The image displays the full 14m acoustic core. This slice is taken at 13.54m BML (44.4ft BML)

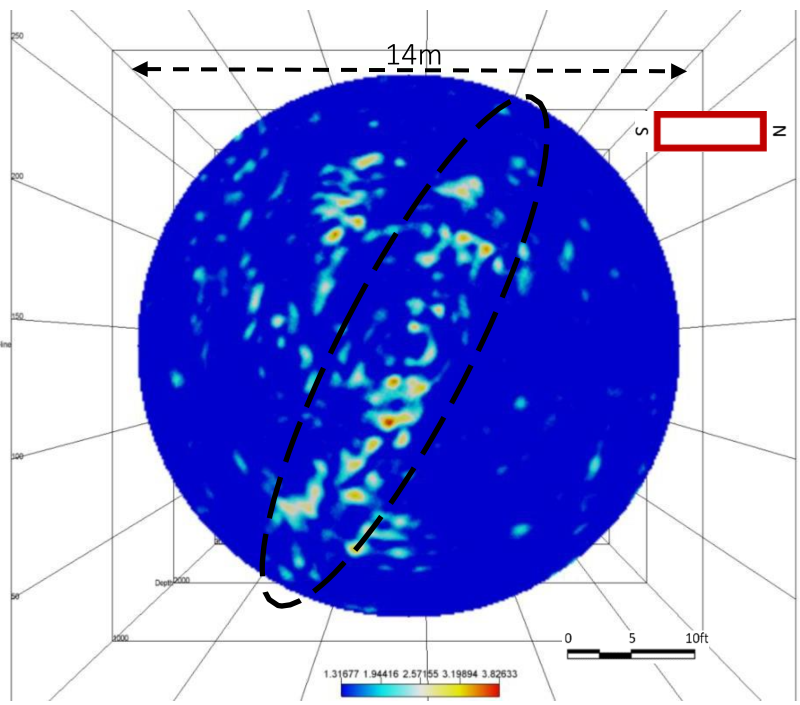


Figure 45 - Plan-view Image of B9-HF-C3 correlated in the LF SAS. The image displays the full 14m acoustic core. This slice is taken at 13.54m BML (44.4ft BML)

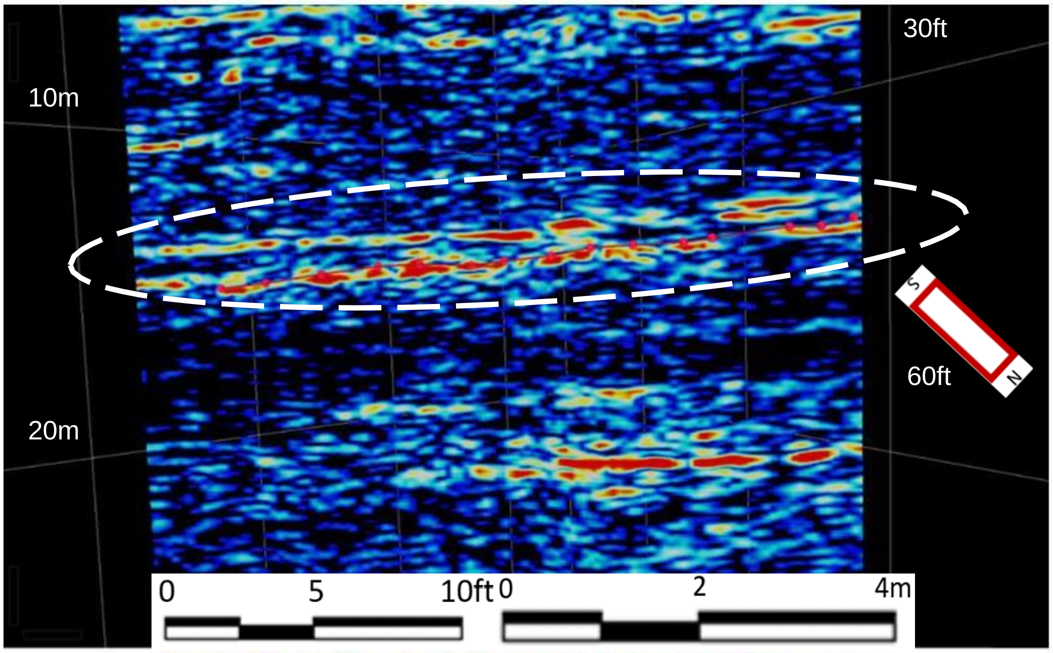


Figure 46 - Side-View image of B9-HF-C7. The feature is located between 46-49ft BML

7.4.2 Site B9 Anomalies

The anomaly analysis result is summarized in Table 20 as well as plan-view and cross-sectional plots in Figure 47 and Figure 48 below. Three anomalies were identified within the HF Core while 7 anomalies were identified in the LF Core. After further analysis, B9-LF-A01 and B9-LF-A02 first identified in the LF core were actually correlated with a dipping section of the linear feature B9-HF-C2 and B9-HF-C6 respectively. All anomalies were located between 10-27m BML (32-88ft). Sample images of identified anomalies can also be found in Figure 49 and Figure 50 below.

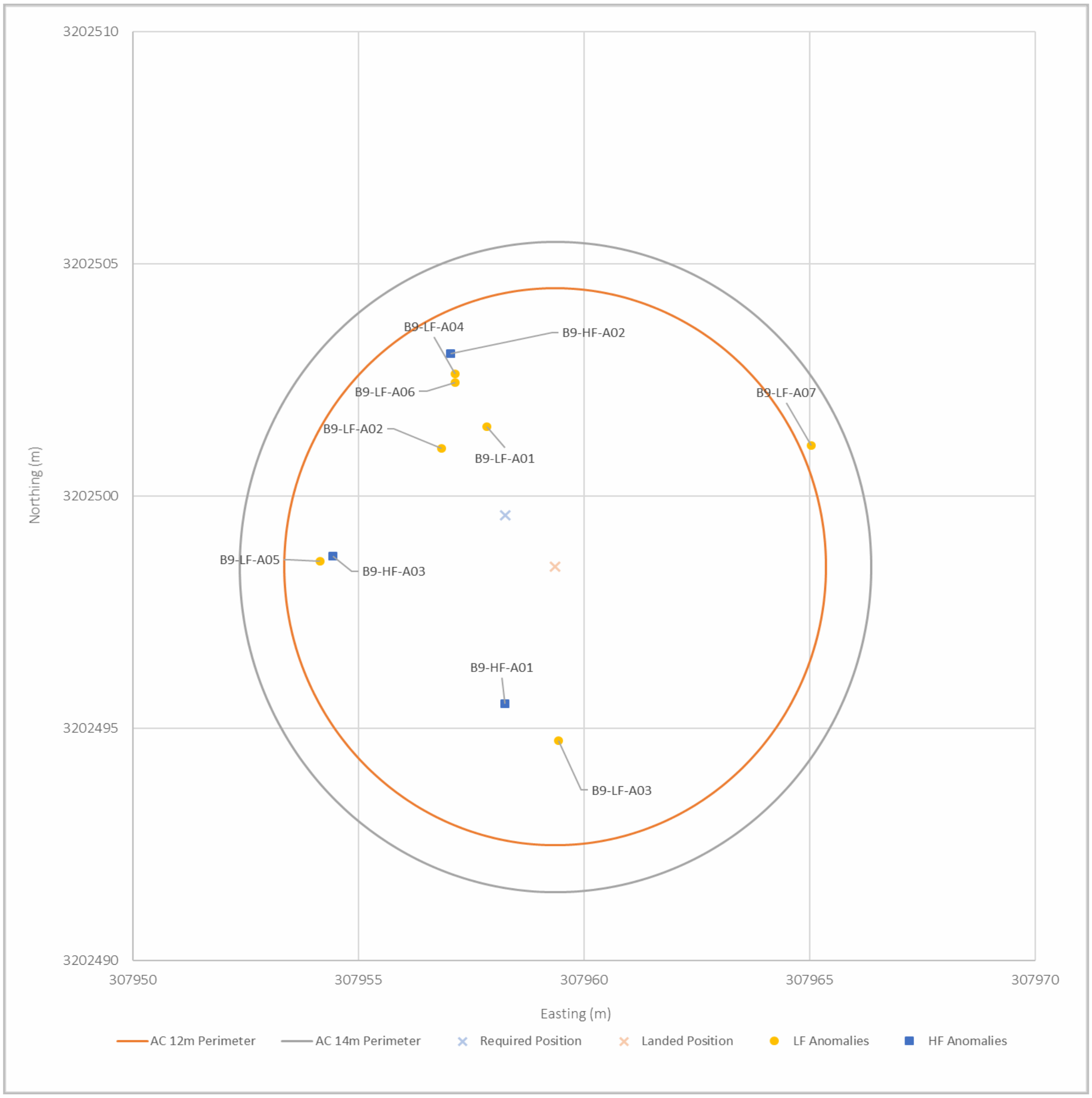


Figure 47 - Plan-View Image of Anomalies at Site B9

Figure 48 - Cross-Sectional view of the HF and LF acoustic anomalies at Site B9 oriented East-West (left image) and North-South (right image)

Anomaly ID	Easting (m)	Northing (m)	Equivalent Length (m)	Equivalent Width (m)	Depth Below Seafloor (m)	Easting (ft)	Northing (ft)	Equivalent Diameter (ft)	Equivalent Width (ft)	Depth Below Mudline (ft)	Suggestive Interpretation
B9-HF-A01	307958.24	3202495.53	3.47	2.07	15.39	1010359.6	10506854.0	11.4	6.8	50.5	Grouped anomalous Cluster suggestive of Debris or Infrastructure
B9-LF-A01	307957.84	3202501.50	0.58	0.17	10.95	1010358.3	10506873.6	1.9	0.6	35.9	Rounded anomaly correlated with a section of B9-HF-C2
B9-HF-A02	307957.04	3202503.07	1.85	0.17	17.14	1010355.7	10506878.7	6.1	0.5	56.2	Grouped anomalous Cluster suggestive of Debris or Infrastructure
B9-LF-A02	307956.84	3202501.03	1.34	0.49	12.59	1010355.1	10506872.0	4.4	1.6	41.3	Ovular anomaly; correlated with a section of B9-HF-C6
B9-HF-A03	307954.44	3202498.71	1.38	0.28	18.79	1010347.2	10506864.4	4.5	0.9	61.7	Grouped anomalous Cluster suggestive of Debris or Infrastructure

Anomaly ID	Easting (m)	Northing (m)	Equivalent Length (m)	Equivalent Width (m)	Depth Below Seafloor (m)	Easting (ft)	Northing (ft)	Equivalent Diameter (ft)	Equivalent Width (ft)	Depth Below Mudline (ft)	Suggestive Interpretation
B9-LF-A03	307959.44	3202494.73	0.82	0.24	15.74	1010363.6	10506851.4	2.7	0.8	51.6	Grouped anomalous cluster suggestive of Man-made Debris or Infrastructure
B9-LF-A04	307957.14	3202502.64	0.87	0.21	17.14	1010356.0	10506877.3	2.9	0.7	56.2	Irregularly shaped anomaly cluster suggestive of debris or infrastructure; Correlated with B9-HF-A02
B9-LF-A05	307954.14	3202498.60	1.19	0.39	18.79	1010346.2	10506864.1	3.9	1.3	61.7	Grouped anomalous cluster suggestive of Man-made Debris or Infrastructure; Correlated with B9-HF-A03

Anomaly ID	Easting (m)	Northing (m)	Equivalent Length (m)	Equivalent Width (m)	Depth Below Seafloor (m)	Easting (ft)	Northing (ft)	Equivalent Diameter (ft)	Equivalent Width (ft)	Depth Below Mudline (ft)	Suggestive Interpretation
B9-LF-A06	307957.14	3202502.45	1.02	0.16	20.13	1010356.0	10506876.7	3.3	0.5	66.1	Irregularly shaped anomaly suggestive of debris or infrastructure
B9-LF-A07	307965.04	3202501.09	1.87	0.25	26.83	1010382.0	10506872.2	6.14	0.8	88.03	Grouped anomalous cluster suggestive of Man-made Debris or Infrastructure

Table 20 - Anomaly Summary Plot for Site B9

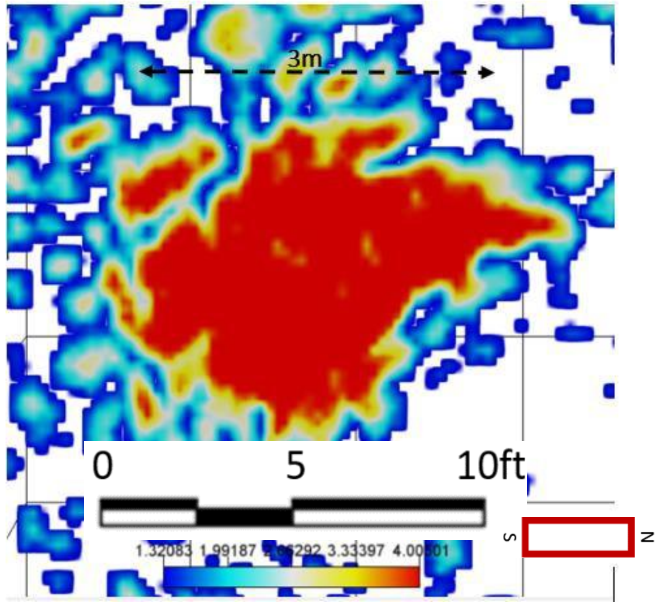


Figure 49 - Plan-view Image of B9-HF-A01.

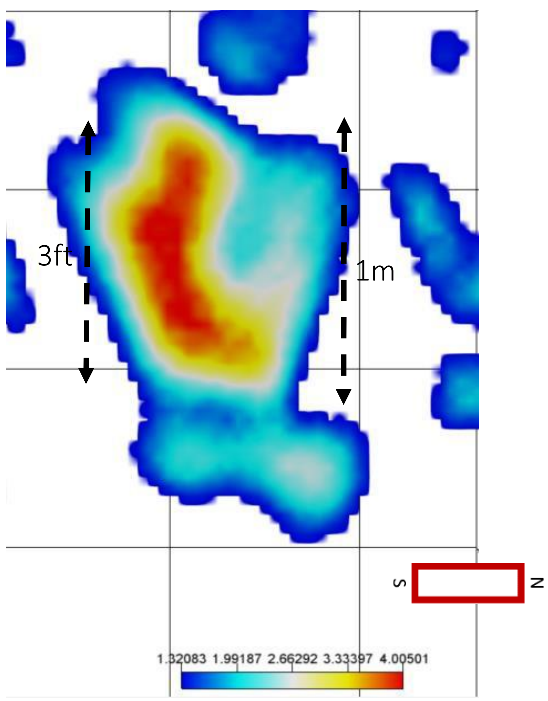


Figure 50 - Plan-view Image of B9-LF-A06

8 CONCLUSION

PanGeo Subsea carried out 3 Acoustic Corer™ (AC) surveys at the Mississippi Canyon Block 20 Site, in the Gulf of Mexico. The objective of these surveys was to prove the technology could be used to accurately map conductors and associated tubulars, as well as debris or infrastructure. The AC is an independent, tethered, seafloor tool for the acquisition of high resolution volumetric acoustic data.

The AC surveys were carried out during September 2019. All equipment was mobilized onto the O.S.R.V. Chloe Candies, a vessel managed by Oceaneering® Survey. During mobilization the vessel was equipped with the Acoustic Corer equipment along with a Launch and Recovery system (LARS) frame, two Oceaneering® Millennium® Plus 220 hp work class ROVs, a Sub-Bottom Imager system, [redacted] a stabbing guide for the AC, and two USBL heads to be mounted on the AC booms.

Just prior to the MC20 campaign, Couvillion Group provided PanGeo with a selection of previously acquired geophysical side-scan data and geotechnical data for the MC20 Block where the Taylor Energy platform was downed. The geological nature of this area is primarily normally consolidated clay that has very low shear strength. The nature of the seabed presented several challenges with respect to the AC deployment. [redacted] Vessel, ROV, and survey services were provided by Oceaneering. Throughout the campaign safety and environmental considerations was of paramount importance.

All data was collected as per the PanGeo Survey Acquisition Plan (PanGeo Report SAP-08370-4). This involved acquiring JYG-Cross and HF/LF acoustic core data at Site B6, and HF/LF acoustic core data at Sites B3 and B9. The acquired JYG-Cross multifold data, which employs the low frequency chirp acoustics, was used to determine a compressional wave velocity profile that represented the survey area. Compressional wave velocities increased with increasing depth from 1430m/s at mudline to 1691m/s at full penetration depth. This velocity profile was used in subsequent data processing. Acoustic data was recorded to a depth 55m (180ft) BML.

Linear features and anomalies were identified using the HF and LF acoustic core volumetric images of the sub-seabed. During processing, the data was filtered to remove specular reflections, which are associated with stratigraphy and shallow water reverberation, and to allow non-specular reflections associated with linear objects such as conductors, or particulates such as debris, infrastructure, and boulders to be visualized easily. The data volumes were analyzed to identify linear features that matched the 30-inch, smaller diameter conductors or conductor strings as well as any large anomaly using OpendTect image analysis software. The identification and interpretation of anomalies relies on the strength of acoustic return from buried targets (i.e. red coloration indicates a strong acoustic response relative to soil background levels (blue)) together with the size and shape of these objects. The linear features trends are presented in the Linear Feature Summary Tables, which provide X-Y-Z co-ordinates of the top of the linear feature. The conclusion is that the linear features have a north west to south east orientation. The data set as it stands is sparse, consisting of just 3 acoustic cores that are each spaced approximately 33m apart (107 ft). It is not possible at this stage to identify which of the linear features are common to each of the acoustic cores. Additional acoustic cores would make alignment of linear features feasible if this is a requirement for the remediation of the site.

The results of the acoustic anomaly analysis are presented as Anomaly Summary Tables and Anomaly Plots, which provides X-Y-Z co-ordinates of the top-center of the anomaly together with size data and suggestive interpretation.

The filter to remove specular reflections from the volumetric data set allowed conductors and anomalies, that would otherwise be masked by stratigraphy or reverberation, to be clearly visualized. The volumetric data acquired was obtained up to the required 55m (180 ft) depth below mud line. The limit at which features were detected was circa 40m (132 ft) below mud line. The geological conditions of this area were expected to contain little to no interstitial cobbles or boulders, and this was confirmed during imaging of the LF and HF data sets.

Anomaly interpretation has been carried with a high degree of confidence. The reader is reminded that anomalies are imaged through the coherent summation of up to 20,000 sampled data points. Highest confidence was realized when anomalies were identified in both the HF and LF acoustic cores. Much has been presented herein to show the value of the AC's multiple acoustic sensor acquisition and integrated data interpretation. The HF acoustic core is designed to deliver the highest resolution images within the upper regions of the acoustic core and the LF acoustic core to provide lower resolution confirmation of the upper anomalies, but also to deliver images of anomalies located deep within the soil column.

Low and high frequency (LF and HF) acoustic core result provides a 12m (39.4ft) diameter volumetric image of the sub-bottom down to full penetration depth. These data were interpreted to identify and map linear feature site. A total of fourteen (14) linear features were identified and the track of these have been digitized and easting, northing and depth BML is reported in tabular form within the appropriate section of the report. These tables have combined below in Table 21.

The acoustic core data was also analysed to identify acoustic anomalies suggestive of buried debris, feature or geohazard. Nine (9) anomalies were identified in the HF acoustic cores and 14 anomalies were identified in the LF acoustic cores. The LF acoustic data provides deeper sub-bottom penetration than the HF data, but the LF has lower resolution than that of the HF acoustic data. Acoustic anomalies are reported for each site within the body of the report. Table 22 combines all the acoustic anomaly results into a single reference table.

A stratigraphic layer was identified at Site B3. This stratum was located between 9.0-12.3m (29.5ft and 40.5ft) BML with a dip of approximately 14 degrees.

The Acoustic Corer surveys carried out at sites B3, B6 and B9 successfully identified linear features located within the subsurface. Acoustic data was recorded to 55m (180ft) below, but sub-bottom features were only identified within the top 40m (132ft). The results provided a wealth of information on the occurrence and track of linear features that generally trend in a north-west to south-east orientation across the site. The presence of these linear features was confirmed in both LF and HF acoustic cores.

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B3-HF-C1-01	308008.34	3202449.24	0.00	15.17	1010524.0	10506702.1	0.0	49.8	10 ± 1
B3-HF-C1-02	308008.04	3202449.81	0.64	15.19	1010523.0	10506704.0	2.1	49.8	10 ± 1
B3-HF-C1-03	308007.34	3202450.71	1.78	15.19	1010520.7	10506706.9	5.8	49.8	10 ± 1
B3-HF-C1-04	308006.84	3202451.42	2.65	15.22	1010519.1	10506709.2	8.7	49.9	10 ± 1
B3-HF-C1-05	308005.94	3202452.54	4.09	15.25	1010516.1	10506712.9	13.4	50.0	10 ± 1
B3-HF-C1-06	308005.44	3202453.41	5.09	15.25	1010514.5	10506715.8	16.7	50.0	10 ± 1
B3-HF-C1-07	308005.04	3202453.73	5.61	15.28	1010513.2	10506716.8	18.4	50.1	10 ± 1
B3-HF-C1-08	308004.64	3202454.63	6.59	15.37	1010511.9	10506719.8	21.6	50.4	10 ± 1
B3-HF-C1-09	308004.04	3202455.89	7.99	15.37	1010509.9	10506723.9	26.2	50.4	10 ± 1
B3-HF-C1-10	308003.44	3202457.11	9.35	15.37	1010507.9	10506727.9	30.7	50.4	10 ± 1
B3-HF-C2-01	308009.14	3202460.98	0.00	16.54	1010526.6	10506740.6	0.0	54.3	8 ± 1
B3-HF-C2-02	308009.34	3202460.70	0.34	16.54	1010527.3	10506739.7	1.1	54.3	8 ± 1

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B3-HF-C2-03	308009.64	3202460.50	0.70	16.54	1010528.3	10506739.0	2.3	54.3	8 ± 1
B3-HF-C2-04	308009.94	3202460.33	1.05	16.54	1010529.3	10506738.5	3.4	54.3	8 ± 1
B3-HF-C2-05	308010.14	3202459.92	1.50	16.69	1010529.9	10506737.2	4.9	54.8	8 ± 1
B3-HF-C2-06	308010.44	3202459.06	2.42	16.69	1010530.9	10506734.3	7.9	54.8	8 ± 1
B3-HF-C2-07	308010.84	3202458.51	3.10	16.69	1010532.2	10506732.5	10.2	54.8	8 ± 1
B3-HF-C2-08	308011.24	3202458.08	3.68	16.69	1010533.5	10506731.1	12.1	54.8	8 ± 1
B3-HF-C2-09	308011.64	3202457.66	4.26	16.69	1010534.8	10506729.7	14.0	54.8	8 ± 1
B3-HF-C2-10	308012.34	3202457.23	5.08	16.69	1010537.1	10506728.3	16.7	54.8	8 ± 1
B3-HF-C2-11	308012.84	3202456.79	5.75	16.69	1010538.8	10506726.9	18.9	54.8	8 ± 1
B3-HF-C2-12	308013.14	3202456.48	6.19	16.69	1010539.8	10506725.8	20.3	54.8	8 ± 1
B3-HF-C3-01	308014.94	3202451.993	0.00	21.52	1010545.7	10506711.1	0.0	70.6	20 ± 2
B3-HF-C3-02	308014.44	3202452.491	0.71	21.35	1010544.0	10506712.8	2.3	70.0	20 ± 2

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B3-HF-C3-03	308014.04	3202452.831	1.23	21.39	1010542.7	10506713.9	4.0	70.2	20 ± 2
B3-HF-C3-04	308013.14	3202453.64	2.44	21.28	1010539.8	10506716.5	8.0	69.8	20 ± 2
B3-HF-C3-05	308012.54	3202454.171	3.24	21.31	1010537.8	10506718.3	10.6	69.9	20 ± 2
B3-HF-C3-06	308012.14	3202454.459	3.73	21.24	1010536.5	10506719.2	12.3	69.7	20 ± 2
B3-HF-C3-07	308011.54	3202454.923	4.49	21.43	1010534.5	10506720.8	14.7	70.3	20 ± 2
B3-HF-C3-08	308011.24	3202455.097	4.84	21.28	1010533.5	10506721.3	15.9	69.8	20 ± 2
B3-HF-C3-09	308010.74	3202455.531	5.50	21.15	1010531.9	10506722.7	18.1	69.4	20 ± 2
B3-HF-C3-10	308010.14	3202455.922	6.22	21.09	1010529.9	10506724.0	20.4	69.2	20 ± 2
B3-HF-C3-11	308009.74	3202456.296	6.77	21.07	1010528.6	10506725.3	22.2	69.1	20 ± 2
B3-HF-C3-12	308009.34	3202456.558	7.24	20.87	1010527.3	10506726.1	23.8	68.5	20 ± 2
B3-HF-C3-13	308008.64	3202457.028	8.09	20.72	1010525.0	10506727.7	26.5	68.0	20 ± 2
B3-HF-C3-14	308008.34	3202457.603	8.74	20.63	1010524.0	10506729.5	28.7	67.7	20 ± 2

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B3-HF-C3-15	308008.04	3202458.278	9.47	20.41	1010523.0	10506731.8	31.1	67.0	20 ± 2
B3-HF-C3-16	308007.54	3202458.922	10.29	20.27	1010521.4	10506733.9	33.8	66.5	20 ± 2
B3-HF-C3-17	308007.24	3202459.339	10.80	20.36	1010520.4	10506735.2	35.4	66.8	20 ± 2
B3-HF-C3-18	308006.74	3202459.896	11.55	20.38	1010518.8	10506737.1	37.9	66.9	20 ± 2
B3-HF-C3-19	308006.34	3202460.611	12.37	20.43	1010517.5	10506739.4	40.6	67.0	20 ± 2
B3-HF-C3-20	308006.14	3202461.059	12.86	20.48	1010516.8	10506740.9	42.2	67.2	20 ± 2
B3-HF-C3-21	308005.84	3202461.597	13.48	20.38	1010515.8	10506742.6	44.2	66.9	20 ± 2
B3-HF-C3-22	308005.74	3202461.879	13.78	20.35	1010515.5	10506743.6	45.2	66.7	20 ± 2
B3-HF-C4-01	308012.94	3202450.16	0.00	13.22	1010539.1	10506705.1	0.0	43.4	17 ± 2
B3-HF-C4-02	308012.44	3202450.82	0.83	13.22	1010537.5	10506707.3	2.7	43.4	17 ± 2
B3-HF-C4-03	308011.54	3202452.05	2.35	13.37	1010534.5	10506711.3	7.7	43.9	17 ± 2
B3-HF-C4-04	308010.64	3202453.43	4.00	13.45	1010531.6	10506715.9	13.1	44.1	17 ± 2

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B3-HF-C4-05	308010.04	3202454.88	5.57	13.51	1010529.6	10506720.6	18.3	44.3	17 ± 2
B3-HF-C4-06	308009.34	3202455.75	6.68	13.68	1010527.3	10506723.4	21.9	44.9	17 ± 2
B6-HF-C1-01	307981.16	3202482.61	0.00	9.11	1010434.8	10506811.6	0.0	29.9	10 ± 1
B6-HF-C1-02	307981.86	3202481.74	1.12	9.20	1010437.1	10506808.7	3.7	30.2	10 ± 1
B6-HF-C1-03	307982.16	3202481.45	1.54	9.37	1010438.1	10506807.8	5.1	30.7	10 ± 1
B6-HF-C1-04	307982.76	3202480.13	2.98	9.48	1010440.1	10506803.5	9.8	31.1	10 ± 1
B6-HF-C1-05	307983.06	3202479.59	3.60	9.60	1010441.1	10506801.7	11.8	31.5	10 ± 1
B6-HF-C1-06	307983.56	3202479.11	4.29	9.71	1010442.7	10506800.1	14.1	31.9	10 ± 1
B6-HF-C1-07	307984.26	3202478.54	5.20	9.82	1010445.0	10506798.2	17.1	32.2	10 ± 1
B6-HF-C1-08	307984.76	3202478.21	5.80	9.91	1010446.7	10506797.1	19.0	32.5	10 ± 1
B6-HF-C1-09	307986.26	3202476.73	7.90	10.14	1010451.6	10506792.3	25.9	33.3	10 ± 1
B6-HF-C1-10	307986.56	3202476.29	8.44	10.48	1010452.6	10506790.9	27.7	34.4	10 ± 1

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B6-HF-C1-11	307986.96	3202475.67	9.18	10.48	1010453.9	10506788.8	30.1	34.4	10 ± 1
B6-HF-C1-12	307987.56	3202475.14	9.97	10.54	1010455.8	10506787.1	32.7	34.6	10 ± 1
B6-HF-C2-01	307979.16	3202481.91	0.00	13.87	1010428.3	10506809.3	0.0	45.5	30 ± 3
B6-HF-C2-02	307979.66	3202481.59	0.59	13.89	1010429.9	10506808.2	1.9	45.6	30 ± 3
B6-HF-C2-03	307979.86	3202480.90	1.31	13.92	1010430.6	10506806.0	4.3	45.7	30 ± 3
B6-HF-C2-04	307980.06	3202480.15	2.09	13.98	1010431.2	10506803.5	6.8	45.9	30 ± 3
B6-HF-C2-05	307980.36	3202479.69	2.63	14.09	1010432.2	10506802.0	8.6	46.2	30 ± 3
B6-HF-C2-06	307980.86	3202479.28	3.28	14.12	1010433.9	10506800.7	10.8	46.3	30 ± 3
B6-HF-C2-07	307981.36	3202478.64	4.09	14.18	1010435.5	10506798.6	13.4	46.5	30 ± 3
B6-HF-C2-08	307981.56	3202478.23	4.55	14.27	1010436.2	10506797.2	14.9	46.8	30 ± 3
B6-HF-C2-09	307981.96	3202477.68	5.23	14.29	1010437.5	10506795.4	17.2	46.9	30 ± 3
B6-HF-C2-10	307982.26	3202477.11	5.87	14.44	1010438.5	10506793.5	19.3	47.4	30 ± 3

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B6-HF-C2-11	307983.56	3202475.39	8.03	14.49	1010442.7	10506787.9	26.3	47.6	30 ± 3
B6-HF-C2-12	307984.46	3202474.67	9.18	14.55	1010445.7	10506785.5	30.1	47.7	30 ± 3
B6-HF-C2-13	307985.56	3202473.57	10.74	14.58	1010449.3	10506781.9	35.2	47.8	30 ± 3
B9-HF-C1-01	307961.04	3202495.74	0.00	9.17	1010368.8	10506854.7	0.0	30.1	24 ± 2
B9-HF-C1-02	307960.64	3202495.99	0.47	9.16	1010367.5	10506855.5	1.5	30.1	24 ± 2
B9-HF-C1-03	307960.24	3202496.34	1.00	9.13	1010366.2	10506856.6	3.3	30.0	24 ± 2
B9-HF-C1-04	307959.84	3202496.67	1.52	9.15	1010364.9	10506857.7	5.0	30.0	24 ± 2
B9-HF-C1-05	307959.34	3202497.01	2.12	9.11	1010363.3	10506858.8	7.0	29.9	24 ± 2
B9-HF-C1-06	307958.54	3202497.52	3.07	9.05	1010360.6	10506860.5	10.1	29.7	24 ± 2
B9-HF-C1-07	307957.74	3202498.28	4.18	9.01	1010358.0	10506863.0	13.7	29.5	24 ± 2
B9-HF-C1-08	307957.54	3202498.54	4.50	8.96	1010357.4	10506863.8	14.8	29.4	24 ± 2
B9-HF-C1-09	307957.34	3202498.82	4.85	9.03	1010356.7	10506864.8	15.9	29.6	24 ± 2

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B9-HF-C1-10	307957.04	3202499.09	5.25	8.99	1010355.7	10506865.6	17.2	29.5	24 ± 2
B9-HF-C1-11	307956.84	3202499.25	5.51	8.94	1010355.1	10506866.2	18.1	29.3	24 ± 2
B9-HF-C1-12	307956.64	3202499.39	5.75	9.01	1010354.4	10506866.6	18.9	29.6	24 ± 2
B9-HF-C1-13	307956.34	3202499.59	6.12	9.04	1010353.4	10506867.3	20.1	29.7	24 ± 2
B9-HF-C1-14	307956.14	3202499.75	6.37	9.00	1010352.8	10506867.8	20.9	29.5	24 ± 2
B9-HF-C1-15	307955.94	3202499.92	6.63	9.02	1010352.1	10506868.4	21.8	29.6	24 ± 2
B9-HF-C1-16	307955.74	3202500.11	6.91	9.05	1010351.4	10506869.0	22.7	29.7	24 ± 2
B9-HF-C1-17	307955.54	3202500.27	7.16	9.08	1010350.8	10506869.5	23.5	29.8	24 ± 2
B9-HF-C1-18	307955.34	3202500.46	7.44	9.08	1010350.1	10506870.2	24.4	29.8	24 ± 2
B9-HF-C2-01	307957.24	3202502.14	0.00	11.01	1010356.4	10506875.7	0.0	36.1	12 ± 2
B9-HF-C2-02	307957.84	3202501.66	0.76	11.04	1010358.3	10506874.1	2.5	36.2	12 ± 2
B9-HF-C2-03	307958.74	3202501.41	1.70	11.07	1010361.3	10506873.3	5.6	36.3	12 ± 2

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B9-HF-C2-04	307959.74	3202500.96	2.80	11.07	1010364.6	10506871.8	9.2	36.3	12 ± 2
B9-HF-C2-05	307960.44	3202500.70	3.54	11.12	1010366.9	10506870.9	11.6	36.5	12 ± 2
B9-HF-C2-06	307961.34	3202499.97	4.70	11.12	1010369.8	10506868.5	15.4	36.5	12 ± 2
B9-HF-C2-07	307961.64	3202499.74	5.08	11.15	1010370.8	10506867.8	16.7	36.6	12 ± 2
B9-HF-C2-08	307963.04	3202499.36	6.53	11.21	1010375.4	10506866.5	21.4	36.8	12 ± 2
B9-HF-C2-09	307963.64	3202498.55	7.54	11.32	1010377.4	10506863.9	24.7	37.2	12 ± 2
B9-HF-C2-10	307964.04	3202498.32	8.00	11.41	1010378.7	10506863.1	26.2	37.4	12 ± 2
B9-HF-C3-01	307964.64	3202494.52	0.00	13.49	1010380.6	10506850.7	0.0	44.3	27 ± 3
B9-HF-C3-02	307963.84	3202495.52	1.28	13.49	1010378.0	10506853.9	4.2	44.3	27 ± 3
B9-HF-C3-03	307963.04	3202496.58	2.61	13.49	1010375.4	10506857.4	8.6	44.3	27 ± 3
B9-HF-C3-04	307962.04	3202497.36	3.88	13.49	1010372.1	10506860.0	12.7	44.3	27 ± 3
B9-HF-C3-05	307960.44	3202498.45	5.82	13.41	1010366.9	10506863.6	19.1	44.0	27 ± 3

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B9-HF-C3-06	307958.54	3202499.51	7.99	13.29	1010360.6	10506867.0	26.2	43.6	27 ± 3
B9-HF-C3-07	307957.54	3202500.34	9.29	13.29	1010357.4	10506869.8	30.5	43.6	27 ± 3
B9-HF-C3-08	307956.04	3202500.46	10.80	13.44	1010352.4	10506870.2	35.4	44.1	27 ± 3
B9-HF-C3-09	307955.04	3202500.93	11.90	13.44	1010349.2	10506871.7	39.0	44.1	27 ± 3
B9-HF-C3-10	307954.34	3202501.35	12.72	13.47	1010346.9	10506873.1	41.7	44.2	27 ± 3
B9-HF-C4-01	307958.14	3202492.19	0.00	10.63	1010359.3	10506843.0	0.0	34.9	29 ± 3
B9-HF-C4-02	307957.94	3202492.56	0.42	10.68	1010358.7	10506844.2	1.4	35.0	29 ± 3
B9-HF-C4-03	307957.64	3202492.95	0.92	10.72	1010357.7	10506845.5	3.0	35.2	29 ± 3
B9-HF-C4-04	307957.54	3202493.20	1.19	10.62	1010357.4	10506846.3	3.9	34.8	29 ± 3
B9-HF-C4-05	307957.34	3202493.46	1.51	10.63	1010356.7	10506847.2	5.0	34.9	29 ± 3
B9-HF-C4-06	307956.94	3202494.28	2.42	10.59	1010355.4	10506849.9	7.9	34.7	29 ± 3
B9-HF-C4-07	307956.74	3202494.45	2.69	10.59	1010354.7	10506850.4	8.8	34.8	29 ± 3

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B9-HF-C4-08	307956.44	3202494.92	3.24	10.54	1010353.7	10506852.0	10.6	34.6	29 ± 3
B9-HF-C4-09	307956.14	3202495.34	3.76	10.43	1010352.8	10506853.3	12.3	34.2	29 ± 3
B9-HF-C4-10	307955.94	3202495.62	4.10	10.50	1010352.1	10506854.3	13.5	34.5	29 ± 3
B9-HF-C4-11	307955.74	3202495.85	4.41	10.54	1010351.4	10506855.0	14.5	34.6	29 ± 3
B9-HF-C4-12	307955.44	3202496.11	4.80	10.44	1010350.5	10506855.9	15.8	34.2	29 ± 3
B9-HF-C4-13	307955.24	3202496.37	5.14	10.38	1010349.8	10506856.7	16.9	34.0	29 ± 3
B9-HF-C4-14	307954.94	3202496.73	5.60	10.33	1010348.8	10506857.9	18.4	33.9	29 ± 3
B9-HF-C4-15	307954.64	3202497.09	6.07	10.44	1010347.8	10506859.1	19.9	34.2	29 ± 3
B9-HF-C4-16	307954.14	3202497.60	6.79	10.27	1010346.2	10506860.8	22.3	33.7	29 ± 3
B9-HF-C4-17	307953.74	3202497.96	7.32	10.18	1010344.9	10506862.0	24.0	33.4	29 ± 3
B9-HF-C4-18	307953.44	3202498.26	7.75	10.21	1010343.9	10506862.9	25.4	33.5	29 ± 3
B9-HF-C4-19	307953.14	3202498.53	8.15	10.23	1010342.9	10506863.8	26.7	33.6	29 ± 3

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B9-HF-C4-20	307952.74	3202499.11	8.86	10.44	1010341.6	10506865.7	29.1	34.3	29 ± 3
B9-HF-C4-21	307952.54	3202499.33	9.15	10.51	1010340.9	10506866.4	30.0	34.5	29 ± 3
B9-HF-C5-01	307961.54	3202494.09	0.00	10.12	1010370.5	10506849.2	0.0	33.2	20 ± 2
B9-HF-C5-02	307960.84	3202494.79	0.99	10.12	1010368.2	10506851.5	3.3	33.2	20 ± 2
B9-HF-C5-03	307959.94	3202495.39	2.08	10.12	1010365.2	10506853.5	6.8	33.2	20 ± 2
B9-HF-C5-04	307958.84	3202495.97	3.32	10.15	1010361.6	10506855.4	10.9	33.3	20 ± 2
B9-HF-C5-05	307957.84	3202496.47	4.44	10.15	1010358.3	10506857.1	14.6	33.3	20 ± 2
B9-HF-C5-06	307957.14	3202496.96	5.29	10.18	1010356.0	10506858.7	17.4	33.4	20 ± 2
B9-HF-C5-07	307956.24	3202497.58	6.38	10.18	1010353.1	10506860.7	20.9	33.4	20 ± 2
B9-HF-C5-08	307955.34	3202498.51	7.68	10.21	1010350.1	10506863.8	25.2	33.5	20 ± 2
B9-HF-C5-09	307954.74	3202498.77	8.33	10.21	1010348.2	10506864.6	27.3	33.5	20 ± 2
B9-HF-C5-10	307954.24	3202499.40	9.14	10.21	1010346.5	10506866.7	30.0	33.5	20 ± 2

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B9-HF-C5-11	307954.04	3202500.30	10.06	10.27	1010345.9	10506869.6	33.0	33.7	20 ± 2
B9-HF-C5-12	307953.84	3202501.06	10.85	10.27	1010345.2	10506872.1	35.6	33.7	20 ± 2
B9-HF-C6-01	307965.64	3202496.03	0.00	12.54	1010383.9	10506855.6	0.0	41.1	21 ± 2
B9-HF-C6-02	307964.84	3202496.72	1.06	12.54	1010381.3	10506857.9	3.5	41.1	21 ± 2
B9-HF-C6-03	307964.14	3202497.25	1.94	12.59	1010379.0	10506859.6	6.4	41.3	21 ± 2
B9-HF-C6-04	307962.94	3202497.95	3.32	12.62	1010375.1	10506861.9	10.9	41.4	21 ± 2
B9-HF-C6-05	307962.34	3202498.23	3.98	12.68	1010373.1	10506862.8	13.1	41.6	21 ± 2
B9-HF-C6-06	307961.94	3202498.57	4.51	12.82	1010371.8	10506863.9	14.8	42.1	21 ± 2
B9-HF-C6-07	307961.24	3202498.84	5.26	12.97	1010369.5	10506864.8	17.3	42.5	21 ± 2
B9-HF-C6-08	307960.44	3202499.08	6.10	12.97	1010366.9	10506865.6	20.0	42.5	21 ± 2
B9-HF-C6-09	307959.64	3202499.67	7.09	12.97	1010364.2	10506867.6	23.3	42.5	21 ± 2
B9-HF-C6-10	307958.94	3202500.06	7.89	12.94	1010361.9	10506868.9	25.9	42.4	21 ± 2

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B9-HF-C6-11	307958.04	3202500.61	8.94	12.91	1010359.0	10506870.6	29.3	42.4	21 ± 2
B9-HF-C6-12	307957.54	3202501.07	9.63	12.79	1010357.4	10506872.2	31.6	42.0	21 ± 2
B9-HF-C6-13	307956.34	3202501.80	11.03	12.71	1010353.4	10506874.5	36.2	41.7	21 ± 2
B9-HF-C6-14	307955.74	3202502.55	11.99	12.45	1010351.4	10506877.0	39.3	40.9	21 ± 2
B9-HF-C6-15	307955.04	3202503.37	13.07	12.28	1010349.2	10506879.7	42.9	40.3	21 ± 2
B9-HF-C6-16	307954.64	3202503.60	13.53	12.08	1010347.8	10506880.4	44.4	39.6	21 ± 2
B9-HF-C7-01	307960.34	3202496.21	0.00	14.90	1010366.5	10506856.2	0.0	48.9	13 ± 2
B9-HF-C7-02	307960.04	3202496.55	0.46	14.82	1010365.6	10506857.3	1.5	48.6	13 ± 2
B9-HF-C7-03	307959.54	3202496.94	1.09	14.66	1010363.9	10506858.6	3.6	48.1	13 ± 2
B9-HF-C7-04	307959.04	3202497.24	1.67	14.54	1010362.3	10506859.6	5.5	47.7	13 ± 2
B9-HF-C7-05	307958.64	3202497.47	2.13	14.52	1010361.0	10506860.3	7.0	47.6	13 ± 2
B9-HF-C7-06	307958.14	3202497.82	2.74	14.58	1010359.3	10506861.5	9.0	47.8	13 ± 2

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B9-HF-C7-07	307957.94	3202498.05	3.05	14.52	1010358.7	10506862.3	10.0	47.6	13 ± 2
B9-HF-C7-08	307957.64	3202498.46	3.56	14.45	1010357.7	10506863.6	11.7	47.4	13 ± 2
B9-HF-C7-09	307957.34	3202498.80	4.01	14.32	1010356.7	10506864.7	13.2	47.0	13 ± 2
B9-HF-C7-10	307957.04	3202499.07	4.42	14.29	1010355.7	10506865.6	14.5	46.9	13 ± 2
B9-HF-C7-11	307956.64	3202499.38	4.92	14.27	1010354.4	10506866.6	16.2	46.8	13 ± 2
B9-HF-C7-12	307956.44	3202499.56	5.19	14.21	1010353.7	10506867.2	17.0	46.6	13 ± 2
B9-HF-C7-13	307955.84	3202500.03	5.95	14.04	1010351.8	10506868.8	19.5	46.1	13 ± 2
B9-HF-C7-14	307955.64	3202500.23	6.24	14.06	1010351.1	10506869.4	20.5	46.1	13 ± 2
B9-HF-C7-15	307955.44	3202500.43	6.52	13.91	1010350.5	10506870.1	21.4	45.6	13 ± 2
B9-HF-C8-01	307961.54	3202494.12	0.00	9.45	1010370.5	10506849.4	0.0	31.0	20 ± 2
B9-HF-C8-02	307961.14	3202494.52	0.56	9.36	1010369.2	10506850.6	1.8	30.7	20 ± 2
B9-HF-C8-03	307960.64	3202494.90	1.19	9.36	1010367.5	10506851.9	3.9	30.7	20 ± 2

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B9-HF-C8-04	307960.14	3202495.23	1.79	9.35	1010365.9	10506853.0	5.9	30.7	20 ± 2
B9-HF-C8-05	307959.84	3202495.44	2.16	9.44	1010364.9	10506853.7	7.1	31.0	20 ± 2
B9-HF-C8-06	307959.44	3202495.63	2.60	9.52	1010363.6	10506854.3	8.5	31.2	20 ± 2
B9-HF-C8-07	307959.24	3202495.77	2.84	9.40	1010362.9	10506854.8	9.3	30.8	20 ± 2
B9-HF-C8-08	307958.94	3202495.92	3.18	9.41	1010361.9	10506855.3	10.4	30.9	20 ± 2
B9-HF-C8-09	307958.44	3202496.17	3.74	9.45	1010360.3	10506856.1	12.3	31.0	20 ± 2
B9-HF-C8-10	307958.14	3202496.33	4.08	9.48	1010359.3	10506856.6	13.4	31.1	20 ± 2
B9-HF-C8-11	307957.84	3202496.48	4.41	9.43	1010358.3	10506857.1	14.5	30.9	20 ± 2
B9-HF-C8-12	307957.44	3202496.76	4.90	9.41	1010357.0	10506858.0	16.1	30.9	20 ± 2
B9-HF-C8-13	307956.84	3202497.20	5.65	9.35	1010355.1	10506859.5	18.5	30.7	20 ± 2
B9-HF-C8-14	307956.34	3202497.51	6.23	9.27	1010353.4	10506860.5	20.4	30.4	20 ± 2
B9-HF-C8-15	307955.74	3202498.07	7.05	9.31	1010351.4	10506862.3	23.1	30.6	20 ± 2

Linear Feature Name	Easting (m)	Northing (m)	Distance Along Conductor (m)	Depth Below Mudline (m)	Easting (ft)	Northing (ft)	Distance Along Conductor (ft)	Depth Below Mudline (ft)	Diameter of Interpreted Conductors (in)
B9-HF-C8-16	307955.44	3202498.46	7.55	9.32	1010350.5	10506863.6	24.8	30.6	20 ± 2
B9-HF-C8-17	307955.14	3202498.60	7.88	9.26	1010349.5	10506864.0	25.8	30.4	20 ± 2
B9-HF-C8-18	307954.44	3202499.20	8.80	9.26	1010347.2	10506866.0	28.9	30.4	20 ± 2
B9-HF-C8-19	307954.24	3202499.46	9.13	9.22	1010346.5	10506866.9	29.9	30.3	20 ± 2
B9-HF-C8-20	307954.14	3202499.73	9.42	9.31	1010346.2	10506867.8	30.9	30.5	20 ± 2
B9-HF-C8-21	307954.04	3202500.06	9.77	9.29	1010345.9	10506868.9	32.0	30.5	20 ± 2
B9-HF-C8-22	307953.94	3202500.48	10.20	9.37	1010345.5	10506870.2	33.4	30.8	20 ± 2
B9-HF-C8-23	307953.94	3202500.76	10.48	9.38	1010345.5	10506871.1	34.4	30.8	20 ± 2

Table 21 - Linear Feature Summary Table for MC20 *NAD27 UTM Zone 16N*

Anomaly ID	Easting (m)	Northing (m)	Equivalent Length (m)	Equivalent Width (m)	Depth Below Seafloor (m)	Easting (ft)	Northing (ft)	Equivalent Diameter (ft)	Equivalent Width (ft)	Depth Below Mudline (ft)	Suggestive Interpretation
B3-HF-A01	**308013.4**	**3202457.1**	1.56	0.25	25.60	**1010540.8**	**10506728.0**	5.1	0.8	84.0	Grouped anomalous cluster suggestive of Man-made Debris or Infrastructure
B3-LF-A01	308006.84	3202451.07	4.06	0.46	15.39	1010519.1	10506708.1	13.32	1.51	50.49	Grouped anomalous cluster suggestive of Man-made Debris or Infrastructure
B3-LF-A02	308013.94	3202457.12	1.41	0.34	25.15	1010542.4	10506728.0	4.6	1.1	82.5	Grouped anomalous cluster suggestive of Man-made Debris or Infrastructure
B6-HF-A01	307988.26	3202475.77	1.55	0.35	12.01	1010458.1	10506789.2	5.1	1.1	39.4	Linear cluster of anomalies; Correlated with B6_LF_01

Anomaly ID	Easting (m)	Northing (m)	Equivalent Length (m)	Equivalent Width (m)	Depth Below Seafloor (m)	Easting (ft)	Northing (ft)	Equivalent Diameter (ft)	Equivalent Width (ft)	Depth Below Mudline (ft)	Suggestive Interpretation
B6-LF-A01	307988.06	3202476.50	1.98	0.50	12.01	1010457.5	10506791.5	6.5	1.6	39.4	Linear cluster of anomalies; Correlated with B6_HF_01
B6-HF-A02	307985.46	3202483.61	3.21	1.65	13.45	1010449.0	10506814.9	10.5	5.4	44.1	Irregular shaped cluster of 2 larger anomalies; Correlated with B6_LF_02
B6-LF-A02	307985.06	3202483.88	3.37	1.40	13.45	1010447.6	10506815.8	11.1	4.6	44.1	Irregular shaped cluster of 2 larger anomalies; Correlated with B6_HF_02
B6-HF-A03	307980.86	3202479.27	3.03	1.47	14.18	1010433.9	10506800.6	9.9	4.8	46.5	Irregular shaped anomaly; Correlated with B6_LF_03

Anomaly ID	Easting (m)	Northing (m)	Equivalent Length (m)	Equivalent Width (m)	Depth Below Seafloor (m)	Easting (ft)	Northing (ft)	Equivalent Diameter (ft)	Equivalent Width (ft)	Depth Below Mudline (ft)	Suggestive Interpretation
B6-LF-A03	307980.66	3202478.78	1.57	0.41	14.15	1010433.2	10506799.0	5.2	1.3	46.4	Irregular shaped anomaly; Correlated with B6_HF_03
B6-HF-A04	307978.96	3202478.66	2.3	0.84	19.09	1010427.6	10506798.6	7.5	2.8	62.6	Elongated anomaly; Correlated with B6_LF_04
B6-LF-A04	307978.96	3202478.24	1.16	0.86	19.09	1010427.6	10506797.3	3.8	2.8	62.6	Elongated anomaly; Correlated with B6_HF_04
B6-HF-A05	307987.96	3202480.60	4.75	1.65	20.09	1010457.2	10506805.0	15.6	5.4	65.9	Elongated, irregular shaped anomaly; Correlated with B6_LF_05

Anomaly ID	Easting (m)	Northing (m)	Equivalent Length (m)	Equivalent Width (m)	Depth Below Seafloor (m)	Easting (ft)	Northing (ft)	Equivalent Diameter (ft)	Equivalent Width (ft)	Depth Below Mudline (ft)	Suggestive Interpretation
B6-LF-A05	307987.16	3202481.66	2.94	1.24	20.03	1010454.5	10506808.5	9.6	4.1	65.7	Elongated, irregular shaped anomaly; Correlated with B6_HF_05
B9-HF-A01	307958.24	3202495.53	3.47	2.07	15.39	1010359.6	10506854.0	11.4	6.8	50.5	Grouped anomalous Cluster suggestive of Debris or Infrastructure
B9-LF-A01	307957.84	3202501.50	0.58	0.17	10.95	1010358.3	10506873.6	1.9	0.6	35.9	Rounded anomaly correlated with a section of B9_HF_C2
B9-HF-A02	307957.04	3202503.07	1.85	0.17	17.14	1010355.7	10506878.7	6.1	0.5	56.2	Grouped anomalous Cluster suggestive of Debris or Infrastructure
B9-LF-A02	307956.84	3202501.03	1.34	0.49	12.59	1010355.1	10506872.0	4.4	1.6	41.3	Ovular anomaly; correlated with a section of B9_HF_C6

Anomaly ID	Easting (m)	Northing (m)	Equivalent Length (m)	Equivalent Width (m)	Depth Below Seafloor (m)	Easting (ft)	Northing (ft)	Equivalent Diameter (ft)	Equivalent Width (ft)	Depth Below Mudline (ft)	Suggestive Interpretation
B9-HF-A03	307954.44	3202498.71	1.38	0.28	18.79	1010347.2	10506864.4	4.5	0.9	61.7	Grouped anomalous Cluster suggestive of Debris or Infrastructure
B9-LF-A03	307959.44	3202494.73	0.82	0.24	15.74	1010363.6	10506851.4	2.7	0.8	51.6	Grouped anomalous cluster suggestive of Man-made Debris or Infrastructure
B9-LF-A04	307957.14	3202502.64	0.87	0.21	17.14	1010356.0	10506877.3	2.9	0.7	56.2	Irregularly shaped anomaly cluster suggestive of debris or infrastructure; Correlated with B9_HF_A02

Anomaly ID	Easting (m)	Northing (m)	Equivalent Length (m)	Equivalent Width (m)	Depth Below Seafloor (m)	Easting (ft)	Northing (ft)	Equivalent Diameter (ft)	Equivalent Width (ft)	Depth Below Mudline (ft)	Suggestive Interpretation
B9-LF-A05	307954.14	3202498.60	1.19	0.39	18.79	1010346.2	10506864.1	3.9	1.3	61.7	Grouped anomalous cluster suggestive of Man-made Debris or Infrastructure; Correlated with B9_HF_A03
B9-LF-A06	307957.14	3202502.45	1.02	0.16	20.13	1010356.0	10506876.7	3.3	0.5	66.1	Irregularly shaped anomaly suggestive of debris or infrastructure
B9-LF-A07	307965.04	3202501.09	1.87	0.25	26.83	1010382.0	10506872.2	6.14	0.8	88.03	Grouped anomalous cluster suggestive of Man-made Debris or Infrastructure

Table 22 - Anomaly Summary Table for MC20 *NAD27 UTM Zone 16N*

APPENDIX A COMMUNICATIONS REGARDING SOIL CONDITIONS

E-mail dated 31/7/2019 from REDACTED [redacted], consulting Geotechnical Engineer to the Couvillion Group.

"I have made an initial assessment of the foundation capacity given the revised 'mud mat' area of 20 m^2. Based solely on this area, the submerged weight of the AC and the existing shallow soils data the foundation appears to be robust. However, there are several uncertainties regarding this assessment which I'll discuss below.

The submerged weight of the AC is 33kN. With this weight and the new area, the foundation pressure is 1.65 kPa. Using API-RP2 GEO procedures for shallow foundations on clay I have determined a vertical capacity of about 9.6 kPa. Therefore, the calculated Factor of Safety is 5.8 (very robust). However, the vertical capacity is highly dependent on the shear strength right at the mudline which is highly variable. In my experience it can range from about 1 to 4 kPa. I have chosen a value of 1 kPa for the calculations. The existing data at the site support this lower value. With the data we presently have at the site and the geologic conditions, we can anticipate the shear strength to be highly variable between locations.

I would note that any lateral loads, eccentricities or torque loads will reduce this vertical capacity. My interpretation based on the illustration of the AC is that the system is very balanced and there will be minimal eccentric loads. Depending on the rotating loads there could be some torque. Lateral loads would result from any bottom currents.

The hole in the center of the mudmat is a very good idea so we don't build up pressures underneath the mudmat during installation. These pressures could further reduce the mudline shear strength if they caused a soil failure. The allowable lowering speed can be easily calculated to keep these pressures low enough to prevent a bearing pressure failure and strength reductions. In my experience 4% to 8% of the mudmat footprint area will allow reasonable lowering speeds.

I anticipate that the foundation will be much more flexible than a typical mudmat foundation and as a result the loads will not be evenly distributed across the mudmat. I'd expect initially higher loads near the legs, but as they penetrate, there will be redistribution of these loads toward the interior of the mudmat. This redistribution will depend on the stiffness of the sail. Higher loads near the legs could result in some localized failure. This could be analysed but only with more complex finite element analyses. However, I'd suggest that past performance of the system in similar soils be used as an initial guide for how the mudmat foundation will perform. A localized failure also does not necessarily indicate that the system would be outside of serviceability limits.

Settlement of a mudmat foundation can also be a concern, especially if the foundation will be used for a long time. With the expected duration for this application I do not anticipate there will be any long-term settlement issues. However, short term elastic settlement should be anticipated. These can be easily calculated. If the soil is uniform across the mudmat footprint these settlements will not be an issue. Highly variable soils, however, could produce some rotation from differential settlements.

Finally, I would note again that his initial calculation indicates a high Factor of Safety and a corresponding large margin to account for the uncertainties I've discussed. As we establish some upper bound limits on these other factors, we should be able to estimate if this margin is adequate".

APPENDIX B COMMUNICATIONS [redacted] REDACTED

REDACTED [redacted]

APPENDIX C COMMUNICATIONS REGARDING SOIL PLUG STABILITY

REDACTED

[redacted]

APPENDIX D DATA PROCESSING OVERVIEW

The data acquisition, processing and interpretation flow is outlined in Figure 51 below. Figure 52 and Figure 53 provide a detailed processing flow list for JYGS Cross data and Acoustic (SAS) Core data respectively. AC data comprises specular (stratigraphy) & non-specular (diffractors e.g. pipes) returns. AC SAS acquisition is biased towards non-specular imaging. Further enhancement of results was achieved using ZoomSpace specular/non-specular filters which were used to enhance and isolate the acoustic responses. Volumetric SAS data, consisting of both HF and LF chirp sonar data sets, was incorporated to identify the buried conductors and anomalies suggestive of buried geohazards, particularly debris and infrastructure from the downed platform. The HF chirp is optimized for high resolution imaging of anomalies in the uppermost seabed and the LF chirp is optimized for resolving anomalies from the seafloor to maximum penetration depth. Increased confidence in the data interpretation is achieved when both HF and LF system image a given anomaly. The resulting data cubes were analysed using 3D imaging software, OpendTect. Data processing, interpretation and reporting was carried out from the PanGeo (Canada) office.

All raw data acquired offshore was subject to continuous QA/QC checks by the offshore team in order to ensure data quality. QA/QC reports were generated offshore following each AC scan showing the co-ordinates of the required vs landed AC REDACTED [redacted] Data coverage statistical plots for JYG Cross and SAS scans were also presented to confirm all positions had been met. A sample shot-gather for the JYG Cross scan and a sample echogram of the SAS scan was provided in these reports as well and presented to the client onboard the vessel.

Due to the expensive nature of transferring the data via a satellite connection. It was decided that the Raw PanGeo data be uploaded to several USB drives and couriered to the St. John’s PanGeo office following the completion of the campaign. Each USB drive contained data from each individual site, for three drives in total. The data was then uploaded for secure archiving onto the PanGeo (Canada) data archive server prior to data processing. The upload time took approximately two (2) hours. Following this, work on the Site reports began and were submitted to the Client office within 24 hours of beginning work on the reports.

The JYG-Cross and Volumetric (SAS) data processing flow are summarized in Figure 52 and Figure 53 respectively. The JYG-Cross data was used to carry out a semblance analysis to provide a velocity profile for each of the sites (see Table 23).

The following area maps (Figure 55 and Figure 56) are provided as a layout for the possible Acoustic Core locations. Table 24 lists center co-ordinates of those positions in both ft and meters. Positions labelled B6, B3 and B9 were the 3 Acoustic Core locations. Thereafter, any additional Acoustic Core’s will be at the discretion of the client, based on the results achieved from the first 3 surveys.

REDACTED

[redacted]

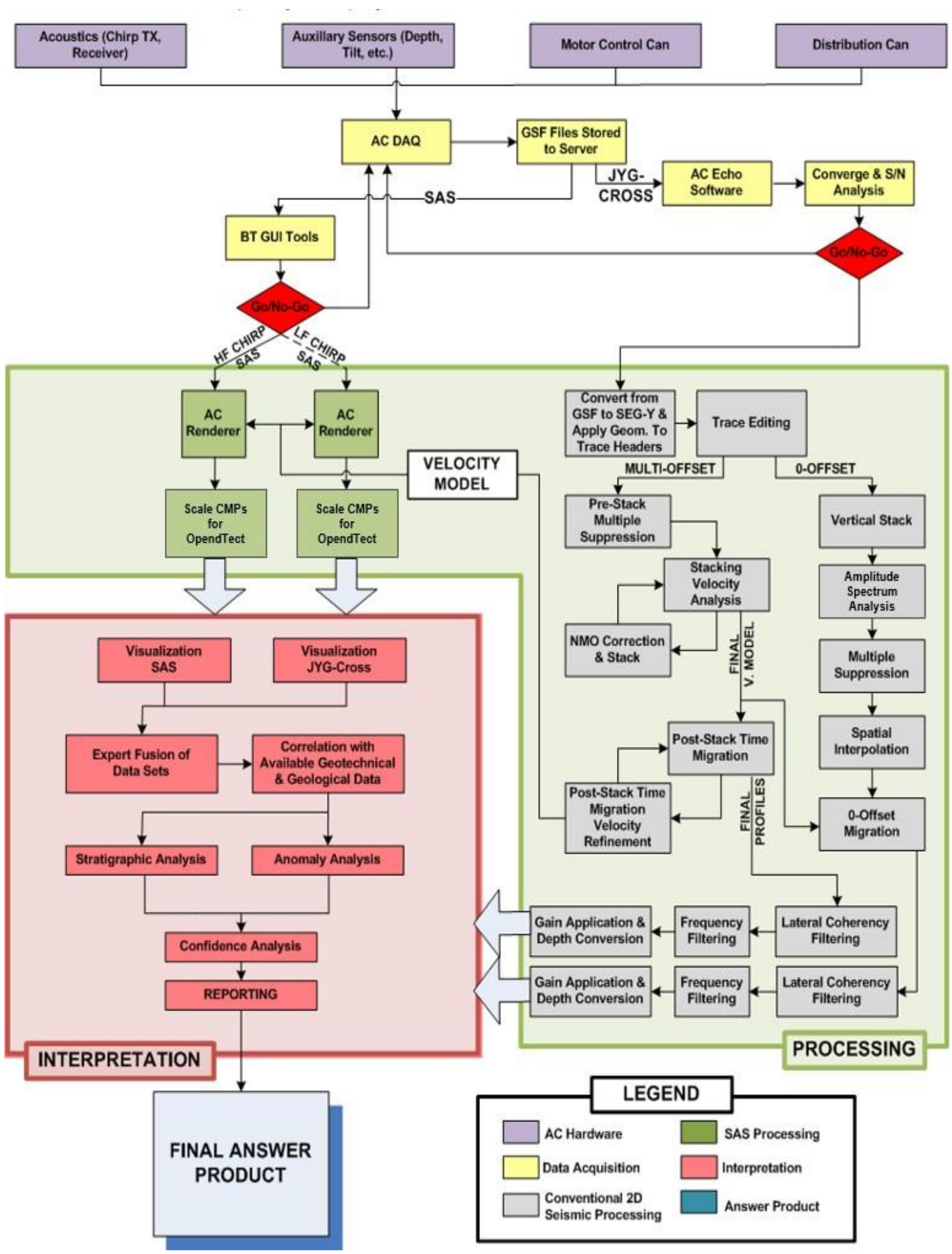


Figure 51 - AC Acquisition, Processing and Interpretation Flow Diagram

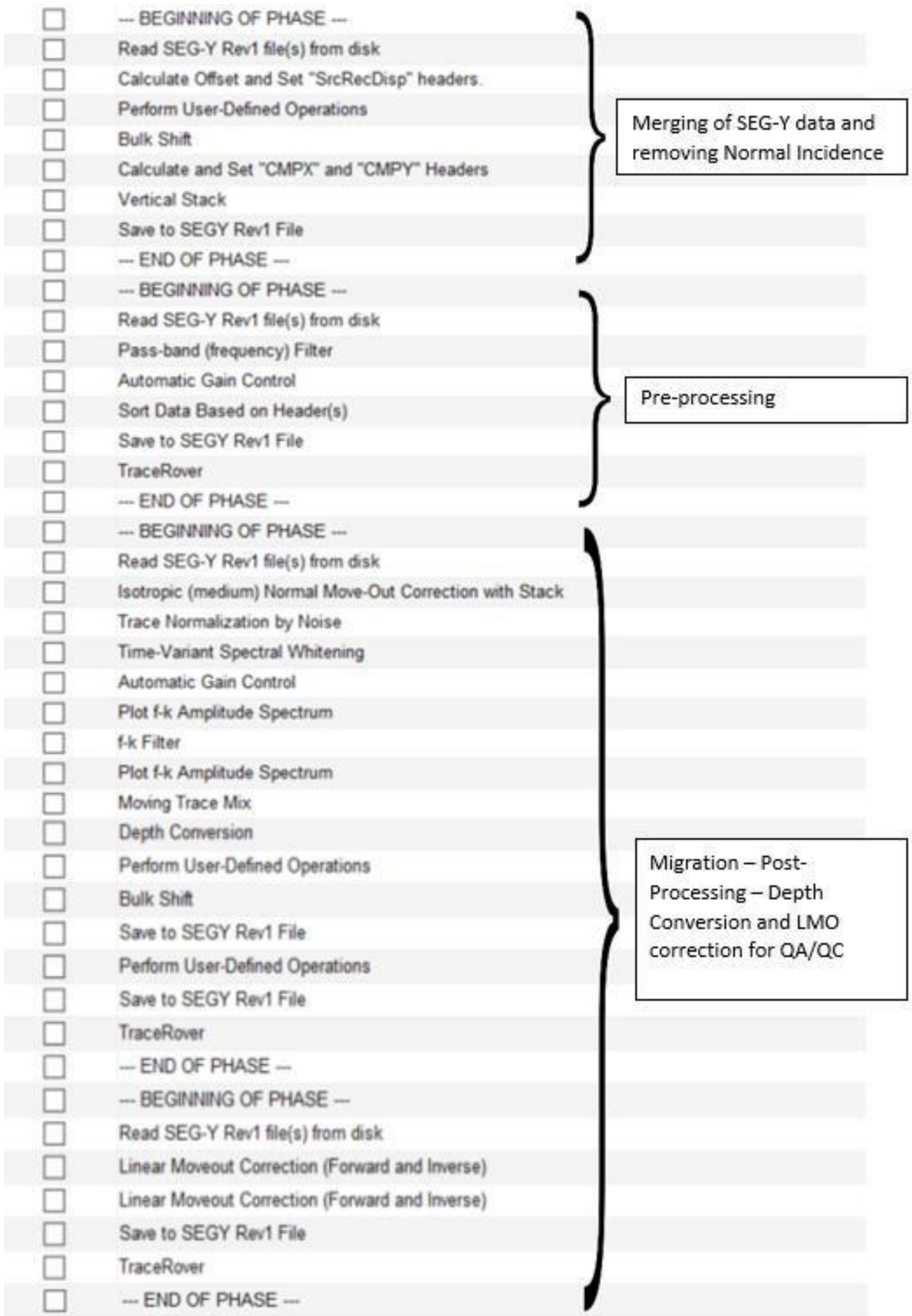


Figure 52 - Processing Flow for JYGS Cross Data

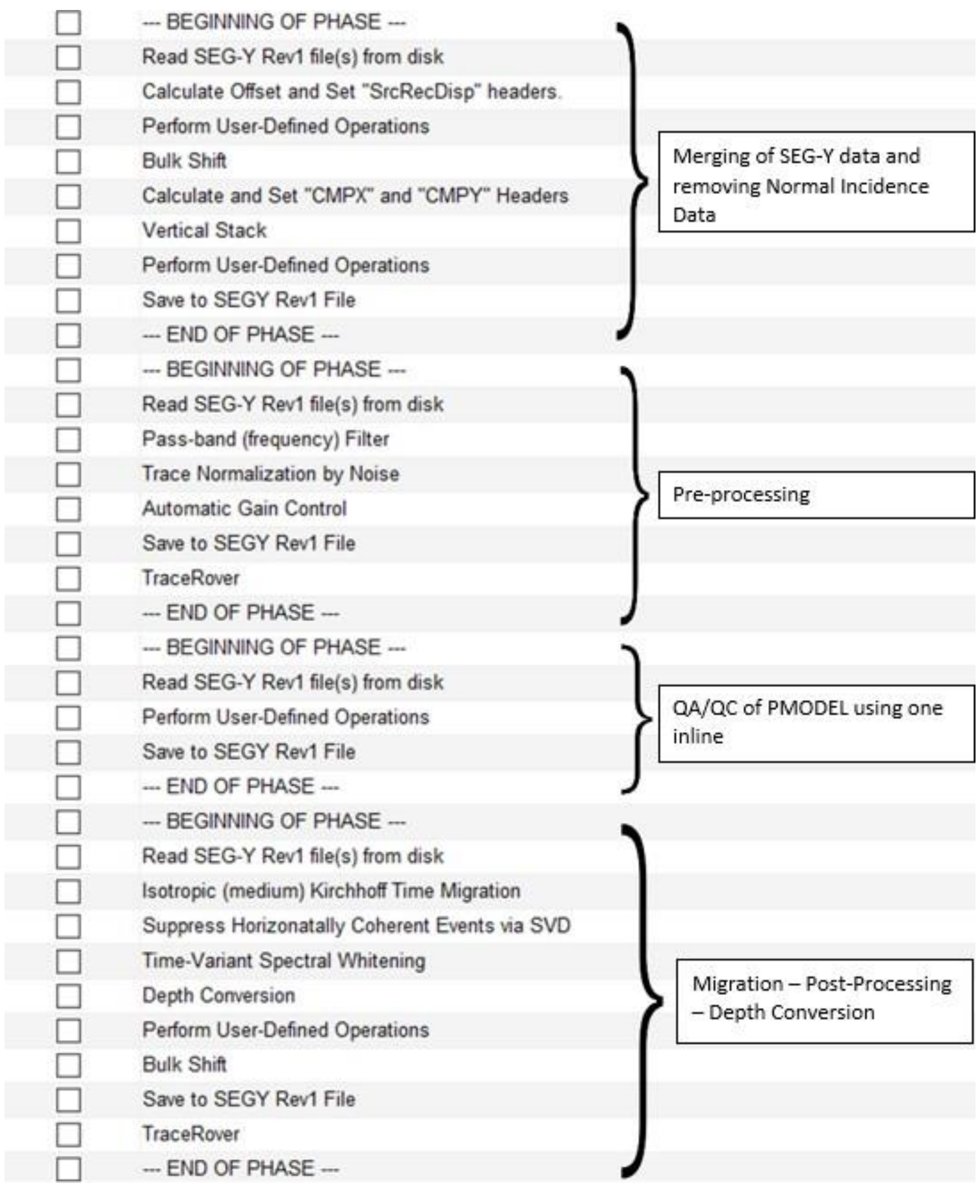


Figure 53 - Processing Flow for Acoustic (SAS) Core Data

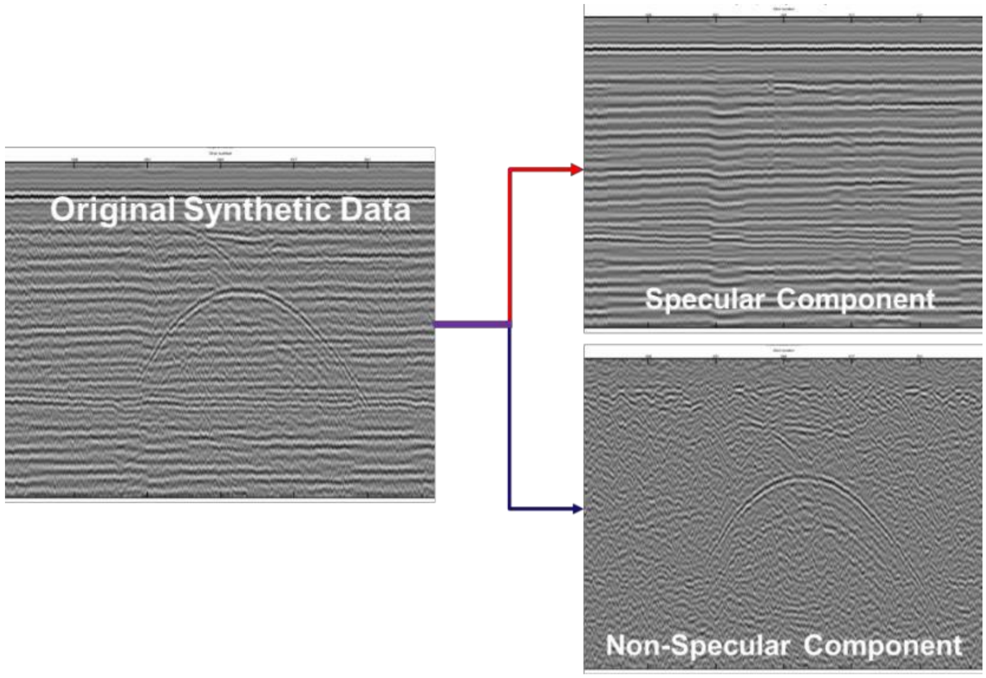


Figure 54 - Applying ZoomSpace filters to enhance AC data

Site B6	
Time (ms)	V_{RMS} (m/s)
0	1429.90
6.15	1429.90
19.69	1486.77
29.39	1504.90
31.24	1514.40
33.77	1529.61
37.89	1569.52
52.56	1691.23

Table 23 - Site soil velocity profile used for all sites obtained from semblance analysis

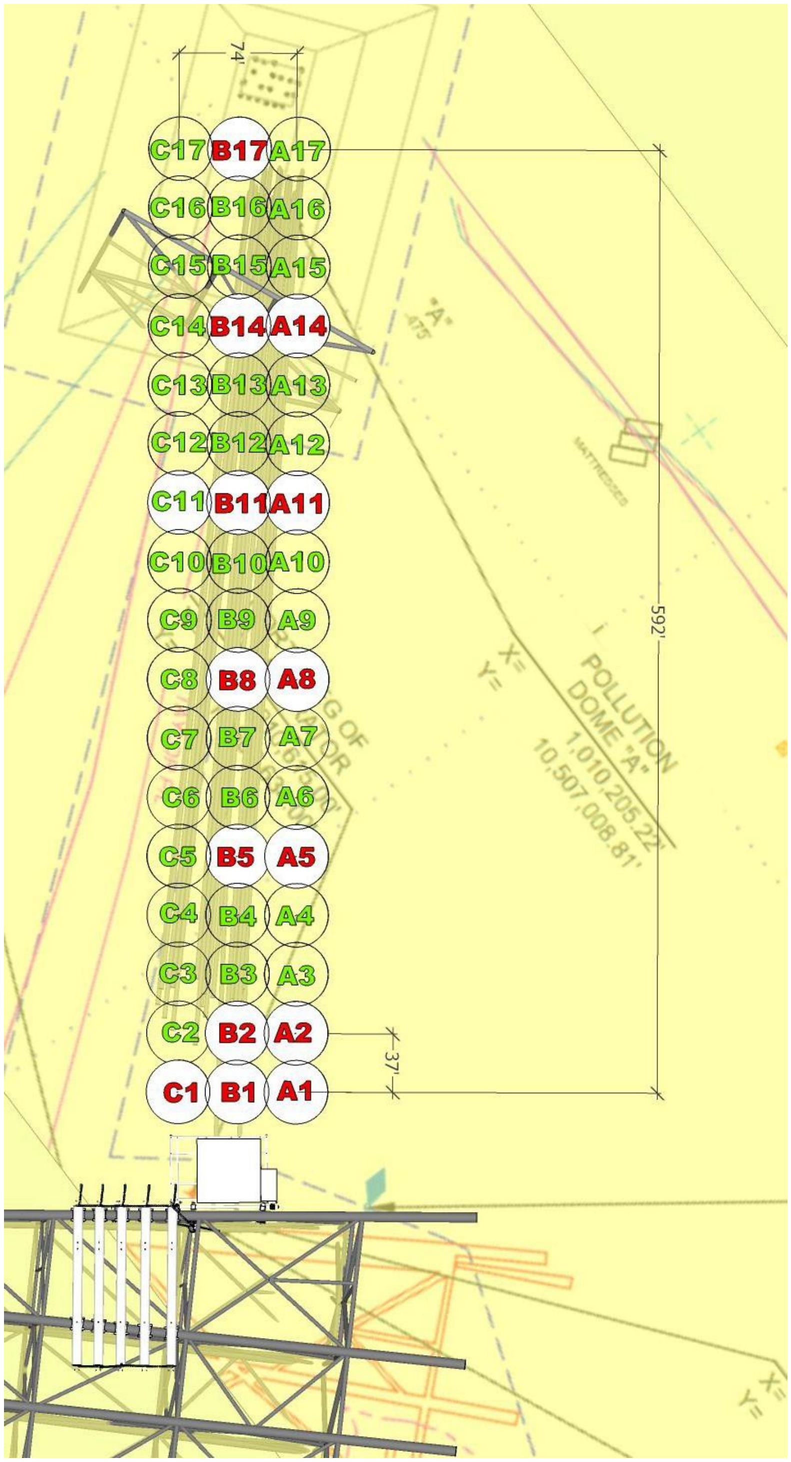


Figure 55 - Initial layout for the possible Acoustic Cores

POINT	X COORDINATE	Y COORDINATE	X COORDINATE	Y COORDINATE
A1	1,010,608.25'	10,506,702.44'	308,034.01m	3,202,449.31m
A2	1,010,580.20'	10,506,726.56'	308,025.46m	3,202,456.66m
A3	1,010,552.15'	10,506,750.69'	308,016.91m	3,202,464.02m
A4	1,010,524.10'	10,506,774.82'	308,008.36m	3,202,471.37m
A5	1,010,496.05'	10,506,798.95'	307,999.81m	3,202,478.72m
A6	1,010,468.00'	10,506,823.07'	307,991.26m	3,202,486.08m
A7	1,010,439.95'	10,506,847.20'	307,982.71m	3,202,493.43m
A8	1,010,411.90'	10,506,871.33'	307,974.16m	3,202,500.79m
A9	1,010,383.85'	10,506,895.46'	307,965.61m	3,202,508.14m
A10	1,010,355.79'	10,506,919.58'	307,957.06m	3,202,515.49m
A11	1,010,327.74'	10,506,943.71'	307,948.51m	3,202,522.85m
A12	1,010,299.69'	10,506,967.84'	307,939.96m	3,202,530.20m
A13	1,010,271.64'	10,506,991.97'	307,931.41m	3,202,537.56m
A14	1,010,243.59'	10,507,016.10'	307,922.86m	3,202,544.91m
A15	1,010,215.54'	10,507,040.22'	307,914.31m	3,202,552.27m
A16	1,010,187.49'	10,507,064.35'	307,905.76m	3,202,559.62m
A17	1,010,159.44'	10,507,088.48'	307,897.21m	3,202,566.97m
B1	1,010,584.13'	10,506,674.38'	308,026.66m	3,202,440.76m
B2	1,010,556.07'	10,506,698.51'	308,018.11m	3,202,448.11m
B3	1,010,528.02'	10,506,722.64'	308,009.56m	3,202,455.47m
B4	1,010,499.97'	10,506,746.77'	308,001.01m	3,202,462.82m
B5	1,010,471.92'	10,506,770.90'	307,992.46m	3,202,470.17m
B6	1,010,443.87'	10,506,795.02'	307,983.91m	3,202,477.53m
B7	1,010,415.82'	10,506,819.15'	307,975.36m	3,202,484.88m
B8	1,010,387.77'	10,506,843.28'	307,966.81m	3,202,492.24m
B9	1,010,359.72'	10,506,867.41'	307,958.26m	3,202,499.59m
B10	1,010,331.67'	10,506,891.53'	307,949.71m	3,202,506.94m
B11	1,010,303.62'	10,506,915.66'	307,941.16m	3,202,514.30m
B12	1,010,275.57'	10,506,939.79'	307,932.61m	3,202,521.65m
B13	1,010,247.51'	10,506,963.92'	307,924.06m	3,202,529.01m
B14	1,010,219.46'	10,506,988.04'	307,915.51m	3,202,536.36m
B15	1,010,191.41'	10,507,012.17'	307,906.96m	3,202,543.72m
B16	1,010,163.36'	10,507,036.30'	307,898.41m	3,202,551.07m
B17	1,010,135.31'	10,507,060.43'	307,889.86m	3,202,558.42m
C1	1,010,560.00'	10,506,646.33'	308,019.30m	3,202,432.21m
C2	1,010,531.95'	10,506,670.46'	308,010.75m	3,202,439.56m
C3	1,010,503.90'	10,506,694.59'	308,002.20m	3,202,446.92m
C4	1,010,475.85'	10,506,718.72'	307,993.65m	3,202,454.27m
C5	1,010,447.79'	10,506,742.84'	307,985.10m	3,202,461.62m
C6	1,010,419.74'	10,506,766.97'	307,976.55m	3,202,468.98m
C7	1,010,391.69'	10,506,791.10'	307,968.00m	3,202,476.33m
C8	1,010,363.64'	10,506,815.23'	307,959.45m	3,202,483.69m
C9	1,010,335.59'	10,506,839.36'	307,950.90m	3,202,491.04m
C10	1,010,307.54'	10,506,863.48'	307,942.35m	3,202,498.39m
C11	1,010,279.49'	10,506,887.61'	307,933.80m	3,202,505.75m
C12	1,010,251.44'	10,506,911.74'	307,925.25m	3,202,513.10m
C13	1,010,223.39'	10,506,935.87'	307,916.70m	3,202,520.46m
C14	1,010,195.34'	10,506,959.99'	307,908.15m	3,202,527.81m
C15	1,010,167.28'	10,506,984.12'	307,899.60m	3,202,535.17m
C16	1,010,139.23'	10,507,008.25'	307,891.05m	3,202,542.52m
C17	1,010,111.18'	10,507,032.38'	307,882.50m	3,202,549.87m

Table 24 - Possible AC Locations

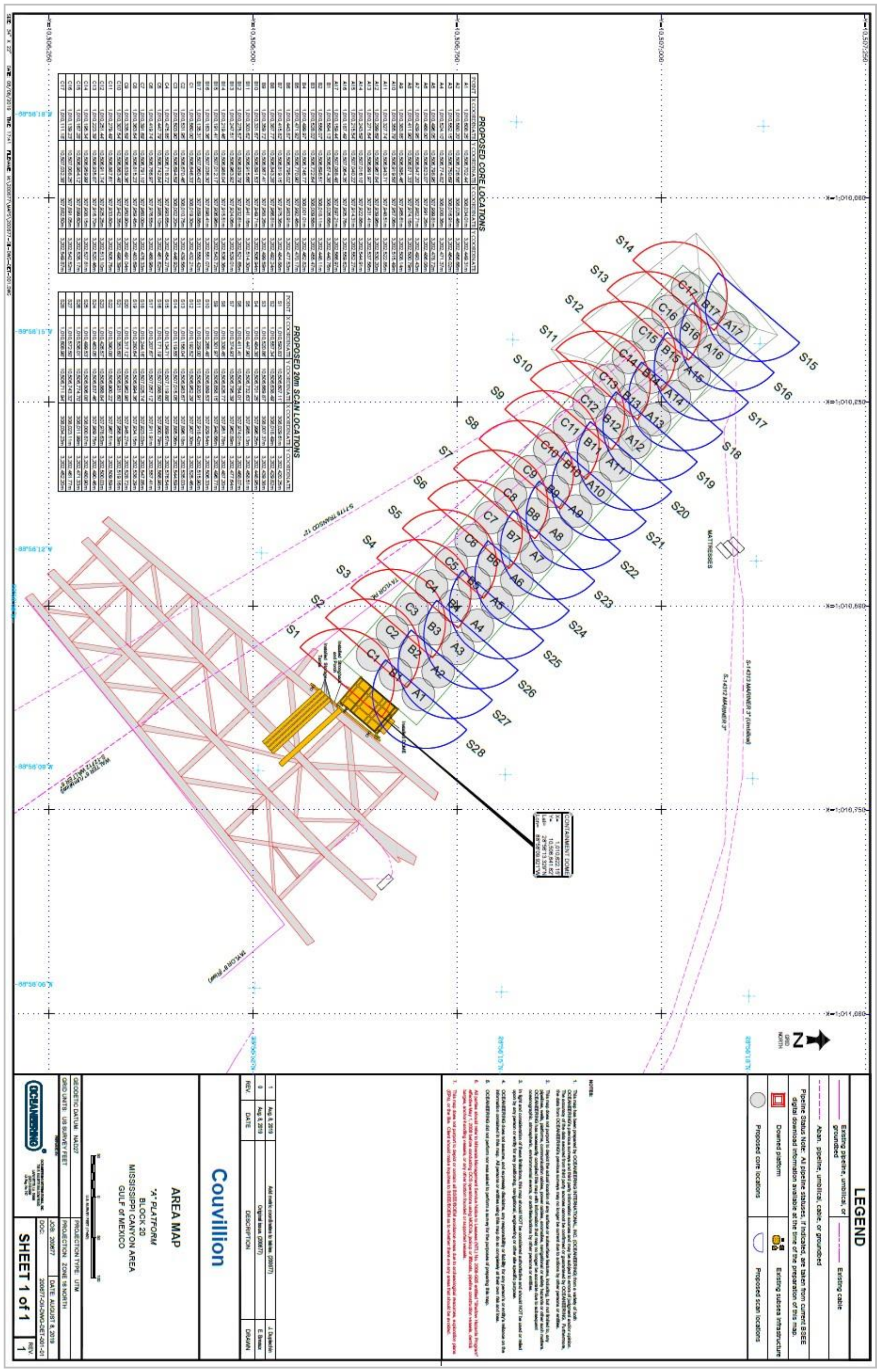


Figure 56 - Possible AC locations in relation to the toppled rig.

APPENDIX E TECHNICAL CORRECTION ON THE CONDUCTOR TRENDS

Memorandum

Technical Correction on the Conductor Trends Acoustic Corer™ Survey

For

Couvillion Group

Introduction:

After a detailed audit and investigation of our field procedures, data acquisition and management software along with a thorough analysis of our processing data conversions and rendering into imagery, it was determined that during preparation for this campaign, the TOGS Gyro was installed incorrectly. The investigation identified the following root cause and three contributing factors in this incident.

Root Cause:

The TOGS Gyro was installed incorrectly, +90 degree to the desired orientation.

Contributing Factors:

1. Competency

   Due to personal issues, Pangeo's lead mechanical expert was not present during the completion of the Acoustic Core (AC) maintenance program including alignment of the TOGS Gyro system. The task was led by PanGeo's senior ops manager who was not as familiar with the system's engineering drawings.

2. Management of Change

   During the change to the REDACTE system, the team failed to identify unintended consequences of changes to established Pangeo procedures and checks.

3. Confirmation Bias

   The Pangeo team immediately recognized the apparent irregularity of orientation after processing the data. QC checks were performed to confirm the orientation. The team initially focused on software driven issues assuming that the TOGS Gyro was in the correct orientation. The software analysis did not show any issues and hence the report was released to the Client. Upon receiving the report, the Couvillion team also recognized the apparent orientation issue and commented that the expected orientation would be -90 deg / 270 deg of what was being displayed. Pangeo repeated its review several times, to include bringing in an independent systems team to perform a detailed audit addressing all field procedures, data acquisition and management software including a thorough analysis of our processing data conversions and rendering into imagery. It was not until the senior ops manager was reviewing with the lead mechanical expert, that the physical alignment problem was recognized.

Overview Explanation of the Installation and Alignment of the TOGS

The "heading arrow" on the TOGS Gyro system should point toward the rear of the AC as per PanGeo engineering drawings. (Alignment Notch in direction of Boom Extensions). Prior to the MC 20 project the AC underwent a complete refurbishment. During the final stages of reassembly, PanGeo's lead mechanical expert was absent due to personal reasons. The QC audit revealed that the onsite lead responsible for the AC maintenance program recalled orienting the arrow on the TOGS mounting flange to point toward Boom 1. This offset would cause a 90-degree shift in the heading reading.

Image below shows the correct installation:

Direction of Boom 2 Extension

Direction of Boom 1 Extension

Figure: Image showing correct installation of TOGS, Husky Campaign 2014

Rear of AC (Direction of the Floor)

Heading Arrow

Pangeo engineered drawing displays the heading arrow to be pointing to the rear of the AC. On MC 20 the arrow was aligned wards Boom 1 causing the +90-degree misalignment to the correct installation as per the AC's engineering documentation. This resulted in an apparent 90-degree rotation in the AC data set.

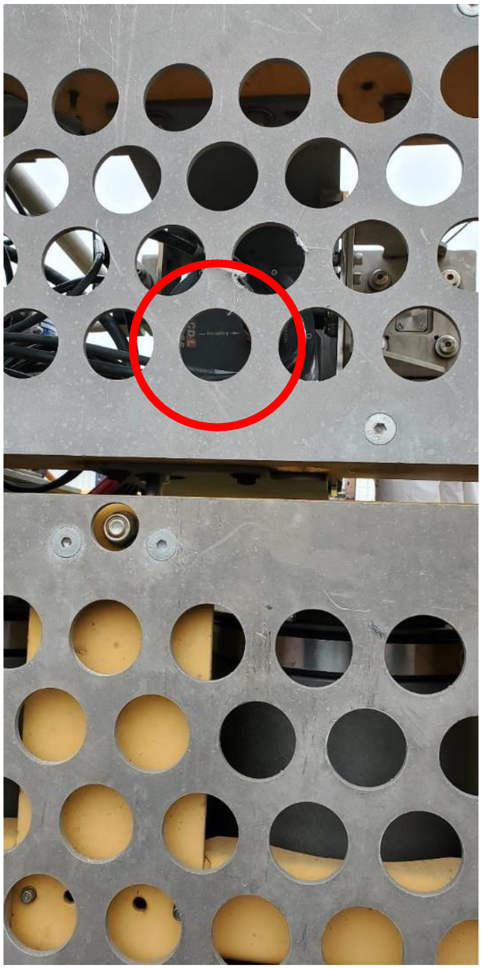


Figure: Image showing incorrect orientation of TOGS, Mississippi Canyon Campaign 2019

AC Approach Taken When In The Hydraulic Tripod Configuration REDACTED

The hydraulic tripod configuration requires a specific boom orientation to minimize reflections from the legs especially in aligning the JYG lines data acquisitions (When obtaining the velocity profile of the sub-seabed). The following are steps that are taken and used to verify correct alignments REDACTED

	QC Steps with Tripod Configuration (Standard)	QC Steps for MC 20REDACTED REDACTED
1.	Land AC and set hub motor to zero point	AC Landed REDACTED (B6) and set hub motor to zero point
2.	Align Booms to the JYG line position to avoid interference from legs while obtaining velocity profile	REDACTED
3.	AC is lifted and held 1m off the seafloor	N/A

4.	The ROV rotates the AC to a predefined heading based on the ROV.	N/A
5.	The AC is then considered landed	Considered landed
6.	The heading from the TOGS is compared to the heading given from the ROV to ensure the JYG lines are in the specific pre-project geologic desired orientation.	N/A – There were no pre-project specified geologic orientation.

Issue Arose in Applying for the First Time REDACTED [redacted]

The procedure was modified REDACTED [redacted] thus alignment of the JYG lines was not required. Step 2 was not performed, which would have identified the heading issue. Additionally, as there were no specific geologic orientational requirements, step 6 was removed without consideration to its secondary purpose being to verify the TOGS Gyro. Had this step been done, it would have identified the discrepancy in the orientation.

Lessons Learned:

REDACTED [redacted] will be a two-level verification procedure in place in the field to certify that the positioning of the booms is true.

Pangeo is also looking into an engineering design change that would eliminate this risk by assuring the TOGS Gyro system can only be affixed in the correct orientation.

APPENDIX F DAILY PROGRESS REPORTS

PGS Project #	P19-017O	Project Field	Mississippi Canyon 20
Client	Couvillion Group	End Client	
Vessel	VES Chloe Candies	Location/Sector	GoM MC20
Mob port	Fourchon, LA, USA	De-mob port	Fourchon, LA, USA
SBI #	AC	Deployment method	Crane / ROV

Summary of today's activity				
Midnight Position @ 00:00	Lat:	Alongside Port Fourchon	Long:	

Key Project Performance Indicators

Acquisition	0/XXX AC	% Complete:	
Processing	0/XXX AC	% Complete:	

Daily Report

From (UTC)	To (UTC)	Hours	Time Code	Details of events/Activities
13:00	15:00	02:00	MOB	PanGeo Crew Mob from New Orleans to Port Fourchon
15:00	17:00	2:00	MOB	Vessel induction and orientation
17:00	22:00	5:00	MOB	Removed Legs andinstalledstabbing guide.RemovedInnomarbottleandcaging.Assembled Larsinto twocomponents for vessel mob to startat 2019-09-02 @ 11:00 UTC
22:00	24:00	2:00	MOB	Crew in on standby waiting for crane OPS

total hours: 11:00

Cumulative hours/days

Time Code	Description	Today (HRS)	Today (Days)	Previous (Days)	Total (Days)	Comments
MOB	Mob / Demob	11:00	0.458		0.458	
OP	Operational	00:00	0.000		0.000	
WOW	Weather Standby	00:00	0.000		0.000	
BR	Breakdown/Downtime	00:00	0.000		0.000	
ST	Standby/Transit	00:00	0.000		0.000	
	Totals	11:00	0.458	0.000	0.458	

HSEQ Statistics

HSEQ event	Today	Previous	Total
Risk Assessment / JSA	1		1
Shift Handover	1		1
Tool Box Talks	1		1
Project Briefings			0
Management Attendance (not P.M.)			0
Facility Induction (per person)	6		6
Incident			0
Accident			0
Near Miss			0
First Aid/Injury			0
Drills/Musters Etc.			0
Safety Observations			0
Offshore Team Days	6		6

Personnel Status (Pangeo Subsea)

Name	Role	Arrived	Departed	Comments
Tommy McGarry	SBI Manager	2019-09-01		

Chris Hicks	Technician	2019-09-01		
Jon Aucoin	Technician	2019-09-01		
Megan Tucker	Technician	2019-09-01		
Ben Coghlan	Geo/Processor	2019-09-01		
Joel Soper	Technician	2019-09-01		

Equipment Status

Item	Description	Location	Status	Comments
1	Mobilization	Key Side	Mb	
2				
3				
4				
5				

(Mb=Mobilizing. Op=Operational, S=Storage, T=Transit, R=Repair/Maintenance,)

Next 24HRS Plan

Mobilize SBI and AC onto Vessel, interface and test

Comments - Pangeo Subsea

Comments - Client

DPR Distribution List

Pangeo Subsea:	DPR@pangeosubsea.com
Client:	

DPR Approved By

PGSS AC Manager	Signature	Date
T.McGarry		2019-09-01

Client Representative	Signature	Date

PGS Project #	P19-017O	Project Field	Mississippi Canyon 20
Client	Couvillion Group	End Client	
Vessel	VES Chloe Candies	Location/Sector	GoM MC20
Mob port	Fourchon, LA, USA	De-mob port	Fourchon, LA, USA
SBI #	AC	Deployment method	Crane / ROV

Summary of today's activity	Commence deck welding, SBI and AC Mob			
Midnight Position @ 00:00	Lat:	Alongside Port Fourchon	Long:	

Key Project Performance Indicators

Acquisition	0/XXX AC	% Complete:	
Processing	0/XXX AC	% Complete:	

Daily Report

From (UTC)	To (UTM)	Hours	Time Code	Details of events/Activities
0:00	13:30	13:30	MOB	Vessel prep for lifting, AC Van on deck at 13:00 , SBI in Hanger at 13:30
13:30	24:00	10:30	MOB	VesselcontinueDeckWeldingoperations,equipmentlifting.PowerinstalledinACVAN14:45, start interfacing SBI topside at 15:00

total hours: 24:00

Cumulative hours/days

Time Code	Description	Today (HRS)	Today (Days)	Previous (Days)	Total (Days)	Comments
MOB	Mob / Demob	24:00	1.000	0.458	1.458	
OP	Operational	00:00	0.000		0.000	
WOW	Weather Standby	00:00	0.000		0.000	
BR	Breakdown/Downtime	00:00	0.000		0.000	
ST	Standby/Transit	00:00	0.000		0.000	
	Totals	24:00	1.000	0.458	1.458	

HSEQ Statistics

HSEQ event	Today	Previous	Total
Risk Assessment / JSA	2	1	3
Shift Handover	1	1	2
Tool Box Talks	1	1	2
Project Briefings		1	1
Management Attendance (not P.M.)			0
Facility Induction (per person)	0	6	6

Incident			0
Accident			0
Near Miss			0
First Aid/Injury			0
Drills/Musters Etc.			0
Safety Observations			0
Offshore Team Days	6	6	12

Personnel Status (Pangeo Subsea)

Name	Role	Arrived	Departed	Comments
Tommy McGarry	SBI Manager	2019-09-01		
Chris Hicks	Technician	2019-09-01		
Jon Aucoin	Technician	2019-09-01		
Megan Tucker	Technician	2019-09-01		
Ben Coghlan	Geo/Processor	2019-09-01		
Joel Soper	Technician	2019-09-01		

Equipment Status

Item	Description	Location	Status	Comments
1	Mobilization	Key Side	Mb	VAN, SBI and Winch on board
2				
3				
4				
5				

(Mb=Mobilizing. Op=Operational, S=Storage, T=Transit, R=Repair/Maintenance,)

Next 24HRS Plan

Continue welding, Finish mobilizing AC and SBI interfacing

Comments - Pangeo Subsea

PanGeo Subsea

Comments - Client

DPR Distribution List

Pangeo Subsea:	DPR@pangeosubsea.com
Client:	

DPR Approved By

PGSS AC Manager	Signature	Date
T.McGarry		2019-09-02

Client Representative	Signature	Date

PGS Project #	P19-017O	Project Field	Mississippi Canyon 20
Client	Couvillion Group	End Client	
Vessel	VES Chloe Candies	Location/Sector	GoM MC20
Mob port	Fourchon, LA, USA	De-mob port	Fourchon, LA, USA
SBI #	AC	Deployment method	Crane / ROV

Summary of today's activity				
Midnight Position @ 00:00	Lat:	Alongside Port Fourchon	Long:	

Key Project Performance Indicators

Acquisition	0/XXX AC	% Complete:	
Processing	0/XXX AC	% Complete:	

Daily Report

From (UTC)	To (UTC)	Hours	Time Code	Details of events/Activities
0:00	14:25	14:25	MOB	Finish Deck Welding, ACMoband SBIinterface. ACfunction Stabguideandfunction test completeat14:25, Issuewith Network Speedfrom ROV,Issuewithintegrating Survey GGA, ZDA feedongoing
14:25	24:00	9:35	ST	Waiting to depart for site, SBI Trouble

total hours: **24:00**

Cumulative hours/days

Time Code	Description	Today (HRS)	Today (Days)	Previous (Days)	Total (Days)	Comments
MOB	Mob / Demob	14:25	0.601	1.458	2.059	
OP	Operational	00:00	0.000		0.000	
WOW	Weather Standby	00:00	0.000		0.000	
BR	Breakdown/Downtime	00:00	0.000		0.000	
ST	Standby/Transit	09:35	0.399		0.399	
	Totals	24:00	1.000	1.458	2.458	

HSEQ Statistics

HSEQ event	Today	Previous	Total
Risk Assessment / JSA		3	3
Shift Handover		2	2
Tool Box Talks		2	2

Project Briefings		1	1
Management Attendance (not P.M.)			0
Facility Induction (per person)		6	6
Incident			0
Accident			0
Near Miss			0
First Aid/Injury			0
Drills/Musters Etc.			0
Safety Observations			0
Offshore Team Days	6	12	18

Personnel Status (Pangeo Subsea)

Name	Role	Arrived	Departed	Comments
Tommy McGarry	SBI Manager	2019-09-01		
Chris Hicks	Technician	2019-09-01		
Jon Aucoin	Technician	2019-09-01		
Megan Tucker	Technician	2019-09-01		
Ben Coghlan	Geo/Processor	2019-09-01		
Joel Soper	Technician	2019-09-01		

Equipment Status

Item	Description	Location	Status	Comments
1	Mobilization	Key Side	Mb	
2				
3				
4				
5				

(Mb=Mobilizing. Op=Operational, S=Storage, T=Transit, R=Repair/Maintenance,)

Next 24HRS Plan

Continue Trouble shooting issue with ROV network
Continue Trouble shooting issue with Survey Feed

Comments - Pangeo Subsea

PanGeo Subsea

Comments - Client

DPR Distribution List

Pangeo Subsea:	DPR@pangeosubsea.com
Client:	

DPR Approved By

PGSS AC Manager	Signature	Date
T.McGarry		2019-09-03

Client Representative	Signature	Date

PGS Project #	P19-017O	Project Field	Mississippi Canyon 20
Client	Couvillion Group	End Client	
Vessel	VES Chloe Candies	Location/Sector	GoM MC20
Mob port	Fourchon, LA, USA	De-mob port	Fourchon, LA, USA
SBI #	AC	Deployment method	Crane / ROV

Summary of today's activity	Troubleshoot Survey stream, transit to site, test ROV positioning			
Midnight Position @ 00:00	Lat:	28 56 14	Long:	-88 58 10

Key Project Performance Indicators

Acquisition	0/XXX AC	% Complete:	
Processing	0/XXX AC	% Complete:	

Daily Report

From (UTC)	To (UTC)	Hours	Time Code	Details of events/Activities

PanGeo Subsea

0:00	24:00	24:00	ST	Continuetroubleshootingonsurveystreamand ROVnetworkspeed. Vesseldepartedfor siteat00:00, VesselatUSBLtestsiteat08:15, ROVoffDeckat09:34, Testcompleteand ROV onDeckat10:01.Surveystreamcorrected(workaround)@10:50. ROVgigabitswitchnot compatiblewiththeircurrentbulk endconnector,ROVtoreplaceduringACScan.SBI movedtolowerdeckat15:20.VesseldeparttoSu[redacted]20,Vessel on site at 18:00, commence[redacted]installation

totalhours: 24:00

Cumulative hours/days

Time Code	Description	Today (HRS)	Today (Days)	Previous (Days)	Total (Days)	Comments
MOB	Mob / Demob	00:00	0.000	2.059	2.059	
OP	Operational	00:00	0.000		0.000	
WOW	Weather Standby	00:00	0.000		0.000	
BR	Breakdown/Downtime	00:00	0.000		0.000	
ST	Standby/Transit	24:00	1.000	0.399	1.399	

Totals	24:00	1.000	2.458	3.458

HSEQ Statistics

HSEQ event	Today	Previous	Total
Risk Assessment / JSA	2	3	5
Shift Handover	1	2	3
Tool Box Talks	1	2	3
Project Briefings		1	1
Management Attendance (not P.M.)			0
Facility Induction (per person)		6	6
Incident			0
Accident			0
Near Miss			0
First Aid/Injury			0
Drills/Musters Etc.		1	1
Safety Observations			0
Offshore Team Days	6	12	18

Personnel Status (Pangeo Subsea)

Name	Role	Arrived	Departed	Comments
Tommy McGarry	SBI Manager	2019-09-01		
Chris Hicks	Technician	2019-09-01		
Jon Aucoin	Technician	2019-09-01		
Megan Tucker	Technician	2019-09-01		
Ben Coghlan	Geo/Processor	2019-09-01		
Joel Soper	Technician	2019-09-01		

Equipment Status

Item	Description	Location	Status	Comments
1	Mobilization	Key Side	Mb	
2				

(Mb=Mobilizing. Op=Operational, S=Storage, T=Transit, R=Repair/Maintenance,)

Next 24HRS Plan

Instal REDACTED movetoACsurveywhencomplete.Rovtocorrectnetworkissue(bulkheadconnector)while surveying and test

Comments - Pangeo Subsea

AC operational as 03 Sept 2019 at 16:25
Waiting to Test Network speed on ROV

Edit, muster drill on the 3Sept2019

Comments - Client

DPR Distribution List

Pangeo Subsea:	DPR@pangeosubsea.com
Client:	

DPR Approved By

PGSS AC Manager	Signature	Date
T.McGarry		2019-09-04

Client Representative	Signature	Date

PGS Project #	P19-017O	Project Field	Mississippi Canyon 20
Client	Couvillion Group	End Client	
Vessel	VES Chloe Candies	Location/Sector	GoM MC20
Mob port	Fourchon, LA, USA	De-mob port	Fourchon, LA, USA
SBI #	AC	Deployment method	Crane / ROV

Summary of today's activity				
Midnight Position @ 00:00	Lat:	28 56 15.98	Long:	-088 58 10.72

Key Project Performance Indicators

Acquisition	0/XXX AC	% Complete:	
Processing	0/XXX AC	% Complete:	

PanGeo Subsea

Daily Report

From (UTC)	To (UTC)	Hours	Time Code	Details of events/Activities
0:00	13:30	13:30	OP	REDACTED [redacted]
13:30	15:53	2:23	OP	Ac Launch (14:13), move into B6 and lower into stabbing guide (15:53)
15:53	16:16	0:23	OP	REDACTED [redacted]
16:16	18:15	1:59	OP	Derigging and standoff
18:15	24:00	5:45	OP	JYG scan

totalhours: 24:00

Cumulative hours/days

Time Code	Description	Today (HRS)	Today (Days)	Previous (Days)	Total (Days)	Comments
MOB	Mob / Demob	00:00	0.000	2.059	2.059	
OP	Operational	24:00	1.000		1.000	
WOW	Weather Standby	00:00	0.000		0.000	
BR	Breakdown/Downtime	00:00	0.000		0.000	
ST	Standby/Transit	00:00	0.000	1.399	1.399	
	Totals	24:00	1.000	3.458	4.458	

PanGeo Subsea

HSEQ Statistics

HSEQ event	Today	Previous	Total
Risk Assessment / JSA	1	5	6
Shift Handover	1	3	4
Tool Box Talks	1	3	4
Project Briefings		1	1
Management Attendance (not P.M.)			0
Facility Induction (per person)	0	6	6
Incident			0
Accident			0
Near Miss			0
First Aid/Injury			0
Drills/Musters Etc.			0
Safety Observations			0
Offshore Team Days	6	18	24

Personnel Status (Pangeo Subsea)

Name	Role	Arrived	Departed	Comments
Tommy McGarry	SBI Manager	2019-09-01		
Chris Hicks	Technician	2019-09-01		
Jon Aucoin	Technician	2019-09-01		
Megan Tucker	Technician	2019-09-01		
Ben Coghlan	Geo/Processor	2019-09-01		
Joel Soper	Technician	2019-09-01		

Equipment Status

Item	Description	Location	Status	Comments
1	AC onsite	MC20	OP	JYG Scan
2	SBI, waitingfor new Bulkhead connector onROV	MC20	Mb	
3				
4				
5				

(Mb=Mobilizing. Op=Operational, S=Storage, T=Transit, R=Repair/Maintenance,)

Next 24HRS Plan

Continue JYG SCAN and complete SAS scan, move to Site B3
Gigabit card to be installed

Comments - Pangeo Subsea

Multiple power Faults from over voltage
SBI Troubleshooting ongoing

Comments - Client

DPR Distribution List

Pangeo Subsea:	DPR@pangeosubsea.com
Client:	

DPR Approved By

PGSS AC Manager	Signature	Date
T.McGarry		2019-09-05

Client Representative	Signature	Date

PGS Project #	P19-017O	Project Field	Mississippi Canyon 20
Client	Couvillion Group	End Client	
Vessel	VES Chloe Candies	Location/Sector	GoM MC20
Mob port	Fourchon, LA, USA	De-mob port	Fourchon, LA, USA
SBI #	AC	Deployment method	Crane / ROV

Summary of today's activity	Complete SCAN B6, move and start Scan at B3			
Midnight Position @ 00:00	Lat:	28 56 15.98	Long:	-088 58 10.72

Key Project Performance Indicators

Acquisition	1/3 AC	% Complete:	33

PanGeo Subsea

Processing	1/3 AC	% Complete:	33

Daily Report

From (UTC)	To (UTC)	Hours	Time Code	Details of events/Activities
0:00	00:45	00:45	OP	JYG scan at B6
0:45	17:29	16:44	OP	SAS Scan at B6, start time was 00:52
17:29	22:55	5:26	OP	Moveinpickup ACandtransitto B3, install AC, layumbilical, return ROVtocagefor Noise test
22:55	23:20	0:25	OP	Continue noise test, pre-scan checks
23:20	23:24	0:04	OP	ROV on Deck at 23:27, Start sas scan at 23:24
23:24	24:00	0:36	OP	SAS scan at B3

totalhours: 24:00

Cumulative hours/days

Time Code	Description	Today (HRS)	Today (Days)	Previous (Days)	Total (Days)	Comments
MOB	Mob / Demob	00:00	0.000	2.059	2.059	
OP	Operational	24:00	1.000	1.000	2.000	
WOW	Weather Standby	00:00	0.000		0.000	
BR	Breakdown/Downtime	00:00	0.000		0.000	
ST	Standby/Transit	00:00	0.000	1.399	1.399	

Totals	24:00	1.000	4.458	5.458

HSEQ Statistics

HSEQ event	Today	Previous	Total
Risk Assessment / JSA	1	6	7
Shift Handover	1	4	5
Tool Box Talks	1	4	5
Project Briefings		1	1
Management Attendance (not P.M.)			0
Facility Induction (per person)	0	6	6
Incident			0
Accident			0
Near Miss			0
First Aid/Injury			0
Drills/Musters Etc.			0
Safety Observations			0
Offshore Team Days	6	24	30

Personnel Status (Pangeo Subsea)

Name	Role	Arrived	Departed	Comments
Tommy McGarry	SBI Manager	2019-09-01		
Chris Hicks	Technician	2019-09-01		
Jon Aucoin	Technician	2019-09-01		
Megan Tucker	Technician	2019-09-01		
Ben Coghlan	Geo/Processor	2019-09-01		
Joel Soper	Technician	2019-09-01		

Equipment Status

Item	Description	Location	Status	Comments
1	AC onsite	MC20	OP	Sas scan
2				
3				
4				
5				

(Mb=Mobilizing. Op=Operational, S=Storage, T=Transit, R=Repair/Maintenance,)

REDACTED [redacted]

PanGeo Subsea

Comments - Pangeo Subsea

Comments - Client

DPR Distribution List

Pangeo Subsea:	DPR@pangeosubsea.com
Client:	

DPR Approved By

PGSS AC Manager	Signature	Date
T.McGarry		2019-09-06

Client Representative	Signature	Date

PGS Project #	P19-017O	Project Field	Mississippi Canyon 20
Client	Couvillion Group	End Client	
Vessel	VES Chloe Candies	Location/Sector	GoM MC20
Mob port	Fourchon, LA, USA	De-mob port	Fourchon, LA, USA
SBI #	AC	Deployment method	Crane / ROV

Summary of today's activity	CompletedscanB3,recoveredtodeck, REDACTED			
Midnight Position @ 00:00	Lat:	28 56 15.98	Long:	-088 58 10.72

Key Project Performance Indicators

PanGeo Subsea

Acquisition	2/3 AC	% Complete:	66
Processing	2/3 AC	% Complete:	66

Daily Report

From (UTC)	To (UTC)	Hours	Time Code	Details of events/Activities
0:00	14:30	14:30	OP	SAS scan at B3
14:30	18:34	4:04	OP	ToolBoxtalk,vesselmovein,disconnectbasket,LiftACmoveouttosaferecoveryzone, recovered
18:34	23:00	4:26	ST	REDACTED [redacted]
23:00	24:00	1:00	OP	

total hours: 24:00

Cumulative /days

Time Code	Description	Today (HRS)	Today (Days)	Previous (Days)	Total (Days)	Comments
MOB	Mob / Demob	00:00	0.000	2.059	2.059	
OP	Operational	19:34	0.815	2.000	2.815	
WOW	Weather Standby	00:00	0.000		0.000	
BR	Breakdown/Downtime	00:00	0.000		0.000	

ST	Standby/Transit	04:26	0.185	1.399	1.584	
	Totals	24:00	1.000	5.458	6.458	

HSEQ Statistics

HSEQ event	Today	Previous	Total
Risk Assessment / JSA	1	7	8
Shift Handover	1	5	6
Tool Box Talks	1	6	7
Project Briefings		1	1
Management Attendance (not P.M.)			0
Facility Induction (per person)	0	6	6
Incident			0
Accident			0
Near Miss			0
First Aid/Injury			0
Drills/Musters Etc.			0
Safety Observations			0
Offshore Team Days	6	30	36

Personnel Status (Pangeo Subsea)

Name	Role	Arrived	Departed	Comments
Tommy McGarry	SBI Manager	2019-09-01		
Chris Hicks	Technician	2019-09-01		
Jon Aucoin	Technician	2019-09-01		
Megan Tucker	Technician	2019-09-01		
Ben Coghlan	Geo/Processor	2019-09-01		
Joel Soper	Technician	2019-09-01		

Equipment Status

Item	Description	Location	Status	Comments
1	AC onsite B9	MC20	OP	Sas scan
2	SBI standing by	MC20	S	
3				
4				
5				

(Mb=Mobilizing. Op=Operational, S=Storage, T=Transit, R=Repair/Maintenance,)

Next 24HRS Plan

Complete site B9 and recover, start transit to Dock

Comments - Pangeo Subsea

Comments - Client

DPR Distribution List

Pangeo Subsea:	DPR@pangeosubsea.com
Client:	

DPR Approved By

PGSS AC Manager	Signature	Date
T.McGarry		2019-09-06

Client Representative	Signature	Date

PGS Project #	P19-017O	Project Field	Mississippi Canyon 20
Client	Couvillion Group	End Client	
Vessel	VES Chloe Candies	Location/Sector	GoM MC20
Mob port	Fourchon, LA, USA	De-mob port	Fourchon, LA, USA
SBI #	AC	Deployment method	Crane / ROV

Summary of today's activity	CompleteScanB9,recovertodeckandcommencedemob duringtransittodock			
Midnight Position @ 00:00	Lat:	28 56 16.94	Long:	-088 58 13.12

PanGeo Subsea

Key Project Performance Indicators

Acquisition	3/3 AC	% Complete:	100
Processing	3/3 AC	% Complete:	100

Daily Report

From (UTC)	To (UTC)	Hours	Time Code	Details of events/Activities
0:00	01:26	01:26	OP	Complete move in, set AC and move out to
1:26	16:55	15:29	OP	SAS scan at B9
16:55	20:30	3:35	OP	ACrecovery, issues withcrane, one HPU notfunctioning. Movedin, attachedriggingand lifted AC to Deck
20:30	24:00	3:30	OP	Post dive checks and commence demob. Vessel heading to port

totalhours: 24:00

Cumulative hours/days

Time Code	Description	Today (HRS)	Today (Days)	Previous (Days)	Total (Days)	Comments
MOB	Mob / Demob	00:00	0.000	2.059	2.059	
OP	Operational	24:00	1.000	3.000	4.000	
WOW	Weather Standby	00:00	0.000		0.000	
BR	Breakdown/Downtime	00:00	0.000		0.000	

ST	Standby/Transit	00:00	0.000	1.399	1.399	
	Totals	24:00	1.000	6.458	7.458	

HSEQ Statistics

HSEQ event	Today	Previous	Total
Risk Assessment / JSA	1	8	9
Shift Handover	1	6	7
Tool Box Talks	1	7	8
Project Briefings		1	1
Management Attendance (not P.M.)			0
Facility Induction (per person)	0	6	6
Incident			0
Accident			0
Near Miss			0
First Aid/Injury			0
Drills/Musters Etc.			0
Safety Observations			0
Offshore Team Days	6	36	42

Personnel Status (Pangeo Subsea)

Name	Role	Arrived	Departed	Comments
Tommy McGarry	SBI Manager	2019-09-01		
Chris Hicks	Technician	2019-09-01		
Jon Aucoin	Technician	2019-09-01		
Megan Tucker	Technician	2019-09-01		
Ben Coghlan	Geo/Processor	2019-09-01		
Joel Soper	Technician	2019-09-01		

Equipment Status

Item	Description	Location	Status	Comments
1	AC onsite B9	MC20	OP	Sas scan
2	SBI standing by	MC20	S	
3				
4				
5				

(Mb=Mobilizing. Op=Operational, S=Storage, T=Transit, R=Repair/Maintenance,)

Next 24HRS Plan

Start transit back to dock and demob

Comments - Pangeo Subsea

Comments - Client

DPR Distribution List

Pangeo Subsea:	DPR@pangeosubsea.com
Client:	

DPR Approved By

PGSS AC Manager	Signature	Date
T.McGarry		2019-09-08

Client Representative	Signature	Date

PGS Project #	P19-017O	Project Field	Mississippi Canyon 20
Client	Couvillion Group	End Client	
Vessel	VES Chloe Candies	Location/Sector	GoM MC20
Mob port	Fourchon, LA, USA	De-mob port	Fourchon, LA, USA
SBI #	AC	Deployment method	Crane / ROV

Summary of today's activity	Demob equipmentfromVesselandtransporttoCouvillionyard,reinstalllegs

PanGeo Subsea

Midnight Position @ 00:00	Lat:	along side	Long:	

Key Project Performance Indicators

Acquisition	3/3 AC	% Complete:	100
Processing	3/3 AC	% Complete:	100

Daily Report

From (UTC)	To (UTC)	Hours	Time Code	Details of events/Activities
0:00	09:30	09:30	ST	Vessel transit into port, alongside at 09:30
9:30	17:00	7:30	MOB	Demobed equipment from vessel and onto to trucks
17:00	19:00	2:00	MOB	crew and equipment travel to Couvillion's yard
19:00	24:00	5:00	MOB	REDACTED [redacted]

totalhours: 24:00

Cumulative hours/days

Time Code	Description	Today (HRS)	Today (Days)	Previous (Days)	Total (Days)	Comments
MOB	Mob / Demob	14:30	0.604	2.059	2.663	
OP	Operational	00:00	0.000	4.000	4.000	

PanGeo Subsea

WOW	Weather Standby	00:00	0.000		0.000	
BR	Breakdown/Downtime	00:00	0.000		0.000	
ST	Standby/Transit	09:30	0.396	1.399	1.795	
	Totals	24:00	1.000	7.458	8.458	

HSEQ Statistics

HSEQ event	Today	Previous	Total
Risk Assessment / JSA	1	9	10
Shift Handover	1	7	8
Tool Box Talks	1	8	9
Project Briefings		1	1
Management Attendance (not P.M.)			0
Facility Induction (per person)	0	6	6
Incident			0
Accident			0
Near Miss			0
First Aid/Injury			0
Drills/Musters Etc.			0
Safety Observations			0
Offshore Team Days	6	42	48

Personnel Status (Pangeo Subsea)

Name	Role	Arrived	Departed	Comments
Tommy McGarry	SBI Manager	2019-09-01		
Chris Hicks	Technician	2019-09-01		
Jon Aucoin	Technician	2019-09-01		
Megan Tucker	Technician	2019-09-01		
Ben Coghlan	Geo/Processor	2019-09-01		
Joel Soper	Technician	2019-09-01		

Equipment Status

Item	Description	Location	Status	Comments
1	AC demobed	Belle Chasse	Mb	Located in Couvillion's yard
2	SBI demobed	Belle Chasse	Mb	Located in Couvillion's yard
3				
4				
5				

(Mb=Mobilizing. Op=Operational, S=Storage, T=Transit, R=Repair/Maintenance,)

Next 24HRS Plan

Return to yard in the AM and complete demob, prep AC and vans for transit

PanGeo Subsea

Comments - Pangeo Subsea

Comments - Client

DPR Distribution List

Pangeo Subsea:	DPR@pangeosubsea.com
Client:	

DPR Approved By

PGSS AC Manager	Signature	Date
T.McGarry		2019-09-09

Client Representative	Signature	Date

PGS Project #	P19-017O	Project Field	Mississippi Canyon 20
Client	Couvillion Group	End Client	
Vessel	VES Chloe Candies	Location/Sector	GoM MC20
Mob port	Fourchon, LA, USA	De-mob port	Fourchon, LA, USA
SBI #	AC	Deployment method	Crane / ROV

PanGeo Subsea

Summary of today's activity	Finalize demob and prep work for transit		
Midnight Position @ 00:00	Lat: along side	Long:	

Key Project Performance Indicators

Acquisition	3/3 AC	% Complete:	100
Processing	3/3 AC	% Complete:	100

Daily Report

From (UTC)	To (UTC)	Hours	Time Code	Details of events/Activities
0:00	14:00	14:00	MOB	returned to Couvillion's yard and completed demob and prepped AC for transit
14:00	24:00	10:00	MOB	Crew travel back to YYT

totalhours: 24:00

Cumulative hours/days

Time Code	Description	Today (HRS)	Today (Days)	Previous (Days)	Total (Days)	Comments
MOB	Mob / Demob	24:00	1.000	2.663	3.663	

OP	Operational	00:00	0.000	4.000	4.000	
WOW	Weather Standby	00:00	0.000		0.000	
BR	Breakdown/Downtime	00:00	0.000		0.000	
ST	Standby/Transit	00:00	0.000	1.795	1.795	
	Totals	24:00	1.000	8.458	9.458	

HSEQ Statistics

HSEQ event	Today	Previous	Total
Risk Assessment / JSA	1	9	10
Shift Handover	1	7	8
Tool Box Talks	1	8	9
Project Briefings		1	1
Management Attendance (not P.M.)			0
Facility Induction (per person)	0	6	6
Incident			0
Accident			0
Near Miss			0
First Aid/Injury			0
Drills/Musters Etc.			0
Safety Observations			0
Offshore Team Days	6	42	48

Personnel Status (Pangeo Subsea)

Name	Role	Arrived	Departed	Comments
Tommy McGarry	SBI Manager	2019-09-01		
Chris Hicks	Technician	2019-09-01		
Jon Aucoin	Technician	2019-09-01		
Megan Tucker	Technician	2019-09-01		
Ben Coghlan	Geo/Processor	2019-09-01		
Joel Soper	Technician	2019-09-01		

Equipment Status

Item	Description	Location	Status	Comments
1	AC demobed	Belle Chasse	Mb	Located in Couvillion's yard
2	SBI demobed	Belle Chasse	Mb	Located in Couvillion's yard
3				
4				
5				

(Mb=Mobilizing. Op=Operational, S=Storage, T=Transit, R=Repair/Maintenance,)

Next 24HRS Plan

Crew to transit home

Comments - Pangeo Subsea

Comments - Client

DPR Distribution List

Pangeo Subsea:	DPR@pangeosubsea.com
Client:	

DPR Approved By

PGSS AC Manager	Signature	Date
T.McGarry		2019-09-10

Client Representative	Signature	Date